



NIROO RESAN



Earthing & Lightning



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1-Introduction

Electrical industry as an underlying and primary one has an important role in economic development and social welfare . Increasing the use of electric power and the need of speeding the information processing has changed the electrical engineering to one of the most important and popular fields of engineering and industry. Niroo-Resan Engineering & Construction group is an engineering, designing, supplying, installing, running, maintenance, and training company. This group established with the effort of board and a team of experts in electrical engineering industry field and with the purpose of presence in civil projects, industrial projects, power plant projects, refinery projects as EP, PC, EPC, EPCF, and with the purpose of participating in prosperity and development of the country. The group has found its position between competitors by means of efficient manpower and promotion of technical knowledge. In next step, Vala Electrical and Electronic Company with approved grade from Plan and Budget Organization added to this group and running the production unit of cable lug, earthing and lightening equipment, wire and cable included in working plan as production part. Niroo-Resan factory with high capability is produced different types of cable lug including copper, bimetal, full bimetal, aluminum, and different types of earthing equipment, lightening protection, secondary protection, and copper and galvanized earth wire. Due to the high importance of above mentioned equipment, this company attempts to provide all of the raw materials with purity of %99.99. The entire cable lugs manufactured by this company are competitable with domestic and foreign productions and passed successfully all the stages of required standards and quality control and received ISO certifications

9001, 14001, 45001, 10002, 10004 from IAS American company. This company is one of the approved manufacturer in ministry of power and ministry of vendor lists.

We are honored to be accountable to your orders and requests in all production fields.



Characteristics of a Good Grounding System

Low resistance and electrical impedance.

Withstanding high fault currents with no evidence of fusing or mechanical deterioration in the event of a foreseeable fault. Energy is dissipated into the ground in the safest possible way.

High frequency lightning impulses will flow through the ground electrode path. In preference to any other.

Good corrosion resistance

Electrically interconnecting many dissimilar metals in the soil environment can lead to significantly increased corrosion rates on some of the underground structures.

In addition to its inherent high conductivity copper is usually cathodic with respect to other metals in association with grounding sites.

Good electrical conductivity that causes

Mechanically robust, reliable and ability to perform for at least 40 years working life-time for a facility

Selection of Conductors and Related Corrosion Problems

When materials such as black iron (BI) cast iron (CI) and ductile iron (DI) are interconnected. They are very close together in the electromotive series of metals and therefore, each would suffer very little additional corrosion by connecting to the other metal. When a dissimilar metal couple is created by connecting BI, CI, or DI to copper or brass a significant corrosion cell is created.

Copper is electropositive with respect to all ferrous construction materials. In addition copper will not polarize readily as is the case for ferrous structures. Therefore accelerated corrosion is the result on ferrous structures whenever they are directly coupled to bare copper in the soil.

Tinning of copper has been tried by some utilities, that reduces the corrosion cell with respect to steel and zinc by about 50% and practically eliminates this potential with respect to lead.

Most electrical engineers specify copper for grounding grid since it is the preferred material of choice for electrical conductivity. However, when copper is directly buried in the soil and completely isolated from other construction materials, it will corrode.

In acidic soil conditions, the corrosion rate of copper may be greater than that of iron or steel.

Aluminum has been used for ground grid less frequently. Though at first glance the use of aluminum would seem to be a natural choice for gas insulated substation (GIS), equipment since the enclosures are made of aluminum or aluminum alloys.

Steel has been used for ground-grid conductors in many European countries mainly for the benefit of eliminating most of the adverse effects of copper already mentioned.

Application of galvanized or stainless steel in combination with cathodic protection is typical.

Solid Earth Rod

These rods are designed for use where extremely high corrosion resistance and exceptionally long life is required. When the solid rods are required, it is necessary to put them into a bore hole and back fill the hole.

These rods are manufactured from hard drawn copper with purity and mechanical properties to BS 2874, hard drawn grade C101, C102



code:NR-CU
Standard: IEC62561 , UL467

Rod Dia mm	L mm	Thread Dia. mm	PART No.
16	1200	M10	NR-CU 16/1200
16	1500	M10	NR-CU 16/1500
16	2000	M10	NR-CU16/2400
20	1200	M14	NR-CU 20/1200
20	1500	M14	NR-CU 20/1500
20	2000	M14	NR-CU 20/2400

Dowel

Manufactured from stainless steel



Code: NR-D
Standard: IEC62561 , UL467

Rod Dia mm	Thread Dia. mm	PART No.
16	M10	NR-D16
20	M14	NR-D20

Driving Head

These reusable high tensile steel driving heads are suitable for driving earth rods by hand or with a power hammer. Special driving head are used for Thread or non-Thread earth rods, but normal driving heads screws into the coupling to allow deep driving of the earth rods.

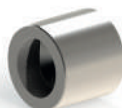


Code: NR-DH
Standard: IEC62561 , UL467

Rod Dia mm	Thread Dia. mm	PART No.
16	M10	NR-DH16
20	M14	NR-DH20

Driving Head

These reusable high tensile steel driving heads are suitable for driving earth rods by hand or with a power hammer. Special driving head are used for Thread or non-Thread earth rods.



Code: NR-SH
Standard: IEC62561 , UL467

Rod Dia mm	PART No.
16	NR-SH16
20	NR-SH20

Spike

Manufactured from high strength steel to BS 970. These spikes protect the tip of the rods



Code: NR-SH
Standard: IEC62561 , UL467

Rod Dia mm	Thread Dia. mm	PART No.
16	M10	NR-SH 16
20	M14	NR-SH 20

STAINLESS STEEL EARTH ROD & ACC.

These rods are designed for use where problems may be caused by galvanic corrosion due to dissimilar metals being buried in close proximity. In this situation a copper rod may react adversely with the buried metal, thus allowing corrosion to take place. The solution is to use stainless steel rods or austenitic stainless steel to BS 970 Grade 316S12.

Rod Dia mm	L mm	Thread Dia. mm	PART No.
16	1200	M10	NR-SS 16/1200
16	1500	M10	NR-SS 16/1500
16	2000	M10	NR-SS 16/2400
16	3000	M10	NR-SS 16/3000
20	1200	M14	NR-SS 20/1200
20	1500	M14	NR-SS 20/1500
20	2000	M14	NR-SS 20/2400
20	3000	M14	NR-SS 20/3000



code;NR-SS

Standard: IEC62561 , UL467

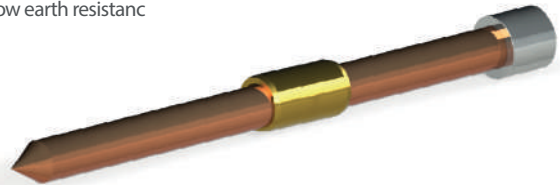
Copper Bond Earth

Copper bond earth rods are the ideal driven earth electrodes, as they offer the installer an economical and efficient earth rod grounding system. Pure electrolyte copper is uniformly molecularly bonded into a high tensile steel core to a minimum thickness of 0.254 mm, as UL1996 467) States:

"The copper jacket shall not be less than 0.010 inch (0.25mm) thick at any point and shall comply with the adherence requirement and bending requirement thus ensuring excellent corrosion resistance and eliminating electrolytic action."

Deep driven Petunia copper bond earth rods are an economical method of achieving a low earth resistance

Rod Dia mm	L mm	Actual Dia. mm	PART No.
16	1200	14.2	NR-SCU 16/1200
16	1500	14.2	NR-SCU 16/1500
20	1200	17.2	NR-SCU 20/1200
20	1500	17.2	NR-SCU 20/1500



code:NR-SCU

Standard: IEC62561 , UL467

Rod Dia mm	Thread Dia. inch	PART No.
16	5/8"	NR-C 16
20	3/4"	NR-C 20



Code: NR-C

Standard: IEC62561 , UL467

Coupling

PTS have a high copper content to ensure excellent corrosion resistance. They facilitate deep driving head, and also protect the rod threads while using the driving head. GRUN couplers are used for non-Threaded and GRU couplers are used for Threaded rods.

