

# Kumwell



## **GROUNDING & LIGHTNING PROTECTION SYSTEM**

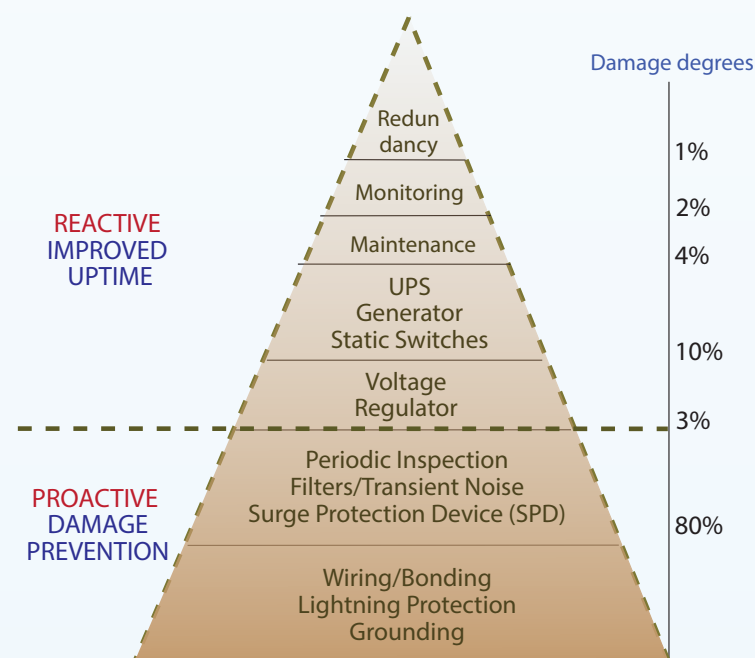
**as Foundation of Power Quality & Our Safety**

## Company Profile

Kumwell emphasizing on **Safety to Society for human life and maintain power quality with perfect Grounding & Lightning Protection System.**

Lightning is natural phenomena that can cause life and property damage both structure and electronic system. Kumwell has designed Grounding & Lightning Protection Products in accordance with international standards and has provided stable safety foundation in various countries' infrastructure starting from electricity (generating, transmission, and distribution line), transportation (metro line, sky train, subway and high speed train), telecommunication (data centers), industrial plant (petrochemical, oil & gas, food & chemical), building sectors (real estate and housing)

Through the professional management of a private sector in Thailand name K.M.L Technology Co., Ltd. under the brand name Kumwell to stand on the frontline with world class quality, in house innovation, and competitive products for Grounding & Lightning Protection including Lightning Detection and Warning System.



## Foundation of Power Quality

# Kumwell

Kumwell vision **To be Leader with Total Solution in Grounding & Lightning Protection System with High Performance Organization and Sustainable Growth.**

Kumwell has been established since 1999 with professional engineers emphasized the core of Grounding & Lightning Protection System. Starting with development and manufacturing of Exothermic Welding to connect copper conductor, to copper conductor or copper conductor to ground rod for EGAT (Electricity Generating Authority of Thailand) is one of the most important sector of electricity sector, generation plant, transmission line , substation and distribution line in Thailand.



Kumwell has continued the development for new innovation and manufacturing for complete line of Grounding & Lightning Protection System including Lightning Detection and Warning System .



ISO9001:2008 Standard is internationally recognized standard for Quality Management System (QMS)



CSR - DIW Continuous Award  
2013



The Prime Minister's Industry Award  
2012



ASEAN Outstanding Engineering  
Achievement Award 2013



Prime Minister's Export Award  
2008



CSR Award  
2009



Sufficiency Economy Award  
2010



Kumwell has provided complete solution of Grounding & Lightning Protection system based on international standards namely UL486, UL467, IEEE80, NFPA 780, IEC 62305 series, risk assessment and design protection systems conveying economical and safest solution to our clients. Kumwell has developed many software programs for design purpose namely risk calculation program, ground grid calculation program, and MEG calculation program.



Kumwell has also provided the advice for appropriate material selection to suit with severe corrosion environments concern. These materials can be tested according to IEC 62561 standard. Therefore, Kumwell has foreseen the important of this testing by investing IEC testing laboratory to ensure all Kumwell products in accordance with the IEC 62561-2012 Lightning Protection Component Series.



In addition, Kumwell has provided various types of supports to our designers, contractors, project owners, engineers, and distributors on required technical seminars, and product presentation.

### What is the Kumwell Business ?

Kumwell is the Total Solution Provider in Grounding & Lightning Protection System with Lightning Detection and Warning System;

Kumwell Grounding & Lightning Protection System (KGLS)

Kumwell Lightning Verification System (KLVS)

Kumwell Lightning Inspection System (KLIS)

Kumwell Lightning Detection System (KLDS)

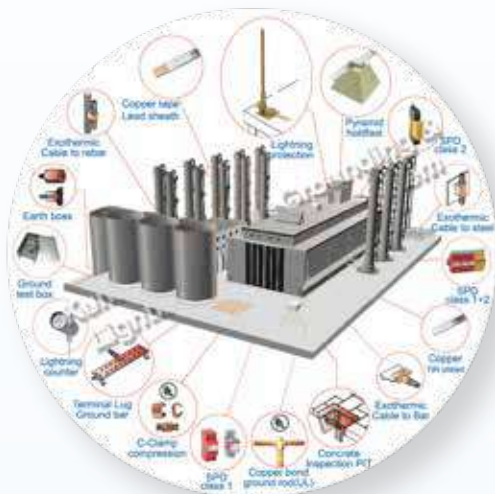
Kumwell has the professional engineer team to inspect clients' critical plants namely electricity generation plant, petrochemical plants, broadcasting sites, telecom cell sites, military armory storage sites whether the condition of Grounding & Lightning Protection System can withstand when lightning strike. Kumwell has inspected the critical plants with the knowledge of Grounding, Lightning Protection, Surge Protection Device, Bonding, Shielding for Grounding & Lightning Protection System to avoid the damage from lightning strike. In addition, Kumwell has utilized the modern measurement equipment to analyze the grounding data to provide reports and recommendation how to improve and maintain the standard of Grounding & Lightning Protection System for clients' critical plants.



To pursue the Vision of Kumwell being the Leader of Total Solution of Grounding & Lightning Protection System, Kumwell has installed latest technology of Lightning Detection and Warning System in Thailand to provide lightning data and warning for various important sectors namely energy suppliers, railway, high speed train, petrochemical, oil & gas, telecommunication, military, air force, aviation, insurance, outdoor sport activities, travelers, camping and farmers.



## Kumwell Grounding and Lightning Protection System (KGLS)



**Benefits :** To provide total solution for electricity, transportation, buildings, telecommunication, industrial plant with a Grounding & Lightning Protection Design using Kumwell Calculation Software to comply with international standards.

To provide a complete internal and external selection of Grounding & Lightning Protection materials such as Lightning Protection Components, Exothermic Welding, Copper-Bonded Ground Rod, Air Terminal, SPD and Copper Clad Steel Wire.

Kumwell has started the business to deliver to the most important sector focusing safety & power quality requiring high quality of Grounding & Lightning Protection System in Electricity sector such as generation, transmission line, substation and distribution. Kumwell has supplied exothermic welding UL List (Underwriters Laboratories Inc.) including complete components such as connectors, flexible braids, ground rod with coupling, driving head, etc.



Exothermic Welding

In substation, grounding system is important on grid design. Kumwell has provided ground grid calculation program to verify the proper protection level.



In the situation of high ground resistance in certain substation, Kumwell can provide ground enhancing compound namely More Effective Grounding (MEG) to conform IEEE80 : Ground Enhancing Compound using MEG Software Calculation to design how to lower the resistance to the safety level.



In transmission line, Kumwell has collaborated to improve high grounding resistance area using Kumwell Ground Enhancing Compound namely More Effective Grounding (MEG) along with MEG Software Calculation to lower the ground resistance tower back flash over problem. As for ground rod installation, Kumwell has continued to develop ground rod driver for easy installation.



Generally, grounding cable is copper cable, but the cable is often stolen in transmission line and solar farm because the installed sites are in the open area. Kumwell has foreseen the problem and has supplied Copper Clad Steel (CCS) both single core wire and stranded wire with high steel strength, and corrosion resistance to replace copper cable.





Kumwell also developed lightning protection for tank farm in power plant with special design of lightning pole over 20 m. that can also withstand tropical wind load.



Solar farm is another important electricity generation that needs high level of Grounding & Lightning Protection, special design lightning pole withstand tropical wind load and without any pole shadow to darken solar panel to affect the power generation capacity.

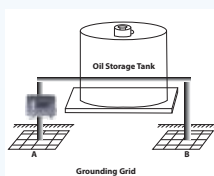
After that, Kumwell has developed Grounding & Lightning Protection System for oil & gas plant with the concern of hazardous environment, Kumwell has developed lead sheathed copper tape and low smoke halogen free (LSHF) copper tape.



The development has continued with heavy duty earth pit withstand 15 MT load.



Since grounding resistance is the most important for Grounding & Lightning Protection System, Kumwell has developed an innovation of real time Smart Ground Monitoring with SMS alert.



Kumwell has continued to pursue the Grounding & Lightning Protection System in railway segment, exothermic welding UL listed for railway signaling bond.



The welding connection for railway signaling bond must not develop any martensite to affect to the rail with increasing risk of cracking and brittle.

The telecommunication is another important segment that Kumwell has provided total solution of Grounding & Lightning Protection System, especially UL Listed exothermic welding, perfect connection for C-Clamp & Copper lug with Kumwell custom design of crimping tool and SPD (Surge Protective Device).



As for building segment, Kumwell has provided the complete protection utilizing risk calculation management program. With the concern of operator safety, Kumwell has developed and designed complete lightning protection components such various custom-made roof clamps to suit for any roof structure with architectural design of the historical and cultural building with the ease of installation for operators' safety during installation.



In addition, for grounding besides UL Listed ground rod with complete accessories, Kumwell has developed several types of inspection earth pit such as 20 kgs. light weight concrete earth pit to withstand 6 MT load and various color of epoxy earth pit to suit with architectural building design and image. Kumwell has also developed water seal earth pit for critical water concern.

To enhance the delivery of total solution of complete Grounding & Lightning Protection System, Kumwell has invested in Lightning Detection Network to provide lightning detection and warning system to emphasize our vision of Safety to Society.

## Kumwell Lightning Verification System (KLVS)



**Benefits :** To guarantee/certify Kumwell customer to receive the best quality products complying with international standards. This system enhances Kumwell to improve and develop existing and new products. Kumwell has Grounding & Lightning Testing Laboratory to conform to IEC 62561:2012 standard

Kumwell has always determined to develop in-house R&D for new technology and modern tooling for Grounding & Lightning Protection System to deliver safety to society. The Latest innovation are as follows:

- Real time Smart Ground monitoring with SMS alert.
- Electric Ignitor (ELITOR) to replace flint gun operator's safety.
- Concrete light weight earth pit only 20 kg but can withstand 6 MT load,
- Perfect connectors of C-Clamp and Copper Lug with crimping tool.

Kumwell has moved forward to develop and invest testing laboratory to ensure Kumwell components can be manufactured and delivered high standard quality to customers in accordance to new 7 parts of IEC 62561:2012 standard "Lightning Protection Component Series" The lab equipment has composed of lightning impulse current machine, tensile strength, conditioning/ageing for environment test, contact resistance measurement.

IEC 62561-1 Requirement for Connection components (Exothermic Welding, Saddle, Flexible connector, Ground bar connector)

IEC 62561-2 Requirement for Conductors and Earth electrodes (Earth rod, Air terminal, Down conductor)

IEC 62561-3 Requirement for Isolating Spark Gaps (ISG)

IEC 62561-4 Requirement for Conductor Fasteners (Metal Sheet Clamps, Tape Support, Cable Support)

IEC 62561-5 Requirement for 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



Lightning Impulse Current Test 60kA, 10/350 $\mu$ s & 8/20 $\mu$ s



Mechanical Tensile Test



A Salt Mist Treatment



A Humid Sulphurous Atmosphere Treatment



Contact Resistance Measurement



## Kumwell Lightning Inspection System (KLIS)



**Benefits :** To verify and monitor existing Grounding & Lightning Protection System problem.

To provide preventive maintenance programs for every Grounding & Lightning Protection System in electricity, buildings, telecommunication, industrial plants, transportation and residential area to that all the systems are in function effectively.

Improper Grounding & Lightning Protection System can cause severe damage to structure, economic in the society and human life in critical plants, residential, and public. The major concern is the lack of inspection, and preventive maintenance program periodically.



Major severe economic impact to the society can come from electricity, transportation, telecommunication, industrial plants, buildings and residential areas sectors.



Kumwell has realized the result of the impact and has launched CSV (Corporate Shared Value) with government sector, electricity sector, industrial sector, and education sector to emphasize of Safety to Society with the knowledge of Grounding & Lightning Protection System on how to inspect the facility to identify the risk of improper grounding system.



Kumwell shall provide tacit knowledge and training of grounding & lightning inspection program by professional engineers on how to utilize Kumwell professional modern tooling such as earth

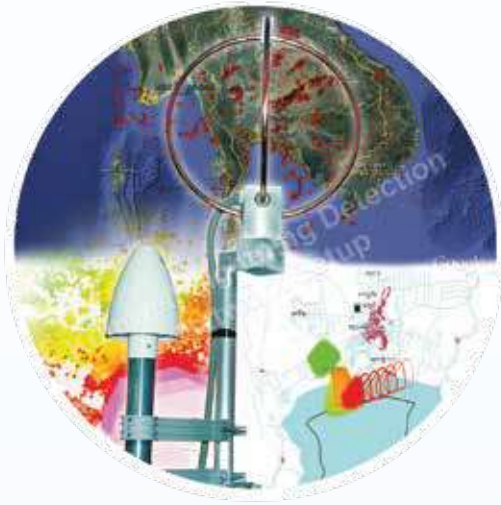
clamp meter, multi-pole meters, impedance meter, SPD tester, and soil resistivity tester especially pH and alkaline soil tester.



Kumwell is ready to provide supervision and training to maintenance engineers of critical plants how to inspect, evaluate and improve Grounding & Lightning Protection to reach the safety standard after installation and yearly preventive maintenance program following IEC 62305-3 and NFPA 780 standard to ensure the system is safe to withstand lightning strike.



## Kumwell Lightning Detection System (KLDS)



**Benefits :** Serve as safety warning for airport, oil and gas plant, outdoor activities, sport complex, golf course, school, construction site and agriculture farms.

Serve as High Accuracy Lightning measurement for better lightning protection improvement of transmission line, distribution line, telecommunication network, electrical distribution for railways, plant and buildings.

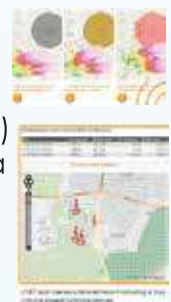
Many industries and public sectors such as energy suppliers, railway, high speed train, petrochemical plants, oil & gas, telecommunication, military, air force, aviation, insurance, outdoor sport activities, travellers, camping, and farmer show the great interest in accurate lightning information.



Important infrastructure industries, especially energy suppliers, require the entire spectrum of lightning data since lightning strokes are one of the most frequent causes of serious malfunctions.

Kumwell have foreseen the importance of lightning data information and warning to provide safety to society. Therefore, Kumwell has a joint venture with nowcast from Germany to set up Kumwell-nowcast to take care Lightning Detection and Warning System in ASEAN. The system will provide

- Real-time and historical evaluation of malfunctions by thunderstorms
- Identify lightning current discharge with intra cloud (IC) and cloud to ground (CG)
- Lightning current level as low as 4 kA at specific latitude and longitude information
- Lightning flash density for risk management in accordance of IEC 62305-2 (Protection against Lightning Part 2: Risk Management).
- Estimation of impending interruptions to operate caused by thunderstorms
- Up to 1 hour (Nowcasting) early warning forecast of approaching thunderstorms
- LINET Spot to identify damage of lightning and overvoltage in the past at pre-defined location and time within 150 m.



In addition, Kumwell provide Lightning Detection and Warning App for personal use

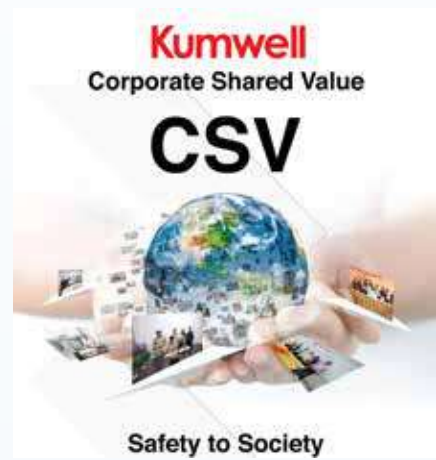
From the successful evidences mentioned earlier are powerful forces that will push forward Kumwell to the following important missions:

- 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
- Give the importance of good governance principle and commitment to communities & environment responsibilities
- Culture of Kumwell – Professional Oriented.

Moreover, Kumwell has focused on research and development of existing and new products for better performance and safety with Human Centric Approach.

## SOCIAL RESPONSIBILITY

Kumwell has announced Corporate Shared Value (CSV) Safety to Society program around the country and ASEAN to provide and share knowledge of Grounding & Lightning Protection System to electricity, education, and government sector, as well as engineering institution to ensure that each sector shall generate qualified technical personnels to serve the local society how to design, install, inspect and maintenance Grounding & Lightning Protection System for both industries and residential sectors.



Kumwell has highly concerned to operate sustainable business. The industry, the community and the environment have to grow together by a good support among one another.

Kumwell consequently has promoted Social Responsibility with the following concerns: CSR-DIW (CSR-ISO 26000) Corporate Social Responsibility-Department of Industrial Works.

Create learning center in the community share knowledge value of Grounding and Lightning Protection with designers, consultants, contractors, engineering institutions and various key customers & partners.





As a result of the total solution system above, Kumwell has been accepted from various industries such as Electricity, Transportation, Telecommunication, Industrial plant, Building both in ASEAN and international market.

Subjected to the management principles above, Kumwell brand has been recognized and certified from various institutions namely UL certification, ISO 9001:2008, IEEE, IEC and Thailand Trusted Mark (TTM) 2012. At the same time, Kumwell has received awards from Prime Minister's Export Award 2008, and The Prime Minister Industry Award 2012.

To drive the success of Kumwell, we have provided internal and external seminars, trainings with several Grounding & Lightning protection knowledge.

**Kumwell** also has created an awareness of our business and technology through many international exhibitions and conferences.

With a strong determination as the Leader of Total Solution in Grounding & Lightning Protection System, Kumwell will move forward to protect you from the dangers of lightning strike from all directions. Kumwell, The Leader of Total Solution in Grounding & Lightning Protection System.



CHINA : 6100 MW YANGJIAN NUCLEAR POWER PLANT



DUBAI : BARZAN ONSHORE FACILITIES PROJECT IN RAS LAFFAN, QATAR



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



THAILAND : PTT GASSEPARATION PLANT



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



MALAYSIA : KUALA LUMPUR INTERNATIONAL AIRPORT - KLIA (MALAYSIA)



VIETNAM : 500KV TAN DINH - SONG MAY POWER LINE



INDIA : INDIA RAILWAYS



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



CHINA : HIGH SPEED TRAIN



### Grounding and Lightning Protection System

Copper - bonded Ground Rod	1
Copper - bonded Ground Rod - Standard series	2
Copper - bonded Ground Rod - Thread series	3
Coupling	4
Driving Head	4
Tip	4
Ground Rod - Solid Copper / Stainless Steel	5
Driving Head for Solid Copper / Stainless Steel Ground Rod	6
Coupling for Solid Copper / Stainless Steel Ground Rod	6
Hammer driving ground rod	6
Electrolytic Grounding - KEG	7
Ground Plate - Lattice Copper	8
Ground Plate - Solid Copper	8
Ground Plate - Copper - Bonded Steel	8
Signal Reference Ground Grid	9
More Effective Grounding - MEG	10
Rod Copper Tape Clamp	11
Rod Cable Clamp	11
Rod to Cable Lug Clamp	11
Rod to Cable Clamp	12
Rod or Pipe Two Cable Clamp	13
Rod or Pipe Three Cable Clamp	13
U Bolt Rod Clamp	14
Pipe to Cable Clamp	14
Clamp A Cable to Flat Bar	15
Clamp Two Cable to Flat Bar	15
One Cable to Pipe Clamp	16



## Content

Pipe Bond Clamp	16
Tape Clamp	16
Cable Grid	17
Ground Clamp	17
Static Earth Receptacle	17
Earth Point	18
Eye Bolt	19
Earth Boss	19
Connector Screw Type	19
Flexible Copper Braid Bond	20
Grounding Test Box	21
Ground Bar	22 - 23
Disconnecting Link	22
Ground Station	24
Concrete Inspection Pit	25
Copper Earthing Electrode Water Sealing Glands	26
Ground Bar Pit	26
FRP Inspection Pit	27
Ground Rod Seals	27
Static Earth Reels Monitor and interlock controlled	28
Static Earth Reels	29
Grounding Resistance Remote Monitoring System with RTU	30
Grounding Resistance Monitoring Meter	31
Lightning Rod	32
Blunt End Air Terminals	33
Multi Point Air Terminals	34
Strike Pad	35
Air terminal Bracket	35

Puddle Flange	35
Tape Saddle	36
Round Saddle	36
Flat Saddle	37
Ridge Saddle	37
Double Base Saddle	37
Cross Cable Saddle	38
Adjustable Saddle for Cable	38
Adjustable Saddle for Tape	38
Floor Saddle	39
Wall Saddle	39
Cable Support	40
Cable Cross Clamp	40
Cable Test Connector	40
Cable to Tape	41
One Hole Cable Grip	41
Tee Clamp	41
Tape Support	42
Square Tape Support	42
Cable - Tape Test Connector	43
Tape Test Connector	43
Tape Clip	43
Bi - Metallic Connector	44
Back Plate Holdfast	44
Back Holdfast	44
Screw Down Test Clamp	45
Beam Clamp	45
Conductor to Rebar Clamp	45

## Content

Expansion Braid Bond	46
Terminal Lug	46
Split Bolt	46
Circular Conductors Holders	47
Non Metallic Dc Clips	47
Adhesive Base	47
Tape Clip with Adhesive Base	48
Pyramid Holdfast	48
Insulator Support	49
Solvent Cleaning	49
Copper Lug for Exothermic Welding	50
Lightning Pole	51
Metal Sheet Clamp	52 - 53
Roof Holders	54
Anti - Vandal Down Conductor Guard	54
Tape Conductors	55 - 56
Circular Conductors	57
Annealed Copper - Clad Steel Wire	58
Stranded Copper Conductor	58
Copper Lugs - Long Barrel	59 - 60
Copper Lugs - Long Barrel 90° Pad	61 - 62
Copper Lugs - 4 Hole	63
Copper Lugs Barrel Short Pad Blank	64
Copper C-Clamp	65
Hydraulic Crimping Tool	66
Domestic Project Reference	67
International Project Reference	68 - 70
Index	



## Copper-Bonded Ground Rod

**Kumwell** 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 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.

### **Kumwell 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.



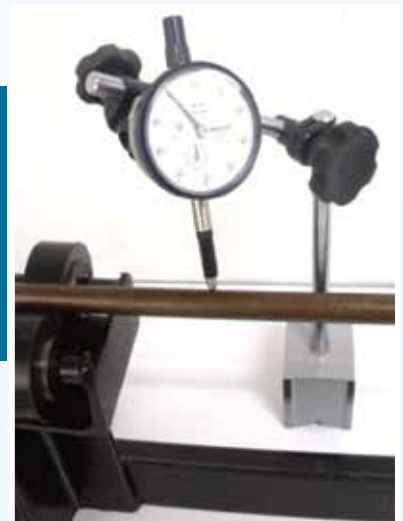
#### **Adherence of Coating Test**

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 467standard 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.

