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EARTHING & LIGHTNING SYSTEMS



www.borna-co.com

Introduction

Borna Electronics Co. is a highly specialized Iranian company operating for more than 35 years in the field of industrial electronic and electric equipment, such as cathodic protection component, earthing & lightning systems, exothermic welding system, electronic relays, and industrial resistors etc. In field of Earthing & Lightning Systems, Borna Electronic is providing below services:

- Design and engineering of Earthing & Lightning systems.
- Consulting services for industrial and non-industrial units.
- Manufacturing equipment with the use of advanced machinery in accordance with the latest international standards.
- Implementation, commissioning and optimization of Earthing & Lightning systems.
- Repair, maintenance, and periodical visit to ensure the correct operation of the system.

Earthing Materials

◆ Earth Rods & Accessories

High quality earth rods are usually made from either solid copper, stainless steel or copper bonded steel. Borna Electronics can supply all three types in a variety of dimensions with their accessories such as clamps, driving stud, coupler, and spike.

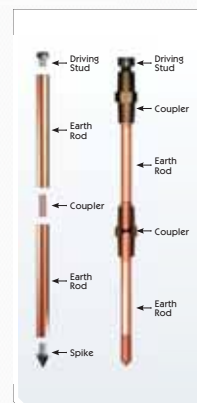
The copper bonded steel cored rod is the most popular, due to its combination of strength, corrosion resistance, and comparatively low cost.

Solid copper and stainless steel rods provide a very high level of corrosion resistance at the expense of lower strength and higher cost.

Copper Bond Earth Rods				
Nominal Diameter (mm)	Length (mm)	Shank Dia (mm)	Weight (kg)	Part No.
16	1200	14.2	1.53	RBB 1612
16	1500	14.2	1.88	RBB 1615
20	1200	17.2	2.19	RBB 2012
20	1500	17.2	2.73	RBB 2015

Solid Copper Earth Rods				
Nominal Diameter (mm)	Length (mm)	Thread Size	Weight (kg)	Part No.
16	1200	M8	2.1	RCB 1612
16	1500	M8	2.6	RCB 1615
20	1200	M10	4.1	RCB 2012
20	1500	M10	5.4	RCB 2015

Stainless Steel Earth Rods				
Nominal Diameter (mm)	Length (mm)	Thread Size	Weight (kg)	Part No.
16	1200	M8	2	RSB 1612
16	1500	M8	2.4	RSB 1615
20	1200	M10	3	RSB 2012
20	1500	M10	3.8	RSB 2015





Coupling Dowel

Rod Nominal Diameter (mm)	Dowel Size	Part No.
16	M8	CDB 16
20	M10	CDB 20



Driving Stud

Rod Nominal Diameter (mm)	Part No.
16	DSB 16
20	DSB 20



Spike

Rod Nominal Diameter (mm)	Part No.
16	SSB 16
20	SSB 20



Coupling

Rod Nominal Diameter (mm)	Thread Size (inch)	Part No.
16	5/8	BCB 16
20	3/4	BCB 20



Rod to Wire "U" Clamp

Rod Nominal Diameter (mm)	Conductor Size (mm²)	Part No.
16-20	16-70	CRB 700



Rod to Tape "U" Clamp

Rod Nominal Diameter (mm)	Conductor Size (mm)	Part No.
16-20	20x3 20x5 25x5 30x3 30x5 40x3 40x5	CPB 1620



Rod to Tape Clamp

Rod Nominal Diameter (mm)	Conductor Size (mm)	Part No.
16-20	20x3 20x5 30x3 30x5	CRB 108



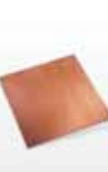
Rod to Wire Clamp

Rod Nominal Diameter (mm)	Conductor Size (mm²)	Part No.
16	16-70	CRB 1616
20	35-90	CRB 2035
20	70-150	CRB 2070



Copper Earth Plate

Dimension (mm)	Part No.
320x320x3	SCPB 323
400x400x3	SCPB 403
600x600x3	SCPB 603
600x600x4	SCPB 604
660x660x3	SCPB 663
660x660x5	SCPB 665
1000x660x3	SCPB 1063
1000x660x5	SCPB 1065



Inspection Earth Pit

Dimension (mm)	Part No.
320x320x230	ECR1
400x400x600	ECR2
650x650x400	ECR3



Low Ohm Material

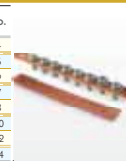
Low Ohm Materials (Activated Bentonite) Used as an earth-electrode backfill in order to reduce soil resistivity. It has the ability to hold its moisture content for a long period of time and to absorb moisture from the surrounding soil.