Rod Dia mm	Thread Dia. inch	PART No.
16	5/8"	NR-C 16
20	3/4"	NR-C 20



Code: SP

Standard: IEC62561 , UL467

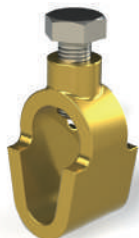
DRIVING HEAD

These reusable high tensile steel driving heads are suitable for driving earth rods by hand or with a power hammer. Special driving head are used for thread or non thread earth rods, but normal driving heads screw into the coupling to allow deep driving of the earth rods

Earth Clamps

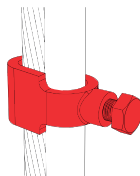
All PTS road clamps have high strength copper alloy bodies, corrosion resistance high conductivity and mechanical strength manufactured to BS 6651

Rod to Wire Clamp



Code:NR-C1

Standard: IEC62561 , UL467

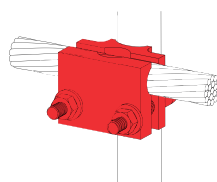


Rod Dia. mm	Conductor Range mm ²	PART No.
16	16-70	NR-C1 70/16
20	50-120	NR-C1 120/20
20	70-185	NR-C1 185/20



Code:NR-C2

Standard: IEC62561 , UL467

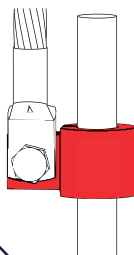


Rod Dia. mm	Conductor Range mm ²	PART No.
16-20	50-240	NR-C2



Code:NR-C3

Standard: IEC62561 , UL467



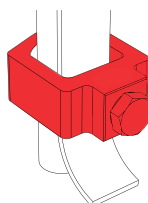
Rod Dia. mm	Conductor Range mm ²	PART No.
16	16-240	NR-C3 16
20	16-240	NR-C3 20

Rod to Tape Clamp



Code:NR-C4

Standard: IEC62561 , UL467

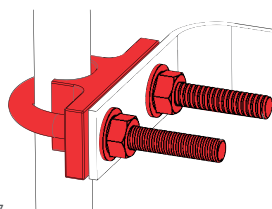


Rod Dia. mm	Conductor Range mm.mm	PART No.
16-20	20*3	NR-C4
	20*5	
	30*3	
	30*5	



Code:NR-C5

Standard: IEC62561 , UL467

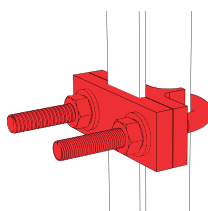


Rod Dia. mm	Conductor Range mm.mm	PART No.
16-20	20*3	NR-C5
	20*5	
	25*3	
	25*5	
	30*3	
	30*5	
	40*3	
	40*5	



Code:NR-C6

Standard: IEC62561 , UL467

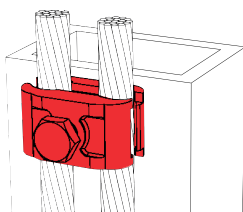


Rod Dia. mm	Conductor Range mm.mm	PART No.
16-20	20*3	NR-C6
	25*3	
	30*3	

Grounding Wire Clamp

PTS grounding clamps have high strength copper alloy bodies, corrosion resistance, high conductivity and mechanical strength, to support wires

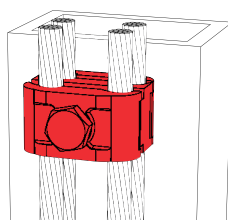
Conductor Range mm ²	Bolt Size mm	PART No.
35-185	M10	NR-SC 185
120-300	M12	NR-SC 300



Code: NR-SC
Standard: IEC62561, UL467

Double Grounding Wire Clamp

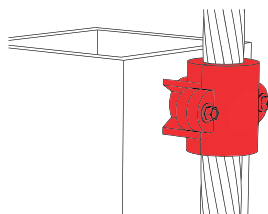
Conductor Range mm ²	Bolt Size mm	PART No.
35-185	M10	NR-DC 185
120-300	M12	NR-DC 300



Code: NR-DC
Standard: IEC62561, UL467

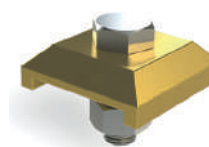
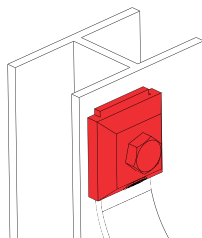
Cable Support Clamp

Conductor Range mm ²	Bolt Size mm	PART No.
70-120	M10	NR-CN 120
150-240	M12	NR-CN 240



Code: NR-CN
Standard: IEC62561, UL467

Conductor Range mm.mm	Bolt Size mm	PART No.
3*25	M10	NR-B 25*3



Code: NR-B
Standard: IEC62561, UL467

Rod Dia. mm	PART No.
25	NR-F 25
29	NR-F 29
33	NR-F 33
41	NR-F 41



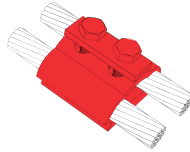
Code: NR-F
Standard: IEC62561, UL467

Parallel Connectors



Code: NR-CP

Standard: IEC62561 , UL467



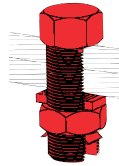
Conductor Range mm ²	Bolt Size mm	PART No.
35-70	M6	NR-CP 35/70
95-185	M8	NR-CP 95/185

Split Bolt Connectors



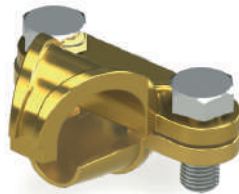
Code:NR-BC

Standard: IEC62561 , UL467



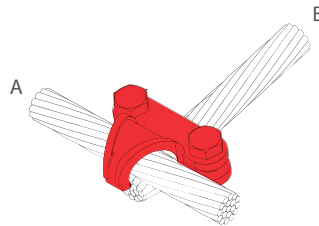
Conductor Range mm ²	PART No.
16-35	NR-BC 35
50-70	NR-BC 70
95-120	NR-BC 120
150-185	NR-BC 185

'T' Connectors



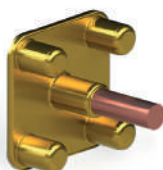
Code: NR-FC

Standard: IEC62561 , UL467



A mm ²	B mm ²	Bolt Size gr.	PART No.
35	35	M8*35	NR-FC 35/35
	50	M8*35	NR-FC 35/50
	70	M8*35	NR-FC 35/70
	95	M8*35	NR-FC 35/95
	120	M8*35	NR-FC 35/120
50	35	M8*35	NR-FC 50/35
	50	M8*35	NR-FC 50/50
	70	M8*35	NR-FC 50/70
	95	M8*35	NR-FC 50/95
	120	M8*35	NR-FC 50/120
70	35	M8*35	NR-FC70/35
	50	M8*35	NR-FC 70/50
	70	M8*35	NR-FC 70/70
	95	M8*35	NR-FC70/95
	120	M8*35	NR-FC 70/120
95	35	M8*35	NR-FC 95/35
	50	M8*35	NR-FC95/50
	70	M8*35	NR-FC 95/70
	95	M8*35	NR-FC 95/95
	120	M8*35	NR-FC95/120
120	35	M8*35	NR-FC 120/35
	50	M8*35	NR-FC 120/50
	70	M8*35	NR-FC 120/70
	95	M8*35	NR-FC 120/95
	120	M8*35	NR-FC 120/120

EARTH POINTS



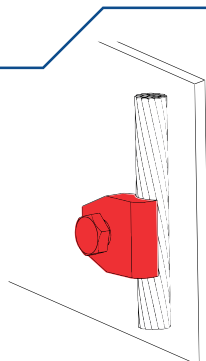
Code: NR-AR

Standard: IEC62561 , UL467

Conductor Range mm ²	PART No.
50	NR-AR 50
70	NR-AR 70

Tower Earth Clamp

Conductor Range mm ²	Bolt Size mm	PART No.
35-70	M8*35	NR-SK 70
95-185	M10*40	NR-SK 185



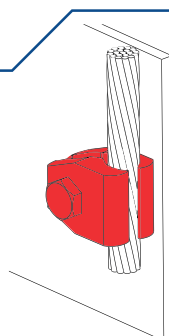
Code: NR-SK

Standard: IEC62561 , UL467



Tower Earth Clamp

Conductor Range mm ²	Bolt Size mm	PART No.
35-70	M40*8	NR-DK 70
95-185	M50*10	NR-DK 185

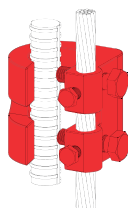


Code: NR-DK

Standard: IEC62561 , UL467

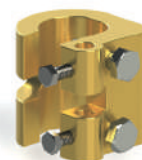


Conductor Range mm ²	Bolt Size mm	PART No.
35-35	M30*8	NR-RB 35
35-50	M30*8	NR-RB 50
35-70	M30*10	NR-RB 70



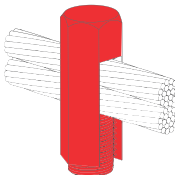
Code: NR-RB

Standard: IEC62561 , UL467



Light Bolt Connectors

Conductor Range mm ²	PART No.
10-16	NR-LS 16
25	NR-LS 25
35	NR-LS 35

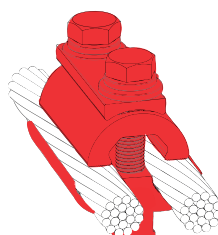


Code: NR-LS

Standard: IEC62561 , UL467



Conductor Range mm ²	Bolt Size mm	PART No.
6-95	M50*8	NR-DS 95

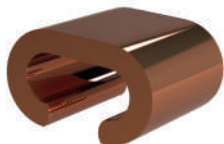


Code: NR-DS

Standard: IEC62561 , UL467

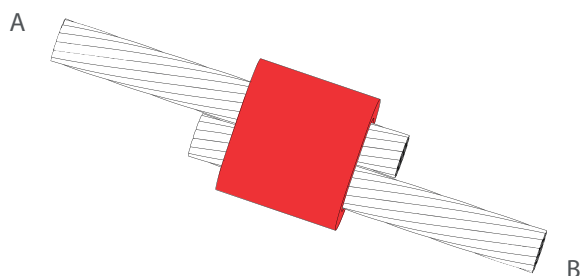
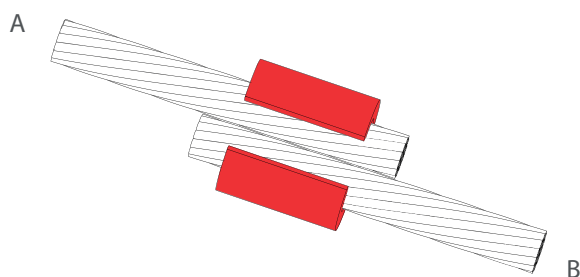


