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)

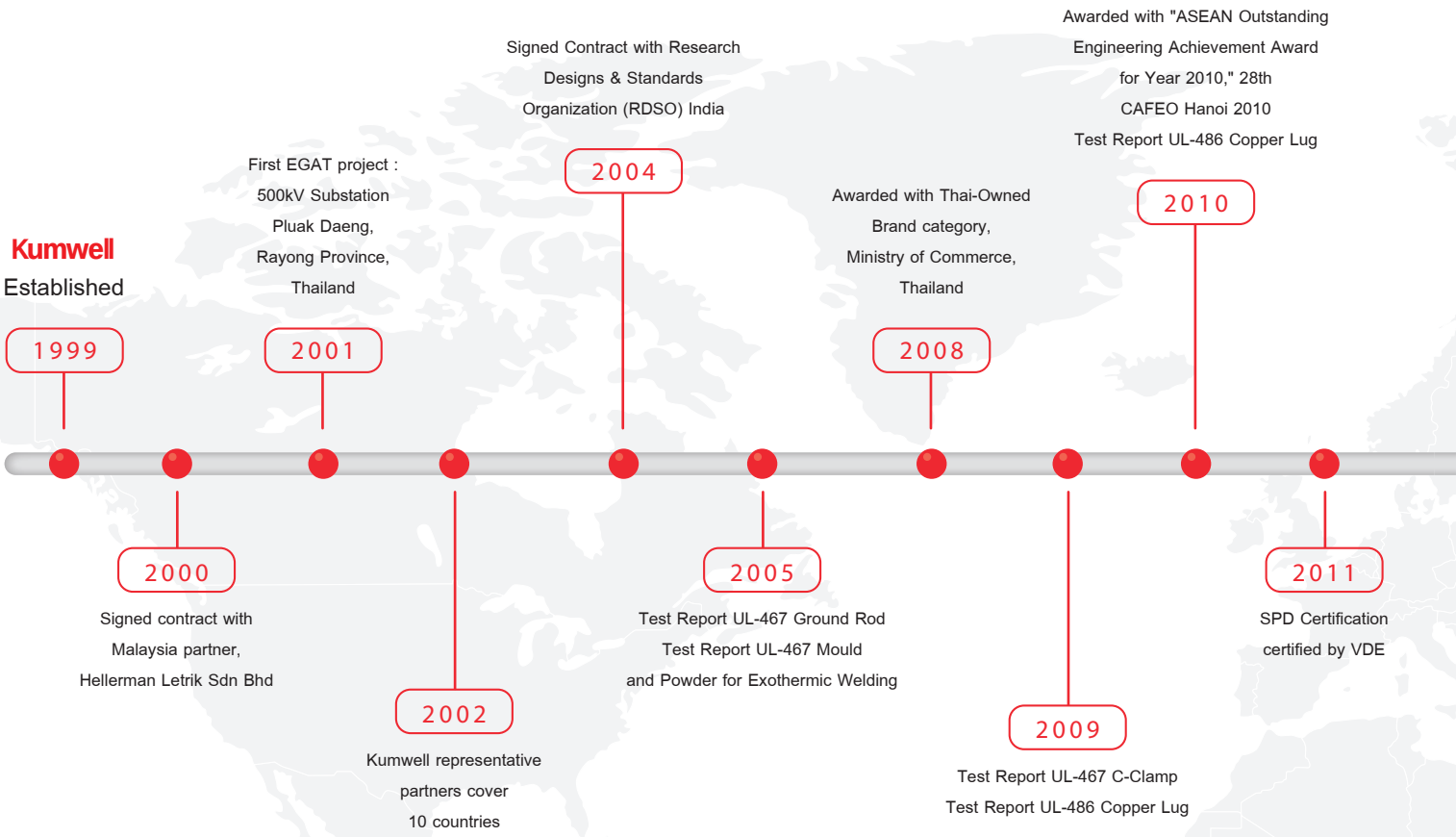
Building (Tower, Complex Building, Stadium, Hospital, School, Home, Castle or Temple)

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 c
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"

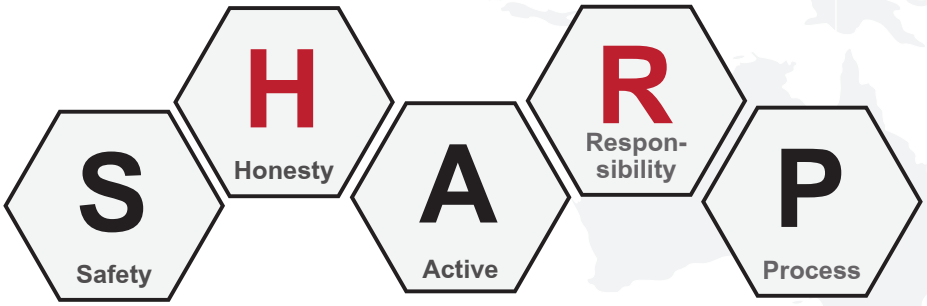
2016
Established Kumwell Learning Center to educate people with grounding and lightning protection knowledge.

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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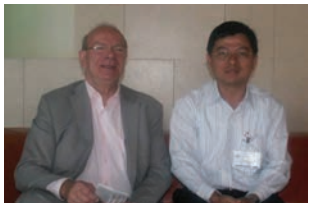

Research & Development

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

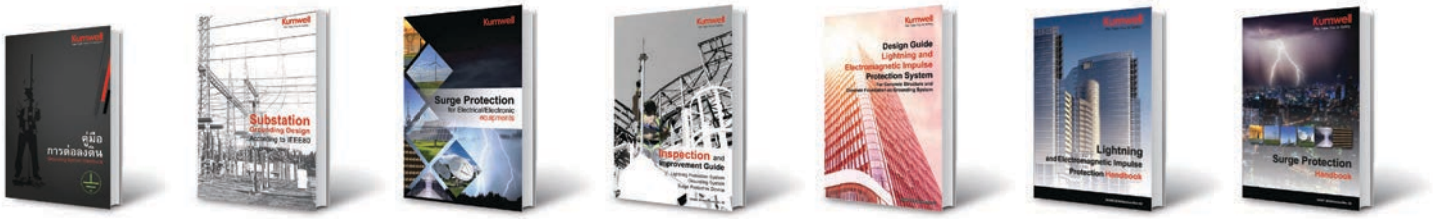
- Is a place to learning about safety standard from lightning strike and proper grouding.
- Is a standard seminar certified from council of engineers.
- Is a place for develop the curriculum to suit the profession.
- Is a place for research and develop product include design innovation for lightning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

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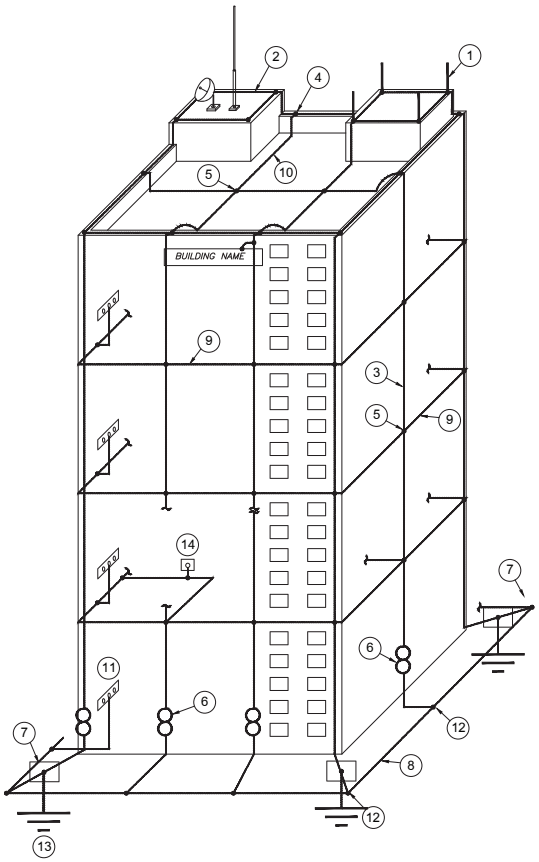
Protection Against Lightning

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 62561 Series** — Requirements for Lightning Protection System Components (LPSC)
  - **IEC 62305-4** — Electrical and Electronic Systems within Structure
    - Magnetic Sheilding
    - SPD
    - Isolating Interface
    - **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

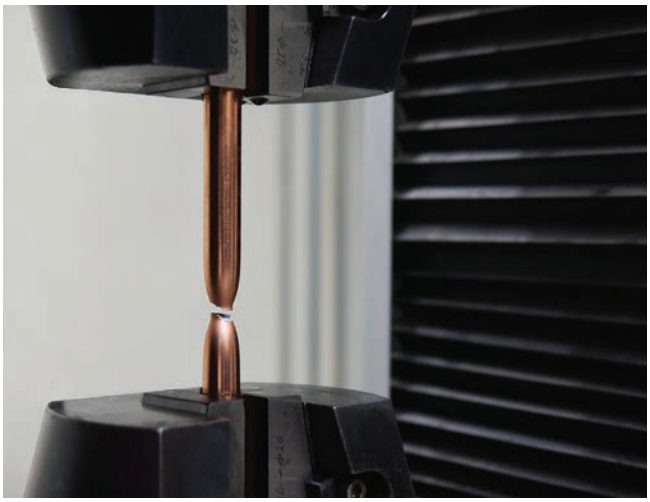
IEC62561-5: Earth Electrode Inspection Housings and Electrode Seals

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".

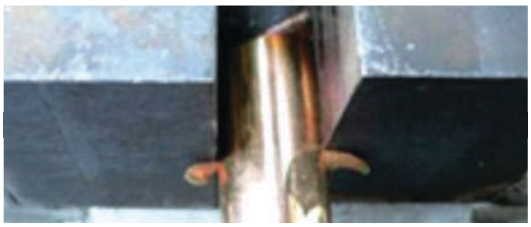
Standard lengths being common used are 4' to 10'.

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.

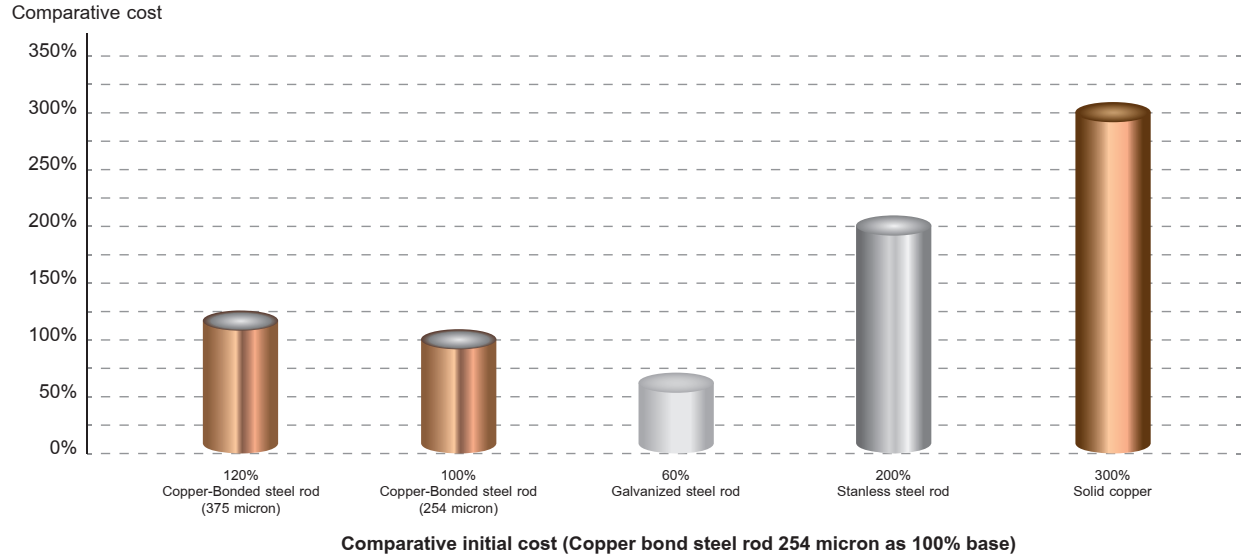
Solid Copper

- 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).