Earth Busbar

Earth Bar

Tape Dimension (mm)	Number of Holes	Part No.
160x30x3	4	BCTB 4
200x30x3	5	BCTB 5
240x50x5	6	BCTB 6
280x50x5	7	BCTB 7
320x50x5	8	BCTB 8
400x50x5	10	BCTB 10
480x50x5	12	BCTB 12
560x50x5	14	BCTB 14



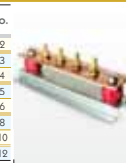
Test Link

Tape Dimension (mm)	Part No.
190x30x3	TLB 303
190x50x5	TLB 505



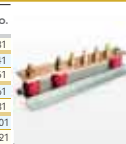
Earth Bar with Holder

Number of Connections	Tape Dimension (mm)	Part No.
2	160x30x3	OCB T2
3	200x30x3	OCB T3
4	240x50x5	OCB T4
5	280x50x5	OCB T5
6	320x50x5	OCB T6
8	440x50x5	OCB T8
10	520x50x5	OCB T10
12	600x50x5	OCB T12



Earth Bar with Single Disconnecting Link

Number of Connections	Tape Dimension (mm)	Part No.
3	270x50x5	EDSB 31
4	315x50x5	EDSB 41
5	355x50x5	EDSB 51
6	395x50x5	EDSB 61
8	515x50x5	EDSB 81
10	595x50x5	EDSB 101
12	675x50x5	EDSB 121



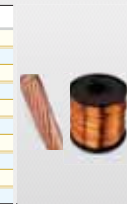
Earth Bar with Double Disconnecting Links

Number of Connections	Tape Dimension (mm)	Part No.
3	350x50x5	EDSB 32
4	390x50x5	EDSB 42
5	430x50x5	EDSB 52
6	470x50x5	EDSB 62
8	590x50x5	EDSB 82
10	670x50x5	EDSB 102
12	750x50x5	EDSB 122



Copper Wire

Wire Size (mm²)	Part No.
16	CWB 016
25	CWB 025
35	CWB 035
50	CWB 050
70	CWB 070
95	CWB 095
120	CWB 120
150	CWB 150
185	CWB 185
240	CWB 240



Yellow /Green Earthing Wire

Wire Size (mm²)	Part No.
16	YGB 016
25	YGB 025
35	YGB 035
50	YGB 050
70	YGB 070
95	YGB 095
120	YGB 120
150	YGB 150
185	YGB 185
240	YGB 240



Earthing Copper Tape

Tape Dimension (mm)	Part No.
20x3	ECB 203
25x3	ECB 253
30x3	ECB 303
50x5	ECB 505
60x5	ECB 605



Flexible Copper Belt

Tape Dimension (mm)	Length (mm)	Hole Size	Part No.
15x1.5	400	7	FBB-400-7
19x2.5	900	9	FBB-16-900
25x3	400	11	FBB-25-400-11
30x5	900	11	FBB-50-900-11
32x6	900	13	FBB-70-900-8



◆ Air termination

Air Rod

Rod Diameter (mm)	Length (mm)	Part No.
16	500	RAB 16/50
16	1000	RAB 16/100
16	1200	RAB 16/120
16	1500	RAB 16/150
16	2000	RAB 16/200
20	500	RAB 20/50
20	1000	RAB 20/100
20	1200	RAB 20/120
20	1500	RAB 20/150
20	2000	RAB 20/200



Multi-Point Air Rod

Rod Diameter (mm)	Length (mm)	Part No.
16	500	3 RAB 16/50
16	1000	3 RAB 16/100
16	1200	3 RAB 16/120
16	1500	3 RAB 16/150
16	2000	3 RAB 16/200
20	500	3 RAB 20/50
20	1000	3 RAB 20/100
20	1200	3 RAB 20/120
20	1500	3 RAB 20/150
20	2000	3 RAB 20/200



Cable Clip

Wire Size (mm²)	Material	Part No.
16	Copper	CPB 916
25	Copper	CPB 925
35	Copper	CPB 935
50	Copper	CPB 950
70	Copper	CPB 970
95	Copper	CPB 995
120	Copper	CPB 9120
185	Copper	CPB 9185
240	Copper	CPB 9240



Cable Clamp (Type A)

Wire Size (mm²)	Material	Part No.
35	Copper Alloy	CPB 800
50	Copper Alloy	CPB 810
70	Copper Alloy	CPB 815
95	Copper Alloy	CPB 835
120	Copper Alloy	CPB 855



Lightning Materials

A lightning rod is a metal rod, which usually manufactured from high conductivity hard drawn copper, mounted on a structure and intended to protect the structure from a lightning strike. If lightning hits the structure, it will preferentially strike the rod and be conducted to ground through a wire, instead of passing through the structure, where it could start a fire or cause electrocution.



Conductor Clamps

Borna Electronics is providing different types of earthing and lightning clamps which are made from high quality copper and aluminum alloys. They are simple to install, providing an effective low resistance connection between earthing equipment. The connections which have been made by clamps are easily made or remade to allow for periodic inspections.