COMPRESSION CONNECTORS



Code: NR-C

Standard: BS 7430



A mm ²	B mm ²	PART No.
10	10	NR-C 20
16	10	NR-C26
	16	NR-C44
25	10	NR-C 44
	16	
	25	
35	10	NR-C 44
	16	
	25	NR-C 60
	35	NR-C76
50	10	NR-C76
	16	
	25	
	35	
70	50	NR-C 98
	10	NR-C76
	16	
	25	NR-C98
	35	
95	50	NR-C 122
	70	
	10	NR-C98
	16	
	25	
	35	NR-C122
120	50	NR-C154
	70	
	95	NR-C 240
	120	
	150	
150	16	NR-C154
	25	
	35	
	50	NR-C190
	70	
	95	NR-C 240
	120	
	150	
185	16	NR-C154
	25	
	35	
	50	NR-C190
	70	
	95	NR-C288
	120	
	150	
240	185	NR-C365
	16	NR-C240
	25	
	35	
	50	
	70	NR-C288
	95	
	120	NR-C 365

Light Bolt Connectors

For more information refer to cable log catalogue

Conductor Range mm ²	Hole Size mm	PART No.
6	6	NR- CL 6/6
	8	NR- CL 6/8
10	6	NR- CL 10/6
	8	NR- CL 10/8
16	8	NR- CL 16/8
	10	NR- CL 16/10
25	8	NR- CL 25/8
	10	NR- CL 25/10
35	8	NR- CL 35/8
	10	NR- CL 35/10
50	8	NR- CL 50/8
	10	NR- CL 50/1
70	10	NR- CL 70/10
	12	NR- CL 70/12
95	10	NR- CL 95/10
	12	NR- CL 95/12
120	10	NR- CL 120/10
	12	NR- CL 120/12
150	12	NR- CL 150/12
	14	NR- CL 150/14
185	12	NR- CL 185/12
	14	NR- CL 185/14
240	14	NR- CL 240/14
	16	NR- CL 240/16



Code:NR-CL

Standard: DIN46235

Conductor Range mm ²	Hole Size mm	Center to center mm	PART No.
50	8	25	NR-LD 50/8-25
	8	40	NR-LD 50/8-40
	10	25	NR-LD 50/10-25
	10	40	NR-LD 50/10-40
70	10	25	NR-LD 70/10-25
	10	40	NR-LD 70/10-40
	12	25	NR-LD 70/12-25
	12	40	NR-LD 70/12-40
	10	25	NR-LD 95/10-25
	10	40	NR-LD 95/10-40
	12	25	NR-LD 95/10-25
	12	40	NR-LD 95/10-40
120	10	25	NR-LD 120/10-25
	10	40	NR-LD 120/10-40
	12	25	NR-LD 120/12-25
	12	40	NR-LD 120/12-40
150	12	25	NR-LD 150/12-25
	12	40	NR-LD 150/12-40
	14	25	NR-LD 150/14-25
	14	40	NR-LD 150/14-40
185	12	25	NR-LD 185/12-25
	12	40	NR-LD 185/12-40
	14	25	NR-LD 185/14-25
	14	25	NR-LD 240/14-25
240	14	40	NR-LD 240/14-40
	16	25	NR-LD 240/16-25
	16	40	NR-LD 240/16-40



Code:NR-LD

standard' DIN 46235

Flexible Copper Earth Bond

The flexible earth bars are manufactured from pure copper wire braid in accordance with BS4109 C101. Depending on customer requests, other sizes are available.



Code: NR-FB
Standard: IEC62561 , UL467

Conductor Range mm.mm	L mm	PART No.
2*20	200	NR-FB 2022
	400	NR-FB 2024
3*20	200	NR-FB 2032
	400	NR-FB 2034
2*25	200	NR-FB 2522
	400	NR-FB 2524
3*25	200	NR-FB 2532
	400	NR-FB 2434
3*30	200	NR-FB 3032
	400	NR-FB 3034

EARTH INSPECTION PIT

Designed to protect and make available for inspection and testing the earth rods and earthing connections.

Designed to protect and make available for inspection and testing connections.



Code: NR-IP
standard: IEC62561 , UL467

Size mm.mm.mm	Conductor Size mm.mm	PART No.
320*320*230	NO	NR-IP1
320*320*230	270*50*5	NR-IP2
320*320*230	Pin Copper 5*50*270	NR-IP3
400*400*600	NO	NR-IP4
400*400*600	210*50*5	NR-IP5
400*400*600	Pin Copper 5*50*210	NR-IP6

SOLID COPPER PLATES

These solid earth plates are used as a part of an earthing system. The material is pure electrolytic copper as BS Standard . They can provide long lasting solution where earth rod are not suitable. Other dimension are available too.



Code: NR-P
Standard: IEC62561 , UL467

Size mm.mm.mm	PART No.
660*660*3	NR-P 663
660*660*5	NR-P 665
1000*660*3	NR-P 1063
1000*660*5	NR-P 1065

Earth Equipotential Mats

These mats are used on top of finish and directly below the operator's normal standing position for manually operating disconnect switches



Code: NR-M
Standard: IEC62561 , UL467

Size mm mm.mm	Conductor Size mm.mm	PART No.
800*500*20	20*3	NR-M 852
800*500*30	30*3	NR-M 853
1000*500*20	20*3	NR-M 1052
1000*500*30	30*3	NR-M 1053

Backfill

One method of reducing the ground bed resistance is to surround the rod electrodes with low resistivity soil, this work has several advantages: Reduce the resistance between conductors and soil. Provide a uniform environment so that the conductors output is predictable and constant the backfill has not organic acids and anaerobic bacteria, consequently reduces rate of corrosion in the neighborhood of rods.



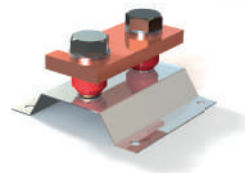
weight	name	PART No.
15 kg	carbon besed	CB 15
15 kg	bentonit besed	BB 15
15 kg	super bentonit	SB 15
15 kg	Active bentonit	AB 15
15 kg	bentonite	PB 15

DISCONNECTING LINK

The disconnecting link is mainly used to offer a temporary break in the connection to earth allowing the testing of an earth rod whilst disconnecting from the lightning protection system.

Bus Bar Size mm.mm.mm	PART No.
120*30*3	NR-T 1/1 *A
120*50*5	NR-T 1/1 *B

Code: NR-T



standard:IEC62561 . UL467

Type	Bus Bar Size mm.mm.mm	PART No.
2	160*30*3	NR-T2
3	200*30*3	NR-T3
4	240*50*5	NR-T 4
5	280*50*5	NR-T 5
6	320*50*5	NR-T 6
8	440*50*5	NR-T 8
10	520*50*5	NR-T10
12	600*50*5	NR-T 12

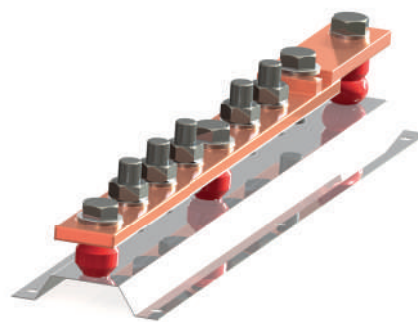
Code: NR-T



standard:IEC62561 . UL467

Type	Bus Bar Size mm.mm.mm	PART No.
3	275*50*5	NR-T 3/1
4	315*50*5	NR-T4/1
5	355*50*5	NR-T 5/1
6	395*50*5	NR-T 6/1
8	515*50*5	NR-T 8/1
10	595*50*5	NR-T 10/1
12	675*50*5	NR-T 12/1

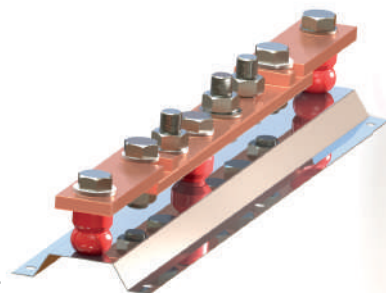
Code: NR-T



standard:IEC62561 . UL467

Type	Bus Bar Size mm.mm.mm	PART No.
3	350*50*3	NR-T 3/2
4	390*50*4	NR-T 4/2
5	430*50*5	NR-T 5/2
6	470*50*6	NR-T 6/2
8	590*50*8	NR-T 8/2
10	670*50*10	NR-T 10/2
12	750*50*12	NR-T 12/2

Code: NR-T

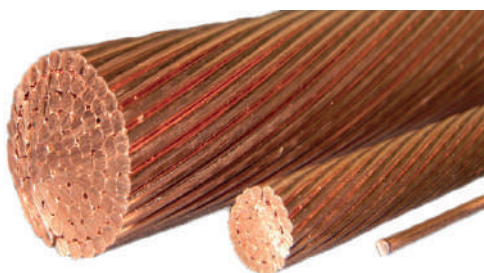


standard:IEC62561 . UL467

CONDUCTORS

All of following stranded PVC/Coated BARE copper conductors are manufactured in accordance with the relevant standards.

