Kumwell

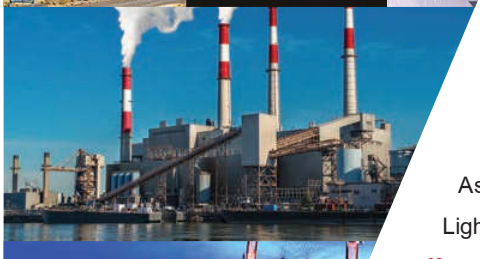
" We Take You to Safety "

Grounding & Lightning **Protection** System

Product Catalogue | 2019

Kumwell

Kumwell Corporation Public Limited or **Kumwell** is manufacturer and distributor of International Standard Lightning Protection product, Grounding System, Surge Protection and Lightning Detection and Warning System.



About us

Passion for Smart Living

Kumwell deliver safety to society for life and property with a International Standard grounding system and lightning protection with perfect standards design for Grounding System, Lightning Protection System, Surge Protection Lightning Detection and Warning System for safety and security in the infrastructure system in various countries such as

Electricity sector (Electricity Generation, Solar Power Plant, Wind Power Plant or Transmission, Distribution)

Transportation sector (Subway, Electric train, High-speed train, Airport, Port or Expressway)

Telecommunications sector (Microwave Station, Radio Station, Television Station, Mobile Phone Station or Data Center)

Industrial sector (Petrochemical Plant, Oil Refinery, Steel Factory and Farm)

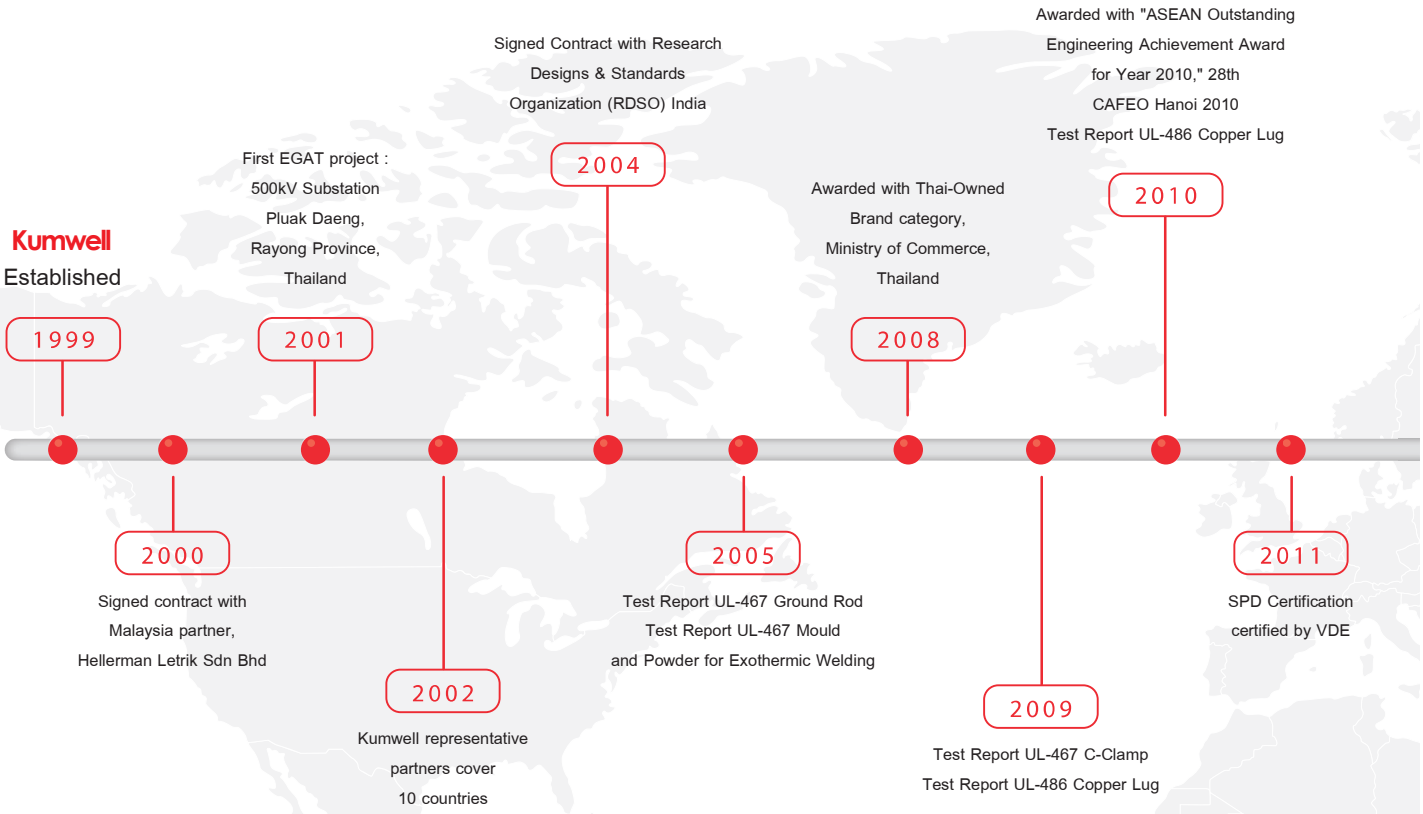
Building (Tower, Complex Building, Stadium, Hospital, School, Home, Castle or Temple)

Kumwell focus on establishing brand awareness in business and technology through world trade shows in China, India, Saudi Arabia, United Arab Emirate, Malaysia, Philippines, Vietnam and Indonesia. Kumwell attend an international conference such as Asia-pacific International Conference on Lightning (APL), International Conference on Lightning Protection (ICPL) and etc

Kumwell very determination to leader for total solution service in grounding system and lightning protection **"We Take You to Safety"**

Milestone & Achievement

Kumwell has been established since 1999 with professional engineers emphasize on the core of Grounding & Lightning Protection : copper conductor to steel structure, and copper conductor to ground rod for Electricity Generating Authority of Thailand (EGAT), also is o in Thailand.



Vision

- Leader with Total Solution in Grounding & Lightning Protection System with the Strongest Global Brand, High Performance Organization and Sustainable Growth.

Mission

- Striving to create value for customer in term of products and services.
- To provide knowledge to global society regarding safety and power quality.
- Research and develop products and services to meet the world highest quality.
- Developing quality management system toward the operational excellence to contribute a sustainable growth.

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System. Starting with the development and manufacturing of Exothermic Welding to connect copper conductor to copper conductor, one of the most important organization of electricity segment for generation plants, transmission lines, substations, and distribution lines

2012
Established complete Laboratory Testing according to IEC Standard

2013
Awarded with "ASEAN Outstanding Engineering Achievement Award for Year 2013, 31st CAFEO Jakarta 2013
Improved new factory at Nonthaburi

2015
Established "Kumwell Nowcast" with support from Nowcast, Germany to provide Lightning Detection and Warning Systems in Thailand and ASEAN under the brand "Kumwell Powered by Nowcast"

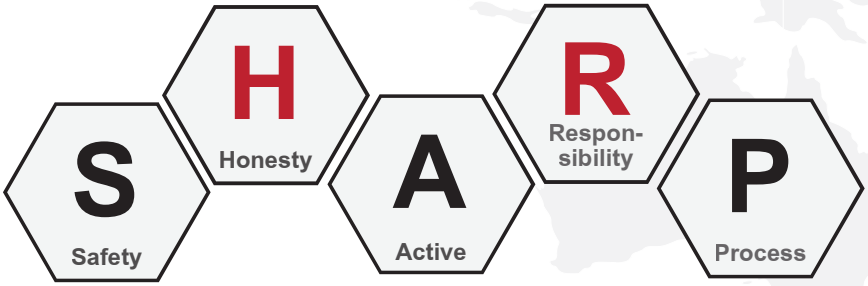
2016
Established Kumwell Learning Center to educate people with grounding and lightning protection knowledge.

2017
Launched the mobile application "Lightning Warning Application"
From Play Store Signed Memorandum of Understanding for Science and Technology Research and Development between Naval Research and Development Office, Royal Thai Navy and Kumwell Corporation Limited.

2018
Launch new products, Lightning warning system for Airport (KAWS), Kumwell Lightning warning system (KSWS), EEC Ligthing Dome, smart SPD, KHV cable for down conductor.

2019
Registered as a Public Company Listed on the Stock Exchange of Thailand.

Corporate Value



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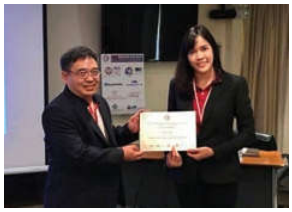

Research & Development

Lightning is natural phenomena that can cause life and property damage and constantly changing, so lightning protection is important and need to be modern at all times (State of the Art) for maximum efficiency. Kumwell Research and Development Team following new technology for lightning protection in bringing to the research, production development include Solution for maximum lightning protection and deliver safety to society, Kumwell join the international research network such as International Conference on Lightning Protection (ICPL), International Electrotechnical Commission (IEC), International Council on Large Electric Systems (CIGRE), Institute of Electrical and Electronics Engineers (IEEE), Asia-Pacific International on Lightning Protection (APL) and etc.

KEY of Kumwell Research

- Present and Published many articles such as ICPL, CIGRE, IEEE and APL
- Best Young Scientish Award form International Conference 2017 (APL 2017)
- MOU with any government agencies such as Navy and King Mongkut's Institute of Technology Ladkrabang.
- Kumwell has the modern test room according to IEC 62561 standards only one in the ASEAN region.
- Innovations
  - Smart Lightning Management System
  - Smart Ground Monitoring System
  - Electronic Ignitor for Exothermic Welding

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Creating Shared Value

Kumwell has announced Creating Shared Value (CSV): Safety to Society program around Thailand and ASEAN countries to provide and share knowledge of Grounding and Lightning Protection System to Government networking such as Ministry of Labour, Ministry of Education, Ministry of Industry, and Council of Engineers. And Private networking such as The Engineering Institute of Thailand, Thai Electrical & Mechanical Contractors Association, and other engineering institutions to ensure that each segment shall generate qualified professional engineers and professional technicians whom serve the local society of how to design, install, inspect and maintenance Grounding System / Lightning Protection System / Surge Protection Device / Lightning Detection and Warning System with a highly concerned of operating sustainable business practice. The industry, community and environment have to grow together by a good support among one another.

Kumwell has moved forward to invest complete laboratory testing equipment according to 7 parts of IEC 62561:2012 Standard **"Lightning Protection Component Series"** (IEC 62561-1 Requirement for Connection components, IEC 62561-2 Requirement for Conductors and Earth Electrodes, IEC 62561-3 Requirement for Isolating Spark Gaps (ISG), IEC 62561-4 Requirement for Conductor Fasteners, IEC 62561-5 Requirementfor Earth Electrode Inspection Housings and Electrode Seals Concrete Inspection Pit, IEC 62561-6 Requirement for Lightning Strike Counters, IEC 62561-7 Requirement for Earthing Enhancing Compounds). The testing equipment has composed of Environment Test (Humid Sulphurous Atmosphere Treatment and Salt Mist Treatment), Mechanical Test (Tensile and Compressive Machine), Electrical Test (Lightning Impulse High Current Machine and Contact Resistance Measurement Machine), SPD functional test cover all SPD application, AC power, communication, DC system which comply to IEC 61643-11, 21, 31. A list of some of the existing equipment is below : 60 kA Lightning Impulse current generator, 10/350 µS and 8/20 µS use wave shape for LPS and SPD (Class I,II) testing, 20 kV/10 kA Combination wave impulse generator for SPD class III testing, 10/700 µS ring wave generator for communication SPD test, SO2 simulation environment chamber corrosion test, Salt spray simulation environment chamber test, Universal mechanical tensile test, Micro ohm contact resist 50Hz 2000 A power source to ensure Kumwell components shall be manufactured and delivered high standard and quality product.

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Kumwell Academy

Kumwell establish Learning Center “Lightning and Grounding” since 2010 and changed name to Kumwell Academy in 2016 from the concept “Safe society in life and property due to lightning disaster” with objective of delivering knowledge and understanding of lightning protection and grounding system according to science and engineering to society and communities for apply knowledge to develop in relevant professions and be a part in driving towards safety for society.

Kumwell Academy deliver safety to society from seminar to educate engineers in relevant fields and those interested in reduction and lightning protection, such as design engineers, consultants, installation engineers include government and private sector.

Kumwell collaborate with public and private networks to develop courses that lead to mutual innovation.

Kumwell Academy course is project for support member of council of engineers, So Kumwell Academy allowed to host that has been certified from council of engineers for continuing professional development. Engineer who pass the seminar from Kumwell Academy to get CPD points from Council of Engineers then Kumwell cooperate with Ministry of Labor, Department of Skill Development for learning center and skill standard and test development of nation in school of grounding and lightning protection.

Kumwell Academy

- Is a place to learning about safety standard from lightning strike and proper grouding.
- Is a standard seminar certified from council of engineers.
- Is a place for develop the curriculum to suit the profession.
- Is a place for research and develop product include design innovation for lightning protection.
- Is a place for research and develop product for grounding system.

Kumwell Academy organize ongoing seminars on a monthly basis from specialist such as

- Asst. Prof. Prasit Pittayapat
- Assoc. Prof. Dr.Weerachet Kunneoen
- Mr. Sinchai Anantapreecha
- Mr. Annop Roma
- Mr. Phatrakit Pisapan
- Mr. Surachai Phommeepun
- Mr. Korbkit Saduakkarn
- Mr. Thanunchai Horchue
- Ms. Panita Pravalpruek
- Ms. Temduan Sungkaro
- Mr. Pathorn Sirachansawang

On many topics such as Grounding handbook, Standard grounding according byThe Engineering Institute of Thailand, Substation Grounding Design According to IEEE 80, Surge Protective Device (SPD) / Risk Assessment / Lightning Protection System Design : Electrical & Electronic Equipment (IEC 62035-4), Lightning Protection System Design According to IEC Standard, Lightning Protection System Design For Concrete Structure / Industrial Plant and Utilizing Concrete Foundation as Grounding System / Lightning Data & Warning System / Design Guide Lightning and Electromagnetic Impulse Protection System for Concrete Structure and Concrete Foundation as Grounding System / Surge Protective Devices etc.

At Kumwell Academy, Which has always received the attention of both domestic and foreign engineers.

Kumwell Clinic Network

Standard of lightning protection from IEC, it's international standard first published in 2006 and update in 2010. As show that standard published shortly, So knowledge about lightning protection has not spread widely and not fully integrated in society. For new building design with standard lightning protection according by IEC but old building lightning protection be flawed which makes damage to operation system and electrical equipment. In which the investigation and analysis of the cause to lead the problems will be difficult because there is no basic about lightning protection. So expert officers are important for examine and analysis to lead to solve every problems effectively.

Kumwell start the project to survey, check, analysis and find the way to solution of development lightning protection, grounding system and surge counter for old building by specialist engineer with technical document such as project design, product information, how to install material and maintenance report. We investigate with eyes and special equipment for check inside and outside building such as Earth Resistance and Soil ResistivityTester, Clamp Earth Resistance Tester, Low Resistance Ohmmeter, Earthing Impulse Impedance meter and Surge Protective Device Tester, etc. Moreover, we have special test equipment for project EMC/EMI is Spectrum Analyzer, Power Quality Analyzer and RF EMF Strength Meter to complete inspection and bring to compare with standard to present and find solution. In 10 years of this project, we found many problems and solutions such as hotel and resort on the mountain lack of lightning protection and surge counter, high voltage line in Lao improve the grounding system with Earthing Enhancing Compounds because due it's in an area with high soil resistance, Communication radar pole of Navy, Oil Refinery Binhson Refining & Petrochemical (BSR) in Vietnam, Tank Farm, Coal power plant and Combined cycle power plant. Operation system fault form wave by incomplete lightning protection such as Metro Control, Battleship Weapon System and Automatic control of building or factory.

Kumwell Clinic is total solution center for investigate and analysis lightning protection, grounding system, surge counter, lightning and warning system and smart lightning management system covering all areas in Thailand and the ASEAN region to protect against threats from lightning strikes and the electromagnetic field for the safety of life and property, as well as allowing various operating systems to work continuously in all conditions seamless.

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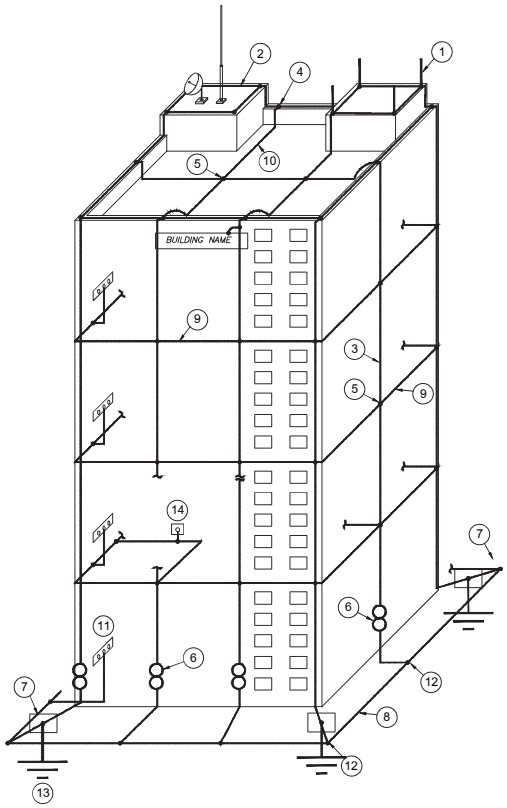
Protection Against Lightning

Lightning is one of nature's most powerful and destructive phenomena. Lightning strikes present a real and significant threat to life, to the structures in which we live and work, and to the electronic systems which support us in our daily lives.

The effects of a direct strike are obvious and immediately apparent - structures damaged, personal injuries and even loss of life. However, the secondary effects of lightning - the surge overvoltages and lightning electromagnetic impulse (LEMP) can cause damage to electrical and electronic systems within structures.

A reliable lightning protection system must encompass external lightning protection, effective grounding and surge protection of electrical and electronic system as well as the LEMP protection measures.
That's why the protection against lightning according to IEC 62305 Series is essential.
IEC 62305-1 (General Principals): Describe the purpose of IEC 62305 Series and the connection between each part.
IEC 62305-2 (Risk Management): Determine the need for protection, the economic benefits of installing protection measures and the selection of adequate protection measures.
IEC 62305-3 (Physical Damage to Structures and Life Hazard): Main protection measures in and around a structure against physical damage and injury to living beings due to touch and step voltages.
IEC 62305-4 (Electrical and Electronics Systems within Structures): Provides information on protection measures to reduce the risk of permanent failures of electrical and electronic systems within structures caused by the lightning electromagnetic impulse (LEMP).



Description

1. Air Terminals
2. Conductors
3. Down Conductors
4. Three Way Connection
5. Four Way Connection
6. Test Box
7. Concrete Inspection Pit
8. Ring Earth Electrode
9. Ring Conductor
10. Fastener
11. Bonding Bar
12. Exothermic welding
13. Ground Rod
14. Earth Point

The connection between the parts of IEC 62305 Series as shown in figure below.

Protection Against Lightning

IEC 62305 Series

- **IEC 62305-1** — General Principles
- **IEC 62305-2** — Risk Management
  - **IEC 62305-3** — Physical Damage to Structure and Life Hazard
    - Air Termination System
    - Down Conductor System
    - Grounding System and Bonding Network
  - **IEC 62305-4** — Electrical and Electronic Systems within Structure
    - Magnetic Sheilding
    - SPD
    - Isolating Interface

IEC 62561 Series

Requirements for Lightning Protection System Components (LPSC)

IEC 61643 Series

Low-Voltage Surge Protective Devices

Test and Certificate

Using components and devices which have been tested in compliance with the latest standards is a basic prerequisite for a functional lightning protection system. Installers of lightning protection systems must select components according to the requirements at the installation site and install them in accordance with the manufacturer specifications.

All of lightning protection components used for installing the external lightning protection system shall meet the requirements of IEC 62561 Series as following;

IEC62561-1: Connection Component

IEC62561-2: Conductors and Earth Electrodes

IEC62561-3: Isolating Spark Gaps (ISG)

IEC62561-4: Conductors Fasteners

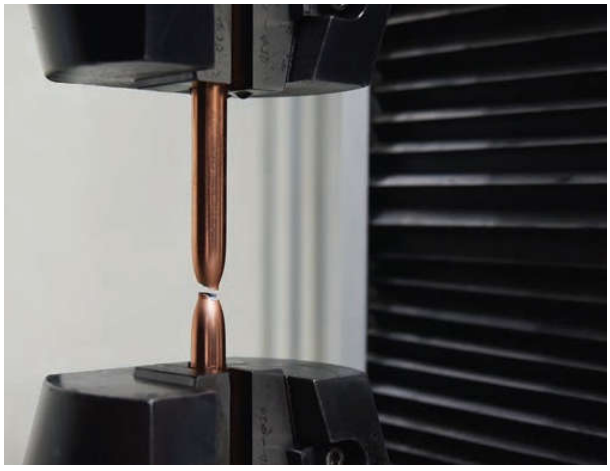
IEC62561-5: Earth Electrode Inspection Housings and Electrode Seals

IEC62561-6: Lightning Strike Counters

IEC62561-7: Earthing Enhancing Compounds

IEC62561-8: Components for Isolated LPS

All of Kumwell components are tested according to IEC 62561 Series and certified by accredited third-party.



Standard Ground Rod

Copper-Bonded Ground Rods meet the requirements of the world rigorous standard-UL. Ground rods are made by molecularly bonding process 99.9% purity electrolytic copper onto high tensile and low carbon steel cores to ensure a perfect and even bonding between the steel and copper. The copper layer whose minimum thickness is 254 micron met to IEC 62561-2 and UL standard.

Standard size diameters being common used are 1/2" , 5/8" , 3/4" , and 1".

Standard lengths being common used are 4' to 10'.

Thread type ground rods are available for extensible the length of ground rods by coupling.

Intensive Test and Inspection of Ground Rod Ground Rods should pass the following criterions of international standards as shown;

Thickness Inspection

Copper shell of each ground rod shall be passed the thickness inspection to ensure its protective coating. The copper shell shall not be less than 0.254 mm (254 micron) thick at any point met to UL 467 standard.

Adherence of Coating Test

There shall be no separation of the coating from the steel core when subjected to the test described as follow met with UL 467standard requirements. Peeling of the coating by the steel plates or the jaws of the vise shall be allowed.

Bending Strength Test

There shall be no cracking of the coating when subjected to the test met with UL 467 standard requirements. The application of force shall be such that the rod is permanently bent through a 30° angle.

Straightness Test

Ground rod should be passed straightness test to ensure in its straightness and high tensile with acceptable sag. The deviation of every 305 mm ground rod shall be less than 3.05 mm.

Ground Rod

There are several main objectives providing for well-designed grounding system. First priority is personal safety which followed by protection equipment, signal reference quality, return path for faults and surges, and static dissipation.

In order to follow these objectives, all components shall be meet up to international standards as IEC 62561-2, UL 467. Grounding system must be maintained in a low permanent resistance under adverse conditions for the expected lifetime of Grounding System.

Ground Rods, Conductors, and Connectors in Grounding Network are subjected to severe corrosion to acidic and high concession of salt environment. In case of high mechanical stress is due to the electromagnetic force, and also rapid thermal heating is due to the high current magnitude during fault conditions.

Ground Rod Selection

When choosing which material types to use for a ground rod, the best way is to consider the installation location by measuring soil pH whether if it is acidic, neutral or alkaline.

- If it is acidic (pH < 6), the recommended selection is stainless steel ground rod.
- If it is neutral (pH between 6 - 8), the recommended selection is copper bonded ground rod (254 micron).
- If it is alkaline (pH > 8), the recommended selection is solid copper ground rod. In case of hard soil condition, the recommended selection is copper bonded ground rod 375 or 508 micron.

Copper-Bond Ground

- Earth rods are made from high tensile low carbon steel.
- Each rod is made by molecularly bonding 99.9 % pure electrolytic copper.
- Molecular bond to nickel-sealed high strength steel core
- The copper layer whose minimum thickness 254 micron met to UL standard
- High tensile steel core 450 N/mm^2 and ensurer a long life span.

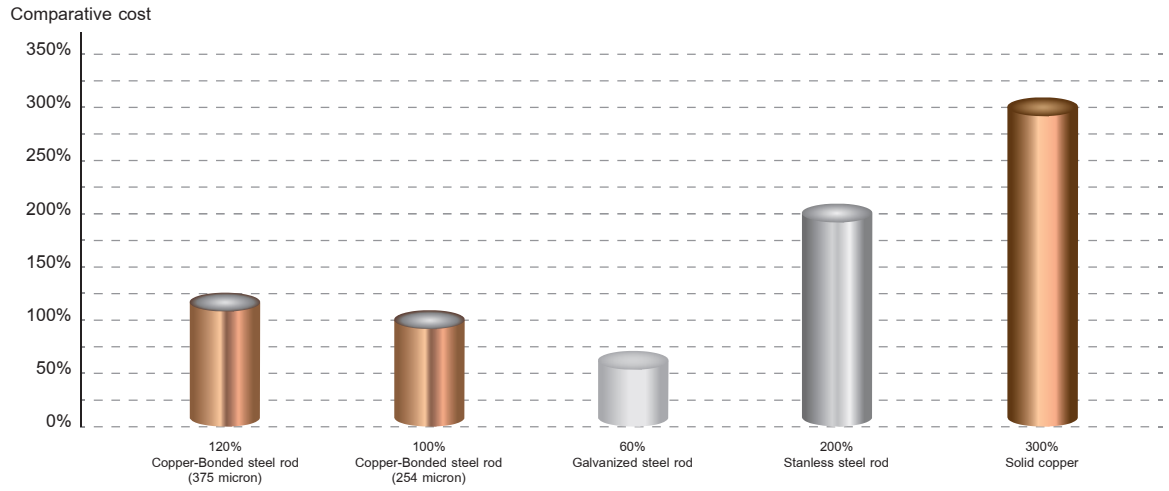
Solid Copper

- High investment and high resistance to corrosion
- Low resistivity
- Solid Copper Ground Rod must be prepared a hole which deep down equal with length rod for protect bending (can’t be hammering rod).

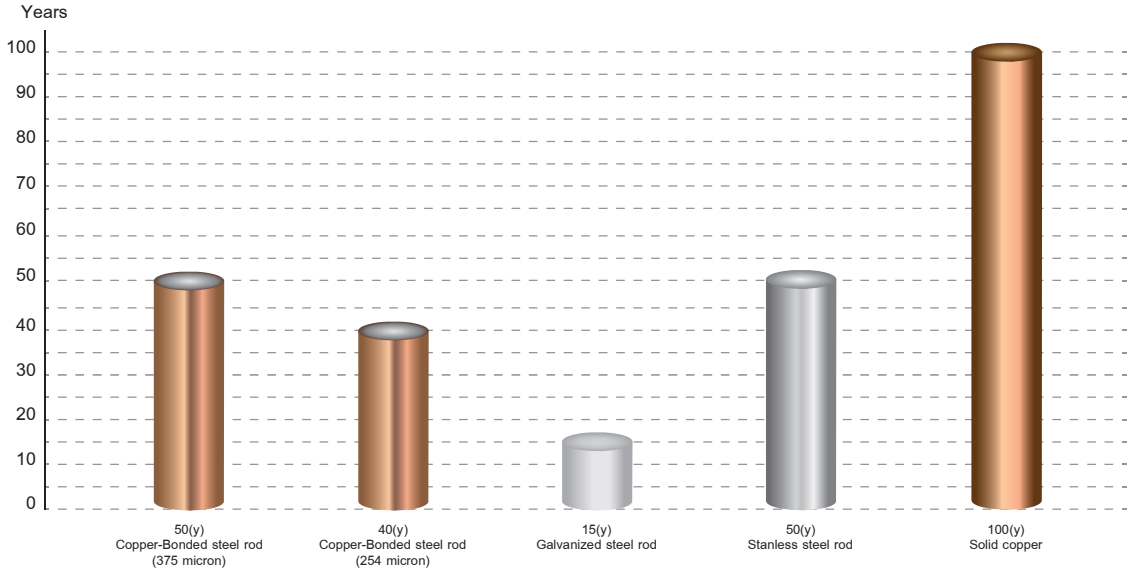
Stainless steel (316L)

- High investment and high resistance to corrosion
- High Strength

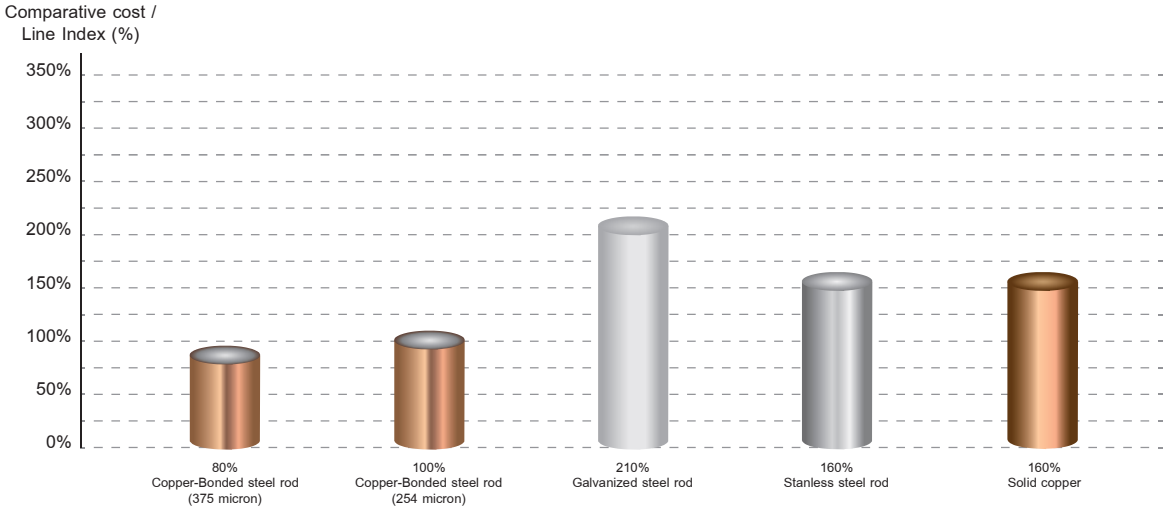
Ground Rod



Comparative initial cost (Copper bond steel rod 254 micron as 100% base)



Expected Average Service Life



Comparative Annual cost (Lower is Better)

Ground Rod Selection

There are two main factors for choosing Ground Rod.

- Material
- Size

Material Selection

BS 7430 standard contains the following corrosion protection recommendations:

- Stainless steel has the best resistant to corrosion with normal resistivity but has a relatively high price
- Solid Copper Rod is very resistant to corrosion with very low resistivity but has a very high price.
- Copper Bond Rod (254 micron) is resistant to corrosion with a low resistivity, and is very strong. Because the core is steel, but cheap

Corrosion resistance and Price

		Soil Copper	Copper Bond	Galvanized Steel	Stainless Steel	
Soil-pH	Acidic (pH < 6)	●●●	●●●	●●●●	●●	Corrosion Rate
	Neutral (pH 6 to 8)	●	●	●	●	
	Alkaline (pH > 8)	●●	●●	●●●	●	
Price		Very High	Normal	Low	High	
Age		100 Year	40-60 Year*	15 Year	50 Year	

Note : BS 7430 : 2011,Table 9, Page 59

*Copper Bond 254 micron = 40 year, 375 micron = 50 year, 508 micron = 60 year

The corrosion characteristics of each material compared to the soil (●)

● = indicate corrosion resistance generally unaffected

●● = indicate corrosion resistance only slightly reduced

●●● = indicate corrosion resistance moderately reduced

●●●● = indicate corrosion resistance considerably reduced

Sizing

The selection of material, configuration and cross-sectional area of ground rods shall be in accordance to IEC 62561-2 (Requirements for Conductors and Earth Electroded)

Material, configuration and cross-sectional area of earth electrodes

Material	Configuration	Cross-sectional area [a]			Recommended dimensions
		Earth rod mm^2	Earth conductor mm^2	Earth plate cm^2	
Copper, Tin plated copper [f]	Stranded		≥ 50 [i]		1, 7 mm strand diameter
	Solid round		≥ 50		8 mm diameter
	Solid tape		≥ 50		2 mm thick
	Solid round	≥ 176			15 mm diameter
	Pipe	≥ 110			20 mm diameter with 2 mm wall thickness
	Solid plate			≥ 2 500	500 mm x 500 mm and 1, 5 mm thick [g]
	Lattice plate [g]			≥ 3 600	600 mm x 600 mm consisted of 25 mm x 2 mm section for tape or 8 mm diameter for round conductor
Copper-Bonded steel	Solid round	≥ 150 h			14 mm diameter if 250 µm minimum radial copper coating with 99.9% copper content
	Solid round		≥ 50		8 mm diameter if 250 µm minimum radial copper coating of 99.9% copper content
	Solid round [l]		≥ 78		10 mm diameter if 250 µm minimum radial copper coating of 99.9% copper content
	Solid tape [l]		≥ 90		3 mm thick if 250 µm minimum copper coating of 99.9% copper content
Stainless steel [j]	Solid round		≥ 78		10 mm diameter
	Solid round	≥ 176 h			15 mm diameter
	Solid tape		≥ 100		2 mm thick

Note: For the application of the earth electrodes, see IEC 62305-3.

a Manufacturing tolerance : -3%.

b Threads, where utilized, shall be machined prior to galvanizing.

c The copper shall be intrinsically bonded to the steel. The coating can be measured using an electronic coating measuring thickness instrument.

d Lattice plate constructed with a minimum total conductor length of 4, 8 m.

e Different profiles are permitted with a cross section of 290 mm^2 and a minimum thickness of 3 mm, e.g. cross profile.

f Hot dipped or electroplated; minimum thickness coating of 1 µm. There is no requirement to measure the tin plated copper because it is for aesthetic reasons only.

g In some countries, the cross-sectional area may be reduced to ≥ 1 800 cm^2 and the thickness to ≥ 0, 8 mm.

h In some countries, the cross-sectional area may be reduced to 125 mm^2.

i The cross-sectional area of stranded conductors is determined by the resistance of the conductor according to IEC 60228.

j Chomium ≥ 16%, nickel ≥ 5%, molybdenum ≥ 2%, carbon ≤ 0.08%.

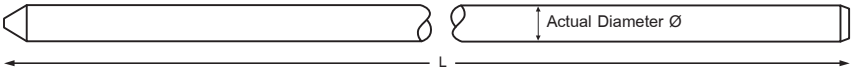
k Shall be embedded in concrete for a minimum depth of 50 mm.

l Due to higher corrosion rate for solid tape earth conductors, it is recommended to use copper-coated steel with a coating of 250 µm.

Copper-Bonded Ground Rod (254 micron)

LISTED
GROUNDING ELECTRODE
32UG

Copper-Bonded ground rod is made by molecularly bonding pure electrolytic copper onto a low carbon, high tensile steel core with exceeding 0.254 mm (254 micron) thick. The material made of 99.9% pure electrolytic copper with high tensile steel. To ensure in safety and quality, it meets UL and IEC standard for grounding and bonding equipments.



Standard Type (UL-Listed)

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Length (ft)	Weight (kg)
GRCBU 128	1/2	12.7	8	2.47
GRCBU 1210	1/2	12.7	10	3.08
GRCBU 588	5/8	14.2	8	3.08
GRCBU 5810	5/8	14.2	10	3.80
GRCBU 348	3/4	17.2	8	4.46
GRCBU 3410	3/4	17.2	10	5.58
GRCBU 18	1	23.1	8	8.04
GRCBU 110	1	23.1	10	10.15

Standard Type

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Length (ft)	Weight (kg)
GRCBU 124	1/2	12.7	4	1.23
GRCBU 126	1/2	12.7	6	1.85
GRCBU 584	5/8	14.2	4	1.54
GRCBU 586	5/8	14.2	6	2.31
GRCBU 344	3/4	17.2	4	2.23
GRCBU 346	3/4	17.2	6	3.35
GRCBU 14	1	23.1	4	4.30
GRCBU 16	1	23.1	6	6.09

Test Certificate
IEC 62561 Part 2
UL 467

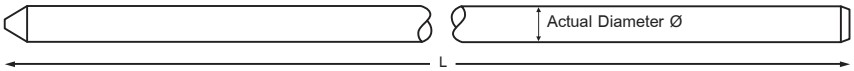
Material
High tensile strength steel
Copper purity > 99.9%

Application
Suitable for disperse current into the earth.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Copper-Bonded Ground Rod (375 micron)

Copper-Bonded ground rod is made by molecularly bonding pure electrolytic copper onto a low carbon, high tensile steel core with exceeding 0.375 mm (375 micron) thick. The material made of 99.9% pure electrolytic copper with high tensile steel. To ensure in safety and quality, it meets UL and IEC standard for grounding and bonding equipments.



