



# TABLE OF CONTENT

<b>GROUNDING SYSTEM</b>	<b>PAGE</b>
GROUNDING SYSTEM INTRODUCTION	1
COPPER BOND EARTH ROD AND ACCESSORIES	2-3
SOLID COPPER BOND EARTH ROD AND ACCESSORIES	4
STAINLESS STEEL EARTH ROD AND ACCESSORIES	4
EARTH ROD CLAMPS	5
EARTH ROD DRIVER, EARTH INSPECTION PITS, EARTH PLATES	6
EARTH EQUIPOTENTIAL MATS, "SADFILL" BACKFILL, STRUCTURE CLAMPS/SUPPORT, BIMETAL WASHER	7-8
CONNECTORS	9
OTHERS	10
CONDUCTORS	11
TEMPORARY EARTHING SYSTEM INTRODUCTION	12
CABLES	12
CONDUCTORS CLAMP	13
CHOICE OF FITTINGS	14
EARTH CLAMPS	15
EARTH TERMINAL DOUBLE POSITION	15
HEAVY DUTY INSTALLATION STICKS	15
LIGHTNING PROTECTION SYSTEM INTRODUCTION	16
EARLY STREAMER EMISSION AIR TERMINAL (ESE)	17
ADAPTING PIECES, ANCHORING AND SUPPORT	18-19
AIR TERMINAL, AIR TERMINAL SADDLES	20
AIR BRACKETS, FIXINGS	21-22
"SADWELD" EXOTHERMIC WELDING INTRODUCTION	23
PREPARATION	24
GRAPHITE MOLD AND HANDLE CLAMP	25
MOLD AND HANDLE CLAMP TYPE	26
"SADWELD" CARTRIDGE	26
ACCESSORIES	27
"SADWELD" CONNECTION	28-29
CONNECTION DETAIL	28-35

# GROUNDING SYSTEM INTRODUCTION



The Primary goal of the Grounding System throughout any facility is SAFETY. Secondary are effective lighting protection, diminishing electromagnetic pulses (EMP).

Grounding is implemented to ensure rapid clearing of faults and to prevent hazardous voltage. Which in turn reduces the risk of fires and personnel injuries. Grounding serves the primary functions of referencing the AC Systems and providing a means to ensure fault clearing.

External changes in the grounding system (environment) may affect the ultimate functionality of the electrical system .

Frequently matter is very complex grounding system. Leakage currents of the equipment don't return to the earth; high frequency leakage currents return to the equipment which generated them, while power frequency leakage currents return to the derived source.

The impedance of the system is viewed from the perspective of power frequencies and immediate harmonics.

Generally accepted electrical wiring practices are not good grounding system wiring practices.

Grounding system are not meant to last forever. The best grounding systems need the most attention as they will corrode the quickest.

## CHARACTERISTICS OF A GOOD GROUNDING SYSTEM.

### GOOD ELECTRICAL CONDUCTIVITY CAUSES:

1. Low Resistance and electrical impedance.
2. Withstanding high fault currents with no evidence of fusing or mechanical deterioration in the event of a foreseeable fault.
3. Energy is dissipated into the ground in the safest possible way.
4. High frequency lightning impulses will flow through the ground electrode path, in preference to any other.

### GOOD CORROSION RESISTANCE:

1. Electrically interconnecting many dissimilar metals in the soil environment can lead to significantly increased corrosion rates on some of the underground structures.
2. High conductivity copper is usually cathodic with respect to other metals in associates with grounding sites.

MECHANICALLY ROBUST, RELIABLE AND ABILITY TO PERFORM FOR AT LEAST 40 YEARS WORKING LIFE-TIME FOR A FACILITY

## COPPER BOND EARTH ROD AND ACCESSORIES



# COPPER BOND EARTH ROD AND ACCESORRIES

SADENCO Couplings have a high copper content to ensure excellent corrosion resistance, It can tolerate deep driving and also protects the rod threads while using the driving heads. CNTR are used for non threaded and CTR are used for the threaded rod.

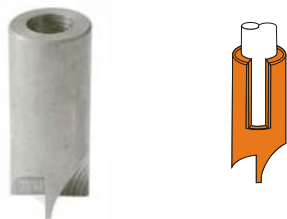
## COUPLING



These Special Spike protect the tip of the rods and let the installer to push the rods to earth when driving.

## SPECIAL SPIKE

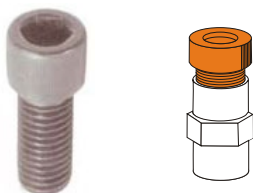
DHS-S



Actual Dia. (Mm.)	Thread Dia. "TD"(inch)	Item Code			
		Coupler	Driving Head	Special D. Head	Special Spike
14.2	5/8	CTR 16	DHTR 16	DHS 16	DHS-S 16
14.2		CNTR 16		DHS 16	DHS-S 16
17.2	3/4	CTR 20	DHTR 20	DHS 20	DHS-S 20
17.2		CNTR 20		DHS 20	DHS-S 20

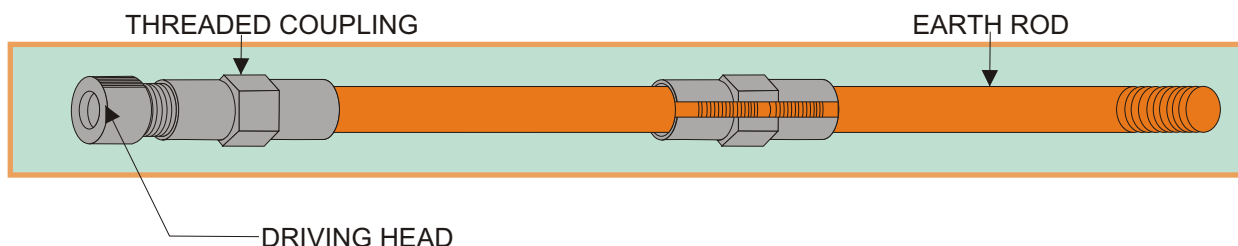
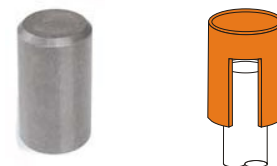
## DRIVING HEAD

DHTR



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

DHS



# SOLID COPPER EARTH ROD & ACCESSORIES

## SCTR



These solid copper earth rod were designed for extremely high corrosion resistance and exceptionally long life is required. These rods are fabricated from a hard drawn copper with purity and mechanical properties to BS- 2874, hard drawn grade c101,c102.

Rod Details			
Dia. (mm)	Length (mm)	Weight (Kg.)	Item Code
16	1200	2.1	SCTR-16/1200
16	1500	2.6	SCTR-16/1500
20	1500	4.1	SCTR-20/1500
20	2000	5.4	SCTR-20/2000

## DRIVING HEAD

Driving Heads are made from high strength steel to BS 970. It also enable the rods to be driven easily and avoid any damages.

Rod Diameter (mm)	Weight (Kg.)	Item Code
16	0.04	DHCS 16
20	0.06	DHCS 20



DHSC



## SPIKE



SCS

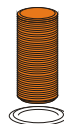


Rod Diameter (mm)	Weight (Kg.)	Item Code
16	0.04	SCS 16
20	0.06	SCS 20

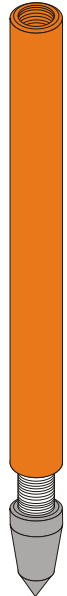
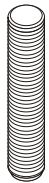
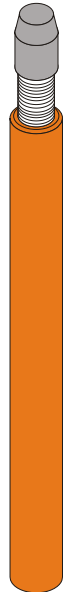
Made from high strength steel to BS 970. Spikes use to protect the tip of the rods.

## DOWEL

Made from phosphor bronze for solid copper rods or 100% Stainless Steel for Stainless Steel Rods.



Rod Diameter (mm)	Weight (Kg.)	Item Code
16	0.028	DCS 16
20	0.044	DCS 20



# EARTH ROD CLAMPS

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

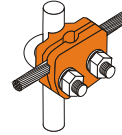
## ROD TO CABLE CLAMP



RCC



## ROD TO CONDUCTOR CLAMP

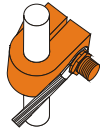


RTCC

CLAMP BODY:NAVAL BRASS/GUN METAL

## SPLIT TO CONNECTOR CLAMP

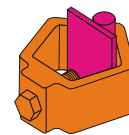
SCC



CLAMP BODY:NAVAL BRASS/GUN METAL

Nominal Rod (Dia. mm)	Conductor Range (mm2)	ITEM CODE	
		RCC	RTCC
16	25-70	RCC 16/70	RTCC 70
	-----	SCC 16	
20	50-120	RCC 20/120	RTCC 120
	-----	SCC 20	
25	70-185	RCC 25/185	RTCC 185
	-----	SCC 25	

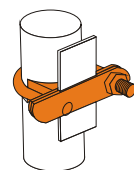
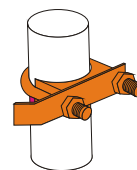
## ROD TO TAPE CLAMP



RTCC

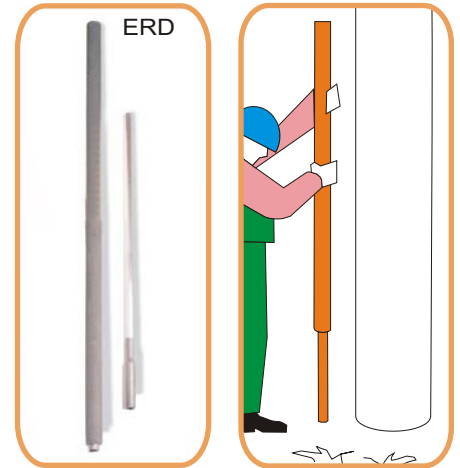


CLAMP BODY:NAVAL BRASS/GUN METAL



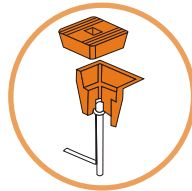
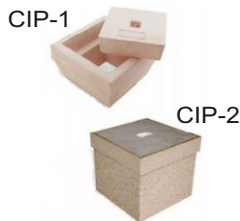
## EARTH ROD DRIVER

The very efficient instrument for installing the earth rods into the ground without deforming the end of the rod that is made of heavy duty steel and is usable for all types of round earth rods. Easy to use, being safe and effective are other advantages of this device.