Bare Stranded Copper Conductors

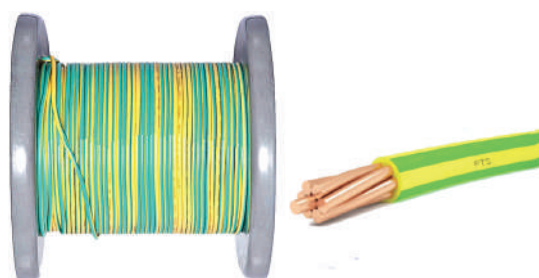


Code: NR-SC

Standard: IEC 60228

Bus Bar Size mm ²	PART No.
16	NR-CW 016
25	NR-CW 025
35	NR-CW 035
50	NR-CW 050
70	NR-CW 070
95	NR-CW 095
120	NR-CW 120
150	NR-CW 150
185	NR-CW 185
240	NR-CW 240

Yellow/Green PVC Coated Stranded Copper Conductors



Code: NR-SC

Standard: IEC 60228

Conductor Range mm ²	PART No.
16	NR-YW 016
25	NR-YW025
35	NR-YW 035
50	NR-YW 050
70	NR-YW 070
95	NR-YW 095
120	NR-YW 120
150	NR-YW150
185	NR-YW 185
240	NR-YW240

Flat Copper Tape

Copper tapes are used in both earthing and lightning protection systems. They are manufactured to BS 1432 C101/C103



Code: NR-SC

Standard: BS EN 13601

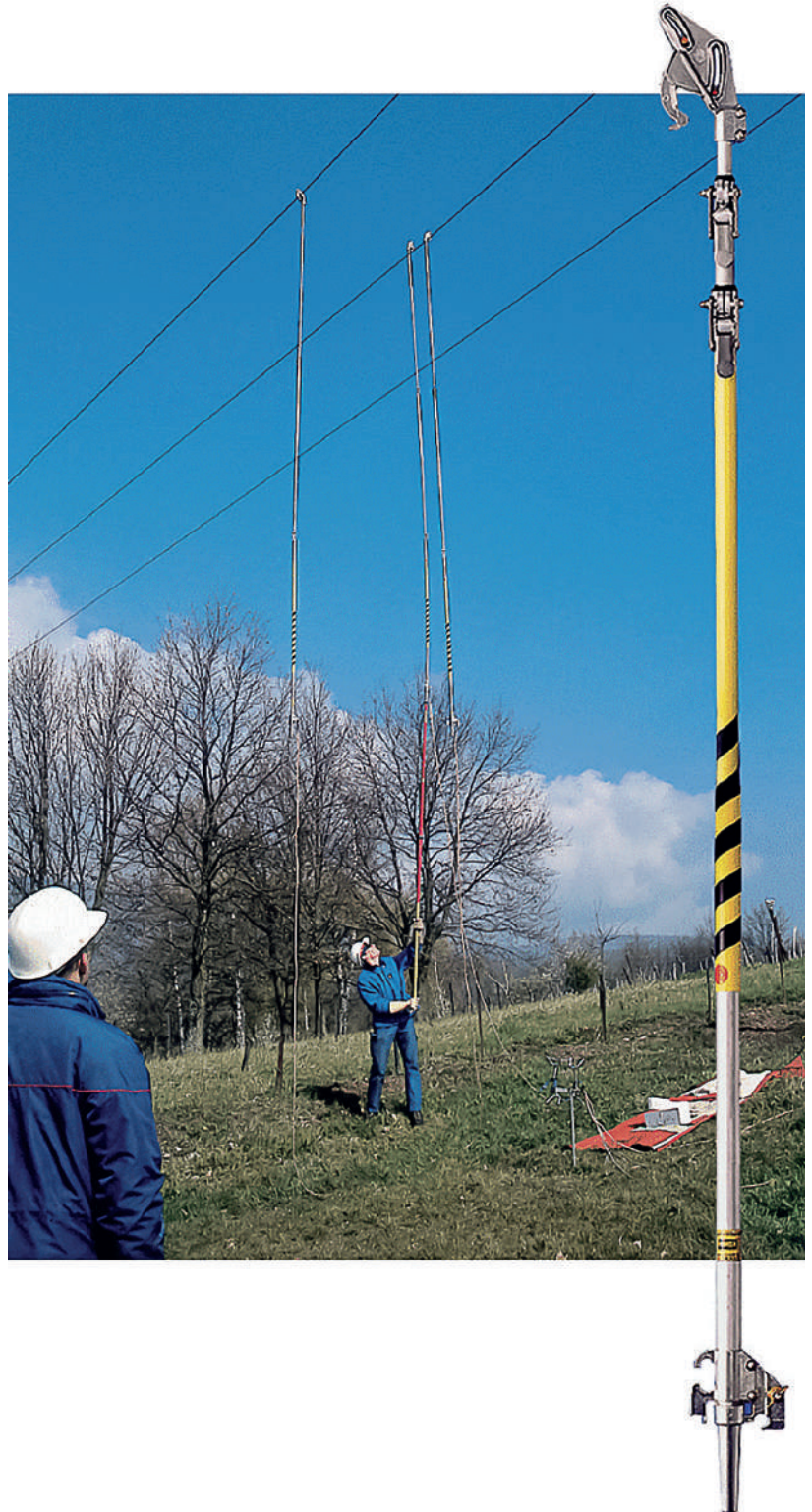
Conductor Size mm.mm	PART No.
20*3	NR-TP 20*3
25*3	NR-TP 25*3
30*3	NR-TP 30*3
50*5	NR-TP 50*5
60*5	NR-TP 60*5

Temporary Earthing System

Temporary grounding devices are hand-held equipment that brought and connected to the connecting points of electrical instigations for earthing and it permits conductors to be earthed as well as short circuit.

PTS is manufacturer of an acceptable range of temporary earthing devices for 20KV

up to 400KV, and maximum 40KA, 0.5sec. Short circuit current. Temporary devices as well as the matching connection points on the conductor and on the conductor and on the earthing system, must be designed to withstand the rated short-circuit current of the respective electrical installation.



Lightning Protection System

Lightning Protection System Introduction

Early Streamer Emission Air Terminal (ESE)

Early Streamer Emission Air Terminal (ESE), Pulsating emitter lightning conductor are characterized by reaching to the approach of lightning, capturing it before any other element within its protection zone in order to conduct the lightning current to earth via a safe path "The standard name of this advance is "Advance Time (Dt)". It determines the radius of protection of the air terminal and must be tested and certified by official and therefore independent laboratories. It is essential for these tests to be protected by lightning current withstanding tests, with the aim of proving that the air terminal is not perishable and works after numerous lightning discharges.

Also, an ESE lightning conductor must remain operative in bad weather conditions, since it would become ineffective if short-circuited by rain. Equipped with triple insulating system protector, stepped electrostatic charge accumulator, upward streamer electronic generator and multiple spark-gap. Wholly made of stainless steel type AISI316-, no need for an unnatural power supply.

Lightning Protection System installation must comply with the UNE 21186 Standard (Protection of Structures, building and open areas with early streamer emission air terminals), maintaining security distances, using proper materials and always searching for the safest and most direct way to conduct lightning currents from the air termination system to the earth termination system. The earth termination system must be able to disperse the high lightning currents rapidly, thus making low resistance and enduring characteristics necessary.