# Copper-Bonded Ground Rod

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. To ensure in safety and quality, it meets UL standard for grounding and bonding equipments.

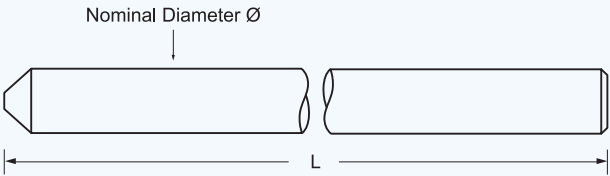


## Standard Type (UL-Listed)

Code No.	Nominal Diameter (Ø)		Length (L)	Weight (kg)
	(in)	(mm)	(ft)	
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	7.46
GRCBU 110	1	23.1	10	10.15

## Standard Type

Code No.	Nominal Diameter (Ø)		Length (L)	Weight (kg)
	(in)	(mm)	(ft)	
GRCBU 124	1/2	12.7	4	1.23
GRCBU 125	1/2	12.7	5	1.54
GRCBU 126	1/2	12.7	6	1.85
GRCBU 584	5/8	14.2	4	1.54
GRCBU 585	5/8	14.2	5	1.92
GRCBU 586	5/8	14.2	6	2.31
GRCBU 587	5/8	14.2	7	2.69
GRCBU 344	3/4	17.2	4	2.23
GRCBU 345	3/4	17.2	5	2.78
GRCBU 346	3/4	17.2	6	3.35
GRCBU 347	3/4	17.2	7	3.89
GRCBU 16	1	23.1	6	6.09



Special size can be requested.

**Tested** : IEC 62561 - 2 , UL 467

**Application** : Suitable for disperse current into the earth

**Material** : Copper-bonded Steel

# Copper-Bonded Ground Rod

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. To ensure in safety and quality, it meets UL standard for grounding and bonding equipments.

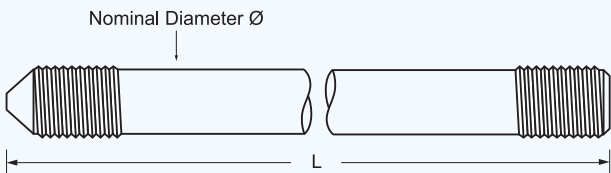


## Threaded Type (UL-Listed)

Code No.	Nominal Diameter (Ø)		Length (L)	Weight (kg)
	(in)	(mm)	(ft)	
GRCBUT 128	1/2	12.7	8	2.47
GRCBUT 1210	1/2	12.7	10	3.08
GRCBUT 588	5/8	14.2	8	3.08
GRCBUT 5810	5/8	14.2	10	3.80
GRCBUT 348	3/4	17.2	8	4.46
GRCBUT 3410	3/4	17.2	10	5.58
GRCBUT 18	1	23.1	8	7.46
GRCBUT 110	1	23.1	10	10.15

## Threaded Type

Code No.	Nominal Diameter (Ø)		Length (L)	Weight (kg)
	(in)	Approx (mm)	(ft)	
GRCBUT 124	1/2	12.7	4	1.23
GRCBUT 125	1/2	12.7	5	1.54
GRCBUT 126	1/2	12.7	6	1.85
GRCBUT 584	5/8	14.2	4	1.54
GRCBUT 585	5/8	14.2	5	1.92
GRCBUT 586	5/8	14.2	6	2.31
GRCBUT 587	5/8	14.2	7	2.69
GRCBUT 344	3/4	17.2	4	2.23
GRCBUT 345	3/4	17.2	5	2.78
GRCBUT 346	3/4	17.2	6	3.35
GRCBUT 347	3/4	17.2	7	3.89
GRCBUT 16	1	23.1	6	6.09



Special size can be requested.

**Tested** : IEC 62561 - 2 , UL 467

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

**Material** : Copper-bonded steel



Coupling



For Threaded Type

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

**Tested** : IEC 62561 - 2  
**Application** : Extend to the length of ground rod  
**Material** : High Strength Silicon Bronze

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

**Tested** : IEC 62561 - 2  
**Application** : Protect the top of ground rod while driving  
**Material** : High Tensile Steel

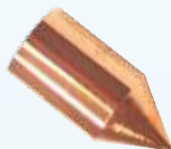


For Standard Type

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

**Tested** : IEC 62561 - 2  
**Application** : Protect the top of ground rod while driving  
**Material** : Zinc-plated Steel

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

**Application** : Lead the ground rod into the hard soil area  
**Material** : High Tensile Steel

## Ground Rod Solid Copper / Stainless Steel

Solid Copper and Stainless Steel Ground Rods are used in critical soil application which has a pH value below 3 or more 8.



### Solid Copper

Code No.	Diameter (ϕ) (mm)	Length (L) (mm)	Weight (kg)
GRSC 1510	15	1000	1.58
GRSC 1515	15	1500	2.37
GRSC 1520	15	2000	3.17
GRSC 2010	20	1000	2.81
GRSC 2015	20	1500	4.22
GRSC 2020	20	2000	5.63

**Tested** : IEC 62561 - 2

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

**Material** : Solid Copper - BS EN 13601

### Stainless Steel

Code No.	Diameter (ϕ) (mm)	Length (L) (mm)	Weight (kg)
GRSS 1610	16	1000	1.60
GRSS 1615	16	1500	2.40
GRSS 1620	16	2000	3.20
GRSS 2010	20	1000	2.50
GRSS 2015	20	1500	3.75
GRSS 2020	20	2000	5.00

**Tested** : IEC 62561 - 2

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

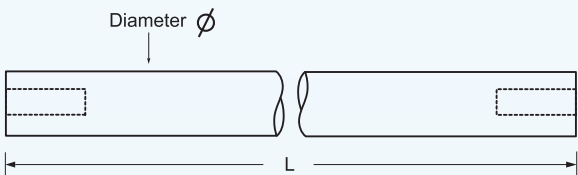
**Material** : Stainless steel

### Spike for Solid / Stainless Steel

Code No.	For Rod Diameter (ϕ) (mm)	Weight (kg)
GRSP 15	15	0.08
GRSP 16	16	0.10
GRSP 20	20	0.12

**Application** : Lead the ground rod into soil

**Material** : Stainless steel



Special size can be requested.

# Driving Head



## For Solid Copper / Stainless Steel

Code No.	For Rod Size Diameter (ϕ) (mm)	Weight (kg)
GRSDH 15	15	0.043
GRSDH 16	16	0.047
GRSDH 20	20	0.055

**Tested** : IEC 62561 - 2

**Application** : Protect the top of ground rod

**Material** : High Tensile Steel

# Coupling



## For Solid Copper

Code No.	For Rod Size Diameter (ϕ) (mm)	Weight (kg)
GRSC 15	15	0.03
GRSC 16	16	0.03
GRSC 20	20	0.03

## For Stainless Steel

Code No.	For Rod Size Diameter (ϕ) (mm)	Weight (kg)
GRSSCO 15	15	0.025
GRSSCO 16	16	0.025
GRSSCO 20	20	0.025

**Tested** : IEC 62561 - 2

**Application** : Extend to the length of ground rod

**Material** : Copper Alloy / Stainless steel

# Hammer Driving Ground Rod



Code No.	Description	Weight (kg)
GHSD-1500-12	Hammer slide driving ground rod set	16.0
GSH-6	Hammer slide 6 kg	6.5
GSH-12	Hammer slide 12 kg	12.8
GPR-1500	Prove rod	3.2

**Application** : The manual slide hammer system for driving ground rod.  
Provide for ground rod standard type 1/2" - 1" and threaded 1/2" - 3/4" nominal diameter 3.00 m length

**Material** : Prove rod - Black steel pipe  
Hammer - Mild Steel



## Electrolytic Grounding (KEG)

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

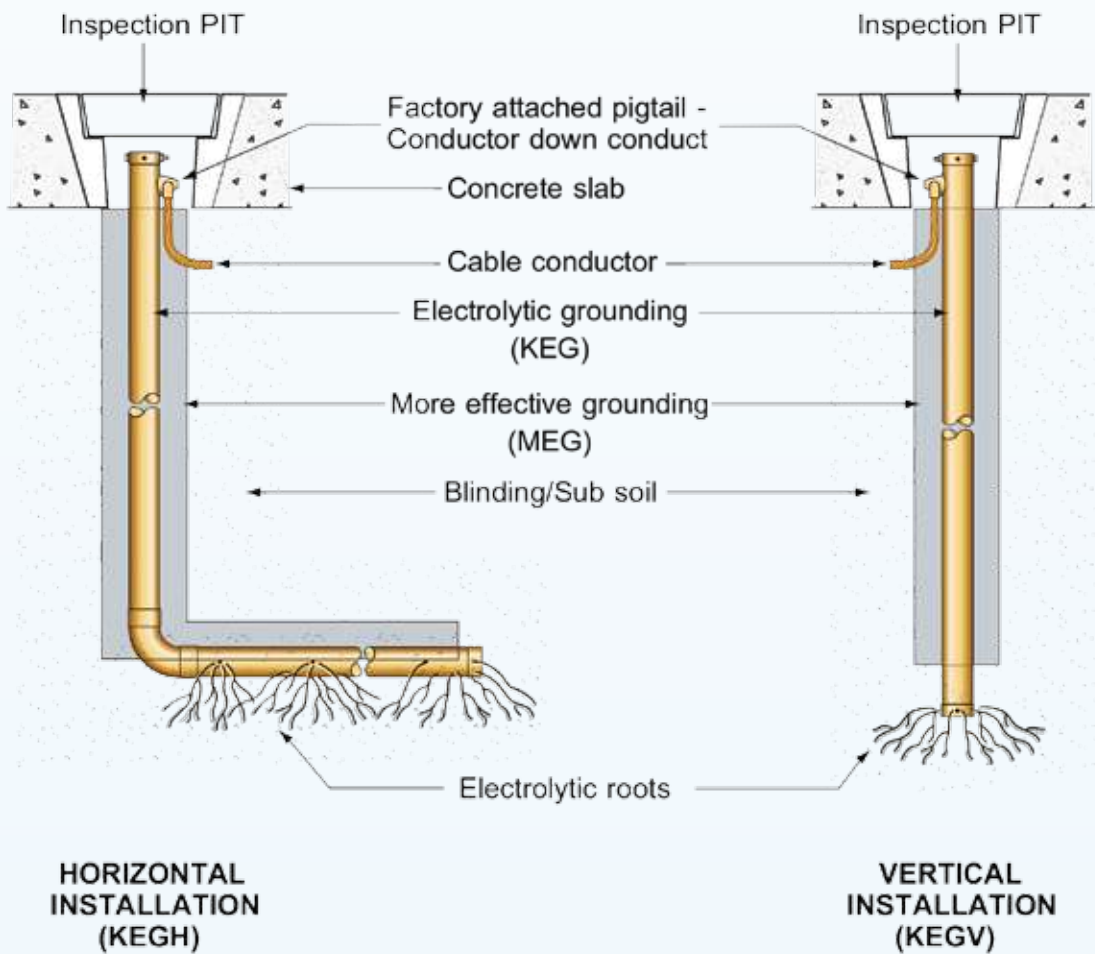
Exothermic welding is used for connecting conductor to the copper pipe.



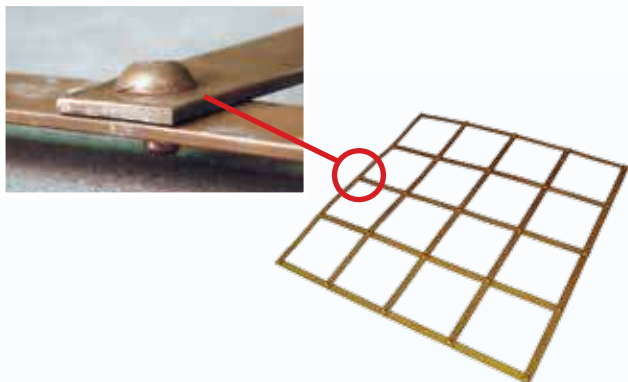
Code No.	Rod Length (L) (ft)	Conductor Size (mm <sup>2</sup> )	Conductor Length (mm)	Rod Type
KEGV-8	8	95	500	Vertical
KEGV-10	10	95	500	Vertical
KEGV-12	12	95	500	Vertical
KEGV-15	15	95	500	Vertical
KEGH-8	8	95	500	Horizontal
KEGH-10	10	95	500	Horizontal
KEGH-12	12	95	500	Horizontal
KEGH-15	15	95	500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

**Tested** : IEC 62561 - 2

**Application** : Suitable for an area where unable to drive ground rod

**Material** : Copper - BS EN 13601



### 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

**Tested** : IEC 62561 - 2

**Application** : Suitable for an area where unable to drive ground rod

**Material** : Copper - BS EN 13601



### Copper-Bonded Steel

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

**Application** : Suitable for an area where unable to drive ground rod

**Material** : Copper-Bonded Steel

**Note** : 254 micron copper thickness

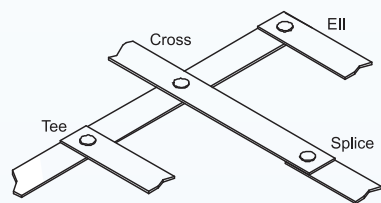
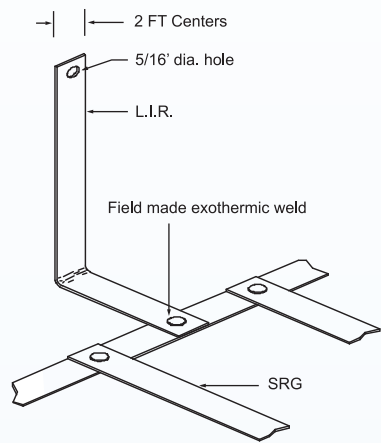
## Signal Reference Ground Grid

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

### SRG Comply to IEEE Std.1100

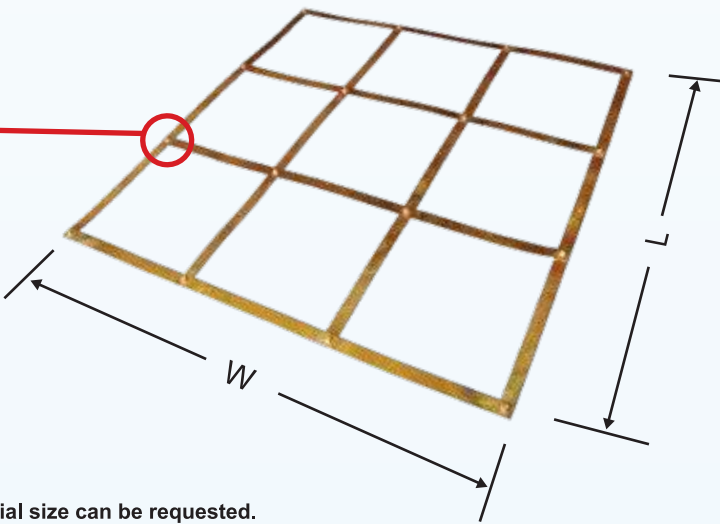
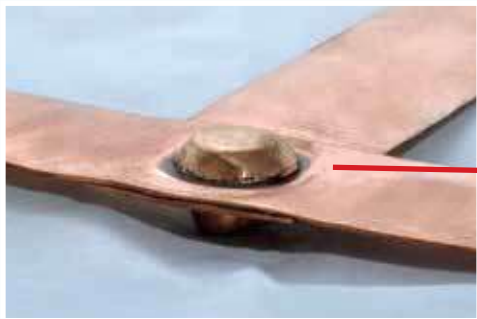
Code No.	Length (mm)	Width (mm)	Spacing (mm)	Weight (kg)
GRSRG 240240	2400	2400	600	6.20
GRSRG 240480	2400	4800	600	11.66

Material : Copper - BS EN 13601



Exothermic welding by Code BB46-C-550 mould and KW32 metal powder can provide Tee, Cross, and Splice All connections as shown.

Mould	Copper Strip Size (mm)	Metal Powder (g)	Handle Clamp Type
BB46-C-550	50 x 0.5	32	HCC00



Special size can be requested.



## More Effective Grounding (MEG)

Kumwell MEG is an alternate solution for effectively by modifying the soil surrounding the electrode. In practically, to achieve the desired reduction in ground resistance by adding more grid conductors or ground rods is often impossible. Soil Treatment is an effective solution to decrease ground resistance which is utilized to an advantage in poor conductive area such as rocky soil,

Kumwell MEG is ground enhancement materials in accordance with requirements of IEEE Standard 80-2000 with a resistivity of 0.01  $\Omega$ -m. MEG manufacturing is environmental - friendly, high reliability, quality, and long shelf life.