Standard Type

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Length (ft)	Weight (kg)
GRCB375 124	1/2	12.9	4	1.12
GRCB375 126	1/2	12.9	6	1.68
GRCB375 128	1/2	12.9	8	2.59
GRCB375 1210	1/2	12.9	10	3.24
GRCB375 584	5/8	14.3	4	1.60
GRCB375 586	5/8	14.3	6	2.24
GRCB375 588	5/8	14.3	8	3.17
GRCB375 5810	5/8	14.3	10	3.97
GRCB375 344	3/4	17.3	4	2.33
GRCB375 346	3/4	17.3	6	3.49
GRCB375 348	3/4	17.3	8	4.72
GRCB375 3410	3/4	17.3	10	5.80
GRCB375 14	1	23.3	4	4.19
GRCB375 16	1	23.3	6	6.29
GRCB375 18	1	23.3	8	8.35
GRCB375 110	1	23.3	10	10.47

Test Certificate
IEC 62561 Part 2
UL 467

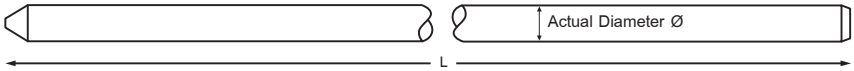
Material
High tensile strength steel
Copper purity > 99.9%

Application
Suitable for disperse current into the earth.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Copper-Bonded Ground Rod (508 micron)

Copper-Bonded ground rod is made by molecularly bonding pure electrolytic copper onto a low carbon, high tensile steel core with exceeding 0.508 mm (508 micron) thick. The material made of 99.9% pure electrolytic copper with high tensile steel. To ensure in safety and quality, it meets UL and IEC standard for grounding and bonding equipments.



Standard Type

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Length (ft)	Weight (kg)
GRCB508 124	1/2	13.2	4	1.13
GRCB508 126	1/2	13.2	6	1.78
GRCB508 128	1/2	13.2	8	2.71
GRCB508 1210	1/2	13.2	10	3.39
GRCB508 584	5/8	14.6	4	1.65
GRCB508 586	5/8	14.6	6	2.48
GRCB508 588	5/8	14.6	8	3.30
GRCB508 5810	5/8	14.6	10	4.14
GRCB508 344	3/4	17.6	4	2.38
GRCB508 346	3/4	17.6	6	3.57
GRCB508 348	3/4	17.6	8	4.79
GRCB508 3410	3/4	17.6	10	6.00
GRCB508 14	1	23.6	4	4.26
GRCB508 16	1	23.6	6	6.40
GRCB508 18	1	23.6	8	8.57
GRCB508 110	1	23.6	10	10.74

Test Certificate
IEC 62561 Part 2
UL 467

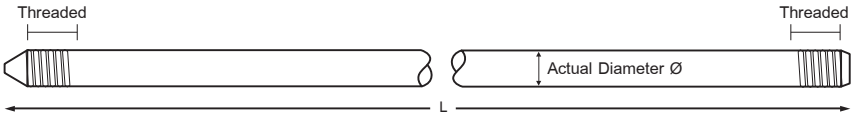
Material
High tensile strength steel
Copper purity > 99.9%

Application
Suitable for disperse current into the earth.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Copper-Bonded Ground Rod (254 micron)

Copper-Bonded ground rod is made by molecularly bonding pure electrolytic copper onto a low carbon, high tensile steel core with exceeding 0.254 mm (254 micron) thick. The material made of 99.9% pure electrolytic copper with high tensile steel. To ensure in safety and quality, it meets UL and IEC standard for grounding and bonding equipments.



UL LISTED
GROUNDING ELECTRODE
32UG

Threaded Type (UL-Listed)

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Threaded Size (in)	Length (ft)	Weight (kg)
GRCBUT 128	1/2	12.7	1/2	8	2.47
GRCBUT 1210	1/2	12.7	1/2	10	3.08
GRCBUT 588	5/8	14.2	5/8	8	3.08
GRCBUT 5810	5/8	14.2	5/8	10	3.80
GRCBUT 348	3/4	17.2	3/4	8	4.46
GRCBUT 3410	3/4	17.2	3/4	10	5.58
GRCBUT 18	1	23.1	1	8	8.25
GRCBUT 110	1	23.1	1	10	10.15

Threaded Type

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Threaded Size (in)	Length (ft)	Weight (kg)
GRCBUT 124	1/2	12.7	1/2	4	1.23
GRCBUT 126	1/2	12.7	1/2	6	1.85
GRCBUT 584	5/8	14.2	5/8	4	1.54
GRCBUT 586	5/8	14.2	5/8	6	2.31
GRCBUT 344	3/4	17.2	3/4	4	2.23
GRCBUT 346	3/4	17.2	3/4	6	3.35
GRCBUT 14	1	23.1	1	4	4.12
GRCBUT 16	1	23.1	1	6	6.09

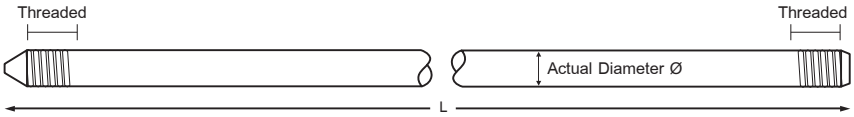
Test Certificate
IEC 62561 Part 2
UL 467

Application
Suitable for disperse current into the earth
to extend the length of ground rod by coupling.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Copper-Bonded Ground Rod (375 micron)

Copper-Bonded ground rod is made by molecularly bonding pure electrolytic copper onto a low carbon, high tensile steel core with exceeding 0.375 mm (375 micron) thick. The material made of 99.9% pure electrolytic copper with high tensile steel. To ensure in safety and quality, it meets UL and IEC standard for grounding and bonding equipments.



Threaded Type

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Threaded Size (in)	Length (ft)	Weight (kg)
GRCBT375 124	1/2	12.9	1/2	4	1.31
GRCBT375 126	1/2	12.9	1/2	6	1.96
GRCBT375 128	1/2	12.9	1/2	8	2.59
GRCBT375 1210	1/2	12.9	1/2	10	3.24
GRCBT375 584	5/8	14.3	5/8	4	1.60
GRCBT375 586	5/8	14.3	5/8	6	2.40
GRCBT375 588	5/8	14.3	5/8	8	3.17
GRCBT375 5810	5/8	14.3	5/8	10	3.97
GRCBT375 344	3/4	17.3	3/4	4	2.33
GRCBT375 346	3/4	17.3	3/4	6	3.49
GRCBT375 348	3/4	17.3	3/4	8	4.63
GRCBT375 3410	3/4	17.3	3/4	10	5.80
GRCBT375 14	1	23.3	1	4	4.19
GRCBT375 16	1	23.3	1	4	6.29
GRCBT375 18	1	23.3	1	8	8.35
GRCBT375 110	1	23.3	1	10	10.47

Test Certificate
IEC 62561 Part 2

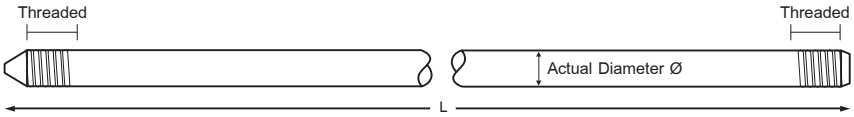
Material
High tensile strength steel
Copper purity > 99.9%

Application
Suitable for disperse current into the earth
to extend the length of ground rod by coupling.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Copper-Bonded Ground Rod (508 micron)

Copper-Bonded ground rod is made by molecularly bonding pure electrolytic copper onto a low carbon, high tensile steel core with exceeding 0.508 mm (508 micron) thick. The material made of 99.9% pure electrolytic copper with high tensile steel. To ensure in safety and quality, it meets UL and IEC standard for grounding and bonding equipments.



Threaded Type

Code No.	Nominal Diameter (Ø) (in)	Actual Diameter (Ø) (mm)	Threaded Size (in)	Length (ft)	Weight (kg)
GRCBT508 124	1/2	13.2	1/2	4	4.26
GRCBT508 126	1/2	13.2	1/2	4	6.40
GRCBT508 128	1/2	13.2	1/2	8	2.71
GRCBT508 1210	1/2	13.2	1/2	10	3.39
GRCBT508 584	5/8	14.6	5/8	4	1.65
GRCBT508 586	5/8	14.6	5/8	6	2.48
GRCBT508 588	5/8	14.6	5/8	8	3.30
GRCBT508 5810	5/8	14.6	5/8	10	4.14
GRCBT508 344	3/4	17.6	3/4	4	2.38
GRCBT508 346	3/4	17.6	3/4	4	3.57
GRCBT508 348	3/4	17.6	3/4	8	4.79
GRCBT508 3410	3/4	17.6	3/4	10	6.00
GRCBT508 14	1	23.6	1	4	4.26
GRCBT508 16	1	23.6	1	6	6.40
GRCBT508 18	1	23.6	1	8	8.57
GRCBT508 110	1	23.6	1	10	10.74

Test Certificate
IEC 62561 Part 2

Material
High tensile strength steel
Copper purity > 99.9%

Application
Suitable for disperse current into the earth
to extend the length of ground rod by coupling.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Coupling

For Threaded Type

Code No.	Rod (Ø) (in)	Length (mm)	Weight (kg)
GRBCO 12	1/2	60	0.07
GRBCO 58	5/8	64	0.09
GRBCO 34	3/4	70	0.14
GRBCO 1	1	90	0.25

Test Certificate
IEC 62561 Part 2

Material
Silicon bronze

Application
Extend the length of ground rod

For Standard Type

Code No.	Rod (Ø) (in)	Length (mm)	Weight (kg)
GRBCO 12NT	1/2	60	0.10
GRBCO 58NT	5/8	64	0.12
GRBCO 34NT	3/4	70	0.14
GRBCO 1NT	1	90	0.18

Test Certificate
IEC 62561 Part 2

Material
Silicon bronze

Application
Extend the length of ground rod

Driving Head

For Threaded Type

Code No.	Rod (Ø) (in)	Weight (kg)
GRBDH 12	1/2	0.06
GRBDH 58	5/8	0.09
GRBDH 34	3/4	0.16
GRBDH 1	1	0.35

Test Certificate
IEC 62561 Part 2

Material
High tensile strength steel

Application
Protect the top of ground rod while driving.

For Standard Type

Code No.	Rod (Ø) (in)	Weight (kg)
GRDSR 12	1/2	0.13
GRDSR 58	5/8	0.16
GRDSR 34	3/4	0.19
GRDSR 1	1	0.30

Test Certificate
IEC 62561 Part 2

Material
High tensile strength steel

Application
Protect the top of ground rod while driving.

Tip

For Threaded Type

Code No.	Rod (Ø) (in)	Weight (kg)
GRTTR 12	1/2	0.025
GRTTR 58	5/8	0.030
GRTTR 34	3/4	0.070
GRTTR 1	1	0.10

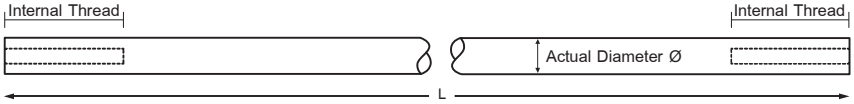
Test Certificate
IEC 62561 Part 2

Material
High tensile strength steel

Application
Lead the ground rod into the hard soil area.

Ground Rod Solid Copper Stainless Steel

Solid Copper and Stainless Steel Ground Rod are recommended using in critical soil condition which has a pH value less than 3 or more than 8.



Stainless Steel

Code No.	Diameter (Ø) (mm)	Length (mm)	Weight (kg)
GRSS 1610	16	1000	1.60
GRSS 1615	16	1500	2.40
GRSS 1620	16	2000	3.20
GRSS 1630	16	3000	4.69
GRSS 2010	20	1000	2.50
GRSS 2015	20	1500	3.75
GRSS 2020	20	2000	5.00
GRSS 2030	20	3000	7.44

Test Certificate
IEC 62561 Part 2

Material
Stainless steel 316L

Application
Suitable for critical soil application which has a poor pH value.

Solid Copper

Code No.	Diameter (Ø) (mm)	Length (mm)	Weight (kg)
GRSC 1510	15	1000	1.58
GRSC 1515	15	1500	2.37
GRSC 1520	15	2000	3.17
GRSC 1530	15	3000	4.73
GRSC 1610	16	1000	1.80
GRSC 1615	16	1500	2.70
GRSC 1620	16	2000	3.60
GRSC 1630	16	3000	5.40
GRSC 2010	20	1000	2.81
GRSC 2015	20	1500	4.22
GRSC 2020	20	2000	5.63
GRSC 2030	20	3000	8.42

Test Certificate
IEC 62561 Part 2

Material
Solid copper - (BS EN 13601)

Application
Suitable for critical soil application which has a poor pH value.

Caution : When deep driving a solid copper ground rod shall be insert the rod into a bore hole. Do not hammering to the rod directly otherwise the rod might be damaged.

Note : Special Size, Dimeter, Length Copper thickness can be requested.

Coupling

For Stainless Steel and Solid Copper Rod

Code No.	Rod (Ø) (mm)	Weight (kg)
GRSSCO 15	15	0.025
GRSSCO 16	15,16	0.025
GRSSCO 20	20	0.025

Test Certificate
IEC 62561 Part 2

Material
Stainless steel 316L

Application
Extend to the length of ground rod.

For Solid Copper Rod

Code No.	Rod (Ø) (mm)	Weight (kg)
GRSC 15	15	0.03
GRSC 16	15,16	0.03
GRSC 20	20	0.03

Test Certificate
IEC 62561 Part 2

Material
High strength copper alloy

Application
Extend to the length of ground rod.

Driving Head

For Solid Copper and Stainless Steel Rod

Code No.	For Rod Size Diameter (Ø) (mm)	Weight (kg)
GRSDH 16	15,16	0.047
GRSDH 20	20	0.055

Test Certificate
IEC 62561 Part 2

Material
High tensile strength steel

Application
Protect the top of ground rod.

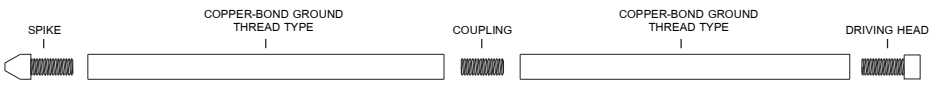
Spike

For Solid Copper and Stainless Steel Rod

Code No.	Diameter (Ø) (mm)	Weight (kg)
GRSP 16	15,16	0.10
GRSP 20	20	0.12

Material
Stainless steel 316L

Application
Lead the ground rod into soil



Ground Rod Driving Hammer

GHDG-P12

GHDG-S12

GHDG-SE

Code No.	Description	Weight (kg)
GHDG - SP12	Ground rod Sliding Hammer Set	11.8
GHDG - S12	Sliding Hammer	9.2
GHDG - P12	Extension Driving Probe	2.6
GHDG - SE	Ground rod driving hammer for electric driving hammer	11.8

Application
GHDG - SP12 is for driving ground rod. Provide for ground rod standard type 1/2"- 3/4" and threaded 1/2"- 3/4" nominal diameter.

GHDG - SE is for driving ground rod. Provide for ground rod standard type 1/2"- 3/4" and threaded 1/2"- 3/4" nominal diameter and can be use with electric driving hammer or by manually.

Material
Body - Black Steel Pipe
Hammer - Steel S45C
Extansion Driving Probe - Steel S45C

One Man Can Do It !

Ground Rod Electric Driving Hammer

GHDE-01

Electric Driving Hammer

Code No.	Rate Power (W)	Voltage (V)	Frequency (Hz)	Speed(No Load) (rpm)	Weight (kg)
GHDE-01	1240	230	50	1400	13.0

Application
The electric driving hammer system is for driving ground rod with GHDG -SE. Provide for ground rod standard type 1/2"- 3/4" and threaded 1/2"- 3/4" nominal diameter 3.00 m length.

Material
1240 W Electric Jackhammer

Electrolytic Grounding (KEG)

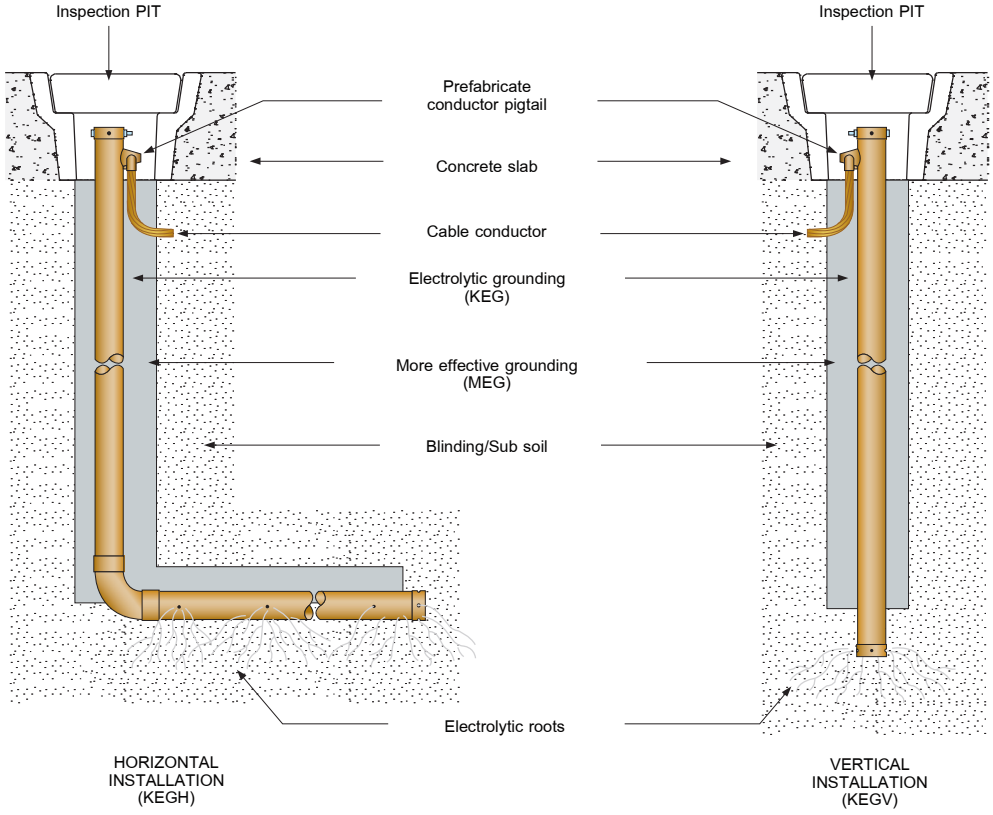
Electrolytic Grounding is made of type K copper pipe with 54 mm (2-1/8") OD diameter which natural chemical electrolytic salt can be refilled inside.

Exothermic welding is used for connecting conductor to the copper pipe.

Code No.	Rod Length (L) (ft)	Conductor Size (mm^2)	Conductor Length (mm)	Rod Type
KEGV-8	8	95	500	Vertical
KEGV-10	10	95	500	Vertical
KEGV-12	12	95	500	Vertical
KEGV-15	15	95	500	Vertical
KEGH-8	8	95	500	Horizontal
KEGH-10	10	95	500	Horizontal
KEGH-12	12	95	500	Horizontal
KEGH-15	15	95	500	Horizontal

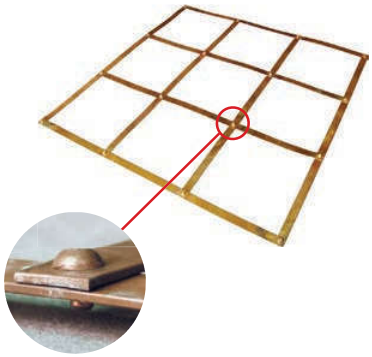
Application
Suitable for disperse current into the earth in critical soil area

Material
Type K Copper pipe



Ground Plate

Lattice Copper



Code No.	Dimensions (mm)	Weight (kg)
GRPL 663	600x600x3	4.20
GRPL 993	900x900x3	7.20

Test Certificate
IEC 62561 Part 2

Material
Copper - BS EN 13601

Application
To minimize the danger of exposure to high step and touch voltages.

Solid Copper

Code No.	Dimensions (mm)	Weight (kg)
GRPS 6615	600x600x1.5	5.00
GRPS 6630	600x600x3	9.74
GRPS 9915	900x900x1.5	10.90
GRPS 9930	900x900x3	21.77

Test Certificate
IEC 62561 Part 2

Material
Copper - BS EN 13601

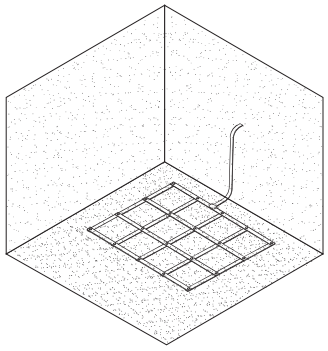
Application
Suitable for an area where unable to drive ground rod.

Copper-Bonded Steel

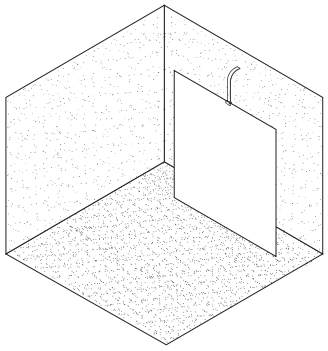
Code No.	Dimensions (mm)	Weight (kg)
GRPC 6615	600x600x1.5	4.25
GRPC 6630	600x600x3	8.50

Material
Copper-Bonded steel 254 micron Copper thickness

Application
Suitable for an area where unable to drive ground rod

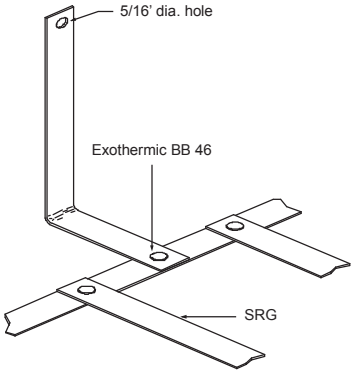


For Lattice Copper



For Copper Plate

Signal Reference Ground Grid



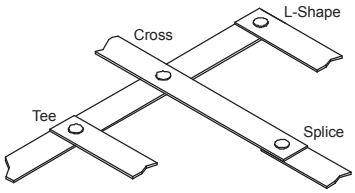
Signal Reference Ground Grid (SRG) manufactures from 50 mm by 0.5 mm copper strip with 600 mm spacing.

SRG Comply to IEEE Std.1100

Code No.	Length (L) (mm)	Width (W) (mm)	Spacing (mm)	Weight (kg)
GRSRG 240240	2400	2400	600	6.20
GRSRG 240480	2400	4800	600	11.66

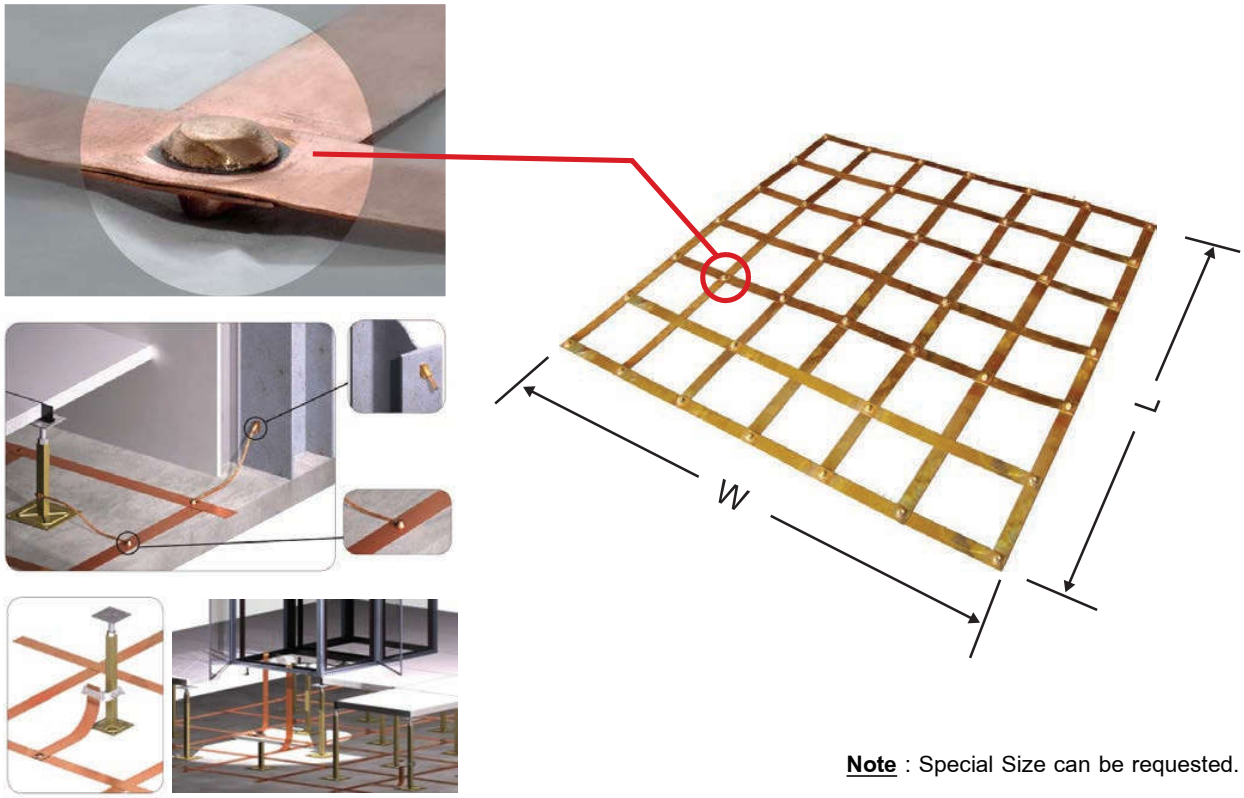
Test Certificate
IEC 62561 Part 1
(For Connection Joint)

Material
Copper - BS EN 13601



Kumwell Exothermic Welding Code BB46-C-550 mould and KW32 metal powder can provide Tee, Cross, L-Shape and Splice connections as shown.

Mould	Copper Strip Size (mm)	Metal Powder (g)	Handle Clamp Type
BB46-C-550	50x0.5	32	HCC00



Note : Special Size can be requested.

More Effective Grounding

A Superior conductive material that improves grounding effectiveness, are a solution for special case grounding that is high resistivity soil and hard to improve, limited area, mountain area, arid area. In such case, soil treatment by Kumwell MEG

MEG is an earthing enhancing compound tested, according to IEC 62561-7 certified by DEKRA and the application is in accordance with requirements of IEEE standard 80-2013 with an extreme low resistivity 0.03 Ohm-m. (After Fully Cured)

MEG contains Portland cement, which sets within hours and fully cured within 28 days, to become a highly conductive concrete that performs in all soil conditions irrespective of the presence of water

MEG is also the answer in situations where ground rods can't be driven or where limited land area makes adequate grounding difficult with conventional methods.

MEG is maintains a constant level of superior performance once cured that will not diminish over the life of the grounding system.

Permanent

- Does not dissolve, decompose or leach out with time
- Performs in all soil conditions even during dry season and does not required replacement, periodic charging treatments and continuous presence of water to maintain its conductivity
- Reduce theft since conductors are difficult to remove after coagulation

Conform to IEC 62561-7 (Requirement for Earthing Enhancing Compounds)

- Perform the test for leaching test, sulfur determination, material resistivity and corrosion effect according to IEC 62561-7 and certified by DEKRA

Environmental

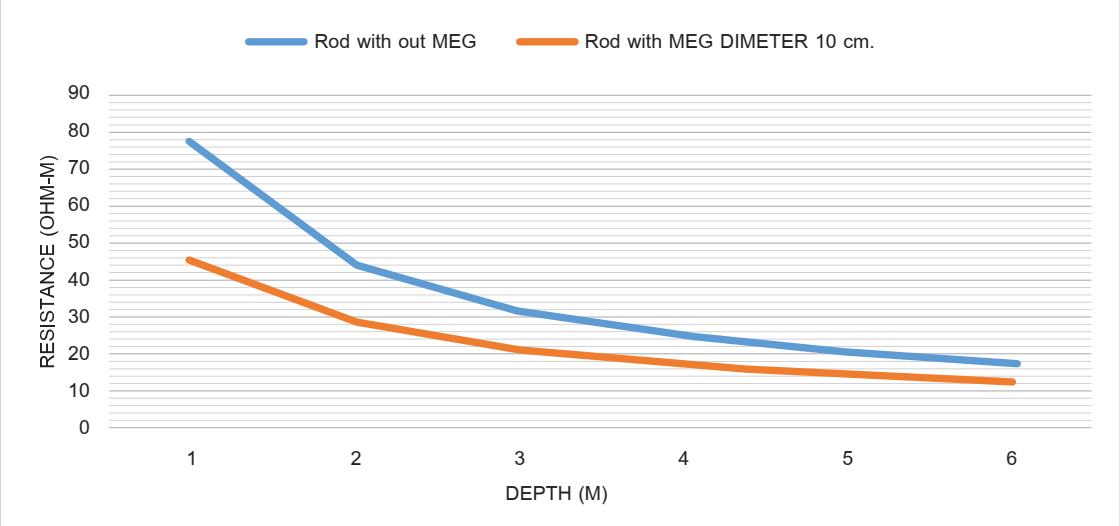
- Meet IEC 62561-7 which does not leaching any toxic, sulfur and other environmental regulation substance
- Neutral and inert with encased electrodes

Effective to Lower Resistance

- Contain of high conductive carbon and cement based to become superior conductive concrete after fully cured with resistivity 0.03 Ohm-m
- Maintains constant resistance for the life of the system once in its fully cured
- Reduce grounding resistance in critical area such as rocky soil, mountain top and sandy soil
- Using MEG to coat Ground Rod conductors with a diameter of 10cm, compared to Ground Rod can ground resistance reduction up to 40%.

Compare Resistance of Ground Rod using MEG

The Example show the soil resistance for 100 ohm-m. Graph below show that by using Ground Rod with MEG compare to normal Ground Rod is can reduce resistance by to 40% at the length of 1-meter long. But as the depth got higher the difference is lower. Recommend that the depth should not be more than 6 meter to meet 40% reduction.



More Effective Grounding (MEG)

Kumwell MEG is a ground enhancement material in accordance with requirements of IEEE Standard 80-2013 with a resistivity of 0.03 Ω-m. Dose not dissolve, decompose and leach out by water. Dose not leaching any toxic, sulfur and other environmental regulation substance. MEG manufacturing is environmentally - friendly, high reliability, quality, and long shelf life.

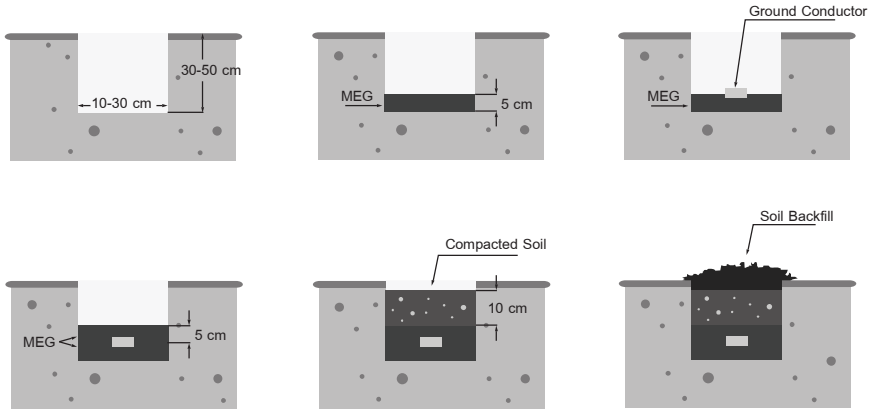
Kumwell MEG is an alternate solution for effectively reducing ground resistance of the soil surrounding the electrode instead of adding more grid conductors or more ground rods. Soil Treatment is an effective solution to decrease ground resistance which is utilized to an advantage in poor conductivearea such as rocky soil.

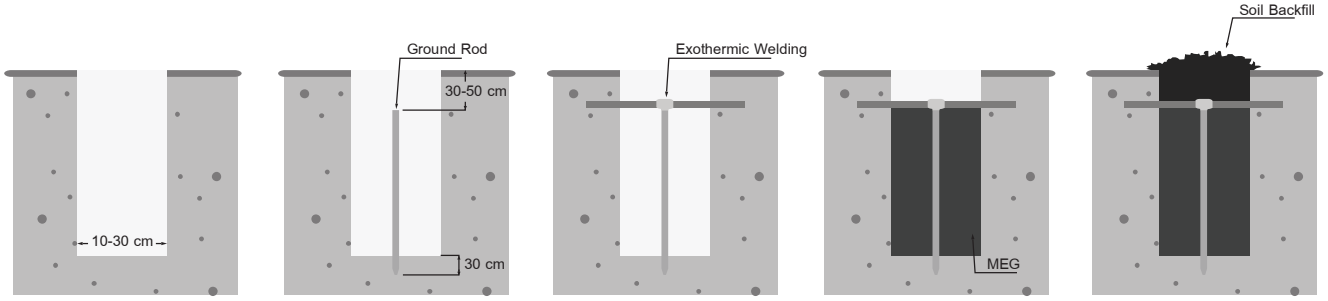
Code No.	Weight/bag (lbs/kg)
GRMEG-25 LBS	25/11.5
GRMEG-55 LBS	55/25

Test Certificate
IEC 62561 Part 7

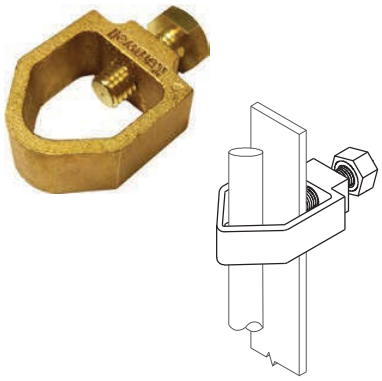
Packing
25 LBS and 55 LBS MEG in the heavy duty bag Special packing can be requested.

Application
- **Reduce grounding resistance in critical area such as rocky soil, sandy soil with a resistivity of 0.03 Ω-m**
- **Meet IEEE Standard 80-2013**
- **Require simple instruction manual and tools for installation.**
- **Non toxic**





Rod to Tape Clamp



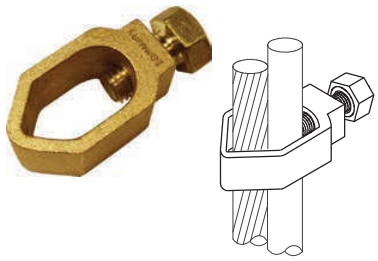
Code No.	Rod Diameter (Ø) (in)	(mm)	Max. Tape Size (mm)	Weight (kg)
GXCT 127-2512	1/2	12.7	25x12	0.12
GXCT 127-2620	1/2	12.7	26x20	0.13
GXCT 142-2512	5/8	14.2	25x12	0.12
GXCT 142-2618	5/8	14.2	26x18	0.13
GXCT 142-302	5/8	14.2	30x2	0.13
GXCT 142-4012	5/8	14.2	40x12	0.14
GXCT 142-518	5/8	14.2	51x8	0.17
GXCT 172-2510	3/4	17.2	25x10	0.12
GXCT 172-2610	3/4	17.2	26x10	0.12
GXCT 172-302	3/4	17.2	30x2	0.13
GXCT 172-5112	3/4	17.2	51x12	0.17
GXCT 231-2610	1	23.1	26x10	0.13

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Bolt - Brass

Application
Clamp ground rod with copper tape conductor.

Rod to Cable Clamp



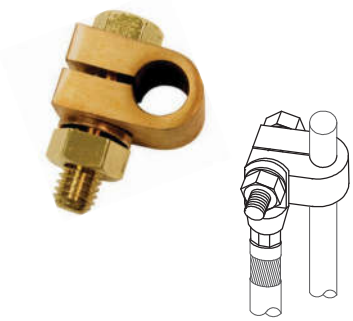
Code No.	Rod Diameter (Ø) (in)	(mm)	Cable Size (mm^2)	Weight (kg)
GXC 95-35	3/8	9.5	6-35	0.05
GXC 127-50	1/2	12.7	16-50	0.08
GXC 142-70	5/8	14.2	16-70	0.09
GXC 172-95	3/4	17.2	35-95	0.12
GXC 231-120	1	23.1	70-120	0.14

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Bolt - Brass

Application
Clamp ground rod with copper conductor.