Air Rod Base

These saddles are used for supporting air rods onto the roof network of the lightning protection system and connecting the down conductor to the air rods.



code:NR-AT
standard: IEC62561 . UL467

Rod Dia. mm	L mm	PART No.
16	500	NR-AT 500/16
16	1000	NR-AT 1000/16
16	1200	NR-AT 1200/16
16	1500	NR-AT 1500/16
16	2000	NR-AT 2000/16
20	500	NR-AT 500/20
20	1000	NR-AT 1000/20
20	1200	NR-AT 1200/20
20	1500	NR-AT 1500/20
20	2000	NR-AT 2000/20



Code: NR-MT
Standard: IEC62561 . UL467

Rod Dia. mm	L mm	PART No.
16	500	NR-MT 500/16
16	1000	NR-MT 1000/16
16	1200	NR-MT 1200/16
16	1500	NR-MT1500/16
16	2000	NR-MT 2000/16
20	500	NR-MT 500/20
20	1000	NR-MT1000/20
20	1200	NR-MT 1200/20
20	1500	NR-MT1500/20
20	2000	NR-MT2000/20

Rod Dia. mm	Conductor Range mm ²	Threaded Size mm	PART No.
16	35	M 16	NR-BB 35/16
	50	M16	NR-BB 50/16
	70	M16	NR-BB 70/16
	95	M16	NR-BB 95/16
	120	M16	NR-BB 120/16
20	185	M16	NR-BB 185/16
	35	M20	NR-BB 35/20
	50	M20	NR-BB 50/20
	70	M20	NR-BB 70/20
	95	M20	NR-BB 95/20
	120	M20	NR-BB 120/20
	185	M20	NR-BB 185/20



Code:NR-BB

Standard: IEC62561 . UL467

Rod Dia. mm	Conductor Range mm.mm	Threaded Size mm	PART No.
16	20*3	M 16	NR-BB 16/25*3
	20*3	M16	NR-BB 16/25*3
	30*3	M16	NR-BB 16/30*3
20	20*3	M20	NR-BB 20/25*3
	25*3	M20	NR-BB 20/25*3
	30*3	M20	NR-BB 20/30*3



Code:NR-BB

Standard: IEC62561 . UL467

Rod Dia. mm	Conductor Range mm.mm	Threaded Size mm	PART No.
16	20*3	M 16	NR-BB1 16/25*3
	25*3	M16	NR-BB1 16/25*3
20	20*3	M20	NR-BB1 20/25*3
	25*3	M20	NR-BB1 20/25*3



Code:NR-BB1

Standard: IEC62561 . UL467

Rod Dia. mm	Conductor Range mm ²	Threaded Size mm	PART No.
16	35	M 16	NR-BB2 16/35
	50	M16	NR-BB2 16/50
	70	M16	NR-BB2 16/70
	95	M16	NR-BB2 16/95
	120	M16	NR-BB2 16/120
	185	M16	NR-BB2 16/185
20	35	M20	NR-BB2 20/35
	50	M20	NR-BB2 20/50
	70	M20	NR-BB2 20/70
	95	M20	NR-BB2 20/95
	120	M20	NR-BB2 20/120
	185	M20	NR-BB2 20/185



Code:NR-BB2

Standard: IEC62561 . UL467

Rod Dia. mm	Conductor Range mm.mm	Threaded Size mm	PART No.
16	3	M 16	NR-BB3 16/25*3
	3	M16	NR-BB3 16/25*3
	3	M16	NR-BB3 16/30*3
20	3	M20	NR-BB3 20/25*3
	3	M20	NR-BB3 20/25*3
	3	M20	NR-BB3 20/30*3



Code:NR-BB3

Standard: IEC62561 . UL467

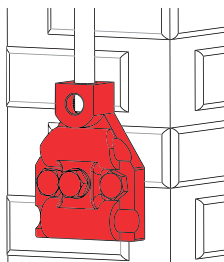
Air Rod Wall Base

Used for fixing air rods onto the wall network of the lightning protection system and connecting the down wire to the air rods



Code:NR-WB

Standard: IEC62561 . UL467



Rod Dia. mm	Conductor Range mm ²	Threaded Size mm	PART No.
70	10-50	M 10	NR-WB1
70	12-50	M12	NR-WB2

DC Tape Clamp

Brackets provide projection from the building face. Conjunction with the side mounting brackets is made with the air rod to tape coupling



Code: NR-L

Standard: IEC62561 . UL467

Rod Dia. mm	Rod Coupler mm	PART No.
16	16	NR-L 16
20	20	NR-L 20



Code: NR-CL

Standard: IEC62561 . UL467

Rod Dia. mm	Rod Coupler mm	PART No.
16	16	NR-CL 16
20	20	NR-CL 20

Standing Masts

The masts are produced with high quality hot deep galvanized in accordance with relevant international standards.

L m	PART No.
2	NR-M 2
3	NR-M 3
4	NR-M 4
5	NR-M 5
6	NR-M 6
8	NR-M 8
10	NR-M10

Code: NR-M

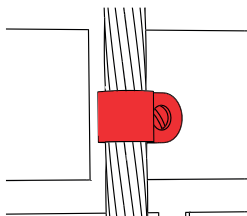
Standard: ASTM A123



Lightning Protection Clamp

One Hole Cable Clip

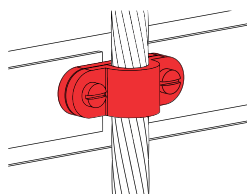
Conductor Range mm ²	Material	PART No.
35	Copper	NR-W1 35
50	Copper	NR-W1 50
70	Copper	NR-W1 70
95	Copper	NR-W1 95
120	Copper	NR-W1 120



Code:NR-W1

Standard: IEC62561 . UL467

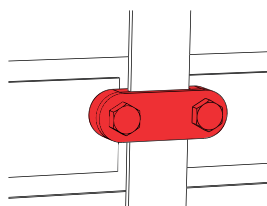
Conductor Range mm ²	Material	PART No.
35	Copper alloy	NR-W2 35
50	Copper alloy	NR-W2 50
70	Copper alloy	NR-W2 70
95	Copper alloy	NR-W2 95
120	Copper alloy	NR-W2 20



Code:NR-W2

Standard: IEC62561 . UL467

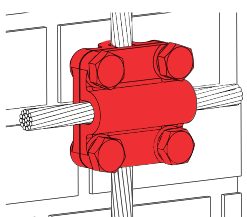
Conductor Range mm.mm	Material	PART No.
20*3 & 25*3	Copper alloy	NR-W3 25*3
30*3	Copper alloy	NR-W3 30*3
50*5	Copper alloy	NR-W3 50*5



Code:NR-W3

Standard: IEC62561 . UL467

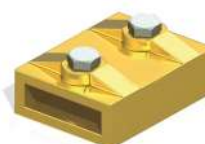
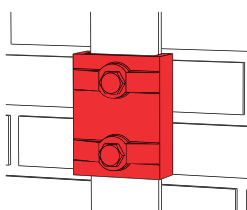
Conductor Range mm ²	Material	PART No.
35	Copper alloy	NR-W4 35
50	Copper alloy	NR-W4 50
70	Copper alloy	NR-W4 70
95	Copper alloy	NR-W4 95
120	Copper alloy	NR-W4120



Code:NR-W4

Standard: IEC62561 . UL467

Conductor Range mm.mm	Material	PART No.
20*3 & 25*3	Copper alloy	NR-W5 25*3
30*3	Copper alloy	NR-W5 30*3



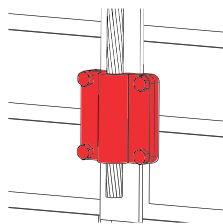
Code:NR-W5

Standard: IEC62561 . UL467



Code: NR-W6

Standard: IEC62561 . UL467

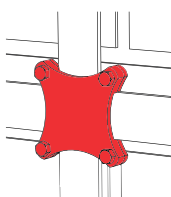


Conductor Size mm ²	Tape Size mm.mm	Material	PART No.
35	20*3 & 25*3	Copper alloy	NR-W6 35/25*3
50	20*3 & 25*3	Copper alloy	NR-W6 50/25*3
70	20*3 & 25*3	Copper alloy	NR-W6 70/25*3
95	20*3 & 25*3	Copper alloy	NR-W6 95/25*3
120	20*25 & 25*3	Copper alloy	NR-W6 120/25*3



Code:NR-W7

Standard: IEC62561 . UL467

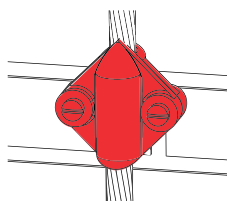


Conductor Range mm.mm	Material	PART No.
20*3 & 25*3	Copper alloy	NR-W7 25*3
30*3	Copper alloy	NR-W7 30*3

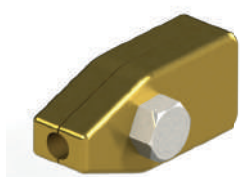


Code: RN-W8

Standard: IEC62561 . UL467

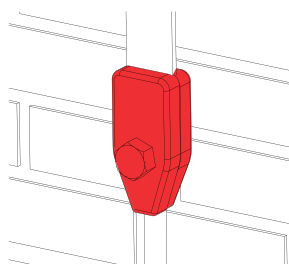


Conductor Range mm ²	Material	PART No.
35	Copper alloy	NR-W8 35
50	Copper alloy	NR-W8 50
70	Copper alloy	NR-W8 70
95	Copper alloy	NR-W8 95
120	Copper alloy	NR-W8 120



Code: NR-W9

Standard: IEC62561 . UL467

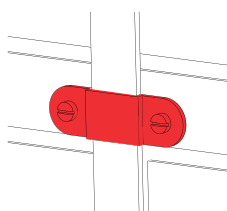


Conductor Size mm.mm	Conductor Range mm ²	PART No.
20*3 & 25*3	50	NR-W9 50/25*3
	70	NR-W9 70/25*3
	95	NR-W9 95/25*3
30*3	50	NR-W9 50/30*3
	70	NR-W9 70/30*3
	95	NR-W9 95/30*3



Code: NR-W10

Standard: IEC62561 . UL467



Conductor Range mm.mm	Material	PART No.
20*3 & 25*3	Copper	NR-W10 25*3
20*3 & 25*3	Stinless Steel	NR-W10 25*3

Exothermic Welding System

Introduction

Thermo welding system is an easy simple to use field/process for welding copper to copper or copper to steel, without the use of an external power source. Thermite connections utilize the high temperature reaction of powdered copper oxide and aluminum, which when ignited; produce aluminum oxide (in the form of slag) and superheated copper.