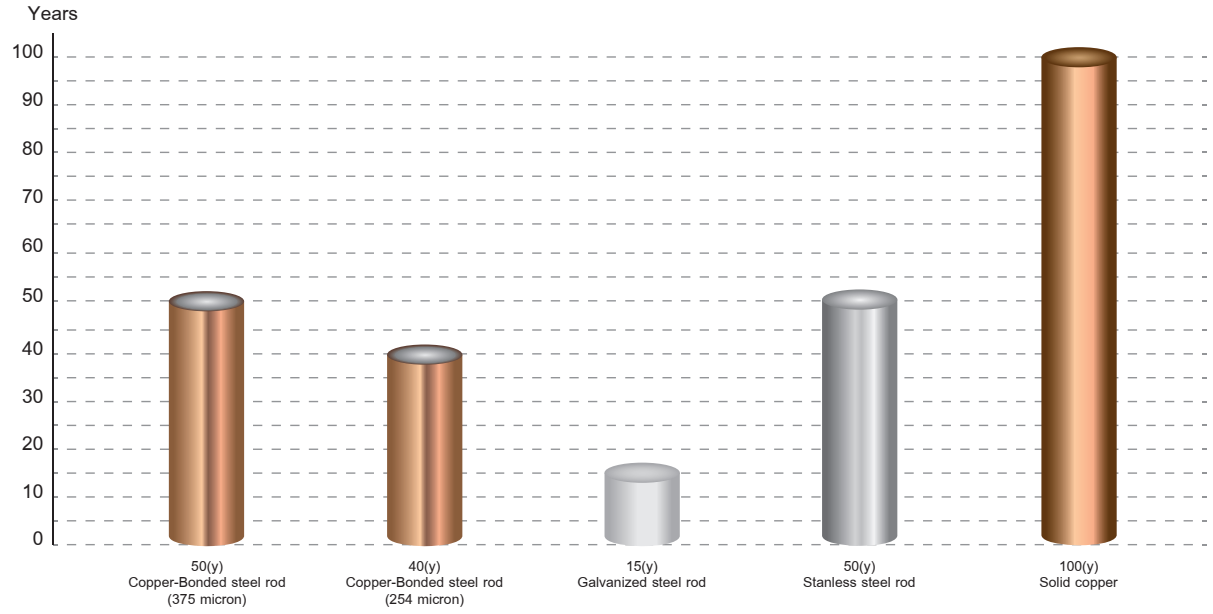
Stainless steel (316L)

- High investment and high resistance to corrosion
- High Strength

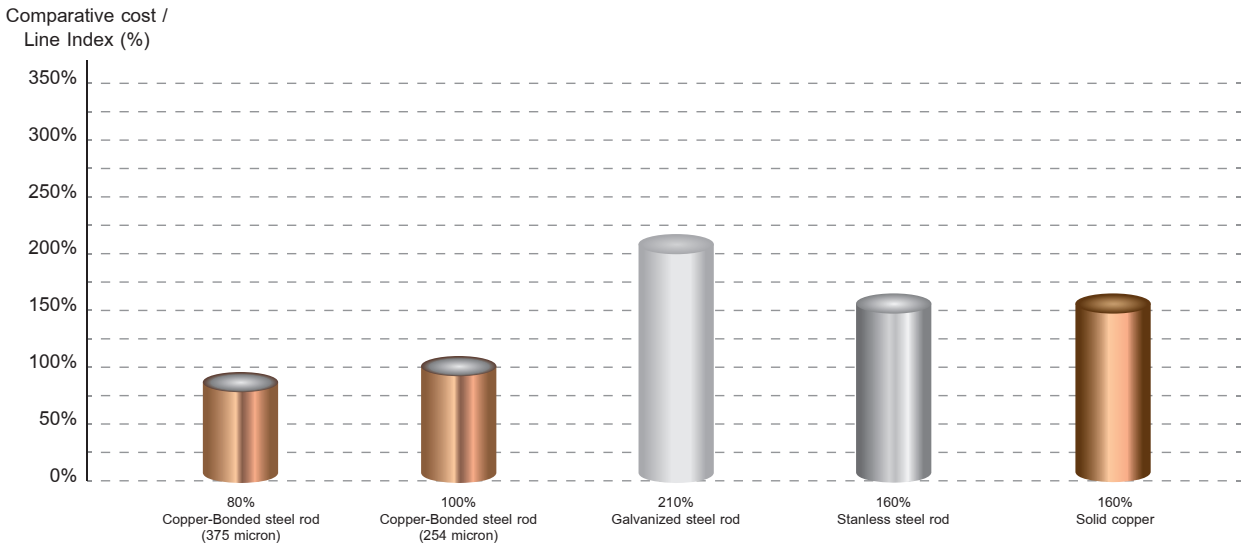
Ground Rod



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%.

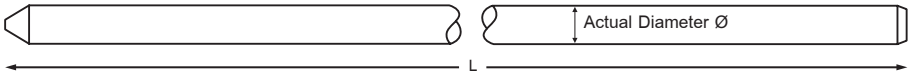
k Shall be embedded in concrete for a minimum depth of 50 mm.

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

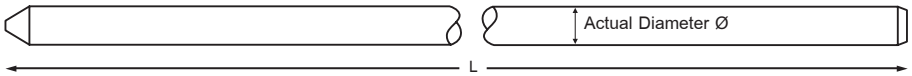
Material
High tensile strength steel
Copper purity > 99.9%

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

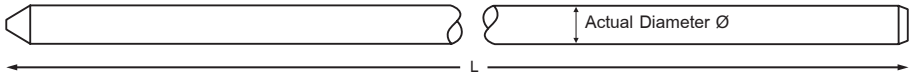
Material
High tensile strength steel
Copper purity > 99.9%

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%

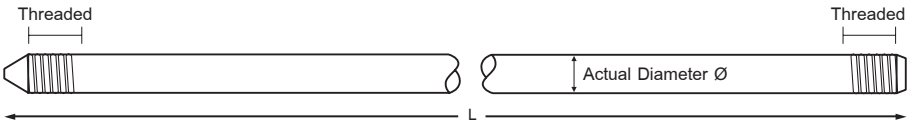
Application
Suitable for disperse current into the earth.

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

Copper-Bonded Ground Rod (254 micron)

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.



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

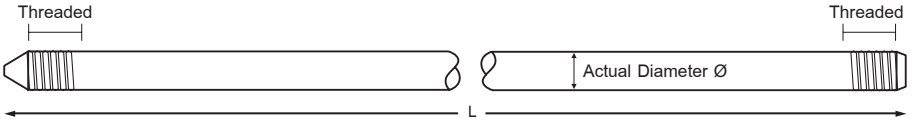
Test Certificate
IEC 62561 Part 2
UL 467

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

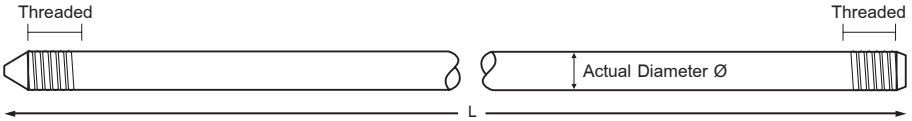
Material
High tensile strength steel
Copper purity > 99.9%

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

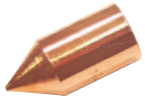
Code No.	Rod (Ø) (in)	Weight (kg)
GRDSR 12	1/2	0.13
GRDSR 58	5/8	0.16
GRDSR 34	3/4	0.19
GRDSR 1	1	0.30

Test Certificate
IEC 62561 Part 2

Material
High tensile strength steel

Application
Protect the top of ground rod while driving.

Tip



For Threaded Type

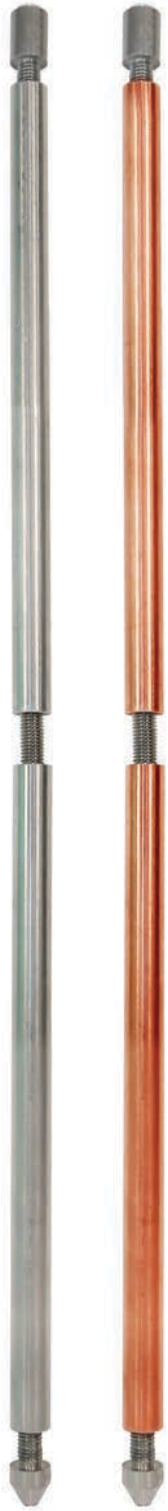
Code No.	Rod (Ø) (in)	Weight (kg)
GRTTR 12	1/2	0.025
GRTTR 58	5/8	0.030
GRTTR 34	3/4	0.070
GRTTR 1	1	0.10

Test Certificate
IEC 62561 Part 2

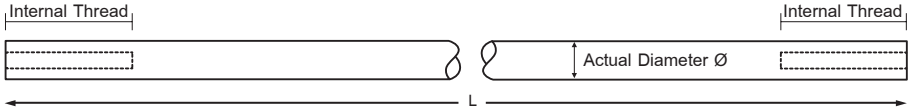
Material
High tensile strength steel

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.