Rod to Cable Lugs Clamp



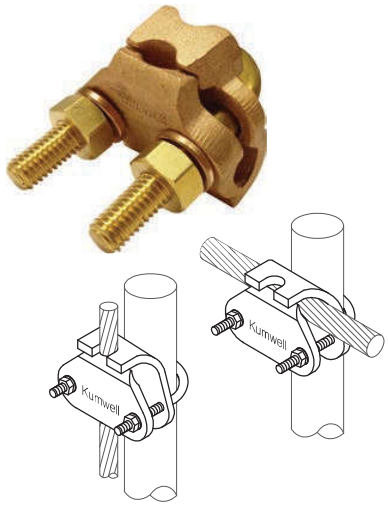
Code No.	Rod Diameter (Ø) (in)	(mm)	Weight (kg)
GXCL 127	1/2	12.7	0.25
GXCL 142	5/8	14.2	0.27
GXCL 172	3/4	17.2	0.32
GXCL 231	1	23.1	0.41

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Bolt, Nut - Brass

Application
Clamp rod to cable lug conductor.

Rod to Cable Clamp



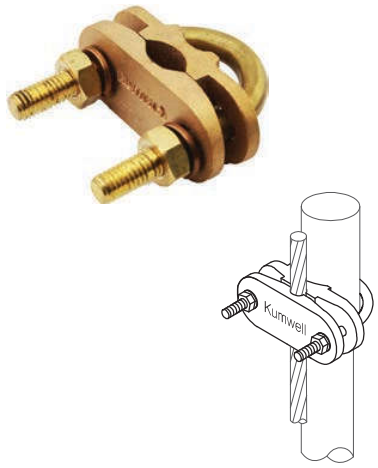
Code No.	Rod Diameter (Ø) (in)	(mm)	Cable Size (mm^2)	Weight (kg)
GXCCC 142-95	5/8	14.2	16-95	0.32
GXCCC 142-185	5/8	14.2	70-185	0.37
GXCCC 142-300	5/8	14.2	150-300	0.53
GXCCC 172-70	3/4	17.2	16-70	0.32
GXCCC 172-150	3/4	17.2	70-150	0.37
GXCCC 172-300	3/4	17.2	150-300	0.53
GXCCC 231-70	1	23.1	16-70	0.37
GXCCC 231-150	1	23.1	70-150	0.32
GXCCC 231-300	1	23.1	150-300	0.53

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Bolt, Nut - Brass

Application
Clamp ground rod through or parallel to cable conductor

Rod to Cable Clamp



Code No.	Rod Diameter (Ø) (in)	(mm)	Cable Size (mm^2)	Weight (kg)
GXCC 127-25	1/2	12.7	10-25	0.21
GXCC 127-70	1/2	12.7	35-70	0.21
GXCC 142-95	5/8	14.2	16-95	0.22
GXCC 142-185	5/8	14.2	70-185	0.24
GXCC 142-300	5/8	14.2	150-300	0.31
GXCC 172-70	3/4	17.2	16-70	0.22
GXCC 172-150	3/4	17.2	70-150	0.24
GXCC 172-300	3/4	17.2	150-300	0.31
GXCC 231-70	1	23.1	16-70	0.31
GXCC 231-150	1	23.1	70-150	0.38
GXCC 231-300	1	23.1	150-300	0.40

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
U Bolt, Nut - Brass

Application
Clamp ground rod parallel to cable conductor

Rod or Pipe to Two Cable Clamp

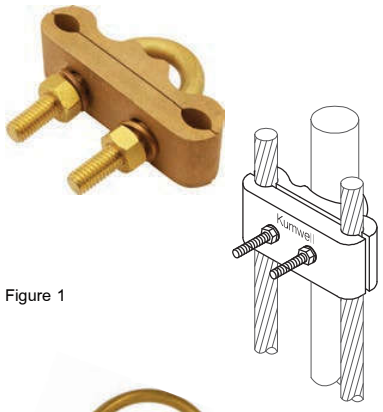


Figure 1

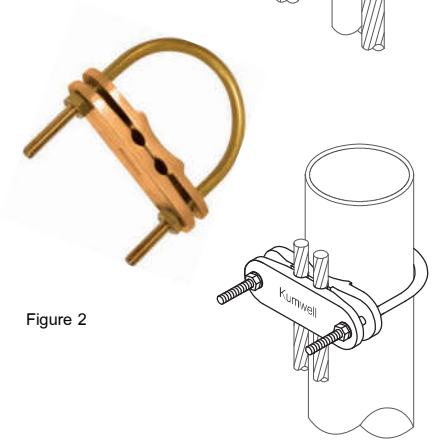


Figure 2

Code No.	Conductor Pipe (in)	Conductor Rod (in)	Conductor Rod (mm)	Cable Size (Sq-mm)	Weight (kg)	Figure
GXCTW 127-70	-	1/2	12.7	25-70	0.38	1
GXCTW 127-120	-	1/2	12.7	95-120	0.38	1
GXCTW 172-70	-	5/8-3/4	15.9-19.1	25-70	0.43	1
GXCTW 172-120	-	5/8-3/4	15.9-19.1	95-120	0.43	1
GXCTW 172-240	-	5/8-3/4	15.9-19.1	150-240	0.86	1
GXCTW 231-70	-	1	23.1	25-70	0.51	1
GXCTW 231-120	-	1	23.1	95-120	0.51	1
GXCTW 231-240	-	1	23.1	150-240	0.82	1
GXCTW 25-70	1	-	34.2	25-70	0.59	1
GXCTW 25-120	1	-	34.2	95-120	0.59	1
GXCTW 40-70	1¼-1½	-	42.9-48.8	25-70	0.45	2
GXCTW 40-120	1¼-1½	-	42.9-48.8	95-120	0.45	2
GXCTW 50-70	2	-	60.8	25-70	0.58	2
GXCTW 50-120	2	-	60.8	95-120	0.58	2
GXCTW 65-70	2½	-	76.6	25-70	0.83	2
GXCTW 65-120	2½	-	76.6	95-120	0.83	2
GXCTW 80-70	3	-	89.5	25-70	0.86	2
GXCTW 80-120	3	-	89.5	95-120	0.86	2

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
U Bolt, Nut - Brass

Application
Clamp rod parallel to 2 cable

Rod or Pipe to Three Cable Clamp

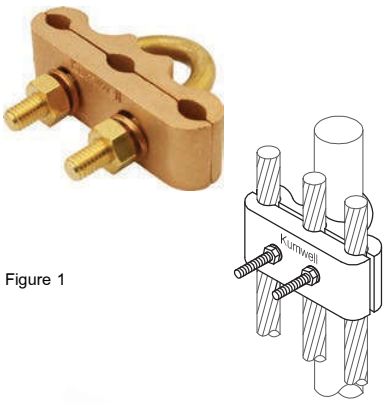


Figure 1

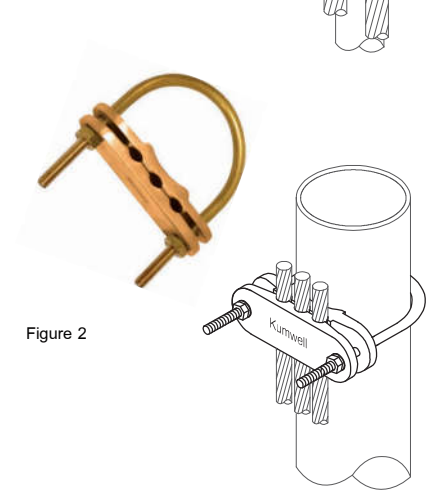


Figure 2

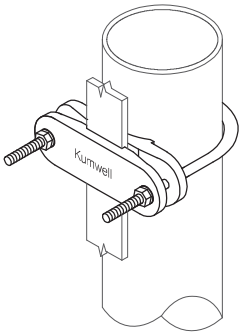
Code No.	Conductor Pipe (in)	Conductor Rod (in)	Conductor Rod (mm)	Cable Size (Sq-mm)	Weight (kg)	Figure
GXCTH 127-70	-	1/2	12.7	25-70	0.37	1
GXCTH 127-120	-	1/2	12.7	95-120	0.37	1
GXCTH 172-70	-	5/8-3/4	15.9-19.1	25-70	0.42	1
GXCTH 172-120	-	5/8-3/4	15.9-19.1	95-120	0.42	1
GXCTH 172-240	-	5/8-3/4	15.9-19.1	150-240	0.73	1
GXCTH 231-70	-	1	23.1	25-70	0.49	1
GXCTH 231-120	-	1	23.1	95-120	0.49	1
GXCTH 231-240	-	1	23.1	150-240	0.77	1
GXCTH 25-70	1	-	34.2	25-70	0.58	1
GXCTH 25-120	1	-	34.2	95-120	0.58	1
GXCTH 40-70	1¼-1½	-	42.9-48.8	25-70	0.79	1
GXCTH 40-120	1¼-1½	-	42.9-48.8	95-120	0.79	1
GXCTH 50-70	2	-	60.8	25-70	0.56	2
GXCTH 50-120	2	-	60.8	95-120	0.56	2
GXCTH 65-70	2½	-	76.6	25-70	0.81	2
GXCTH 65-120	2½	-	76.6	95-120	0.81	2
GXCTH 80-70	3	-	89.5	25-70	0.84	2
GXCTH 80-120	3	-	89.5	95-120	0.84	2

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
U Bolt, Nut - Brass

Application
Clamp rod parallel to 3 cable

U Bolt Rod Clamp



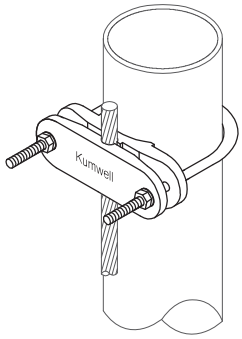
Code No.	Rod Diameter (Ø) (mm)	Tape Size (mm)	Weight (kg)
GXCTC 16-253	16	25x3	0.28
GXCTC 16-254	16	25x4	0.28
GXCTC 16-256	16	25x6	0.28
GXCTC 20-253	20	25x3	0.30
GXCTC 20-254	20	25x4	0.30
GXCTC 20-256	20	25x6	0.30
GXCTC 25-253	25	25x3	0.33
GXCTC 25-254	25	25x4	0.33
GXCTC 25-256	25	25x6	0.33
GXCTC 31-253	31	25x3	0.35
GXCTC 31-254	31	25x4	0.35
GXCTC 31-256	31	25x6	0.35
GXCTC 38-253	38	25x3	0.36
GXCTC 38-254	38	25x4	0.36
GXCTC 38-256	38	25x6	0.36
GXCTC 50-253	50	25x3	0.44
GXCTC 50-254	50	25x4	0.44
GXCTC 50-256	50	25x6	0.44

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
U Bolt, Nut - Brass

Application
Clamp rod parallel to copper tape conductor.

Pipe to Cable Clamp



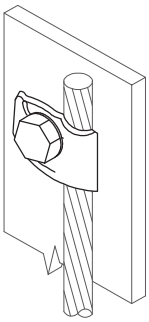
Code No.	Pipe Diameter (Ø) (in)	Cable Size (Sq-mm)	Weight (kg)
GXCPC 10-70	3/8	16-70	0.26
GXCPC 10-120	3/8	70-120	0.26
GXCPC 20-70	3/4	16-70	0.29
GXCPC 20-120	3/4	70-120	0.29
GXCPC 25-70	1	16-70	0.32
GXCPC 25-120	1	70-120	0.32
GXCPC 40-70	1¼-1½	16-70	0.54
GXCPC 40-120	1¼-1½	70-120	0.54
GXCPC 50-70	2	16-70	0.77
GXCPC 50-120	2	70-120	0.77
GXCPC 65-70	2½	16-70	0.84
GXCPC 65-120	2½	70-120	0.84
GXCPC 80-70	3	16-70	0.97
GXCPC 80-120	3	70-120	0.97
GXCPC 100-70	4	25-70	1.47
GXCPC 100-120	4	70-120	1.47

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
U Bolt, Nut - Brass

Application
Clamp pipe parallel to one cable.

Clamp A Cable to Flat Bar



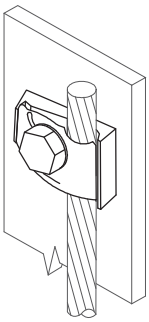
Flat Bar

Code No.	Cable Size (mm^2)	Bolt Size (in)	Weight (kg)
GXCCF-G1	25-50	3/8x1½	0.076
GXCCF-G2	70-120	1/2x2	0.136
GXCCF-G3	150-240	1/2x2	0.144

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
U Bolt, Nut - Brass

Application
Clamp cable conductors to steal flat surface.



Flat Bar Clamp

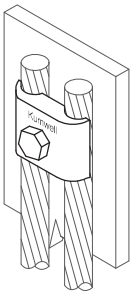
Code No.	Cable Size (mm^2)	Bolt Size (in)	Weight (kg)
GXCCF-G1P	25-50	3/8x1½	0.124
GXCCF-G2P	70-120	1/2x2	0.194
GXCCF-G3P	150-240	1/2x2	0.228

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
U Bolt, Nut - Brass

Application
Clamp 2 cable conductors to steal flat surface with grooving piece in order to cable dirtortion.

Clamp Two Cable to Flat Bar



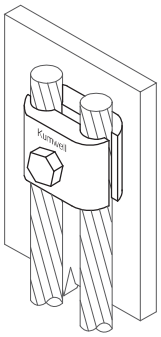
Flat Bar

Code No.	Cable Size (mm^2)	Bolt Size (in)	Weight (kg)
GXCCP-G1	25-50	3/8x1½	0.16
GXCCP-G2	70-120	1/2x2	0.24
GXCCP-G3	150-240	1/2x2	0.31

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
U Bolt, Nut - Brass

Application
Clamp 2 cable conductors to steal flat surface.



Flat Bar Clamp

Code No.	Cable Size (mm^2)	Bolt Size (in)	Weight (kg)
GXCCP-G1P	25-50	3/8x1½	0.28
GXCCP-G2P	70-120	1/2x2	0.39
GXCCP-G3P	150-240	1/2x2	0.45

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
U Bolt, Nut - Brass

Application
Clamp 2 cable conductors to steal flat surface with grooving piece in order to cable dirtortion.

One Cable to Pipe Clamp

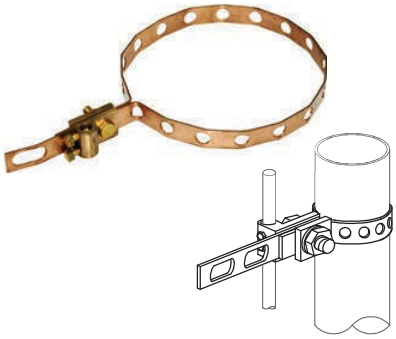
Code No.	Pipe Diameter (Ø) (in)	Cable Size (mm^2)	Weight (kg)
GXPCP1-50-95	1¼-2	25-95	0.40
GXPCP1-75-95	2½-3	25-95	0.52
GXPCP1-100-95	3½-4	25-95	0.70

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
U Bolt, Nut - Brass

Application
Clamp cable conductors to steal pipe.

Pipe Bond Clamp



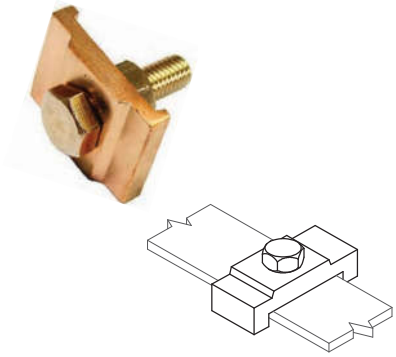
Code No.	Pipe Diameter (mm)	Conductor Type	Conductor Size (mm)	Weight (kg)
GBP 8	50-200	Solid	8	0.59

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Copper Tape - BS EN 13601
Bolt, Nut - Brass

Application
Bond Solid copper conductor to large metal pipe.

Tape Clamp



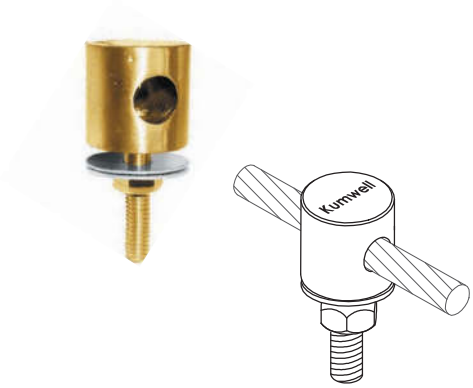
Code No.	Tape Size (mm)	Bolt Size (in)	Weight (kg)
LPTBC	25x3	3/8	0.13
LPTBC-A	25x3	3/8	0.039

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Bolt, Nut - Brass
Aluminium Alloy -BS 2898,
Bolt, Nut - Brass

Application
Fix copper tape conductor with steal flat surface.

Cable Grid



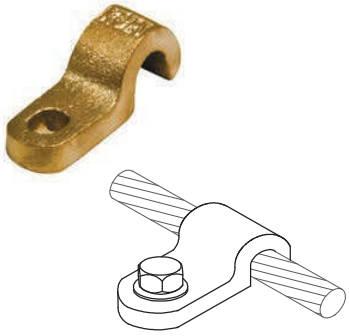
Code No.	Cable Size (mm^2)	Stud Size (in)	Weight (kg)
GXCG 95	95	5/16	0.16
GXCG 120	120	5/16	0.18
GXCG 185	185	3/8	0.25

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Stud, Nut - Brass
Washer - Bi - Copper, Aluminium

Application
Clamp cable conductors to framework to earthing cable conductor.

Ground Clamp



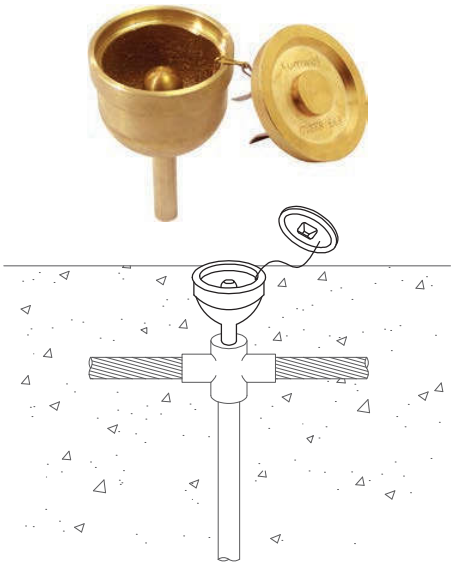
Code No.	Cable Size (mm^2)	Weight (kg)
LGRC-A70	50-70	0.045
LGRC-A	95-120	0.050
LGRC-B	150-185	0.100
LGRC-C	240-300	0.120
LGRC-AA	95-120	0.015
LGRC-BA	150-185	0.031
LGRC-CA	240-300	0.036

Test Certificate
IEC 62561 Part 4

Material
Copper Alloy - BS EN 1982
Aluminium Alloy - BS EN 2898

Application
Lock wire or cable conductor on flat surface.

Static Earth Receptacle



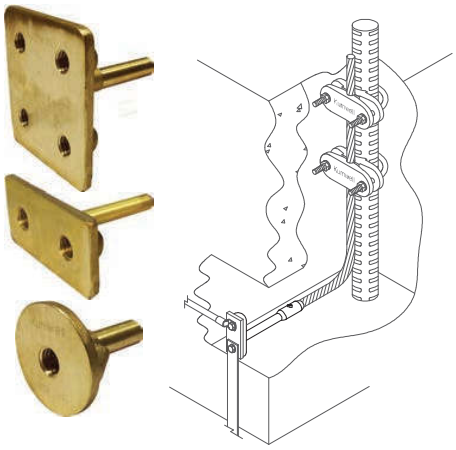
Code No.	Dimensions (mm) W	L	Ø	Weight (kg)
GYSER 663	69	114	12.7	0.65
GYSER 993	120.6	158.8	12.7	1.88

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982

Application
Connect to grounding system by installing runway, gas station or else to discharge static electricity from airplane or oil tank.

Earth Point



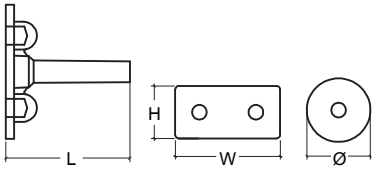
Earth Point

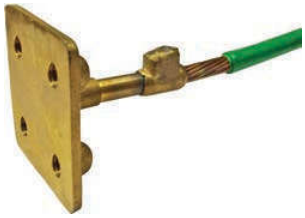
Code No.	No. of Hole	Stud LxWxH (in)	Weight (kg)
GXEP 120(1)	1	55xØ50	0.30
GXEP 120(2)	2	76x82.5x41	0.30
GXEP 120(4)	4	76x82.5x82.5	0.60

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982

Application
Connect rebar to earth point





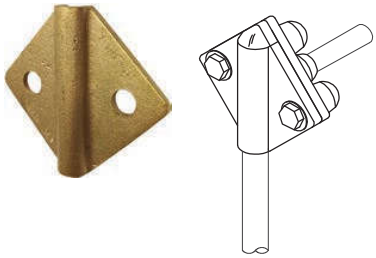
Earth Point with Prewelding

Code No.	No. of Hole	Cable with PVC		Weight (kg)
		Cable Size (mm^2)	Length (mm)	
GXEP 1201-500	1	70	500	0.77
GXEP 1202-500	2	70	500	0.72
GXEP 1202-1000	2	70	1000	1.10
GXEP 1202-3000	2	70	3000	2.50
GXEP 1204-500	4	70	500	0.90
GXEP 1204-1000	4	70	1000	1.30
GXEP 1204-3000	4	70	3000	2.20

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Cable - Stranded Copper with Green PVC cover
Connection - Exothermic Welding

Application
Connect rebar to earth point



Front Cover

Code No.	Cable Size (mm^2)	Earth Point (Code No.)	Weight (kg)
GXEP 120B	70	GXEP 120(4)	0.25

Material
Copper Alloy - BS EN 1982

Application
Fix conductor on earth point

*Special cable's size of earth point with prewelding can be requested.

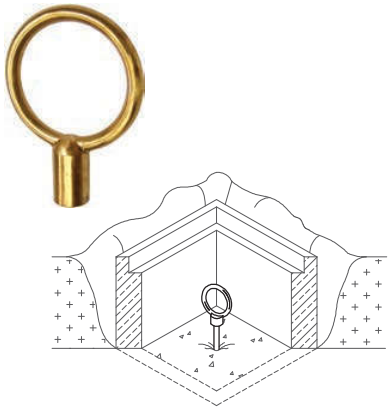
Stainless Steel Earth Point

Code No.	Conductor Length (L)	Thread Size	Conductor (Ø) (mm)
GXEP 801-SS-M10-150	150	M10	10
GXEP 801-SS-M10-400	400	M10	10
GXEP 801-SS-M10-600	600	M10	10

Material
Body : Stainless Steel 304
Tail : Galvanized Steel

Note : IEC has recommended to use double connector for every connection to earth point for safety and reliability of the system.

Eye Bolt



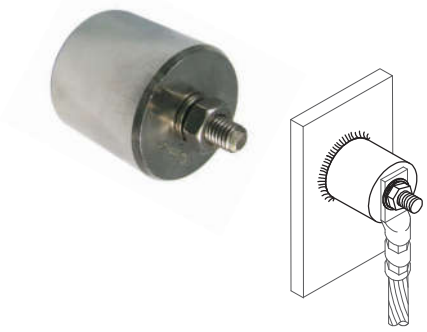
Code No.	Thread (in)	Weight (kg)
GXEYB 58	5/8	0.41
GXEYB 34	3/4	0.52

Test Certificate
IEC 62561 Part 2

Material
Copper Alloy - BS EN 1982

Application
Connect with ground rod as a static earth point in grounding system

Earth Boss

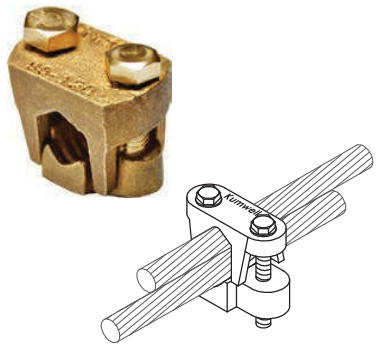


Code No.	Diameter (Ø) (mm)	L (mm)	Stud Size	Weight (kg)
GXEAB	50	45	M10	0.73
GXEAB-MS	50.8	45	M10	0.75

Material
Stainless Steel - 304 (GXEAB)
Mild Steel (GXEAB-MS)
Stud, Nut - Stainless Steel

Application
Weld onto steel vessel, tank or other structure forbonding point in grounding & lightning protection

Connector Screw Type



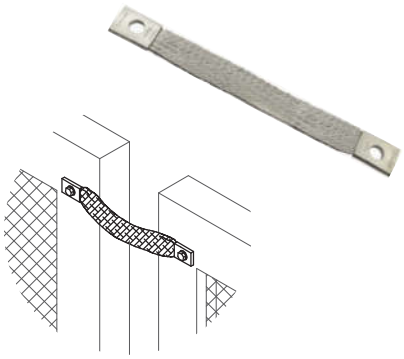
Code No.	Cable Size (mm^2) Run	Tap	Bolt Size (in)	Weight (kg)
LXCNS 16-35	16-35	4-35	1/4x1	0.08
LXCNS 50-70	50-70	4-70	1/4x1½	0.10
LXCNS 95-120	95-120	4-120	5/16x1½	0.16
LXCNS 150-185	150-185	4-185	3/2x2	0.39

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Bolt - Brass

Application
Suitable for joint copper conductor (above ground).

Flexible Copper Braid Bond

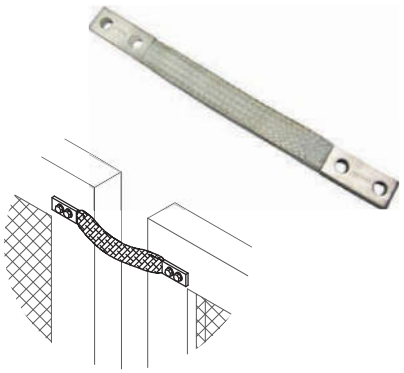


Copper Braid with Tinned (1 Hole)

Code No.	Amp Rating (A)	No. of Layer	Length (mm)	Cross Section (mm^2)	Weight (kg)
LZFCB 502001	200	1	200	50	0.12
LZFCB 503001	200	1	300	50	0.16
LZFCB 504001	200	1	400	50	0.21

Material
Hight conductivity tinned copper wire.

Application
gate, fence, etc., where flexibility is required or the bond is subject to movements.

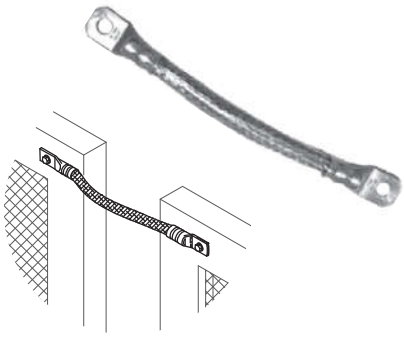


Copper Braid with Tinned (2 Hole)

Code No.	Amp Rating (A)	No. of Layer	Length (mm)	Cross Section (mm^2)	Weight (kg)
LZFTB 353501	150	1	350	35	0.15
LZFTB 503501	200	1	350	50	0.18
LZFTB 703501	250	1	350	70	0.25
LZFTB 953501	300	1	350	95	0.35
LZFTB 1203501	360	1	350	120	0.42
KGZFCB 39533	700	3	386	150	0.60

Material
Hight conductivity tinned copper wire.

Application
Suitable for bonding of metal door, gate, fence, etc., where flexibility is required or the bond is subject to movements.



Copper Braid with Tinned (Round Type)

Code No.	Amp Rating (A)	Length (mm)	Cross Section (mm^2)	Weight (kg)
GRB20-350	480	350	150	0.75
GRB20-1000	480	1000	150	2.15

Material
Hight conductivity tinned copper wire.

Application
gate, fence, etc., where flexibility is required or the bond is subject to movements.

*Special size can be requested.

Expansion Braid Bond

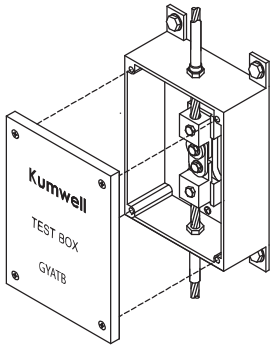
Code No.	Length (L) (mm)	Cross Section (mm^2)	Weight (kg)
LXEBB 200	200	35	0.42
LXEBB 300	300	35	0.62

Material
High conductivity copper wire with tinned.
Bolt - Stainless Steel

Application
Suitable for bonding of metal door, gate, fence, etc., where flexibility is required or the bond is subject

Grounding Test Box

Aluminium enclosure

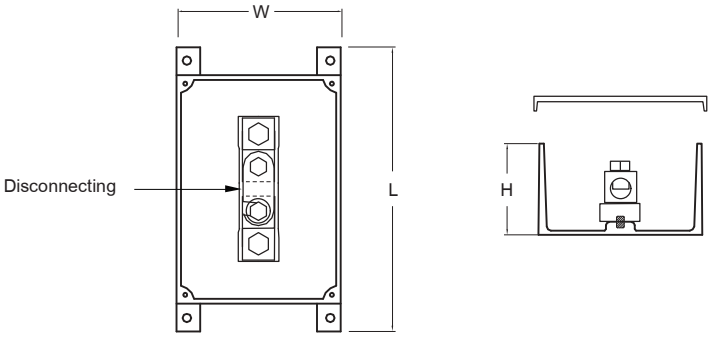


Code No.	Connection	Lug Size (mm^2)	Dimensions (mm) L	W	H	Weight (kg)
GYATB	Copper-Copper	50-120	265	153	70	2.40
GYATB-AC	Aluminium-Copper	50-120	265	153	70	2.40

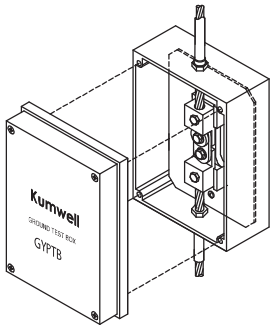
Test Certificate
IEC 62561 Part 1

Application
Suitable for inspection and testing point in grounding system

Material
Box - Cast Aluminium Alloy IP66
Bolt - Stainless Steel
Terminal - Copper Alloy (GYATB)
Disconnecting - Tin Plated Copper (GYATB)
Terminal - Aluminium/Copper Alloy (GYATB-AC)
Disconnecting - Tin Plated Copper (GYATB-AC)



ABS enclosure

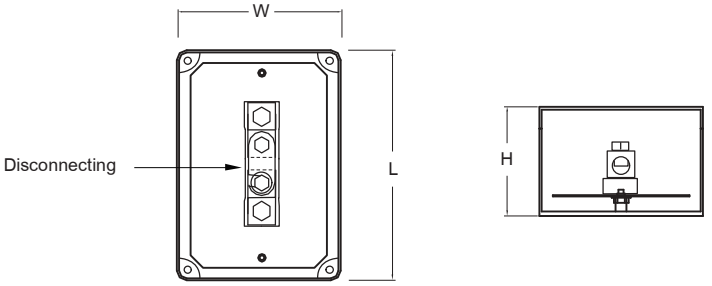


Code No.	Connection	Lug Size (mm^2)	Dimensions (mm) L	W	H	Weight (kg)
GYPTB	Copper-Copper	50-120	200	150	100	1.10
GYPTB-AC	Aluminium-Copper	50-120	200	150	100	1.10

Test Certificate
IEC 62561 Part 1

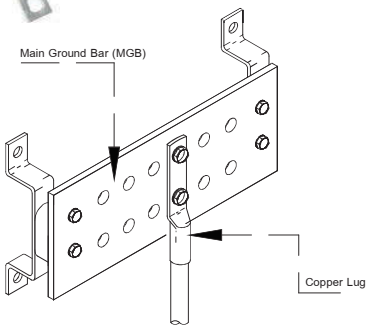
Application
Suitable for inspection and testing point in grounding system

Material
Box - ABS IP66
Bolt - Stainless Steel
Terminal - Copper Alloy (GYATB)
Disconnecting - Tin Plated Copper (GYATB)
Terminal - Aluminium/Copper Alloy (GYPTB-AC)
Disconnecting - Tin Plated Copper (GYPTB-AC)



Ground Bar

Main Ground Station

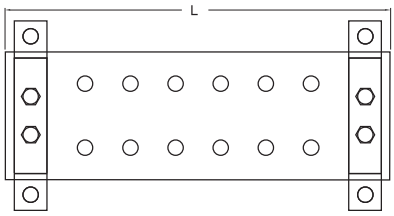


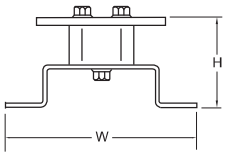
Code No.	No. of Hole	Ø Hole (mm)	Busbar (mm)	Dimensions (mm) L	W	H	Weight (kg)
GBPGSS-6D	12	14.3	100x350x6	148	350	75	1.80
GBPGSS-8D	16	14.3	100x440x6	148	440	75	2.50
GBPGSS-12D	24	14.3	100x610x6	148	610	75	3.60

Test Certificate
IEC 62561 Part 1

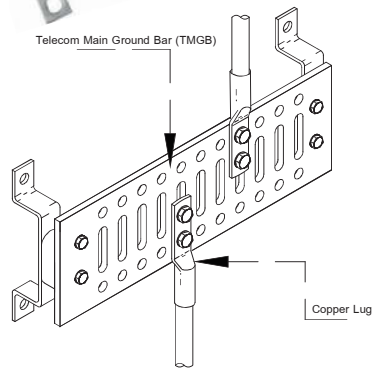
Material
Copper - 99.9%
Tin Plated Copper - BS EN 13601
Support - Hot Dip Galvanized with Insulator
Bolt - Stainless Steel

Application
Connect ground conductor wires to earth electrode





Telecommunication / Communication Ground Station

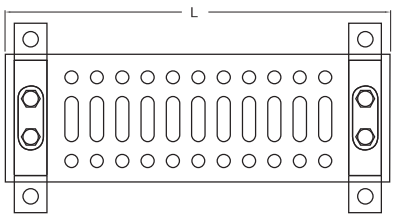


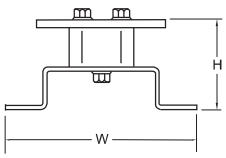
Code No.	No. of Hole	Ø Hole (mm)	Busbar (mm)	Dimensions (mm) L	W	H	Weight (kg)
GBCGSS-200	6	10	100x200x6	148	200	83	0.86
GBCGSS-300	11	10	100x300x6	148	300	83	1.60
GBCGSS-400	15	10	100x400x6	148	400	83	1.80
GBCGSS-450	18	10	100x450x6	148	450	83	2.40
GBCGSS-600	24	10	100x600x6	148	600	83	3.20

Test Certificate
IEC 62561 Part 1

Material
Copper - 99.9%
Tin Plated Copper - BS EN 13601
Support - Hot Dip Galvanized with Insulator
Bolt - Stainless Steel

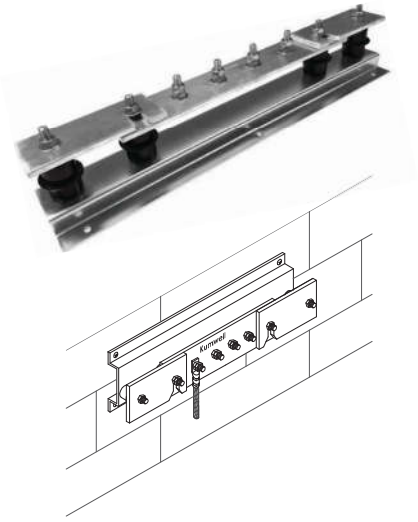
Application
Connect ground conductor wires to earth electrode

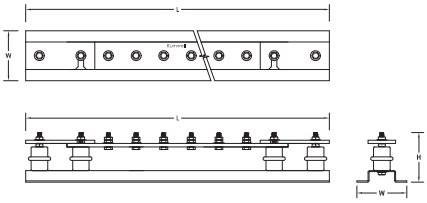




Ground Bar

Twin Disconnecting Link





Code No.	No. of Terminal	Dimensions (mm) L	W	H	Weight (kg)
GBDL 42	4	450	90	90	2.80
GBDL 62	6	550	90	90	2.80
GBDL 82	8	575	90	90	3.20
GBDL 102	10	650	90	90	3.80
GBDL 122	12	800	90	90	4.20
GBDL 142	14	900	90	90	4.60
GBDL 162	16	1000	90	90	5.00
GBDL 182	18	1100	90	90	5.40
GBDL 202	20	1200	90	90	6.00
GBDL 222	22	1350	90	90	6.40
GBDL 242	24	1450	90	90	6.80
GBDL 262	26	1550	90	90	7.20
GBDL 282	28	1650	90	90	7.90
GBDL 302	30	1850	90	90	8.30

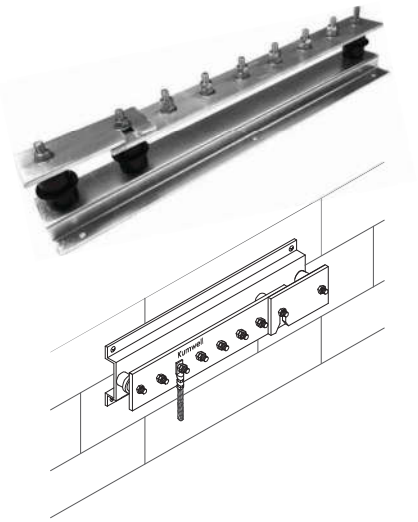
Test Certificate
IEC 62561 Part 1

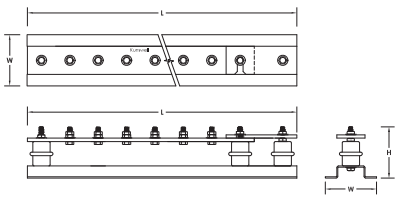
Material
Busbar - Tin Plated Copper - BS EN 13601
Support - Zinc Plated Steel with Insulator
Bolt M8 - Stainless Steel. All the above products consist of 50x6 mm copper bar.
Fix using wood screws 1½" x no.10

Application
Suitable for bonding and testing point in grounding system.