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

**Tested** : IEC 62561 - 7

**Application** : - Reduce grounding resistance in critical area such as rocky soil, sandy soil with a resistivity of 0.01  $\Omega$ -m  
- Meet IEEE Standard 80-2000  
- Require simple instruction manual and tools for installation  
- Non toxic

**Packing** : 25 LBS and 55 LBS MEG with heavy duty bag Special packing can be requested.

## Rod Copper Tape Clamp



Code No.	Rod Diameter (φ)		Max. Tape Size (mm)	Weight (kg)
	(in)	(mm)		
GXCT 127-2512	1/2	12.7	25 x 12	0.12
GXCT 127-2620	1/2	12.7	26 x 20	0.13
GXCT 142-2512	5/8	14.2	25 x 12	0.12
GXCT 142-2618	5/8	14.2	26 x 18	0.13
GXCT 142-302	5/8	14.2	30 x 2	0.13
GXCT 142-4012	5/8	14.2	40 x 12	0.14
GXCT 142-518	5/8	14.2	51 x 8	0.17
GXCT 172-2510	3/4	17.2	25 x 10	0.12
GXCT 172-2610	3/4	17.2	26 x 10	0.12
GXCT 172-302	3/4	17.2	30 x 2	0.13
GXCT 172-5112	3/4	17.2	51 x 12	0.17
GXCT 231-2610	1	23.1	26 x 10	0.13

**Tested** : IEC 62561 - 1

**Application** : Clamp ground rod with copper tape conductor

**Material** : Copper Alloy - BS EN 1982

Bolt - Brass

## Rod Cable Clamp



Code No.	Rod Diameter (φ)		Cable Size (mm²)	Weight (kg)
	(in)	(mm)		
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

**Tested** : IEC 62561 - 1

**Application** : Clamp ground rod with copper conductor

**Material** : Copper Alloy - BS EN 1982

Bolt - Brass

## Rod to Cable Lug Clamp



Code No.	Rod Diameter (φ)		Weight (kg)
	(in)	(mm)	
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

**Tested** : IEC 62561 - 1

**Application** : Clamp rod to cable lug conductor

**Material** : Copper Alloy - BS EN 1982

Bolt, Nut - Brass

## Rod to Cable Clamp



Code No.	Rod Diameter( $\phi$ )		Cable Size (mm <sup>2</sup> )	Weight (kg)
	(in)	(mm)		
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	0.37
GXCCC 231-300	1	23.1	150 - 300	0.53

**Tested** : IEC 62561 - 1  
**Application** : Clamp ground rod through or parallel to cable conductor  
**Material** : Copper Alloy - BS EN 1982  
U Bolt, Nut - Brass

## Rod to Cable Clamp



Code No.	Rod Diameter( $\phi$ )		Cable Size (mm <sup>2</sup> )	Weight (kg)
	(in)	(mm)		
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

**Tested** : IEC 62561 - 1  
**Application** : Clamp ground rod parallel to cable conductor  
**Material** : Copper Alloy - BS EN 1982  
U Bolt, Nut - Brass

## Rod or Pipe Two Cable Clamp



Figure 1



Figure 2

Code No.	Conductor			Cable Size (Sq-mm)	Weight (kg)	Figure
	Tube (in)	Rod (in)	O.D. Renge (mm)			
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	1 1/4 - 1 1/2	-	42.9 - 48.8	25 - 70	0.45	2
GXCTW 40-120	1 1/4 - 1 1/2	-	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	2 1/2	-	76.6	25 - 70	0.83	2
GXCTW 65-120	2 1/2	-	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

**Tested** : IEC 62561 - 1

**Application** : Clamp rod parallel to 2 cable

**Material** : Copper Alloy - BS EN 1982

U Bolt, Nut - Brass

## Rod or Pipe Three Cable Clamp



Figure 1



Figure 2

Code No.	Conductor			Cable Size (Sq-mm)	Weight (kg)	Figure
	Tube (in)	Rod (in)	O.D. Renge (mm)			
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	1 1/4 - 1 1/2	-	42.9 - 48.8	25 - 70	0.79	1
GXCTH 40-120	1 1/4 - 1 1/2	-	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	2 1/2	-	76.6	25 - 70	0.81	2
GXCTH 65-120	2 1/2	-	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

**Tested** : IEC 62561 - 1

**Application** : Clamp rod parallel to 3 cable

**Material** : Copper Alloy - BS EN 1982

U Bolt, Nut - Brass



## U Bolt Rod Clamp



Code No.	Rod Diameter( $\phi$ ) (mm)	Tape Size (mm)	Weight (kg)
GXCTC 16-253	16	25 x 3	0.28
GXCTC 16-254	16	25 x 4	0.28
GXCTC 16-256	16	25 x 6	0.28
GXCTC 20-253	20	25 x 3	0.30
GXCTC 20-254	20	25 x 4	0.30
GXCTC 20-256	20	25 x 6	0.30
GXCTC 25-253	25	25 x 3	0.33
GXCTC 25-254	25	25 x 4	0.33
GXCTC 25-256	25	25 x 6	0.33
GXCTC 31-253	31	25 x 3	0.35
GXCTC 31-254	31	25 x 4	0.35
GXCTC 31-256	31	25 x 6	0.35
GXCTC 38-253	38	25 x 3	0.36
GXCTC 38-254	38	25 x 4	0.36
GXCTC 38-256	38	25 x 6	0.36
GXCTC 50-253	50	25 x 3	0.44
GXCTC 50-254	50	25 x 4	0.44
GXCTC 50-256	50	25 x 6	0.44

**Tested** : IEC 62561 - 1  
**Application** : Clamp rod parallel to copper tape conductor  
**Material** : Copper Alloy - BS EN 1982  
                   U Bolt, Nut - Brass

## Pipe to Cable Clamp



Code No.	Pipe Dimeter ( $\phi$ ) 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	1 1/4-1 1/2	16 - 70	0.54
GXCPC 40-120	1 1/4-1 1/2	70 - 120	0.54
GXCPC 50-70	2	16 - 70	0.77
GXCPC 50-120	2	70 - 120	0.77
GXCPC 65-70	2 1/2	16 - 70	0.84
GXCPC 65-120	2 1/2	70 - 120	0.84
GXCPC 80-70	3	16 - 70	0.97
GXCPC 80-120	3	70 - 120	0.97
GXCPC 100-70	4	16 - 70	1.47
GXCPC 100-120	4	70 - 120	1.47

**Tested** : IEC 62561 - 1  
**Application** : Clamp pipe parallel to one cable  
**Material** : Copper Alloy - BS EN 1982  
                   U Bolt, Nut - Brass

## Clamp A Cable to Flat Bar



### Flat Bar

Code No.	Cable Size (mm²)	Bolt Size (in)	Weight (kg)
GXCCF-G1	25 - 50	3/8 x 1 1/2	0.076
GXCCF-G2	70 - 120	1/2 x 2	0.136
GXCCF-G3	150 - 240	1/2 x 2	0.144

**Tested** : IEC 62561 - 1

**Application** : Clamp cable conductor to steel flat surface

**Material** : Copper Alloy – BS EN 1982  
Bolt, Nut – Brass



### Flat Bar Clamp

Code No.	Cable Size (mm²)	Bolt Size (in)	Weight (kg)
GXCCF-G1P	25 - 50	3/8 x 1 1/2	0.124
GXCCF-G2P	70 - 120	1/2 x 2	0.194
GXCCF-G3P	150 - 240	1/2 x 2	0.228

**Tested** : IEC 62561 - 1

**Application** : Clamp cable conductor to steel flat surface with grooving piece in order to cable distortion

**Material** : Copper Alloy – BS EN 1982  
Bolt, Nut – Brass

## Clamp Two Cable to Flat Bar



### Flat Bar

Code No.	Cable Size (mm²)	Bolt Size (in)	Weight (kg)
GXCCP-G1	25 - 50	3/8 x 1 1/2	0.16
GXCCP-G2	70 - 120	1/2 x 2	0.24
GXCCP-G3	150 - 240	1/2 x 2	0.31

**Tested** : IEC 62561 - 1

**Application** : Clamp 2 cable conductors to steel flat surface

**Material** : Copper Alloy – BS EN 1982  
Bolt, Nut – Brass



### Flat Bar Clamp

Code No.	Cable Size (mm²)	Bolt Size (in)	Weight (kg)
GXCCP-G1P	25 - 50	3/8 x 1 1/2	0.28
GXCCP-G2P	70 - 120	1/2 x 2	0.39
GXCCP-G3P	150 - 240	1/2 x 2	0.45

**Tested** : IEC 62561 - 1

**Application** : Clamp 2 cable conductors to steel flat surface with grooving piece in order to cable distortion

**Material** : Copper Alloy – BS EN 1982  
Bolt, Nut – Brass

## One Cable to Pipe Clamp



Code No.	Pipe Diameter (ϕ) (in)	Cable Size (mm²)	Weight (kg)
GXPCP1-50-95	1 ¼ - 2	25 - 95	0.40
GXPCP1-75-95	2 ½ - 3	25 - 95	0.52
GXPCP1-100-95	3 ½ - 4	25 - 95	0.70

**Tested** : IEC 62561 - 1  
**Application** : Clamp cable conductors to steel pipe  
**Material** : Copper Alloy - BS EN 1982  
 U Bolt, Nut - Brass

## Pipe Bond Clamp



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

**Tested** : IEC 62561 - 1  
**Application** : Bond Solid copper conductor to large metal pipe  
**Material** : Copper Alloy - BS EN 1982  
 Copper Tape - BS EN 13601  
 Bolt, Nut - Brass

## Tape Clamp



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

**Tested** : IEC 62561 - 1  
**Application** : Fix copper tape conductor with steel flat surface  
**Material** : Copper Alloy - BS EN 1982, Bolt / Nut : Brass  
 Aluminium Alloy - BS 2898,  
 Bolt / Nut : Stainless Steel

## Cable Grid



Code No.	Cable Size (mm <sup>2</sup> )	Stud Size (in)	Weight (kg)
GXCG 95	95	5/16	0.16
GXCG 185	185	3/8	0.25

**Tested** : IEC 62561 - 1

**Application** : Clamp cable conductor to framework to earthing cable conductor

**Material** : Copper Alloy – BS EN 1982  
Stud, Nut – Brass  
Washer – Bi – Metallic

## Ground Clamp



Code No.	Cable Size (mm <sup>2</sup> )	Weight (kg)
LGRC-A	95 - 120	0.050
LGRC-B	150 - 185	0.100
LGRC-C	240 - 300	0.120
LGRCA-A	95 - 120	0.015
LGRCA-B	150 - 185	0.031
LGRCA-C	240 - 300	0.036

**Tested** : IEC 62561 - 4

**Application** : Lock wire or cable conductor on flat surface

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

## Static Earth Receptacle



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

**Tested** : IEC 62561 - 1

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

**Material** : Copper Alloy – BS EN 1982



## Earth Point



### Earth Point

Code No.	No. of Hole	Size LxWxH (mm)	Weight (kg)
GXEP 120 (1)	1	55 x $\phi$ 50	0.30
GXEP 120 (2)	2	76 x 82.5 x 41	0.30
GXEP 120 (4)	4	76 x 82.5 x 82.5	0.60

**Tested** : IEC 62561 - 1

**Application** : Connect rebar to earth point

**Material** : Copper Alloy – BS EN 1982

### Earth Point with Prewelding

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

**Tested** : IEC 62561 - 1

**Application** : Connect rebar to earth point

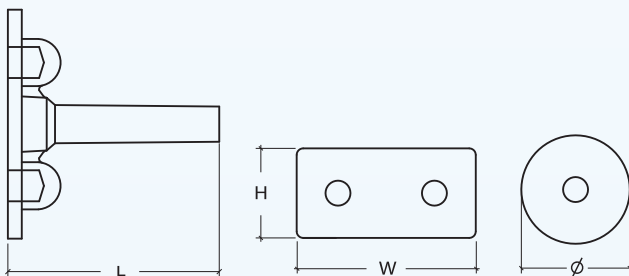
**Material** : Copper Alloy – BS EN 1982  
Cable - Stranded Copper with Green PVC cover  
Connection – Exothermic welding

### Front Cover

Code No.	Cable Size (mm <sup>2</sup> )	Earth Point (Code No.)	Weight (kg)
GXEP 120B	70	GXEP 120 (4)	0.25

**Application** : Fix conductor on earth point

**Material** : Copper Alloy – BS EN 1982



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

## Eye Bolt



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

**Tested** : IEC 62561 - 2

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

**Material** : Copper Alloy - BS EN 1982

## Earth Boss



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

**Application** : Weld onto steel vessel, tank or other structure for bonding point in grounding & lightning protection

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

## Connector Screw Type



Code No.	Cable size (mm <sup>2</sup> )		Bolt Size (in)	Weight (kg)
	Run	Tap		
LXCNS 16-35	16 - 35	4 - 35	1/4 x 1	0.08
LXCNS 50-70	50 - 70	4 - 70	1/4 x 1 1/2	0.10
LXCNS 95-120	95 - 120	4 - 120	5/16 x 1 1/2	0.16
LXCNS 150-185	150 - 185	4 - 185	3/2 x 2	0.39

**Tested** : IEC 62561 - 1

**Application** : Suitable for joint copper conductor (above ground)

**Material** : Copper Alloy - BS EN 1982  
Bolt - Stainless Steel

## Flexible Copper Braid Bond



### Copper Braid with Tinned (1 Hole)

Code No.	Amp Rating (A)	No. of Layer	Length (mm)	Cross Section (mm <sup>2</sup> )	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

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

**Material :** Hight conductivity copper wire with tinned



### Copper Braid with Tinned (2 Hole)

Code No.	Amp Rating (A)	No. of Layer	Length (mm)	Cross Section (mm <sup>2</sup> )	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

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

**Material :** Hight conductivity copper wire with tinned



### Copper Braid with Tinned (Round Type)

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

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

**Material :** Hight conductivity copper wire with tinned

Special size can be requested.

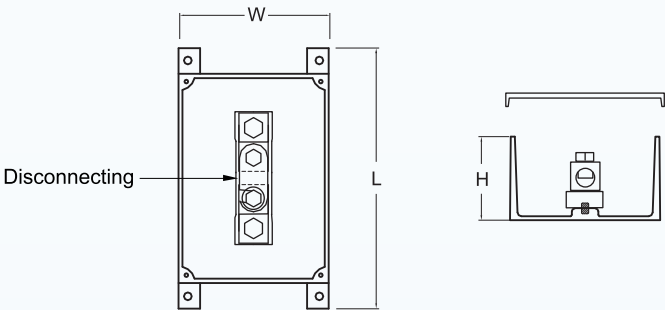
## Grounding Test Box



### Aluminium enclosure

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

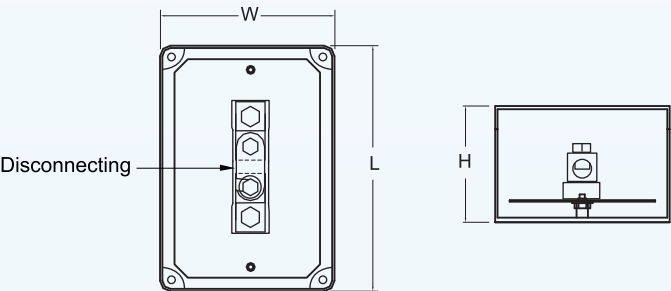
- Tested** : IEC 62561-1
- Application** : Suitable for Inspection and testing point in grounding system
- Material** : Box - Cast Aluminium Alloy  
Bolt - Stainless Steel  
Terminal - Copper Alloy (GYATB)  
Disconnecting - Copper (GYATB)  
Terminal - Aluminium / Copper Alloy (GYATB-AC)  
Disconnecting - Stainless steel (GYATB-AC)



### ABS enclosure

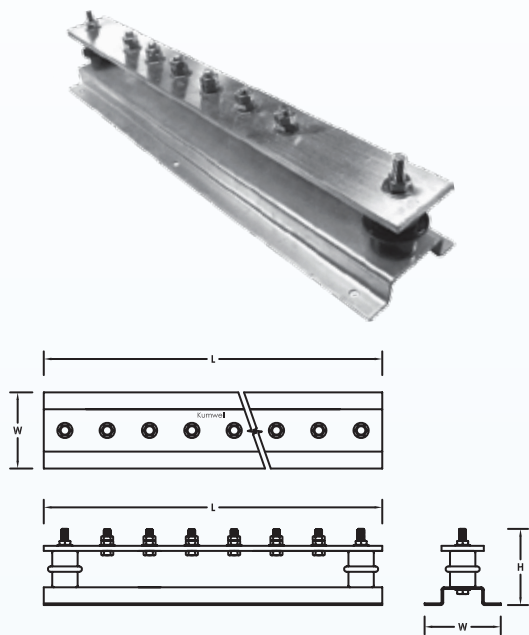
Code No.	Connection	Lug Size (mm <sup>2</sup> )	Dimensions (mm)			Weight (kg)
			L	W	H	
GYPTB	Copper - Copper	50 - 120	200	150	100	1.10
GYPTB-AC	Aluminium - Copper	50 - 120	200	150	100	1.10

- Tested** : IEC 62561-1
- Application** : Suitable for inspection and testing point in grounding system
- Material** : Box - ABS IP66  
Bolt - Stainless Steel  
Terminal - Copper Alloy (GYPTB)  
Disconnecting - Copper (GYPTB)  
Terminal - Aluminium / Copper Alloy (GYATB-AC)  
Disconnecting - Stainless steel (GYPTB-AC)





## Ground Bar



### Without Disconnecting Link

Code No.	No. of Terminals	Dimensions (mm)			Weight (kg)
		L	W	H	
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

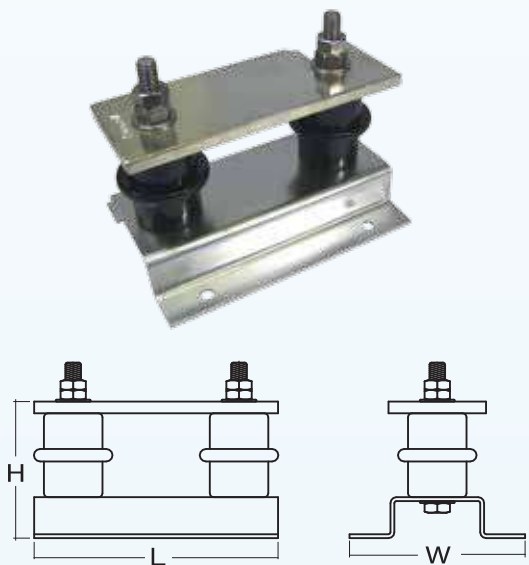
**Tested** : IEC 62561 - 1

**Application** : Suitable for bonding and testing point in grounding system. All the above products consist of 50x6 mm copper bar. Fix using wood screws 1 1/2" x no.10

**Material** : Busbar - Tin Plated Copper - BS EN 13601  
Support - Zinc Plated Steel with Insulator  
Bolt M8 - Stainless Steel

Special Length can be requested

## Disconnecting Link



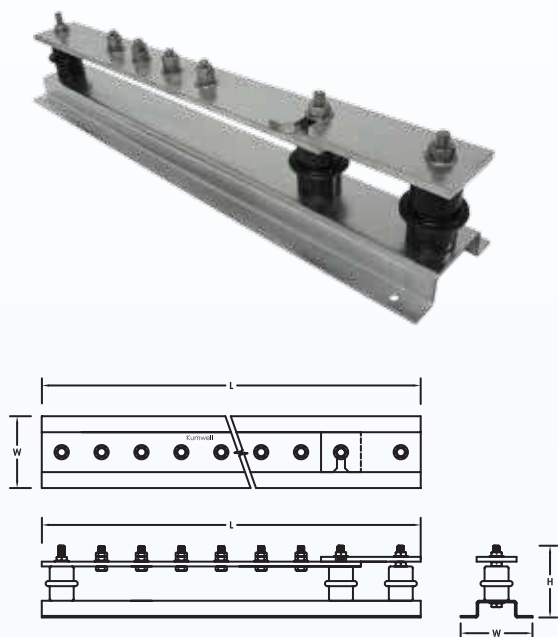
Code No.	Dimensions (mm)			Weight (kg)
	L	W	H	
GBDL 253	125	90	90	0.74

**Tested** : IEC 62561 - 1

**Application** : Suitable for bonding and testing point in grounding system. All the above products consist of 50x6 mm copper bar. Fix using wood screws 1 1/2" x no. 10 and wall plugs.

**Material** : Tin Plated Copper Bar - BS EN 13601  
Support - Zinc Plated Steel with Insulator  
STUD M8 - Stainless Steel

## Ground Bar



### Single Disconnecting Link

Code No.	No. of Terminals	Dimensions (mm)			Weight (kg)
		L	W	H	
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

- Tested** : IEC 62561 - 1
- Application** : Suitable for testing point in grounding system.  
All the above products consist of 50x6 mm copper bar. Fix using wood screws 1 1/2" x no.10
- Material** : Busbar - Tin Plated Copper - BS EN 13601  
Support - Zinc Plated Steel with Insulator  
Bolt M8 - Stainless Steel

Special Length can be requested

### Twin Disconnecting Link

Code No.	No. of Terminals	Dimensions (mm)			Weight (kg)
		L	W	H	
GBDL 42	4	450	90	90	2.80
GBDL 62	6	550	90	90	2.80
GBDL 82	8	650	90	90	3.20
GBDL 102	10	800	90	90	3.80
GBDL 122	12	900	90	90	4.20
GBDL 142	14	1000	90	90	4.60
GBDL 162	16	1100	90	90	5.00
GBDL 182	18	1200	90	90	5.40
GBDL 202	20	1350	90	90	6.00
GBDL 222	22	1450	90	90	6.40
GBDL 242	24	1550	90	90	6.80
GBDL 262	26	1650	90	90	7.20
GBDL 282	28	1750	90	90	7.90
GBDL 302	30	1850	90	90	8.30

- Tested** : IEC 62561 - 1
- Application** : Suitable for testing point in grounding system.  
All the above products consist of 50x6 mm copper bar. Fix using wood screws 1 1/2" x no.10
- Material** : Busbar - Tin Plated Copper - BS EN 13601  
Support - Zinc Plated Steel with Insulator  
Bolt M8 - Stainless Steel

Special Length can be requested

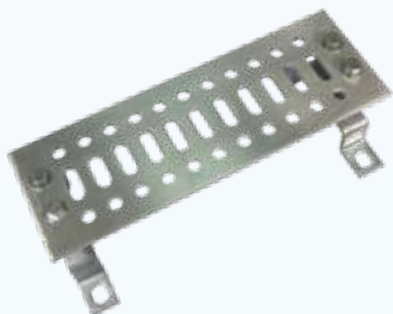
## Ground Station



### For Power

Code No.	No. of Hole	Ø Stud (mm)	Busbar (mm)	Dimensions (mm)			Weight (kg)
				W	L	H	
GBPGSS-6	6	14.3	50 x 350 x 6	148	350	70	1.20
GBPGSS-8	8	14.3	50 x 440 x 6	148	440	70	1.20
GBPGSS-12	12	14.3	50 x 610 x 6	148	610	70	1.80
GBPGSS-6D	12	14.3	100 x 350 x 6	148	350	70	1.80
GBPGSS-8D	16	14.3	100 x 440 x 6	148	440	70	2.50
GBPGSS-12D	24	14.3	100 x 610 x 6	148	610	70	3.60

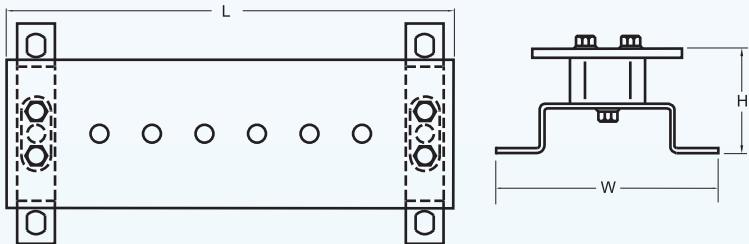
- Tested** : IEC 62561 - 1
- Application** : Connect ground conductor wires to earth electrode
- Material** : Tin Plated Copper Bar – BS EN 13601  
Support – Hot Dip Galvanized Steel with Insulator Bolt -Stainless Steel



### For Communication

Code No.	No. of Hole	Ø Stud (mm)	Busbar (mm)	Dimensions (mm)			Weight (kg)
				W	L	H	
GBCGSS-200	6	10	100 x 200 x 6	148	200	70	0.86
GBCGSS-300	11	10	100 x 300 x 6	148	300	70	1.60
GBCGSS-400	15	10	100 x 400 x 6	148	400	70	1.80
GBCGSS-450	18	10	100 x 450 x 6	148	450	70	2.40
GBCGSS-600	24	10	100 x 600 x 6	148	600	70	3.20