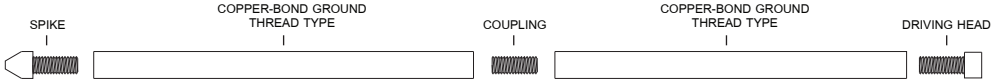
Spike

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)

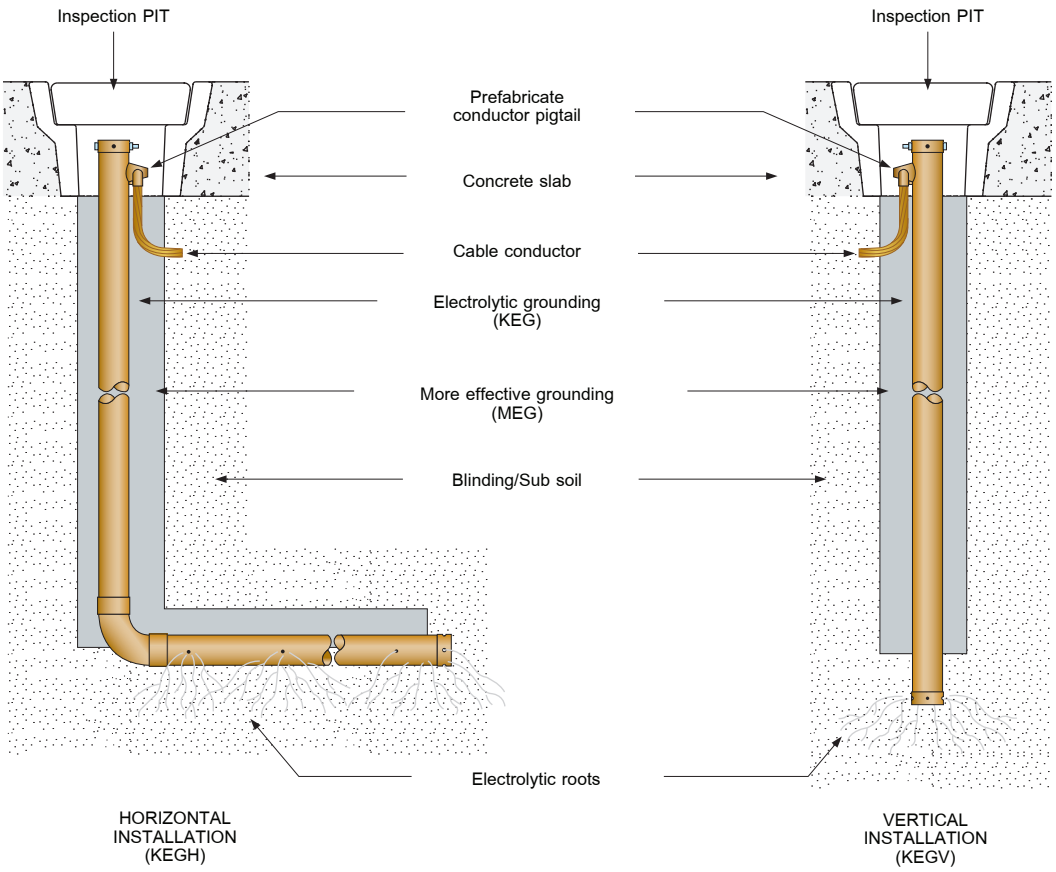
Electrolytic Grounding is made of type K copper pipe with 54 mm (2-1/8") OD diameter which natural chemical electrolytic salt can be refilled inside.

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

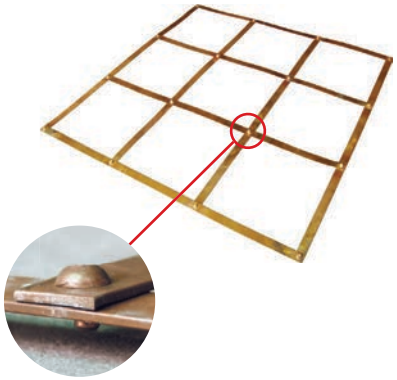
Code No.	Rod Length (L) (ft)	Conductor Size (mm^2)	Conductor Length (mm)	Rod Type
KEGV-8	8	95	500	Vertical
KEGV-10	10	95	500	Vertical
KEGV-12	12	95	500	Vertical
KEGV-15	15	95	500	Vertical
KEGH-8	8	95	500	Horizontal
KEGH-10	10	95	500	Horizontal
KEGH-12	12	95	500	Horizontal
KEGH-15	15	95	500	Horizontal

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

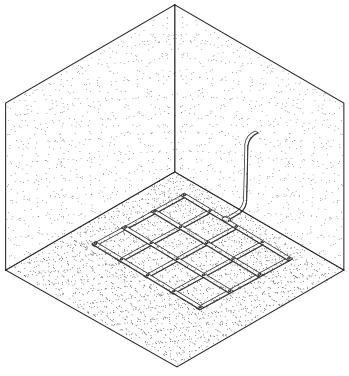
Application
Suitable for an area where unable to drive ground rod.

Copper-Bonded Steel

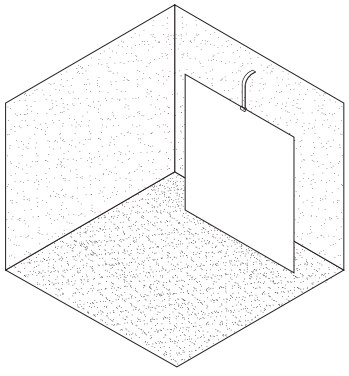
Code No.	Dimensions (mm)	Weight (kg)
GRPC 6615	600x600x1.5	4.25
GRPC 6630	600x600x3	8.50

Material
Copper-Bonded steel 254 micron Copper thickness

Application
Suitable for an area where unable to drive ground rod

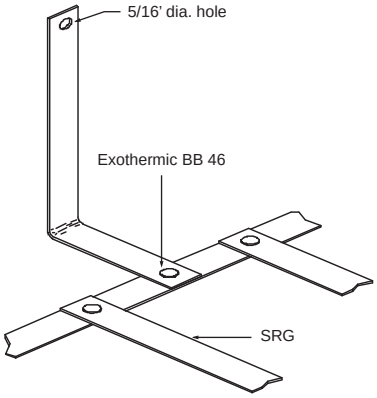


For Lattice Copper



For Copper Plate

Signal Reference Ground Grid



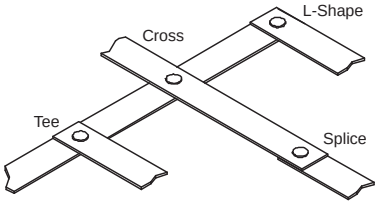
Signal Reference Ground Grid (SRG) manufactures from 50 mm by 0.5 mm copper strip with 600 mm spacing.

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

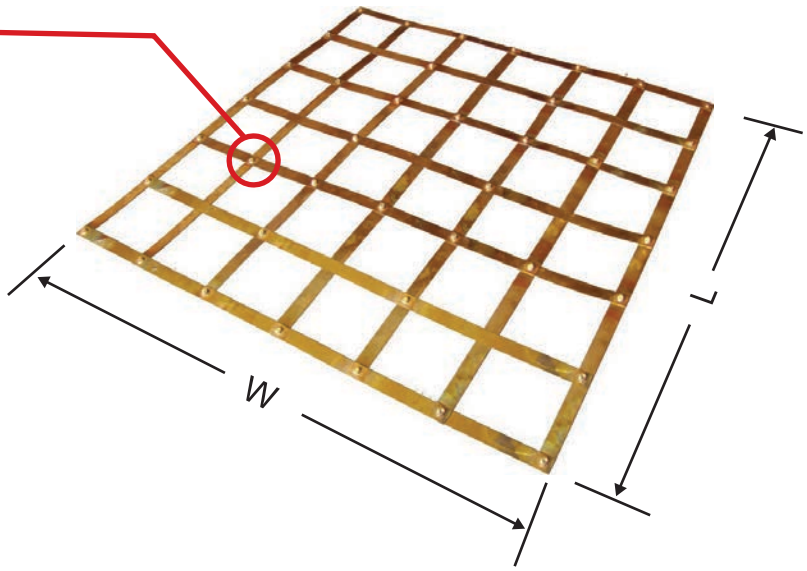
Test Certificate
IEC 62561 Part 1
(For Connection Joint)

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

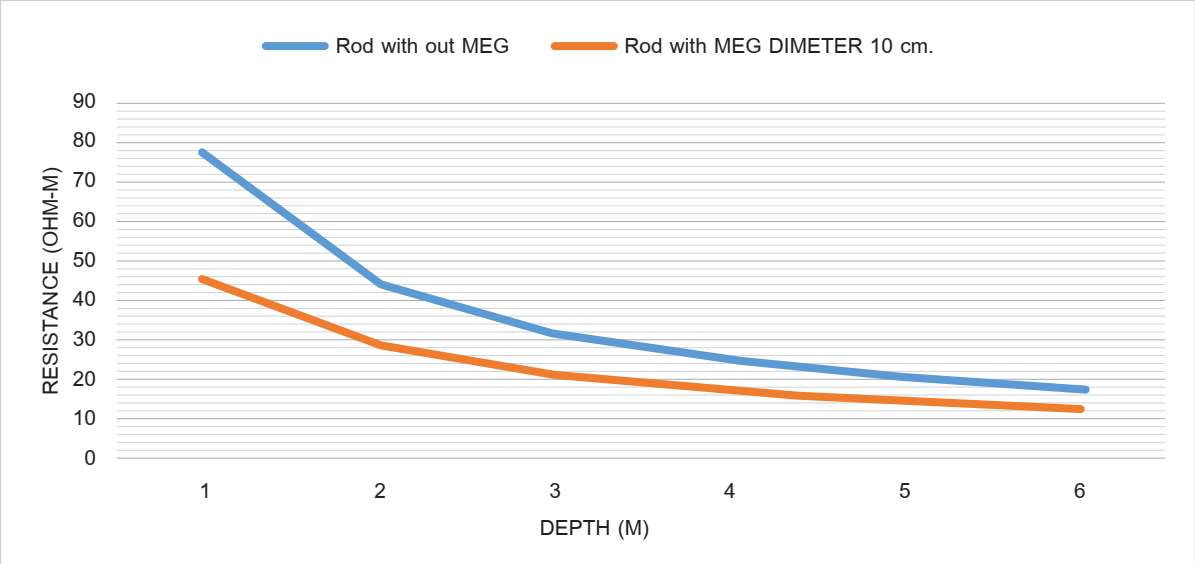
- Meet IEC 62561-7 which does not leaching any toxic, sulfur and other environmental regulation substance
- Neutral and inert with encased electrodes

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.

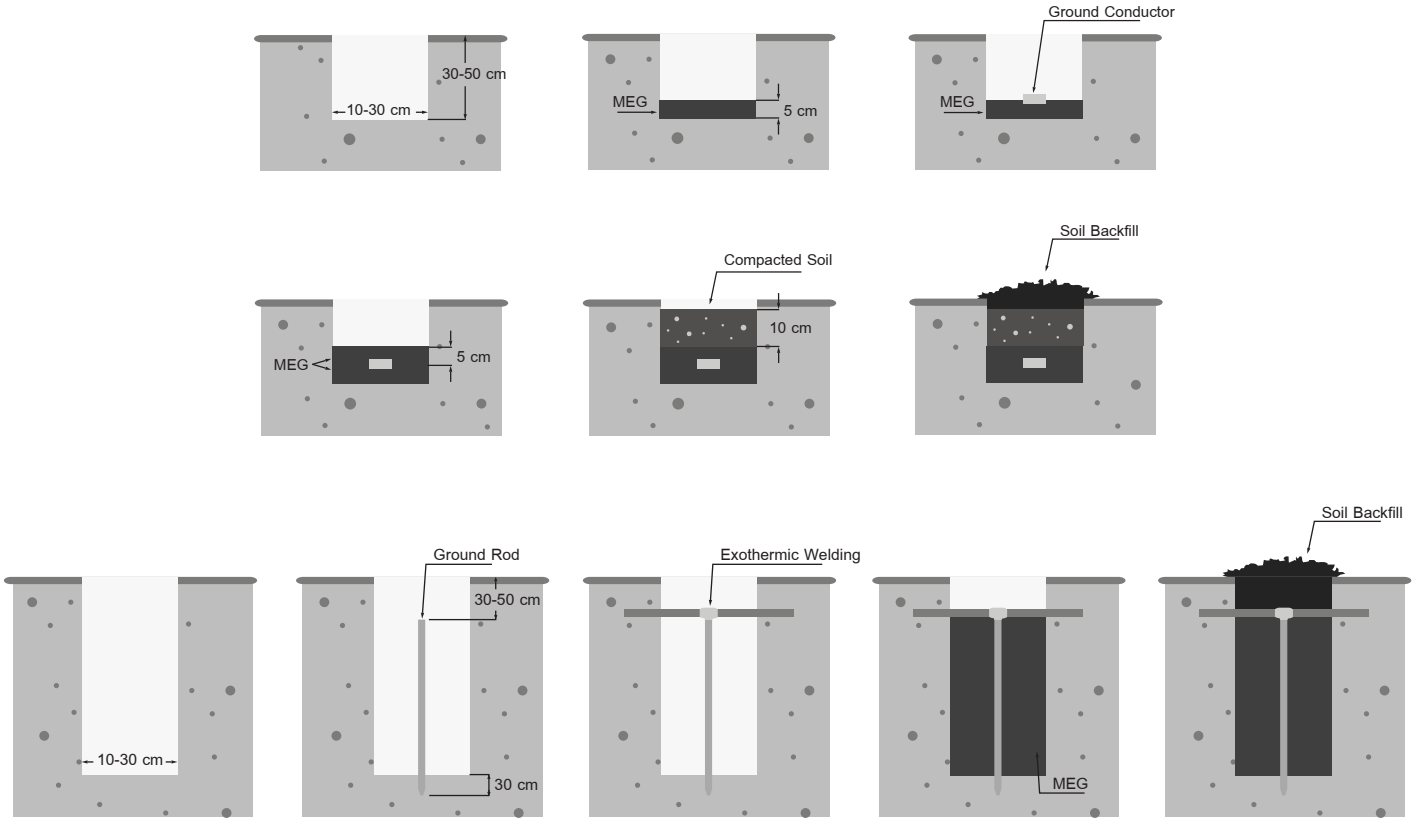
Kumwell MEG is an alternate solution for effectively reducing ground resistance of the soil surrounding the electrode instead of adding more grid conductors or more ground rods. Soil Treatment is an effective solution to decrease ground resistance which is utilized to an advantage in poor conductivearea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