The reaction takes place in a semi permanent graphite mould where the materials are joint and positioned.

When the total mass of powder becomes super heated molten copper, it flows through the mould onto the conductors to be joined by melting a thin steel disc which previously has stopped the powder from dropping through the mould.

This causes the conductors or surfaces to melt and form a fusion weld between them. The finished connection in the majority of cases sectional area of the

conductors being welded and therefore:

1. Will not be affected by high current surges.
2. Will not loosen or corrode at the point of weld.
3. Has a current carrying capacity equal to or greater than that of the conductors welded.
4. Other efficiencies are:
 - Will withstand repeated faults.
 - Has a low labor cost.
 - Requires no special skills.
 - Can be checked for quality by visual inspection.
 - Requires no external power or heat.
 - Maintenance saving, as the welds are unaffected by oxidation and fault currents.



Code: NR-P

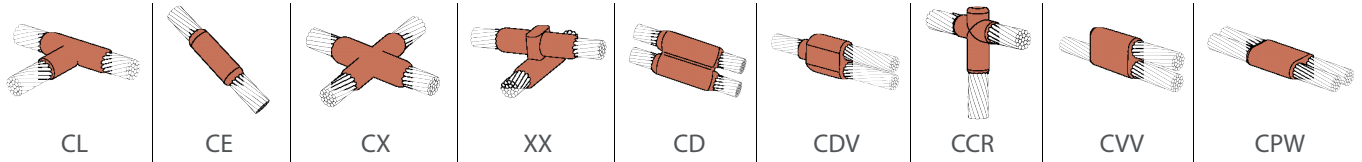
standard: IEC 62561 .UL467

Table Welding Powder

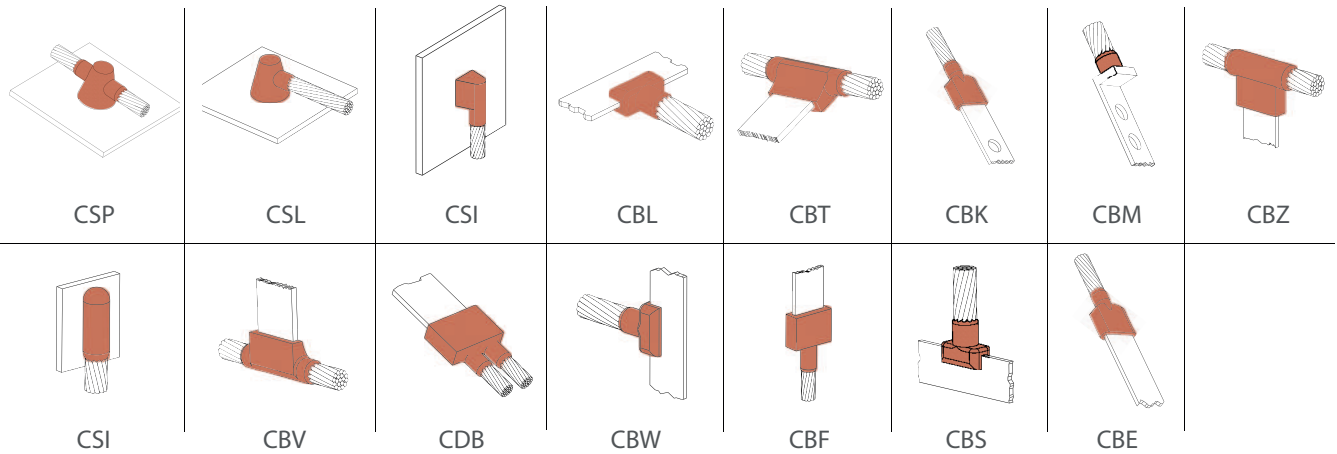
Weight powder gr	Number in a pack	PART No.
32	12	NR-P32
45	12	NR-P45
65	12	NR-P65
90	12	NR-P90
115	12	NR-P115
150	12	NR-P150
200	12	NR-P200
250	12	NR-P250

Exothermic Welding System

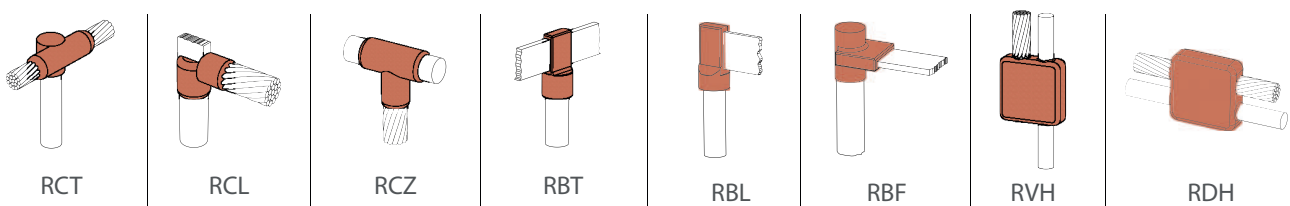
Cable to Cable



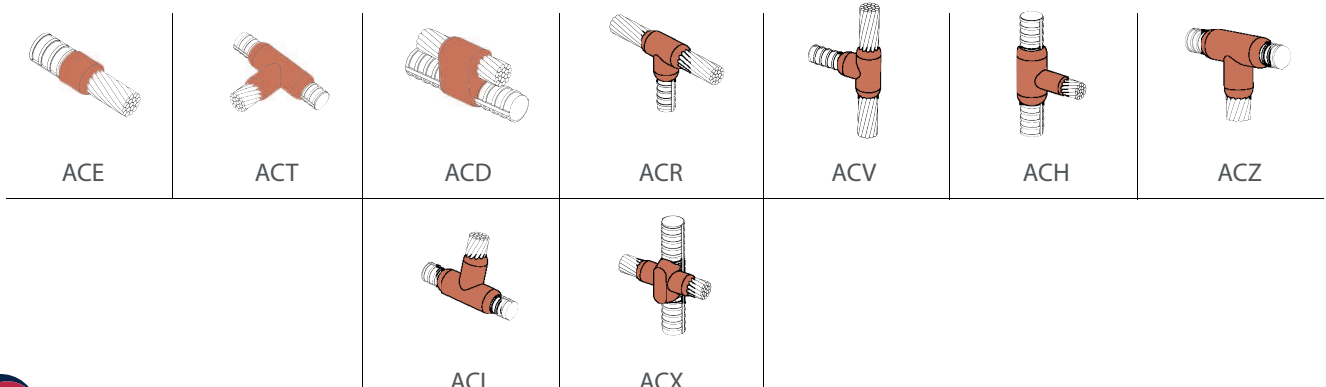
Cable to Bus Bar & Surface



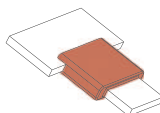
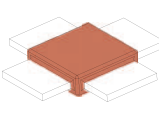
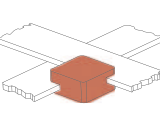
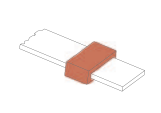
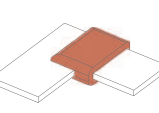
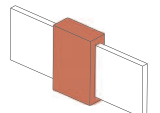
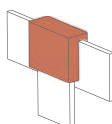
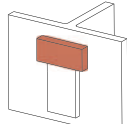
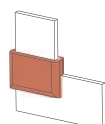
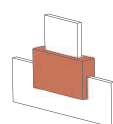
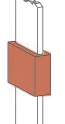
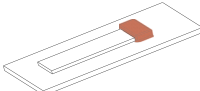
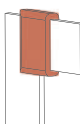
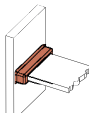
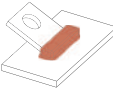
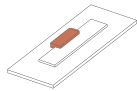
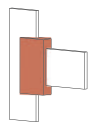
Cable to Earth Rod