- Tested** : IEC 62561 - 1
- Application** : Connect ground conductor wires to earth electrode
- Material** : Tin Plated Copper Bar – BS EN 13601  
Support – Hot Dip Galvanized Steel with Insulator Bolt -Stainless Steel



## Concrete Inspection Pit

### Square Type



GXICIP

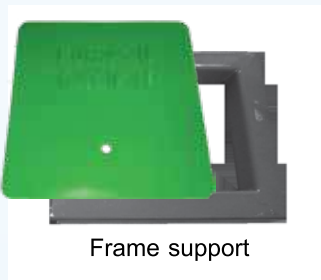


GXICIP - N



GXICIP - H

Cover



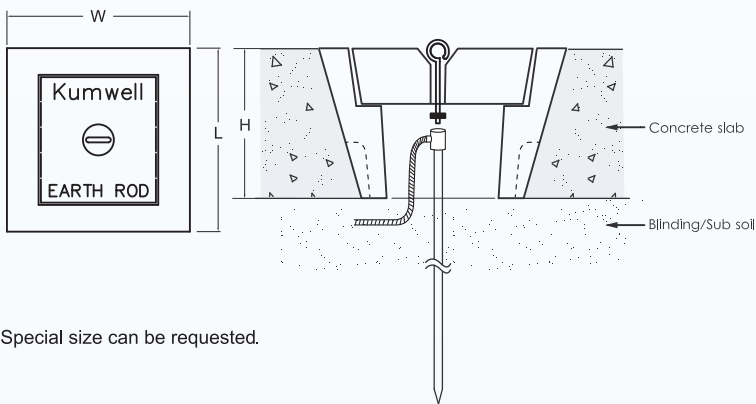
Frame support

Code No.	Dimensions (mm)			Weight (kg)
	L	W	H	
GXICIP	320	320	190	25.7
GXICIP-N	320	320	190	21.5

**Tested** : IEC 62561 - 5

**Application** : Inspection and Testing point in grounding system  
Available for high load up to 6,000 kg

**Material** : Concrete



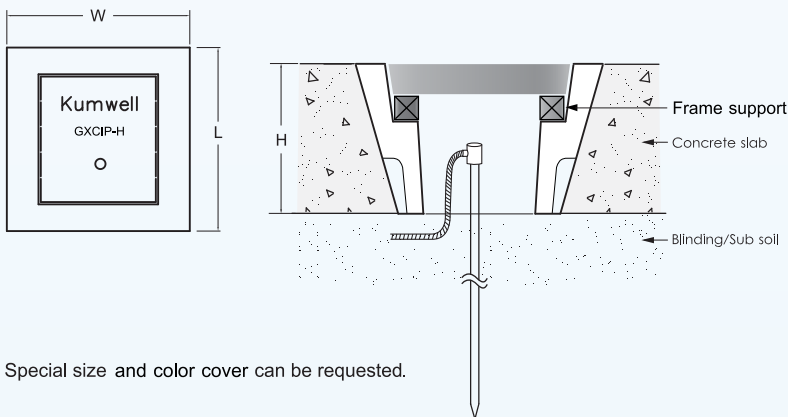
Special size can be requested.

Code No.	Dimensions (mm)			Weight (kg)
	L	W	H	
GXICIP-H	320	320	190	30.0

**Tested** : IEC 62561 - 5

**Application** : Inspection and Testing point in grounding system  
Available for high load up to 15,000 kg

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



Special size and color cover can be requested.



# Copper Earthing Electrode

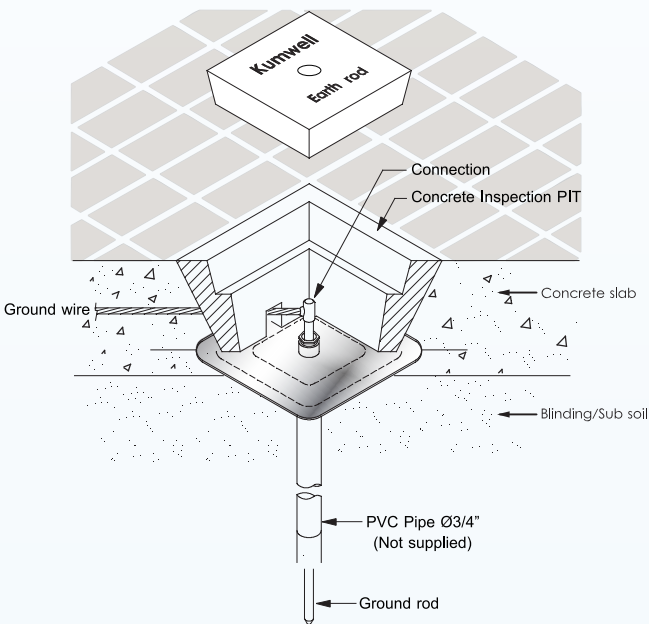
## Water Sealing Glands

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

**Tested** : IEC 62561 - 5

**Application** : Suitable for constructions where internal earth are specified

**Material** : Stainless steel



# Ground Bar Pit



Code No.	No. of Terminals	Ø Hole (mm)	Weight (kg)
GXGBP 2505	5	10	0.31
GXGBP 2507	7	10	0.30
GXGBP 3005	5	10	0.41
GXGBP 3007	7	10	0.40

**Tested** : IEC 62561 - 1

**Application** : Suitable for testing point in grounding system to separate connections with another inspection pit without welding

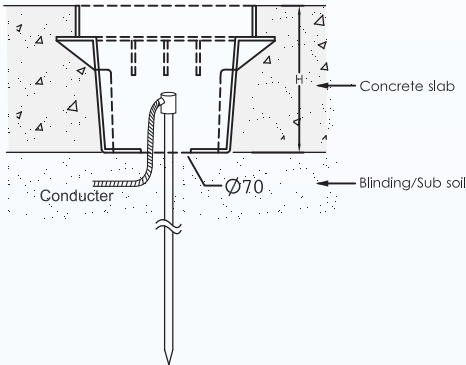
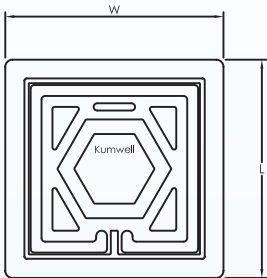
**Material** : Copper - BS EN 13601

## FRP Inspection Pit



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

- Tested** : IEC 62561 - 5
- Application** : Suitable for Inspection and Testing point in grounding system  
Available for high load up to 5000 kg.
- Material** : Heavy high-grade polypropylene

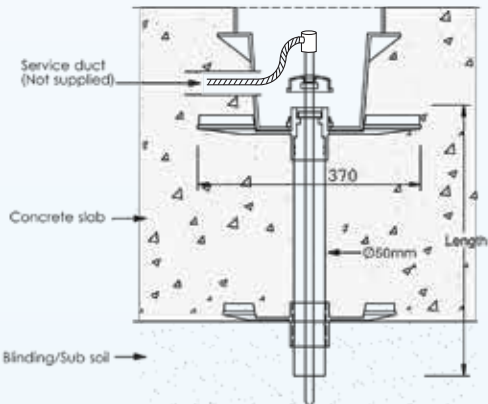
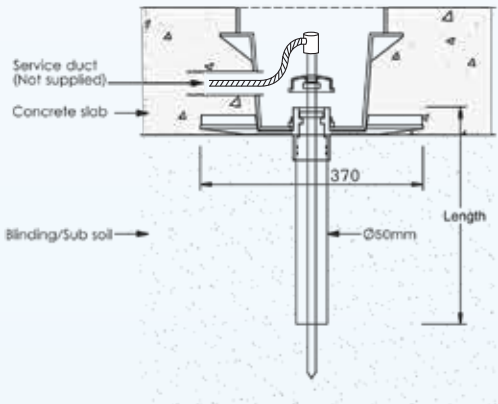


## Ground Rod Seals

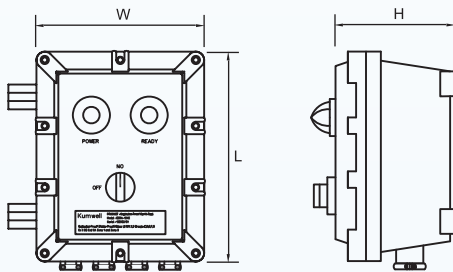


Code No.	Ø Size (mm)	Ø Rod (in)	Weight (kg)	Length (mm.)
GXCIP-WP	370	5/8 , 3/4	2.0	385
GXCIP-WPD		5/8 , 3/4	3.0	1060

- Tested** : IEC 62561 - 5
- Application** : A waterproof ground rod seal for use in constructions where internal ground are specified
- Material** : Plastic
- Note** : Please specify ground rod diameter to be used with



## Static Earth Reels Monitor and Remote Interlock Controlled



Code No.	Cable Length (m)	Dimensions (mm)			Weight (kg)
		W	L	H	
GERA 10ME	10	203	254	145	12.0
GERA 15ME	15	203	254	145	12.0
GERA 10MP	10	150	200	100	6.0
GERA 15MP	15	150	200	100	6.0

### Application :

Earth reel is an equipment for eliminating the electrostatic charges generated 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 dispenser valve thru dry contact.

### Technical specification :

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

### Housing protection

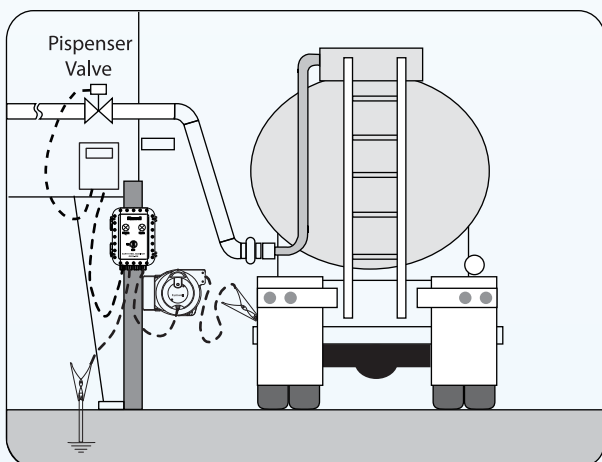
Ex environment according to ATEX : II 2G Exd IIA  
 Weatherproof : IP66

### Accessories

Cable reel - PVC ABS body  
 Cable - 3x1.5mm<sup>2</sup> to increase fraction resistance,  
 Clamp - Jaw Copper alloy / Brass sharp contacts 20 mm. opening

### Feature :

- 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



## Static Earth Reels

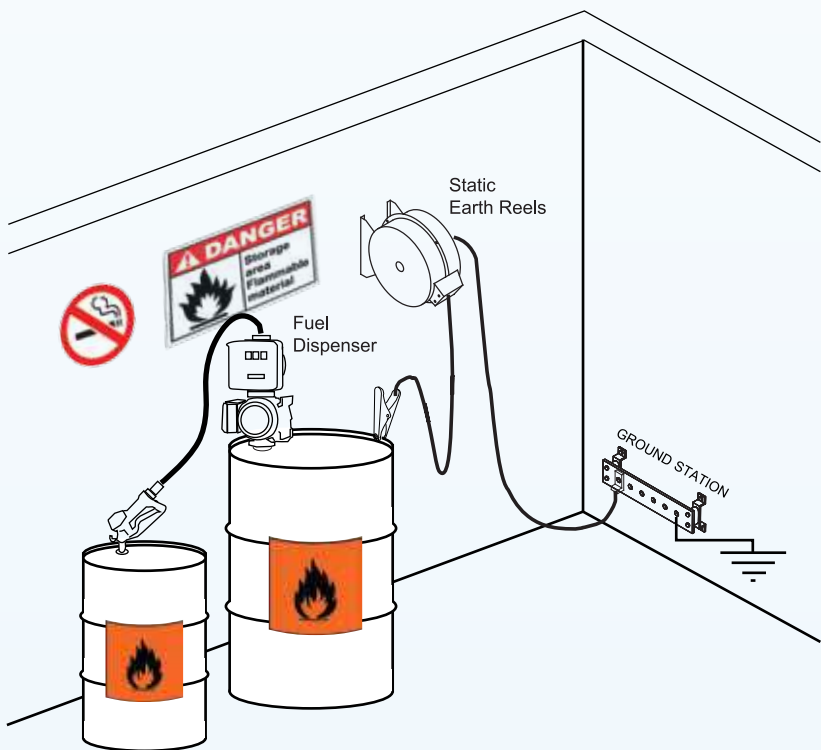
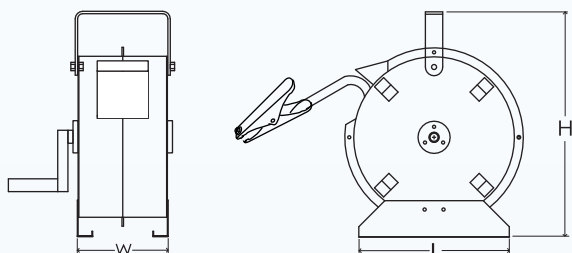


### Manual

Code No.	Cable Length (m)	Dimensions (mm)			Weight (kg)
		W	L	H	
GER 1610	10	230	310	440	14
GER 1615	15	230	310	440	20
GER 1620	20	260	310	440	25
GER 1625	25	260	310	440	27

**Application :** Discharge static electricity from airplane, gas station, petrochemical plant, etc in grounding system

**Material :** Tin Plated Copper - BS EN 13601  
Ground Clamp - Copper bond steel  
Conductor - VCT 1 Core -16 mm<sup>2</sup> diameter  
Body - Color coating Steel Plate  
- Stainless steel GER-\_\_SS can be request



## Grounding Resistance Remote Monitoring System with RTU



KIGM-GLX (MASTER)



KIGM-G1 (SLAVE UNIT)



Resistance Meters

Code No.	Dimensions (mm)			Weight (kg)
	L	W	H	
KIGM-GLX	500	400	250	20.5
KIGM-G1	200	300	250	5.0

### System Feature

- Ground resistance real time data and resistance alarm trigger send to user by mobile phone SMS
- Measurement points can connected upto 6 points for one master remote terminal unit
- Communication protocol Modbus RTU /RS 485 port
- Stainless steel enclosure with good seal for severe environment service.
- GPRS / internet / WAN/LAN can provide and customize (option).

### AREA Application

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

### RTU specification

No. of Meters for one RTU : 6 sets

Meters interface protocol : Modbus RTU / RS 485

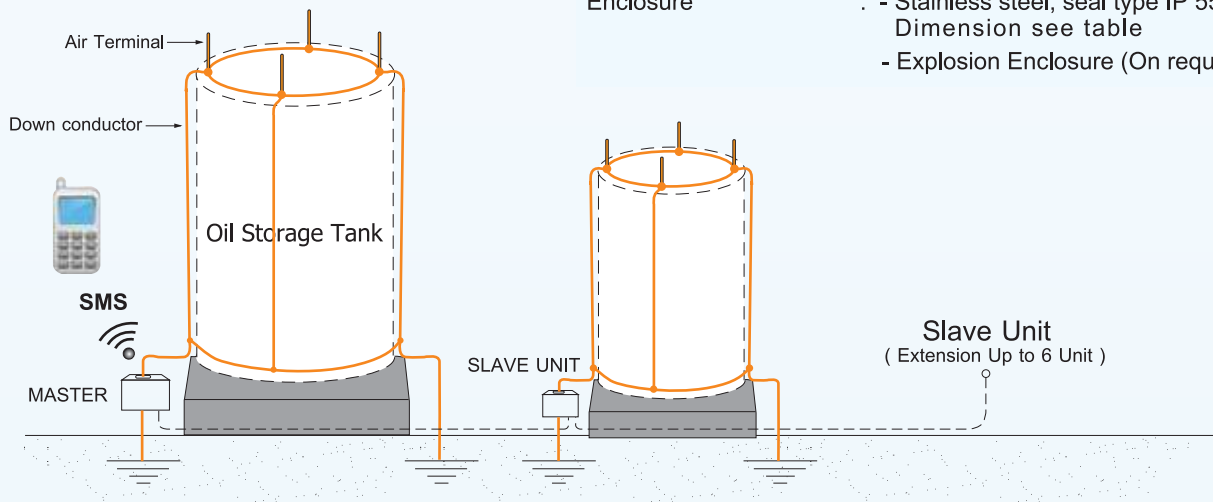
Remote communication : - Remote terminal unit GSM / GPRS  
send to mobile phone SMS

- Remote setting and command by SMS  
available

No. of remote users : 6 users

Surge protection circuit : AC / DC voltage protected included

Enclosure : - Stainless steel, seal type IP 55  
Dimension see table  
- Explosion Enclosure (On request)

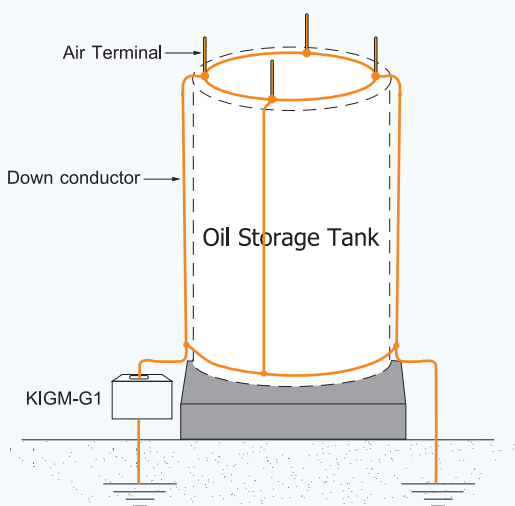




## Grounding Resistance Monitoring Meter



Enclosure



Code No.	Dimensions (mm)			Weight (kg)
	L	W	H	
KIGM-G1	200	300	250	5.0

### Meter Feature

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

### Benefits

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

### Meter Technical Specifications

Functions : Return circuit (loop) ground resistance, metallic return connection resistance

Resistance Range : 0.01Ω~200Ω : Resolution : 0.001Ω

Accuracy : 2% Reading, 3 digit

Alarm Setting Value Range : 0.01Ω~200Ω, detector panel setting

Display Mode : - 4digits LCD direct indication.  
When : - When show value is beyond 500Ω,- LCD shows “OLΩ” sign.  
- Alarm light is flashing when the measured value is beyond pre-set critical value

Single Measurement : 0.5 second  
Time

Power Supply : 9-12 VDC ; Max: 50mA.

Enclosure : Stainless steel, seal type IP 55  
: Explosion Enclosure (Option on request)

## Lightning Rod

A lightning rod is a metal rod or conductor mounted on top of a building and electrically connected to the ground through a wire, to protect the building in the event of lightning. If lightning strikes the building it will preferentially strike the rod, and be conducted harmlessly to ground through the wire, instead of passing through the building, where it could start a fire or cause electrocution.



Benjamin Franklin and his son in experiment



Blunt rods were struck by lightning

## Lightning Rod Improvement Studies

Although lightning rods have long been used to limit damage from lightning, there are currently no standards for the sharp form of these devices. Following tradition, however, sharp-tipped rods are widely installed despite evidence that, on occasion, lightning strikes objects in their vicinity. In recent tests of various tip configurations to determine which were preferentially struck by lightning, several hemispherically tipped, blunt rods were struck but none of nearby, sharper rods were hit by lightning.

Calculations of the relative strengths of the electric fields above similarly exposed sharp and blunt rods show that although fields, prior to any emissions, are much stronger at the tip of a sharp rod, they decrease more rapidly with distance.

A number of differently shaped rods were exposed to the atmospheric electric fields over South Baldy in an effort to determine which shape of lightning rod would be preferentially struck by lightning tests, sharply tipped rods were exposed, with blunter rods mounted nearby (with distance ranging from 5 to 20 m).



Thunderstorm measurement station on the South Baldy Park, New Mexico.