Note : Special Size Length can be requested.

Single Disconnecting Link





Code No.	No. of Terminal	Dimensions (mm) L	W	H	Weight (kg)
GBDL 41	4	375	90	90	1.90
GBDL 61	6	475	90	90	2.30
GBDL 81	8	575	90	90	2.70
GBDL 101	10	725	90	90	3.30
GBDL 121	12	825	90	90	3.70
GBDL 141	14	925	90	90	4.10
GBDL 161	16	1025	90	90	4.50
GBDL 181	18	1125	90	90	4.90
GBDL 201	20	1275	90	90	5.50
GBDL 221	22	1375	90	90	5.90
GBDL 241	24	1475	90	90	6.30
GBDL 261	26	1575	90	90	6.70
GBDL 281	28	1675	90	90	7.40
GBDL 301	30	1775	90	90	7.80

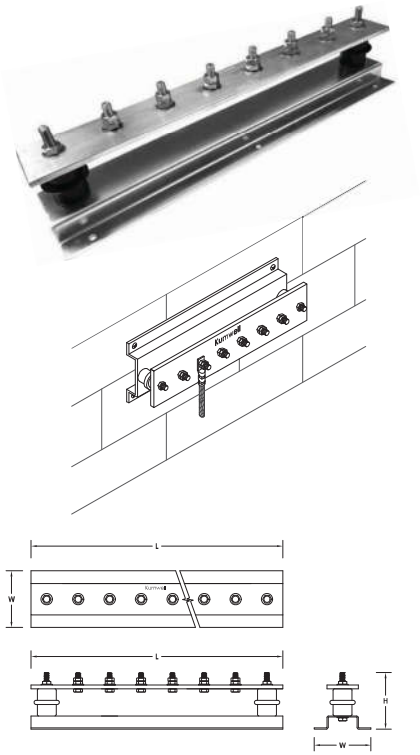
Test Certificate
IEC 62561 Part 1

Material
Busbar - Tin Plated Copper - BS EN 13601
Support - Zinc Plated Steel with Insulator
Bolt M8 - Stainless Steel. All the above products consist of 50x6 mm copper bar.
Fix using wood screws 1½" x no.10

Application
Suitable for bonding and testing point in grounding system.

Note : Special Size Length can be requested.

Ground Bar



Without Disconnecting Link

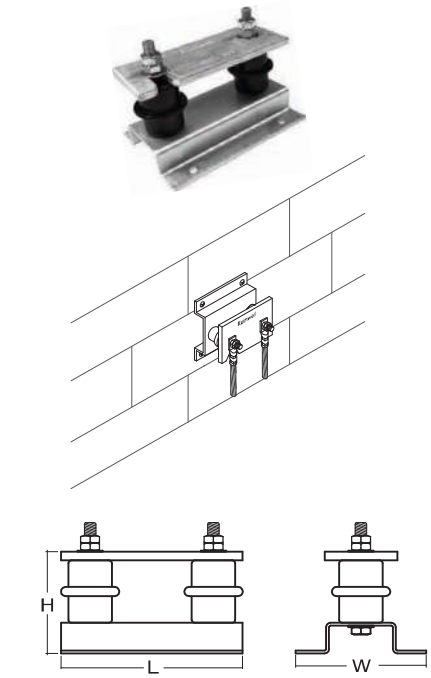
Code No.	No. of Terminal	Dimensions (mm) L	W	H	Weight (kg)
GBDL 40	4	300	90	90	1.50
GBDL 60	6	400	90	90	1.80
GBDL 80	8	500	90	90	2.20
GBDL 100	10	650	90	90	2.80
GBDL 120	12	750	90	90	3.20
GBDL 140	14	850	90	90	3.60
GBDL 160	16	950	90	90	4.00
GBDL 180	18	1050	90	90	4.40
GBDL 200	20	1200	90	90	5.00
GBDL 220	22	1300	90	90	5.40
GBDL 240	24	1400	90	90	5.80
GBDL 260	26	1500	90	90	6.20
GBDL 280	28	1600	90	90	6.90
GBDL 300	30	1700	90	90	7.30

Test Certificate
IEC 62561 Part 1

Material
Busbar - Tin Plated Copper - BS EN 13601
Support - Zinc Plated Steel with Insulator
Bolt M8 - Stainless Steel. All the above products consist of 50x6 mm copper bar.
Fix using wood screws 1½" x no.10

Application
Suitable for bonding and testing point in grounding system.

Note : Special Size Length can be requested.



Disconnecting Link

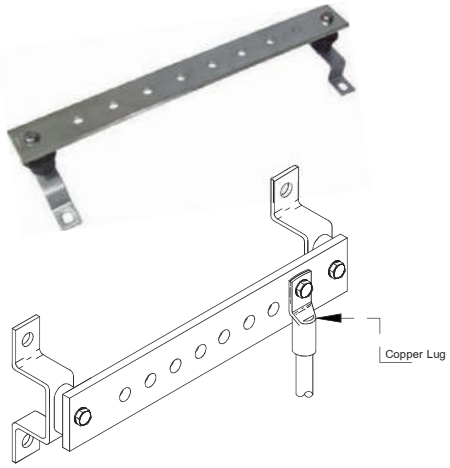
Code No.	Dimensions (mm) L	W	H	Weight (kg)
GBDL 253	125	90	90	0.74

Test Certificate
IEC 62561 Part 1

Material
Tin Plated Copper Bar - BS EN 13601
Support - Zinc Plated Steel with Insulator
STUD M8 - Stainless Steel. All the above products consist of 50x6 mm copper bar.
Fix using wood screws 1½" x no.10

Application
Suitable for bonding and testing point in grounding system.

Ground Bar



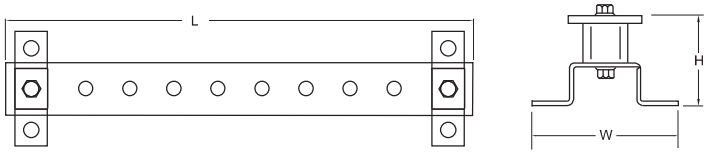
For Bonding and Equipotential

Code No.	No. of Hole	Ø Hole (mm)	Busbar (mm)	Dimensions (mm) L	W	H	Weight (kg)
GBPGSS-6	6	14.3	50x350x6	350	148	75	1.28
GBPGSS-8	8	14.3	50x440x6	440	148	75	1.50
GBPGSS-12	12	14.3	50x610x6	610	148	75	1.80

Test Certificate
IEC 62561 Part 1

Material
Tin Plated Copper - BS EN 13601
Support - Hot Dip Galvanized with Insulator
Bolt - Stainless Steel

Application
Connect ground conductor wires to earth electrode



Concrete Inspection Pit

Standard Type

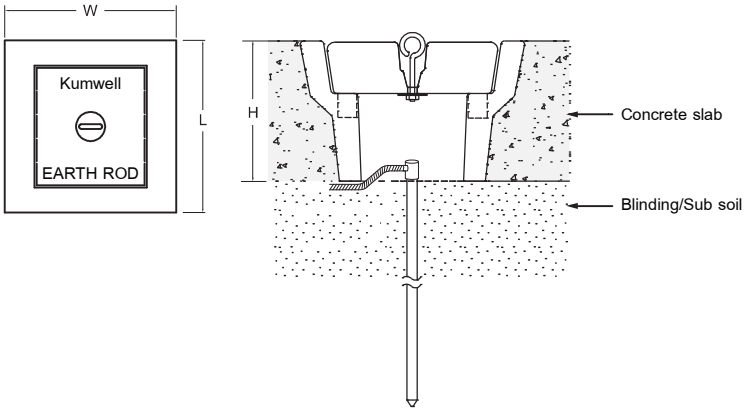
GXCIP

Code No.	Dimensions (mm) L	W	H	Weight (kg)
GXCIP	310	310	192	21.5

Test Certificate
IEC 62561 Part 5 - Heavy Duty Type

Material
Concrete

Application
Inspection and Testing point in grounding system.
Provide high compressive strength up to 60,000 kN (6,000kg).



Note : Special Size and color cover can be requested.

Cast Iron Lid

GXCIP-H

Code No.	Dimensions (mm) L	W	H	Weight (kg)
GXCIP-H	310	310	192	25.5

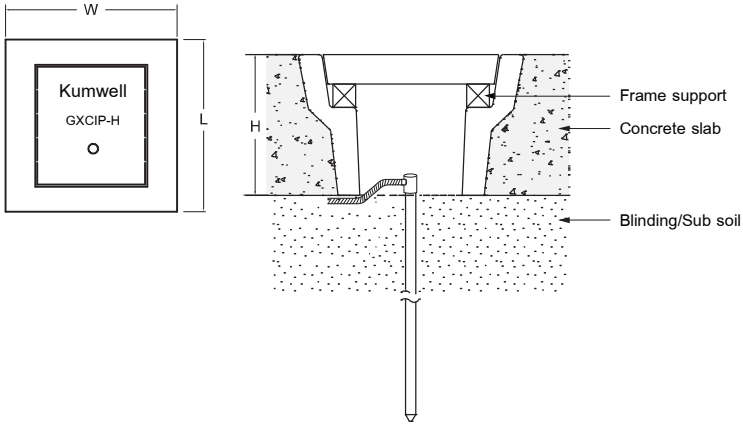
Test Certificate
IEC 62561 Part 5 - Heavy Duty Type

Material
Body - Concrete
Cover - Cast iron steel with epoxy gray color
Frame - Mild Steel

Application
Inspection and Testing point in grounding system.
Provide high compressive strength up to 125,000 kN (12,500kg).

Cover

Frame Support



Note : Standard Color - Grey

Concrete Inspection Pit

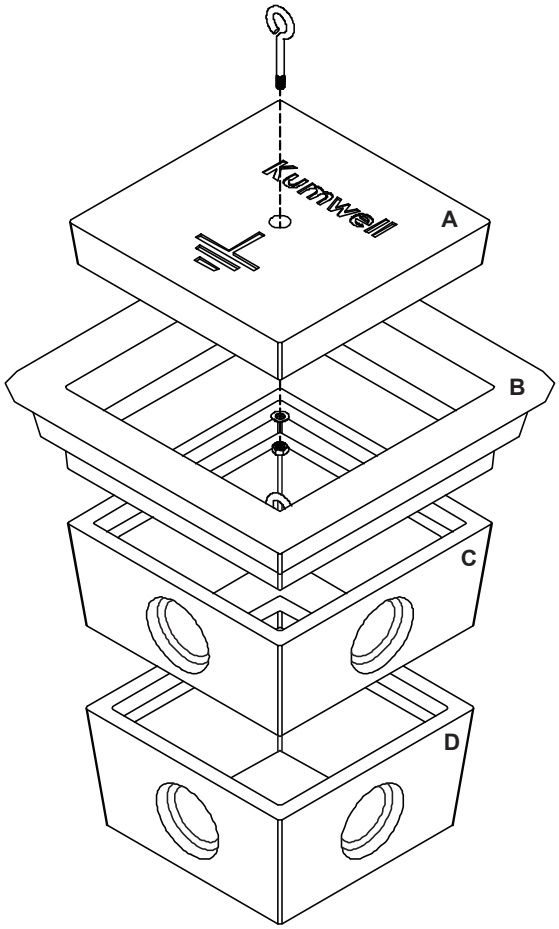
Generally the large size of concrete pit are in heavy single piece (> 100 kg) and may need mobile crane for transportation and installation at-site.

Hence we innovate the stackable pit which each part is easy to carry by man as well as still keep high compressive strength up to 60 kN (6,000 kg).

Code No.	Dimensions (mm) W	D	H	Assembly Part	Total Weight (kg)
GXCIP-404050-4P	400	400	500	4	Approx. 60
GXCIP-505050-4P	500	500	500	4	Approx. 92.5

Test Certificate
IEC 62561 Part 5 - Heavy Duty Type

Material
Concrete



Part / Code	GXCIP-404050-4P	GXCIP-505050-4P
Concrete Lid **(A)**	13 kg	25 kg
Upper Part **(B)**	19 kg	25 kg
Body 1 **(C)**	11 kg	22 kg
Body 2 **(D)**	17 kg	20 kg

Note : Kumwell stackable pit provide safety load weight for workers and saving for transportation cost.

One man can do it, every parts A,B,C,D are below 30 kg easy to carry by a man and installation at- site.

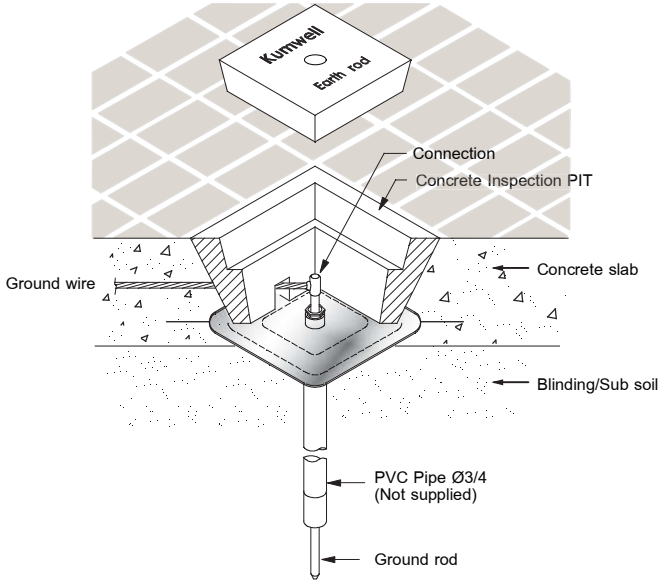
Copper Earthing Electrode Water Sealing Glands

Code No.	Size (mm)	Ø Rod (in)	Weight (kg)
GXCIP-WS	300x300x2	5/8, 3/4	1.63

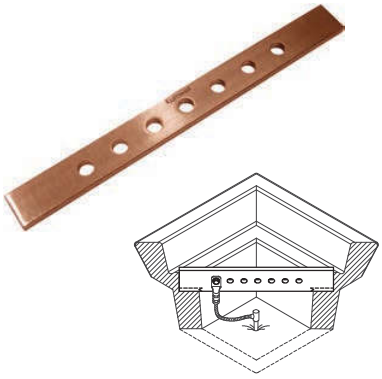
Test Certificate
IEC 62561 Part 5

Material
Stainless Steel

Application
Suitable for constructions where internal earth are specified



Ground Bar Pit



Code No.	No. of Terminal	Size (mm)	Weight (kg)
GXGBP 2505	5	25x250x6	0.31
GXGBP 2507	7	25x250x6	0.30
GXGBP 2505T	5	25x250x6	0.31
GXGBP 2507T	7	25x250x6	0.30

Test Certificate
IEC 62561 Part 1

Material
Copper - BS EN 13601
Copper with Tin

Application
Suitable for testing point of grounding system that separate connections with another inspection pit.

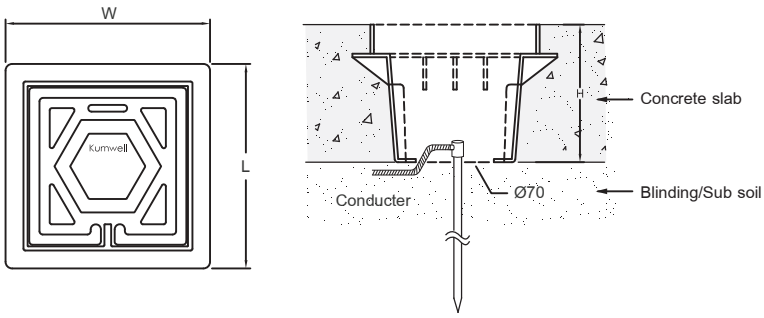
FRP Inspection Pit

Code No.	Dimensions (mm) L	W	H	Weight (kg)
GXFIP	306	306	215	2.40

Test Certificate
IEC 62561 Part 5 - Heavy Duty Type

Material
Heavy high-grade polypropylene

Application
Suitable for Inspection and Testing point in grounding system. Provide high compressive strength up to 50,000 kN (5,000kg).



Ground Rod Seal

GXCIP-WP-XXX

GXCIP-WPD-XXX

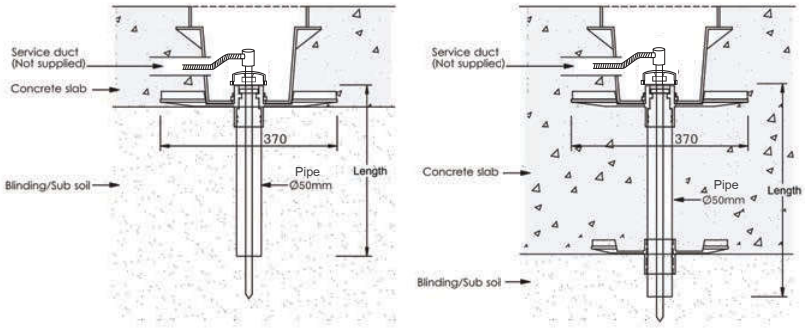
Code No.	Ø Size (mm)	Ø Rod (in)	Length (mm)	Weight (kg)
GXCIP-WP-12.7	366	1/2	385	2.0
GXCIP-WP-14.2	366	5/8	385	2.0
GXCIP-WP-17.2	366	3/4	385	2.0
GXCIP-WPD-12.7	366	1/2	1,060	3.0
GXCIP-WPD-14.2	366	5/8	1,060	3.0
GXCIP-WPD-17.2	366	3/4	1,060	3.0

Test Certificate
IEC 62561 Part 5

Material
Plastic (Body)
Stainless Steel (Pipe)

Application
A waterproof ground rod seal for use in constructions where internal ground are specified.

Note : Please specify ground rod diameter to be used with



GXCIP-WP GXCIP-WPD

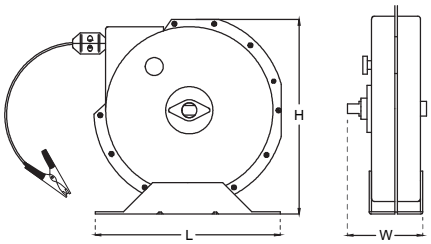
Static Earth Reels

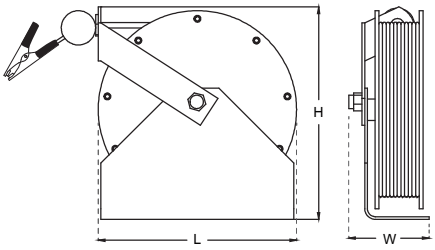
Kumwell Static earth reels are used to ground equipment operating in hazardous area. When properly clamped to ground, the static earth reel dissipates static electrical buildup, reducting the chances of sparking and the potential for explosion.

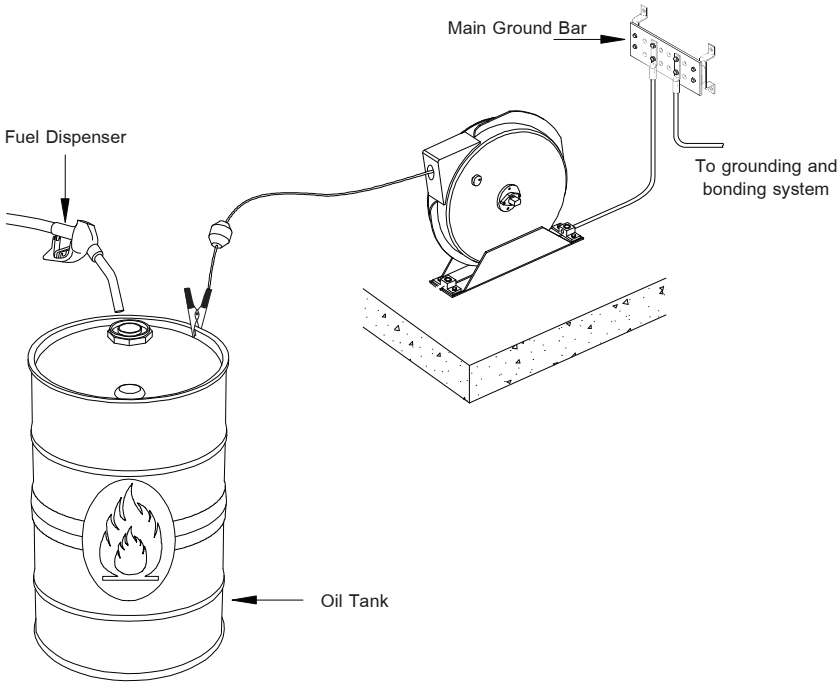
Code No.	Cable Length (m)	Diameter (mm) L	W	H	Weight (kg)
GERA-15SL-N	15	222	85	225	5
GERA-30SL-N	30	235	95	250	7

Material
Automatic Reels - Steel
Ground Clamp - Copper
Conductor - Sling 3/32"
Steel aircraft cable
(Hi-Vis orange nyloncovered cable)

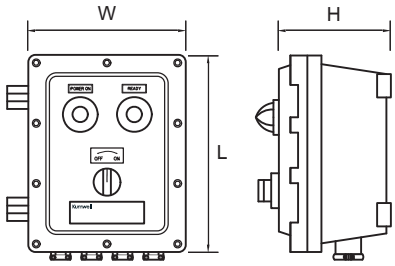
Application
Discharge static electricity from airplane, gas station, petrochemical plant, etc. in grounding system, reducing the chances of sparking and the potential for explosion. Resistance is approximately one ohm per 15 m of steel cable.



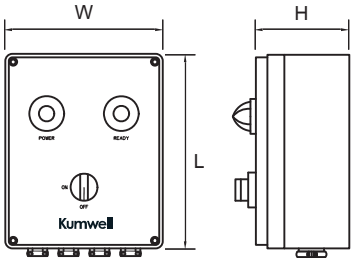




Static Earth Reels Monitor and Remote Interlock Controlled



GERA 15ME



GERA 15MP

Code No.	Cable Length (m)	Dimensions (mm) L	W	H	Weight (kg)
GERA 15ME	15	254	203	145	18.5
GERA 15MP	15	200	150	100	11.5

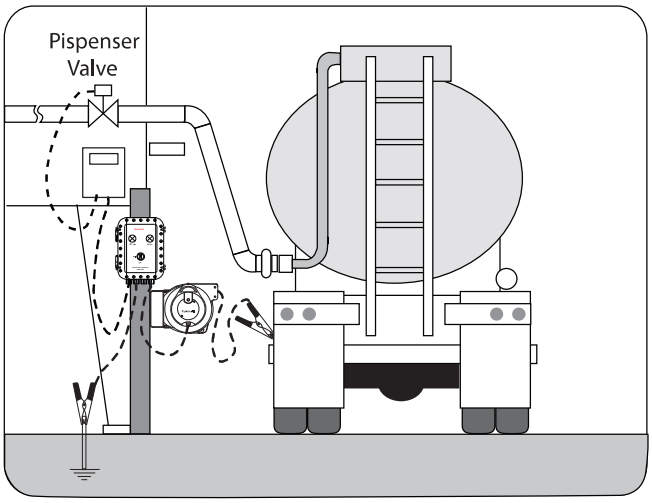
Application
Earth reel is an equipment for eliminating the electrostatic charges generates during the filling and emptying operations of tank-trucks which flammable and explosive products and to maintain them at electric zero potential.
- Explosion Proof Enclosure for static discharge.
- With remote monitor and control interface for fuel pispenser valve thru dry contact.

Technical Specification
Supply voltage : 110 or 230 VAC +10% (24 VDC/AC - on request)
Frequency : 50/60 Hz
Consumptio : 12W
Working temperature : -10o C to +50o C

Housing Protection
Ex environment according to ATEX : II 2G Exd IIA
Weatherproof : IP66

Accessories
Cable reel - PVC ABS body
Cable - 3x1.5mm2 to increase fraction resistance,
Clamp - Jaw Copper alloy / Brass sharp contacts 20 mm. opening

Features
With light indicate : - Green light flashing when is safety operation
- Green light OFF indicating grounding system failure
Explosion proof or ABS IP66 box control
Electric resistance control is not exceed 5 Ohm
Contact voltage free (NO-NC-C) for interlock fuel operation



Blunt End Air Terminal

Copper

Code No.	Rod Length (L) (mm)	Rod Diameter (Ø) (mm)	Thread (in)	Weight (kg)
LTAT 58-30	300	15	5/8	0.50
LTAT 58-50	500	15	5/8	0.80
LTAT 58-60	600	15	5/8	0.96
LTAT 58-100	1000	15	5/8	1.60
LTAT 34-30	300	19	3/4	0.75
LTAT 34-50	500	19	3/4	1.20
LTAT 34-60	600	19	3/4	1.51
LTAT 34-100	1000	19	3/4	2.50

Test Certificate
IEC 62561 Part 2

Material
Copper - BS EN 13601

Application
Suitable for typical installation

Tin Plated Copper

Code No.	Rod Length (L) (mm)	Rod Diameter (Ø) (mm)	Thread (in)	Weight (kg)
LTAT 58-30T	300	15	5/8	0.50
LTAT 58-50T	500	15	5/8	0.80
LTAT 58-60T	600	15	5/8	0.96
LTAT 58-100T	1000	15	5/8	1.60
LTAT 34-30T	300	19	3/4	0.75
LTAT 34-50T	500	19	3/4	1.20
LTAT 34-60T	600	19	3/4	1.51
LTAT 34-100T	1000	19	3/4	2.50

Test Certificate
IEC 62561 Part 2

Material
Tin plated copper - BS EN 13601

Application
Suitable for extra high corrosive area

Aluminium

Code No.	Rod Length (L) (mm)	Rod Diameter (Ø) (mm)	Thread (in)	Weight (kg)
LTAT 58-30A	300	16	5/8	0.16
LTAT 58-50A	500	16	5/8	0.27
LTAT 58-60A	600	16	5/8	0.33
LTAT 58-100A	1000	16	5/8	0.55

Test Certificate
IEC 62561 Part 2

Material
Aluminium - BS 2898

Application
Suitable for installation on metal roof

Blunt End Air Terminal (Height ≥1.5 m.)

Copper with Guy Wire Support

Code No.	Rod Length (L) (mm)	Rod Diameter (Ø) (mm)	Thread (in)	Weight (kg)
LTATG 58-150	1500	15	5/8	3.01
LTATG 58-200	2000	15	5/8	3.90
LTATG 34-150	1500	19	3/4	4.19
LTATG 34-200	2000	19	3/4	5.47

Test Certificate
IEC 62561 Part 2

Material
Copper - BS EN 13601

Application
Suitable for typical installation

Tin Plated Copper with Guy Wire Support

Code No.	Rod Length (L) (mm)	Rod Diameter (Ø) (mm)	Thread (in)	Weight (kg)
LTATG 58-150T	1500	15	5/8	3.01
LTATG 58-200T	2000	15	5/8	3.90
LTATG 34-150T	1500	19	3/4	4.19
LTATG 34-200T	2000	19	3/4	5.47

Test Certificate
IEC 62561 Part 2

Material
Tin plated copper - BS EN 13601

Application
Suitable for extra high corrosive area

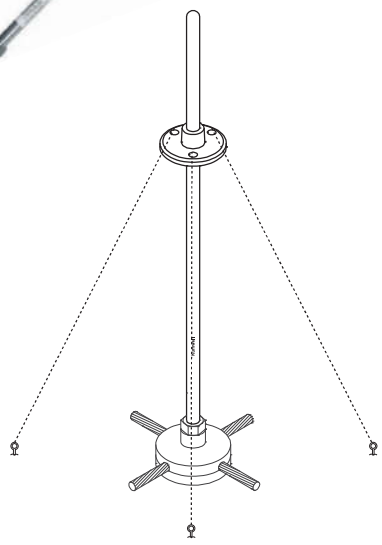
Aluminium with Guy Wire Support

Code No.	Rod Length (L) (mm)	Rod Diameter (Ø) (mm)	Thread (in)	Weight (kg)
LTATG 58-150A	1500	16	5/8	0.91
LTATG 58-200A	2000	16	5/8	1.18

Test Certificate
IEC 62561 Part 2

Material
Aluminium - BS 2898

Application
Suitable for installation on metal roof



Note : Guy wire is not included.

Multi Point Air Terminals

Code No.	Diameter (Ø) (in)	Material	Weight (kg)
LMAT 58	5/8	Copper	0.36
LMAT 34	3/4	Copper	0.36

Test Certificate
IEC 62561 Part 2

Material
Copper BS EN 13601

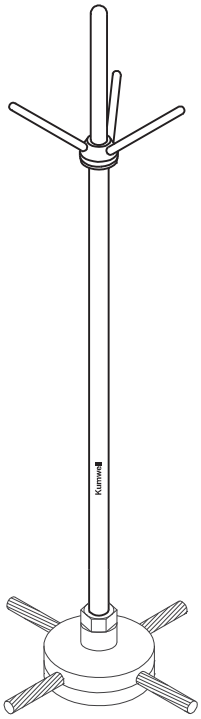
Application
Connect copper tape pointed air rods with multi point air terminals for typical installation.

Code No.	Rod Length (Ø) (mm)	Rod Diameter (Ø) (mm)	Threaded (in)	Weight (kg)
LTAT 16-30	300	15	5/8	0.50
LTAT 16-50	500	15	5/8	0.80
LTAT 16-60	600	15	5/8	0.96
LTAT 16-100	1000	15	5/8	1.60
LTAT 20-30	300	19	3/4	0.75
LTAT 20-50	500	19	3/4	1.27
LTAT 20-60	600	19	3/4	1.51
LTAT 20-100	1000	19	3/4	2.50

Test Certificate
IEC 62561 Part 2

Material
Copper BS EN 13601

Application
Connect copper tape pointed air rods with multi point air terminals for typical installation.



Note : Special size can be request.

Blunt End Air Terminals

Code No.	For Air Terminal Diameter (in)	Threaded (in)	Weight (kg)
LMBT 58	5/8	5/8	0.29
LMBT 34	3/4	3/4	0.27
LMBT 58T	5/8	5/8	0.27
LMBT 34T	3/4	3/4	0.29

Test Certificate
IEC 62561 Part 2

Material
Copper bonded Steel
Copper bonded Steel With Tin Plated

Elevation Terminals for Blunt End Air Terminal

Copper

Code No.	Rod Length (L) (mm)	Rod Diameter (Ø) (mm)	Threaded (in)	Weight (kg)
LELT 58 - 30	300	15	5/8	0.50
LELT 58 - 50	500	15	5/8	0.80
LELT 58 - 60	600	15	5/8	0.96
LELT 58 - 100	1000	15	5/8	1.60
LELTG 58 - 150	1500	15	5/8	2.36
LELTG 58 - 200	2000	15	5/8	3.16
LELT 34 - 30	300	19	3/4	0.75
LELT 34 - 50	500	19	3/4	1.20
LELT 34 - 60	600	19	3/4	1.51
LELT 34 - 100	1000	19	3/4	2.50
LELTG 34 - 150	1500	19	3/4	3.82
LELTG 34 - 200	2000	19	3/4	5.09

Test Certificate
IEC 62561 Part 2

Material
Copper - BS EN 13601

Application
Suitable for typical installation

Tin Plated Copper

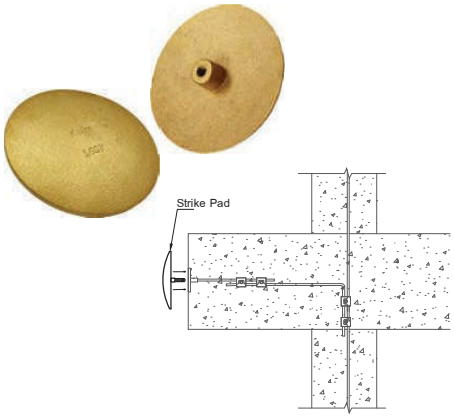
Code No.	Rod Length (L) (mm)	Rod Diameter (Ø) (mm)	Threaded (in)	Weight (kg)
LELT 58 - 30T	300	15	5/8	0.50
LELT 58 - 50T	500	15	5/8	0.80
LELT 58 - 60T	600	15	5/8	0.96
LELT 58 - 100T	1000	15	5/8	1.60
LELTG 58 - 150T	1500	15	5/8	2.36
LELTG 58 - 200T	2000	15	5/8	3.16
LELT 34 - 30T	300	19	3/4	0.75
LELT 34 - 50T	500	19	3/4	1.20
LELT 34 - 60T	600	19	3/4	1.51
LELT 34 - 100T	1000	19	3/4	2.50
LELTG 34 - 150T	1500	19	3/4	3.82
LELTG 34 - 200T	2000	19	3/4	5.09

Test Certificate
IEC 62561 Part 2

Material
Tin plated copper - BS EN 13601

Application
Suitable for typical installation

Strike Pad



Code No.	Diameter (Ø) (mm)	Stud Size (in)	Material	Weight (kg)
LGSP-C	112	3/8 (16 TPI)	Copper Alloy	0.38
LGSP-A	112	3/8 (16 TPI)	Aluminium Alloy	0.11

Material
Copper Alloy - BS EN 1982

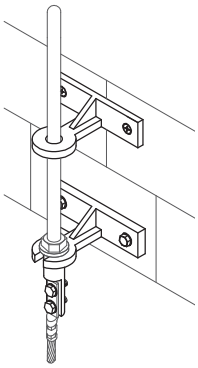
Application
Suitable for side flash protection of building

Air Terminal Bracket


LGABT


LGABB


LPAF



Code No.	Rod Diameter (Ø) (mm)	Material	Weight (kg)
LGABT-C	15, 19	Copper Alloy	0.85
LGABB-C	15, 19	Copper Alloy	0.90
LPAF-C	15, 19	Copper Alloy	0.25
LGABT-CT	15, 19	Tinned Copper Alloy	0.85
LGABB-CT	15, 19	Tinned Copper Alloy	0.90
LPAF-CT	15, 19	Tinned Copper Alloy	0.25
LGABT-A	15, 19	Aluminium Alloy	0.26
LGABB-A	15, 19	Aluminium Alloy	0.27
LPAF-A	15, 19	Aluminium Alloy	0.12

Test Certificate
Code No. LPAF IEC 62561 Part 1
Code No. LGABT, LGABB IEC 62561 Part 4

Material
Copper Alloy - BS EN 1982, Bolt - Brass
Aluminium Alloy - BS 2898,
Bolt - Stainless Steel

Application
Support air terminal by fastening on wall

Puddle Flange

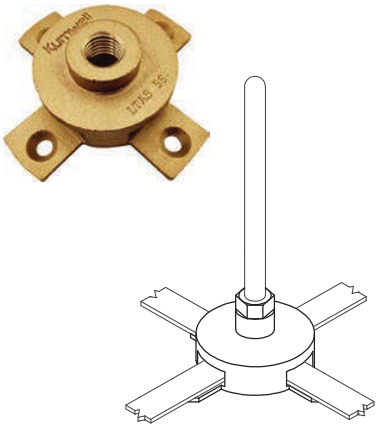
Code No.	Rod Diameter (Ø) (in)	Material	Weight (kg)
GPF-58	5/8	Copper	1.4
GPF-34	3/4	Copper	1.9

Test Certificate
IEC 62561 Part 2

Material
Copper - BS EN 13601

Application
Interconnecting conductors to the other level.

Tape Saddle



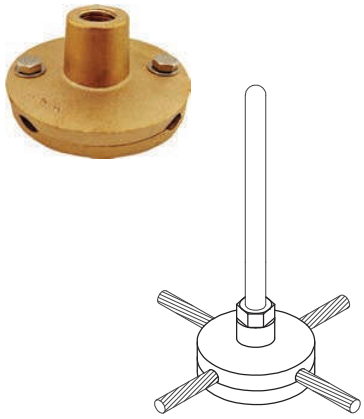
Code No.	Thread Size (in)	Tape Size (mm)	Material	Weight (kg)
LTAS 58	5/8	25x2 , 25x3 , 25x4	Copper Alloy	0.460
LTAS 34	3/4	25x2 , 25x3 , 25x4	Copper Alloy	0.440
LTAS 58T	5/8	25x2 , 25x3 , 25x4	Tinned Copper Alloy	0.460
LTAS 34T	3/4	25x2 , 25x3 , 25x4	Tinned Copper Alloy	0.440
LTAS 58A	5/8	25x3 , 25x4	Aluminium Alloy	0.134
LTAS 34A	3/4	25x3 , 25x4	Aluminium Alloy	0.132

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Aluminium Alloy - BS 2898

Application
Support air terminal to connect with copper or aluminium tape conductors.