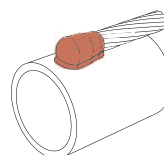
Cable to Rebar



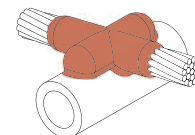
Bus Bar to Bus Bar

					
BL	BX	BXT	BE	BBD	BH
					
BV	SBV	BBL	BBV	BBW	SBD
					
BBN	SBT	SBK	SBG	BBZ	

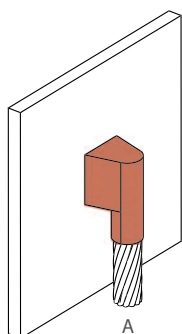
Cable to Pipe



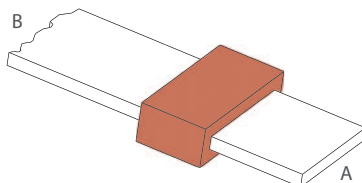
PC



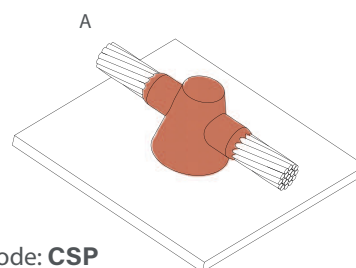
SPC



Code: CSI



Code: BE

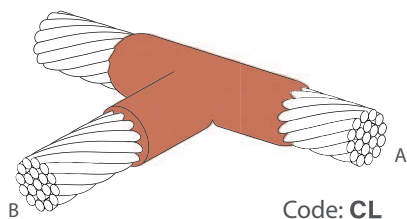


Code: CSP

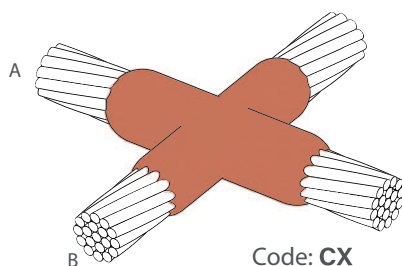
A	Weld Powder	Handle Clamp Type	Graphite Mould Type
25	65	HC 60	CSI 25
35	65		CSI 35
50	90		CSI 50
70	90		CSI 70
95	115	HC 80	CSI 95
120	115		CSI 120
150	150		CSI 150
185	200		CSI 185
240	250		CSI 240

A	B	Weld Powder	Handle Clamp Type	Graphite Mould Type
20*3	20*3	65	HC 80	BE 20*3/20*3
25*3	25*3	65		BE 25*3/25*3
25*5	25*5	90		BE 25*5/25*5
30*3	30*3	90		BE 30*3/30*3
30*5	30*5	115		BE 30*5/30*5
40*3	40*3	90		BL 40*3/40*3
40*5	40*5	150		BE 40*5/40*5
40*10	40*10	2*150		BE 40*10/40*10

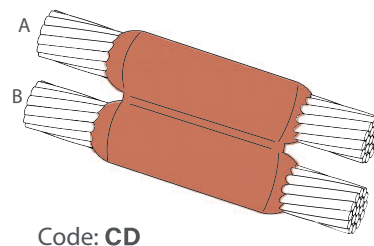
A	Weld Powder	Handle Clamp Type	Graphite Mould Type
25	115	HC 80	CSP 25
35	115		CSP 35
50	150		CSP 50
70	150		CSP 70
95	150		CSP 95
120	200		CSP 120
185	250		CSP 185



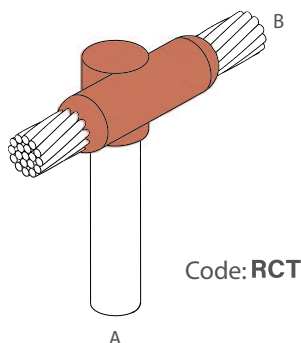
A	B	Weld Powder	Handle Clamp Type	Graphite Mould Type
16	16	45	HC 60	CL 16/16
25	16	45	HC 60	CL 25/16
	25	45		CL 25/25
35	16	45	HC 60	CL 35/16
	25	45		CL 35/25
	35	45		CL 35/35
50	16	65	HC 60	CL 50/16
	25	65		CL 50/25
	35	65		CL 50/35
	50	90		CL 50/50
70	25	65	HC 60	CL 70/25
	35	65		CL 70/35
	50	90		CL 70/50
	70	90		CL 70/70
	95	90		CL 70/95
95	25	90	HC 60	CL 95/25
	35	90		CL 95/35
	50	90		CL 95/50
	70	90		CL 95/70
	95	115		CL 95/95
120	120	150	HC 80	CL 95/120
	25	90	HC 60	CL 120/25
	35	90		CL 120/35
	50	90		CL 120/50
	70	90		CL 120/70
	95	115		CL 120/95
150	120	150	HC 80	CL 120/120
	35	115	HC 80	CL 150/35
	50	115		CL 150/50
	70	115		CL 150/70
	95	150		CL 150/95
	120	150		CL 150/120
	150	200		CL 150/150
185	185	200		CL 150/185
	35	115	HC 80	CL 185/35
	50	115		CL 185/50
	70	150		CL 185/70
	95	150		CL 185/95
	120	200		CL 185/120
	150	200		CL 185/150
240	185	200		CL 185/185
	35	150	HC 80	CL 240/35
	50	150		CL 240/50
	70	150		CL 240/70
	95	150		CL 240/95
	120	200		CL 240/120
	150	200		CL 240/150
	185	250		CL 240/185
	240	2*150+45		CL 240/240



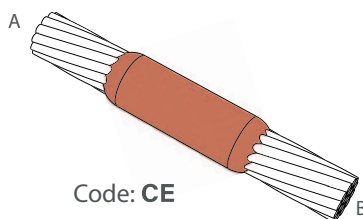
A	B	Weld Powder	Handle Clamp Type	Graphite Mould Type
16	16	45	HC 60	CX 16/16
25	16	45	HC 60	CX 25/16
	25	45		CX 25/25
35	16	65	HC 60	CX 35/16
	25	65		CX 35/25
	35	65		CX 35/35
50	16	90	HC 60	CX 50/16
	25	90		CX 50/25
	35	90		CX 50/35
	50	90		CX 50/50
70	25	115	HC 60	CX 70/25
	35	115		CX 70/35
	50	115		CX 70/50
	70	115		CX 70/70
	95	150		CX 70/95
95	25	115	HC 80	CX 95/25
	35	115		CX 95/35
	50	115		CX 95/50
	70	150		CX 95/70
	95	150		CX 95/85
	120	200		CX 95/120
120	25	115	HC 80	CX 120/25
	35	115		CX 120/35
	50	150		CX 120/50
	70	150		CX 120/70
	95	200		CX 120/95
	120	200		CX 120/120
150	35	150	HC 80	CX 150/35
	50	150		CX 150/50
	70	150		CX 150/70
	95	200		CX 150/95
	120	250		CX 150/120
	150	250		CX 150/150
	185	250		CX 150/185
185	35	115	HC 80	CX 185/35
	50	200		CX 185/50
	70	200		CX 185/70
	95	200		CX 185/95
	120	250		CX 185/120
	150	250		CX 185/150
	185	150+115		CX 115/115
240	35	200	HC 80	CX 240/35
	50	250		CX 240/50
	70	250		CX 240/70
	95	250		CX 240/95
	120	150+115		CX 120/120
	150	2*150		CX 150/150
	185	2*150		CX 185/185
	240	2*150		CX 240/240



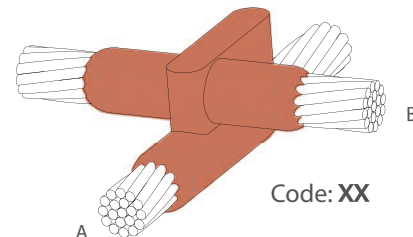
A	B	Weld Powder	Handle Clamp Type	Graphite Mould Type
16	16	65	HC 60	CD 16/16
25	16	65	HC 60	CD 25/16
	25	65		CD 25/25
35	16	65	HC 60	CD 35/16
	25	65		CD 35/25
	35	65		CD 35/35
50	16	65	HC 60	CD 50/16
	25	65		CD 50/25
	35	90		CD 50/35
	50	115		CD 50/50
70	25	90	HC 80	CD 70/25
	35	90		CD 70/35
	50	115		CD 70/50
	70	115		CD 70/70
	95	150		CD 70/95
95	25	115	HC 80	CD 95/25
	35	115		CD 95/35
	50	115		CD 95/50
	70	150		CD 95/70
	95	150		CD 95/95
120	25	150	HC 80	CD 120/25
	35	150		CD 120/35
	50	150		CD 120/50
	70	150		CD 120/70
	95	200		CD 120/95
	120	250		CD 120/120
150	70	150	HC 80	CD 150/70
	95	200		CD 150/95
	120	200		CD 150/120
	150	250		CD 150/150
185	50	150	HC 80	CD 185/50
	70	150		CD 185/70
	95	200		CD 185/95
	120	200		CD 185/120
	150	250		CD 185/150
	185	250		CD 185/185
240	70	200	HC 80	CD 240/70
	95	250		CD 240/95
	120	250		CD 240/120
	150	2*150		CD 240/150
	185	2*150		CD 240/185
	240	2*150		CD 240/240



Code: **RCT**



Code: **CE**

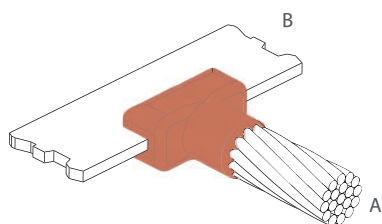


Code: **XX**

A	B	Weld Powder	Handle Clamp Type	Graphite Mould Type
14.5	16	115	HC 80	RCT 14.5/16
	35	115		RCT 14.5/35
	50	115		RCT 14.5/50
	70	115		RCT 14.5/70
	95	115		RCT 14.5/95
	120	150		RCT 14.5/120
	150	200		RCT 14.5/150
	185	200		RCT 14.5/185
	240	200		RCT 14.5/240
16	16	115	HC 80	RCT 16/16
	35	115		RCT 16/35
	50	115		RCT 16/50
	70	115		RCT 16/70
	95	115		RCT 16/95
	120	150		RCT 16/120
	150	200		RCT 16/150
	185	200		RCT 16/185
	240	200		RCT 16/240
17.2	16	115	HC 80	RCT 17.5/16
	35	115		RCT 17.5/35
	50	115		RCT 17.5/50
	70	115		RCT 17.5/70
	95	115		RCT 17.5/95
	120	150		RCT 17.5/120
	150	200		RCT 17.5/150
	185	200		RCT 17.5/185
	240	250		RCT 17.5/240
20	16	115	HC 80	RCT 20/16
	35	115		RCT 20/35
	50	115		RCT 20/50
	70	115		RCT 20/70
	95	115		RCT 20/95
	120	150		RCT 20/120
	150	200		RCT 20/150
	185	200		RCT 20/185
	240	250		RCT 20/240