## Blunt End Air Terminals



### Copper

Code No.	Rod Length (L) (mm)	Rod Diameter (φ) (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 58-150	1500	15	5/8	2.40
LTAT 58-200	2000	15	5/8	3.20
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
LTAT 34-150	1500	19	3/4	3.80
LTAT 34-200	2000	19	3/4	5.00

**Tested** : IEC 62561 - 2

**Application** : Suitable for typical installation

**Material** : Copper – BS EN 13601

### Tin Plated Copper



Code No.	Rod Length (L) (mm)	Rod Diameter (φ) (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 58-150T	1500	15	5/8	2.40
LTAT 58-200T	2000	15	5/8	3.20
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
LTAT 34-150T	1500	19	3/4	3.80
LTAT 34-200T	2000	19	3/4	5.00

**Tested** : IEC 62561 - 2

**Application** : Suitable for extra high corrosive area

**Material** : Tin plated copper - BS EN 13601

### Aluminium



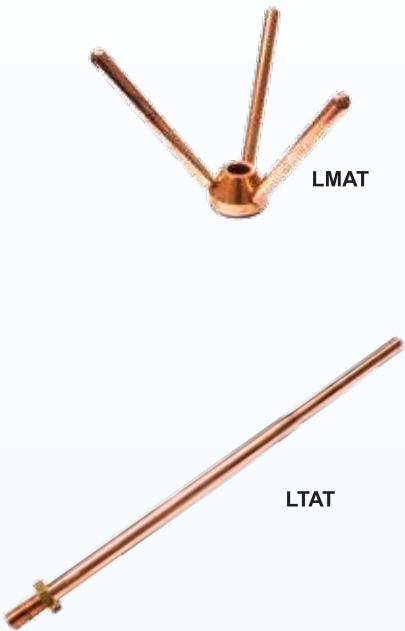
Code No.	Rod Length (L) (mm)	Rod Diameter (φ) (mm)	Thread (in)	Weight (kg)
LTAT 58-30A	300	16	5/8	0.16
LTAT 58-50A	500	16	5/8	0.27
LTAT 58-60A	600	16	5/8	0.33
LTAT 58-100A	1000	16	5/8	0.55
LTAT 58-150A	1500	16	5/8	0.82
LTAT 58-200A	2000	16	5/8	1.10

**Tested** : IEC 62561 - 2

**Application** : Suitable for installation on metal roof

**Material** : Aluminium – BS 2898

# Multi Point Air Terminals



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

Code No.	Diameter (ϕ) (in)	Material	Weight (kg)
LTAT 16-30	5/8	Copper	0.50
LTAT 16-50	5/8	Copper	0.80
LTAT 16-60	5/8	Copper	0.96
LTAT 20-30	3/4	Copper	0.75
LTAT 20-50	3/4	Copper	1.27
LTAT 20-60	3/4	Copper	1.51

Special size can be request

**Tested** : IEC 62561 - 2

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

**Material** : Blunt end - Copper BS EN 13601  
Rod - Copper BS EN 13601

## Strike Pad

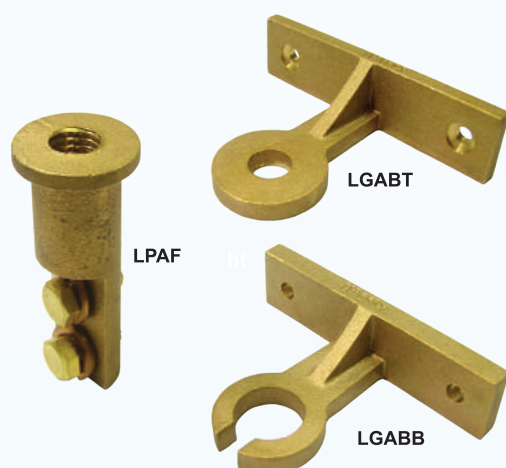


Code No.	Diameter (ϕ) (mm)	Stud Size (in)	Material	Weight (kg)
LGSP - C	112	3/8 (16 TPI)	Copper Alloy	0.38

**Application** : Suitable for side flash protection of building

**Material** : Copper Alloys – BS EN 1982

## Air Terminal Bracket



Code No.	Rod Diameter (ϕ) (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-CA	15,19	Aluminium Alloy	0.26
LGABB-CA	15,19	Aluminium Alloy	0.27
LPAF-CA	15,19	Aluminium Alloy	0.12

**Tested** : Code No. LPAF IEC 62561 - 1

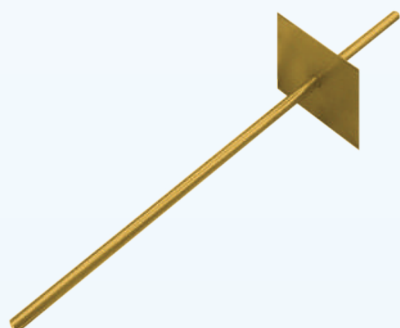
Code No. LGABT, LGABB IEC 62561 - 4

**Application** : Support air terminal by fastening on wall

**Material** : Copper Alloy - BS EN 1982, Bolt - Brass

Aluminium Alloy - BS 2898, Bolt - Stainless Steel

## Puddle Flange



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

**Tested** : IEC 62561 - 2

**Application** : Interconnecting conductors to the other level

**Material** : Copper – BS EN 13601



# Tape Saddle



Code No.	Thread Size (in)	Maximum Conductor width	Material	Weight (kg)
LTAS 58	5/8	25	Copper Alloy	0.460
LTAS 34	3/4	25	Copper Alloy	0.440
LTAS 58A	5/8	25	Aluminum Alloy	0.134
LTAS 34A	3/4	25	Aluminum Alloy	0.132

**Tested** : IEC 62561 - 1

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

**Material** : Copper Alloy – BS EN 1982  
Aluminium Alloy - BS 2898

# Round Saddle



Code No.	Thread Size (in)	Cable Size (mm²)	Material	Weight (kg)
LROS 58	5/8	50-70	Copper Alloy	0.60
LROS 34	3/4	50-70	Copper Alloy	0.60
LROS 58-C120	5/8	95-120	Copper Alloy	0.74
LROS 34-C120	3/4	95-120	Copper Alloy	0.74

**Tested** : IEC 62561 - 1

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

**Material** : Copper Alloy - BS EN 1982, Bolt - Stainless Steel

## Flat Saddle



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

**Tested** : IEC 62561 - 1  
**Application** : Support air terminal to connect with copper stranded, solid or tape conductors.  
**Material** : Copper Alloy – BS EN 1982

## Ridge Saddle



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

**Tested** : IEC 62561 - 1  
**Application** : Support air terminal to connect with copper stranded, solid or tape conductors.  
**Material** : Copper Alloy – BS EN 1982

## Double Base Saddle



Code No.	Thread Size (in)	Cable Size (mm²)	Material	Weight (kg)
LDOS 58	5/8	50-70	Copper Alloy	0.66
LDOS 34	3/4	50-70	Copper Alloy	0.66
LDOS 58C120	5/8	95-120	Copper Alloy	0.69
LDOS 34C120	3/4	95-120	Copper Alloy	0.69

**Tested** : IEC 62561 - 1  
**Application** : Support air terminal to connect with copper stranded, or solid conductors.  
**Material** : Copper Alloy - BS EN 1982, Bolt - Brass

# Cross Cable Saddle



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

**Tested** : IEC 62561 - 1

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

**Material** : Copper Alloy - BS EN 1982, Bolt - Stainless Steel

# Adjustable Saddle



## For Cable

Code No.	Thread Size (in)	Cable Size (mm <sup>2</sup> )	Material	Weight (kg)
LDAS 58	5/8	50-70	Copper alloy	0.72
LDAS 34	3/4	50-70	Copper alloy	0.72
LDAS 58-C120	5/8	95-120	Copper alloy	0.73
LDAS 34-C120	3/4	95-120	Copper alloy	0.73

**Tested** : IEC 62561 - 1

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

**Material** : Copper Alloy – BS EN 1982, Bolt - Brass

## For Tape



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

**Tested** : IEC 62561 - 1

**Application** : Support air terminal onto adjustable angle to connect with copper or aluminium tape conductors

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

## Floor Saddle



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

**Tested** : IEC 62561 - 1

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

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

## Wall Saddle



Code No.	Thread Size (in)	Cable Size (mm <sup>2</sup> )	Material	Weight (kg)
LWAS 58	5/8	50-70	Copper Alloy	0.58
LWAS 34	3/4	50-70	Copper Alloy	0.58
LWAS 58C-95	5/8	95	Copper Alloy	0.54
LWAS 34C-95	3/4	95	Copper Alloy	0.54

**Tested** : IEC 62561 - 1

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

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

# Cable Support



Code No.	Cable Size (mm²)	Material	Weight (kg)
LCAS 25-35	25-35	Copper Alloy	0.060
LCAS 50-70	50-70	Copper Alloy	0.060
LCAS 95-120	95-120	Copper Alloy	0.080
LCAS 150-185	150-185	Copper Alloy	0.110
LCAS 240-300	240-300	Copper Alloy	0.170
LCAS 25-35A	25-35	Aluminium Alloy	0.020
LCAS 50-70A	50-70	Aluminium Alloy	0.020

**Tested** : IEC 62561 - 4  
**Application** : Fix copper stranded or solid conductors  
**Material** : Copper Alloy – BS EN 1982, Bolt - Brass  
Aluminium Alloy - BS 2898, Bolt - Stainless Steel

# Cable Cross Clamp



Code No.	Cable Size (mm²)	Material	Weight (kg)
LCAC 35-70	35-70	Copper Alloy	0.32
LCAC 95-120	95-120	Copper Alloy	0.34
LCAC 150-240	150-240	Copper Alloy	0.62
LCAC 35-70A	35-70	Aluminium Alloy	0.10

**Tested** : IEC 62561 - 1  
**Application** : Connect copper stranded or solid conductors  
**Material** : Copper Alloy - BS EN 1982, Bolt - Brass  
Aluminium Alloy - BS 2898, Bolt - Stainless Steel

# Cable Test Connector



Code No.	Cable Size (mm²)	Material	Weight (kg)
LCATT 35-120	35-120	Copper Alloy	0.192
LCATT 35-120A	35-120	Aluminium Alloy	0.058

**Tested** : IEC 62561 - 1  
**Application** : Connect copper stranded or solid conductors  
**Material** : Copper Alloy - BS EN 1982, Bolt - Brass  
Aluminium Alloy - BS 2898, Bolt - Stainless Steel



## Cable to Tape



Code No.	Cable Size (mm <sup>2</sup> )	Tape Size (mm)	Material	Weight (kg)
LCTT 70-253	35-70	25x3	Copper Alloy	0.264
LCTT 120-253	95-120	25x3	Copper Alloy	0.266
LCTT 70-254	35-70	25x4	Copper Alloy	0.276
LCTT 120-254	95-120	25x4	Copper Alloy	0.292
LCTT 70-256	35-70	25x6	Copper Alloy	0.303
LCTT 120-256	95-120	25x6	Copper Alloy	0.319

**Tested** : IEC 62561 - 1

**Application** : Connect copper tape conductors with copper stranded or solid conductors

**Material** : Copper Alloy - BS EN 1982, Bolt - Brass

## One Hole Cable Grip



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

**Tested** : IEC 62561 - 4

**Application** : Fix copper stranded or solid conductors

**Material** : Copper - BS EN 13601

## Tee Clamp



Code No.	Cable Size (mm <sup>2</sup> )	Material	Weight (kg)
LTEC-A	50-70	Copper Alloy	0.146
LTEC-B	95-120	Copper Alloy	0.287

**Tested** : IEC 62561 - 1

**Application** : Connect copper stranded or solid conductors

**Material** : Copper Alloy - BS EN 1982, Bolt - Brass

# Tape Support



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

**Tested** : IEC 62561 - 4

**Application** : Fix copper or aluminium tape conductors

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

# Square Tape Support



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

**Tested** : IEC 62561 - 1

**Application** : Connect copper or aluminium tape conductors

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

## Cable-Tape Test Connector



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

Code No.	Conductor Size (Sq mm <sup>2</sup> )	Tape Size Size (mm)	Weight (kg)
LPCTTC-70253	70	25x3	0.31
LPCTTC-95253	95	25x3	0.37
LPCTTC-120253	120	25x3	0.37

**Tested** : IEC 62561 - 1

**Application** : Connect copper stranded or solid with copper tape conductors

**Material** : Copper Alloy – BS EN 1982  
Bolt - Brass

## Tape Test Connector



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

**Tested** : IEC 62561 - 1

**Application** : Connect copper or aluminium tape conductors

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

## Tape Clip



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

**Tested** : IEC 62561 - 4

**Application** : Fix copper tape conductor on flat surface

**Material** : Copper - BS EN 13601

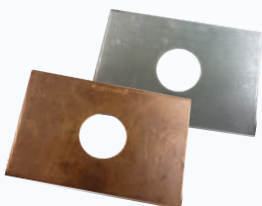
# Bi-Metallic Connector



LBMC



LBMW



LBMP

## Connector

Code No.	Material	Weight (kg)
LBMC	Copper / Aluminium	0.18

Tested : IEC 62561 - 1

## Washer

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

## Plate

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

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

**Material :** Copper / Aluminium  
Bolt - Copper Stainless Steel

# Back Plate Holdfast



Code No.	Material	Weight (kg)
LXPH-C	Copper Alloy	0.26
LXPH-A	Aluminium Alloy	0.08

Tested : IEC 62561 - 4

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

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

# Back Holdfast



Code No.	Material	Weight (kg)
LXGBH-12	Copper Alloy	0.083
LXGBH-12A	Aluminium Alloy	0.032

Tested : IEC 62561 - 4

**Application :** Support conductor onto angle steel

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

## Screw Down Test Clamp



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

**Tested** : IEC 62561 - 1

**Application** : Connect tape conductors in 4-way crossing connection

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

## Beam Clamp



Code No.	Cable Size (mm²)	Material	Weight (kg)
LBC-35-120	35-120	Copper Alloy	0.51
LBC-35-120A	35-120	Aluminium Alloy	0.15

**Tested** : IEC 62561 - 1

**Application** : Connect stranded copper or solid copper conductors onto tower structure, H-beam structure or steel structure

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

## Conductor to Rebar Clamp



Code No.	Conductor Size (mm²)	Rebar Size (mm)	Weight (kg)
LRBC 18-70	10 - 70	8 - 18	0.32

**Tested** : IEC 62561 - 1

**Application** : Hold stranded copper or solid copper conductors to rebar

**Material** : Copper Alloy – BS EN 1982  
Bolt - Brass



## Expansion Braid Bond



Code No.	Length (L) (mm)	Cross Section (mm²)	Weight (kg)
LXEBB 200	200	35	0.42
LXEBB 300	300	35	0.62

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

**Material** : High conductivity copper wire with tinned  
Bolt - Stainless Steel

## Terminal Lug



Code No.	Cable Size (mm²)	Stud Size (in)	Weight (kg)
LXTEL 35	6-35	3/16	0.10
LXTEL 70	50-70	5/16	0.15
LXTEL 120	95-120	5/16	0.24
LXTEL 185	150-185	1/2	0.35
LXTEL 300	240-300	1/2	0.60
LXTEL 500	400-500	1/2	0.80

**Tested** : IEC 62561 - 1

**Application** : Connect copper stranded or solid conductors to flat bar

**Material** : Copper Alloy – BS EN 1982  
Bolt – Silicon Bronze

## Split Bolt



Code No.	Cable Size (mm²)		Weight (kg)
	Run	Tap	
S-2/0	2/0 AWG	2/0 AWG	0.10

**Tested** : IEC 62561 - 1

**Application** : Suitable for joint copper conductors (above ground)

**Material** : Copper Alloy - BS EN 1982

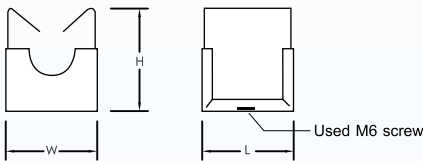
## Circular Conductors Holders



Code No.	Conductpr Size (mm)	Dimension (mm)			Weight (100/kg)
		W	L	H	
LSCH-8	8	20	22	22	1.8
LSCH-10	10	20	22	22	1.8

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

**Material :** Stainless steel 304



## Non Metallic Dc Clips

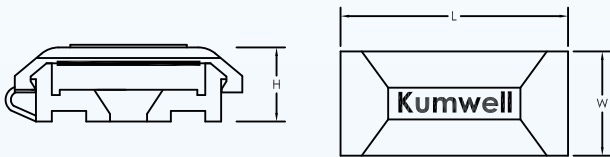


Code No.	Tape Size (mm)	Dimension (mm)			Weight (100/kg)
		W	L	H	
LNDCP 253	25x3	20	37	14	0.6
LNDCP 254	25x4	20	37	14	0.6
LNDCP 256	25x6	20	37	14	0.6
LNDCP 253PVC	25 x 3 with PVC	20	37	14	0.6

**Application :** Hold tape conductors on PVC or metal flat surface

**Material :** High grade and UV stabilized polypropylene (PP)

**Note :** Special color can be requested.



## Adhesive Base



Code No.	Base Diameter(φ) (mm)	Weight/100 (kg)
LADSB	63	2.2

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

**Material :** High grade and UV stabilized polypropylene (PP)

**Note :** Special color can be requested.

## Tape Clip with Adhesive Base



Code No.	Tape Size (mm)	Base Diameter(∅) (mm)	Weight/100 (kg)
LTCS 253	25x3	63	2.50
LTCS 254	25x4	63	2.50
LTCS 256	25x6	63	2.50
LTCS 253 PVC	25 x 3 with PVC	63	2.50

- Application** : Hold conductors on Metallic or Plastic roof
- Material** : High grade and UV stabilized polypropylene (PP)  
Bolt - Stainless steel
- Note** : Special color can be requested.

## Pyramid Holdfast



Code No.	Tape Size (mm)	Base Dimension W x L (mm)	Weight (kg)
LTPH 253	25 x 3	120 x 120	1.12
LTPH 254	25 x 4	120 x 120	1.15
LTPH 256	25 x 6	120 x 120	1.18
LTPH 253 PVC	25 x 3 with PVC	120 x 120	1.16

- Application** : Hold tape conductors on PVC or metal flat surface with recommended heavy duty glue
- Material** : High grade and UV stabilized polypropylene (PP)  
Filled-in-Concrete. Bolt - Stainless steel
- Note** : Special color can be requested.

## Accessories Adhesive



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

- Application** : Adhesive is suitable for adhesion between the adhesive base and Metallic or Plastic roof.  
  
Primer is special product for cleaning the adhesive base and material's surface before adhesion.
- Usage** : Approximately 1 tube of adhesive for 15 pieces and Primer for 50 pieces of Adhesive base

## Insulator Support



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

**Application :** Support equipment as an insulator

**Material :** High grade and UV stabilized Nylon 6

**Note :** Special color can be requested.

## Solvent Cleaning

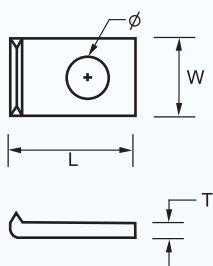


Code No.	Volume (ml)	Weight (g)
ALSC	800	700

**Application :** Clean conductor and clamp before connection

## Copper Lug for Exothermic Welding

### 1-Hole



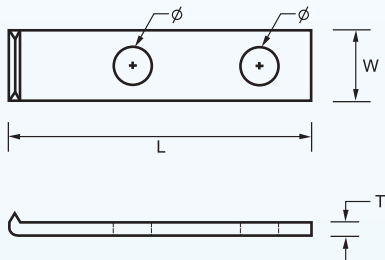
Code No.	Cable Size (mm <sup>2</sup> )	Dimensions (mm)			
		W	L	T	Ø
CL-1-25	25	25.4	40	3.2	14.2
CL-1-35	35	25.4	40	3.2	14.2
CL-1-50	50	25.4	40	3.2	14.2
CL-1-70	70	25.4	40	3.2	14.2
CL-1-95	95	25.4	40	4.8	14.2
CL-1-120	120	25.4	40	4.8	14.2
CL-1-150	150	25.4	40	6.3	14.2
CL-1-185	185	25.4	40	6.3	14.2
CL-1-240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

**Tested** : IEC 62561 - 1

**Application** : Connect copper stromded or solid conductors by exothermic welding

**Material** : Tin Plated Copper - BS EN 13601

### 2-Hole



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

**Tested** : IEC 62561 - 1

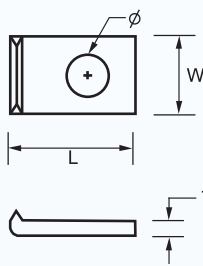
**Application** : Connect copper stromded or solid conductors by exothermic welding

**Material** : Tin Plated Copper - BS EN 13601



## Copper Lug for Exothermic Welding

### 1-Hole



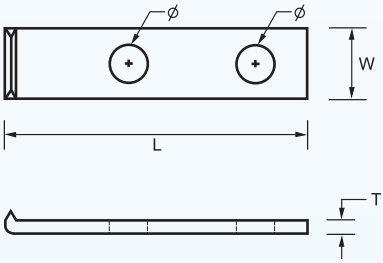
Code No.	Cable Size (mm <sup>2</sup> )	Dimensions (mm)			
		W	L	T	Ø
CL-1-25	25	25.4	40	3.2	14.2
CL-1-35	35	25.4	40	3.2	14.2
CL-1-50	50	25.4	40	3.2	14.2
CL-1-70	70	25.4	40	3.2	14.2
CL-1-95	95	25.4	40	4.8	14.2
CL-1-120	120	25.4	40	4.8	14.2
CL-1-150	150	25.4	40	6.3	14.2
CL-1-185	185	25.4	40	6.3	14.2
CL-1-240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

**Tested** : IEC 62561 - 1

**Application** : Connect copper stranded or solid conductors by exothermic welding

**Material** : Tin Plated Copper - BS EN 13601

### 2-Hole



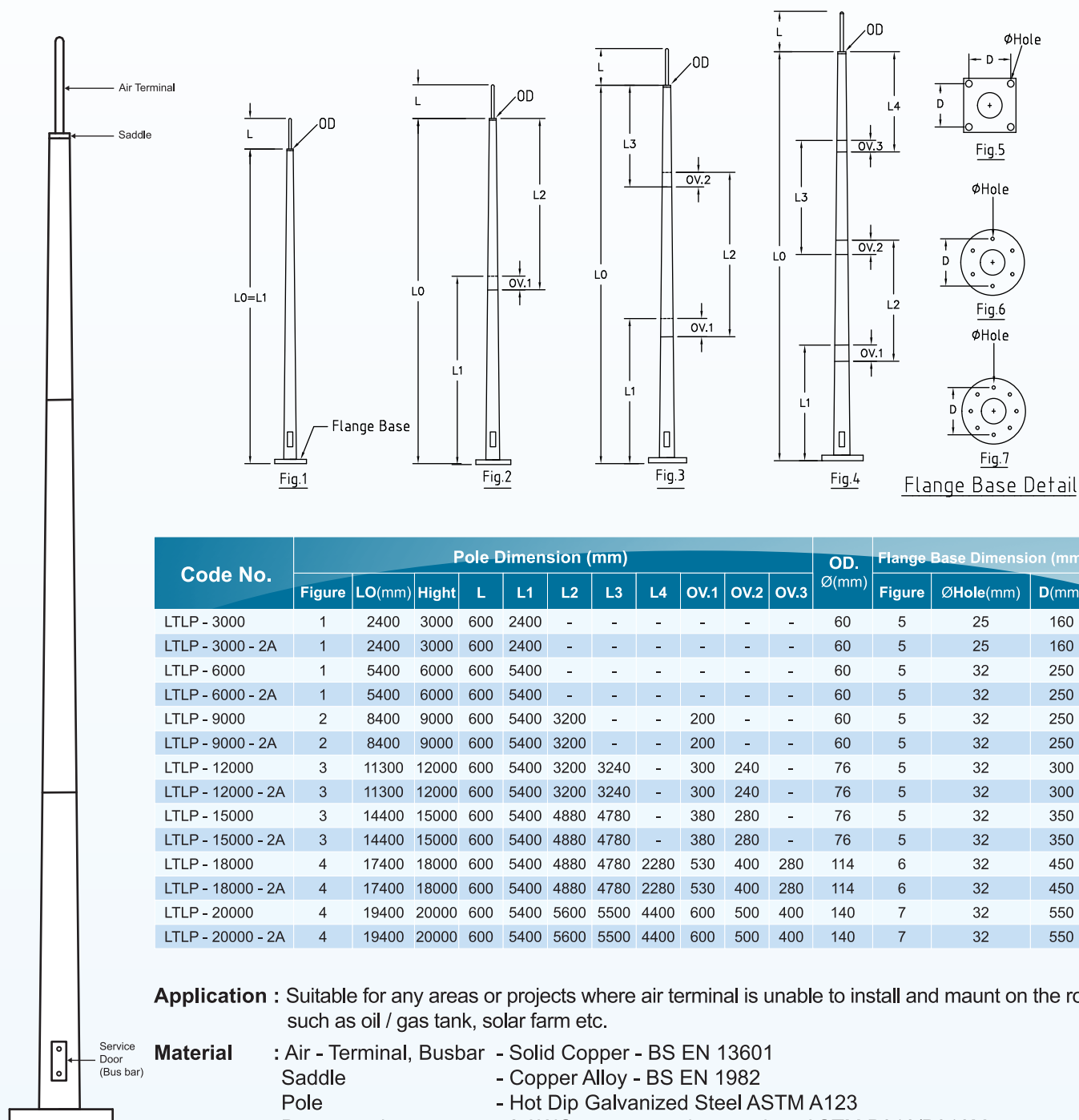
Code No.	Cable Size (mm <sup>2</sup> )	Dimensions (mm)			
		W	L	T	Ø
CL-2-25	25	25.4	85	3.2	14.2
CL-2-35	35	25.4	85	3.2	14.2
CL-2-50	50	25.4	85	3.2	14.2
CL-2-70	70	25.4	85	3.2	14.2
CL-2-95	95	25.4	85	4.8	14.2
CL-2-120	120	25.4	85	4.8	14.2
CL-2-150	150	25.4	85	6.3	14.2
CL-2-185	185	25.4	85	6.3	14.2
CL-2-240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

**Tested** : IEC 62561 - 1

**Application** : Connect copper stranded or solid conductors by exothermic welding

**Material** : Tin Plated Copper - BS EN 13601

# Lightning Pole



**Application :** Suitable for any areas or projects where air terminal is unable to install and maunt on the roof such as oil / gas tank, solar farm etc.