## EARTH INSPECTION PIT

This is specially designed to protect and make available for inspection and testing the earth rods and earth connection.

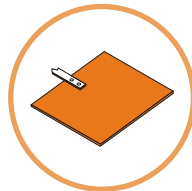
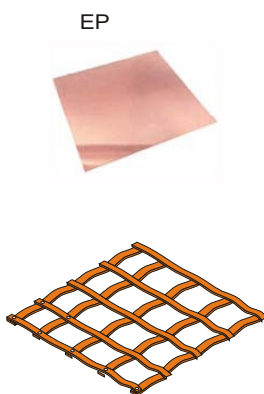


## CONCRETE INSPECTION PIT

ITEM CODE	Materials		Dimension (Cm.)
	Pit	Pit Cover	
CIP-1	Concrete	Concrete	32x32x20
CIP-2	Concrete	Cast Iron	40x40x60

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

## EARTH PLATES



Size (mm)	Weight (Kg.)	Item Code
660x660x3	11.6	EP 663
660x660x5	19.4	EP 665
1000x660x3	17.6	EP 163
1000x660x5	29.4	EP 165

OTHER DIMENSION ARE ALSO AVAILABLE

The Solid Earth Plates are used as a part of an Grounding System. The Materials is pure Electrolytic copper a BS Standard. It can also provide long lasting solution Wherein earth rods are not suitable.



## EARTH EQUIPOTENTIAL MATS

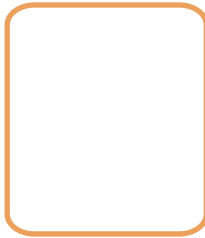


EEM

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

Size (mm)	Steel Tape Size (mm)	Weight (Kg.)	Item Code
1000x500x20	20 x 3	15	EEM 152
1000x500x30	30 x 3	22	EEM 153
1000x800x20	20 x 3	24	EEM 182
1000x800x30	30 x 3	36	EEM 183

## “ SADFILL ” BACKFILL

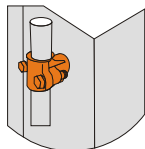


One method for reducing the ground bed resistance is to surround the rod electrodes with low resistivity soil. This work has several advantages. Reduce the resistance between conductors and soil. Provide a uniform environment so that the conductor's output is predictable and constant. The backfill has no organic acids and anaerobic bacteria, consequently reducing the rate of corrosion in the neighborhood of rods. Sadenco produces “PetInfill” in appropriate cases and polyethylene bags. “PetInfill” is a coal coke breeze of low resistivity and low ash content. The coke breeze may be treated by the addition of 10% (by weight) of commercial grade slaked lime.

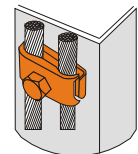
## STRUCTURE CLAMPS/ SUPPORT

Sadenco structure clamps have high strength copper alloy bodies, corrosion resistance, high conductivity and mechanical strength, to support wires..

### CABLE SUPPORT CLAMP



### GROUNDING WIRE CLAMP

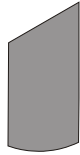


MATERIAL :NAVAL BRASS/COPPER ALLOY

# STRUCTURE CLAMPS/ SUPPORT

## TOWER EARTH CLAMP

DTE



Conductor (mm2)

Item Code



TE

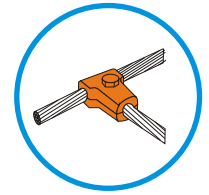


# CONNECTORS

Conductor (mm. <sup>2</sup> )	Item Code			
	SBC	LBCC	TCE	STRC
10 -16	-----	LBCC 16	-----	-----
25 -35	SBC 35	LBCC 35	-----	STRC 35
50 -70	SBC 70	LBCC 70	TCE 70	STRC 70
95 - 120	SBC 120	-----	TCE 120	STRC 120
150 - 185	SBC 185	-----	TCE 185	STRC 185
240 - 300	-----	-----	-----	STRC 300

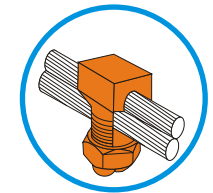
## SPLIT BOLT CONNECTORS

SBC



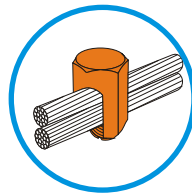
## 'T' CONNECTORS

TCE



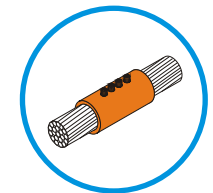
## LIGHT BOLT CONNECTORS

LBCC



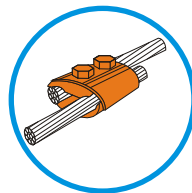
## STRAIGHT CONNECTORS

STRC



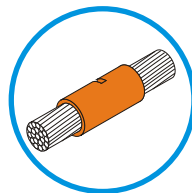
## PARALLEL CONNECTORS

PC



## SIMPLE STRAIGHT CONNECTORS

SSC



Conductor (mm. <sup>2</sup> )	Item Code	
	SSC	PC
25	SSC 25	PC 35
35	SSC 35	
50	SSC 50	PC 95
70	SSC 70	
95	SSC 95	
120	SSC 120	PC 185
150	SSC 150	
185	SSC 185	
240	SSC 240	PC 300
300	SSC 300	

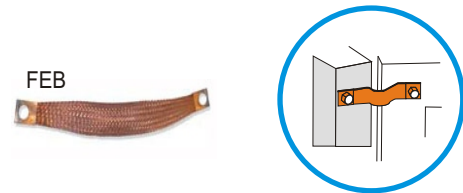
Connector clamps made from copper/ high strength copper alloy bodies, corrosion resistance and mechanical strength, to make a good connection between the conductors. All "C" clamps used for parallel connections and are made from pure copper for passing electrical currents as well.

# OTHERS

## FLEXIBLE COPPER EARTH BONDS

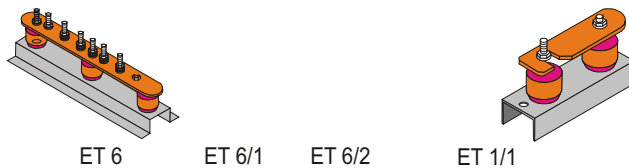
Item Code	Tape Size (mm.x mm.)	Length (mm)	Weight (mm)
FEB 120	20 x 3	200	0.08
FEB 140	20 x 3	400	0.13
FEB 220	25 x 3	200	0.13
FEB 240	25 x 3	400	0.20

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



## EARTH TERMINAL

Depending on customer request for the earth terminals, other sizes are available.



Type	Bus Bar Size(mm.)	Length (mm.)	Item Code
Two Way Disconnecting Link	30x3	180	ET 1/1
Six Way Earth Bar	50x5	400	ET 6
Six Way Single Disconnecting Link	50x5	500	ET 6/1
Six Way Double Disconnecting Link	50x5	600	ET 6/2
Eight Way Double Disconnecting Link	50x5	670	ET 8/2

## CABLE LUGS

The cable lugs are made from high conductive pure copper and tin plate to corrosion resistance. The distance between two holes in DLT lugs is 40 mm, but other sizes are available as your request.



Conductor Range (mm <sup>2</sup> )	Hole Size (mm)	One Hole Item Code	Two Hole Item Code
16	8	CL 16/8	DCL 16/8
	10	CL 16/10	DCL 16/10
25	8	CL 25/8	DCL 25/8
	10	CL 25/10	DCL 25/10
35	8	CL 25/8	DCL 25/8
	10	CL 25/10	DCL 25/10
	12	CL 25/12	DCL 25/12
50	8	CL 50/8	DCL 50/8
	10	CL 50/10	DCL 50/10
	12	CL 50/12	DCL 50/12
70	8	CL 70/8	DCL 70/8
	10	CL 70/10	DCL 70/10
	12	CL 70/12	DCL 70/12
95	8	CL 95/8	DCL 95/8
	10	CL 95/10	DCL 95/10
	12	CL 95/12	DCL 95/12
120	10	CL 120/10	DCL 120/10
	12	CL 120/12	DCL 120/12
	14	CL 120/14	DCL 120/14
150	12	CL 150/12	DCL 150/12
	14	CL 150/14	DCL 150/14
	16	CL 150/16	DCL 150/16
185	12	CL 185/12	DCL 185/12
	14	CL 185/14	DCL 185/14
	16	CL 185/16	DCL 185/16
240	12	CL 240/12	DCL 240/12
	14	CL 240/14	DCL 240/14
	16	CL 240/16	DCL 240/16
300	12	CL 300/12	DCL 300/12
	14	CL 300/14	DCL 300/14
	16	CL 300/16	DCL 300/16

## EARTH CABLE REEL

The earth cable reels used as a temporary earthing devices for connecting flammable liquid carrying tanker to an earthing systems. The earth cable is from bare annealed stranded copper wires and highly flexible. They are mechanically protected by a plastic sheath.



# CONDUCTORS

All of following stranded PVC/Coated BARE copper conductors are manufactured in accordance with the relevant standards. The following conductors represent our standard range and for non standard you may free to contact us.