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

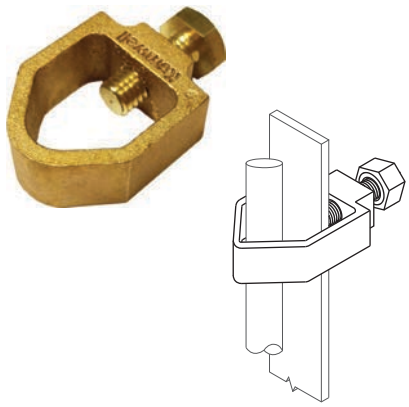
Test Certificate
IEC 62561 Part 7

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



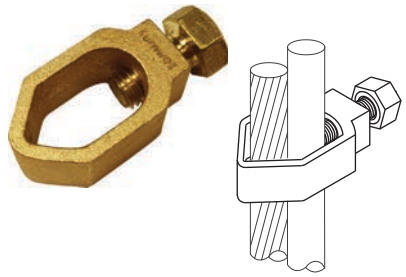
Code No.	Rod Diameter (Ø) (in)	(mm)	Max. Tape Size (mm)	Weight (kg)
GXCT 127-2512	1/2	12.7	25x12	0.12
GXCT 127-2620	1/2	12.7	26x20	0.13
GXCT 142-2512	5/8	14.2	25x12	0.12
GXCT 142-2618	5/8	14.2	26x18	0.13
GXCT 142-302	5/8	14.2	30x2	0.13
GXCT 142-4012	5/8	14.2	40x12	0.14
GXCT 142-518	5/8	14.2	51x8	0.17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



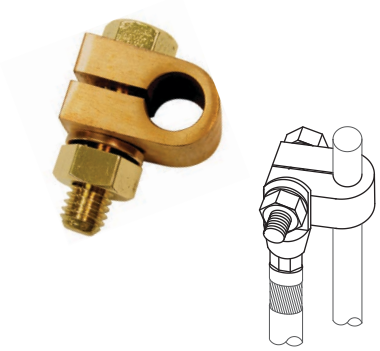
Code No.	Rod Diameter (Ø) (in)	(mm)	Cable Size (mm^2)	Weight (kg)
GXC 95-35	3/8	9.5	6-35	0.05
GXC 127-50	1/2	12.7	16-50	0.08
GXC 142-70	5/8	14.2	16-70	0.09
GXC 172-95	3/4	17.2	35-95	0.12
GXC 231-120	1	23.1	70-120	0.14

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



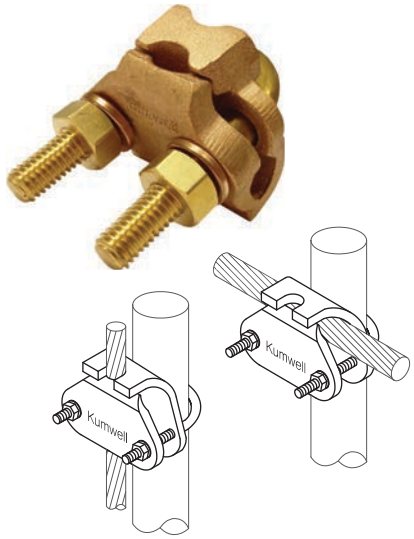
Code No.	Rod Diameter (Ø) (in)	(mm)	Weight (kg)
GXCL 127	1/2	12.7	0.25
GXCL 142	5/8	14.2	0.27
GXCL 172	3/4	17.2	0.32
GXCL 231	1	23.1	0.41

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



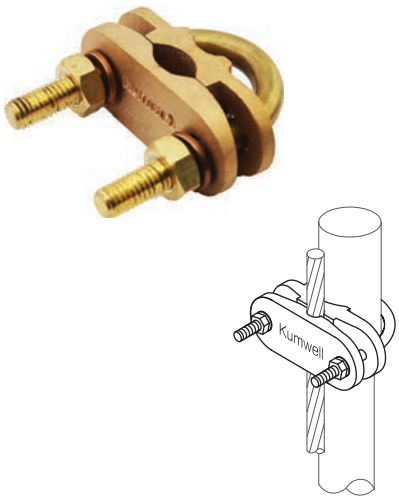
Code No.	Rod Diameter (Ø) (in)	(mm)	Cable Size (mm^2)	Weight (kg)
GXCCC 142-95	5/8	14.2	16-95	0.32
GXCCC 142-185	5/8	14.2	70-185	0.37
GXCCC 142-300	5/8	14.2	150-300	0.53
GXCCC 172-70	3/4	17.2	16-70	0.32
GXCCC 172-150	3/4	17.2	70-150	0.37
GXCCC 172-300	3/4	17.2	150-300	0.53
GXCCC 231-70	1	23.1	16-70	0.37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

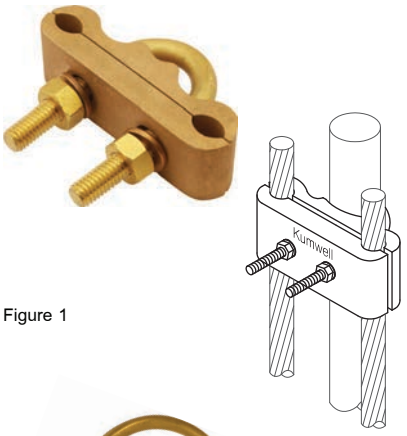


Figure 1

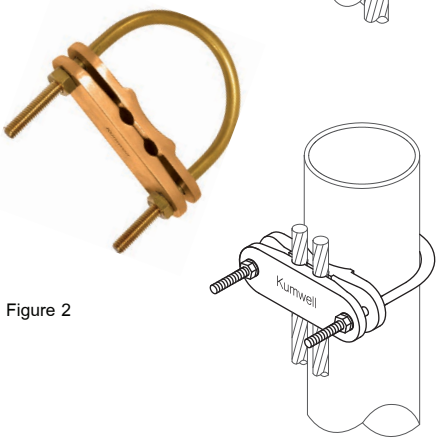


Figure 2

Code No.	Conductor			Cable Size	Weight	Figure
	Pipe (in)	Rod (in)	Rod (mm)	(Sq-mm)	(kg)	
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

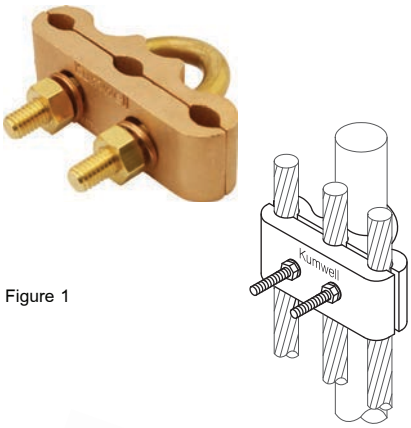


Figure 1

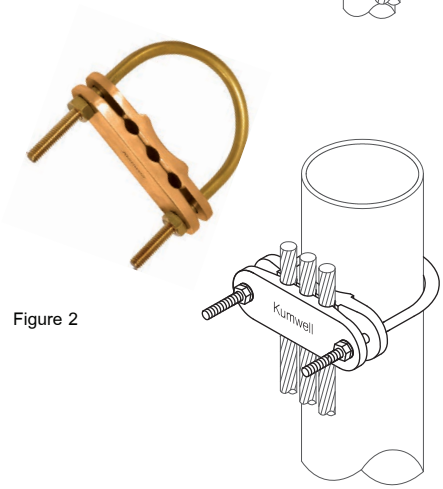


Figure 2

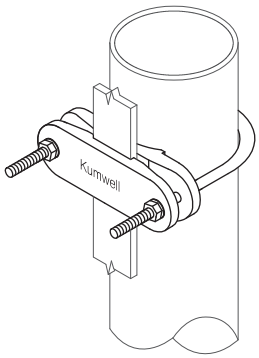
Code No.	Conductor			Cable Size	Weight	Figure
	Pipe (in)	Rod (in)	Rod (mm)	(Sq-mm)	(kg)	
GXCTH 127-70	-	1/2	12.7	25-70	0.37	1
GXCTH 127-120	-	1/2	12.7	95-120	0.37	1
GXCTH 172-70	-	5/8-3/4	15.9-19.1	25-70	0.42	1
GXCTH 172-120	-	5/8-3/4	15.9-19.1	95-120	0.42	1
GXCTH 172-240	-	5/8-3/4	15.9-19.1	150-240	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



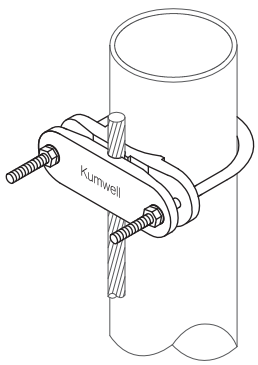
Code No.	Rod Diameter (Ø) (mm)	Tape Size (mm)	Weight (kg)
GXCTC 16-253	16	25x3	0.28
GXCTC 16-254	16	25x4	0.28
GXCTC 16-256	16	25x6	0.28
GXCTC 20-253	20	25x3	0.30
GXCTC 20-254	20	25x4	0.30
GXCTC 20-256	20	25x6	0.30
GXCTC 25-253	25	25x3	0.33
GXCTC 25-254	25	25x4	0.33
GXCTC 25-256	25	25x6	0.33
GXCTC 31-253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