Round Saddle



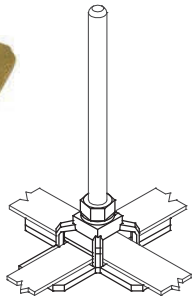
Code No.	Thread Size (in)	Cable Size (mm^2)	Material	Weight (kg)
LROS 58	5/8	50-70	Copper Alloy	0.60
LROS 34	3/4	50-70	Copper Alloy	0.60
LROS 58-C120	5/8	95-120	Copper Alloy	0.74
LROS 34-C120	3/4	95-120	Copper Alloy	0.74
LROS 58A	5/8	50-70	Aluminium Alloy	0.22
LROS 34A	3/4	50-70	Aluminium Alloy	0.21

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982,
Bolt - Brass

Application
Support air terminal to connect with copper stranded or solid conductors.

Flat Saddle



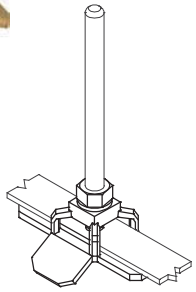
Code No.	Thread Size (in)	Maximum Conductor Width (mm)	Material	Weight (kg)
LFLS 58	5/8	31	Copper Alloy	0.49
LFLS 34	3/4	31	Copper Alloy	0.48
LFLS 58A	5/8	31	Aluminium Alloy	0.15
LFLS 34A	3/4	31	Aluminium Alloy	0.15

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Aluminium Alloy - BS 2898

Application
Support air terminal to connect with copper tape conductors.

Ridge Saddle



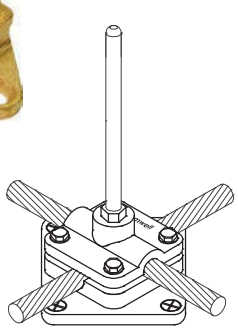
Code No.	Thread Size (in)	Maximum Conductor Width (mm)	Material	Weight (kg)
LRIS 58	5/8	31	Copper Alloy	0.60
LRIS 34	3/4	31	Copper Alloy	0.58
LRIS 58A	5/8	31	Aluminium Alloy	0.20
LRIS 34A	3/4	31	Aluminium Alloy	0.18

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Aluminium Alloy - BS 2898

Application
Support air terminal to connect with copper tape conductors.

Double Base Saddle



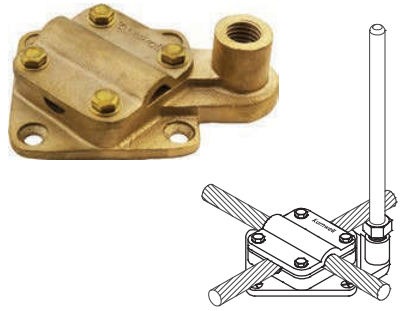
Code No.	Thread Size (in)	Cable Size (mm^2)	Material	Weight (kg)
LDOS 58	5/8	50-70	Copper Alloy	0.66
LDOS 34	3/4	50-70	Copper Alloy	0.66
LDOS 58C120	5/8	95-120	Copper Alloy	0.69
LDOS 34C120	3/4	95-120	Copper Alloy	0.69
LDOS 58A	5/8	50-70	Aluminium Alloy	0.20
LDOS 34A	3/4	50-70	Aluminium Alloy	0.19

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982, Bolt - Brass
Aluminium Alloy - BS 2898,
Bolt - Stainless Steel

Application
Support air terminal to connect with copper stranded or solid conductors.

Cross Cable Saddle



Code No.	Thread Size (in)	Cable Size (mm^2)	Material	Weight (kg)
LCRS 58	5/8	35-70	Copper Alloy	0.95
LCRS 34	3/4	35-70	Copper Alloy	0.95

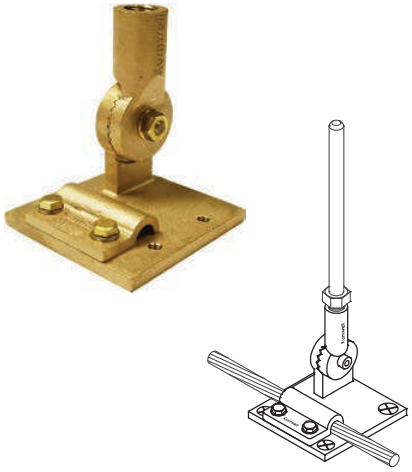
Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Bolt - Brass

Application
Support air terminal to connect with copper stranded or solid conductors.

Adjustable Saddle

For Cable



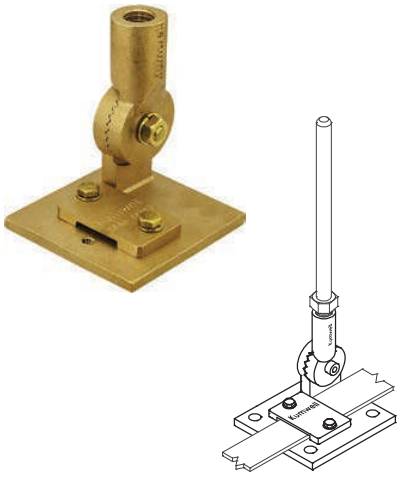
Code No.	Thread Size (in)	Cable Size (mm^2)	Material	Weight (kg)
LDAS 58	5/8	50-70	Copper Alloy	0.72
LDAS 34	3/4	50-70	Copper Alloy	0.72
LDAS 58-C120	5/8	95-120	Copper Alloy	0.73
LDAS 34-C120	3/4	95-120	Copper Alloy	0.73
LDAS 58T	5/8	50-70	Tinned Copper Alloy	0.72
LDAS 34T	3/4	50-70	Tinned Copper Alloy	0.72
LDAS 58A	5/8	50-70	Aluminium Alloy	0.25
LDAS 34A	3/4	50-70	Aluminium Alloy	0.25

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982, Bolt - Brass
Tinned Copper Alloy, Bolt - Stainless Steel
Aluminium Alloy-BS 2898

Application
Support air terminal onto adjustable angle to connect with copper stranded.

For Tape



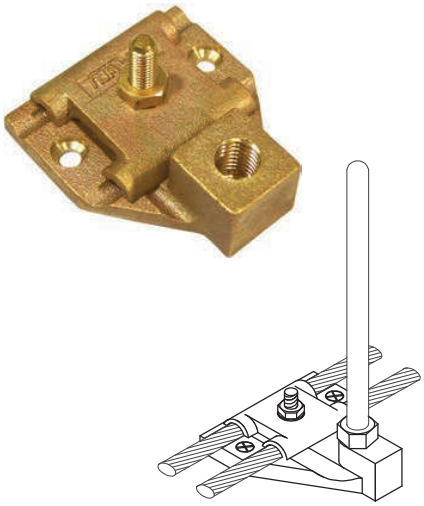
Code No.	Thread Size (in)	Tape Size (mm)	Material	Weight (kg)
LDAS 58-252	5/8	25x2	Copper Alloy	0.81
LDAS 58-253	5/8	25x3	Copper Alloy	0.81
LDAS 34-253	3/4	25x3	Copper Alloy	0.81
LDAS 58-254	5/8	25x4	Copper Alloy	0.81
LDAS 34-254	3/4	25x4	Copper Alloy	0.81
LDAS 58-253T	5/8	25x3	Tinned Copper Alloy	0.81
LDAS 34-253T	3/4	25x3	Tinned Copper Alloy	0.81
LDAS 58-253A	5/8	25x3	Aluminium Alloy	0.25
LDAS 34-253A	3/4	25x3	Aluminium Alloy	0.25
LDAS 58-254A	5/8	25x4	Aluminium Alloy	0.25
LDAS 34-254A	3/4	25x4	Aluminium Alloy	0.25

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982, Bolt - Brass
Tinned Copper Alloy, Bolt - Stainless Steel
Aluminium Alloy-BS 2898

Application
Support air terminal onto adjustable angle toconnect with copper or aluminium tape conductors.

Floor Saddle



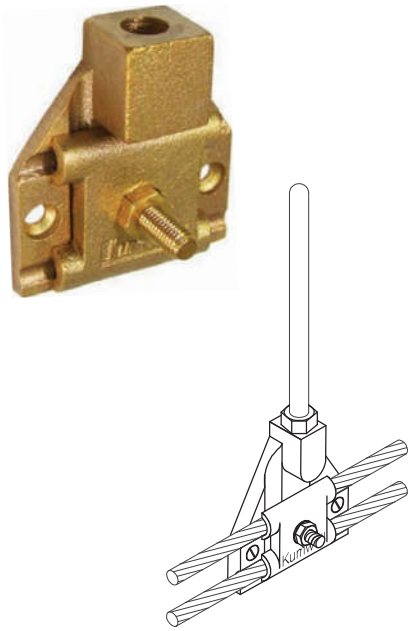
Code No.	Thread Size (in)	Cable Size (mm^2)	Material	Weight (kg)
LFRS 58	5/8	50-70	Copper Alloy	0.58
LFRS 34	3/4	50-70	Copper Alloy	0.58
LFRS 58C-95	5/8	95	Copper Alloy	0.54
LFRS 34C-95	3/4	95	Copper Alloy	0.54
LFRS 58A	5/8	50-70	Aluminium Alloy	0.23
LFRS 34A	3/4	50-70	Aluminium Alloy	0.23

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Bolt Nut - Brass
Aluminium Alloy-BS 2898

Application
Support air terminal to connect with copper stranded or solid conductors.

Wall Saddle



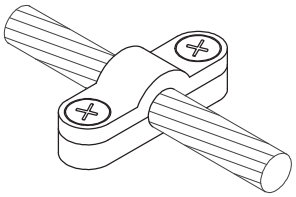
Code No.	Thread Size (in)	Cable Size (mm^2)	Material	Weight (kg)
LWAS 58	5/8	25-70	Copper Alloy	0.58
LWAS 34	3/4	25-70	Copper Alloy	0.58
LWAS 58C-95	5/8	95	Copper Alloy	0.54
LWAS 34C-95	3/4	95	Copper Alloy	0.54
LWAS 58A	5/8	25-70	Aluminium Alloy	0.23
LWAS 34A	3/4	25-70	Aluminium Alloy	0.23

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Bolt Nut - Brass
Aluminium Alloy-BS 2898

Application
Support air terminal to connect with copper stranded or solid conductors.

Cable Support



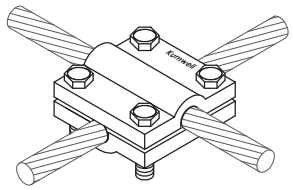
Code No.	Cable Size (mm^2)	Material	Weight (kg)
LCAS 25-35	25-35	Copper Alloy	0.06
LCAS 50-70	50-70	Copper Alloy	0.06
LCAS 95-120	95-120	Copper Alloy	0.08
LCAS 150-185	150-185	Copper Alloy	0.10
LCAS 240-300	240-300	Copper Alloy	0.17
LCAS 25-35T	25-35	Tinned Copper Alloy	0.06
LCAS 50-70T	50-70	Tinned Copper Alloy	0.06
LCAS 95-120T	95-120	Tinned Copper Alloy	0.08
LCAS 25-35A	25-35	Aluminium Alloy	0.02
LCAS 50-70A	50-70	Aluminium Alloy	0.02
LCAS 95-120A	95-120	Aluminium Alloy	0.03
LCASD-8-10A	Aluminium Ø 8-10 mm	Aluminium Alloy	0.03

Test Certificate
IEC 62561 Part 4

Material
Copper Alloy - BS EN 1982, Bolt - Brass
Tinned Copper Alloy, Bolt - Stainless Steel
Aluminium Alloy - BS 2898,
Bolt - Stainless Steel

Application
Fix copper stranded or solid conductors.

Cable Cross Clamp



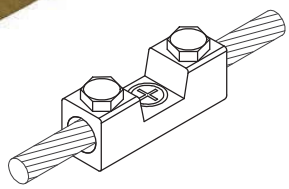
Code No.	Cable Size (mm^2)	Material	Weight (kg)
LCAC 35-70	70	Copper Alloy	0.32
LCAC 95-120	95-120	Copper Alloy	0.34
LCAC 150-240	150-240	Copper Alloy	0.62
LCAC 35-70A	70	Aluminium Alloy	0.10
LCAC 95-120A	95-120	Aluminium Alloy	0.16

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982, Bolt - Brass
Aluminium Alloy - BS 2898,
Bolt - Stainless Steel

Application
Connect copper stranded or solid conductors.

Cable Test Connector



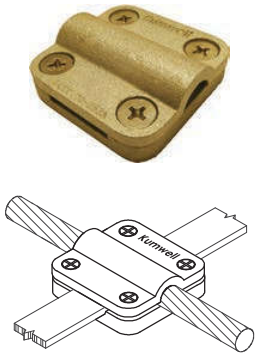
Code No.	Cable Size (mm^2)	Material	Weight (kg)
LCATT 35-120	35-120	Copper Alloy	0.192
LCATT 35-120T	35-120	Tinned Copper Alloy	0.192
LCATT 35-120A	35-120	Aluminium Alloy	0.058

Test Certificate
IEC 62561 Part 1

Material
Tinned Copper Alloy, Bolt - Stainless Steel
Aluminium Alloy - BS 2898,
Bolt - Stainless Steel

Application
Connect copper stranded or solid conductors.

Cable to Tape



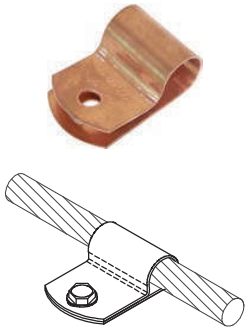
Code No.	Cable Size (mm^2)	Tape Size (mm)	Material	Weight (kg)
LCTT 70-252	35-70	25x2	Copper Alloy	0.264
LCTT 120-252	95-120	25x2	Copper Alloy	0.266
LCTT 70-253	35-70	25x3	Copper Alloy	0.264
LCTT 120-253	95-120	25x3	Copper Alloy	0.266
LCTT 70-254	35-70	25x4	Copper Alloy	0.276
LCTT 120-254	95-120	25x4	Copper Alloy	0.292
LCTT 70-256	35-70	25x6	Copper Alloy	0.303
LCTT 120-256	95-120	25x6	Copper Alloy	0.319
LCTT 70-253A	35-70	25x3	Aluminium Alloy	0.090
LCTT 70-254A	35-70	25x4	Aluminium Alloy	0.110

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982, Bolt - Brass
Aluminium Alloy - BS 2898, (A)

Application
Connect copper tape conductors with copper stranded or solid conductors.

One Hole Cable Grip



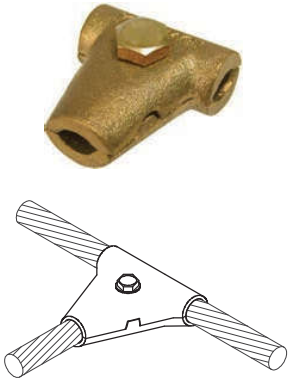
Code No.	Cable Size (mm^2)	Material	Weight/100 (kg)
LOCG 25-35	25-35	Copper	1.2
LOCG 50-70	50-70	Copper	1.4
LOCG 95-120	95-120	Copper	2.5
LOCG 150-185	150-185	Copper	2.9
LOCG 240-300	240-300	Copper	9.0

Test Certificate
IEC 62561 Part 4

Material
Copper - BS EN 13601

Application
Fix copper stranded or solid conductors.

Tee Clamp



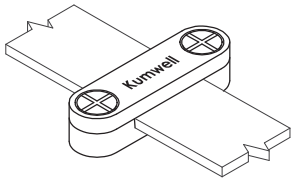
Code No.	Cable Size (mm^2)	Material	Weight (kg)
LTEC-A	50-70	Copper Alloy	0.146
LTEC-B	95-120	Copper Alloy	0.287
LTEC-AT	50-70	Tinned Copper Alloy	0.146
LTEC-BT	95-120	Tinned Copper Alloy	0.287

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982, Bolt - Brass
Tinned Copper Alloy, Bolt - Stainless Steel

Application
Connect copper stranded or solid conductors.

Tape Support



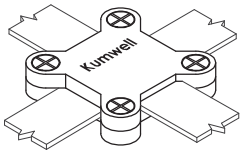
Code No.	Tape Size (mm)	Material	Weight (kg)
LTAS-252	25x2	Copper Alloy	0.067
LTAS-253	25x3	Copper Alloy	0.067
LTAS-254	25x4	Copper Alloy	0.071
LTAS-256	25x6	Copper Alloy	0.076
LTAS-304	30x4	Copper Alloy	0.087
LTAS-305	30x5	Copper Alloy	0.090
LTAS-324	32x4	Copper Alloy	0.094
LTAS-325	32x5	Copper Alloy	0.098
LTAS-326	32x6	Copper Alloy	0.101
LTAS-403	40x3	Copper Alloy	0.112
LTAS-404	40x4	Copper Alloy	0.116
LTAS-405	40x5	Copper Alloy	0.121
LTAS-503	50x3	Copper Alloy	0.117
LTAS-506	50x6	Copper Alloy	0.127
LTAS-253T	25x3	Tinned Copper Alloy	0.067
LTAS-254T	25x4	Tinned Copper Alloy	0.071
LTAS-256T	25x6	Tinned Copper Alloy	0.076
LTAS-253A	25x3	Aluminium Alloy	0.021
LTAS-254A	25x4	Aluminium Alloy	0.027
LTAS-256A	25x6	Aluminium Alloy	0.029

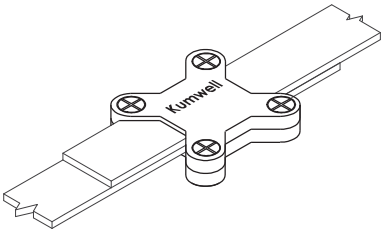
Test Certificate
IEC 62561 Part 4

Material
Copper Alloy - BS EN 1982, Bolt - Brass
Tinned Copper Alloy, Bolt - Stainless Steel
Aluminium Alloy - BS 2898, (A)
Bolt - Stainless Steel

Application
Fix copper or aluminium tape conductors

Square Tape Support





Code No.	Tape Size (mm)	Material	Weight (kg)
LSQS-252	25x2	Copper Alloy	0.150
LSQS-253	25x3	Copper Alloy	0.150
LSQS-254	25x4	Copper Alloy	0.172
LSQS-256	25x6	Copper Alloy	0.216
LSQS-304	30x4	Copper Alloy	0.261
LSQS-305	30x5	Copper Alloy	0.295
LSQS-324	32x4	Copper Alloy	0.245
LSQS-325	32x5	Copper Alloy	0.276
LSQS-403	40x3	Copper Alloy	0.341
LSQS-404	40x4	Copper Alloy	0.381
LSQS-405	40x5	Copper Alloy	0.423
LSQS-503	50x3	Copper Alloy	0.412
LSQS-506	50x6	Copper Alloy	0.561
LSQS-253T	25x3	Tinned Copper Alloy	0.150
LSQS-254T	25x4	Tinned Copper Alloy	0.172
LSQS-256T	25x6	Tinned Copper Alloy	0.216
LSQS-253A	25x3	Aluminium Alloy	0.045
LSQS-254A	25x4	Aluminium Alloy	0.052
LSQS-256A	25x6	Aluminium Alloy	0.065

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982, Bolt - Brass
Tinned Copper Alloy, Bolt - Stainless Steel
Aluminium Alloy - BS 2898, (A)
Bolt - Stainless Steel

Application
Connect copper or aluminium tape conductors.

Cable-Tape Test Connector

Code No.	Conductor Size (mm)	Tape Size (mm)	Weight (kg)
LPCTTC-C	8	25x3	0.31

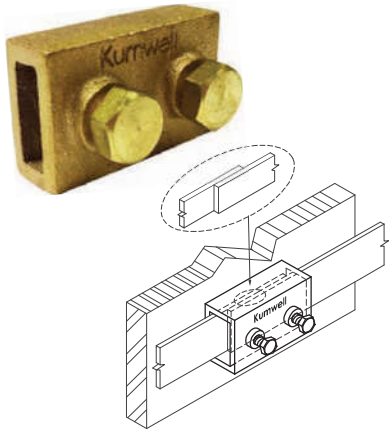
Code No.	Conductor Size (Sq mm^2)	Tape Size (mm)	Weight (kg)
LPCTTC-70252	70	25x2	0.31
LPCTTC-70253	70	25x3	0.31
LPCTTC-70253A	70	25x3	0.085
LPCTTC-95252	95	25x2	0.37
LPCTTC-95253	95	25x3	0.37
LPCTTC-120252	120	25x2	0.37
LPCTTC-120253	120	25x3	0.37

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982, Bolt - Brass

Application
Connect copper stranded or solid with copper tape conductors.

Tape Test Connector



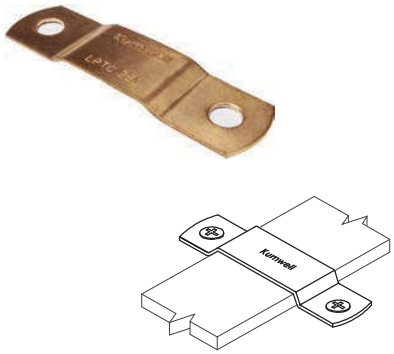
Code No.	Maximum Tape Size (mm)	Material	Weight (kg)
LTCT 256	26x8	Copper Alloy	0.236
LTCT 256T	26x8	Copper Alloy	0.236
LTCT 506	51x8	Copper Alloy	0.425
LTCT 256A	26x8	Aluminium Alloy	0.072
LTCT 506A	51x8	Aluminium Alloy	0.128

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982, Bolt - Brass
Aluminium Alloy - BS 2898,
Bolt - Stainless Steel

Application
Connect copper or aluminium tape conductors.

Tape Clip



Code No.	Tape Size (mm)	Weight/100 (kg)
LPTC-203	20x3	1.25
LPTC-252	25x2	1.34
LPTC-253	25x3	1.34
LPTC-254	25x4	1.38
LPTC-256	25x6	1.40
LPTC-303	30x3	1.35
LPTC-304	30x4	1.57
LPTC-306	30x6	1.60
LPTC-506	50x6	3.55

Test Certificate
IEC 62561 Part 4

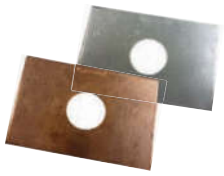
Material
Copper - BS EN 13601

Application
Fix copper tape conductor on flat surface.

Bi-Metallic Connector

LBMC

LBMW



LBMP

Connector

Code No.	Connection Length (mm)	Material	Weight (kg)
LBMC	80	Copper / Aluminium	0.18

Test Certificate
IEC 62561 Part 1

Washer

Code No.	Dimension (mm)	Hole Size (mm)	Weight/100 (kg)
LBMW-6	30x2	7	0.46
LBMW-8	30x2	9	0.45
LBMW-10	30x2	11	0.45
LBMW-12	30x2	14	0.44
LBMW-16	30x2	18	0.44

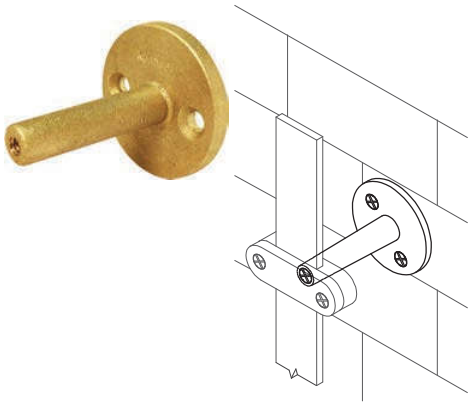
Plate

Code No.	Dimension (mm)	Hole Size (mm)	Weight/100 (kg)
LBMP-6	55x36x2	7	0.68
LBMP-8	55x36x2	9	0.68
LBMP-10	55x36x2	11	0.68
LBMP-12	55x36x2	14	0.68
LBMP-16	55x36x2	18	0.68

Material
Copper Alloy - BS EN 1982
Aluminium - BS 2898

Application
Connect copper and aluminium conductors by non-corrosive contact which is made by fusion method

Back Plate Holdfast



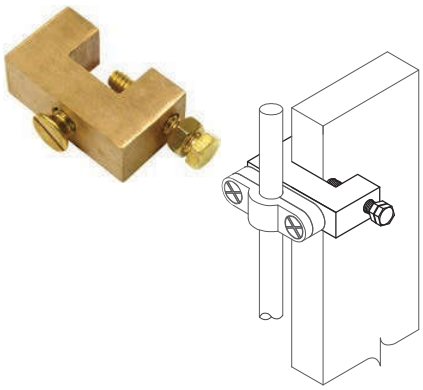
Code No.	Diameter (Ø) (mm)	Material	Weight (kg)
LXPH-C	63	Copper Alloy	0.26
LXPH-A	68	Aluminium Alloy	0.08

Test Certificate
IEC 62561 Part 4

Copper Alloy - BS EN 1982
Aluminium - BS 2898

Application
Place copper stranded, solid or tape conductors onto flat surface.

Back Holdfast



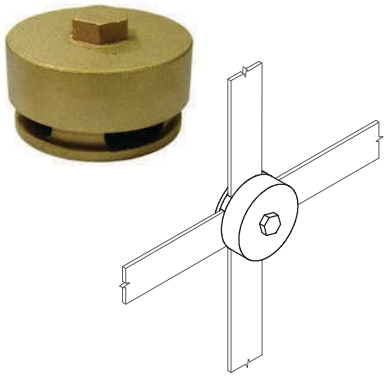
Code No.	Steel Plate Thickness (mm)	Material	Weight (kg)
LXGBH-12	1-13	Copper Alloy	0.083
LXGBH-12A	1-13	Aluminium Alloy	0.032

Test Certificate
IEC 62561 Part 4

Material
Copper Alloy - BS EN 1982,
Bolt - Brass
Aluminium Alloy - BS 2898,
Bolt - Stainless Steel

Application
Support conductor onto angle Steel.

Screw Down Test Clamp



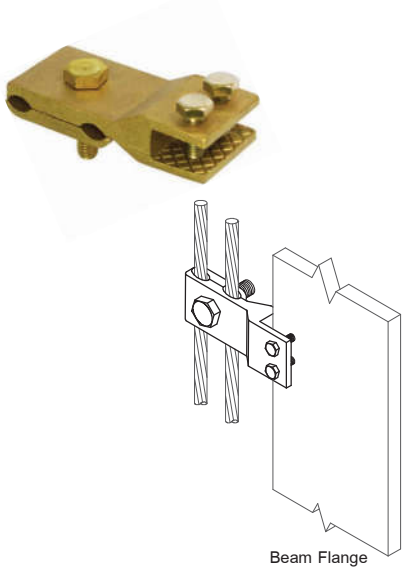
Code No.	Tape Size (mm)	Material	Weight (kg)
LXSTC-252	25x2	Copper Alloy	0.48
LXSTC-253	25x3	Copper Alloy	0.48
LXSTC-253A	25x3	Aluminium Alloy	0.15

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982,
Aluminium Alloy - BS EN 2898

Application
Connect tape conductors in 4-way crossing connection.

Beam Clamp



Beam Flange

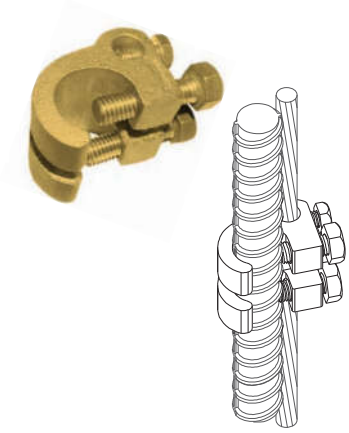
Code No.	Cable Size (mm^2)	Material	Weight (kg)
LBC-35-120	35-120	Copper Alloy	0.51
LBC-35-120A	35-120	Aluminium Alloy	0.15

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Bolt - Brass
Aluminium Alloy - BS 2898,
Bolt - Stainless Steel

Application
Connect stranded copper or solid copper conductor onto tower structure, H-beam structure or steel structure.

Conductor to Rebar Clamp



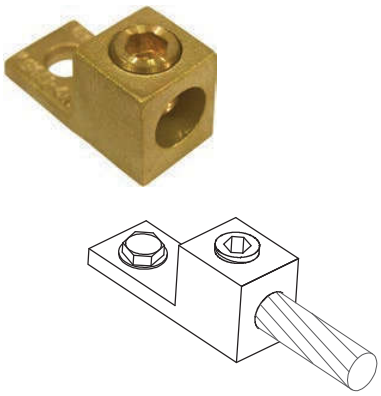
Code No.	Cable Size (mm^2)	Rebar Size (mm)	Weight (kg)
LRBC 18-70	10-70	8-18	0.32

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982
Bolt - Brass

Application
Hold stranded copper or solid copper conductors to rebar.

Terminal Lug



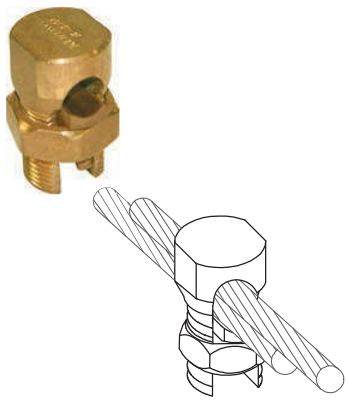
Code No.	Cable Size (mm^2)	Stud Size (in)	Weight (kg)
LXTEL 35	6-35	3/16	0.10
LXTEL 70	50-70	5/16	0.15
LXTEL 120	95-120	5/16	0.24
LXTEL 185	150-185	1/2	0.35
LXTEL 300	240-300	1/2	0.60
LXTEL 500	400-500	1/2	0.80

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982,
Bolt - Silicon Bronze

Application
Connect copper stranded or solid conductors to flat bar.

Split Bolt



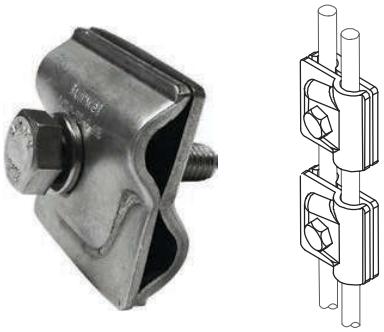
Code No.	Cable Size (mm^2)		Weight (kg)
	Run	Tap	
S-2/0	2/0 AWG	2/0 AWG	0.10
LXSB 70	70	70	0.10

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982

Application
Suitable for joint copper conductors (above ground).

Universal Connector



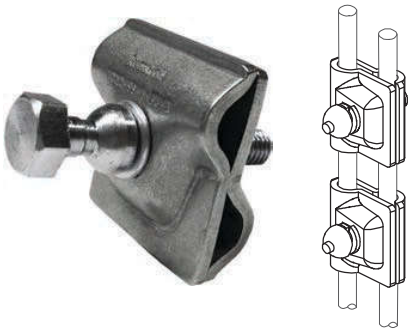
Universal Connector is made of Stainless Steel. There are two types of connecting process cross joint and parallel joint. The contact resistance shall be less than 1 mΩ, as well as the connected conductors tensile force s hall be more than 900 N

Code No.	Cable Size (mm)	Torque (N•m)	Bolt Size (mm)	Weight (kg)
LCAC-SS-10-M10	8-10	26	M10 (1.50x35)	0.11

Test Certificate
IEC 62561 Part 1

Material
Stainless Steel 304

Shear Bolt Connector



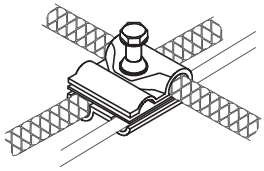
Shear Bolt Connector provide connection for cross joint or parallel joint.
Easy installation, no torque wrench required.

Code No.	Cable Size (mm)	Torque (N•m)	Bolt Size (mm)	Weight (kg)
LCAC-SS-10-M10-N	8-10	26	M10 (1.50x35)	0.11

Test Certificate
IEC 62561 Part 1

Material
Stainless Steel - 304

Rebar Clamp Connector with Shear Bolt



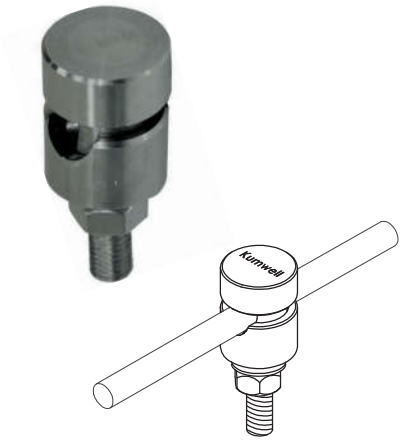
The universal clamp connector for connection type T-joint, cross joint and parallel join between rebar to rebar, rebar to round conductor, round conductor to round conductor. The shear bolt provide quick installation and the superior of connection.

Code No.	Rebar Size (mm)	Conductor Size (mm)
GCRER-SB-25-10	16 - 25	8 - 10
GCRER-SB-25-20	16 - 25	14 - 20
GCRER-SB-40-10	32 - 40	8 - 10
GCRER-SB-40-20	32 - 40	14 - 20

Test Certificate
IEC 62561 Part 1

Material
Zinced Steel

Q-Connector



Code No.	Conductor (Ø) (mm)	Weight (kg)
GXCCSS 8	8	0.068
GXCCSS 10	10	0.068

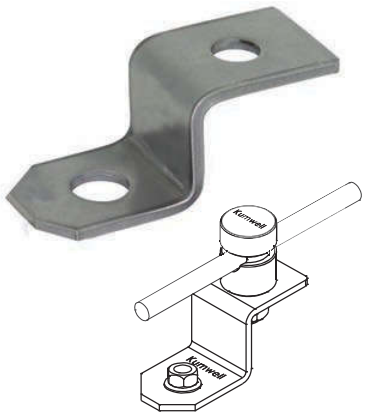
Test Certificate
IEC 62561 Part 4

Material
Stainless Steel 304

Application
Fix Gavanized /Stanless Steel round

Z-Connector

Galvanized Steel



Code No.	Hold Size (mm)	Weight (kg)
TSSS 7030-1H	11	0.054

Test Certificate
IEC 62561 Part 1

Material
Stainless Steel 304

Application
Connect Q-Connector to Earth Point.

Tape Support

Code No.	Tape Size (mm)	Weight (kg/m)
LTSSS-303.5	20x3 to 30x3.5	0.112

Test Certificate
IEC 62561 Part 4

Material
Stainless Steel 304

Application
Fix Gavanized /Stanless Steel round

Tape Lug Connector

Tape Lug Connector is use for connecting Tape conductor to earth point or earth termination without drilling.

Code No.	Tape Size (mm)	Weight (kg/m)
LTSSC-303.5	20x3 to 30x3.5	0.140

Test Certificate
IEC 62561 Part 1

Material
Stainless Steel 304

Square Tape Clamp

Code No.	Tape Conductor (mm)	Torque (N•m)	Weight (kg/m)
LCACSS-T303.5	20x3 to 30x3.5	14	0.242
LCACSS-T406	30x3.5 to 40x6	14	0.312

Test Certificate
IEC 62561 Part 1

Material
Stainless Steel 304

Application
Connect Gavanized /
Stanless Steel tape conductor

Round and Tape Connector

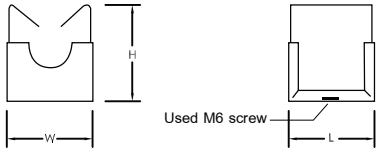
Code No.	Tape Conductor (mm)	Circutar Conductor (Ø) (mm)	Weight (kg)
LCACSS-W10-T303.5	20x3 to 30x3.5	8-10	0.236
LCACSS-W10-T406	30x3.5 to 40x4	8-10	0.306

Test Certificate
IEC 62561 Part 1

Material
Stainless Steel 304

Application
Connect Gavanized /Stanless Steel tape
to round conductor

Circular Conductors Holders

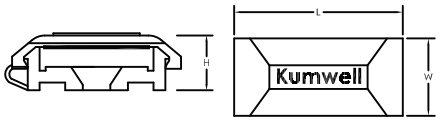


Code No.	Conductor Size (mm)	Dimension (mm) W	L	H	Weight/100 (kg)
LSCH-8	8	20	22	22	1.8

Material
Stainless steel 304

Application
Hold Circular conductors to wall or floor and install above metal sheet clamp for GI Roof.

Non Metallic DC Clips



Code No.	Tape Size (mm)	Dimension (mm) W	L	H	Weight (kg)
LNDCP 252	25x2	20	37	14	0.6
LNDCP 253	25x3	20	37	14	0.6
LNDCP 254	25x4	20	37	14	0.6
LNDCP 256	25x6	20	37	14	0.6
LNDCP 253PVC	25x3 with PVC	20	37	14	0.6

Material
High grade and UV stabilized polypropylene (PP)

Application
Hold tape conductors on PVC or metal flat surface

Note : Special color can be requested.