Conductor Range (mm <sup>2</sup> )	Item Code	
	Bare Conductor	Y/G PVC Covered Conductor
16	BSCC 016	PSCC 016
35	BSCC 035	PSCC 035
50	BSCC 050	PSCC 050
70	BSCC 070	PSCC 070
95	BSCC 095	PSCC 095
120	BSCC 120	PSCC 120
150	BSCC 150	PSCC 150
185	BSCC 185	PSCC 185
240	BSCC 240	PSCC 240
300	BSCC 300	PSCC 300

## BARE STRANDED COPPER CONDUCTORS



## Y/G PVC COVERED STRANDED COPPER CONDUCTORS



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

## FLAT COPPER TAPE

Conductor		Thick (mm)	
		3	5
Width (mm)	20	FCT 603	FCT 1005
	25	FCT 703	FCT 1255
	30	FCT 903	FCT 1505
	50	----	FCT 2505

Conductor Size (mm)	Item No.
20 x 3	TTC 220
25 x 3	TTC 230
30 x 3	TTC 330



FCT



TTC



The PVC covered copper tape are available too. They are used mainly for running as down conductor in lightning protection systems, the PVC covering is used for aesthetic purpose to bend the down conductor into the building.

# TEMPORARY EARTHING SYSTEM INTRODUCTION

Earthing System defines the Electrical potential of the conductors relative to that of the Earth's conductive surface. The choice of grounding system has implication for the safety and Electromagnetic compatibility of the power supply. Note that regulation for the grounding systems vary considerably between different countries.

A Protective Ground (PG) connection ensures that all expose conductive surfaces are at the same electrical potential as the surface of the earth, to avoid the risk of electrical shock if a person touches a device in which an insulation fault has occurred. It ensures that in the case of insulation fault (" short circuit" ), a very high current flows, which will trigger an over current protection device (fuse, circuit breaker) that disconnect the power supply.

A Functional Ground connection serves a purpose other than providing protection against electrical shock. In contrast to a protective ground connection, a functional ground connection may carry a current during the normal operation of a device. Functional Ground connections may be required by devices such as surgesuppression and electromagnetic interference filters, some types of antennas and various measurement instruments. Generally the protective ground is also used as a functuional ground, though this requires care in some situations.



SADENCO - Al Bander Co. Ltd. is a manufacturer of an acceptable range of temporary earthing devices for 20 KV up to 400 KV, and maximum 40 KV, 0.5 sec., Short circuit current.

Temporary devices as well as the matching connection points on the conductor and on earthing system, must be designed to withstand the short-circuit current of the respective electrical installation.

## CABLES

Our earth cables, in conformity with standards IEC 61138, are of bare annealed stranded copper wires and highly flexible. They are mechanically protected by a transparent plastics heath. Cables are factory lugged under press. Their waterproof quality is strengths by a heat-shrunk transparent or black sleeve.

SAC



SAC		Length in Meter					
		5	6	7	8	9	
Item Code	Section (mm <sup>2</sup> )	Item Extension Code					
SAC 50	50	5005	5006	5007	5008	5009	5010
SAC 70	70	7005	7006	7007	7008	7009	7010
SAC 95	95	9505	9506	9507	9508	9509	9510
SAC 120	120	12005	12006	12007	12008	12009	12010
SAC 150	150	15005	15006	15007	15008	15009	15010

# CONDUCTORS CLAMP

## CONDUCTOR CLAMP FOR HV LINES

This clamps are made of aluminum alloy and with double thread system for quick operation. Using of spring system in these clamps, help to absorb the electro-dynamic shock in case of fault current.

Clamps are tested according IEC61230

Item Code	Line Clamping Capacity (mm)	Maximum Short-Circuit Current (KA/Sec)	Length	Weight (Kg.)	End Fittings
CHV 15 60 & CHV 5 40	15 to 60 5 to 40	40	156	1.4	E 46 EC VC VE V
CHV 20 120	20 to 40	40	217	1.8	
CHV-S 200	120 to 200	40	280	3.7	E 46 VC VE

\* CHV 15 60 & CHV 5 40 For Lines

CHV 20 120 For Cylindrical Bars

Made of aluminum alloy for cylindrical bars and with double thread system for quick operation. Using of spring system in these clamps, help to absorb the electro-dynamic shock in case of fault current.

Clamps are tested according IEC 61230



## CHOICE OF FITTINGS

Each conductor clamp could be deliver with fittings. Which identifying in the previous table. Considering following pictures guidance you to choice appropriate end fitting for a complete temporary earthing device.





## EARTH CLAMPS

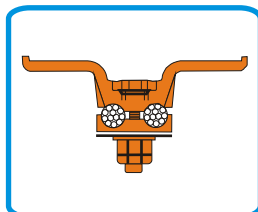
SADENCO earth clamps have high strength copper alloy bodies, corrosion resistance, high conductivity and mechanical strength, to support and passing electrical current.



Material	Clamping Capacity	Max. Fault Current	Length	Weight	Item Code
Brass	30 mm.	40 KA/1 Sec.	100 mm.	1.4 kg.	NB 33C
AL	22 mm.	40 KA/1 Sec.	170 mm.	0.5 kg.	AL 38
Brass	25 mm.	20 KA/1 Sec.	110 mm.	0.5 kg.	BM 8

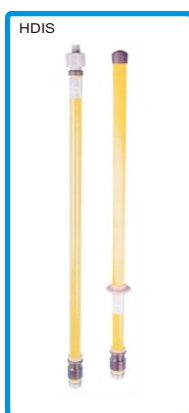
\* AL 38 For Steel Plates

## EARTH TERMINAL DOUBLE POSITION



Made of Brass for providing earthing points in electrical installations in order to use standard conductor clamps. They are installed on the frame work of substations and high voltage installations.

## HEAVY DUTY INSTALLATION STICKS



Item Code	Total Length (Meter)	Stick No. Section	Weight (Kg.)
TUBE DIAMETER: 39 mm/IEC/IEC 60855			
HDIS 1 100	1.0	1	1.1
HDIS 1 150	1.5	1	1.5
HDIS 1 200	2.0	1	1.9
HDIS 1 250	2.5	1	2.3
HDIS 1 300	3.0	1	2.6
HDIS 1 400	4.0	1	3.4
HDIS 2 200	2.0	2	2.3
HDIS 2 250	2.5	2	2.5
HDIS 2 300	3.0	2	3.0
HDIS 2 400	4.0	2	3.8
HDIS 3 300	3.0	3	3.4
HDIS 3 450	4.5	3	4.5
HDIS 3 600	6.0	3	5.7
HDIS.....			

HDIS designed for heavy duty operation like earthing of high and very high voltage lines and sub station. They are made of composite fiber glass tube with 100 KV/30 cm. Die electric strength in humid atmosphere.

## BOXES

In each SBOX case, three sets of earth cables, earth clamps and line earthing clamps are included in the packages.



PBOX is designed to contain one set of cable, earth clamp and line earthing clamp.



# LIGHTNING PROTECTION SYSTEM

## INTRODUCTION

Lightning is a high energy stepped waveform pulse, rapidly changing steps in voltage contain high frequency energy. This energy has a peak in the dozens or hundreds of Kilohertz, with the bulk of energy ranging from low frequency to perhaps 1 MGZ.

Damaging energy extends hundreds of megahertz. Lightning should be considered a dc to Volt energy source with the bulk of energy at lower frequencies. Current is massive, thousand of amperes can flow in one lightning strike. A good ground must have a very low impedance over a very wide frequency range. This rule out wires, and loosely woven braided conductors should be avoided. The very best ground leads are solid wide smooth surfaces, although braiding sometimes must be used in areas that require flexibility.

Most of the time damage come from lightning strikes on powe lines. Lightning most often follows the utility living in the house, through house wiring, and to ground in antenna systems. The real danger is lightning flowing through equipment and the house to seek a ground.

With taller towers, lightning can be a frequent unwelcome visitor. Tall structures often require a large area ground low impedance wide smooth copper flashing surrounding critical areas. The goal is to prevent object near the structure from rising faster in voltage than other objects located near the tower. Very high currents can flow between things near the tower is important to provide a low impedance path for these currents.

## MATERIALS SPECIFICATION

All products in lightning protection are produces in accordance BS 6651 that ensure a satisfactory life span of at least 30 years.

To ensure an effective system a satisfactory long term performance all fittings should be mechanically robust and provide good corrosion resistance in widely different environment.

Aluminum and copper are the two metals which commonly used in lightning protection system particularly where they come into contact with each other. If aluminum is selected as the materials for air termination networks and down conductors, it has to be connected to copper at or around the test clamp. This connection should be positioned at the beginning of the earth termination network.

This is due to the fact that both BS 6651 and the earthing code BS 7430 do not permit aluminum to be buried underground.

The contact surfaces of the same metals should be kept completely dry and protected against the ingress of moisture otherwise corrosion will occur.

A particularly effective means of excluding moisture id to inhibitor pastes, bioclimatic paint or approved protective wrapping.