Air Rod Saddle

Rod Diameter (mm)	Wire Size (mm²)	Threaded Size	Part No.
16	35	M16	SDB 35/16
	50	M16	SDB 50/16
	70	M16	SDB 70/16
	90	M16	SDB 90/16
	120	M16	SDB 120/16
20	35	M20	SDB 35/20
	50	M20	SDB 50/20
	70	M20	SDB 70/20
	90	M20	SDB 90/20
	120	M20	SDB 120/20



Air Rod Wall Base (Type A)

Rod Diameter (mm)	Part No.
16	BBB 16
20	BBB 20



Air Rod Wall Base (Type A)

Rod Diameter (mm)	Part No.
16	CSB 16
20	CSB 20



Cable Clamp (Type B)

Wire Size (mm²)	Material	Part No.
35	Copper Alloy	FCPB 35
50	Copper Alloy	FCPB 50
70	Copper Alloy	FCPB 70
95	Copper Alloy	FCPB 95
120	Copper Alloy	FCPB 120



Wire to Tape Clamp

Wire Size (mm²)	Tape Dimension (mm)	Material	Part No.
35	25x3	Copper Alloy	FCPB 35/25
50	25x3	Copper Alloy	FCPB 50/25
70	25x3	Copper Alloy	FCPB 70/25



Tape Clamp

Tape Dimension (mm)	Material	Part No.
25x3	Copper Alloy	CPB 210-H
25x6	Copper Alloy	CPB 220-H
25x3	Aluminum Alloy	CPB 110-H
25x6	Aluminum Alloy	CPB 110-H
30x3	Copper Alloy	CPB 227
38x5	Copper Alloy	CPB 245
40x4	Copper Alloy	CPB 241
50x4	Copper Alloy	CPB 256



Cross Tape Clamp

Tape Dimension (mm)	Material	Part No.
20x3	Copper Alloy	FCPB 903
25x3	Copper Alloy	FCPB 953
30x3	Copper Alloy	FCPB 303



C-Clamp

Cable Size (mm²)	6	10	16	25	35	50	70	95	120	150	185	240	300
6	T-11												
10	T-16	T-20											
16	T-20	T-26	T-44										
25	T-44	T-44	T-44										
35	T-44	T-44	T-60	T-76									
50	T-60	T-76	T-76	T-76	T-98	T-120							
70	T-76	T-76	T-98	T-98	T-120	T-154							
95	T-98	T-98	T-120	T-120	T-154	T-154	T-190						
120	T-154	T-154	T-154	T-154	T-190	T-190	T-240	T-288					
150	T-190	T-190	T-190	T-190	T-240	T-240	T-288	T-365					
185	T-190	T-190	T-240	T-240	T-240	T-288	T-365	T-365	T-365				
240	T-240	T-240	T-240	T-240	T-288	T-365	T-365	T-450	T-450				
300	T-365	T-365	T-365	T-365	T-365	T-450	T-450	T-560	T-560	T-700			
400													
500													



Cable Lug

Cable Size (mm²)	Hole Size (mm²)	Part No.	Cable Size (mm²)	Hole Size (mm²)	Part No.
6	6	KLB 6/6	70	10	KLB 70/10
10	8	KLB 6/8	95	10	KLB 70/12
16	8	KLB 10/6	120	12	KLB 95/10
25	8	KLB 10/8	150	12	KLB 120/10
35	8	KLB 12/8	185	12	KLB 120/12
50	10	KLB 16/10	240	14	KLB 150/12
	10	KLB 25/10		14	KLB 185/12
	10	KLB 35/8		14	KLB 150/14
	10	KLB 35/10		14	KLB 185/14
	10	KLB 50/8		14	KLB 240/12
	10	KLB 50/10		14	KLB 240/14



Tape Clip

Tape Dimension (mm)	Material	Part No.
90x3	Copper	CPB 203
95x3	Copper	CPB 253
30x3	Copper	CPB 303
50x3	Copper	CPB 503
50x5	Copper	CPB 505



Wire to Plate Clamp

Wire Size (mm²)	Part No.
16-70	CRB 310



Tape to Wire Test Clamp

Tape Dimension (mm)	Wire Size (mm²)	Part No.
30x3	35	CGCB 30/3
95x3	35	CGCB 25/3
50x3	50	CGCB 50/3
50x5	70	CGCB 50/5



Connector Clamp

Main Wire Size (mm²)	Secondary Wire Size (mm²)	Part No.
10	1.5-10	CNB 1010
16	1.5-16	CNB 1616
25	16-25	CNB 2525
35	23-35	CNB 3535
50	35-50	CNB 5050
70	35-70	CNB 7070
95	70-95	CNB 9595



Exothermic Welding System

Exothermic welding, is a welding process that employs molten metal to permanently join the conductors. The process employs an exothermic reaction of a thermite composition to heat the metal, and requires no external source of heat or current.

The Borna Electronics Exothermic Welding system:

- is completely portable
- makes excellent corrosion resistance and highly conductive connections
- can be used for over 40 standard connection configurations
- is cost effective
- requires no external power or heat source
- creates high quality electrical connections



Tape to Tape



Tape to Plate



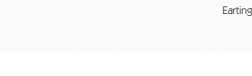
Cable to Earth Rod



Cable to Plate or Pipe



Cable to Rebar



Cable to Cable



Cable to Earth Rod



Cable to Tape