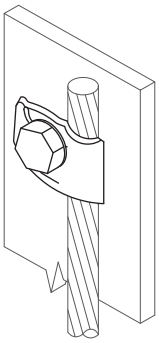
Code No.	Pipe Diameter (Ø) (in)	Cable Size (Sq-mm)	Weight (kg)
GXCPC 10-70	3/8	16-70	0.26
GXCPC 10-120	3/8	70-120	0.26
GXCPC 20-70	3/4	16-70	0.29
GXCPC 20-120	3/4	70-120	0.29
GXCPC 25-70	1	16-70	0.32
GXCPC 25-120	1	70-120	0.32
GXCPC 40-70	1¼-1½	16-70	0.54
GXCPC 40-120	1¼-1½	70-120	0.54
GXCPC 50-70	2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



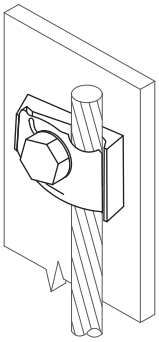
Flat Bar

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

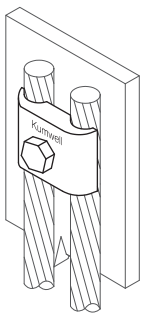
Code No.	Cable Size (mm^2)	Bolt Size (in)	Weight (kg)
GXCCF-G1P	25-50	3/8x1½	0.124
GXCCF-G2P	70-120	1/2x2	0.194
GXCCF-G3P	150-240	1/2x2	0.228

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



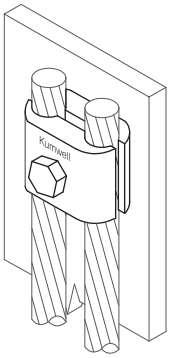
Flat Bar

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

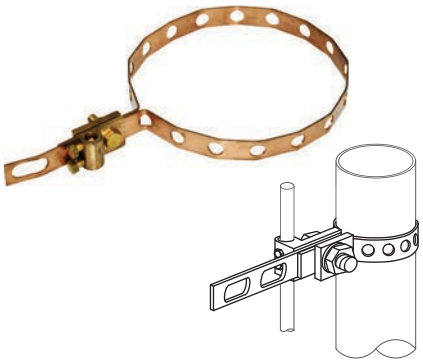
Code No.	Pipe Diameter (Ø) (in)	Cable Size (mm^2)	Weight (kg)
GXPCP1-50-95	1¼-2	25-95	0.40
GXPCP1-75-95	2½-3	25-95	0.52
GXPCP1-100-95	3½-4	25-95	0.70

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



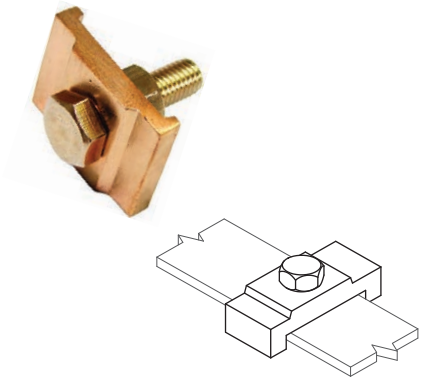
Code No.	Pipe Diameter (mm)	Conductor Type	Conductor Size (mm)	Weight (kg)
GBP 8	50-200	Solid	8	0.59

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



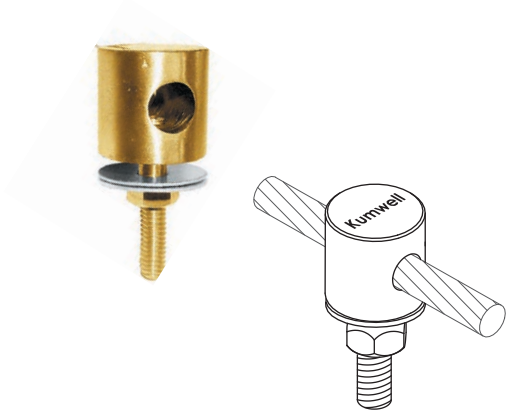
Code No.	Tape Size (mm)	Bolt Size (in)	Weight (kg)
LPTBC	25x3	3/8	0.13
LPTBC-A	25x3	3/8	0.039

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



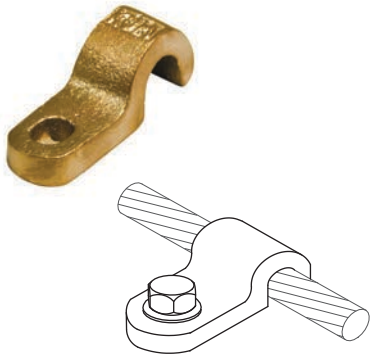
Code No.	Cable Size (mm^2)	Stud Size (in)	Weight (kg)
GXCG 95	95	5/16	0.16
GXCG 120	120	5/16	0.18
GXCG 185	185	3/8	0.25

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



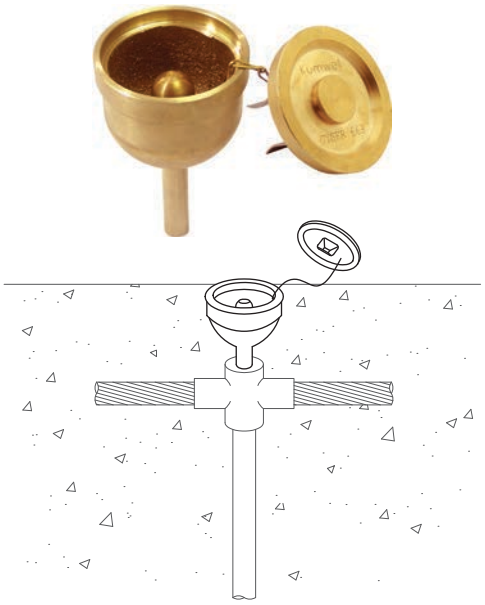
Code No.	Cable Size (mm^2)	Weight (kg)
LGRC-A70	50-70	0.045
LGRC-A	95-120	0.050
LGRC-B	150-185	0.100
LGRC-C	240-300	0.120
LGRC-AA	95-120	0.015
LGRC-BA	150-185	0.031
LGRC-CA	240-300	0.036

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



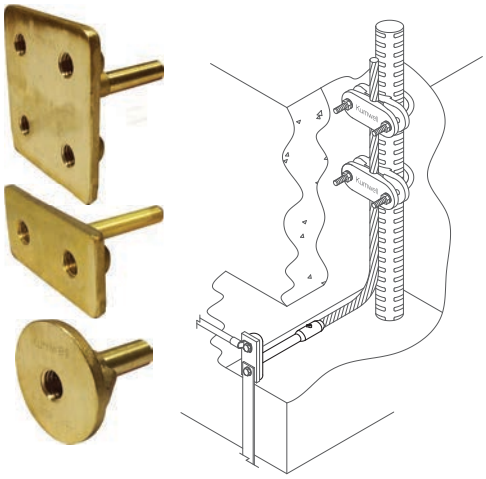
Code No.	Dimensions (mm) W	L	Ø	Weight (kg)
GYSER 663	69	114	12.7	0.65
GYSER 993	120.6	158.8	12.7	1.88

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



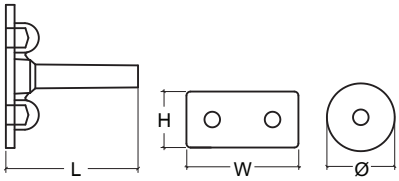
Earth Point

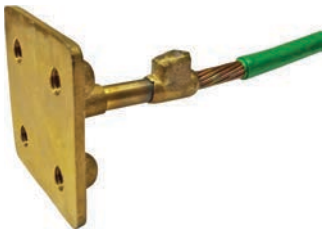
Code No.	No. of Hole	Stud LxWxH (in)	Weight (kg)
GXEP 120(1)	1	55xØ50	0.30
GXEP 120(2)	2	76x82.5x41	0.30
GXEP 120(4)	4	76x82.5x82.5	0.60

Test Certificate
IEC 62561 Part 1

Material
Copper Alloy - BS EN 1982

Application
Connect rebar to earth point





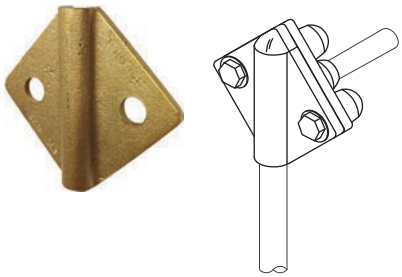
Earth Point with Prewelding

Code No.	No. of Hole	Cable with PVC Cable Size (mm^2)	Length (mm)	Weight (kg)
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.

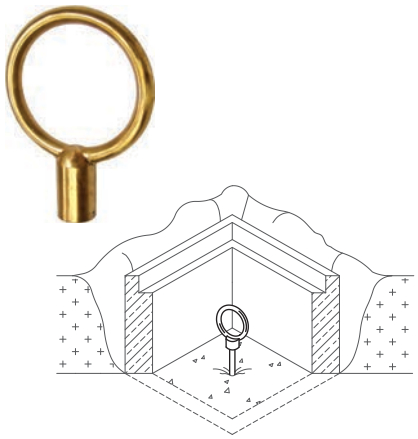
Stainless Steel Earth Point

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



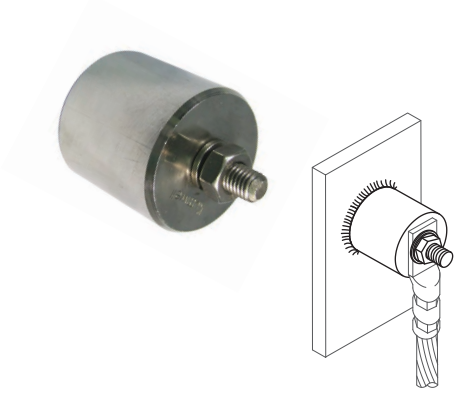
Code No.	Thread (in)	Weight (kg)
GXEYB 58	5/8	0.41
GXEYB 34	3/4	0.52

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

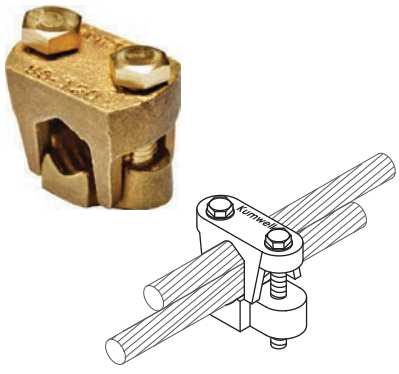


Code No.	Diameter (Ø) (mm)	L (mm)	Stud Size	Weight (kg)
GXEAB	50	45	M10	0.73
GXEAB-MS	50.8	45	M10	0.75

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



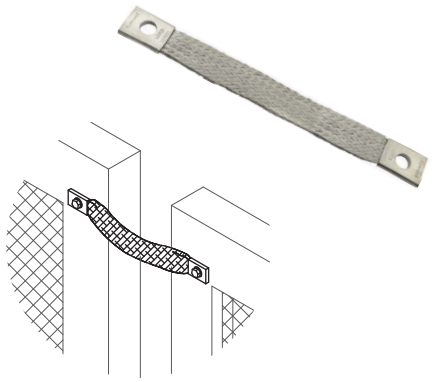
Code No.	Cable Size (mm^2) Run	Tap	Bolt Size (in)	Weight (kg)
LXCNS 16-35	16-35	4-35	1/4x1	0.08
LXCNS 50-70	50-70	4-70	1/4x1½	0.10
LXCNS 95-120	95-120	4-120	5/16x1½	0.16
LXCNS 150-185	150-185	4-185	3/2x2	0.39

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

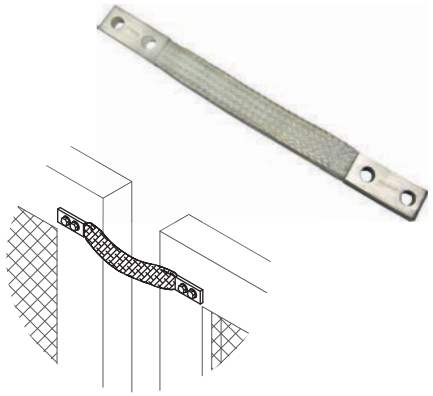


Copper Braid with Tinned (1 Hole)

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.