# 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 safe path.

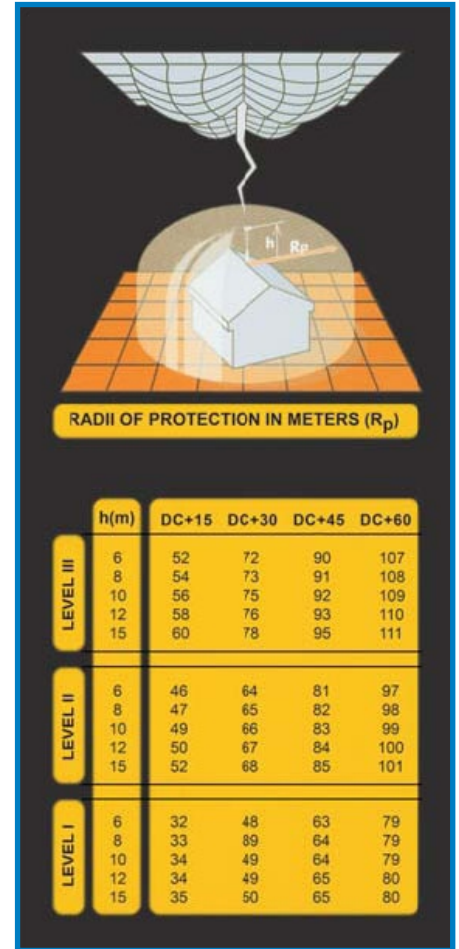
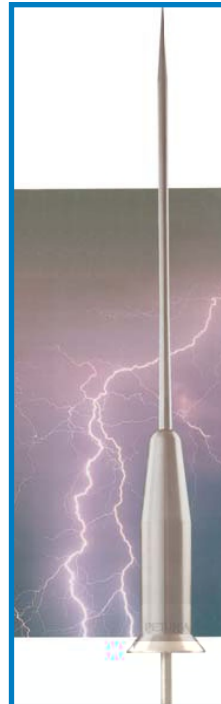
The standard name of this advance is "Advance Time"(AT). It determined the radius of protections of the air terminal and must be tested and certified by the official and therefore independent laboratories. It is essential for these tests to be protected by lightning current with standing tests, with the aid 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. Fully made of Stainless Steel type AISI-316, no need for an unnatural power supply.

Lightning Protection System installation must comply with the UNE 21186 standard (Protection the structure, Building and open areas with the streamer emission air terminal), maintaining security distances using proper materials and always searching for the safest and most direct way to conduct lightning current from the air termination system.

The Earth Termination System must be able to disperse the high lightning currents rapidly, thus making low resistance and enduring characteristics necessary.



## TECHNICAL DATA

Electronic Circuit, High Voltage impulse emitter and upward streamer generator. Working thresholds below 50 KV/M potential gradient below atmosphere and ground. This circuit is water tight. Located into the central body of the lightning conductor and protected against electric discharges by faraday cage shaped assemblage.

Triple insulating system protector, which warrants the system performance in weather condition.

Stepped electrostatic charge accumulator and a single discharging tip in order to avoid the ineffective discharge spread.

Wholly manufactured with stainless steel type AISI-316 (without the aluminum parts to avoid the formation of the galvanic pairs and corrosion).

Atmospheric electric charge as its only power supply, being thus autonomous and maintenance free.

## ADAPTING PIECES

### AIR ROD ADAPTING PIECE



# ANCHORING AND SUPPORT

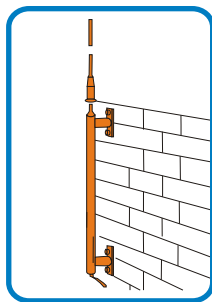
## PIPE BOND



Pipe Bond can be use for any application where the tape can be wrapped around circular object like pipes or rails.

Materials	Mast	Tape Width (mm)	Conductor dia. (mm.)	Item Code
Stainless Steel	50 - 70	25 - 30	Ø8-10	PB 70
Stainless Steel	70 - 90	25 - 30	Ø8-10	PB 90
Stainless Steel	90 - 100	25 - 30	Ø8-10	PB 100
Stainless Steel	100 - 120	25 - 30	Ø8-10	PB 120

## SUPPORT FOR ROD TO STACK



Materials	Length (M)	Item Code
H.D.G. Steel	1	SRS

## MASTS

### FREE STANDING MASTS

Materials	Length of Mast (M)	Base Plate (mm. x mm.)	Item Code
H.D.G. Steel	2	300 x 300	FSM2 2
H.D.G. Steel	4	500 x 500	FSM2 4
H.D.G. Steel	6	500 x 500	FSM2 6

SADENCO Masts is made of high quality Hot Dip Galvanized in accordance with the existing International Standard.

The mast are being calculated according to suitable standards. The velocity in this masts are 215 km/h with security factor of 1.5.

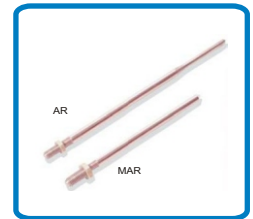
Materials	Length of Mast (M)	Item Code
H.D.G. Steel	6	FSM1 6
H.D.G. Steel	8	FSM1 8
H.D.G. Steel	10	FSM1 10
H.D.G. Steel	12	FSM1 12
H.D.G. Steel	15	FSM1 15
H.D.G. Steel	20	FSM1 20
H.D.G. Steel	25	FSM1 25



# AIR TERMINAL

## AIR RODS

Rod Diameter (mm)	Rod Length (mm)	Taper Point		Simple	
		Item Code	Wt. (Kg.)	Item Code	Wt. (Kg.)
16	500			AR 16/500	0.89
16	1000	MAR 16/1000	1.24	AR 16/1000	1.79
20	1000	MAR 20/1000	2.17	AR 20/1000	2.80
20	2000	MAR 20/2000	4.96	AR 20/2000	5.59



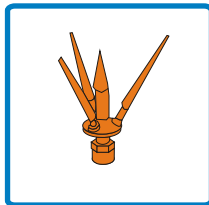
## MULTI POINT



Rod Diameter (mm)	Weight (Kg.)	Item Code
16	0.40	MPAR 16
20	0.50	MPAR 20

SADENCO Air Rods are made of Copper, typically nickel chrome coated. SADENCO can provide wide range of Length and Diameter as per order. It is available in two types, Simple Air Rods and Taper pointed multipoint head.

Multi point Head Taper pointed is made up of copper alloy for its body and pure copper for its spikes. It is commonly used in conjunction with the taper pointed terminal.

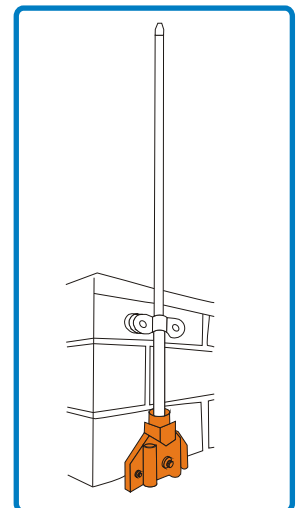
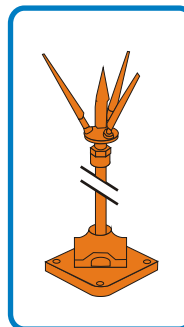


## AIR TERMINAL SADDLES

### AIR ROD BASE

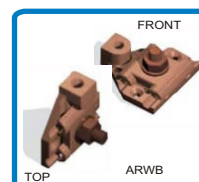
These saddles are usually used for supporting the Air Rods into the roof network of the lightning protection system and connecting the conductor below to the air rod.

Rod Diameter (mm)	Conductor Size		Item Code
	Max. Tape Width (mm.)	Wire (mm <sup>2</sup> )	
16	30	50	ARB 16/50
16	30	70	ARB 16/70
20	30	95	ARB 20/95



### AIR ROD WALL BASE

Air Rod Wall Base is designed for fixing air rods onto the wall network of the lightning protection system and connecting below wire to the air rod.



Rod Diameter (mm)	Weight (Kg.)	Item Code
10	0.35	ARWB 10
12	0.35	ARWB 12

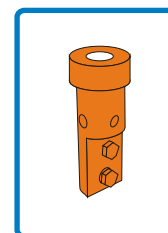
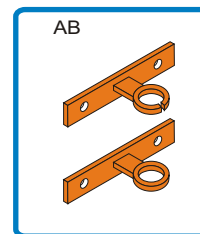
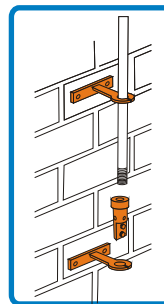
# AIR BRACKETS

## AIR ROD COUPLERS AND BRACKETS

Air Rod dia. (Mm)	Rod Coupler		Rod Bracket	
	Item Code	Weight (Kg)	Item Code	Weight (Kg)
16	ARC 16	0.20	AB 16	0.24
20	ARC 20	0.32	AB 20	0.32

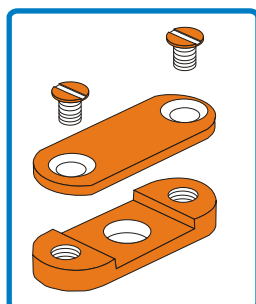
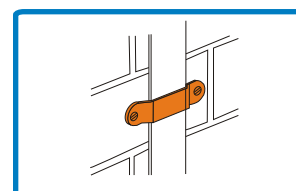
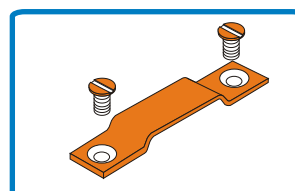
SADENCO Brackets is designed to provide projection from the building face. Conjunction with the side mounting with the air rod to tape coupling

### FIXINGS

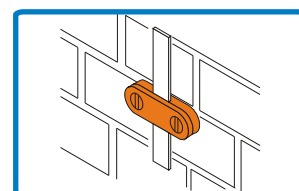
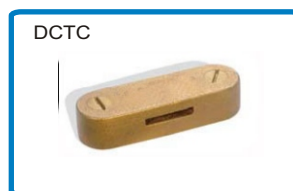


### TAPE CLIP

SADENCO Metallic clamps were designed to lock the conductor to the building, the tape robust into the clip.