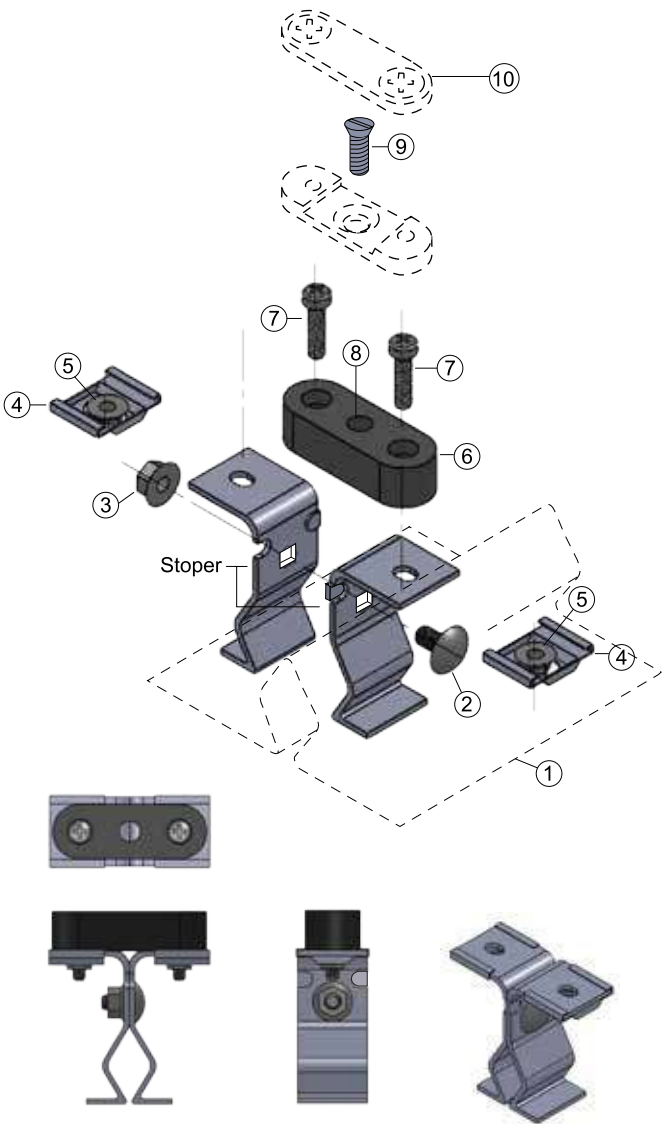
<b>Material</b>	: Air - Terminal, Busbar - Solid Copper - BS EN 13601
	Saddle - Copper Alloy - BS EN 1982
	Pole - Hot Dip Galvanized Steel ASTM A123
	Down conductor - 2 AWG. copper clad steel wire - ASTM B910/B910M

**Note** : Code No. “ LTLP - (Length) ” without down conductor  
Code No. “ LTLP - (Length) - 2A ” with 2 AWG. Copper cladd steel wire connected Air terminal end to end by Exothermic Welding.

# Metal Sheet Clamp

Kumwell has continually developed and designed Metal Sheet Clamp for easier, faster and more safety to installation on the metal sheet roof when installing lightning protection system to meet IEC62561.

We have designed it to help you to install Square Neck Bolt (no.2) and Flange Locking Nut (no.3) into the square on each side of T-Block easily and faster than ever. The Stopper also enables all accessories double locking tightly. Moreover, the Flange Locking Nut (no.5) and the Socket (no.4) are designed to prevent any accessory loosen from Metal Sheet Clamp during installation.



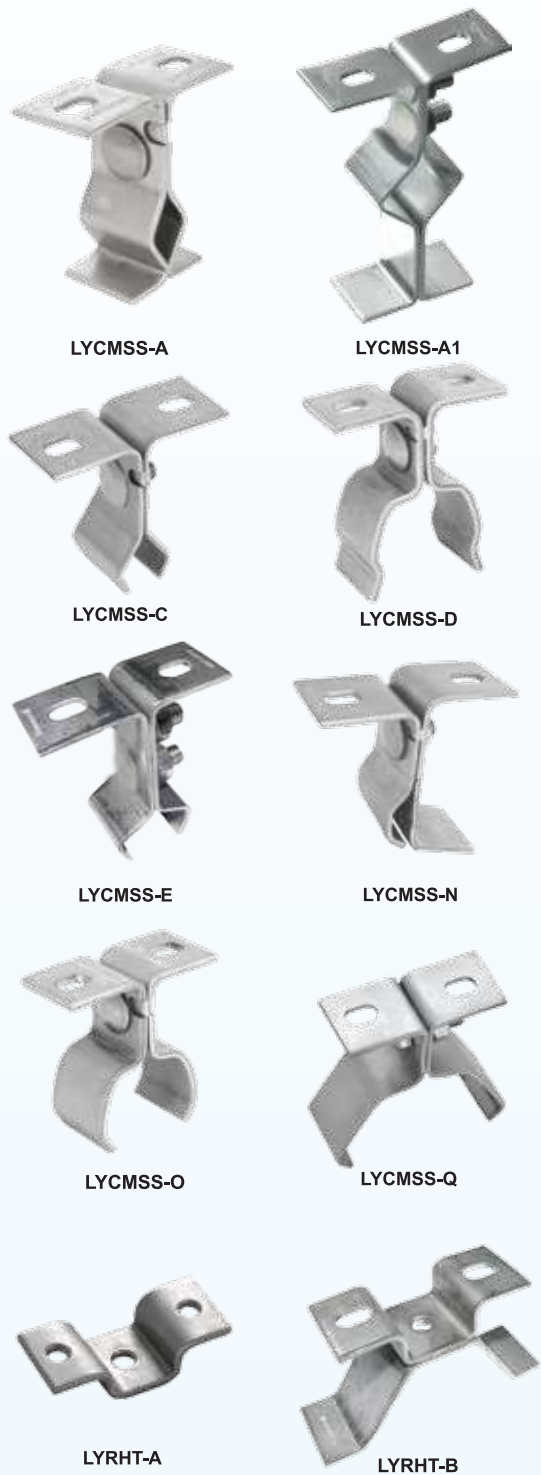
## Verification

Metal Sheet Clamp are classified in Lightning Protection System Component (LPSC) which the criteria of test shall be followed IEC 62561 Part 4 Standard: Requirement for Conductors Fastener.

- Environmental Influence Test
- Resistance to Mechanical Effects
  - 2.1 Lateral Load Test (200 N)
  - 2.2 Axial Load Test (50 N)

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

## Metal Sheet Clamp



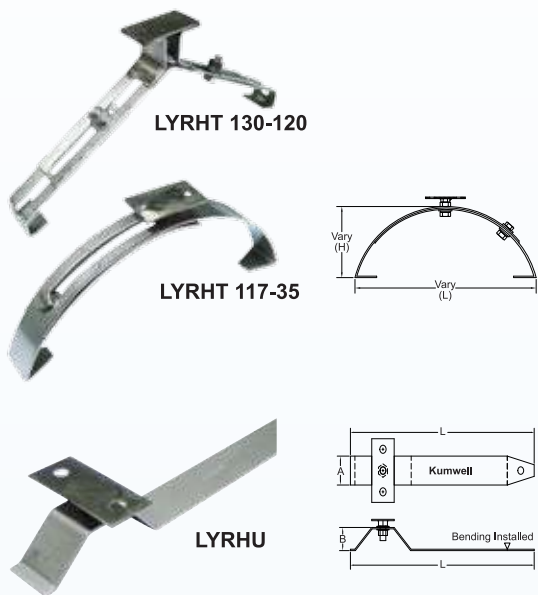
Code No.	Material	Weight (kg)
LYCMSS-A	Stainless Steel	0.09
LYCMSS-A1	Stainless Steel	0.15
LYCMSS-AA	Stainless Steel	0.09
LYCMSS-C	Stainless Steel	0.07
LYCMSS-D	Stainless Steel	0.12
LYCMSS-E	Stainless Steel	0.08
LYCMSS-N	Stainless Steel	0.08
LYCMSS-O	Stainless Steel	0.12
LYCMSS-Q	Stainless Steel	0.08
LYRHT-A	Stainless Steel	0.03
LYRHT-B	Stainless Steel	0.07

**Application :** Hold tape conductors to metal roof

**Material :** Stainless Steel  
Bolt - Stainless Steel

Special new model GI cladding can be requested.

Roof Holders



For Hip or Ridge Tiled

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

For Tile Sheet

Code No.	Dimensions (mm)			Weight (kg)
	A	B	L	
LYRHU-702	25	20	205	0.02
LYRHU-704	25	20	405	0.05

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

**Material :** Stainless Steel

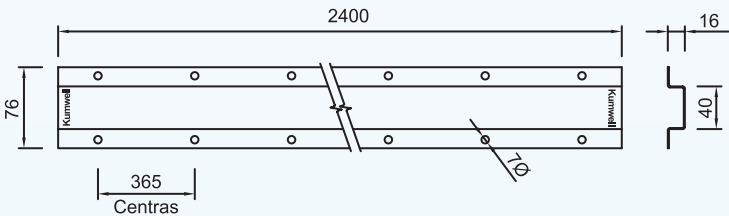
Anti-Vandal Down Conductor Guard



Code No.	Tape Size (mm)	Length (mm)	Weight (kg)
LAVCG	25 x 3, 25 x 4	2400	3

**Application :** Protect tape conductor

**Material :** Zinc-Coated Steel



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



## Tape Conductors



### Bare Copper

Code No.	Size (mm)	Size (mm <sup>2</sup> )	Weight (kg/m)	Coil Size (m)
COBCT 203	20 x 3	60	0.55	100
COBCT 253	25 x 3	75	0.67	100
COBCT 254	25 x 4	100	0.90	100
COBCT 256	25 x 6	150	1.34	25
COBCT 303	30 x 3	90	0.81	50
COBCT 304	30 x 4	120	1.07	50
COBCT 305	30 x 5	150	1.34	50
COBCT 324	32 x 4	128	1.15	50
COBCT 404	40 x 4	160	1.44	50
COBCT 405	40 x 5	200	1.78	25
COBCT 406	40 x 6	240	2.15	25
COBCT 503	50 x 3	150	1.34	20
COBCT 505	50 x 5	250	2.60	20
COBCT 506	50 x 6	300	2.68	20

**Tested** : IEC 62561 - 2

**Application** : Suitable for grounding and lightning protection

**Material** : Copper - BS EN 13601

### Tinned Copper

Code No.	Size (mm)	Size (mm <sup>2</sup> )	Weight (kg/m)	Coil Size (m)
COBCT 203T	20 x 3	60	0.55	100
COBCT 253T	25 x 3	75	0.67	100
COBCT 254T	25 x 4	100	0.90	100
COBCT 256T	25 x 6	150	1.34	25
COBCT 303T	30 x 3	90	0.81	50
COBCT 304T	30 x 4	120	1.08	50
COBCT 305T	30 x 5	150	1.34	50
COBCT 324T	32 x 4	128	1.15	50
COBCT 404T	40 x 4	160	1.43	50
COBCT 405T	40 x 5	200	1.79	25
COBCT 406T	40 x 6	240	2.15	25
COBCT 503T	50 x 3	150	1.34	20
COBCT 505T	50 x 5	250	2.24	20
COBCT 506T	50 x 6	300	2.68	20

**Tested** : IEC 62561 - 2

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

**Material** : Tin plated copper - BS EN 13601

### Bare Aluminium

Code No.	Size (mm)	Size (mm <sup>2</sup> )	Weight (kg/m)	Coil Size (m)
COBAT 253	25 x 3	75	0.20	50
COBAT 254	25 x 4	100	0.27	50
COBAT 256	25 x 6	150	0.41	50

**Tested** : IEC 62561 - 2

**Application** : Suitable for installation on metal roof in lightning protection

**Material** : Aluminium - BS 2898



## Tape Conductors



### Copper with PVC

Code No.	Size (mm)	Weight (kg/m)	Coil Size (m)
COBCT 253P	25 x 3	0.77	50
COBCT 256P	25 x 6	1.53	25
COBCT 253P-LSHF	25 x 3	0.77	50
COBCT 256P-LSHF	25 x 6	1.53	25

**Tested** : IEC 62561 - 2

**Application** : Suitable for down conductor in lightning protection

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



### Aluminium with PVC

Code No.	Size (mm)	Weight (kg/m)	Coil Size (m)
COBAT 253P	25 x 3	0.30	50
COBAT 254P	25 x 4	0.36	50
COBAT 253P-LSHF	25 x 3	0.30	50
COBAT 254P-LSHF	25 x 4	0.36	50

**Tested** : IEC 62561 - 2

**Application** : Suitable for down conductor in lightning protection

**Material** : Aluminium tape - BS 2898  
Green PVC cover with low smoke halogen free



### Copper with Lead

Code No.	Size (mm)	Weight (kg/m)	Lead-covered Thickness (mm)	Coil Size (m)
COBCTL 253	25 x 3	2.06	2	25
COBCTL 506	50 x 6	5.40	2	20

**Tested** : IEC 62561 - 2

**Application** : Suitable for high corrosion area

**Material** : High conductivity copper - BS EN 13601



### Tinned Copper with Lead

Code No.	Size (mm)	Weight (kg/m)	Lead-covered Thickness (mm)	Coil Size (m)
COBCTL 506T	50 x 6	5.40	2	25

**Tested** : IEC 62561 - 2

**Application** : Suitable for high corrosion area especially high salty or acidity

**Material** : Tin plated copper - BS EN 13601

## Circular Conductors



### Bare Copper

Code No.	Conductor (φ) (mm)	Weight (kg/m)	Coil Size (m)
COSC-8	8	0.45	50
COSC-9.5	9.5	0.65	50

**Tested** : IEC 62561 - 2

**Application** : Suitable for grounding and lightning protection conductors

**Material** : Copper – BS EN 13601



### Tinned Copper

Code No.	Conductor (φ) (mm)	Weight (kg/m)	Coil Size (m)
COSC-8T	8	0.45	50
COSC-9.5T	9.5	0.65	50

**Tested** : IEC 62561 - 2

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

**Material** : Tin Plated Copper - BS EN 13601



### Copper with PVC

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

**Tested** : IEC 62561 - 2

**Application** : Suitable for down conductor lightning protection

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



### Bare Aluminium

Code No.	Conductor (φ) (mm)	Weight (kg/m)	Coil Size (m)
COSA-8	8	6.79	50
COSA-10	10	10.60	50

**Tested** : IEC 62561 - 2

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

**Material** : Tin Plated Copper - BS 2898

## Annealed Copper-Clad Steel Wire



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

- Benefits**
- High conductivity
  - High corrosion resistance

Code No.	Cable Size		Diameter of wire (mm)	Weight (kg/km)
	AWG	mm <sup>2</sup>		
Single wire				
2AWG	2	33.62	6.54	274
WE-COSW20-50	-	50.24	8.0	402
WE-COSW20-70	-	78.5	10.0	628
7 wire strand				
WE-COSS30-016	4	16.40	1.73	91
WE-COSS30-050	1/0	53.49	3.12	440
WE-COSS30-070	7 No. 7	73.86	3.67	608
WE-COSS30-095	7 No. 6	93.09	4.11	766
19 wire strand				
WE-COSS30-120	19 No. 9	126.00	2.91	1041
WE-COSS30-150	19 No. 8	158.97	3.26	1314
WE-COSS30-240	19 No. 6	252.66	4.11	2088

**Tested** : IEC 62561 - 2 (For cable size ≥ 50 sq.mm only)  
**Material** : Annealed Copper - Clad Steel Wire - ASTM B 910/B 910 M

## Stranded Copper Conductor

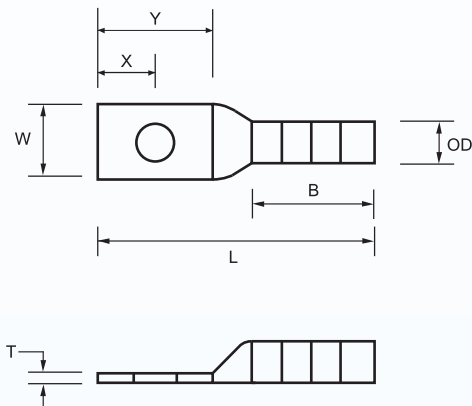


Code No.	Cable Size (mm²)	Number and Diameter of Wire (no./mm)	Approx.Weight per Mtr (kg)
COSC 010	10	7/1.35	0.09
COSC 016	16	7/1.70	0.14
COSC 025	25	7/2.14	0.23
COSC 035	35	7/2.52	0.32
COSC 050	50	19/1.78	0.43
COSC 070	70	19/2.14	0.62
COSC 095	95	19/2.52	0.86
COSC 120	120	19/2.85	1.10
COSC 150	150	37/2.25	1.33
COSC 185	185	37/2.52	1.68
COSC 240	240	61/2.25	2.20

Code No.	Cable Size (mm²)	Number and Diameter of Wire (no./mm)	Approx.Weight per Mtr (kg)
COSCS 070	70	7/3.55	0.64

**Tested** : IEC 62561 - 2 (For cable size ≥ 50 sq.mm only)  
**Material** : Copper

## Copper Lugs



### 1-Hole Copper Lugs

Code No.	Copper Conductor		Stud Size	Dimensions (in)							
	AWG / MCM	mm <sup>2</sup>		I.D	O.D	L	W	X	Y	T	B
KOH 8-6	8	-	1/4"	0.18	0.28	1.53	0.43	0.25	0.62	0.10	0.71
KOH 6-6	6	16	1/4"	0.22	0.31	1.93	0.48	0.25	0.62	0.08	1.07
KOH 4-6	4	25	1/4"	0.28	0.38	1.95	0.55	0.25	0.62	0.09	1.07
KOH 2-8	2	35	5/16"	0.31	0.42	2.27	0.66	0.32	0.76	0.10	1.16
KOH 1/0-12	1/0	50	1/2"	0.40	0.52	2.82	0.76	0.47	1.10	0.12	1.44
KOH 2/0-12	2/0	70	1/2"	0.45	0.58	3.12	0.85	0.50	1.13	0.13	1.50
KOH 3/0-12	3/0	95	1/2"	0.51	0.64	3.14	0.96	0.50	1.13	0.13	1.50
KOH 4/0-12	4/0	-	1/2"	0.58	0.71	3.24	1.06	0.50	1.13	0.14	1.56
KOH 250-12	250	120	1/2"	0.63	0.77	3.36	1.17	0.50	1.13	0.14	1.61
KOH 300-12	300	150	1/2"	0.65	0.81	3.91	1.19	0.53	1.16	0.19	2.05
KOH 350-12	350	-	1/2"	0.70	0.88	3.91	1.28	0.53	1.16	0.19	2.05
KOH 400-16	400	185	5/8"	0.76	0.95	4.14	1.41	0.66	1.35	0.19	2.17
KOH 500-16	500	240	5/8"	0.84	1.06	4.50	1.53	0.66	1.35	0.22	2.30
KOH 600-16	600	300	5/8"	0.92	1.19	5.11	1.69	0.88	1.76	0.28	2.67
KOH 750-16	750	-	5/8"	1.03	1.30	5.67	1.75	0.88	1.94	0.28	2.88
KOH 800-16	800	400	5/8"	1.05	1.35	5.67	1.89	0.88	1.94	0.29	2.88
KOH1000-16	1000	500	5/8"	1.17	1.50	6.23	2.16	0.97	2.16	0.34	2.99