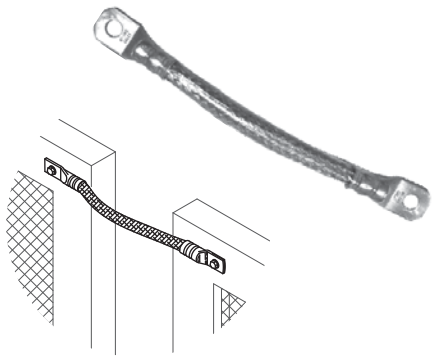


Copper Braid with Tinned (2 Hole)

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.

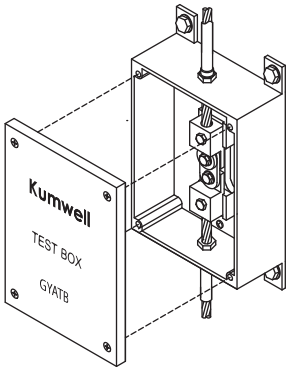
Expansion Braid Bond

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



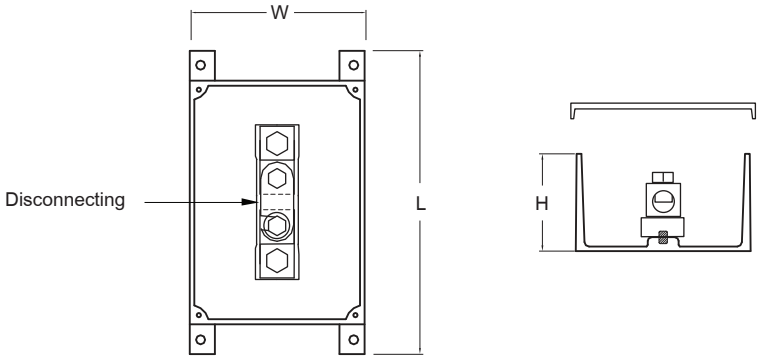
Aluminium enclosure

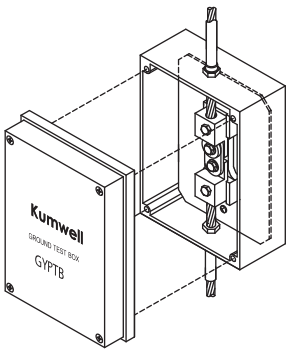
Code No.	Connection	Lug Size (mm^2)	Dimensions (mm) L	W	H	Weight (kg)
GYATB	Copper-Copper	50-120	265	153	70	2.40
GYATB-AC	Aluminium-Copper	50-120	265	153	70	2.40

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)





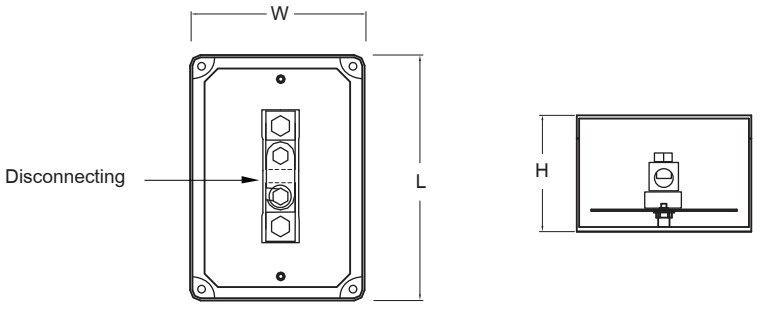
ABS enclosure

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

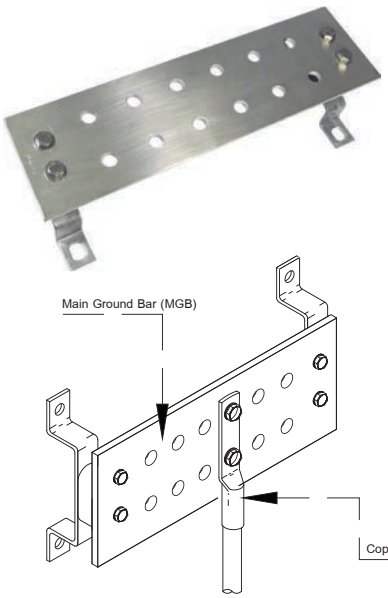
Application
Suitable for inspection and testing point in grounding system

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

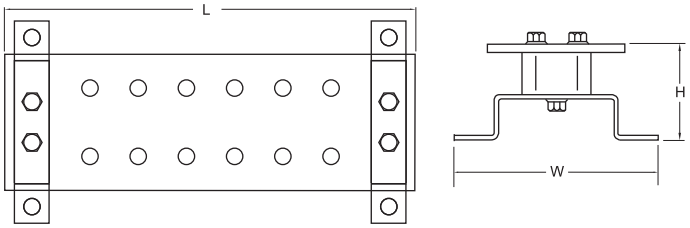


Code No.	No. of Hole	Ø Hole (mm)	Busbar (mm)	Dimensions (mm) L	W	H	Weight (kg)
GBPGSS-6D	12	14.3	100x350x6	148	350	75	1.80
GBPGSS-8D	16	14.3	100x440x6	148	440	75	2.50
GBPGSS-12D	24	14.3	100x610x6	148	610	75	3.60

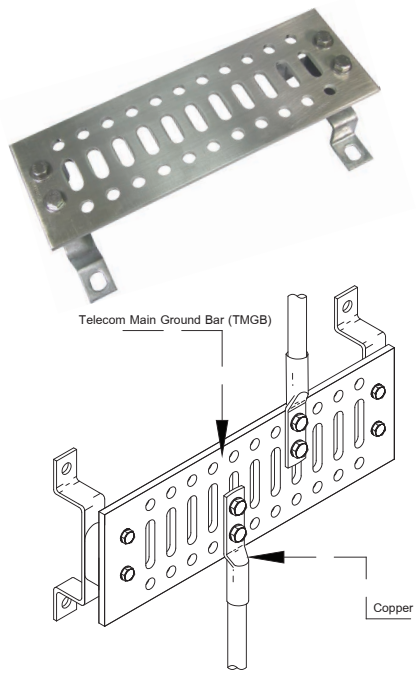
Test Certificate
IEC 62561 Part 1

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

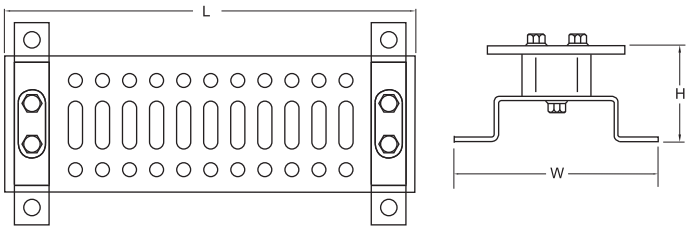


Code No.	No. of Hole	Ø Hole (mm)	Busbar (mm)	Dimensions (mm) L	W	H	Weight (kg)
GBCGSS-200	6	10	100x200x6	148	200	83	0.86
GBCGSS-300	11	10	100x300x6	148	300	83	1.60
GBCGSS-400	15	10	100x400x6	148	400	83	1.80
GBCGSS-450	18	10	100x450x6	148	450	83	2.40
GBCGSS-600	24	10	100x600x6	148	600	83	3.20

Test Certificate
IEC 62561 Part 1

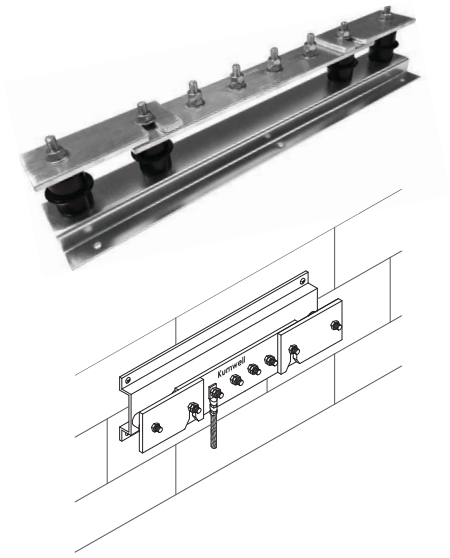
Material
Copper - 99.9%
Tin Plated Copper - BS EN 13601
Support - Hot Dip Galvanized with Insulator
Bolt - Stainless Steel

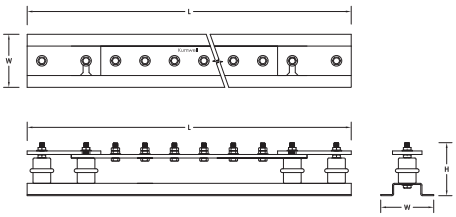
Application
Connect ground conductor wires to earth electrode



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

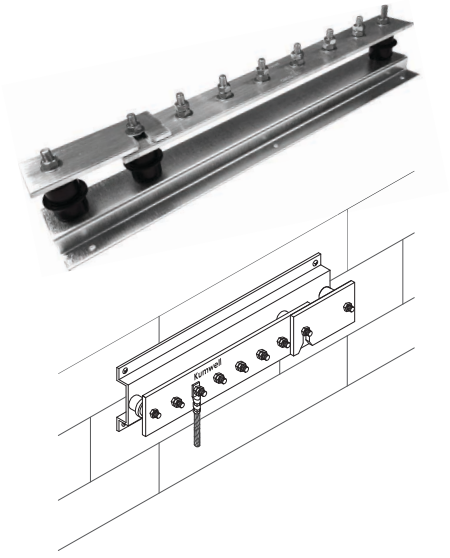
Test Certificate
IEC 62561 Part 1

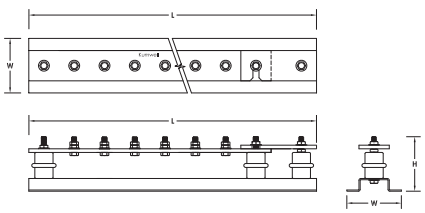
Application
Suitable for bonding and testing point in grounding system.

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

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

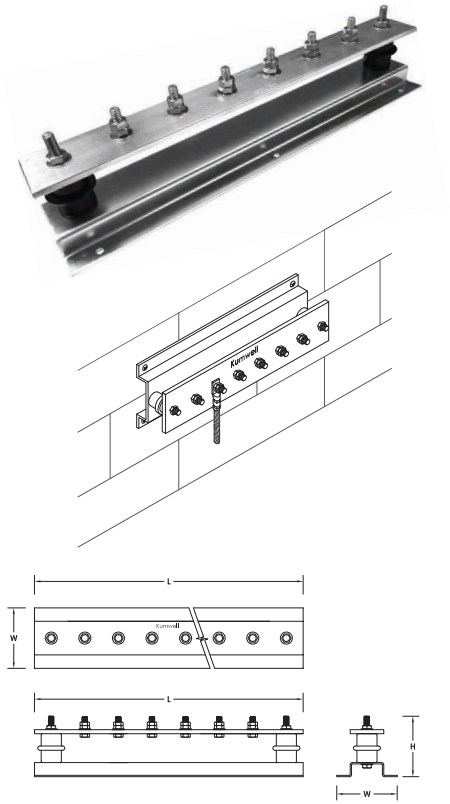
Test Certificate
IEC 62561 Part 1

Application
Suitable for bonding and testing point in grounding system.