### DC TAPE CLAMP

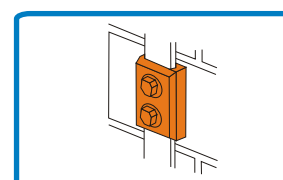
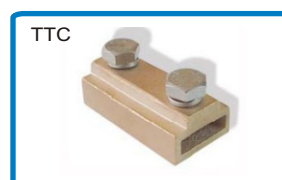
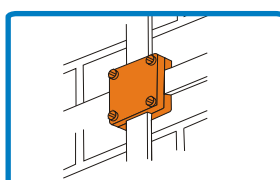


Tape Size (mm)	Tape Clip		DC Tape Clamp	
	Item Code	(Kg.)	Item Code	(Kg.)
25 x 3	TC 25 x 3	0.02	DCTC 25 x 3	0.08
30 x 3	TC 30 x 3	0.02	DCTC 30 x 3	0.08
50 x 5	TC 50 x 5	0.02	DCTC 50 x 5	0.13

Tape Size (mm)	Tape Test Clamp		Cross Tape Clamp	
	Item Code	(Kg.)	Item Code	(Kg.)
25 x 3	TTC 25 x 3	0.27	CTCC 25 x 3	0.24
30 x 3	TTC 30 x 3	0.32	CTCC 30 x 3	0.26
50 x 5	TTC 50 x 5	0.47	CTCC 50 x 5	0.28

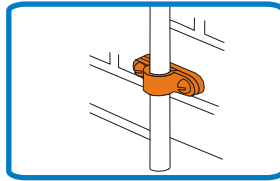
### CROSS TAPE CONNECTION CLAMP

### TAPE TEST CLAMP



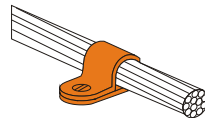
# FIXINGS

## CABLE CLIP

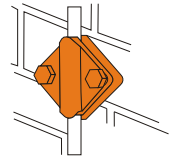


Conductor Size (mm)	Cable Clip		One Hole Cable Clip	
	Item Code	(Kg.)	Item Code	(Kg.)
50	CCIW 50	0.97	CCW 50	0.02
70	CCIW 70	0.97	CCW 70	0.02
95	CCIW 90	0.97	CCW 90	0.03

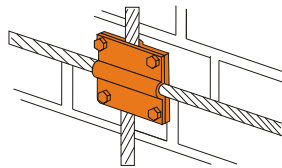
## ONE HOLE CABLE CLIP



## CABLE TEST CLAMP

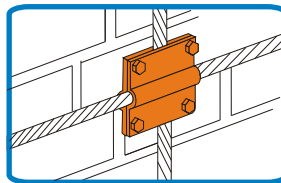
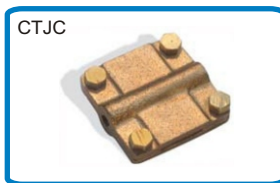


## CROSS CABLE CONNECTION CLAMP



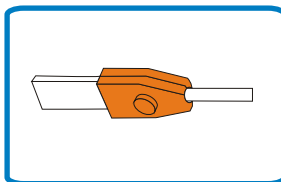
Conductor Size (mm)	Cross Cable Clamp		Cable Test Clamp	
	Item Code	(Kg.)	Item Code	(Kg.)
50	SCC1 50	0.17	CTC1 50	0.29
70	SCC1 70	0.17	CTC1 70	0.29
95	SCC1 90	0.17	CTC1 90	0.29

## CABLE TO TAPE JUNCTION CLAMP



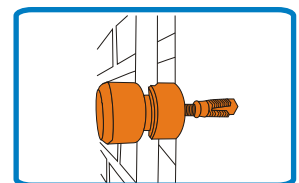
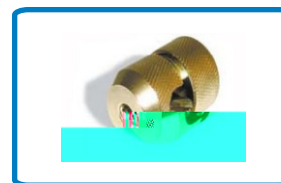
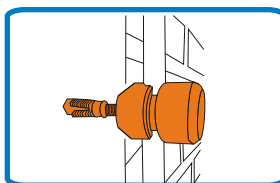
Tape Size (mm.)	Cable Size (mm)	Straight Cable to tape test Clamp		Cable to Tape Junction Clamp	
		Item Code	(Kg.)	Item Code	(Kg.)
50x3	50	CTTC 50/25x3	0.25	CTJC 50/25x3	0.41
30x3	50	CTTC 50/30x3	0.25	CTJC 50/30x3	0.41
50x5	70	CTTC 70/50x5	0.31	CTJC 70/50x5	0.41

## STRAIGHT CABLE TO TAPE TEST CLAMP



Wire Dia. (Mm.)	Fixing	Item Code
6 - 10	Flat Base	
6 - 10	Inner Corner	

## CYLINDRIC



# “SADWELD” EXOTHERMIC WELDING INTRODUCTION



Exothermic Welding System provides the ultimate molecular bonding. The process of exothermic welding, in which no outside source of heat or power is required, is the universally prepared method of making electrical connections of copper - to - copper or copper - to - steel. Lightning protection and grounding system requires connection that maintain current carrying capacity exceeding that one of the conductors used in the system. “ SADweld ” connections provide higher fusing capacity than the conductors to which they are bonded. System resistance, impedance and ampacity related directly to functionality, safety and regulatory compliance. “ SADweld” weld meet this challenges and delivers assurance .

SADweld connections provides performance superior to all existing surface-to-surface mechanical retention connectors. Pressure type connections are susceptible to variation, aging, corrosion, and failure .

## Advantages of “SADweld” Exothermic Welding

1. It is not affected by high current surge or overcurrent.
2. It has a smooth metal connection that will not loosen or corrode.
3. It has a current carrying capacity equal to or greater than that of the of conductors welded.
4. It has a low labor cost and time saving on job site.
5. The quality can be easily check by means of visual inspection.
6. Because the weld are not affected by oxidation and fault current, it is also maintenance saving.



## PREPARATION

### FOR STEEL OR CAST IRON

1. Make sure that the surface to be welded must be clean and dry.
2. Rust and mill scale should be remove.
3. Remove Oil, Grease or Pitch coating with a solvent or torch.
4. Galvanized surface may be cleaned with cloth to remove oxide film.
5. Cast Iron surfaces must be free from large pits and flaws. For Cast iron less than  $\frac{1}{2}$  " thick , avoid using cartridge larger than # 65.
6. Under some conditions of temperature and humidity the surface to be welded will sweat causing porous welds. It can be eliminated by warming the surface with a hand torch.

### FOR CABLE

1. The Cable must be Bright, Clean and dry.
2. Cable that soaked with oil or grease must be cleaned. It may be clean by burning it with the use of torch. After burning a wire brush should be use to remove the residue.
3. The corroded cable must be cleaned using cable cleaning brush or a card cloth brush.
4. Bend or off round cable will holds mold open and causes leaks. Cable should be straighten before clamping molds in place.
5. Remove insulation from insulated cable before cutting with hack saw. Other wise end of strands will become coated with insulating material which may cause defective welds.

### GROUNDS ROD AND RECEPTACLE

1. Ends and Adjacent length of rods and receptacle stud must be clean and dry to insure a good weld. Use brush to remove surface oxide , Use file to remove rust and mill scale.
2. End of rod that has been mushroomed by driving must be cut off. A driving sleeve is recommended to prevent mushrooming.

### INSTRUCTION OF USE



Insert the conductor(s) into dried mold, nothing any special information under "positioning" for application type.



Lock mold, insert suitable steel disk on tap hole



Dump cartridge into crucible. Spread starting powder uniformly over it and close the cover. Ignite the starter with ignitor

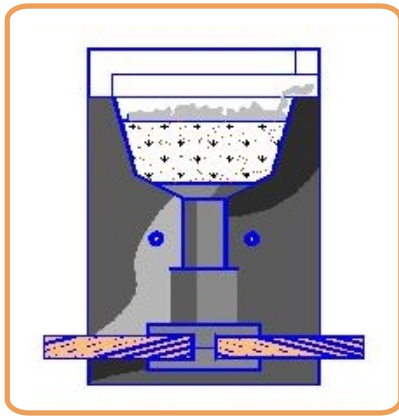


If you should use quick starter, put it into the mold, be sure that the quick starter top to be out from the cover. Ignite it with fire flame.

After finishing of thermite reaction, remove all slag from mold before making next weld. When drawing out the connection, keep mould fully open for avoiding inside edges to break. Don't make fast movements. Clean cover after every 6 to 10 welds.

# GRAPHITE MOLD AND HANDLE CLAMP

## GRAPHITE MOLD



SADENCO molds are made of a heat-resistant semi-permanent graphite and are used for making the “SADweld” connection. They comprise a crucible, tap hole and a weld cavity.

The high temperature thermic reaction takes place in the crucible of the molds allowing molten copper to flow through the tap hole into the weld cavity producing a solid joint. They can be used for over than 70 connections under normal usage.

Graphite cover protects from the reaction projections.

## SMOKELESS MOLD

SADENCO offer a line of smokeless “SADweld” molds for indoor use and for confined spaces. The process uses an integrated filter system on the mold and wick ignition of the weld to produce a finished connection with minimal smoke emission. The wicks are used for only one time and the filter should be changed every 4 to 6 connections to ensure the best performance. 15 filters are included with every mold. The quantity of wicks are depend on the quantity of powders.



## UNI-SHOT MOLD



SADENCO can supply a variety of one time use ceramic molds. These product are designed to make only one exothermic weld. The system is a cost effective solution when only a small number of joints are required. The one time molds are supplied complete with the powders and retaining disc.

