Color-Keyed® Blackburn®

Grounding

F

Thomas&Betts

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Grounding Connectors and Accessories — Product Overview

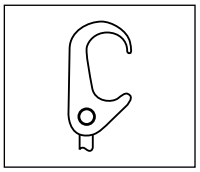

Figure 6
Page F87

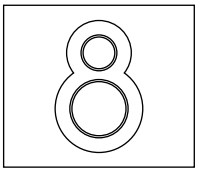

Figure 8
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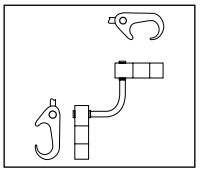

Figure 6-6
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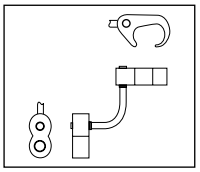

Figure 6-8
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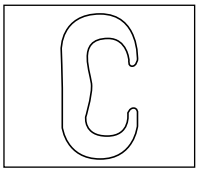

C-Taps
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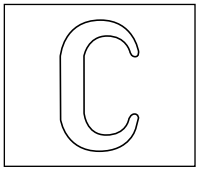

C-Crimp
Page F89

Type GR
Pigtail Connectors
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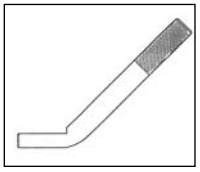

Grounding Studs
Page F91

I-Beam
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Two Way Connector
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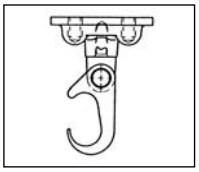

Grounding Plate
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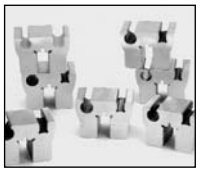
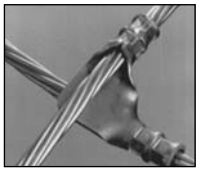
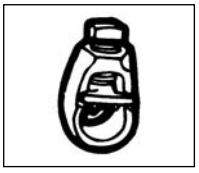


Ground Bus
Bar Connector
Page F95

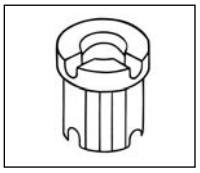
Snap Tap
Connector
Page F96



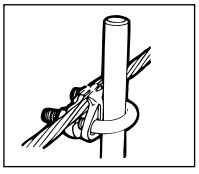
Type GRD, GG
Ground Grid
Connectors
Pages F97-F100



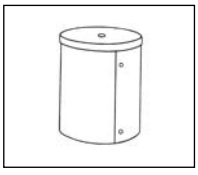
Type GG, GGH,
JAB, G
Ground Rod Clamps
Pages F101-F102



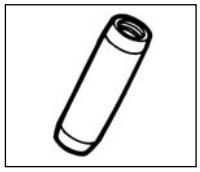
Type DGC
Drive-on Ground
Clamps
Page F102-F104



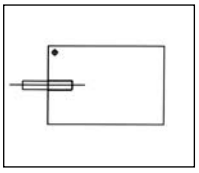
Type GUV
U-Bolt Ground Clamps
Page F105



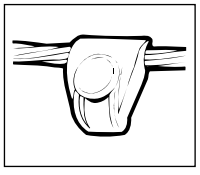
Ground Electrode
Boxes
Page F105



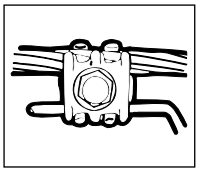
Sectional Ground
Rod Couplings
Page F106



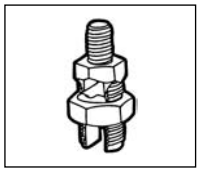
Ground Plate
Page F107



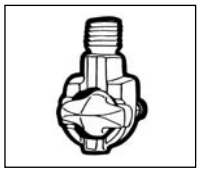
Type GTC
Tower Ground Clamps
Page F108



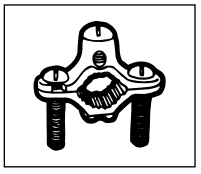
Parallel Connectors
Page F109



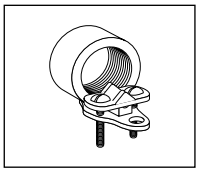
Type SP
Service Post
Connectors
Pages F109-F110