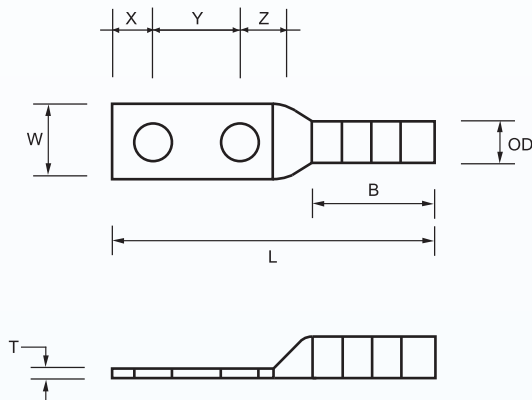
**Tested** : IEC 62561 - 1, UL 486, NEMA CC1

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

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



## Copper Lugs

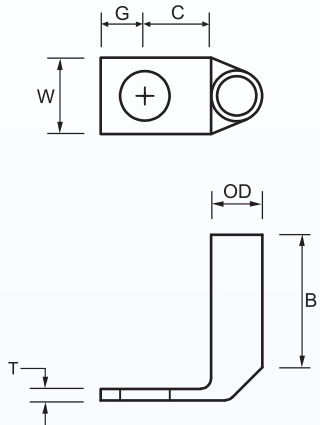


### 2-Hole Copper Lugs

Code No.	Copper Conductor		Stud Size	Dimensions (in)								
	AWG / MCM	mm <sup>2</sup>		I.D	O.D	L	W	X	Y	Z	T	B
KTH 8-6 DN	8	-	1/4"	0.18	0.28	2.16	0.43	0.25	0.63	0.37	0.10	0.71
KTH 6-6 DN	6	16	1/4"	0.22	0.31	2.56	0.48	0.25	0.63	0.37	0.08	1.07
KTH 4-6 DN	4	25	1/4"	0.28	0.38	2.58	0.55	0.25	0.63	0.37	0.09	1.07
KTH 2-8 DN	2	35	5/16"	0.31	0.42	3.02	0.66	0.36	0.75	0.44	0.10	1.16
KTH 1/0-12 DN	1/0	50	1/2"	0.40	0.52	4.90	0.76	0.63	1.75	0.63	0.12	1.44
KTH 2/0-12 DN	2/0	70	1/2"	0.45	0.58	4.98	0.85	0.63	1.75	0.63	0.13	1.50
KTH 3/0-12 DN	3/0	95	1/2"	0.51	0.64	4.98	0.96	0.63	1.75	0.63	0.13	1.50
KTH 4/0-12 DN	4/0	-	1/2"	0.58	0.71	5.13	1.06	0.63	1.75	0.63	0.14	1.56
KTH 250-12 DN	250	120	1/2"	0.63	0.77	5.23	1.17	0.63	1.75	0.63	0.14	1.61
KTH 300-12 DN	300	150	1/2"	0.65	0.81	5.80	1.19	0.63	1.75	0.63	0.19	2.05
KTH 350-12 DN	350	-	1/2"	0.70	0.88	5.80	1.28	0.63	1.75	0.75	0.19	2.05
KTH 400-12 DN	400	185	1/2"	0.76	0.95	6.05	1.41	0.63	1.75	0.75	0.19	2.17
KTH 500-12 DN	500	240	1/2"	0.84	1.06	6.11	1.53	0.63	1.75	0.75	0.22	2.30
KTH 600-12 DN	600	300	1/2"	0.92	1.19	6.77	1.69	0.63	1.75	0.75	0.28	2.67
KTH 750-12 DN	750	-	1/2"	1.03	1.30	7.05	1.75	0.63	1.75	0.75	0.28	2.88
KTH 800-12 DN	800	400	1/2"	1.05	1.35	7.05	1.89	0.63	1.75	0.75	0.29	2.88
KTH1000-12 DN	1000	500	1/2"	1.17	1.50	7.26	2.16	0.63	1.75	0.75	0.34	2.99

- Tested** : IEC 62561 - 1, UL 486, NEMA CC1
- Application** : Long barrel lugs are usable with high voltage up to 35 kV
- : Suitable for grounding and lightning protection system
- Material** : One piece seamless, high conductivity pure electrolytic copper and tin plated

## Copper Lugs



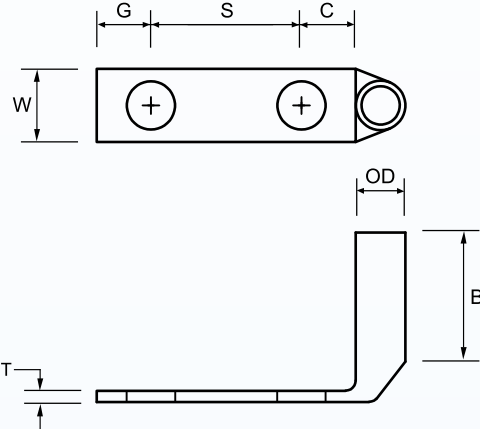
### Copper Lugs One-Hole Long Barrel 90° Pad

Code No.	Copper Conductor		Stud Size	Dimensions (in)						
	AWG / MCM	mm <sup>2</sup>		I.D	O.D	W	G	C	T	B
KOHL 8-6	8	-	1/4"	0.18	0.28	0.43	0.25	0.37	0.10	0.71
KOHL 6-6	6	16	1/4"	0.22	0.31	0.48	0.25	0.37	0.08	1.07
KOHL 4-6	4	25	1/4"	0.28	0.38	0.55	0.25	0.37	0.09	1.07
KOHL 2-8	2	35	5/16"	0.31	0.42	0.66	0.32	0.44	0.10	1.16
KOHL 1/0-12	1/0	50	1/2"	0.40	0.52	0.76	0.47	0.63	0.12	1.44
KOHL 2/0-12	2/0	70	1/2"	0.45	0.58	0.85	0.50	0.63	0.13	1.50
KOHL 3/0-12	3/0	95	1/2"	0.51	0.64	0.96	0.50	0.63	0.13	1.50
KOHL 4/0-12	4/0	-	1/2"	0.58	0.71	1.06	0.50	0.63	0.14	1.56
KOHL 250-12	250	120	1/2"	0.63	0.77	1.17	0.63	0.63	0.14	1.61
KOHL 300-12	300	150	1/2"	0.65	0.81	1.19	0.63	0.63	0.19	2.05
KOHL 350-12	350	-	1/2"	0.70	0.88	1.28	0.63	0.63	0.19	2.05
KOHL 400-16	400	185	5/8"	0.76	0.95	1.41	0.66	0.69	0.19	2.17
KOHL 500-16	500	240	5/8"	0.84	1.06	1.53	0.66	0.69	0.22	2.30
KOHL 600-16	600	300	5/8"	0.92	1.19	1.69	0.88	0.88	0.28	2.67
KOHL 750-16	750	-	5/8"	1.03	1.30	1.75	0.88	1.06	0.28	2.88
KOHL 800-16	800	400	5/8"	1.05	1.35	1.89	0.88	1.06	0.29	2.88
KOHL 1000-16	1000	500	5/8"	1.17	1.50	2.10	0.97	1.19	0.34	2.99

**Application :** Long barrel lugs are usable with high voltage up to 35 kV

**Material :** One piece seamless, high conductivity pure electrolytic copper and tin plated  
Complied with NEMA standard CC 1

Copper Lugs

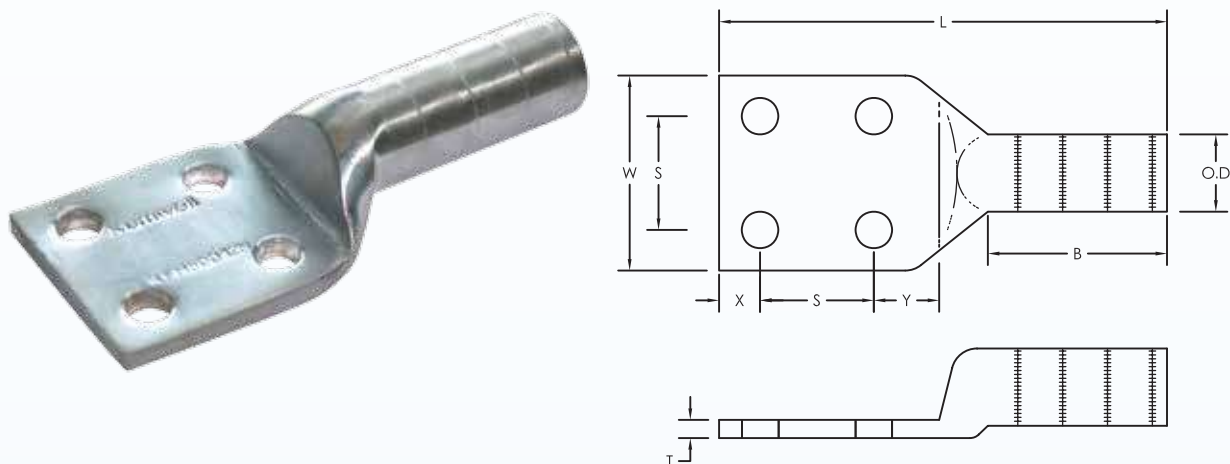


Copper Lugs Two-Hole Long Barrel 90° Pad

Code No.	Copper Conductor		Stud Size	Dimensions (in)							
	AWG / MCM	mm²		I.D	O.D	W	G	S	C	T	B
KTHL 8-6 DN	8	-	1/4"	0.18	0.28	0.43	0.25	0.63	0.37	0.10	0.71
KTHL 6-6 DN	6	16	1/4"	0.22	0.31	0.48	0.25	0.63	0.37	0.08	1.07
KTHL 4-6 DN	4	25	1/4"	0.28	0.38	0.55	0.25	0.63	0.37	0.09	1.07
KTHL 2-6 DN	2	35	5/16"	0.31	0.42	0.66	0.36	0.75	0.44	0.10	1.16
KTHL 1/0-12 DN	1/0	50	1/2"	0.40	0.52	0.76	0.63	1.75	0.63	0.12	1.44
KTHL 2/0-12 DN	2/0	70	1/2"	0.45	0.58	0.85	0.63	1.75	0.63	0.13	1.50
KTHL 3/0-12 DN	3/0	95	1/2"	0.51	0.64	0.96	0.63	1.75	0.63	0.13	1.50
KTHL 4/0-12 DN	4/0	-	1/2"	0.58	0.71	1.06	0.63	1.75	0.63	0.14	1.56
KTHL 250-12 DN	250	120	1/2"	0.63	0.77	1.17	0.63	1.75	0.63	0.14	1.61
KTHL 300-12 DN	300	150	1/2"	0.65	0.81	1.19	0.63	1.75	0.63	0.19	2.05
KTHL 350-12 DN	350	-	1/2"	0.70	0.88	1.28	0.63	1.75	0.63	0.19	2.05
KTHL 400-12 DN	400	185	1/2"	0.76	0.95	1.41	0.63	1.75	0.75	0.19	2.17
KTHL 500-12 DN	500	240	1/2"	0.84	1.06	1.53	0.63	1.75	0.75	0.22	2.30
KTHL 600-12 DN	600	300	1/2"	0.92	1.19	1.69	0.63	1.75	0.75	0.28	2.67
KTHL 750-12 DN	750	-	1/2"	1.03	1.30	1.75	0.63	1.75	0.75	0.28	2.88
KTHL 800-12 DN	800	400	1/2"	1.05	1.35	1.89	0.63	1.75	0.75	0.29	2.88
KTHL 1000-12 DN	1000	500	1/2"	1.17	1.50	2.16	0.63	1.75	0.75	0.34	2.99

- Tested** : IEC 62561 - 1, UL 486, NEMA CC1
- Application** : Long barrel lugs are usable with high voltage up to 35 kV  
: Suitable for grounding and lightning protection system
- Material** : One piece seamless, high conductivity pure electrolytic copper and tin plated

## Copper Lugs

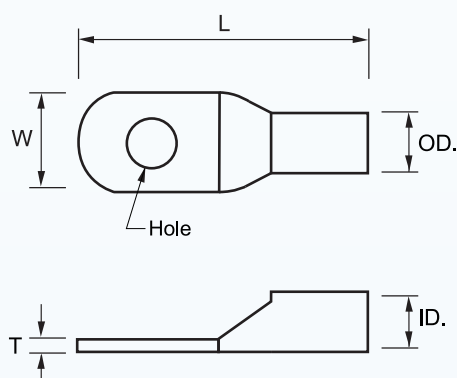


### 4 - Hole Copper Lugs

Code No.	Copper Conductor		Stud Size	Dimensions (in)									Weight (kg.)
	MCM	mm <sup>2</sup>		I.D	O.D	L	W	X	S	Y	T	B	
KFH 250-12N	250	120	1/2"	0.63	0.77	5.23	3	0.63	1.75	0.75	0.14	1.61	0.26
KFH 300-12N	300	150	1/2"	0.65	0.81	5.80	3	0.63	1.75	0.75	0.19	2.05	0.37
KFH 350-12N	350	-	1/2"	0.70	0.88	5.80	3	0.63	1.75	0.75	0.19	2.05	0.38
KFH 400-12N	400	185	1/2"	0.76	0.95	6.05	3	0.63	1.75	0.75	0.19	2.17	0.39
KFH 500-12N	500	240	1/2"	0.84	1.06	6.11	3	0.63	1.75	0.75	0.22	2.30	0.48
KFH 600-12N	600	300	1/2"	0.92	1.19	6.77	3	0.63	1.75	0.75	0.28	2.67	0.69
KFH 750-12N	750	-	1/2"	1.03	1.30	7.05	3	0.63	1.75	0.75	0.28	2.88	0.71
KFH 800-12N	800	400	1/2"	1.05	1.35	7.05	3	0.63	1.75	0.75	0.29	2.88	0.83
KFH 1000-12N	1000	500	1/2"	1.17	1.50	7.25	3	0.63	1.75	0.75	0.34	2.98	0.92
KFH 1250-12N	1250	630	1/2"	1.30	1.68	7.50	3	0.63	1.75	0.75	0.40	3.19	1.22
KFH 1500-12N	1500	-	1/2"	1.44	1.85	7.50	3	0.63	1.75	0.75	0.40	3.19	1.30
KFH 2000-12N	2000	1000	1/2"	1.67	2.14	8.16	3.06	0.63	1.75	0.75	0.46	3.44	1.66

- Tested** : IEC 62561 - 1, UL 486, NEMA CC1
- Application** : Long barrel lugs are usable with high voltage up to 35 kV  
: Suitable for grounding and lightning protection system
- Material** : One piece seamless, high conductivity pure electrolytic copper and tin plated

## Copper Lugs



### Copper Lugs Barrel Short Pad Blank

Code No.	Cable (mm²)	Hole (mm)	Dimensions(mm)					Weight (kg)
			OD.	ID.	L	W	T	
KOL 10-6	10	6.4	6.2	4.5	25	10.0	1.5	0.01
KOL 10-8		8.4				12.6		
KOL 16-6	16	6.4	7.1	5.4	30	10.0	1.5	0.01
KOL 16-8		8.4				12.6		
KOL 25-6	25	6.4	8.8	6.8	30	12.6	1.5	0.01
KOL 25-8		8.4			30	12.6		
KOL 25-10		10.5			31	15.0		
KOL 35-6	35	6.4	10.6	8.2	35	15.0	2.5	0.01
KOL 35-8		8.4				15.0		
KOL 35-10		10.5				15.0		
KOL 35-12		13				18.6		
KOL 50-8	50	8.4	12.4	9.5	43	18.0	3.0	0.02
KOL 50-10		10.5				18.0		
KOL 50-12		13				19.0		
KOL 70-8	70	8.4	14.7	11.2	50	21.0	3.4	0.04
KOL 70-10		10.5				21.0		
KOL 70-12		13				21.0		
KOL 95-8	95	8.4	17.4	13.5	55	25.5	3.4	0.06
KOL 95-10		10.5				25.5		
KOL 95-12		13				25.5		
KOL 120-10	120	10.5	19.4	15.0	60	28.0	4.0	0.06
KOL 120-12		13				28.0		
KOL 120-14		15				28.0		
KOL 120-16		17				28.0		
KOL 150-10	150	10.5	21.2	16.5	69	30.5	4.0	0.09
KOL 150-12		13				30.5		
KOL 150-14		15				30.5		
KOL 150-16		17				30.5		
KOL 185-12	185	13	23.5	18.5	78	34.0	4.5	0.12
KOL 185-14		15				34.0		0.12
KOL 185-16		17				34.0		0.11
KOL 240-12	240	13	26.5	21.0	92	38.5	5.5	0.16
KOL 240-14		15				38.5		0.16
KOL 240-16		17				38.5		0.17
KOL 240-18		19				38.5		0.17
KOL 300-12	300	13	30.0	23.5	101	43.5	6.5	0.23
KOL 300-14		15				43.5		
KOL 300-16		17				43.5		
KOL 300-18		19				43.5		
KOL 400-14	400	15	36.5	28.5	114	53.0	7.5	0.40
KOL 400-16		17				53.0		0.40
KOL 400-18		19				53.0		0.39
KOL 400-20		21				53.0		0.39
KOL 500-14	500	15	38.1	29.7	124	56.0	8.5	0.48
KOL 500-16		17				56.0		0.48
KOL 500-18		19				56.0		0.47
KOL 500-20		21				56.0		0.47

**Tested** : IEC 62561 - 1, UL 486

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

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

## Copper C-Clamp



Code No.	Cable Size (mm <sup>2</sup> )		Weight (kg)	Hydraulic crimping	
	Run	Tap		HCT-M1	HCT-P1
CCC 6-6	6-2.5	6-1.5	0.01		
CCC 10-10	10	10-1.5	0.01	MC 10	
CCC 16-16	16	16-1.5	0.02		
CCC 25-10	25	10-1.5	0.02	MC 25	
* CCC 25-25	25	25-10	0.02		
CCC 35-16	35	16-1.5	0.04	MC 35	
* CCC 35-35	35	35-10	0.04		
CCC 50-25	50	25-4	0.08		
* CCC 50-50	50	50-35	0.09	MC 70	
CCC 70-35	70	35-4	0.08		
* CCC 70-70	70	70-35	0.08		
CCC 95-35	95	35-4	0.13	MC 95	MC 95
CCC 95-70	95	70-50	0.12		
* CCC 95-95	95	95-50	0.12		
* CCC 120-120	120	120-25	0.17		
CCC 150-120	150	120-25	0.15	MC 185	MC 185
* CCC 150-150	150	150-25	0.13		
* CCC 185-95	185	95-25	0.13		
CCC 185-185	185	185-120	0.23		
CCC 240-70	240	70-35	0.22		
CCC 240-120	240	120-95	0.24		MC 240
CCC 240-240	240	240-120	0.32		

**Tested** : IEC 62561 - 1

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

**Material** : High purity copper profiles

**Note** : “ \* ” means to meet UL Listed



## Hydraulic Crimping Tool

### HCT-M1



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

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

**Application :** • Copper Lugs size 10 - 400 mm<sup>2</sup>  
• C-Clamp Code no. CCC 10 - 10 to CCC 185 - 95

### HCT-P1



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

<b>Specification :</b>	Crimping force	540	KN
	Stroke	28	mm.
	Length	380	mm.
	Weight	43.4	Kg.
	Hydraulic pump	11.4	Kg.
	Crimping tool	32	Kg.