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

Note : Special Size Length can be requested.

Ground Bar



Without Disconnecting Link

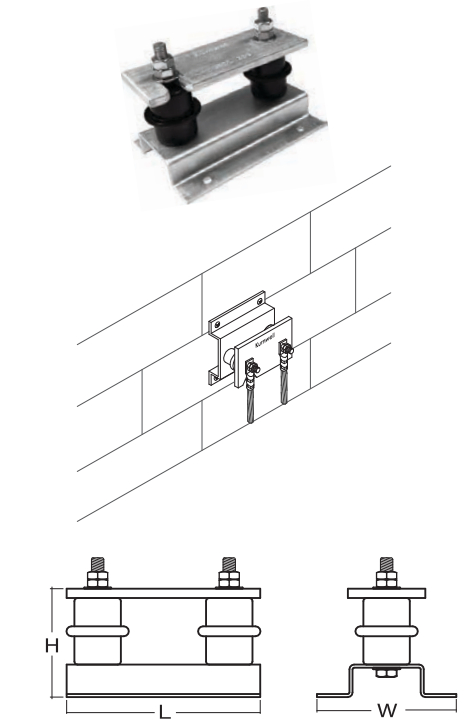
Code No.	No. of Terminal	Dimensions (mm) L	W	H	Weight (kg)
GBDL 40	4	300	90	90	1.50
GBDL 60	6	400	90	90	1.80
GBDL 80	8	500	90	90	2.20
GBDL 100	10	650	90	90	2.80
GBDL 120	12	750	90	90	3.20
GBDL 140	14	850	90	90	3.60
GBDL 160	16	950	90	90	4.00
GBDL 180	18	1050	90	90	4.40
GBDL 200	20	1200	90	90	5.00
GBDL 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

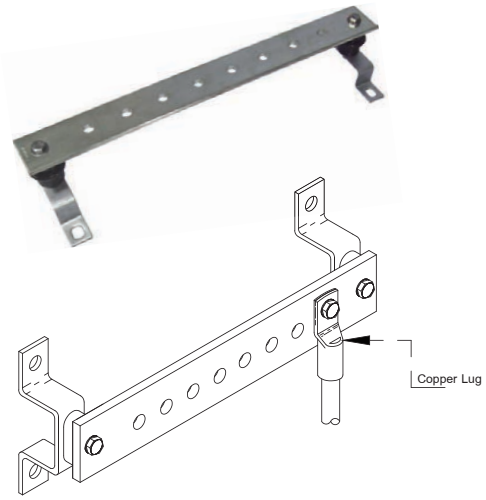
Code No.	Dimensions (mm) L	W	H	Weight (kg)
GBDL 253	125	90	90	0.74

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



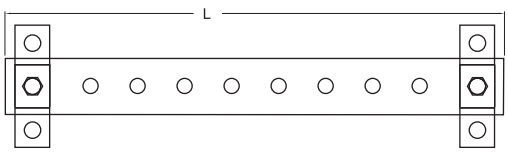
For Bonding and Equipotential

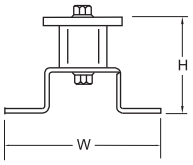
Code No.	No. of Hole	Ø Hole (mm)	Busbar (mm)	Dimensions (mm) L	W	H	Weight (kg)
GBPGSS-6	6	14.3	50x350x6	350	148	75	1.28
GBPGSS-8	8	14.3	50x440x6	440	148	75	1.50
GBPGSS-12	12	14.3	50x610x6	610	148	75	1.80

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

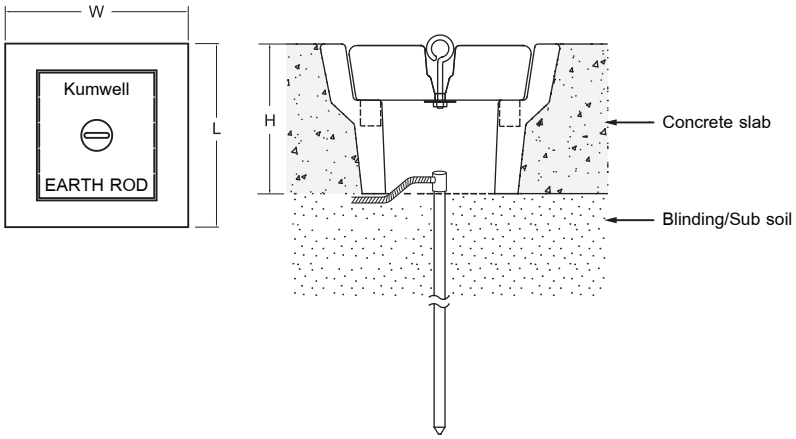
GXCIP

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

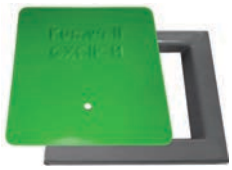
Code No.	Dimensions (mm) L	W	H	Weight (kg)
GXCIP-H	310	310	192	25.5

Test Certificate
IEC 62561 Part 5 - Heavy Duty Type

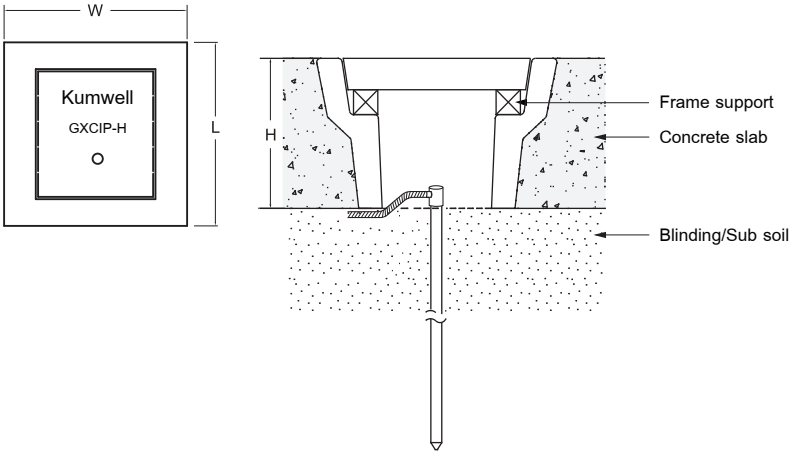
Material
Body - Concrete
Cover - Cast iron steel with epoxy gray color
Frame - Mild Steel

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

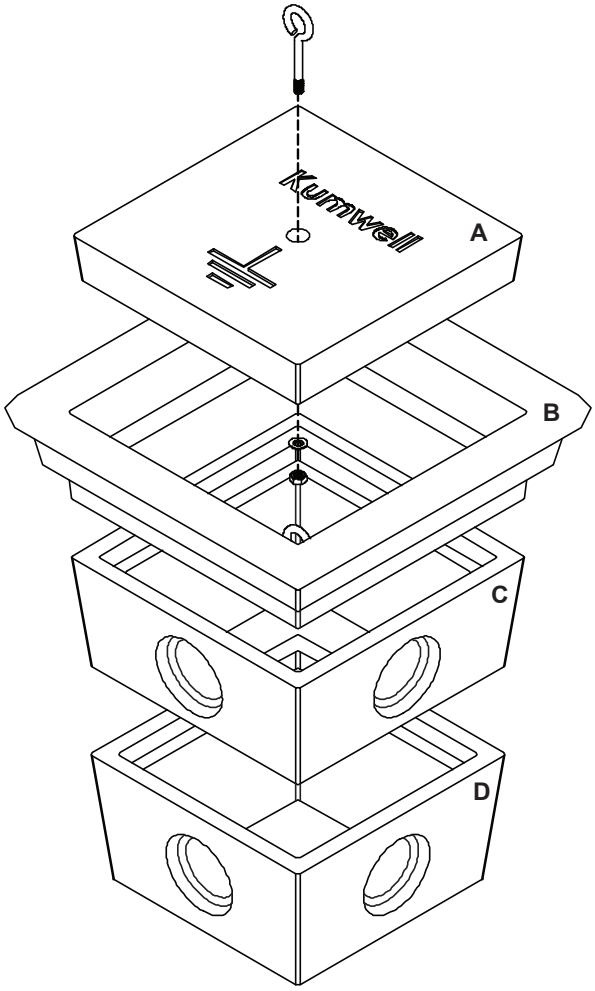
Concrete Inspection Pit

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.

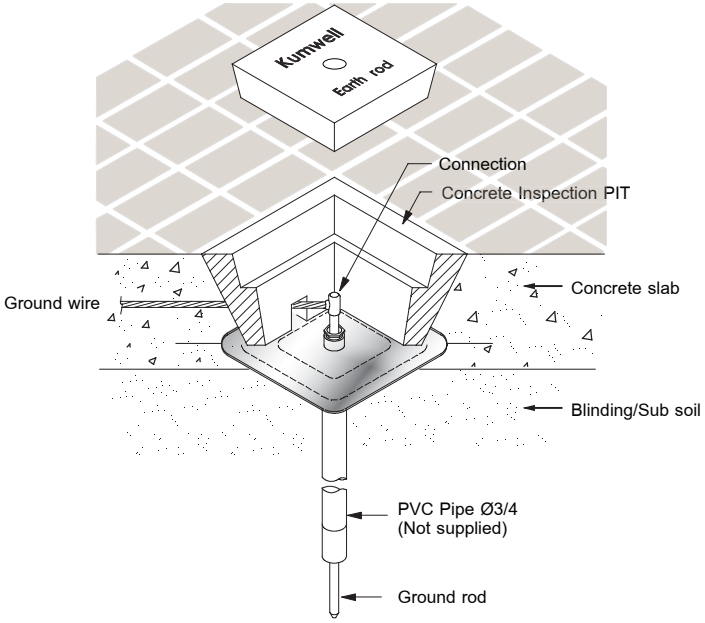
Copper Earthing Electrode Water Sealing Glands

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

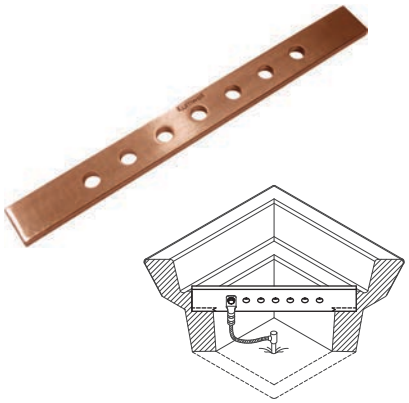
Test Certificate
IEC 62561 Part 5

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.