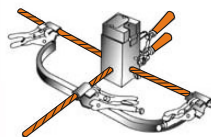
## HANDLE CLAMP

Handle Clamp is designed for holding the mold. By means of this, molds are easy to open or close.

## ROD & CABLE CLAMP

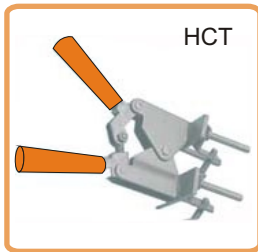
Item Code	Rod/Cable Dia.
UTCC-200	8-25 mm

UTCC



This Cable Clamp is designed for fixing of conductor in molds right position preventing cable under tension from moving during welding and ensuring no weld metal leakage.

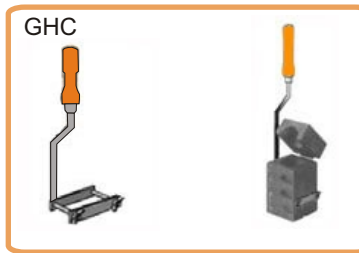
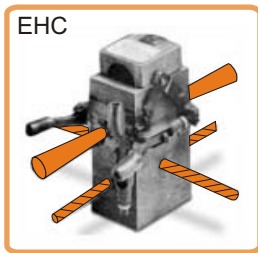
## MOLDS HANDLE CLAMP TYPE



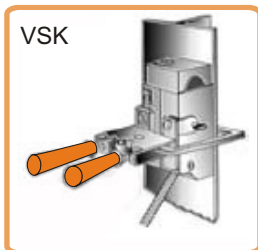
These kind of clamp are used for most of the molds. These are available in 3 types depending on mold size.

Item Code	Mold Size
EHC - 80	Standard
EHC - 80	Big

Item Code	Mold Size
HCT-50	Small
HCT-80	Standard
HCT-100	Big



Item Code	Mold Size
GHC - 50	Small
GHC - 60	Standard



Vertical Support Kit (VSK) is use to convert HCT handle into a vertical supporter in order to hold the mold on "H" Shape Steel column.

Item Code	Mold Size
VSK-80	Standard
VSK-100	Big



Item Code	Pipe Dia.
V/HSC-60	1/2" - 1 1/2"

Specifically designed to fit mold fabricated from a solid pieces of graphite or steel pipe.

## "SADWELD" CARTRIDGE

"SADweld" powder is a composition of Aluminum and copper oxide place in a plastic tube contain a measured quality of weld-materials powder. Powders are available in two types for general and cathodic protection purposes.

Item Code	Pack in Box	Suitable Disk Size	Unit Weight (g.)
S - 32	20		38
S - 45	20		53
S - 65	10		76
S - 90	10		102
S - 115	10		129
S - 150	10		166
S - 200	10		220
S - 250	10		274

Item Code	Pack in Box	Suitable Disk Size	Unit Weight (g.)
CP - 15	20		19
CP - 25	20		30
CP - 32	20		38
CP - 45	20		53
CP - 65	10		76
CP - 90	10		102
CP - 115	10		129
CP - 150	10		166

# ACCESSORIES

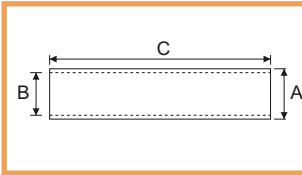
## TOOLS KIT

SADENCO offers Tolls Kit is also upon order . Set of tools are Torch, Brushes, Flint gun Scraper and Gloves.



## SLEEVES

Sleeves can be use if the cable Openingin the mold is larger than the cable, copper sleeves are slide over to fit smaller size cable opening to a larger size cable opening.



Item Code	Real Size	Changed Dia.Size	A (mm)	B (mm)	C (mm)	Weight (Kg.)	Pack
SL-10/25	10	25	6.5	4.3	26	0.22	50
SL-16/35	16	35	7.8	5.3	26	0.30	50
SL-25/50	25	50	9.3	6.5	26	0.40	50
SL-35/70	35	70	10.8	7.7	26	0.52	50

## STEEL DISK

The Disk rest on the bottom on the bottle of the crucible and hold the welding powder in place until the reaction take place. For each weld made a new disk is required. Disk are included in the weld material.




## QUICK STARTER

One way to star welding metal is to use wick. It is also used for igniting of exothermic welding powder in smokeless molds.



## LIGHTER

Lighter is used for igniting quick starter

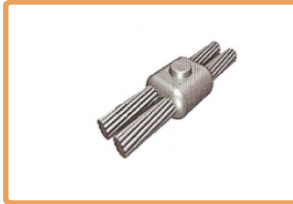


# "SADWELD" CONNECTION

## CABLE TO CABLE



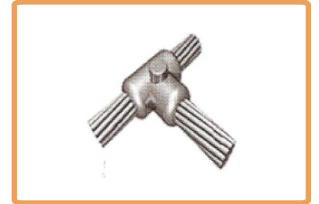
Cable to Cable -CH



Cable to Cable -CHN



Cable to Cable -CHX1



Cable to Cable -CHT



Cable to Cable -CHF

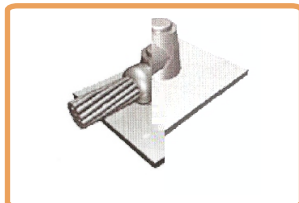


Cable to Cable -CHX2

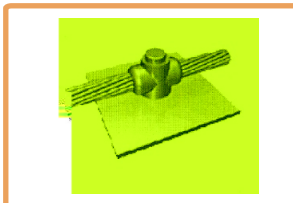


Cable to Cable -CZ

## CABLE TO STEEL



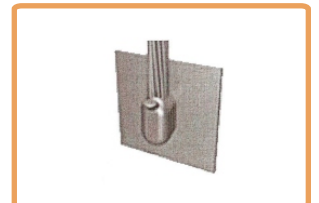
Cable to Steel -CMP



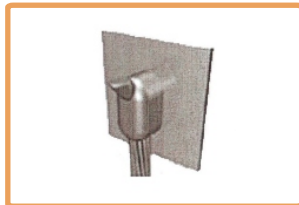
Cable to Steel -CMH



Cable to Steel -CMY1



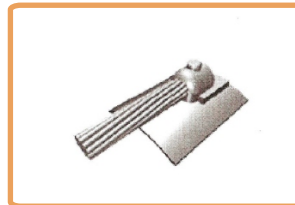
Cable to Steel -CMV



Cable to Steel -CMV2



Cable to Steel -CMHL

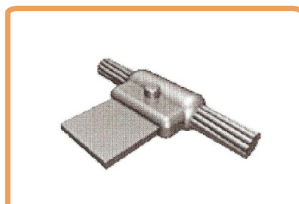


Cable to Steel -COP



Cable to Steel -COH

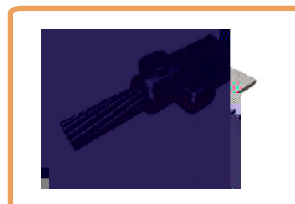
## CABLE TO BUS BAR



Cable to Bus Bar - CB



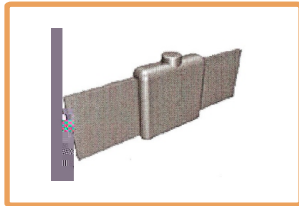
Cable to Bus Bar -CBTQ



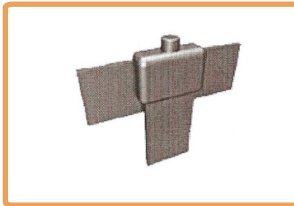
Cable to Bus Bar -CBT

# "SADWELD" CONNECTION

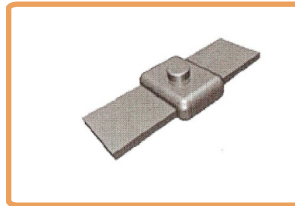
## BUS BAR TO BUS BAR



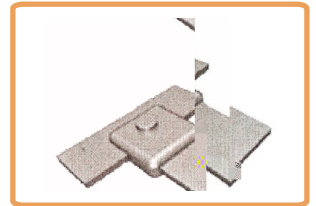
Bus Bar to Bus Bar - BHV



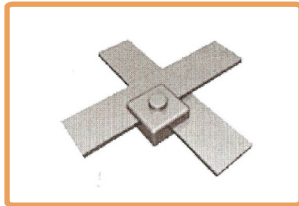
Bus Bar to Bus Bar - BHT



Bus Bar to Bus Bar - BH

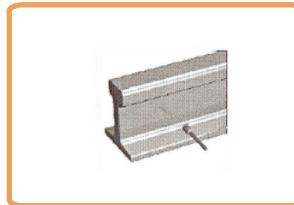


Bus Bar to Bus Bar - BHT2

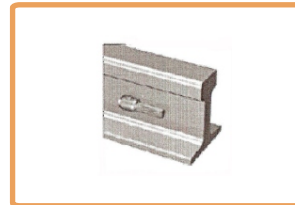


Bus Bar to Bus Bar - BBX

## CABLE TO RAIL



Cable to Rail - CTR1

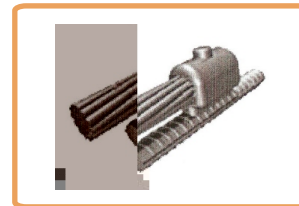


Cable to Rail - CTR2

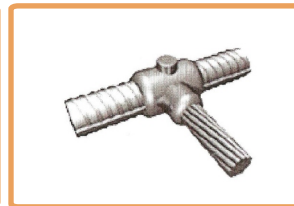


Cable to Rail - CTR3

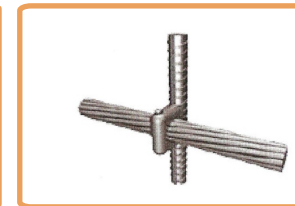
## CABLE TO REBAR



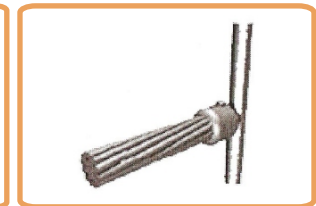
Cable to Rebar - CRB1



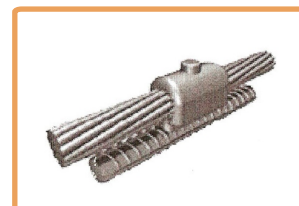
Cable to Rebar - CRB2



Cable to Rebar - CRB3



Cable to Rebar - CRB4



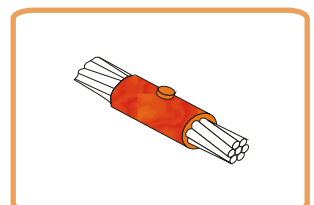
Cable to Rebar - CRB5

## CONNECTION DETAIL

### HORIZONTAL SPLICE CONNECTION

Cable ends should make contact in the center of tap hole but for cable of 240 mm<sup>2</sup> and above a gap of 3-4 mm is required between the ends. Splices of different and mixed cable size are available. Please ask for information.