Adhesive Base

Code No.	Base Diameter (Ø) (mm)	Weight (kg)
LADSB	63	2.2

Material
High grade and UV stabilized polypropylene (PP)

Application
Support tape clip by adhere to PVC or metal flat surface with recommended heavy duty gule

Note : Special color can be requested.

Tape Clip with Adhesive Base

Code No.	Tape Size (mm)	Base Diameter (Ø) (mm)	Weight/100 (kg)
LTCS 252	25x2	63	2.50
LTCS 253	25x3	63	2.50
LTCS 254	25x4	63	2.50
LTCS 256	25x6	63	2.50
LTCS 253 PVC	25x3 with PVC	63	2.50

Material
High grade and UV stabilized polypropylene (PP)
Bolt - Stainless Steel

Application
Hold conductors on Metallic or Plastic roof

Note : Special color can be requested.

Pyramid Holdfast

Code No.	Tape Size (mm)	Base Diameter (Ø) WxL (mm)	Weight/100 (kg)
LTPH 252	25x2	120x120	1.12
LTPH 253	25x3	120x120	1.12
LTPH 254	25x4	120x120	1.15
LTPH 256	25x6	120x120	1.18
LTPH 253 PVC	25x3 with PVC	120x120	1.16

Material
High grade and UV stabilized polypropylene (PP)
Filled-in-Concrete.
Bolt - Stainless Steel

Application
Hold tape conductors on PVC or metal flat surfacewith recommended heavy duty glue

Note : Special color can be requested.

Insulator Support

Code No.	Color	Weight/100 (kg)
LISUV-3-25B	Black	2.50
LISUV-3-25W	White	2.50

Material
High grade and UV stabilized Nylon 6

Application
Support equipment as an insulator

Note : Special color can be requested.

Accessories Adhesive

LADHS

LPRM

Code No.	Material	Standard Pack (g)	Weight (kg)
LADHS	Ethly Cyanoacrylate	20	0.02
LPRM	Aliphatic Amine	50	0.05

Application
Adhesive is suitable for adhesion between the adhesive base and Metallic or Plastic roof. Primer is special product for cleaning the adhesive base and material's surface before adhesion.

Usage
15 pieces and Primer for 50 pieces of Adhesive base

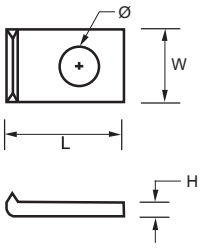
Solvent Cleaning

Code No.	Volume (ml)	Weight (kg)
ALSC	800	0.70

Application
Clean conductor and clamp before connection

Copper Lug for Exothermic Welding

1-Hole



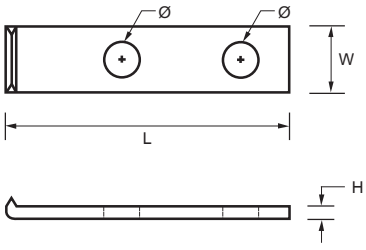
Code No.	Cable Size (mm^2)	Dimensions (mm) W	L	H	Ø
CL-1-25	25	25.4	40	3.2	14.2
CL-1-35	35	25.4	40	3.2	14.2
CL-1-50	50	25.4	40	3.2	14.2
CL-1-70	70	25.4	40	3.2	14.2
CL-1-95	95	25.4	40	4.8	14.2
CL-1-120	120	25.4	40	4.8	14.2
CL-1-150	150	25.4	40	6.3	14.2
CL-1-185	185	25.4	40	6.3	14.2
CL-1-240	240	38.2	40	6.3	14.2

Test Certificate
IEC 62561 Part 1

Material
Tin Plated Copper - BS EN 13601

Application
Connect copper stranded or solid conductors by exothermic welding

2-Hole

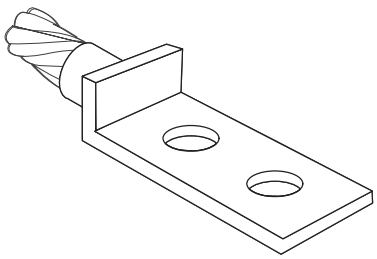


Code No.	Cable Size (mm^2)	Dimensions (mm) W	L	H	Ø
CL-2-25	25	25.4	85	3.2	14.2
CL-2-35	35	25.4	85	3.2	14.2
CL-2-50	50	25.4	85	3.2	14.2
CL-2-70	70	25.4	85	3.2	14.2
CL-2-95	95	25.4	85	4.8	14.2
CL-2-120	120	25.4	85	4.8	14.2
CL-2-150	150	25.4	85	6.3	14.2
CL-2-185	185	25.4	85	6.3	14.2
CL-2-240	240	38.2	85	6.3	14.2

Test Certificate
IEC 62561 Part 1

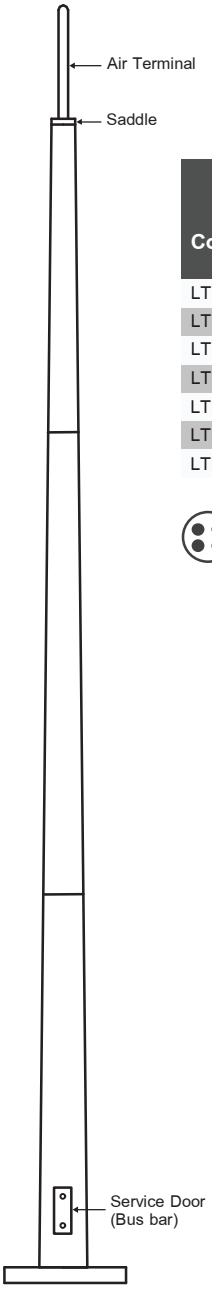
Material
Tin Plated Copper - BS EN 13601

Application
Connect copper stranded or solid conductors by exothermic welding.



Exothermic Welding with (Lug)CB1

Lightning Pole



Code No.	Dimensions (mm)											O.D. Ø(mm)	Flange Base Dimensions (mm)			Approx. Weight (kg)
	Figure	LO (mm)	High	L	L1	L2	L3	L4	OV.1	OV.2	OV.3		Figure	Ø Hole (mm)	D (mm)	
LTLP-3000	1	2400	3000	600	2400	-	-	-	-	-	-	60	5	25	160	26.92
LTLP-6000	1	5400	6000	600	5400	-	-	-	-	-	-	60	5	32	250	78.88
LTLP-9000	2	8400	9000	600	5400	3200	-	-	200	-	-	60	5	32	250	132.74
LTLP-12000	3	11300	12000	600	5400	3200	3240	-	300	240	-	76	5	32	300	227.45
LTLP-15000	3	14400	15000	600	5400	4880	4780	-	380	280	-	76	5	32	350	311.05
LTLP-18000	4	17400	18000	600	5400	4880	4780	3550	530	400	280	114	6	32	450	461.26
LTLP-20000	4	19400	20000	600	5400	5600	5500	4400	600	500	400	140	7	32	550	664.11

Material
Air - Terminal, Busbar - Solid Copper - BS EN 13601
Saddle - Copper Alloy - BS EN 1982
Pole - Hot Dip Galvanized Steel ASTM A123
Down conductor - 50 sq mm IEC 01

Application
Suitable for any areas or projects where air terminal is unable to install and maunt on the roof such as oil / gas tank, solar farm etc.
Max wind load with stand 120 km/h.

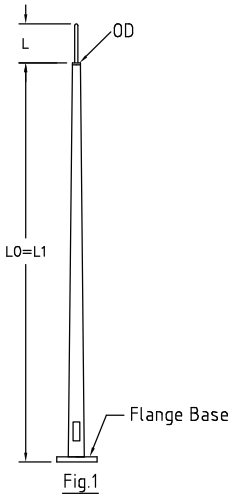


Fig.1

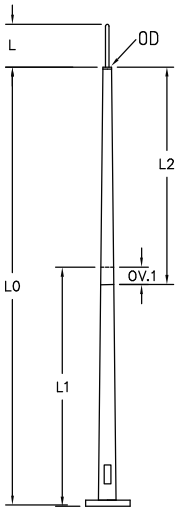


Fig.2

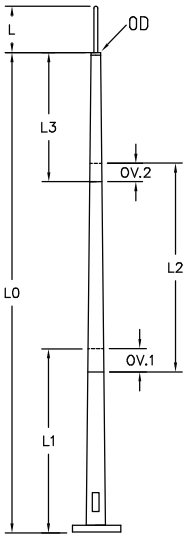


Fig.3

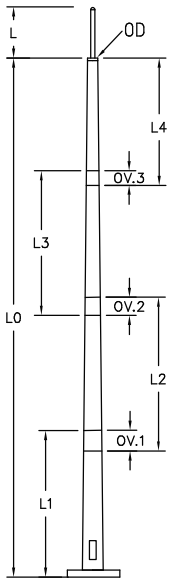


Fig.4

Flange Base Detail →

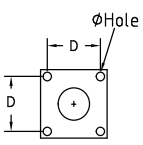


Fig.5

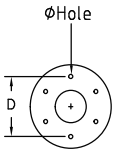


Fig.6

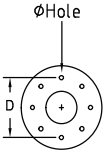
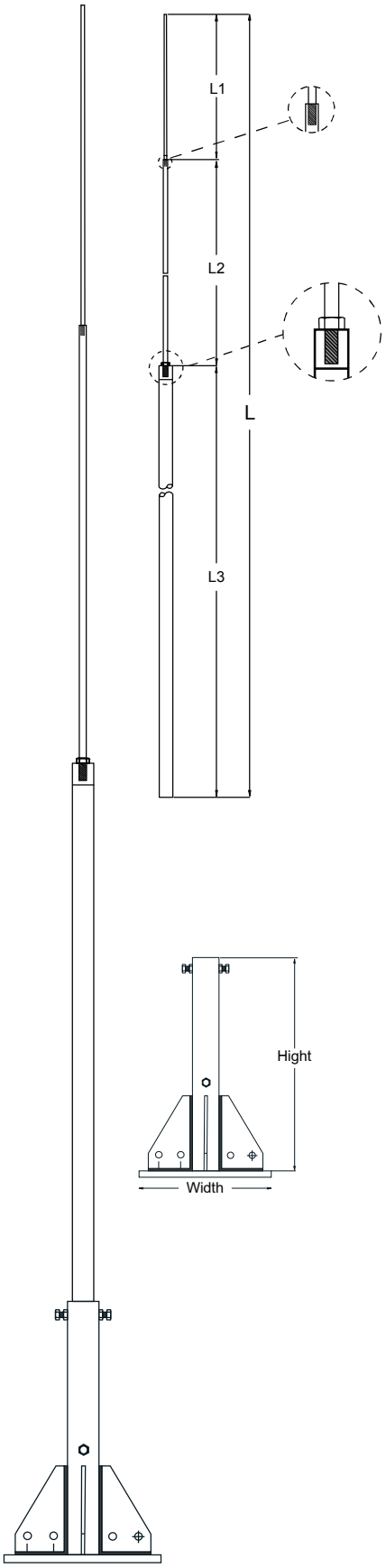


Fig.7

Self - Standing Lightning Pole (Hot Dip Galvanized)



Pole

Code No.	L - Hight (mm)	Dimension (mm) L1	L2	L3	Weight (kg)
LTSP - 3000	3000	1000	1000	1000	3.29
LTSP - 4500	4500	1000	1500	2000	5.58
LTSP - 6000	6000	1000	2000	3000	7.87

Test Certificate
IEC 62561 Part 2 (Air Terminal)

Material
L1 : Air rod - Aluminium Dia. 10 mm.
L2 : Stainless Round bar SUS 304 Dia. 16 mm.
L3 : Stainless steel pipe SUS 304 Dia. 42 mm.

Application
Suitable for lightning protection,
Chose select foundation type below.

Fixing foundation

Code No.	Dimension (mm) Hight	Width	Weight (kg)
LTSP-F	500	300	15.70

Material
Hot dipgalvanized steel

Application
Suitable for support self-standing lightning pole. Installation with J-bolt 3/4"(on request) fixing ambed in concre foundation.

Metal Sheet Clamp

Kumwell has continually developed and designed Metal Sheet Clamp for easier, faster and more safety to installation on the metal sheet roof when installing lightning protection system to meet IEC 62561.

We have designed it to help you to install Square Neck Bolt and Flange Locking Nut into the square on each side of T-Block easily and faster than ever. The Stopper also enables all accessories double locking tightly. Moreover, the Flange Locking Nut and the Socket are designed to prevent any accessory loosen from Metal Sheet Clamp during installation.

The unique design provide safety and easy work for installer where they can tighten by one hand while another hand can hold safety rope in case of accident.

Due to a large roof area where there are many tons of conductor, metal sheet clamp shall be provide highly mechanical strength to fixing the LPSC parts to the roof as well as good corrosion resistance to suit for any expose environment.

Metal sheet clamp shall be tested according to IEC 62561-4 (Requirement for Conductor Fastener) to secure the safety for installation.

Features & Benefits

- Quick and easy to install
- Safety for installer
- High mechanical strength, firmly secured to roof profile
- Corrosion resistance
- Custom made to suit any roof profile

Metal Sheet Clamp

LYCMSS-AN

LYCMSS-AA

LYCMSS-CN

LYCMSS-C-2N

LYCMSS-DN

LYCMSS-EN

LYCMSS-ON

LYCMSS-QN

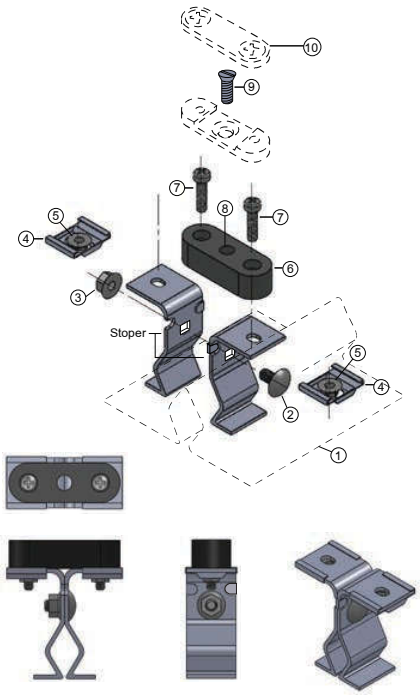
LYRHT-AN

LYRHT-BN

Code No.	Weight (kg)
LYCMSS-AN	0.09
LYCMSS-AA	0.09
LYCMSS-CN	0.07
LYCMSS-DN	0.12
LYCMSS-EN	0.08
LYCMSS-N	0.08
LYCMSS-ON	0.12
LYCMSS-QN	0.08
LYRHT-AN	0.03
LYRHT-BN	0.07

Material
Stainless Steel
Bolt - Stainless Steel

Application
Hold tape conductors to metal roof



Item	Description	Q'ty
1	Metal Sheet RooF	-
2	Square Neck Bolt M6	1
3	Flang Locking Nut M6	1
4	Socket	2
5	Flang Locking Nut M5	2
6	Insulator	1
7	Screw M5	2
8	Nut 1/4" in Insulator	1
9	Stainless Screw 1/4"	1
10	Tape Support	-

"Quick Installation"

Note : Special new model GI clading can be requested.

Roof Holders

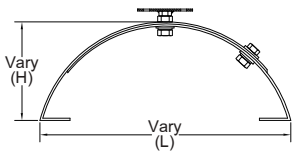
LYRHT 130-120

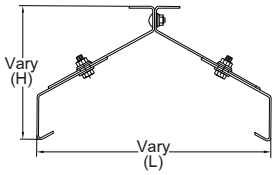
LYRHT 117-35

LYRHU-XXX

For Hip or Ridge Tileds

Code No.	Dimensions (mm) Vary (H) Max.	Vary (H) Min.	Vary (L) Max.	Vary (L) Min.	Weight (kg)
LYRHT 130-120	180	145	340	225	0.25
LYRHT 140-120	156	104	394	207	0.23
LYRHT 117-35	180	90	242	235	0.25



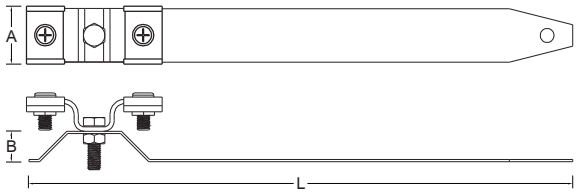


For Tile Sheet

Code No.	Dimensions (mm) A	B	L	Weight (kg)
LYRHU-702	25	20	205	0.02
LYRHU-704	25	20	475	0.05

Material
Stainless Steel

Application
Hold copper strande / solid or copper / aluminium / solid aluminium conductors for hip, ridge and sheet tiled roof installation

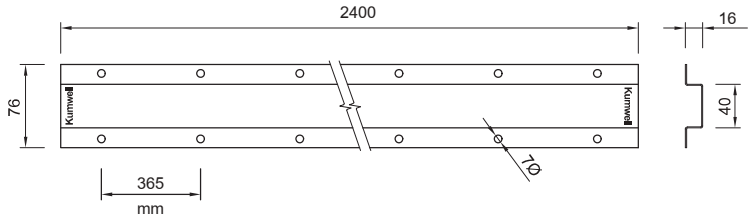


Anti-Vandal Down Conductor Guard

Code No.	Tape Size (mm)	Length (mm)	Weight (kg)
LAVCG	25x3, 25x4	2400	3

Material
Zinc-Coated Steel

Application
Protect tape conductor



Note : Fix using round head wood screws 1 1/2" x no.10 and wall plug.

Conductor

When designing a structural lightning protection system using the Faraday Cage principle, it is possible to use one or more of a variety of available conductor systems; namely tape conductor, circular conductor or stranded conductor.

The decision about which type to use is often based more on country-specific historical preferences or aesthetic considerations than the superiority of one type over another. High quality Kumwell conductors, plus appropriate fittings, are available for all three systems.

Tape conductor system

Tape conductors are easy to install, with no need to straighten for a neat finish. Available in copper or aluminium, tape conductor can be installed bare or with a choice of PVC coverings, to enable the tape to blend with modern building fabrics. Tinned copper tape is also available for applications that require additional protection measures.

Circular conductor system

Circular conductors can be used in applications where aesthetic considerations are important. Circular conductor is less conspicuous than the tape conductor system, and lends itself much better to being concealed. Available in copper or aluminium, circular conductors can also have PVC coverings.

A coil of circular conductor can be quickly installed, being easy to bend in any plane, and only needing a straightening tool to give a very neat finish.

Stranded conductor system

The Kumwell stranded conductors are available in copper and copper-clad steel wire, and are supplied bare.
The copper-clad steel wire can reduce risk is stolen.

Selection Martials

Martial	Corrosion resistance suitable for	Use		
		In open air	In earth	In concrete
Copper	Normal environments	Solid tape	Solid tape	Solid tape
		Solid round	Solid round	Solid round
		Stranded	Stranded	Stranded
Tin plated copper	Near seaside	Solid tape	Solid tape	Solid tape
		Solid round	Solid round	Solid round
Copper with lead	The chimney emit toxic gas	Solid tape	**Unsuitable**	**Unsuitable**
Tin copper with lead	Area especically high salty and acidty	Solid tape	**Unsuitable**	**Unsuitable**
Aluminium	On the metal sheet roof because it does not corrode	Solid tape	**Unsuitable**	**Unsuitable**
		Solid round		
Copper-Clad steel	Normal environments	Solid tape	Solid tape	Solid tape
		Solid round	Solid round	Solid round

Note: Copper/Aluminium joints should be avoided wherever possible. In cases where they cannot be avoided, the connections should be used Bi-Metallic Connector.

Tape Conductors

Bare Copper

Code No.	Size (mm)	Size (mm^2)	Coil Size (m)	Weight (kg/m)
COBCT 203	20x3	60	100	0.55
COBCT 252	25x2	50	100	0.45
COBCT 253	25x3	75	100	0.67
COBCT 254	25x4	100	100	0.90
COBCT 256	25x6	150	25	1.34
COBCT 303	30x3	90	50	0.81
COBCT 304	30x4	120	50	1.07
COBCT 305	30x5	150	50	1.34
COBCT 324	32x4	128	50	1.15
COBCT 404	40x4	160	50	1.44
COBCT 405	40x5	200	25	1.78
COBCT 406	40x6	240	25	2.15
COBCT 503	50x3	150	20	1.34
COBCT 505	50x5	250	20	2.60
COBCT 506	50x6	300	20	2.68

Test Certificate
IEC 62561 Part 2

Material
Copper - BS EN 13601

Application
Suitable for grounding and lightning protection

Tinned Copper

Code No.	Size (mm)	Size (mm^2)	Coil Size (m)	Weight (kg/m)
COBCT 203T	20x3	60	100	0.55
COBCT 252T	25x2	50	100	0.45
COBCT 253T	25x3	75	100	0.67
COBCT 254T	25x4	100	100	0.90
COBCT 256T	25x6	150	25	1.34
COBCT 303T	30x3	90	50	0.81
COBCT 304T	30x4	120	50	1.08
COBCT 305T	30x5	150	50	1.34
COBCT 324T	32x4	128	50	1.15
COBCT 404T	40x4	160	50	1.43
COBCT 405T	40x5	200	25	1.79
COBCT 406T	40x6	240	25	2.15
COBCT 503T	50x3	150	20	1.34
COBCT 505T	50x5	250	20	2.24
COBCT 506T	50x6	300	20	2.68

Test Certificate
IEC 62561 Part 2

Material
Tin Plated Copper - BS EN 13601

Application
Suitable for grounding and lightning protection in high corrosion resistance area.

Bare Aluminium

Code No.	Size (mm)	Size (mm^2)	Coil Size (m)	Weight (kg/m)
COBAT 253	25x3	75	50	0.20
COBAT 254	25x4	100	50	0.27
COBAT 256	25x6	150	50	0.41

Test Certificate
IEC 62561 Part 2

Material
Aluminium - BS 2898

Application
Suitable for installation on metal roof in lightning protection

Tape Conductors

Galvanized Steel Tape is made of special steel with low resistivity. The electrical resistivity is less than 0.15 μΩm and, tensile strength is less than 490 N/mm^2

Galvanized Steel Tape

Code No.	Size (mm)	Size (mm^2)	Coil Size (m)	Weight (kg/m)
COBGAT 203	20x3	60	50	0.47
COBGAT 3035	30x3.5	105	25	0.83

Test Certificate
IEC 62561 Part 2

Material
Hot-Dip Galvanized Steel

Stainless Steel Tape is made of stainless steel with a chromium ≥ 16%, nickel ≥ 8%, molybdenum ≥ 2% and carbon ≤ 0.07% The electrical resistivity is less than 0.8 μΩm

Stainless Steel Tape

Code No.	Grade	Size (mm)	Size (mm)	Coil Size (m)	Weight (kg/m)
COTSS316L-303.5	316L	30x3.5	105	50	0.84

Test Certificate
IEC 62561 Part 2

Material
Stainless Steel - 316L

Tape Conductors

Copper with PVC

Code No.	Size (mm)	Coil Size (m)	Weight (kg/m)
COBCT 253P	25x3	50	0.77
COBCT 256P	25x6	25	1.53
COBCT 253P-LSHF	25x3	50	0.77
COBCT 256P-LSHF	25x6	25	1.53

Test Certificate
IEC 62561 Part 2

Material
High conductivity copper - BS EN 13601
Green PVC cover with low smoke halogen free (LSHF)

Application
Suitable for down conductor in lightning protection

Aluminium with PVC

Code No.	Size (mm)	Coil Size (m)	Weight (kg/m)
COBAT 253P	25x3	50	0.30
COBAT 254P	25x4	50	0.36
COBAT 253P-LSHF	25x3	50	0.30
COBAT 254P-LSHF	25x4	50	0.36

Test Certificate
IEC 62561 Part 2

Material
Aluminium tape - BS 2898
Green PVC cover with low smoke halogen free (LSHF)

Application
Suitable for down conductor in lightning protection

Copper with Lead

Code No.	Size (mm)	Coil Size (m)	Lead-Cover Thickness (m)	Weight (kg/m)
COBCTL 253	25x3	25	2	2.06
COBCTL 506	50x6	20	2	5.40

Test Certificate
IEC 62561 Part 2

Material
Copper with Lead
(Copper - BS EN 13601)

Application
Suitable for high corrosion area

Tinned Copper with Lead

Code No.	Size (mm)	Coil Size (m)	Lead-Cover Thickness (m)	Weight (kg/m)
COBCTL 506T	50x6	25	2	5.40

Test Certificate
IEC 62561 Part 2

Material
Tinned Copper with Lead
(Copper - BS EN 13601)

Application
Suitable for high corrosion area especially high salty or acidity

Circular Conductors

Bare Aluminium

Code No.	Conductor (Ø) (mm)	Cross Section (mm^2)	Coil Size (m)	Weight (kg/m)
COSA-8	8	50	50	0.136
COSA-10	10	78	50	0.218

Test Certificate
IEC 62561 Part 2

Material
Aluminium - BS 2898

Application
Suitable for grounding and lightning protection conductors in high corrosion area.

Bare Copper

Code No.	Conductor (Ø) (mm)	Cross Section (mm^2)	Coil Size (m)	Weight (kg/m)
COSC-8	8	50	50	0.45
COSC-9.5	9.5	70	50	0.65
COSC-11	11	95	50	0.85
COSC-12.4	12.4	120	50	1.08
COSC-13.9	13.9	150	50	1.36
COSC-15.4	15.4	185	20	1.67
COSC-17.5	17.5	240	20	2.16

Test Certificate
IEC 62561 Part 2

Material
Copper - BS EN 13601

Application
Suitable for grounding and lightning protection conductors.

Tinned Copper

Code No.	Conductor (Ø) (mm)	Cross Section (mm^2)	Coil Size (m)	Weight (kg/m)
COSC-8T	8	50	50	0.45
COSC-9.5T	9.5	70	50	0.65
COSC-11T	11	95	50	0.85

Test Certificate
IEC 62561 Part 2

Material
Tin Plated Copper - BS EN 13601

Application
Suitable for grounding and lightning protection conductors in high corrosion area.

Galvanized Steel Conductor is made of special steel with low resistivity. The electrical resistivity is less than 0.15 μΩm and, tensile strength is less than 490 N/mm^2

Galvanized Steel Circular

Code No.	Conductor (Ø) (mm)	Cross Section (mm^2)	Weight (kg/m)	Coil Lenght (m)	Coil Weight (kg)
COGS-8	8	50	0.395	50	approx.20
COGS-10	10	78	0.620	50	approx.31

Test Certificate
IEC 62561 Part 2

Material
Galvanized Steel

Circular Conductors

Stainless Steel Conductor is made of special steel with low resistivity. The electrical resistivity is less than 0.15 μΩm and, tensile strength is less than 490 N/mm^2

Stainless Steel Circular

Code No.	Grade	Conductor (Ø) (mm)	Cross Section (mm^2)	Weight (kg/m)	Coil Lenght (m)	Coil Weight (kg)
COSS316L-8	316L	8	50	0.401	50	approx.20
COSS316L-10	316L	10	78	0.626	50	approx.32

Test Certificate
IEC 62561 Part 2

Material
Stainless Steel - 316L

Copper with PVC

Code No.	Conductor (Ø) (mm)	Coil Size (m)	Weight (kg/m)
COSC-8P	8	50	0.50
COSC-9.5P	9.5	50	0.70
COSC-8P-LSHF	8	50	0.50
COSC-9.5P-LSHF	9.5	50	0.70

Test Certificate
IEC 62561 Part 2

Material
High conductivity copper - BS EN 13601
Green PVC cover with low smoke halogen free

Application
Suitable for down conductor lightning protection.

Copper-Bonded Steel Round Conductor is made of molecularly bonding pure electrolytic copper onto a low resistivity steel. The electrical resistivity is less than 0.1 μΩm, copper thickness is more than 254 micron as well as tensile strength is less than 490 N/mm^2

Copper-Bonded Steel Round Conductor

Code No.	Conductor (Ø) (mm)	Cross Section (mm^2)	Weight (kg/m)	Coil Lenght (m)	Coil Weight (kg)
WE-COCBU-8	8	50	0.40	50	approx.20
WE-COCBU-10	10	78	0.63	50	approx.32

Test Certificate
IEC 62561 Part 2

Material
Copper-Bonded Steel

Conductor Bender

Conductor Bender is manually bend the conductor to prefered shape.

Code No.	Conductor Size (mm)	Weight (kg/set)
TOHCS 8-10	8-10	1.72

Note :1 set = 2 pieces

Conductor Straightener

Conductor Straightner is manually machine for conductor size 8-10 mm

Code No.	Conductor Size (mm)	Weight (kg/set)
TOCS 8-10	8-10	11.85

Conductor Straightener with electric drive

Conductor Straightner with electric drive is motor drive machine for conductor size 8-10 mm

Code No.	Conductor Size (mm)	Weight (kg/set)
TOHCS 8-10P	8-10	Approx. 50

Annealed Copper-Clad Steel Wire

Kumwell Annealed Copper-Clad Steel Wire or CCS is made from copper cladding metallurgical bonded to concentric steel core with continuous solid cladding process. According to International Annealed Copper Standard (IACS), it is taken as 30% conductivity which is suitable for transmission line's and grounding in high corrosive area such as seaside.

Benefit

- High Conductivity
- High corrosoin resistance

Code No.	Cable Size (AWG)	Cable Size (mm^2)	Diameter of Wire (mm)	Weight (kg/m)
Single wire				
2AWG	2	33.62	6.54	274
WE-COSW20-50	-	50.24	8.0	402
WE-COSW20-70	-	78.5	10.0	628
7 wire strand				
WE-COSS30-016	4	16.40	1.73	91
WE-COSS30-050	1/0	53.49	3.12	440
WE-COSS30-070	2/0	67.32	3.50	546
WE-COSS30-095	7 No.7	93.09	4.11	766
19 wire strand				
WE-COSS30-120	19 No.9	126.00	2.91	1041
WE-COSS30-150	19 No.8	158.97	3.26	1314
WE-COSS30-240	19 No.6	252.66	4.11	2088

Test Certificate
IEC 62561 Part 2 (For cable size ≥ 50 sq.mm only)

Material
Annealed Copper - Clad Steel Wire - ASTM B 910-B 910 M

Stranded Copper Conductor

Code No.	Cable Size (mm^2)	Number and Diameter of Wire (no./mm.)	Approx.Weight per Mtr (kg)
COSC 010	10	7/1.35	0.09
COSC 016	16	7/1.70	0.14
COSC 025	25	7/2.14	0.23
COSC 035	35	7/2.52	0.32
COSC 050	50	19/1.78	0.43
COSC 070	70	19/2.14	0.62
COSC 095	95	19/2.52	0.86
COSC 120	120	19/2.85	1.10
COSC 150	150	37/2.52	1.33
COSC 185	185	37/2.52	1.68
COSC 210150	240	61/2.25	2.20
COSCS 070	70	7/3.55	0.64

Test Certificate
IEC 6256 Part 2 (For cable size ≥ 50 sq.mm only)

Material
Copper

High Voltage Insulating Down Conductor Cable (KHV)

KHV Cable with a voltage-controlled sheath is typically used as an isolated down conductor in the field of lightning protection for control the separation distance according to IEC 62305-3

Separation distance : There is a risk of uncontrolled flashover between parts of the external lightning protection system and metal and electrical installations in the building if the distance between the air termination system or down conductor and metal, electrical installations in the structure requiring protection is not sufficient. The separation distance is calculated according to IEC 62305-3. Advantage of KHV cable is the decrease of separation distance.

Code No.	KHV 50 II
Cross-section of the inner conductor (Cu)	50 mm^2
Equivalent separate distance s (air)	≤ 0.50 m
Equivalent separate distance s (solid material)	≤ 1.00 m
Cable weight (approx.)	1058 (kg/km)
Cable length / Coil	50 (m)
Colour of conductor	Black
Diameter Ø conductor	28.4 mm + 10%

Test Certificate
IEC 62561 Part 8

Material
Copper

Application
- LPS installation shall be consider the safety separation distance (SSD) to prevent the consequences of lightning current from LPS components to nearby equipment e.g. satellite, solar panel, chiller, AHU, etc.
- Using for installation in explosion hazardous areas Ex zone 1 (gases, vapours, mists) as well as Ex zone 21 (dusts).

Insulating Cable (KIC)

The area at risk of touch voltages for persons outside a building is located within a distance of 3 m. around the down conductor and at a height of 3 m from ground level. The Insulation of the down-conductor is tested by a 100 kV, 1.2/50 µs impulse withstand voltage shall be adopted for protect dangerous of touch voltage.
The KIC conductor has a copper core and a high voltage resistant XLPE insulation.

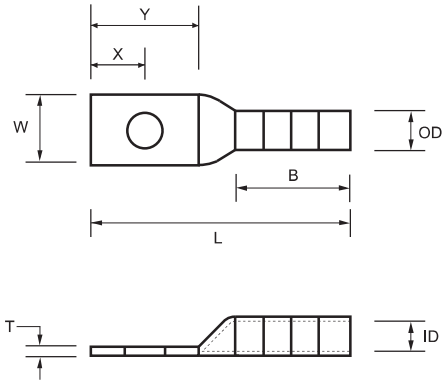
Code No.	KIC 50
Material of conductor	Cu
Material of insulation	XLPE
Outer sheath	UV-Resistant, Flame Retardant
Overall diameter	20 mm
Cross-section of the inner conductor	50 mm^2
Colour of conductor	Gray

Test Certificate
IEC 62561 Part 2
High Voltage 100 kV (1.2/50 us)

Material
Conductor : Copper
Insulation : XLPE
Sheath : UV resistant PO

Application
- The KIC Conductor is used as part of a down conductor system installed near the entrance of sheltering areas of buildings with high visitor frequency, such as theatres, cinemas, shopping centres, etc. Buildings or structures with public access (e.g. shelters).