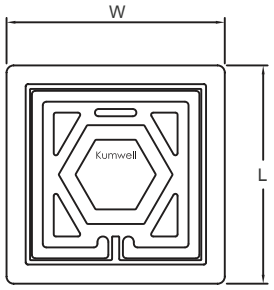
FRP Inspection Pit

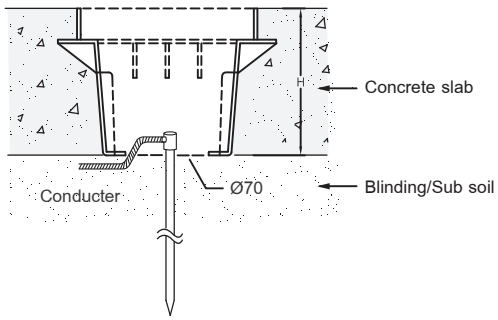
Code No.	Dimensions (mm) L	W	H	Weight (kg)
GXFIP	306	306	215	2.40

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

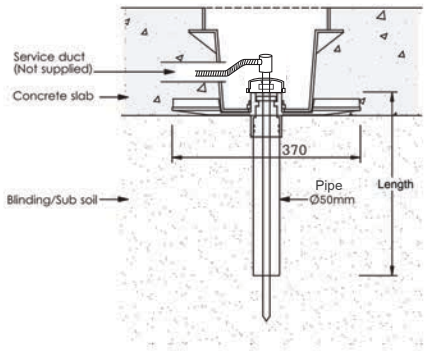
Code No.	Ø Size (mm)	Ø Rod (in)	Length (mm)	Weight (kg)
GXCIP-WP-12.7	366	1/2	385	2.0
GXCIP-WP-14.2	366	5/8	385	2.0
GXCIP-WP-17.2	366	3/4	385	2.0
GXCIP-WPD-12.7	366	1/2	1,060	3.0
GXCIP-WPD-14.2	366	5/8	1,060	3.0
GXCIP-WPD-17.2	366	3/4	1,060	3.0

Test Certificate
IEC 62561 Part 5

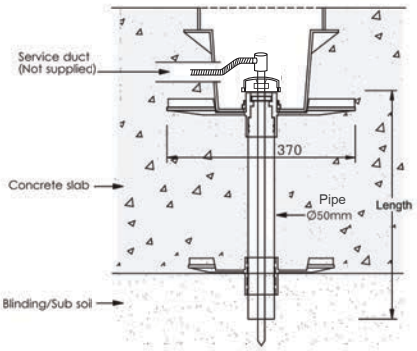
Material
Plastic (Body)
Stainless Steel (Pipe)

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

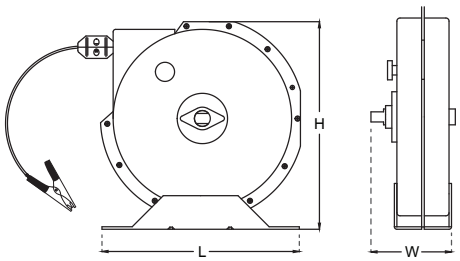
Static Earth Reels

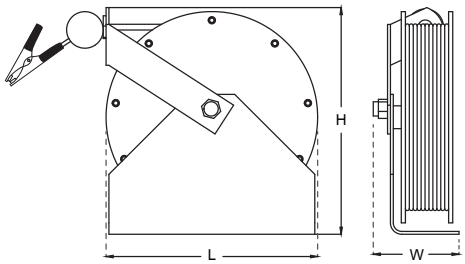
Kumwell Static earth reels are used to ground equipment operating in hazardous area. When properly clamped to ground, the static earth reel dissipates static electrical buildup, reducting the chances of sparking and the potential for explosion.

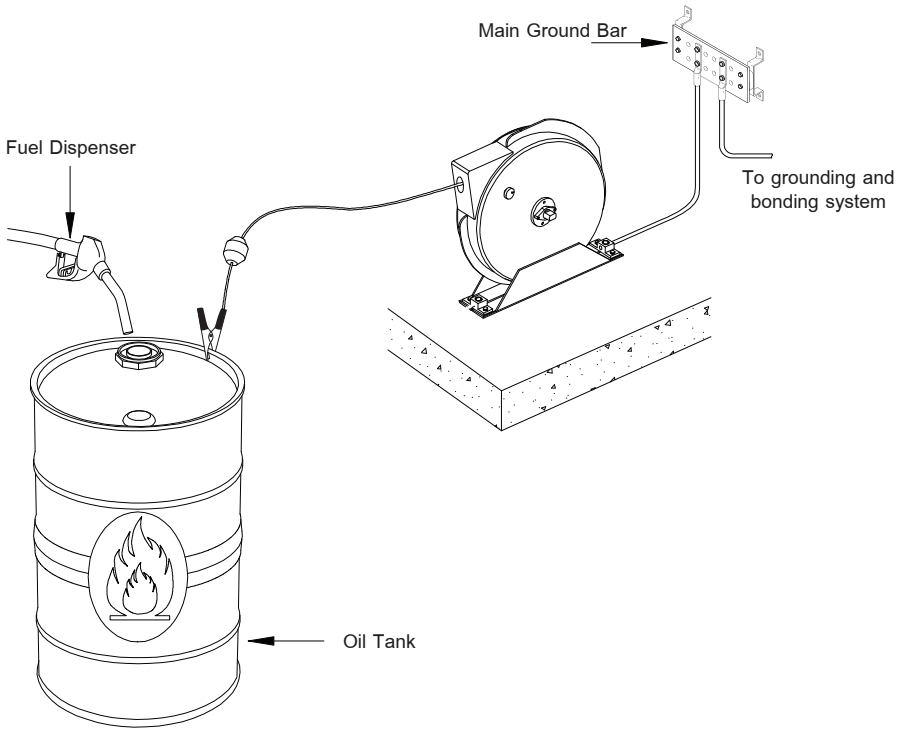
Code No.	Cable Length (m)	Diameter (mm) L	W	H	Weight (kg)
GERA-15SL-N	15	222	85	225	5
GERA-30SL-N	30	235	95	250	7

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

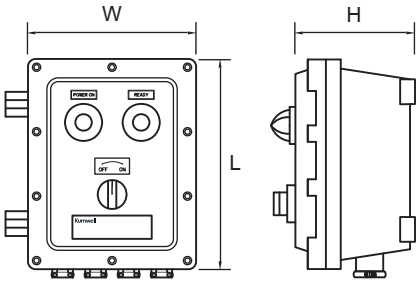
Application
Discharge static electricity from airplane, gas station, petrochemical plant, etc. in grounding system, reducing the chances of sparking and the potential for explosion. Resistance is approximately one ohm per 15 m of steel cable.



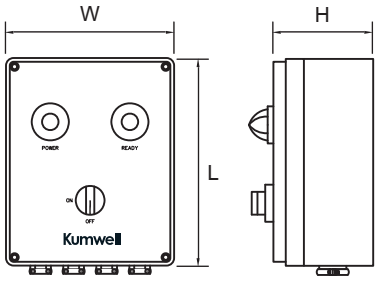




Static Earth Reels Monitor and Remote Interlock Controlled



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

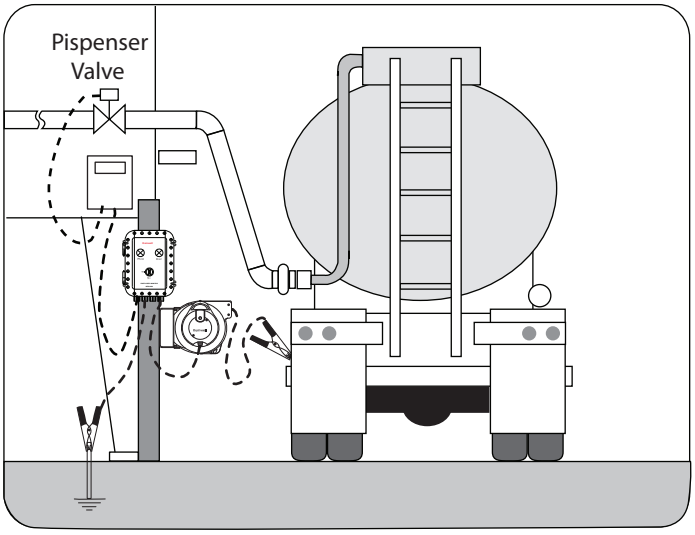
Application
Earth reel is an equipment for eliminating the electrostatic charges generates during the filling and emptying operations of tank-trucks which flammable and explosive products and to maintain them at electric zero potential.
- Explosion Proof Enclosure for static discharge.
- With remote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

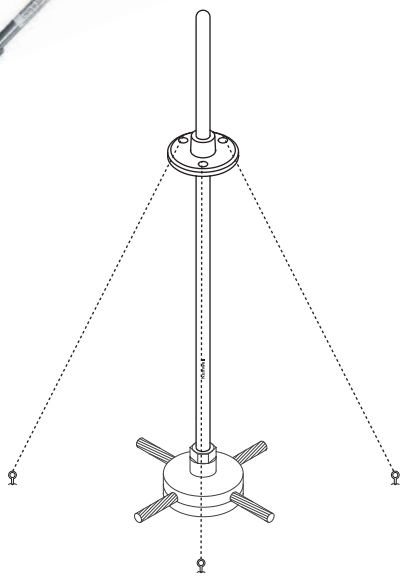
Aluminium with Guy Wire Support

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

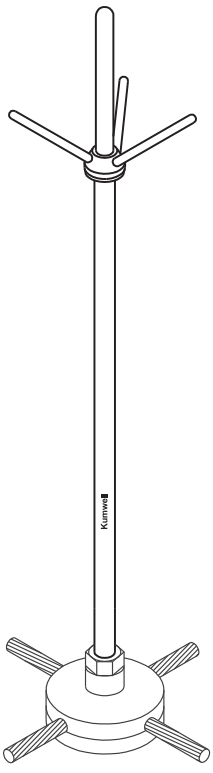
Application
Connect copper tape pointed air rods with multi point air terminals for typical installation.

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

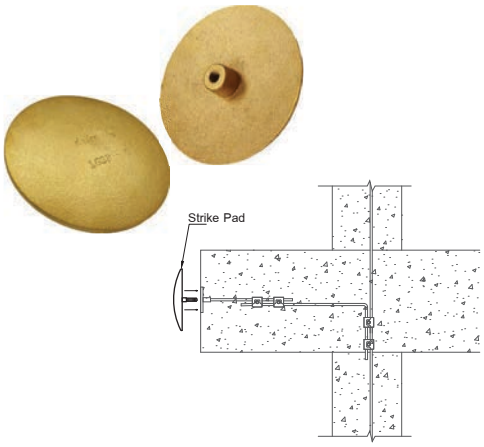
Code No.	Rod Length (L) (mm)	Rod Diameter (Ø) (mm)	Threaded (in)	Weight (kg)
LELT 58 - 30T	300	15	5/8	0.50
LELT 58 - 50T	500	15	5/8	0.80
LELT 58 - 60T	600	15	5/8	0.96
LELT 58 - 100T	1000	15	5/8	1.60
LELTG 58 - 150T	1500	15	5/8	2.36
LELTG 58 - 200T	2000	15	5/8	3.16
LELT 34 - 30T	300	19	3/4	0.75
LELT 34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

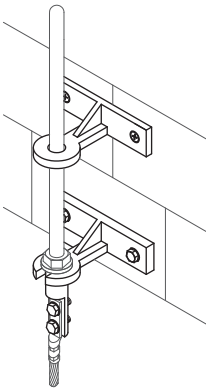
Application
Suitable for side flash protection of building

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.