Tools	
Required	Suggested
Handle Clamp Type HCT-50 or HCT-80	Tool Kit
Mold Scraper	Torch Head
Sleeve for Cable 10mm <sup>2</sup>	Cable Clamp
Sleeve for Cable 16mm <sup>2</sup>	



Mold Type:  
CH - (Main Conductor)

Main Conductor Section mm <sup>2</sup>	25, 16, 10	35	50	70	95	120	150	185	240	300
Cartridge Clamp	S-32 HCT-50	S-45 HCT-50	S-45 HCT-50	S-65 HCT-80	S-90 HCT-80	S-115 HCT-80	S-15 HCT-80	S-150 HCT-80	S-200 HCT-50	S-250 HCT-50

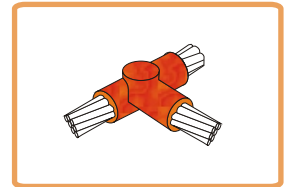


# CONNECTION DETAIL

## HORIZONTAL TEE CONNECTION

The tap cable should make contact with the main cable  
For cable of 200mm<sup>2</sup> and above a gap of 3-4mm is required between the end of tap cable and the main cable

Tools	
Required	Suggested
Handle Clamp Type HCT-50 or HCT - 80 HCT - 100 Mold Scraper Sleeve for Cable 10mm <sup>2</sup> Sleeve for Cable 16mm <sup>2</sup>	Tool Kit Torch Head

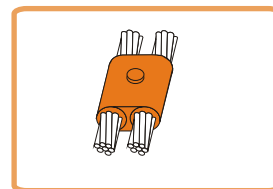


Mold Type:  
CHT-Main Conductor)/  
(Tap Conductor)

Conductor Section mm <sup>2</sup>	Tap Conductor										
	25,16,10	35	50	70	95	120	150	185	240	300	
Main Conductor	25,16,10	S - 45 HCT-50									
	35	S - 45 HCT-50	S - 45 HCT-50								
	50	S - 65 HCT-50	S - 65 HCT-50	S - 90 HCT-80							
	70	S - 65 HCT-50	S - 65 HCT-50	S - 90 HCT-80	S - 90 HCT-80						
	95	S - 90 HCT-80	S - 90 HCT-80	S - 90 HCT-80	S - 90 HCT-80	S - 115 HCT-80					
	120	S - 90 HCT-80	S - 90 HCT-80	S - 90 HCT-80	S - 90 HCT-80	S - 115 HCT-80	S - 150 HCT-80	S - 150 HCT-80	S - 150 HCT-80		
	150		S - 115 HCT-80	S - 115 HCT-80	S - 115 HCT-80	S - 150 HCT-80	S - 150 HCT-80	S - 200 HCT-80	S - 200 HCT-80	S - 200 HCT-80	S - 200 HCT-80
	185		S - 115 HCT-80	S - 115 HCT-80	S - 150 HCT-80	S - 150 HCT-80	S - 200 HCT-80	S - 200 HCT-80	S - 200 HCT-80	S - 250 HCT-80	
	240		S - 150 HCT-80	S - 150 HCT-80	S - 150 HCT-80	S - 150 HCT-80	S - 200 HCT-80	S - 200 HCT-80	S - 200 HCT-80	2*S-150 HCT-100	
	300		S - 250 HCT-80	S - 200 HCT-80	S - 200 HCT-80	S - 200 HCT-80	S - 250 HCT-80	S - 250 HCT-80	2*S-150 HCT-100	2*S-200 HCT-100	2*S-200 HCT-100

## HORIZONTAL PARALLEL CONNECTION

Tools	
Required	Suggested
Handle Clamp Type HCT-50 or HCT - 80 HCT - 100 Mold Scraper Sleeve for Cable 10mm <sup>2</sup> Sleeve for Cable 16mm <sup>2</sup>	Tool Kit Torch Head



Mold Type:  
CHT-Main Conductor)/  
(Tap Conductor)

# CONNECTION DETAIL

Conductor Section mm <sup>2</sup>		Tap Conductor										
		25,16,10	35	50	70	95	120	150	185	240	300	
Main Conductor	25,16,10	<u>S - 65</u> HCT-50										
	35	<u>S - 65</u> HCT-50	<u>S - 65</u> HCT-50					Cartridge Clamp				
	50	<u>S - 65</u> HCT-80	<u>S - 90</u> HCT-80	<u>S - 115</u> HCT-80								
	70		<u>S - 90</u> HCT-80	<u>S - 115</u> HCT-80	<u>S - 115</u> HCT-80							
	95		<u>S - 115</u> HCT-80	<u>S - 115</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80						
	120		<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 200</u> HCT-80	<u>S - 250</u> HCT-80					
	150		<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 250</u> HCT-80	<u>2*S-150</u> HCT-80				
	185		<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 250</u> HCT-80	<u>2*S-150</u> HCT-80	<u>S - 250</u> HCT-100			
	240			<u>S - 200</u> HCT-80	<u>S - 200</u> HCT-80	<u>S - 250</u> HCT-80	<u>S - 250</u> HCT-80	<u>2*S-150</u> HCT-100	<u>2*S-150</u> HCT-100	<u>2*S-150</u> HCT-100		
	300			<u>S - 250</u> HCT-80	<u>S - 250</u> HCT-80	<u>S - 250</u> HCT-80	<u>2*S-150</u> HCT-100	<u>2*S-150</u> HCT-100	<u>2*S-200</u> HCT-100	<u>2*S-250</u> HCT-100	<u>2*S-250</u> HCT-100	

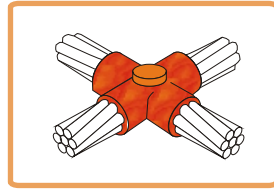
## HORIZONTAL X CONNECTION

Cable Section mm <sup>2</sup>		Tap Conductor										
		25,16,10	35	50	70	95	120	150	185	240	300	
Main Conductor	25,16,10	<u>S - 45</u> HCT-50										
	35	<u>S - 65</u> HCT-50	<u>S - 65</u> HCT-50					Cartridge Clamp				
	50	<u>S - 90</u> HCT-50	<u>S - 90</u> HCT-50	<u>S - 90</u> HCT-50								
	70		<u>S - 115</u> HCT-80	<u>S - 115</u> HCT-80	<u>S - 115</u> HCT-80							
	95		<u>S - 115</u> HCT-80	<u>S - 115</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80						
	120		<u>S - 115</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 200</u> HCT-80	<u>S - 250</u> HCT-80	<u>S - 250</u> HCT-80				
	150		<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 200</u> HCT-80	<u>S - 250</u> HCT-80	<u>S - 250</u> HCT-80				
	185			<u>S - 200</u> HCT-80	<u>S - 200</u> HCT-80	<u>S - 200</u> HCT-80	<u>S - 250</u> HCT-80	<u>S - 250</u> HCT-80	<u>S - 250</u> HCT-80			
	240				<u>S - 250</u> HCT-80	<u>2*S-150</u> HCT-100	<u>2*S-150</u> HCT-100	<u>2*S-200</u> HCT-100	<u>2*S-200</u> HCT-100	<u>2*S-250</u> HCT-100		
	300				<u>2*S-150</u> HCT-100	<u>2*S-150</u> HCT-100	<u>2*S-200</u> HCT-100	<u>2*S-200</u> HCT-100	<u>2*S-200</u> HCT-100	<u>2*S-250</u> HCT-100	<u>2*S-250</u> HCT-100	

Note: One of the Cable should be cut and its end should be in contact with the other.