**Application :** • Copper Lugs size 400 - 1000 mm<sup>2</sup>  
• C-Clamp Code no. CCC95-35 to CCC240-240

## References

Owner	Project Name	Distributor	Period
THAILAND	● SOUTH BANGKOK COMBINED CYCLE POWER PLANT	SINO - THAI ENGINEERING & CONSTRUCTION CO.,LTD	2009
THAILAND	● 500 KV GIS AT ON NUCH SUBSTATION UNDER BLUK POWER	SRI-U-THONG CO.,LTD.	2009
	SUPPLY FOR THE GREATER BANGKOK AREA PHASE 2		
THAILAND	● MITR PHULUANG SUGAR MILS AT LOEI	K.M.L. INTERNATIONAL CO.,LTD	2012
	● BELLE CONDOMINIUM	K.M.L. INTERNATIONAL CO.,LTD	
THAILAND	● CHANA POWER PLANT	K.M.L. INTERNATIONAL CO.,LTD	2012
	● WANGNOI POWER PLANT	K.M.L. INTERNATIONAL CO.,LTD	
THAILAND	● LOPBURI SOLAR POWER PLANT	K.M.L. INTERNATIONAL CO.,LTD	2012
THAILAND	● SUPHANBURI SOLAR POWER PLANT	K.M.L. INTERNATIONAL CO.,LTD	
THAILAND	● TOT 3 G	K.M.L. INTERNATIONAL CO.,LTD	2012
THAILAND	● MITR PHOL SUGAR MILS AT KAMPHAENGPHET	K.M.L. INTERNATIONAL CO.,LTD	
THAILAND	● BANG PA - IN POWER PLANT	K.M.L. INTERNATIONAL CO.,LTD	2012
THAILAND	● NONGSANG POWER PLANT	K.M.L. INTERNATIONAL CO.,LTD	2012
THAILAND	● CENTRAL PLAZA SURATTHANI	K.M.L. INTERNATIONAL CO.,LTD	
THAILAND	● AMATA B - GRIMM AT RAYONG	K.M.L. INTERNATIONAL CO.,LTD	2012
THAILAND	● BOONTHAVORN RAMA II	K.M.L. INTERNATIONAL CO.,LTD	
THAILAND	● SOLAR THERMAL POWER PLANT AT KANCHANABURI	K.M.L. INTERNATIONAL CO.,LTD	
THAILAND	● X - RAY BUILDING RAYONG	K.M.L. INTERNATIONAL CO.,LTD	
THAILAND	● HATYAI SUBMARINE CABLE	K.M.L. INTERNATIONAL CO.,LTD	2012
THAILAND	● 115 KV BANG PA - IN 2 - AYUTTHAYA 1	K.M.L. INTERNATIONAL CO.,LTD	
THAILAND	● P/ J THE SIAM ON THE RIVER HOTEL	K.M.L. INTERNATIONAL CO.,LTD	
THAILAND	● 115 KV, XEKONG SS&XEKHAMANE3 - XEKONG TL, LAOS	K.M.L. INTERNATIONAL CO.,LTD	
THAILAND	● BANG PA - IN SOLAR PLANT	K.M.L. INTERNATIONAL CO.,LTD	2012
THAILAND	● UBONRATCHATHANI BIOETERNAL SUBSTATION	K.M.L. INTERNATIONAL CO.,LTD	
THAILAND	● THE INTERNATIONAL CONVENTION AND EXHIBITION	K.M.L. INTERNATIONAL CO.,LTD	2012
	CENTER COMMEMORATING HIS MAJESTY'S 7 HT		
	CYCLE BIRTHDAY ANNIVERSARY		
THAILAND	● CENTRAL RAMA 9	K.M.L. INTERNATIONAL CO.,LTD	2012
THAILAND	● CENTRAL FESTIVAL SAMUL	ELMEC ENGINEERING CO.,LTD	2013
THAILAND	● S ONE PERSPECTIVE DEPARTMENT STORE AT KADRINCOME	PRECISE CORPORATION CO.,LTD	2013
THAILAND	● BOONTHAVORN RAMA 2	SECCO CO.,LTD	2013
THAILAND	● MRTA PURPLE LINE	SINO - THAI ENGINEERING & CONSTRUCTION CO.,LTD	2013
THAILAND	● CENTRAL HATYAI PROJECT	205 ENGINEERING CO.,LTD	2013
THAILAND	● PHUKET AIRPORT DEVERLOPMENT PROJECT	SINO - THAI ENGINEERING & CONSTRUCTION CO.,LTD	2013
THAILAND	● SOLAR POWER PLANT NAKHONSAWAN	AOD SUPPLY CO.,LTD	2013
THAILAND	● NONG SANG POWER PLANT	SINO - THAI ENGINEERING & CONSTRUCTION CO.,LTD	2013
THAILAND	● KANOM POWER SUBSTATION	SIEMENS CO.,LTD	2013
THAILAND	● TESCO LOTUS RDC	PROSPER ENGINEERING CO.,LTD	2013
THAILAND	● BTS BANGWA STATION	SUVIS CO.,LTD	2013
THAILAND	● CHANA POWER PLANT DEVELOPMENT	SIEMENS CO.,LTD	2013

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

## References

Owner	Project Name	Distributor	Period
OMAN	● AL KAMIL POWER PLANT	GULF RADIANT ELECTRICAL & TRADING L.L.C.	2001-2002
OMAN	● SALALAH POWER PLANT	GULF RADIANT ELECTRICAL & TRADING L.L.C.	2001-2002
OMAN	● BARKHA POWER PLANT	GULF RADIANT ELECTRICAL & TRADING L.L.C.	2001-2002
U.A.E	● DEWA PROJECT	GULF RADIANT ELECTRICAL & TRADING L.L.C.	2001-2002
U.A.E	● ADWEA PROJECT	GULF RADIANT ELECTRICAL & TRADING L.L.C.	2001-2002
INDIA	● PURULA-HYDRO POWER PLANT	TAISEI CORPORATION	2003
QATAR	● QATAR PETROLEUM GAS	GULF RADIANT ELECTRICAL & TRADING L.L.C.	2003
SUDAN	● MELUT BASIN OIL	GULF RADIANT ELECTRICAL & TRADING L.L.C.	2003
INDIA	● PURULA-HYDRO POWER PLANT	TAISEI CORPORATION	2003-2004
VIETNAM	● BINH TRIEU-HCM 110KV, PHU THO-HCM 110KV	V.T.E.C.H. ELECTRICAL TECHNOLOGY CO.,LTD.	2004
CHINA	● SHANGHAI POWER PLANT	NOVA TECHNOLOGY CO.,LTD	2004
PAKISATAN	● LPG EXTRACTION PLANT	ABB PVT.LTD.	2004
PAKISATAN	● 500KV/220 NTOC-KEKC	PACIFIC ENGINEERING CO.,LTD	2005
MALAYSIA	● 500KV T/L TRANSMISSION LINES FOR 1400MW IMAH	FUJIKURA LTD.	2005
	POWER PROJECT		
LAOS	● NAM THEUN 2 HYDRO POWER PROJECT EM2	J-POWER SYSTEMS CORPORATION	2005
	TRANSMISSION LINE		
VIETNAM	● CU MAU COMBINE CYCLE POWER PLANT PETRO	V.T.E.C.H. ELECTRICAL TECHNOLOGY CO.,LTD.	2006-2007
CHINA	● SHANTOU 500 KV SUBSTATION	NOVA TECHNOLOGY CO.,LTD	2007
CHINA	● SHI HUA YANG ZHUANG RIVER PROJECT	NOVA TECHNOLOGY CO.,LTD	2008
MALAYSIA	● HOSPITAL PETRONAS (KLCC HEALTH CARE CENTER)	HELLERMAN LETRIK SDN BHD	2008
MALAYSIA	● KUALA LUMPUR INTERNATIONAL AIRPORT (KLIA)	HELLERMAN LETRIK SDN BHD	2008
MALAYSIA	● SYSTEM MONORAIL - DEPOT, SWITCH DEPOT,STATION,	HELLERMAN LETRIK SDN BHD	2008
	TPSS, STEEL ARCH BRIDGE		2008
MALAYSIA	● CU MAU COMBINE CYCLE POWER PLANT PETRO	HELLERMAN LETRIK SDN BHD	2008
MALAYSIA	● MAXIS TELECOM MALAYSIA	HELLERMAN LETRIK SDN BHD	2008
MALAYSIA	● KTM DOUBLE TRACK PROJECT	HELLERMAN LETRIK SDN BHD	2008
INDONESIA	● INDOCEMENT	INDOCEMENT	2008
INDONESIA	● SENGKANG		
PAKISATAN	● GAS TUBINE POWER PLANT	PACIFIC ENGINEERING CO.,LTD	2008
PAKISATAN	● KABUL DISTRIBUTION ENHANCEMENT PROJECT	PACIFIC ENGINEERING CO.,LTD	2009
U.A.E	● DAWA-D.F.O. PIPELINE	GULF RADIANT ELECTRICAL & TRADING L.L.C.	2009
U.A.E	● ABU-DHABI INTERNATIONAL AIRPORT 2K	GULF RADIANT ELECTRICAL & TRADING L.L.C.	2009
	RUNWAY PROJECT		
U.A.E	● DU TELECOM TOWER CIVIL WORKS	GULF RADIANT ELECTRICAL & TRADING L.L.C.	2009
EGYPT	● EZZ-STEEL PLANT, SUEZ	DANIELI	2009
IRAQ	● US ARMY JLSC-DOHA, PROJECT IRAQ/ AFGHANISTAN	GULF RADIANT ELECTRICAL & TRADING L.L.C.	2009
IRAQ	● PIER & SEAWALL PROJECT, UMM QASR, BASRA-IRAQ	CCI INC.	2009
VIETNAM	● MAIN GAS FILLING STATION	V.T.E.C.H. ELECTRICAL TECHNOLOGY CO.,LTD.	2009
COLOMBIA	● H MV INGENIEROS LTDA. HIDRAULIC CENTRAL,	ANTIOQUIA, COLOMBIA	2009
	SANTA ROSA DE OSOS ANTIOQUIA PROJECT 2237		
COLOMBIA	● EPC 2375- EI POPAL HIDROELECTRIC PROJECT	ANTIOQUIA, COLOMBIA	2009-2013
CHINA	● YINNAN PROVINCE XIAO WAN HYDRO-POWER PLANT	NOVA TECHNOLOGY CO.,LTD	2009
CHINA	● SHANGDONG PROVINCE DEZHOU 500 KV SUBSTATION	NOVA TECHNOLOGY CO.,LTD	2009
CHINA	● REATER BANGKOK	NOVA TECHNOLOGY CO.,LTD	2009
TRINIDAD AND	● BRECHIN CASTLE SUBSTATION	PETROTRIN, PETROLIUM COMPANY OF TRINIDAD	2010
TOBAGO		AND TOBAGO LTD.	
TRINIDAD AND	● EPC REFINERY SUBSTATION PROJECT: 2312	PETROTRIN, PETROLIUM COMPANY OF TRINIDAD	2010

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

## References

Owner	Project Name	Distributor	Period
TOBAGO		AND TOBAGO LTD.	
VIETNAM	● DA NANG INTERNATIONAL AIRPORT- DANANG CITY	CNA-HTE / MIDDLE AIRPORTS CORPORATION - MAC	2010
COLOMBIA	● HMV INGENIEROS LTDA. GUANAQUITAS HIDROELECTRIC	MEDELLIN ANTIOQUIA	2010
	CENTRAL PROJECT 2259		
COLOMBIA	● PETROTRIN, PETROLIUM COMPANY OF TRINIDAD	TRINIDAD AND TOBAGO / NETHERLANDS ANTILLES	2010-2011
	AND TOBAGO LTD. EPC REFINERY SUBSTATION		
	PROJECT : 2312		
COLOMBIA	● HMV INGENIEROS LTDA. CANO LIMON- CARUARE	CARICARI	2010
	SUBSTATION PROJECT 2314		
COLOMBIA	● HMV INGENIEROS LTDA. CANO LIMON- CARIARE	SANTA MARTA COLOMBIA	2010
	SUBSTATION PROJECT 2365		
COLOMBIA	● PROJECT. 4500082313 OCCIDENTAL DE COLOMBIA, LLC	ARAUCA, COLOMBIA	2010-2013
	CANO LIMON, OIL INDUSTRIAL COMPLEX		
COLOMBIA	● OCCIDENTAL DE COLOMBIA, LLC	BAEEANCABERMEJA, COLOMBIA	2010-2013
	BARRANCABERMEJA- EL CENTRO, OIL		
	INDUSTRIAL COMPLEX		
COLOMBIA	● PETROTRIN, PETROLIUM COMPANY OF TRINIDAD	TRINIDAD AND TOBAGO / NETHERLANDS ANTILLES	2010
	AND TOBAGO LTD. BRECHIN CASTLE SUNSTATION		
COLOMBIA	● CANOLIMON -CARIARE SUBSTATION PROJECT 2314	HMV INGENIEROS L TDA.	2010
COLOMBIA	● LLC CANO LIMON, OIL INDUSTRIAL COMPLEX	OCCIDENTAL DE COLOMBIA,	2010 - 2013
COLOMBIA	● LLC BARRANCABERMEJA - EL CENTRO,	OCCIDENTAL DE COLOMBIA,	2010 - 2013
	OIL INDUSTRIAL COMPLEX		
COLOMBIA	● EEB- ALTAMIRA SUBTATION	HUILA, COLOMBIA	2010
INDONESIA	● TANJUNG TABALONG		2011
INDONESIA	● 150 KV BALAMBANO AND KAREBBE SUBSTATION	INCO	2011
COLOMBIA	● SIEMENS S.A. ISA-SE JAMONDINO	COLOMBIA	2011
	SUBSTATION.230/115 KV		
COLOMBIA	● SIEMENS S.A. SETAR SE. TARIJA, VILLAABARROA	COLOMBIA	2011
	Y LA TABLADA		
COLOMBIA	● CONSORCIO OIV TOCOMA ODEBRECHT-IMPREGILO-	PUERTO ORDAZ, VENEZUELA	2011-2013
	VINCLER TOCOMA HIDROELECTRIC PROJECT (2000 MVA)		
	RIO CARONI PTO. ORDAZ		
COLOMBIA	● ECOPETROL OIL AND GAS-CORRIENTE AL TERNA	META, COLOMBIA	2011
	PROJECT 176		
COLOMBIA	● CAM COLOMBIA (COMPANIA AMERICANA DE	META, COLOMBIA	2011-2012
	MULTISERVICIOS) PACIFIC RUBIALES CORPORATION		
COLOMBIA	● CAM COLOMBIA (COMPANIA AMERICANA DE	BOGOTA, COLOMBIA	2011
	MULTISERVICIOS) ENERSIS GROUP-ENDESA		
	PROJECT 2211		
COLOMBIA	● SIEMENS S.A. EI DORADO AIRPORT	BOGOTA, COLOMBIA	2011
COLOMBIA	● EL DORADO AIRPORT PROJECT. 4500082313	SIEMENS S.A	2011
COLOMBIA	● ENERSIS GROUP - ENDESA PROJECT 2211	CAM COLOMBIA (COMPANIA AMERICANA DE	2011
		MULTISERVICIOS)	
COLOMBIA	● PACIFIC RUBIALES CORPORATION	CAM COLOMBIA (COMPANIA AMERICANA DE	2011 - 2012
	OIL INDUSTRIAL COMPLEX.	MULTISERVICIOS)	
VENEZUELA	● TOCOMA HIDROELECTRIC PROJECT (2000 MVA)	CONSORCIO OIV TOCOMA ODEBRECHT -	2011 - 2013
	RIO CARONI PTO. ORDAZ	IMPREGILO - VINCLER	
COLOMBIA	● CENTRAL 20MW EPM-EPC SE MALENA SUBSTATION 230KV	COLOMBIA PUERTO BERRIO	2012-2013
COLOMBIA	● 2427 - NUEVA ESPERANZA SUBSTATION 115KV	COLOMBIA	

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

## References

Owner	Project Name	Distributor	Period
PAKISTAN	● LORALAI SUBSTATION/WAPDA	PACIFIC ENGINEERING	2012
COLOMBIA	● EEB 2342-SAN BERNARDINO SUBSTATION	GROUNDING LTD	2012
COLOMBIA	● EB-MOCOA SUBSTATION	GROUNDING LTD	2012
COLOMBIA	● 2227 AOM PCH. LA CASCADA SUBSTATION	GROUNDING LTD	2012
COLOMBIA	● 2486 EPC. HUACHO SUBSTATION	GROUNDING LTD	2012
COLOMBIA	● SIEMENS S.A. EEB CHIVOR II Y NORTE SUBSTATIONS	GROUNDING LTD	2012-2013
COLOMBIA	● EPC 2342-BARROSO HIDROELECTRIC	GROUNDING LTD	2012
COLOMBIA	● EPC 2342-BARROSO HIDROELECTRIC	GROUNDING LTD	2012
PAKISTAN	● GEPCO 04 SUBSTATION / WAPDA	PACIFIC ENGINEERING	2013
PAKISTAN	● GEPCO 05 SUBSTATION / WAPDA	PACIFIC ENGINEERING	2013
PAKISTAN	● MEPCO 17 / 18 SUBSTATION / WAPDA	PACIFIC ENGINEERING	2013
PAKISTAN	● HESCO SUBSTATION / WAPDA	PACIFIC ENGINEERING	2013
PAKISTAN	● FOUNDATION WIND ENERGY LTD. / JHIMPIR	PACIFIC ENGINEERING	2013
PAKISTAN	● FOUNDATION WIND ENERGY LTD. / GHARO	PACIFIC ENGINEERING	2013
PAKISTAN	● GHOTKI SUGAR MILLS / JDW	PACIFIC ENGINEERING	2013
PAKISTAN	● SIEMENS S.A. EEB CHIVOR II Y NORTE SUBSTATIONS	PACIFIC ENGINEERING	2013
COLOMBIA	● SIEMENS S.A. EEB CHIVOR II Y NORTE SUBSTATIONS	GROUNDING LTD	2013
MYANMAR	● NATIONAL GUEST HOUSE TRANSMISSION LINE PROJECT	ARKARTHIT ENTERPRISE	2013
MYANMAR	● THAPYAYWA (MEIKHTILA) - NAYPYITAW_82TMEPE	ARKARTHIT ENTERPRISE	2013
VIETNAM	● NOIBAI INTERNATIONAL AIRPORT	V.T.E.C.H. ELECTRICAL TECHNOLOGY CO.,LTD.	2013
VIETNAM	● MONG DUONG POWER PLANT	V.T.E.C.H. ELECTRICAL TECHNOLOGY CO.,LTD.	2013
VIETNAM	● NGHI SON 1 THERMAL POWER PLANT	V.T.E.C.H. ELECTRICAL TECHNOLOGY CO.,LTD.	2013
VIETNAM	● VUNG ANG THERMAL POWER PLANT	V.T.E.C.H. ELECTRICAL TECHNOLOGY CO.,LTD.	2013
VIETNAM	● PARLIAMENT BUILDING PROJECT	V.T.E.C.H. ELECTRICAL TECHNOLOGY CO.,LTD.	2013

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

## Index

<b>A</b> dhhesive Base	47
Adjustable Saddle for Cable	38
Adjustable Saddle for Tape	38
Air terminal Bracket	35
Annealed Copper - Clad Steel Wire	58
Anti - Vandal Down Conductor Guard	54
<b>B</b> ack Holdfast	44
Back Plate Holdfast	44
Beam Clamp	45
Bi - Metallic Connector	44
Blunt End Air Terminals	33
<b>C</b> able Cross Clamp	40
Cable Grid	17
Cable Support	40
Cable - Tape Test Connector	43
Cable Test Connector	40
Cable to Tape	41
Circular Conductors	57
Circular Conductors Holders	47
Clamp A Cable to Flat Bar	15
Clamp Two Cable to Flat Bar	15
Concrete Inspection Pit	25
Conductor to Rebar Clamp	45
Connector Screw Type	19
Copper - bonded Ground Rod	1
Copper - bonded Ground Rod - Standard series	2
Copper - bonded Ground Rod - Thread series	3



Copper C-Clamp	65
Copper Earthing Electrode Water Sealing Glands	26
Copper Lugs - 4 Hole	63
Copper Lugs Barrel Short Pad Blank	64
Copper Lug for Exothermic Welding	50
Copper Lugs - Long Barrel	59 - 60
Copper Lugs - Long Barrel 90° Pad	61 - 62
Coupling	4
Coupling for Solid Copper / Stainless Steel Ground Rod	6
Cross Cable Saddle	38
<b>D</b> isconnecting Link	22
Domestic Project Reference	67
Double Base Saddle	37
Driving Head	4
Driving Head for Solid Copper / Stainless Steel Ground Rod	6
<b>E</b> arth Boss	19
Earth Point	18
Electrolytic Grounding - KEG	7
Expansion Braid Bond	46
Eye Bolt	19
<b>F</b> lat Saddle	37
Flexible Copper Braid Bond	20
Floor Saddle	39
FRP Inspection Pit	27
<b>G</b> round Bar	22 - 23
Ground Bar Pit	26
Ground Clamp	17

## Index

Ground Plate - Copper - Bonded Steel	8
Ground Plate - Lattice Copper	8
Ground Plate - Solid Copper	8
Ground Rod Seals	27
Ground Rod - Solid Copper / Stainless Steel	5
Ground Station	24
Grounding Resistance Monitoring Meter	31
Grounding Resistance Remote Monitoring System with RTU	30
Grounding Test Box	21
<b>H</b> amer driving ground rod	6
Hydraulic Crimping Tool	66
<b>I</b> nsulator Support	49
International Project Reference	68 - 70
<b>L</b> ightning Pole	51
Lightning Rod	32
<b>M</b> etal Sheet Clamp	52 - 53
More Effective Grounding - MEG	10
Multi Point Air Terminals	34
<b>N</b> on Metallic Dc Clips	47
<b>O</b> ne Cable to Pipe Clamp	16
One Hole Cable Grip	41
<b>P</b> ipe Bond Clamp	16
Pipe to Cable Clamp	14
Puddle Flange	35
Pyramid Holdfast	48
<b>R</b> idge Saddle	37
Rod Cable Clamp	11
Rod Copper Tape Clamp	11

Rod or Pipe Three Cable Clamp	13
Rod or Pipe Two Cable Clamp	13
Rod to Cable Clamp	12
Rod to Cable Lug Clamp	11
Roof Holders	54
Round Saddle	36
<b>S</b> crew Down Test Clamp	45
Signal Reference Ground Grid	9
Solvent Cleaning	49
Split Bolt	46
Square Tape Support	42
Static Earth Receptacle	17
Static Earth Reels	29
Static Earth Reels Monitor and Interlock Controlled	28
Stranded Copper Conductor	58
Strike Pad	35
<b>T</b> ape Clamp	16
Tape Clip	43
Tape Clip with Adhesive Base	48
Tape Conductors	55 - 56
Tape Saddle	36
Tape Support	42
Tape Test Connector	43
Tee Clamp	41
Terminal Lug	46
Tip	4
<b>U</b> Bolt Rod Clamp	14
<b>W</b> all Saddle	39

# Kumwell

## Note