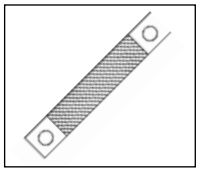
Type TTC
Transformer Tank
Grounding Connector
Page F110



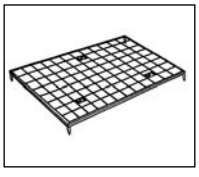
Cast Bronze
Ground Clamps
Pages F111-F114



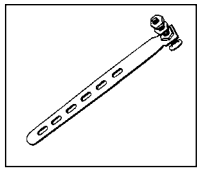
Type CH
Conduit Hubs
Page F115



Type FB
Flexible Braid
Connectors
Pages F116-F117



Metallic Gradient
Control Mat
Page F118



Type FJ
Flexible Ground
Clamp
Page F118

Thomas&Betts

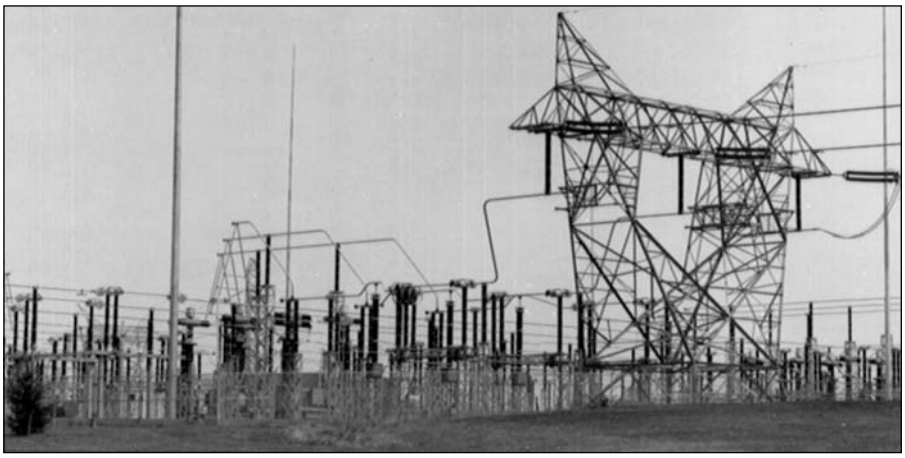
Color-Keyed®
E-Z Ground™ Grounding Connectors

This installation method results in a long lasting low installed cost connection. You can install it and forget it.

Before compression, typical cable connector cross section of cable and connector consists of about 75% metal and 25% air. After Thomas & Betts method compression, the cross section shows 100% metal with virtually no air spaces.

Thomas & Betts introduces a method of compression to replace exothermic welding and its associated disadvantages. This compression method is designed to provide quick, reliable connections for grid grounding at significantly lower installed costs since compression connectors install in less time, in any weather, and are unaffected by moisture, reducing downtime. In addition, our compression connectors for grid grounding require no special training for installation. They are made of high conductivity wrought and cast copper, and are used for connecting and tapping cross grid, loop lines, and ground rods for direct burial or concrete embedded ground grid systems. The Thomas & Betts compression system uses standard electrical connector installation tools.

Compression Method Grounding Connectors Save 50-75% In Time and Labor Costs



- Eliminates exothermic welding.
- Reduces labor and labor costs.
- Minimize possibility of poor connections.
- Mechanical, tensile and electromagnetic force (EMF) criteria.
- Install in any weather – cut downtime.
- Enhance safety.
- Easy to install – no special training.

Meets all applicable specifications

Thomas & Betts grid and ground rod connectors satisfy the requirements of NEC 250-50 for connecting to the Grounding Electrode System. They also meet the requirements of U.L. Std. 467, U.L. Std. 486 CSA Std. C22.2 No. 41 and CSA Std. C22.2 No. 65 being acceptable as grounding and bonding equipment suitable for direct burial. Thomas & Betts grid and ground rod connectors also satisfy the recommended practice for the selection of grounding connector joints described in IEEE 837 standard for qualifying permanent connections used in substation grounding.