# CONNECTION DETAIL



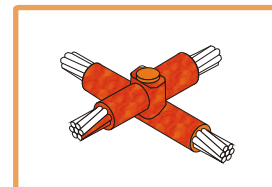
Mold Type:  
CHX1-Main Conductor/  
(Tap Conductor)

Tools	
Required	Suggested
Handle Clamp Type HCT-50 or HCT - 80 HCT - 100 Mold Scraper Sleeve for Cable 10mm2 Sleeve for Cable 16mm2	Tool Kit Torch Head

## HORIZONTAL XS CONNECTION

Cable Section mm2	Tap Conductor										
	25,16,10	35	50	70	95	120	150	185	240	300	
Main Conductor	25,16,10	S - 65 HCT-80									
	35	S - 90 HCT-80	S - 90 HCT-80								
	50		S - 115 HCT-80	S - 150 HCT-80							
	70		S - 150 HCT-80	S - 200 HCT-80	S - 150 HCT-80						
	95		S - 200 HCT-80	S - 200 HCT-80	S - 250 HCT-80	S - 200 HCT-80					
	120			S - 250 HCT-80	S - 250 HCT-80	2*S-150 HCT-80	S - 250 HCT-80				
	150				S - 250 HCT-80	2*S-150 HCT-100	S - 250 HCT-100	3*S-115 HCT-100			
	185				2*S-200 HCT-100	2*S-200 HCT-100	2*S-250 HCT-100	2*S-250 HCT-100	2*S-200 HCT-100		

Tools	
Required	Suggested
Handle Clamp Type HCT-50 or HCT - 80 HCT - 100 Mold Scraper Sleeve for Cable 10mm2 Sleeve for Cable 16mm2	Tool Kit Torch Head

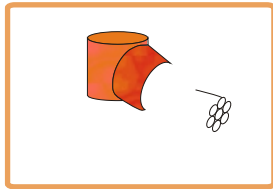
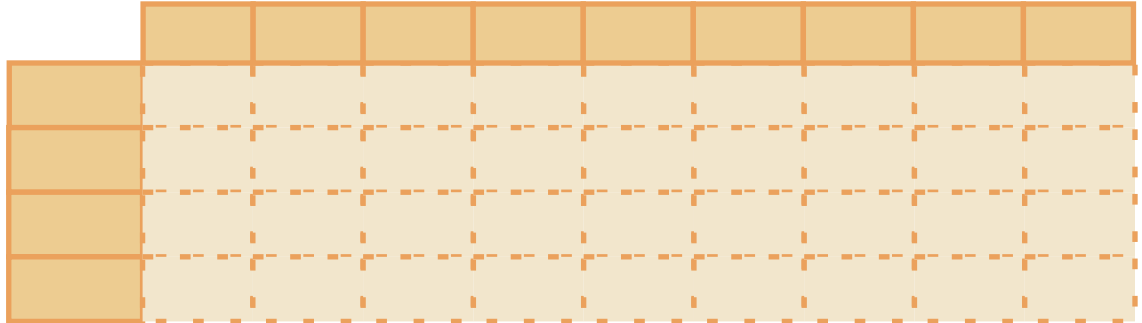


Mold Type:  
CHX1-Main Conductor/  
(Tap Conductor)

Note: Put cables in their place inside the mold. Special Care is required when opening this mold as its configuration can be damage easily.

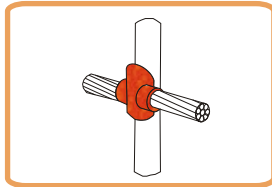
# CONNECTION DETAIL

## CABLE TO GROUND ROD CONNECTION



# CONNECTION DETAIL

## RUN CABLE TO GROUND ROD CROSS CONNECTION



Mold Type:  
CR-AR (Rod)(Cable)

Tools	
Required	Suggested
Handle Clamp Type HCT-50 or HCT - 80 Mold Scraper Sleeve for Cable 10mm <sup>2</sup> Sleeve for Cable 16mm <sup>2</sup>	Tool Kit Torch Head

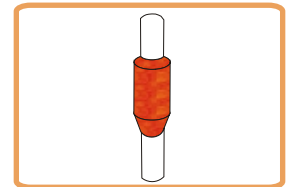
Note:  
Place Cable into the mold and adjust the rod, place the backplate secure it on the mold with a clamp.

Rod Diameter	Cable Section (mm <sup>2</sup> )								
	35	50	70	95	120	150	185	240	300
TR - 16	<u>S - 90</u> HCT-50	<u>S - 115</u> HCT-50	<u>S - 115</u> HCT-80	<u>S - 115</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 250</u> HCT-80	<u>2*S-200</u> HCT-80	<u>2*S-250</u> HCT-80
SCTR - 16 DHSC - 16	<u>S - 90</u> HCT-50	<u>S - 115</u> HCT-50	<u>S - 115</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 200</u> HCT-80	<u>2*S-200</u> HCT-80	<u>2*S-250</u> HCT-80
TR - 20	<u>S - 90</u> HCT-50	<u>S - 115</u> HCT-50	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 250</u> HCT-80	<u>S - 200</u> HCT-80	<u>2*S-250</u> HCT-80	<u>3*S-200</u> HCT-80
SCTR-20 DHSC-20	<u>S - 90</u> HCT-50	<u>S - 115</u> HCT-50	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 150</u> HCT-80	<u>S - 250</u> HCT-80	<u>S - 200</u> HCT-80	<u>2*S-250</u> HCT-80	<u>3*S-200</u> HCT-80

## GROUND ROD TO GROUND ROD

Tools	
Required	Suggested
Handle Clamp Type HCT - 80 Mold Scraper	Tool Kit Torch Head

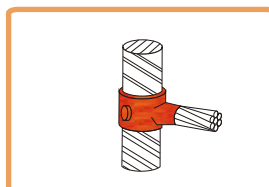
Rod (Dia. mm <sup>2</sup> )	Cartridge Clamp
TR - 14.2	<u>S - 150</u> HCT-80
SCTR - 16 DHSC - 16	<u>2*S-150</u> HCT-80
TR - 17.2	<u>2*S-150</u> HCT-80
SCTR-20 DHSC-20	<u>2*S-150</u> HCT-80



Mold Type:  
R-RV (Rod)(Rod)

## TAP CONDUCTOR TO VERTICAL REBAR CONNECTION

Tools
Suggested
Tool Kit Torch Head
Required
Handle Clamp Type HCT - 80 Mold Scraper Sleeve for Cable 10mm <sup>2</sup> Sleeve for Cable 16mm <sup>2</sup>



Mold Type:  
CRB2 (Rebar)(Cable)

Note:

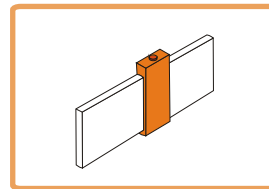
The Cable should be inserted to the mold in order to contact the rod. The gap around the rod, below the weld cavity should be packed with plastic.

## CONNECTION DETAIL

Cable Section mm <sup>2</sup> Rod Dia. mm <sup>2</sup>	25,16, 10	35	50	70	95	120	150	185	240	300
10 Diameter	S - 65 HCT-80	S - 90 HCT-80	S - 115 HCT-80	S - 115 HCT-80	S - 150 HCT-80					
16 Diameter	S - 90 HCT-80	S - 90 HCT-80	S - 150 HCT-80	S - 150 HCT-80	S - 200 HCT-80	S - 200 HCT-80				
20 Diameter		S - 90 HCT-80	S - 150 HCT-80	S - 150 HCT-80	S - 200 HCT-80	S - 200 HCT-80	S - 250 HCT-80	2*S-150 HCT-80	2*S-200 HCT-80	2*S-250 HCT-80

## HORIZONTAL STOOD BUS BAR SPLICE CONNECTION

Tools	
Required	Suggested
Handle Clamp Type HCT-50, HCT - 80 HCT - 100	Tool Kit Torch Head
Mold Scraper	



Mold Type:  
BHV - Main. Conductor

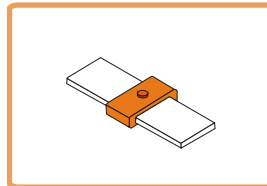
Note:

The Bus Bar end should be "V" with an aperture of 5-6 mm in its superior part for bus bars of up to 30 mm in width and an aperture of 10 to 12 mm for wider bus bar. They should meet under the center of Tap hole.

Main Conductor	20*2 20*3	20*5 25*3	25*5 30*3	30*2 40*3	40*5	40*10	50*5	50*10	60*5	60*10	80*5 100*5	80*10 100*10
Cartridge Clamp	S - 45 HCT-50	S - 65 HCT-80	S - 90 HCT-80	S - 115 HCT-80	S - 150 HCT-80	S - 250 HCT-80	S - 200 HCT-80	2*S-200 HCT-100	2*S-150 HCT-100	2*S-250 HCT-100	2*S-200 HCT-100	2*S-200 HCT-100

## HORIZONTAL LIED BUS BAR SPLICE CONNECTION

Tools	
Required	Suggested
Handle Clamp Type HCT-50, HCT - 80 HCT - 100	Tool Kit Torch Head
Mold Scraper	



Mold Type:  
BH - Main. Conductor

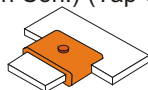
Note:

For Bus Bar up to 3mm thick. A gap of 3 mm is required between their ends. For thicker bus bar, a gap of 5-6 mm is necessary. The gap should be under the center of the tap hole.

Main Conductor	20*2 20*3	20*5 25*3	25*5	30*3	30*5	40*3	40*5	40*10	50*5	50*10	60*5	60*10	80*5	80*10
Cartridge Clamp	S - 45 HCT-50	S - 65 HCT-50	S - 90 HCT-80	S - 65 HCT-80	S - 115 HCT-80	S - 90 HCT-80	S - 150 HCT-80	2*S-150 HCT-80	2*S-200 HCT-100	2*S-200 HCT-100	2*S-150 HCT-100	2*S-250 HCT-100	2*S-200 HCT-100	3*S-200 HCT-100

## HORIZONTAL LIED BUS BAR "T" CONNECTION

BHT2  
(Main Con.)-(Tap Con.)



Tools	
Required	Suggested
HCT-50, HCT - 80 HCT - 100	Tool Kit Torch Head
Mold Scraper	

Note:

For Bus Bar up to 6mm thick. A gap of 5-6 mm is required between main bus bar and the end of the tap bus bar. For thicker bus bar, a gap of 10 mm is required.





A Division of  
AL-BANDER Co. Ltd.



GROUND SYSTEM