Copper Lugs



1-Hole Copper Lugs

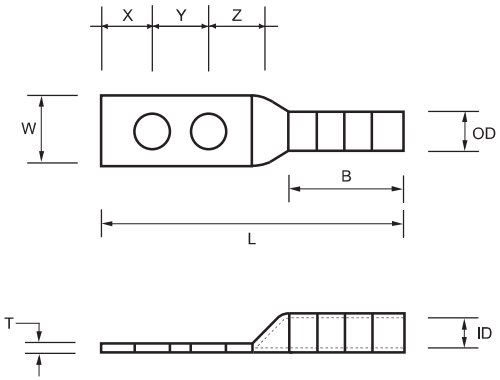
Code No.	Copper Conductor AWG/MCM	Copper Conductor mm^2	Stud Size	Dimensions (in) I.D	O.D	L	W	X	Y	T	B
KOH 8-6	8	-	1/4”	0.18	0.28	1.53	0.43	0.25	0.62	0.10	0.71
KOH 6-6	6	16	1/4”	0.22	0.31	1.93	0.48	0.25	0.62	0.08	1.07
KOH 4-6	4	25	1/4”	0.28	0.38	1.95	0.55	0.25	0.62	0.09	1.07
KOH 2-8	2	35	5/16”	0.31	0.42	2.27	0.66	0.32	0.76	0.10	1.16
KOH 1/0-12	1/0	50	1/2”	0.40	0.52	2.82	0.76	0.47	1.10	0.12	1.44
KOH 2/0-12	2/0	70	1/2”	0.45	0.58	3.12	0.85	0.50	1.13	0.13	1.50
KOH 3/0-12	3/0	95	1/2”	0.51	0.64	3.14	0.96	0.50	1.13	0.13	1.50
KOH 4/0-12	4/0	-	1/2”	0.58	0.71	3.24	1.06	0.50	1.13	0.14	1.56
KOH 250-12	250	120	1/2”	0.63	0.77	3.36	1.17	0.50	1.13	0.14	1.61
KOH 300-12	300	150	1/2”	0.65	0.81	3.91	1.19	0.53	1.16	0.19	2.05
KOH 350-12	350	-	1/2”	0.70	0.88	3.91	1.28	0.53	1.16	0.19	2.05
KOH 400-16	400	185	5/8”	0.76	0.95	4.14	1.41	0.66	1.35	0.19	2.17
KOH 500-16	500	240	5/8”	0.84	1.06	4.50	1.53	0.66	1.35	0.22	2.30
KOH 600-16	600	300	5/8”	0.92	1.19	5.11	1.69	0.88	1.76	0.28	2.67
KOH 750-16	750	-	5/8”	1.03	1.30	5.67	1.75	0.88	1.94	0.28	2.88
KOH 800-16	800	400	5/8”	1.05	1.35	5.67	1.89	0.88	1.94	0.29	2.88
KOH 1000-16	1000	500	5/8”	1.17	1.50	6.23	2.16	0.97	2.16	0.34	2.99

Test Certificate
IEC 62561 Part 1
UL 486
NEMA CC1

Material
One piece seamless, high conductivity pure electrolytic copper and tin plated

Application
Long Barrel lugs are usable with high voltage up to 35 kV
Suitable for grounding and lightning protection system

Copper Lugs



2-Hole Copper Lugs

Code No.	Copper Conductor AWG/MCM	Copper Conductor mm^2	Stud Size	Dimensions (in) I.D	O.D	L	W	X	Y	Z	T	B
KTH 8-6 C	8	-	1/4”	0.18	0.28	2.16	0.43	0.25	0.63	0.37	0.10	0.71
KTH 6-6 C	6	16	1/4”	0.22	0.34	2.72	0.59	0.39	0.79	0.39	0.08	0.67
KTH 6-8 C	6	16	5/16”	0.22	0.34	2.72	0.59	0.39	0.79	0.39	0.08	0.67
KTH 4-8 C	4	25	5/16”	0.28	0.38	2.72	0.59	0.39	0.79	0.39	0.09	0.90
KTH 2-8 C	2	35	5/16”	0.31	0.42	3.02	0.66	0.36	0.79	0.44	0.10	1.13

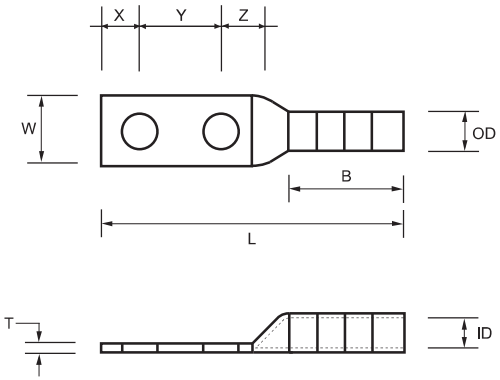
Test Certificate
IEC 62561 Part 1

Material
One piece seamless, high conductivity pure electrolytic copper and tin plated

Application
Long Barrel lugs are usable with high voltage up to 35 kV
Suitable for grounding and lightning protection system

Copper Lugs

UL LISTED



2-Hole Copper Lugs

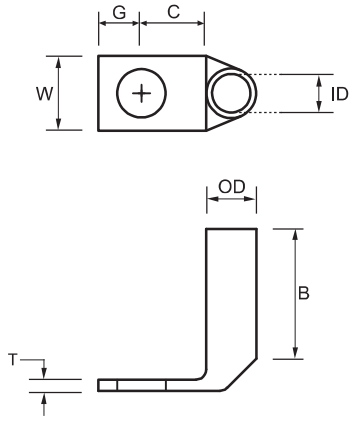
Code No.	Copper Conductor AWG/MCM	Copper Conductor mm^2	Stud Size	Dimensions (in) I.D	O.D	L	W	X	Y	Z	T	B
KTH 8-6 DN	8	-	1/4”	0.18	0.28	2.16	0.43	0.25	0.63	0.37	0.10	0.71
KTH 6-6 DN	6	16	1/4”	0.22	0.31	2.56	0.48	0.25	0.63	0.37	0.08	1.07
KTH 4-6 DN	4	25	1/4”	0.28	0.38	2.58	0.55	0.25	0.63	0.37	0.09	1.07
KTH 2-8 DN	2	35	5/16”	0.31	0.42	3.02	0.66	0.36	0.75	0.44	0.10	1.16
KTH 1/0-12 DN	1/0	50	1/2”	0.40	0.52	4.90	0.76	0.63	1.75	0.63	0.12	1.44
KTH 2/0-12 DN	2/0	70	1/2”	0.45	0.58	4.98	0.85	0.63	1.75	0.63	0.13	1.50
KTH 3/0-12 DN	3/0	95	1/2”	0.51	0.64	4.98	0.96	0.63	1.75	0.63	0.13	1.50
KTH 4/0-12 DN	4/0	-	1/2”	0.58	0.71	5.13	1.06	0.63	1.75	0.63	0.14	1.56
KTH 250-12 DN	250	120	1/2”	0.63	0.77	5.23	1.17	0.63	1.75	0.63	0.14	1.61
KTH 300-12 DN	300	150	1/2”	0.65	0.81	5.80	1.19	0.63	1.75	0.63	0.19	2.05
KTH 350-12 DN	350	-	1/2”	0.70	0.88	5.80	1.28	0.63	1.75	0.75	0.19	2.05
KTH 400-12 DN	400	185	1/2”	0.76	0.95	6.05	1.41	0.63	1.75	0.75	0.19	2.17
KTH 500-12 DN	500	240	1/2”	0.84	1.06	6.11	1.53	0.63	1.75	0.75	0.22	2.30
KTH 600-12 DN	600	300	1/2”	0.92	1.19	6.77	1.69	0.63	1.75	0.75	0.28	2.67
KTH 750-12 DN	750	-	1/2”	1.03	1.30	7.05	1.75	0.63	1.75	0.75	0.28	2.88
KTH 800-12 DN	800	400	1/2”	1.05	1.35	7.05	1.89	0.63	1.75	0.75	0.29	2.88
KTH 1000-12 DN	1000	500	1/2”	1.17	1.50	7.26	2.16	0.63	1.75	0.75	0.34	2.99

Test Certificate
IEC 62561 Part 1
UL 486
NEMA CC1

Material
One piece seamless, high conductivity pure electrolytic copper and tin plated

Application
Long Barrel lugs are usable with high voltage up to 35 kV
Suitable for grounding and lightning protection system

Copper Lugs



Copper Lugs One-Hole Long Barrel 90° Pad

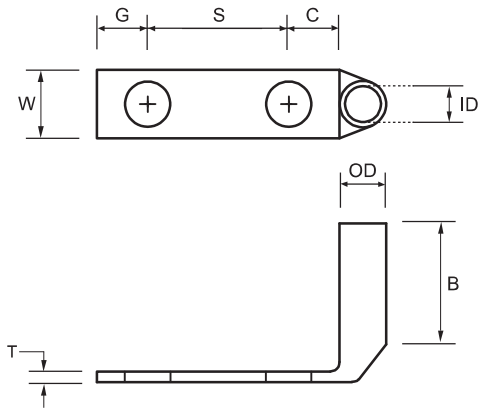
Code No.	Copper Conductor AWG/MCM	Copper Conductor mm^2	Stud Size	Dimensions (in) I.D	O.D	W	G	C	T	B
KOHL 8-6	8	-	1/4”	0.18	0.28	0.43	0.25	0.37	0.10	0.71
KOHL 6-6	6	16	1/4”	0.22	0.31	0.48	0.25	0.37	0.08	1.07
KOHL 4-6	4	25	1/4”	0.28	0.38	0.55	0.25	0.37	0.09	1.07
KOHL 2-8	2	35	5/16”	0.31	0.42	0.66	0.32	0.44	0.10	1.16
KOHL 1/0-12	1/0	50	1/2”	0.40	0.52	0.76	0.47	0.63	0.12	1.44
KOHL 2/0-12	2/0	70	1/2”	0.45	0.58	0.85	0.50	0.63	0.13	1.50
KOHL 3/0-12	3/0	95	1/2”	0.51	0.64	0.96	0.50	0.63	0.13	1.50
KOHL 4/0-12	4/0	-	1/2”	0.58	0.71	1.06	0.50	0.63	0.14	1.56
KOHL 250-12	250	120	1/2”	0.63	0.77	1.17	0.63	0.63	0.14	1.61
KOHL 300-12	300	150	1/2”	0.65	0.81	1.19	0.63	0.63	0.19	2.05
KOHL 350-12	350	-	1/2”	0.70	0.88	1.28	0.63	0.63	0.19	2.05
KOHL 400-16	400	185	5/8”	0.76	0.95	1.41	0.66	0.69	0.19	2.17
KOHL 500-16	500	240	5/8”	0.84	1.06	1.53	0.66	0.69	0.22	2.30
KOHL 600-16	600	300	5/8”	0.92	1.19	1.69	0.88	0.88	0.28	2.67
KOHL 750-16	750	-	5/8”	1.03	1.30	1.75	0.88	1.06	0.28	2.88
KOHL 800-16	800	400	5/8”	1.05	1.35	1.89	0.88	1.06	0.29	2.88
KOHL 1000-16	1000	500	5/8”	1.17	1.50	2.16	0.97	1.19	0.34	2.99

Test Certificate
IEC 62561 Part 1
UL 486
NEMA CC1

Material
One piece seamless, high conductivity pure electrolytic copper and tin plated

Application
Long Barrel lugs are usable with high voltage up to 35 kV
Suitable for grounding and lightning protection system

Copper Lugs



Copper Lugs Two-Hole Long Barrel 90° Pad

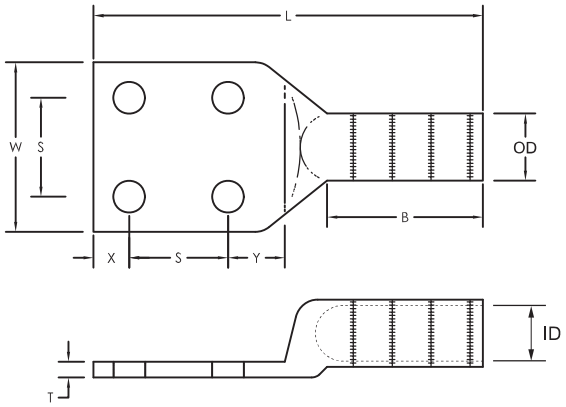
Code No.	Copper Conductor AWG/MCM	Copper Conductor mm^2	Stud Size	Dimensions (in) I.D	O.D	W	G	S	C	T	B
KTHL 8-6 DN	8	-	1/4”	0.18	0.28	0.43	0.25	0.63	0.37	0.10	0.71
KTHL 6-6 DN	6	16	1/4”	0.22	0.31	0.48	0.25	0.63	0.37	0.08	1.07
KTHL 4-6 DN	4	25	1/4”	0.28	0.38	0.55	0.25	0.63	0.37	0.09	1.07
KTHL 2-8 DN	2	35	5/16”	0.31	0.42	0.66	0.36	0.75	0.44	0.10	1.16
KTHL 1/0-12 DN	1/0	50	1/2”	0.40	0.52	0.76	0.63	1.75	0.63	0.12	1.44
KTHL 2/0-12 DN	2/0	70	1/2”	0.45	0.58	0.85	0.63	1.75	0.63	0.13	1.50
KTHL 3/0-12 DN	3/0	95	1/2”	0.51	0.64	0.96	0.63	1.75	0.63	0.13	1.50
KTHL 4/0-12 DN	4/0	-	1/2”	0.58	0.71	1.06	0.63	1.75	0.63	0.14	1.56
KTHL 250-12 DN	250	120	1/2”	0.63	0.77	1.17	0.63	1.75	0.63	0.14	1.61
KTHL 300-12 DN	300	150	1/2”	0.65	0.81	1.19	0.63	1.75	0.63	0.19	2.05
KTHL 350-12 DN	350	-	1/2”	0.70	0.88	1.28	0.63	1.75	0.75	0.19	2.05
KTHL 400-12 DN	400	185	1/2”	0.76	0.95	1.41	0.63	1.75	0.75	0.19	2.17
KTHL 500-12 DN	500	240	1/2”	0.84	1.06	1.53	0.63	1.75	0.75	0.22	2.30
KTHL 600-12 DN	600	300	1/2”	0.92	1.19	1.69	0.63	1.75	0.75	0.28	2.67
KTHL 750-12 DN	750	-	1/2”	1.03	1.30	1.75	0.63	1.75	0.75	0.28	2.88
KTHL 800-12 DN	800	400	1/2”	1.05	1.35	1.89	0.63	1.75	0.75	0.29	2.88
KTHL 1000-12 DN	1000	500	1/2”	1.17	1.50	2.16	0.63	1.75	0.75	0.34	2.99

Test Certificate
IEC 62561 Part 1
UL 486
NEMA CC1

Material
One piece seamless, high conductivity pure electrolytic copper and tin plated

Application
Long Barrel lugs are usable with high voltage up to 35 kV
Suitable for grounding and lightning protection system

Copper Lugs



4 - Hole Copper Lugs

Code No.	Copper Conductor MCM	Copper Conductor mm^2	Stud Size	Dimensions (in) I.D	O.D	L	W	X	S	Y	T	B	Weight (kg)
KFH 250-12N	250	120	1/2”	0.63	0.77	5.23	3	0.63	1.75	0.75	0.14	1.61	0.26
KFH 300-12N	300	150	1/2”	0.65	0.81	5.80	3	0.63	1.75	0.75	0.19	2.05	0.37
KFH 350-12N	350	-	1/2”	0.70	0.88	5.80	3	0.63	1.75	0.75	0.19	2.05	0.38
KFH 400-12N	400	185	1/2”	0.76	0.95	6.05	3	0.63	1.75	0.75	0.19	2.17	0.39
KFH 500-12N	500	240	1/2”	0.84	1.06	6.11	3	0.63	1.75	0.75	0.22	2.30	0.48
KFH 600-12N	600	300	1/2”	0.92	1.19	6.77	3	0.63	1.75	0.75	0.28	2.67	0.69
KFH 750-12N	750	-	1/2”	1.03	1.30	7.05	3	0.63	1.75	0.75	0.28	2.88	0.71
KFH 800-12N	800	400	1/2”	1.05	1.35	7.05	3	0.63	1.75	0.75	0.29	2.88	0.83
KFH 1000-12N	1000	500	1/2”	1.17	1.50	7.25	3	0.63	1.75	0.75	0.34	2.98	0.92
KFH 1250-12N	1250	630	1/2”	1.30	1.68	7.50	3	0.63	1.75	0.75	0.40	3.19	1.22
KFH 1500-12N	1500	-	1/2”	1.44	1.85	7.50	3	0.63	1.75	0.75	0.40	3.19	1.30
KFH 2000-12N	2000	1000	1/2”	1.67	2.14	8.16	3.06	0.63	1.75	0.75	0.46	3.14	1.66

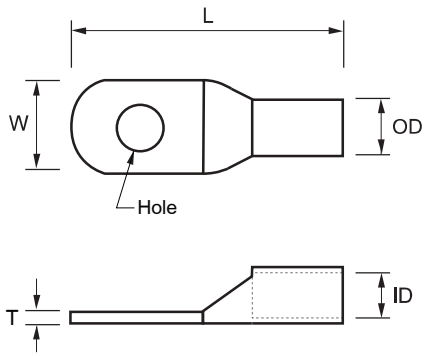
Test Certificate
IEC 62561 Part 1
UL 486
NEMA CC1

Material
One piece seamless, high conductivity pure electrolytic copper and tin plated

Application
Long Barrel lugs are usable with high voltage up to 35 kV
Suitable for grounding and lightning protection system

Copper Lugs

LISTED
TERMINAL CONNECTOR
3RC9



Code No.	Cable (mm^2)	Hole (mm)	Dimensions (mm) I.D	O.D	L	W	T	Weight (kg)
KOL 10-6	10	6.4	4.5	6.2	25	10.0	1.5	0.002
KOL 10-8		8.4			25	12.6	1.5	
KOL 16-6	16	6.4	5.4	7.1	30	10.0	1.5	0.01
KOL 16-8		8.4			30	12.6	1.5	
KOL 25-6	25	6.4	6.8	8.8	30	12.6	1.5	0.01
KOL 25-8		8.4			30	12.6	1.5	
KOL 25-10		10.5			31	15.0	1.5	
KOL 35-6	35	6.4	8.2	10.6	35	15.0	2.5	0.01
KOL 35-8		8.4			35	15.0	2.5	
KOL 35-10		10.5			35	15.0	2.5	
KOL 35-12		13			35	18.6	2.5	
KOL 50-8	50	8.4	9.5	12.4	43	18.0	3.0	0.02
KOL 50-10		10.5			43	18.0	3.0	
KOL 50-12		13			43	19.0	3.0	
KOL 70-8	70	8.4	11.2	14.7	50	21.0	3.4	0.03
KOL 70-10		10.5			50	21.0	3.4	
KOL 70-12		13			50	21.0	3.4	
KOL 95-8	95	8.4	13.5	17.4	55	25.5	3.4	0.04
KOL 95-10		10.5						
KOL 95-12		13						
KOL 120-10	120	10.5	15	19.4	60	28.0	4.0	0.06
KOL 120-12		13						
KOL 120-14		15						
KOL 120-16		17						
KOL 150-10	150	10.5	16.5	21.2	69	30.5	4.0	0.08
KOL 150-12		13						
KOL 150-14		15						
KOL 150-16		17						
KOL 185-12	185	13	18.5	23.5	78	34.0	4.5	0.10
KOL 185-14		15						0.10
KOL 185-16		17						0.09
KOL 240-12	240	13	21	26.5	92	38.5	5.5	0.16
KOL 240-14		15						0.16
KOL 240-16		17						0.17
KOL 240-18		19						0.17
KOL 300-12	300	13	23.5	30.0	101	43.5	6.5	0.23
KOL 300-14		15						
KOL 300-16		17						
KOL 300-18		19						
KOL 400-14	400	15	28.5	36.5	114	53.0	7.5	0.40
KOL 400-16		17						0.40
KOL 400-18		19						0.39
KOL 400-20		21						0.39
KOL 500-14	500	15	29.7	38.1	124	56.0	8.5	0.46
KOL 500-16		17						0.46
KOL 500-18		19						0.45
KOL 500-20		21						0.45

Test Certificate
IEC 62561 Part 1
UL 486
NEMA CC1

Material
One piece seamless, high conductivity pure electrolytic copper and tin plated

Application
These terminals are designed for low voltage up to 600V
Suitable for grounding and lightning protection system

Copper C-Clamp

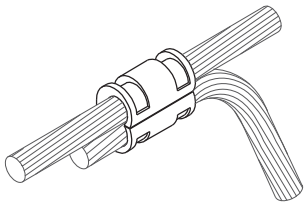
UL LISTED
GROUND CLAMP
32 UG

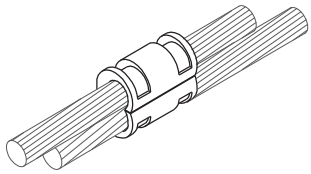
Code No.	Cable Size (mm^2) Run	Tap	Weight (kg)	Hydraulic crimping tools HCT-S1	HCT-M1	HCT-P1
CCC 6-6	6-2.5	6-1.5	0.01	-	-	-
CCC 10-10	10	10-1.5	0.01	MC 10	MC 10	-
CCC 16-16	16	16-1.5	0.02	MC 25	MC 25	-
CCC 25-10	25	10-1.5	0.02	MC 25	MC 25	-
* CCC 25-25	25	25-10	0.02	MC 25	MC 25	-
CCC 35-16	35	16-1.5	0.04	MC 35	MC 35	-
* CCC 35-35	35	35-10	0.04	MC 35	MC 35	-
CCC 50-25	50	25-4	0.08	MC 70	MC 70	-
* CCC 50-50	50	50-35	0.09	MC 70	MC 70	-
CCC 70-35	70	35-4	0.08	MC 70	MC 70	-
* CCC 70-70	70	70-35	0.08	MC 70	MC 70	-
CCC 95-35	95	35-4	0.13	-	MC 95	MC 95
* CCC 95-95	95	95-50	0.12	-	MC 95	MC 95
* CCC 120-120	120	120-25	0.17	-	MC 185	MC 185
* CCC 150-150	150	150-25	0.13	-	MC 185	MC 185
* CCC 185-95	185	95-25	0.13	-	MC 185	MC 185
CCC 185-185	185	185-120	0.23	-	-	MC 300
CCC 240-70	240	70-35	0.22	-	-	MC 300
CCC 240-120	240	120-95	0.24	-	-	MC 300
CCC 240-240	240	240-120	0.32	-	-	MC 300
CCC 300-300	300	300-120	0.28	-	-	MC 300

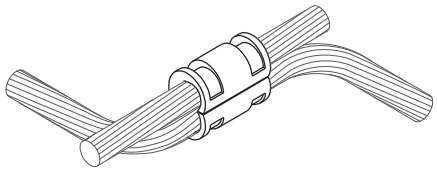
Test Certificate
IEC 62561 Part 1
UL 467

Material
High purity copper profiles

Application
Suitable for copper cable connection in grounding and lightning protection by using hydraulic crimping tools, HCT-S1, HCT-M1 and HCT-P1







Note : " * " means to meet UL Listed

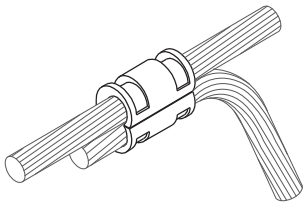
Copper C-Clamp With Tin

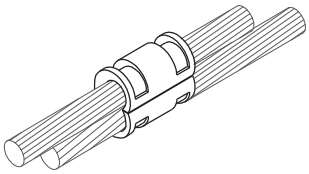
Code No.	Cable Size (mm^2) Run	Tap	Weight (kg)	Hydraulic crimping tools HCT-S1	HCT-M1	HCT-P1
CCC 6-6T	6-2.5	6-1.5	0.01	-	-	-
CCC 10-10T	10	10-1.5	0.01	MC 10	MC 10	-
CCC 16-16T	16	16-1.5	0.02	MC 25	MC 25	-
CCC 25-10T	25	10-1.5	0.02	MC 25	MC 25	-
CCC 25-25T	25	25-10	0.02	MC 25	MC 25	-
CCC 35-16T	35	16-1.5	0.04	MC 35	MC 35	-
CCC 35-35T	35	35-10	0.04	MC 35	MC 35	-
CCC 50-25T	50	25-4	0.08	MC 70	MC 70	-
CCC 50-50T	50	50-35	0.09	MC 70	MC 70	-
CCC 70-35T	70	35-4	0.08	MC 70	MC 70	-
CCC 70-70T	70	70-35	0.08	MC 70	MC 70	-
CCC 95-35T	95	35-4	0.13	-	MC 95	MC 95
CCC 95-95T	95	95-50	0.12	-	MC 95	MC 95
CCC 120-120T	120	120-25	0.17	-	MC 185	MC 185
CCC 150-150T	150	150-25	0.13	-	MC 185	MC 185
CCC 185-95T	185	95-25	0.13	-	MC 185	MC 185
CCC 185-185T	185	185-120	0.23	-	-	MC 300
CCC 240-70T	240	70-35	0.22	-	-	MC 300
CCC 240-120T	240	120-95	0.24	-	-	MC 300
CCC 240-240T	240	240-120	0.32	-	-	MC 300
CCC 300-300T	300	300-120	0.28	-	-	MC 300

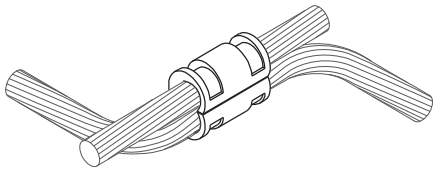
Test Certificate
IEC 62561 Part 1

Material
High purity copper profiles and tin plated.

Application
Suitable for copper cable connection in grounding and lightning protection by using hydraulic crimping tools, HCT-S1, HCT-M1 and HCT-P1







Hydraulic Crimping Tool

Hexagon die Round die

HCT-S1

HCT-S1 Hydraulic Crimping Tool with interchangeable die is suitable for compression of electrical connector on copper or aluminum lug and C-Clamp with 180 degree fully rotated tool head.

Specification
Crimping force 60 KN
Stroke 17 mm
Length 460 mm
Weight 3.3 kg

Application
Copper Lugs size 10-300 mm^2
C-Clamp Code no. CCC 10-10 to CCC 70-70

HCT-M1

HCT-M1 Hydraulic Crimping Tool with interchangeable die is suitable for compression of electrical connector on copper or aluminum lug and C-Clamp with 180 degree fully rotated tool head. The double speed action provides a fast advance speed for rapid approach of the dies to the connector and a lower more powerful speed for crimping.

Specification
Crimping force 120 KN
Stroke 42 mm
Length 550 mm
Weight 7.0 kg

Application
Copper Lugs size 10-400 mm^2
C-Clamp Code no. CCC 10-10 to CCC 185-95

HCT-P1

HCT-P1 Hydraulic Pump Set is suitable for electrical connector and a die for connector copper or aluminium lug and C-Clamp in advance operation and no electricity. Oil can be releasedquickly with 2 stages of high and low pressure which are available besides quick coupling.

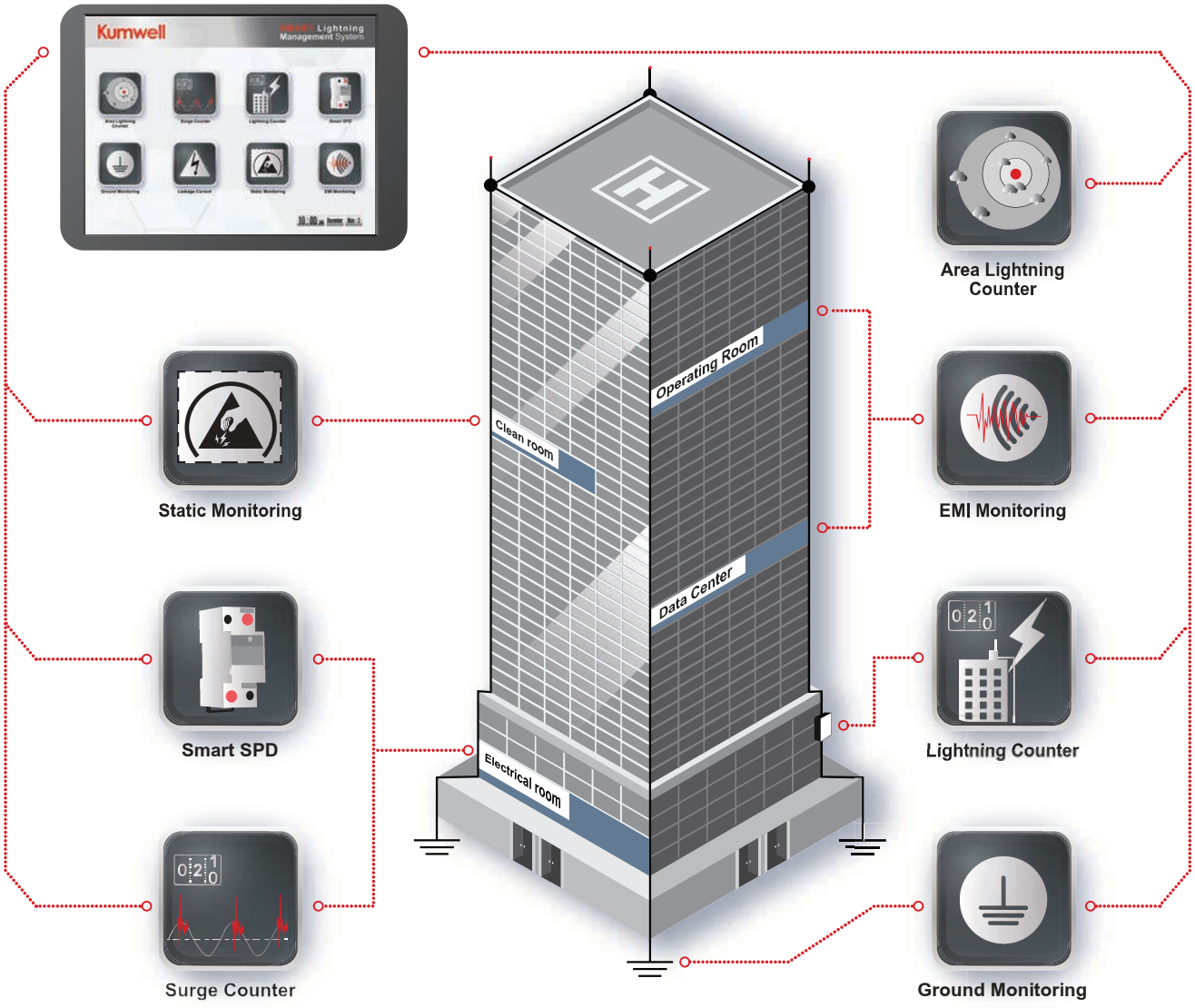
Specification
Crimping force 540 KN
Stroke 28 mm
Length 380 mm
Weight 43.4 kg
Hydraulic pump 11.4 kg
Crimping tool 32 kg

Application
Copper Lugs size 400-1000 mm^2
C-Clamp Code no. CCC 95-35 to CCC 300-300

Innovation

Smart Lightning Management System

The innovative intelligent system by Kumwell providing the smart monitoring and overview real-time reporting on the status of installed systems in your area ie. lightning protection system, grounding and surge protection system etc. Smart Lightning Management system could promptly alarm on a dangerous threat by lightning and electromagnetic fields providing safety to every life in the working area and public places and reducing risk of damage to property, buildings, communication failure and any management system.



Innovation

Smart Lightning Management System

SMART
Smart system : Promptly alarm on a dangerous threat by lightning and electromagnetic fields

SAFETY
Safety : Establish higher safety level to person and public areas

SECURITY
Security : Provide electrical, electronic, communication and operating system continually run in stability and reliability

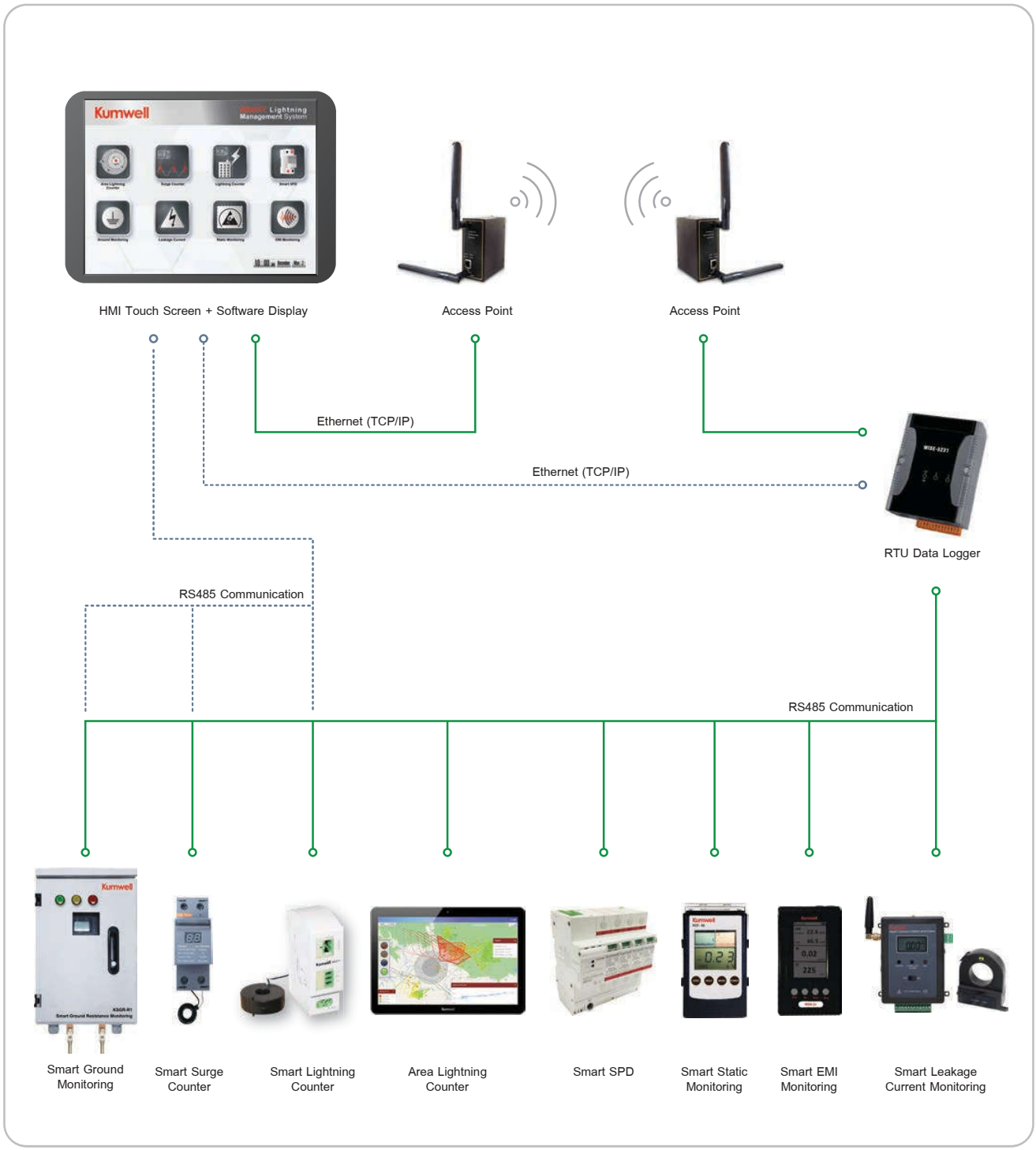
SAVE
Save : Reduce risk of damage to property, buildings, electrical, electronic, communication and operating system as well as reduce the maintenance cost.

Features

- Real-time grounding system monitoring.
- Surge counter with latest date/time display.
- Lightning impulse counter with impulse current and latest date/time display.
- Area Lightning Counter Record the lightning event within an area of concern (AOC). Display and record the latest 5 lightning strike in AOC, showing the date/time, amplitude (kA), daily number of total strike.
- Monitor the electromagnetic interference (EMI) in dedicated surrounding. Display the electromagnetic field (EMF), electric field (EF) and radio frequency power (RF).
- Compatible with Kumwell Smart SPD. Real-time monitor the lifetime of SPD, leakage current, temperature and surge countering.
- Alert when there is electrostatic exceed the limit in the monitoring area. Which is extremely dangerous for hazardous areas such as paint mixing, fuel tank, etc.
- Real-time leakage current monitoring.
- Temperature and Humidity
- Prompt alarm when system failure has occurred.
- Multifunction Display showing status of individual system, alarm and data logger.
- Data transfer to PC client or server to show data logger and report (optional).

Innovation

Smart Lightning Management System : KSLM - Configuration



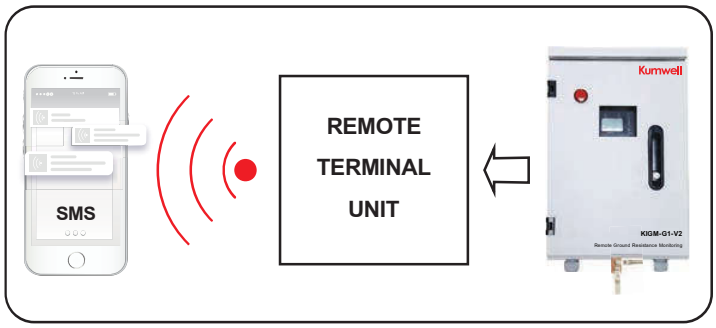
Remote Ground Monitoring System

Introduction

The grounding system reliability and efficiency for plants based on remote monitoring technique, it is success by using SMS data sending multi point resistance data to multi users systems anywhere via SMS mobile phone. By calculating loop resistance, it can detect fluctuations in the installation's grounding caused by accidental grounding disconnection, deterioration of the installation grounding or terrain, and equipment theft

Principle

The synchronous rectifier receives voltage and current data and send them to processor calculation. We obtain resistance value and read out display. If resistance value is more than setting value, then alarm appears. Next, it sends data to Remote terminal unit (RTU) via MODBUS and send SMS data to a mobile phone.



Field application

Easy to adapt by different target requirement. Following segments: Oil & Gas Plant, Tank Farm, Data Center Grounding, Petrochemical Plant etc.

Kumwell has developed Remote Grounding Monitoring System to increase reliability of grounding system by Real-Time grounding resistance detection and alert via SMS by Kumwell MODBUS RTU.

Benefit

- Safety System and Reliable Operation.

  Grounding resistance measurement by Earth Resistance Tester Clamp type.
- Quick Alarm and Real Time Alert.

  Real Time detection of Grounding Resistance.
- Reduce the cost and Increase the efficiency of operation.

  Real Time Monitor by Grounding Resistance detection.
- Having proper grounding and checking it regularly is very important.

  A ground in proper condition ensures protection against voltage surges.

Remote Ground Monitoring System

Stainless steel enclosure
Master unit
KIGM-GLX (Master Unit)

Plastic enclosure
KIGM-GLXP (Master Unit)

Real-Time Meter

Code No.	Diameter (mm) L	W	H	Weight (kg)
KIGM-GLX	500	400	250	20.5
KIGM-GLXP	500	400	200	9.5

Meter System

- Grounding resistance real time data and resistance alarm trigger sent to user by mobile phone SMS.
- Multi points to Multi users (10 points to 10 users for one main remote terminal unit).
- Communication protocol Modbus RTU /RS 485 port.
- Stainless steel enclosure (IP55) with good seal for severe environment service.
- GPRS/internet/WAN/LAN can be provided and customized (option).