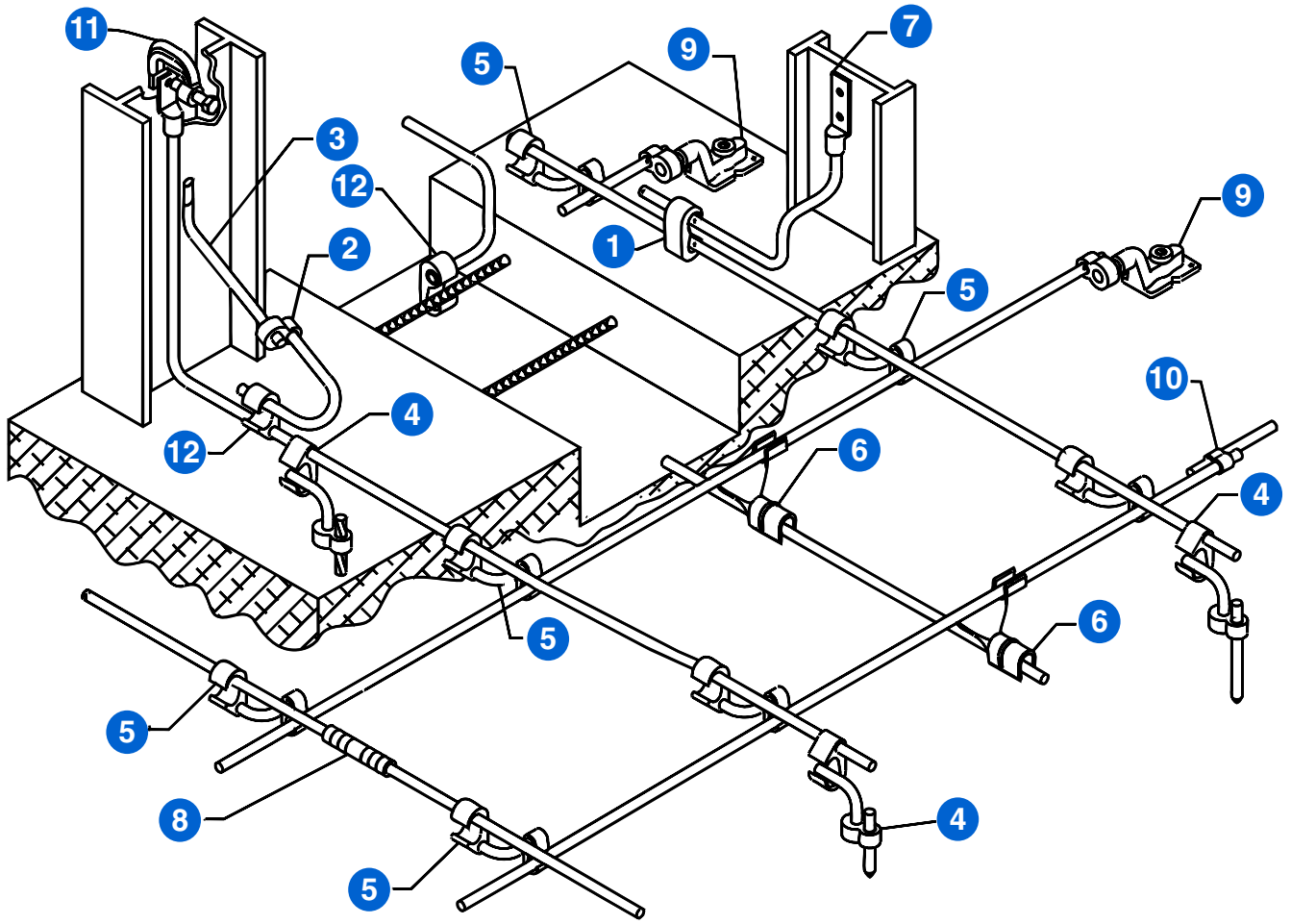
The connectors conform to the following IEEE Standard 837 requirements:

- 350°C current cycling
- Freeze-thaw test
- Accelerated aging – Nitric acid/salt spray.