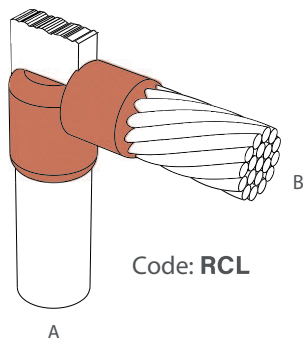
A	B	Weld Powder	Handle Clamp Type	Graphite Mould Type
16	16	32	HC 60	CE 16/16
25	16	32	HC 60	CE 25/16
	25	32		CE 25/25
35	16	45	HC 60	CE 35/16
	25	45		CE 35/25
	35	45		CE 35/35
50	16	45	HC 60	CE 50/16
	25	45		CE 50/25
	35	45		CE 50/35
	50	45		CE 50/50
70	25	65	HC 60	CE 70/25
	35	65		CE 70/35
	50	65		CE 70/50
	70	65		CE 70/70
	95	65		CE 95/25
95	35	65	HC 80	CE 95/35
	50	65		CE 95/50
	70	90		CE 95/70
	95	90		CE 95/95
120	25	90	HC 80	CE 120/25
	35	90		CE 120/35
	50	90		CE 120/50
	70	115		CE 120/70
	95	115		CE 120/95
	120	115		CE 120/120
150	70	115	HC 80	CE 150/70
	95	115		CE 150/95
	120	115		CE 150/120
	150	115		CE 150/150
185	50	115	HC 80	CE 185/50
	70	115		CE 185/70
	95	115		CE 185/95
	120	150		CE 185/120
	150	150		CE 185/150
	185	150		CE 185/185
240	70	150	HC 80	CE 240/70
	95	150		CE 240/95
	120	200		CE 240/120
	150	200		CE 240/150
	185	200		CE 240/185
	240	200		CE 240/240

A	B	Weld Powder	Handle Clamp Type	Graphite Mould Type
16	16	115	HC80	XX 16/16
25	16	115	HC80	XX 25/16
	25	115		XX 25/25
35	16	115	HC80	XX 35/16
	25	115		XX 35/25
	35	115		XX 35/35
50	16	115	HC80	XX 50/16
	25	115		XX 50/25
	35	115		XX 50/35
	50	150		XX 50/50
70	25	115	HC80	XX 70/25
	35	150		XX 70/35
	50	150		XX 70/50
	70	150		XX 70/70
	95	200		XX 95/25
95	35	200	HC80	XX 95/35
	50	200		XX 95/50
	70	200		XX 95/70
	95	200		XX 95/95
120	25	250	HC80	XX 120/25
	35	250		XX 120/35
	50	250		XX 120/50
	70	250		XX 120/70
	95	250		XX 120/95
	120	250		XX 120/120
150	70	250	HC80	XX 150/70
	95	300		XX 150/95
	120	300		XX 150/120
	150	300		XX 150/150
185	50	250	HC80	XX 185/50
	70	250		XX 185/70
	95	300		XX 185/95
	120	300		XX 185/120
	150	300		XX 185/150
	185	2*150+32		XX 185/185
240	70		HC80	XX 240/70
	95			XX 240/95
	120			XX 240/120
	150			XX 240/150
	185			XX 240/185
	240			XX 240/240



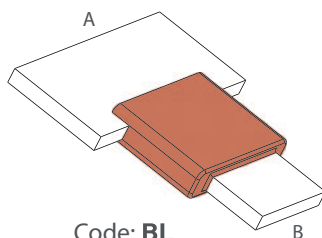
Code: **CBL**

A	B	Weld Powder	Handle Clamp Type	Graphite Mould Type
16	20*3	90	HC 80	CBL 16/20*3
	25*3	90		CBL 16/25*3
25	20*3	90	HC 80	CBL 16/20*3
	20*5	90		CBL 25/20*5
	25*3	90		CBL 25/25*3
	25*5	90		CBL 25/25*3
35	20*3	90	HC 80	CBL 35/20*3
	20*5	90		CBL 35/20*5
	25*3	90		CBL 35/25*3
50	20*3	90	HC 80	CBL 50/20*3
	20*5	90		CBL 50/20*5
	25*3	90		CBL 50/25*3
	30*3	90		CBL 50/30*3
	40*3	90		CBL 50/40*3
	40*5	90		CBL 50/40*5
70	20*3	90	HC 80	CBL 70/20*3
	20*5	90		CBL 70/20*5
	25*3	90		CBL 70/25*3
	30*3	90		CBL 70/30*3
	40*3	90		CBL 70/40*3
	40*5	90		CBL 70/40*5
95	20*3	90	HC 80	CBL 95/20*3
	25*3	90		CBL 95/25*3
	30*3	90		CBL 95/30*3
	40*5	115		CBL 95/40*5
	50*5	115		CBL 95/50*5
120	25*5	115	HC 80	CBL 120/25*5
	30*5	115		CBL 120/30*5
	50*5	115		CBL 120*50*5
	25*10	150		CBL 120*25*10
	30*10	150		CBL 120/30*10
	40*10	150		CBL 120/40*10



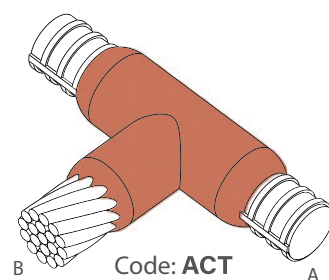
Code: **RCL**

A	B	Weld Powder	Handle Clamp Type	Graphite Mould Type
14.2	50	115	HC 80	RCL 17.5/50
	70	115		RCL 17.5/70
	95	115		RCL 17.5/95
	120	115		RCL 17.5/120
	150	150		RCL 17.5/150
	185	150		RCL 17.5/185
16	240	150		RCL 17.5/240
	50	115	HC 80	RCL 16/50
	70	115		RCL 16/70
	95	115		RCL 16/95
	120	115		RCL 16/120
	150	150		RCL 16/150
17.2	185	150		RCL 16/185
	240	150		RCL 16/240
20	70	150	HC 80	RCL 17.5/70
	95	150		RCL 17.5/95
	120	150		RCL 17.5/120
	150	150		RCL 17.5/150
	185	150		RCL 17.5/185
	240	150		RCL 17.5/240



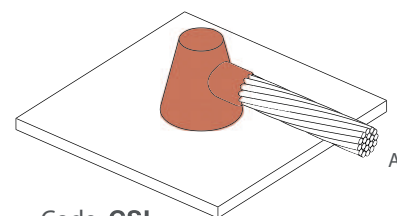
Code: **BL**

A	B	Weld Powder	Handle Clamp Type	Graphite Mould Type
20*3	20*3	90	HC 80	BL 20*3/20*3
25*3	25*3	90		BL 25*3/25*3
25*5	25*5	115		BL 25*5/25*5
30*3	30*3	115		BL 30*3/30*3
30*5	30*5	150		BL 30*5/30*5
40*5	40*5	150		BL 40*5/40*5



Code: **ACT**

A	B	Weld Powder	Handle Clamp Type	Graphite Mould Type
Ø 10	16	90	HC 80	ACT 10/16
	25	90		ACT 10/25
	35	90		ACT 10/35
	50	115		ACT 10/50
	70	115		ACT 10/70
	95	115		ACT 10/95
Ø 16	16	115	HC 80	ACT 16/16
	25	115		ACT 16/25
	35	150		ACT 16/35
	50	150		ACT 16/50
	70	150		ACT 16/70
	95	200		ACT 16/95
Ø 20	16	150	HC 80	ACT 20/16
	25	150		ACT 20/25
	35	150		ACT 20/35
	50	200		ACT 20/50
	70	200		ACT 20/70
	95	200		ACT 20/95
Ø 22	120	250		ACT 20/120
	16	150	HC 80	ACT 22/16
	25	150		ACT 22/25
	35	200		ACT 22/35
	50	250		ACT 22/50
	70	300		ACT 22/70
	95	350		ACT 22/95
	120	350		ACT 22/120



Code: **CSL**

A	Weld Powder	Handle Clamp Type	Graphite Mould Type
16	65	Included	CSL 25
25	65		CSL 35
35	90		CSL 50
50	115		CSL 70
70	115		CSL 95
95	115		CSL 120



NIROO RESAN



NIROO RESAN