AREA Application

- Oil & Gas Plant
- Transmission Line
- Meteorology Station
- Petrochemical Plant
- Satellite & Microwave Station
- Mining
- Tank Farm
- Power Plant
- Distribution Line
- Data Center Grounding

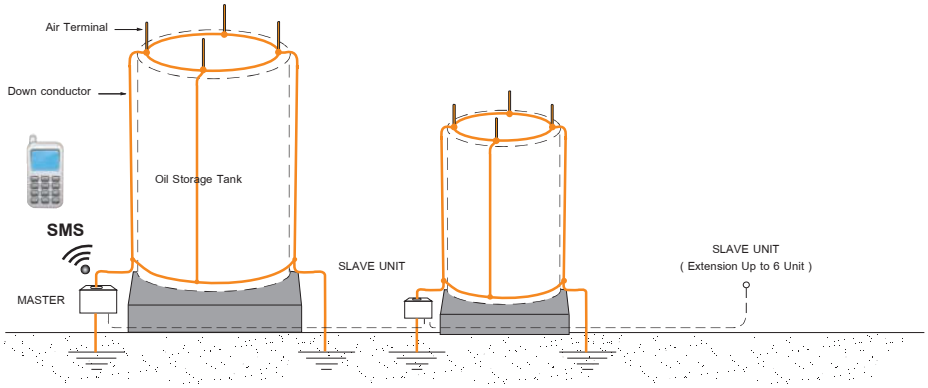
Master Unit

RTU specification

Meters interface protocol	: Modbus RTU / RS 485
No. of Meters for one RTU	: 10 sets
Remote communication	: - Remote terminal unit GSM/GPRS sent to mobile phone SMS - Remote setting and command by SMS available
No. of remote users	: 10 users (registered mobile phone number)

Real-Time Meter Specification

Function	Return circuit (loop) ground resistance, metallic return connection resistance
Resistance Range	0.01Ω -200Ω ,Resolution : 0.001Ω
Accuracy	2% Reading, 3 digits
Alarm Setting Value Range	0.01Ω -200Ω ,Detection panel setting
Display Mode	4 digits LCD direct indication
Single Measurement of	0.5 second



Remote Ground Monitoring System

Stainless steel enclosure

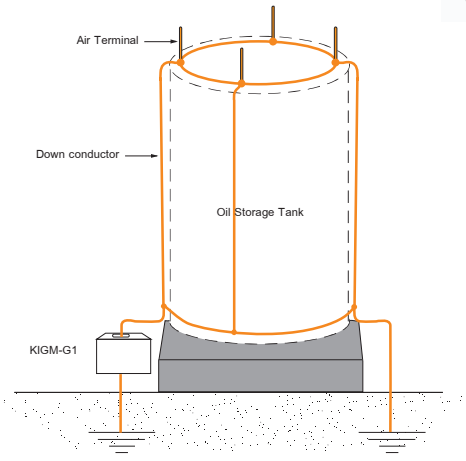
Slave unit

KIGM-G1 (Slave Unit)

Plastic enclosure

KIGM-G1P (Slave Unit)

Real-Time Meter



Code No.	Diameter (mm) L	W	H	Weight (kg)
KIGM-G1	200	300	250	5.0
KIGM-G1P	350	250	180	3.0

System Feature

- Non-contact measurement, safe and reliability, ease of installation. Grounding down lead is directly through the detector perforation, will not affect lightning protection grounding effect and the normal operation off the facilities.
- Allocating display screen and alarming light may show at any time to observe the grounding resistance value. We can set the alarm value; alarm light is flashing when the measured value is beyond pre-set critical value.
- Providing RS 485/Modbus protocol for external out-put data interface.

Benefits

Grounding resistance value change can be harmful effect to safety and malfunction of the plant or equipment also grounding conductor lost by the thief. All can be provided by “KIGM-G1”

AREA Application

- Oil & Gas Plant
- Transmission Line
- Meteorology Station
- Petrochemical Plant
- Satellite & Microwave Station
- Mining
- Tank Farm
- Power Plant
- Distribution Line
- Data Center Grounding

Slave Unit Specification

Real-Time Meter Specification

Function	Return circuit (loop) ground resistance, metallic return connection resistance
Resistance Range	0.01Ω -200Ω ,Resolution : 0.001Ω
Accuracy	2% Reading, 3 digits
Alarm Setting Value Range	0.01Ω -200Ω ,Detection panel setting
Display Mode	4 digits LCD direct indication
Single Measurement of	0.5 second

Grounding Resistance Online Meter

Grounding Resistance Online Meter KIGM-G2

Real-Time Meter

Code No.	Dimentions (mm) L	W	H	Weight (kg)
KIGM-G2	400	250	400	6.0

Grounding Resistance Online Meter increases reliability of grounding system by Real-Time grounding resistance detection and sends resistance data via RS 485/Modbus protocol for external out-put data interface.

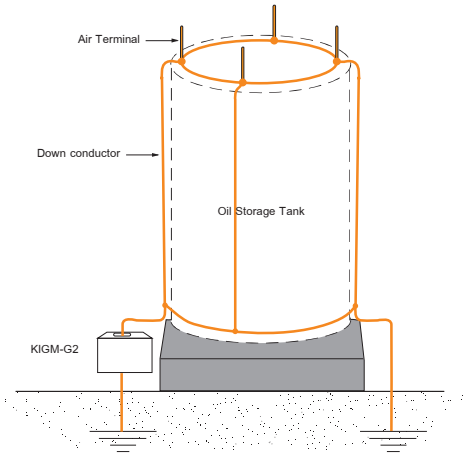
When grounding resistance value is changed. It may be due to grounding loss. It can be harmful effect to safety and malfunction of the plant or equipment. Also grounding conductor may be lost by the thief. All can be provided by Grounding Resistance Online Meter KIGM-G2. It is measuring return circuit resistance, Non-contact measurement, safe and reliability and ease of installation.

Feature :

- Real Time Detection of grounding conductor.
- Online Monitoring of grounding resistance.
- LCD display screen, light and sound alarm.
- Providing RS 485 communication protocol for external out-put data interface.

Technical Data

Function	Return circuit (loop) grounding resistance, metallic return connection resistance
Power Supply	DC6 V~DC9V
Resistance Range	0.01Ω -200Ω ,Resolution : 0.001Ω
Accuracy	2% Reading, 3 digits
Alarm Setting Value Range	0.01Ω -200Ω ,Detection panel setting
Single Measurement of Time	0.5 second
Alarm Setting	Meter panel setting
Data Display	4 digits LCD direct indication
Protocol Standard	RS485 standard MODBUS-RTU communication
Power Supply Mode	External power supply



References

Owner	Project Name	Distributor	Period
Thailand	● South Bangkok Combined Cycle Power Plant	Sino - Thai Engineering & Construction Co.,Ltd	2009
	● 500 Kv Gis At On Nuch Substation Under Bluk Power Supply For The Greater Bangkok Area Phase 2	Sri-u-thong Co.,Ltd.	2009
	● Mitr Phuluang Sugar Mils At Loei	K.M.L. International Co.,Ltd	2012
	● Belle Condominium	K.M.L. International Co.,Ltd	2012
	● Chana Power Plant	K.M.L. International Co.,Ltd	2012
	● Wangnoi Power Plant	K.M.L. International Co.,Ltd	2012
	● Lopburi Solar Power Plant	K.M.L. International Co.,Ltd	2012
	● Tot 3 G	K.M.L. International Co.,Ltd	2012
	● Bang Pa - In Power Plant	K.M.L. International Co.,Ltd	2012
	● Nongsang Power Plant	K.M.L. International Co.,Ltd	2012
	● Central Plaza Suratthani	K.M.L. International Co.,Ltd	2012
	● Amata B - Grimm At Rayong	K.M.L. International Co.,Ltd	2012
	● Boonthavorn Rama Ii	K.M.L. International Co.,Ltd	2012
	● Solar Thermal Power Plant At Kanchanaburi	K.M.L. International Co.,Ltd	2012
	● Hatyai Submarine Cable	K.M.L. International Co.,Ltd	2012
	● 115 Kv Bang Pa - In 2 - Ayutthaya 1	K.M.L. International Co.,Ltd	2012
	● P/j The Siam On The River Hotel	K.M.L. International Co.,Ltd	2012
	● 115 Kv, Xekong Ss&xekhamane3 - Xekong Tl, Laos	K.M.L. International Co.,Ltd	2012
	● Bang Pa - In Solar Plant	K.M.L. International Co.,Ltd	2012
	● Ubonratchathani Bioeternal Substation	K.M.L. International Co.,Ltd	2012
	● The International Convention And Exhibition Center Commemorating His Majesty's 7 Ht Cycle Birthday Anniversary	K.M.L. International Co.,Ltd	2012
	● Central Rama 9	K.M.L. International Co.,Ltd	2012
	● Central Festival Samul	Elmec Engineering Co.,Ltd	2013
	● S One Perspective Department Store At Kadrincome	Precise Corporation Co.,Ltd	2013
	● Boonthavorn Rama 2	Secco Co.,Ltd	2013
	● Mrta Purple Line	Sino - Thai Engineering & Construction Co.,Ltd	2013
	● Central Hatyai Project	205 Engineering Co.,Ltd	2013
	● Phuket Airport Deverlopment Project	Sino - Thai Engineering & Construction Co.,Ltd	2013
	● Solar Power Plant Nakhonsawan	Aod Supply Co.,Ltd	2013
	● Nong Sang Power Plant Nakhonsawan	Sino - Thai Engineering & Construction Co.,Ltd	2013
	● Kanom Power Substation	Siemens Co.,Ltd	2013
	● Tesco Lotus Rdc	Prosper Engineering Co.,Ltd	2013
	● Bts Bangwa Station	Suvis Co.,Ltdsiemens Co.,Ltd	2013
	● Chana Power Plant Development	Siemens Co.,Ltd	2013

Remark : The aforementioned project is some of the domestic project references

References

Owner	Project Name	Distributor	Period
EGAT	● Lam Takong Wind Turbine Generation	Hydrochina Corporation	2017
	● 230 Kv Ayutthaya 4 - Sikhiu 2	C.H.C. Engineering	2017
	● 230kv Mae Moh, Pha Yao	Globaltronic Intertrade Co., Ltd.	2017
	● 500kv Tha Tako Substation Expansion	Sri U-thong Co., Ltd.	2017
	● Mae Moh Generation Plant	Globaltronic Intertrade Co., Ltd.	2017
	● Transmission Lines 115 Kv Nakhon Phanom - Sakon Nakhon 2	Sri U-thong	2017
	● Transmission Lines115 Kv Amnat Charoen Mukdahan	Sri U-thong	2017
	● 115kv Substation Lan Krabu - Phisanulok	Loxley Power System Co., Ltd.	2017
	● Transmission System Expansion And Renovation Projcet Phase 2	Kinden	2017
	● Fire Protection System Phase 3	Kinden	2017
	● T2 Wind Farm	Italthai Engineering	2017
	● T3 Wind Farm	Italthai Engineering	2017
	● Solar Farm	Tns Instrument And Engineering Co., Ltd.	2017
Ramathibodi Hospital	● Ramathibodi Hospital Rama 6 Building	P. S. Power Lines Company Limited	2017
Genesis	● Genesis Data Center	Prosper Engineering	2017
PTT	● Ptt Khao Hin Son, Chachoeng Sao	Rk3 Engineering & Development	2017
	● Ptt Lng	Royaltec International	2017
Cambodia	● Celti 150mw Coal Power Plant, Si Hanoukville	Globaltronic Intertrade	2017
AOT	● Suvarnapbhumi Airport	Italian-thai Development	2017
EGCO	● Rayong Generation Plant, Amata City	Globaltronic Intertrade	2017
Malaysia	● Scc Rapid (Petronas)	Royaltec International	2017
PEA	● 8.965mw Vspp-pea	Italthai Engineering	2017
	● Bang Phai Substation	Royaltec International	2017
	● Lamphun Substation, Northern Region Industrial Estate	Interlink Communication Public Co., Ltd.	2017
	● 115kv Tranmission Line Mae Hon Son	Eastern Technical Engineering Public Company Limited	2017
Sea Gate	● Siri Plaza	Aka Co., Ltd.	2017
IDEO Ananda Development	● Ideo 02 Bang Na	N.R.Engineering Co., Ltd.	2017
Central	● Central Festival Phuket	Power Line Engineering Public Company Limited	2017
	● Central Mahachai	Elmech Engineering Co., Ltd.	2017
	● Central Nakhon Ratchasima	Inwire Engineering Company Limited	2017
Chulalongkorn University	● Cu Centennial Park	Syntec Construction Public Company Limited	2017
Makro	● Makro Pathumthani	Entecon Company Limited	2017
	● Makro Kalasin	Entecon Company Limited	2017
Thai Government	● Paliament House Of Thailand	Power Line Engineering Public Company Limited	2017
	● Thai Supreme Court Building	Power Line Engineering Public Company Limited	2017
	● Office Of Court Of Justice	Power Line Engineering Public Company Limited	2017
Royal Thai Navy	● Royal Thai Navy Armory	Winning System Engineering Limited Partnership	2017
Mass Rapid Transit Authority of Thailand	● Mrt Blue Line	Sino-thai Engineering & Construction Public Company Limited	2017 2017
	● Mrt Green Line	Power Line Engineering Public Company Limited	2017
	● Mrt Red Line	Italian-thai Development	2017
Charoen Pokphand	● Cp Ram Khon Khen	Christiani & Nielsen (Thai) Public Company Limited	2017
Department of Highways	● Motorway Chonburi	Entecon Company Limited	2017
MQDC	● Whizdom Condo Sukhumvit 101	Tri-en Solution Co., Ltd.	2017
Royal Thai Army	● โครงการพัฒนาและปรับปรุงกองบัญชาการกองทัพไทย (แจ้งวัฒนะงานปรับปรุงระบบป้องกันฟ้าผ่า อาคารหมายเลข ๑ บก.ทท.)	Gentrade Engineering Co., Ltd.	2017
Myanmar	● Minjar Power Plant	Demco Public Company Ltd.	2017

Remark : The aforementioned project is some of the domestic project references

References

Owner	Project Name	Distributor	Period
Boonthavorn	● Boonthavorn Udon Thani	Boonthavorn Development Co., Ltd.	2017
Tesco Lotus	● Tesco Lotus Fang District	Thanacha Co., Ltd.	2017
	● Tesco Lotus Prakhon Chai District	Prosper Engineering	2017
IKEA	● Ikea Bang Yai	Thai Semcon Co., Ltd.	2017
MEA	● Mea Feeder Remote Terminal Unit (Frtu)	Precise Electro-mechanical Works Co., Ltd.	2017
	● Substation Prawet	Sb Powertech Co., Ltd.	2017
	● Substation Pra Nakorn Tai	Transec Power Services Co., Ltd.	2017
	● Substation Prachachun	Klang Faifa Rog-ngan Co., Ltd.	2017
CP ALL	● Cp All Buriram	Royaltec International	2017
ENSYS	● Biomass Power Plant Ensys	N.R.Engineering Co., Ltd.	2017
PEA	● 115kv Transmission Line Rojana, Ayutthaya	Rss 2016 Co., Ltd.	2017
Supalai	● Supalai Elite Surawong	Secco Engineering & Construction Co.,Ltd.	2017
	● Supalai Elite Phayathai	Secco Engineering & Construction Co.,Ltd.	2017
	● Supalai Veranda Ratchavipha	Secco Engineering & Construction Co.,Ltd.	2017
	● Supalai Wellington 2	Secco Engineering & Construction Co.,Ltd.	2017
	● Supalai Loft Chaeng Watthana	Secco Engineering & Construction Co.,Ltd.	2017
	● Supalai Elite Phayathai	Secco Engineering & Construction Co.,Ltd.	2017
TESCO LOTUS	● โลตัส กุฉินารายณ์ จ.กาฬสินธุ์ Tesco Lotus Kuchinarai	Prosper Engineering	2017
B.Grimm Power	● 115 Terminal Sub Abpr5	Demco Public Company Ltd.	2017
PEA	● สถานีไฟฟ้าพัทยากลาง Central Pattaya Substation	Secco H.V. Co Ltd	2017
	● 115kv Khao Mai Kaeo, Chonburi	Demco Public Company Ltd.	2017
TFG	● Tfg-further Product Factory	V Neramit Co., Ltd.	2017
JWS Construction	● The Garden 9 (Lat Krabang)	V Neramit Co., Ltd.	2017
มหาวิทยาลัยแม่ฟ้าหลวง จังหวัดเชียงราย	● Mae Fah Luang University	Vars Co., Ltd.	2017
	● Bang Kruai Hospital 2	Royaltec International	2017
	● Gymnasium Chitralada School	Italthai Engineering Co., Ltd.	2017
Platinum Market	● The Market By Platinum	First Technology Co., Ltd.	2017
Vietnam	● Thai Binh 1 Thermal Power Plant	Globaltronic Intertrade	2017
AP (THAILAND)	● Aspire Sathorn-ratchapruek	Tri-en Solution Co., Ltd.	2017
	● Aspire Erawan	Prosper Engineering	2017
TAKATA	● Takata Industrial Plant	Bania Engineering Co., Ltd.	2017
Laos	● Hydroelectric Power Nam Ngiep	R C R Co., Ltd.	2017
	● The Saint Residences Vibhavadi Rangsit	Secco Engineering & Construction Co.,Ltd.	2017
เกษมทรัพย์สิริ 2	● Aec Market Building	Power Line Engineering Public Company Limited	2017
EGAT	● 500 Kv Chaeng Watthana Substation	Demco Public Company Ltd.	2017
	● 500 Kv Transmission Line Chaiyapoom	Demco Public Company Ltd.	2017
Phuket Sirinath Property	● The Terminal Phuket	Engnue Technology Co., Ltd.	2017
EGAT	● Supply Grounding Material	Kumwell	2018
	● Transmission Lines 230kV Chachoengsao 2 - Prachinburi 2	Demco Public Company Limited	2018
	● Transmission Lines 550kV Bang Saphan 2 - Surat Thani 2	Kalpataru Limited	2018
	● Underground Transmission Line 230kV South Bangkok	TEDA Company Limited	2018
	● Transmission Lines 500kV Bang Saphan 2 - Surat Thani 2	Larsen & Toubro Limited	2018
	● 230/115 kV Ao Phai Substation (GIS)	Sinohydro (Thailand) Co., Ltd.	2018
	● Transmission Lines 500kV Ubon Ratchathani 3 - Roi Et 2	RCR	2018
	● Transmission Lines 500kV Bang Saphan 2 - Surat Thani 2	Loxley Public Company Limited	2018
	● Supply of Miscellaneous Equipment Bulk Power Sopply for the Greater Bangkok and Vicinity Area Phase 3	Maclean - Dulhunty Power (Thailand) Limited	2018

Remark : The aforementioned project is some of the domestic project references

References

Owner	Project Name	Distributor	Period
EGAT	● 115 kV Phatthalung Substation (GIS)	Italthai Engineering Co., Ltd.	2018
	● South Bangkok Power Plant	Marubeni Corporation	2018
PEA	● Substation Phuket	Siemens	2018
	● 115 kV Substation Songkhla	IGEN Engineering	2018
	● 115/33 kV Hanuman Wind Farm	ABB	2018
	● Sikhiu 3&5 Wind Farm Substation	Grid Solution	2018
GULF	● Gulf Sriracha Substation	Mitsubishi Electric Asia	2019
EGAT	● 500 KV Surat Thani Substation	Larsen &Toubro Limited	2019
	● 230 KV Ao Phai Substation	Sino Hydro	2019
	● Bangpakong Power Plant	Royaltech International	2019
	● 230 KV Khlong Dan Substation	Larsen &Toubro Limited	2019
	● 500 KV Pluak Daeng Substation	KEC International Limited	2019
SRT	● Bangsue – Rangsit Redline	Italianthai Development	2019
	● Red Line Grand Station	Unique Engineering	2019
MRTA	● Orange Line	Italthai Engineering	2019
	● Green Line	Italianthai Development	2019
ICON SIAM	● Gold Line	Italianthai Development	2019
AOT	● Suvarnabhumi Airport Phase2	Power Line Engineering	2019
AEROTHAI	● VOR / DME Betong Airport	Pornpian Co., Ltd	2019
EGAT	● 500 KV Bang Saphan2 – Surat Thani 2	Uanpataru Power Transmission	2019
	● 230 KV Chatuchak	Globaltronic Intertrade Co.,Ltd.	2019
PEA	● 115KV สฟ. อรัญประเทศ	Demco Public Company Limited	2019
	● สถานีไฟฟ้า คลองเขื่อน	U Services	2019
MEA	● สย. คอต่อ & สย.แพรกษา	TEDA Co., Ltd	2019
	● Chandrakasem, SuanSom, Rungpracha Substation	Siemens	2019
EGAT	● EGAT: Saraburi 6 Substation	Italthai Engineering	2019
	● EGAT: 115 KV Khon-Khaen	Italthai Engineering	2019
	● EGAT: Phuket Substation	Italianthai Development	2019
PEA	● LPWP 8.965 Mw (โครงการนาลมลิกอร์)	Italthai Engineering	2019
	● 115 / 22 KV Gis Substation	ABB	2019
SUPALAI	● Varenda Phasicharoen	Secco	2019
	● Oriental Sukhumvit 39	Secco	2019
	● Riva Grand	Secco	2019
โรงพยาบาลจุฬาลงกรณ์	● อาคาร ภปร.	Quesco	2019
NARAI PROPERTY	● Park Land จรัญ-ปิ่นเกล้า	Secco	2019
CP	● CP Tower 2	Syntec	2019
SIGHA	● Sigha Complex	Secco	2019
THAI OIL	● Main Building Sriracha	Prosper Engineering	2019

Remark : The aforementioned project is some of the domestic project references

References

Owner	Project Name	Distributor	Period
OMAN	Al Kamil Power Plant	Gulf Radiant Electrical & Trading L.L.C.	2001 - 2002
U.A.E	Dewa Project	Gulf Radiant Electrical & Trading L.L.C.	2001 - 2002
	Adwea Project	Gulf Radiant Electrical & Trading L.L.C.	2001 - 2002
INDIA	Purula-hydro Power Plant	Taisei Corporation	2003
QATAR	Qatar Petroleum Gas	Gulf Radiant Electrical & Trading L.L.C.	2003
SUDAN	Melut Basin Oil	Gulf Radiant Electrical & Trading L.L.C.	2003
INDIA	Purula-hydro Power Plant	Taisei Corporation	2003 - 2004
VIETNAM	Binh Trieu-hcm 110KV, Phu Tho-hcm 110KV	V.T.E.C.H. Electrical Technology Co.,Ltd.	2004
CHINA	Shanghai Power Plant	Nova Technology Co.,Ltd.	2004
PAKISTAN	Lpg Extraction Plant	ABB PVT.Ltd	2004
	500KV/220 Ntoc-kekc	Pacific Engineering Co.,Ltd.	2005
MALAYSIA	500KV T/l Transmission Lines For 1400mw Jimah Power Project	Fujikura Ltd.	2005
LAOS	Nam Theun 2 Hydro Power Project Em2 Transmission Line	J-Power System Corporation	2005
VIETNAM	Cu Mau Combine Cycle Power Plant Petro	V.T.E.C.H. Electrical Technology Co.,Ltd.	2006 - 2007
CHINA	Shantou 500KV Substation	Nova Technology Co.,Ltd.	2007
	Shi Hua Yang Zhuang River Project	Nova Technology Co.,Ltd.	2008
MALAYSIA	Hospital Petronas (Klcc Health Care Center)	Hellerman Letrik Sdn. Bhd.	2008
	Kuala Lumpur International Airport (Klia)	Hellerman Letrik Sdn. Bhd.	2008
	Cu Mau Combine Cycle Power Plant Petro	Hellerman Letrik Sdn. Bhd.	2008
	Maxis Telecom Malaysia	Hellerman Letrik Sdn. Bhd.	2008
PAKISTAN	Gas Turbine Power Plant	Pacific Engineering Co.,Ltd.	2008
U.A.E	Dewa-d.f.o. Pipeline	Gulf Radiant Electrical & Trading L.L.C.	2009
	Abu-dhabi International Airport 2k Runway Project	Gulf Radiant Electrical & Trading L.L.C.	2009
	Du Telecom Tower Civil Works	Gulf Radiant Electrical & Trading L.L.C.	2009
EGYPT	Ezz-steel Plant, Suez	DANIELI	2009
IRAQ	Us Army Jlsc-doha, Project Iraq/afghanistan	Gulf Radiant Electrical & Trading L.L.C.	2009
	Pier & Seawall Project, Umm Qasr, Basra-iraq	CCI Inc.	2009
VIETNAM	Main Gas Filling Station	V.T.E.C.H. Electrical Technology Co.,Ltd.	2009
CHINA	Yinnan Province Xiao Wan Hydro-power Plant	Nova Technology Co.,Ltd.	2009
	Shangdong Province Dezhou 500 KV Substation	Nova Technology Co.,Ltd.	2009
INDONESIA	Sengkang		2008
TRINIDAD AND TOBAGO	Brechin Castle Substation	Petrotrin, Petroleum Company of Trinidad and Tobago Limited.	2010
	EPC Refinery Substation Project : 2312	Petrotrin, Petroleum Company of Trinidad and Tobago Limited.	2010
VIETNAM	Da Nang Internation Airport-danang City	CNA-HTE / Middle Airports Corporation-MAC	2010
COLOMBIA	Santa Marta Substation Project 2365	HMV Ingenieros Ltda	2010
	LLC Barrancabermeja-el Centro, Oil Industrial Complex	Occidental De Colombia Inc.	2010 - 2013
INDONESIA	Tanjung Tabalong		2011
COLOMBIA	Pacific Rubiales Corporation Oil Industrial Complax.	CAM Colombia (Compania Americana De Multiservicios)	2011 - 2012
VENEZUELA	Tocoma Hidroelectric Project (2000 Mva) Rio Caroni Pto. Ordaz	Consorcio Oiv Tocoma Odebrecht - Imoregilo - Vincler	2011 - 2013
INDONESIA	KDL 120mw Combined Cycle Power Plant Project	Kratatau Daya Listrik	2013
LAO PDR	Nong Deun - Seno - Meuang Phine 115KV Transmission Project	China-East Resources Import & Export Co.	2014 - 2016
	Xayaburi Hydroelectric Power Project : Package 4 : 500KV Transmission Line	China-East Resources Import & Export Co.	2014 - 2016
SINGAPORE	Exxon	Alstom Grid Pte Ltd (Singapore)	2016

Remark : The aforementioned project is some of the international project references

References

Owner	Project Name	Distributor	Period
MYANMAR	● Ese Project	Arkarthit Enterprise Co.,Ltd.	2014 - 2016
	● Mepe Project	Arkarthit Enterprise Co.,Ltd.	2014 - 2016
	● 66KV Kyaukphyu Substation Switchbay	Arkarthit Enterprise Co.,Ltd.	2015
	● 66/11KV, 10 Mva Kyaukkayate Substation	Arkarthit Enterprise Co.,Ltd.	2015
	● 230KV Switchbay Extension At Thaketa Substation	Arkarthit Enterprise Co.,Ltd.	2015
	● 66/11KV, 5 Mva Shardaw Substation	Arkarthit Enterprise Co.,Ltd.	2015
	● 66KV Moegoke Ss Switchbay	Arkarthit Enterprise Co.,Ltd.	2015
	● Mandalay Project	Arkarthit Enterprise Co.,Ltd.	2016
	● Mawlamying Ss Extention	Arkarthit Enterprise Co.,Ltd.	2016
	● 43T / MEPE (PTP)	Arkarthit Enterprise Co.,Ltd.	2016
	● New Life Myanmar Hotel Project	Arkarthit Enterprise Co.,Ltd.	2016
BANGLADESH	● 230 KV Extension In Existing 230/132 Kv Substation At Khulna South On Turnkey Basis	N.R. Engineering Co.,Ltd.	2016
LAO PDR	● Xe Namnoy And Xe Katam Hydropower Project	B.Grimm Power Public Company Limited	2016
INDONESIA	● Jawa 2 Coal Fired Power Plant	PT. Promindo	2016
	● Kalsel-1 Coal Fired Power Plant	PT. Raj Prima	2016
PAKISTAN	● K Electric Rehabilation (Tp100 Project)	Siemens	2016
	● PABCL Project	Descon	2016
VIETNAM	● Ha Noi Metro Project	V.T.E.C.H. Electrical Technology Co.,Ltd.	2015
	● Nghi Son Refinery Project	V.T.E.C.H. Electrical Technology Co.,Ltd.	2015-2016
	● Npk Phu My Power Plant Project	V.T.E.C.H. Electrical Technology Co.,Ltd.	2016
	● Nestle Hung Yen Project	V.T.E.C.H. Electrical Technology Co.,Ltd.	2016
	● Thai Binh 1 Thermal Power Plant	V.T.E.C.H. Electrical Technology Co.,Ltd.	2016
	● "Ground Improvement : 220kV & 500kV Transmission Tower of PTC1 & PTC2"	V.T.E.C.H. Electrical Technology Co., Ltd.	2016-2017
	● Metro Linie Nhon - Ha Noi Station	V.T.E.C.H. Electrical Technology Co., Ltd.	2017
INDONESIA	● Lumut Balai Geo Thermal	PT.Raj Prima	2017
	● Solar Photovoltaic Electricit	PT.Raj Prima	2017
	● 150kV Bekasi Substation	PT.Raj Prima	2017
	● Tangguh Expension Project	PT.Raj Prima	2017
	● Petrokimia Butadiene Indonesia Extraction Plant	PT.Raj Prima	2017
	● 150kV BSD Substation	PT.Raj Prima	2017
	● 150kV Pasar Kermis Substation	PT.Raj Prima	2017
	● PLTMG Package 4 Project	PT.Raj Prima	2017
	● Kalsel 1- CFPP Project Power Plant	PT.Raj Prima	2017
	● MRT Jakarta Project	PT.Raj Prima	2017
	● PLTMG Package 3 Project	PT.Raj Prima	2017
	● Lumut Balai Geo Thermal - 2nd MTO	PT.Raj Prima	2017
MYANMAR	● 51T / MEPE (PTP) - AMM	Arkarthit Enterprise Co., Ltd.	2017
	● Boxpak Factory Project - CAM	Arkarthit Enterprise Co., Ltd.	2017
	● Shan State Project - MPD	Arkarthit Enterprise Co., Ltd.	2017
MALAYSIA	● Muram to Samalaju 2 - 275kV Transmission Line Project - SEB	KEC Internation Limited	2017
BANGLADESH	● 230/132kV GIS Dhamrai - Shampur PGCG	Siemens Limited	2017
DUBAI, UAE	● TAKREER ADH	Gulf Radiant Electrical & Trading L.L.C.	2017
VIETNAM	● COCOBAY	V.T.E.C.H. Electrical Technology Co., Ltd.	2017
	● Cam Ranh International Airport	V.T.E.C.H. Electrical Technology Co., Ltd.	2017
	● THE ESTELLA HEIGHTS - PHASE 2	V.T.E.C.H. Electrical Technology Co., Ltd.	2017-2018
PAKISTAN	● Zorlu OFS T-3428	Siemens Pakistan Engineering Co., Ltd.	2017-2018

Remark : The aforementioned project is some of the international project references

References

Owner	Project Name	Distributor	Period
PAKISTAN	● KETP 1000	Siemens Pakistan Engineering Co., Ltd.	2017-2018
	● DABS 010	Siemens Pakistan Engineering Co., Ltd.	2017-2018
	● CEL - Chanar	Siemens Pakistan Engineering Co., Ltd.	2017-2018
VIETNAM	● FIRST SOLAR - PHASE 2	V.T.E.C.H. Electrical Technology Co., Ltd.	2017-2018
	● METRO LINE BEN THANH - SUOI TIEN	V.T.E.C.H. Electrical Technology Co., Ltd.	2017-2018
	● RIVIERA POINT - PHASE 1B	V.T.E.C.H. Electrical Technology Co., Ltd.	2017-2018
	● Vinh Tan 4 Thermal Power Plant	V.T.E.C.H. Electrical Technology Co., Ltd.	2018
	● Heineken Vietnam Brewery - Da Nang	V.T.E.C.H. Electrical Technology Co., Ltd.	2018
	● Long Phu 1Thermal Power Plant - OUTDOOR BAY	V.T.E.C.H. Electrical Technology Co., Ltd.	2018
	● LDS System Renting Service for PTC1	V.T.E.C.H. Electrical Technology Co., Ltd.	2018
INDONESIA	● KALSELTENG-2 COAL FIRED STEAM POWER PLANT	PT.Raj Prima	2018
	● CAP NPE	PT.Raj Prima	2018
	● 500kV Delta Mas Substation	PT.Raj Prima	2018
	● 150kV Sinar Sahabat Substation	PT.Raj Prima	2018
	● 150kV Pandaan Baru Substation	PT.Raj Prima	2018
	● 150kV Sukatani Extension Substation	PT.Raj Prima	2018
	● 150kV Nganjuk II Substation	PT.Raj Prima	2018
	● PLTMG Package 3 Project - Extension	PT.Raj Prima	2018
	● PLTMG Package 4 Project - Extension	PT.Raj Prima	2018
MYANMAR	● 46T/MEPE (PTP) - FSI	Arkarthit Enterprise Co., Ltd.	2018
	● Private Project - CAM	Arkarthit Enterprise Co., Ltd.	2018
	● LV-047 LP2 PROJECT - CAM	Arkarthit Enterprise Co., Ltd.	2018
	● EE-032 PROJECT - CAM	Arkarthit Enterprise Co., Ltd.	2018
	● Nestle Factory Project - KKST	Arkarthit Enterprise Co., Ltd.	2018
	● YGN-MDY Railways Improvement Project - BFE	Arkarthit Enterprise Co., Ltd.	2018
	● 43T/MEPE (PTP)_Mawlamying SS Extension - MPS	Arkarthit Enterprise Co., Ltd.	2018
	● Thilawa Project - KST	Arkarthit Enterprise Co., Ltd.	2018
	● Myanmar Beer Factory Project - PKM	Arkarthit Enterprise Co., Ltd.	2018
	● EAC Soft Drink Factory Project - ERC	Arkarthit Enterprise Co., Ltd.	2018
BANGLADESH	● Augmentation & Rehabilitation of 33KV GIS Switchgears at Tongi 230/132/33KV Grid Sub-Station	Siemens Bangladesh Ltd.	2019
PAKISTAN	● Naveena Steel Mills Project	Pacific Engineering	2019-2020
	● Sahiwal 220kV Grid Stations	Pacific Engineering	2019-2020
	● Sahiwal 500kV Grid Stations	Pacific Engineering	2019-2020
INDONESIA	● MULTIFAB GI 150kV AMPEL	PT. RAJ Prima	2019
	● IKPT-AYNI005 NSI i-III	PT. RAJ Prima	2019
	● GI MUARA WAHAU	PT. RAJ Prima	2019
	● Muara Karang Power Station	PT. RAJ Prima	2019
	● MULTIFAB GI 150kV ULEE KARENG	PT. RAJ Prima	2020
PHILIPPINE	● BESS PHILIPPINES (1)	PT. RAJ Prima	2020
MYANMAR	● 66kV Kalewa-Mawleik TL/18-19 (16.7 Miles) -ZLE	Arkarthit Enterprise Co.,Ltd.	2018-2019
	● Private Project/19-20 - TTM	Arkarthit Enterprise Co.,Ltd.	2019-2020
	● Private Project/2019-20-ERL	Arkarthit Enterprise Co.,Ltd.	2019-2020
	● PTTEP Myanmar Project/2019-20 - OSES	Arkarthit Enterprise Co.,Ltd.	2019-2020
	● Makro Myanmar Project 19-20 -NLM	Arkarthit Enterprise Co.,Ltd.	2019-2020
	● Peninsula Hotel Yangon Project/2019-2020	Arkarthit Enterprise Co.,Ltd.	2019-2020
DUBAI	● DEWA 132/11kV Substation	Gulf Radiant Electrical & Trading LLC	2020
	● DEWA IV 700MW CSP	Gulf Radiant Electrical & Trading LLC	2019-2020

Remark : The aforementioned project is some of the international project references

CHINA : 6100 MW YANGJIAN NUCLEAR POWER PLANT

DUBAI : BARZAN ONSHORE FACILITIES PROJECT IN RAS LAFFAN, QATAR

VENEZUELA : TOCOMA HIDROELECTRIC PROJECT (2000 MVA) RIO CARONI PTO. ORDAZ

THAILAND : PTT GASSEPARATION PLANT

COLOMBIA : CENTRAL 20MW EPM-EPC SE MALENA SUBSTATION 230 kV

MALAYSIA : KUALA LUMPER INTERNATIONAL AIRPORT - KLIA (MALAYSIA)

VIETNAM : 500KV TAN DINH - SONG MAY POWER LINE

INDIA : INDIA RAILWAYS

THAILAND : 230/500kV, PLUAK DAENG ELECTRICITY GENERATING AUTHORITY OF THAILAND, (EGAT)

CHINA : HIGH SPEED TRAIN

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WORLD CLASS QUALITY

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