Reliable installations through compression connections

The Thomas & Betts method, utilizing compression tools with matching dies, forms the connector and conductor into a solid, homogeneous mass to provide an optimum electrical bond between connector and conductor. The dies are designed to produce a circumferential, hex-shaped compression rather than a simple indent. The circumferential compression creates a large area of high pressure contact between cable and connector which, in turn, assures high conductivity, low resistance, and high pullout values exceeding all industry requirements.

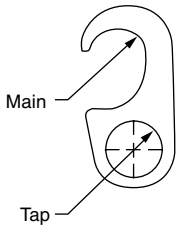
Color-Keyed®
Grounding Connectors

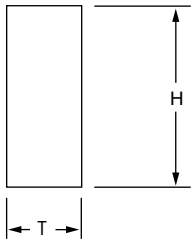


Thomas & Betts offers its complete line of grid-ground compression connectors. Our EZ Ground™ connectors are designed for direct burial and offer a safe, efficient alternative to exothermic welding products. Grid ground installations do not require explosive charges, and can be installed in various climate conditions. These range taking products will reduce the number of connectors and dies needed for your installation. Thomas & Betts E-Z Ground products meet all applicable standards (IEEE837, UL467, CSA 22.2). Connectors are pre-filled with oxide inhibitors and sealed.

1. C-Taps
2. Figure 8
3. Steel Grounding Stud TBG Series
4. Figure 6-8 Connectors
5. Figure 6-6 Connectors
6. GG Connectors
7. Lug
8. Splice/2-Way/Connector
9. Grounding Plate
10. Pigtail Connectors
11. I Beam Clamp
12. Figure 6 Connector

Color-Keyed®
EZ Ground™ Compression Connectors



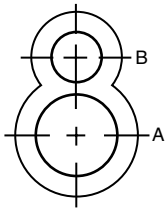


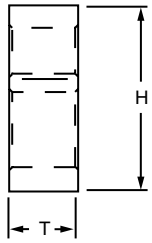
MEETS
IEEE
837 REQUIREMENTS

Figure 6 Compression Ground Tap Connector

Cat. No.	Application		Cable to Rebar Application		Dimensions (In.)		Dies for TBM 14M, 13100A or TBM15I
	Main	Tap	A Ground Rod	B Cable Range	T	H	
54855	1/0 STR. - .250 kcmil or 1/2" - 5/8" ROD	#4 SOL. - #2 STR.	#3 Rebar 3/8 thru 1/2 #4 Rebar	#4 SOL. - #2 STR.	¾"	1 15/16"	15G86R
54860	1/0 STR. - .250 kcmil or 1/2" - 5/8" ROD	1/0 STR. - 2/0 STR.	#3 Rebar 3/8 thru 1/2 #4 Rebar	1/0 STR. - 2/0 STR.	¾"	2 3/16"	15G86R
54865-CK	1/0 STR. - 250 kcmil or 1/2" - 5/8" ROD	3/0 STR. - 250 kcmil	#3 Rebar 3/8 thru 1/2 #4 Rebar	3/0 STR. - .250 kcmil	¾"	2 3/16"	15G86R
54875	#6 SOL. - #2 STR.	#6 SOL. - #2 STR.	–	–	¾"	2 3/16"	15501A
54885	250 kcmil - 500 kcmil or 5/8" - 3/4" ROD	#4 SOL. - #2 STR.	#5 Rebar 5/8 thru 3/4 #6 Rebar	–	¾"	1 15/16"	15G126R
54890	250 kcmil - 500 kcmil or 5/8" - 3/4" ROD	1/0 STR. - 2/0 STR.	#5 Rebar 5/8 thru 3/4 #6 Rebar	1/0 STR. - 2/0 STR.	¾"	2 1/8"	15G126R
54895	250 kcmil - 500 kcmil or 5/8" - 3/4" ROD	3/0 STR. - 250 kcmil	#5 Rebar 5/8 thru 3/4 #6 Rebar	3/0 STR. - 250 kcmil	¾"	2 3/16"	15G126R
54900	250 kcmil - 500 kcmil or 5/8" - 3/4" ROD	350 kcmil - 500 kcmil	#5 REBAR 5/8 thru 3/4 #6 Rebar	350 kcmil - 500 kcmil	1 3/8"	2 7/16"	15G121R

* Tin plated version available of galvanized ground rods. Add suffix -TP





MEETS
IEEE
837 REQUIREMENTS

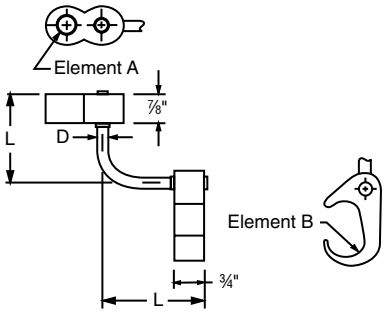
Figure 8 Compression Ground Rod Tap Connector

Cat. No.	A Ground Rod	B Cable Range	Dimensions (In.)		Dies for TBM14M 13100A or TBM15I
			T	H	
GR12-202	½"	2 AWG-2/0 AWG	7/8"	1 15/16"	15G121R
GR58-202	5/8"	2 AWG-2/0 AWG	7/8"	1 31/32"	15G121R
GR34-202	¾"	2 AWG-2/0 AWG	7/8"	2 3/16"	15G121R
GR1-202	1"	2 AWG-2/0 AWG	7/8"	2 3/16"	15G121R
GR12-40250	½"	3/0 AWG-250 kcmil	7/8"	1 15/16"	15G121R
GR58-40250	5/8"	3/0 AWG-250 kcmil	7/8"	2 1/8"	15G121R
GR34-40250	¾"	3/0 AWG-250 kcmil	7/8"	2 3/16"	15G121R
GR1-40250	1"	3/0 AWG-250 kcmil	7/8"	2 7/16"	15G121R
GR58-300500	5/8"	300-500 kcmil	7/8"	2 1/8"	15G121R
GR34-300500	¾"	300-500 kcmil	7/8"	2 7/16"	15G121R
GR1-300500	1"	300-500 kcmil	7/8"	2 11/16"	15G121R

Tooling: Pg. E78-E102
Die Selector Chart: Pg. E107-E111

Color-Keyed®

EZ Ground™ Compression Connectors

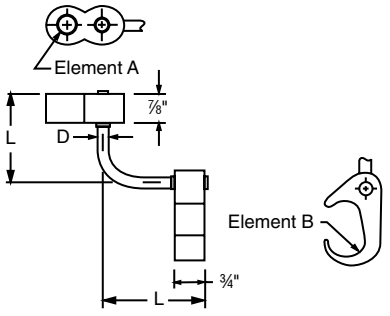


MEETS IEEE 837 REQUIREMENTS

Figure 6 to 8 Compression Ground Rod to Grid Connectors

Cat. No.	A Ground Rod	B Cable Range	Dimensions (In.) D	Dimensions (In.) L	Dies for TBM14M, 13100A or TBM15I Element A	Dies for TBM14M, 13100A or TBM15I Element B
54855LR12*	½"	2 AWG-250 kcmil	5⁄16"	2½"	15G86R	15G121R
54885LR12*	½"	250 kcmil-500 kcmil	5⁄16"	2½"	15G126R	15G121R
54865LR58*	⅝"	2 AWG-250 kcmil	5⁄16"	2½"	15G86R	15G121R
54895LR58*	⅝"	250 kcmil-500 kcmil	5⁄16"	2½"	15G126R	15G121R
54875LR34*	¾"	2 AWG-250 kcmil	½"	2⅝"	15G86R	15G121R
54900LR34*	¾"	250 kcmil-500 kcmil	½"	2⅝"	15G126R	15G121R
54910LR100	1"	2 AWG-250 kcmil	½"	2⅝"	15G86R	15G121R
54920LR100	1"	250 kcmil-500 kcmil	½"	2⅝"	15G126R	15G121R

*Tin plated version available of galvanized ground rods. Add suffix -TP.



MEETS IEEE 837 REQUIREMENTS

Figure 6 to 6 Compression Ground Grid Connectors

Cat. No.	Element A Cable to Cable	Element B Cable to Cable	Element B to Ground Rod	Element B to Rebar	Dimensions (In.) D	Dimensions (In.) T	Dimensions (In.) T-T	Die Selection for TBM14M, 13100A or TBM15I A	Die Selection for TBM14M, 13100A or TBM15I B
54855L	#6SOL-#2STR	#6SOL-#2STR	–	–	⅞"	¾"	¾"	15501A	15501A
54865L	#1STR-250 kcmil	#6SOL-#2STR	½"-⅝"	3/8-1/2" #3-#4 Rebar	⅞"	¾"	¾"	15G86R	15501A
54875L	#2STR-250 kcmil	#2STR-250 kcmil	½"-⅝"	3/8-1/2" #3-#4 Rebar	⅞"	¾"	¾"	15G86R	15G86R
54885L	250 kcmil-500 kcmil	#6SOL-#2STR	⅝"-½"	5/8-3/4" #5-#6 Rebar	⅞"	¾"	¾"	15G126R	15501A
54895L	250 kcmil-500 kcmil	#2STR-250 kcmil	⅝"-½"	5/8-3/4" #5-#6 Rebar	⅞"	¾"	¾"	15G126R	15G86R
54900L	250 kcmil-500 kcmil	250 kcmil-500 kcmil	⅝"-½"	5/8-3/4" #5-#6 Rebar	⅞"	1⅛"	1⅛"	15G121R15	G121R

Tooling: Pg. E78-E102
Die Selector Chart: Pg. E107-E111

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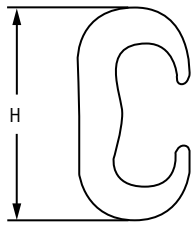

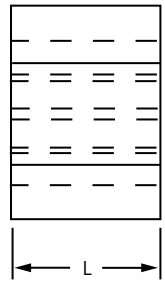

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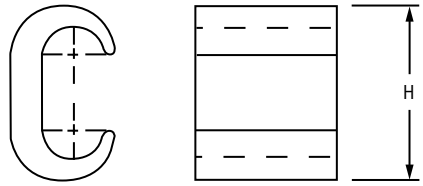
C-Taps

Cat. No.	Main	Tap	H (in.)	L (in,)	Dies for TBM14M, 13100A or TBM15I *	Crimps
CTP22	#6 SOL. - #2 STR.	#6 SOL. - #2 STR.**	1.16	.75	HBKC	1
CTP202	#1 STR. - 2/0 STR.	#6 SOL. - #2 STR.**	1.41	.75	15501A	1
CTP2020	#1 STR. - 2/0 STR.	#1 STR. - 2/0 STR.	1.54	.75	15501A	1
CTP25020	3/0 STR. - 250 kcmil	#6SOL. - 2/0 AWG**	1.97	.75	15G86R	1
CTP250250	3/0 STR. - 250 kcmil	3/0 STR. - 250 kcmil	2.06	.88	15G86R	1
CTP50020	300-500 kcmil	#6 SOL. - 2/0 AWG**	2.42	.88	15G121R	2
CTP500250	300-500 kcmil	3/0 STR. - 250 kcmil	2.67	.88	15G121R	2
CTP500500	300-500 kcmil	300 - 500 kcmil	2.91	1.10	15G121R	3

Material: High Conductivity Copper.
*Cat. No. 15500 adapter required if using TBM15I and 155XX series dies.
**#6 AWG branch must be doubled.



Copper C-Crimps†† Wire Combinations

Connector No.	Run	Tap	Die Index	Installing Die TBM14M, 13100A, TBM15I	Dimensions (in.) L	Dimensions (in.) H
BC48	6 SOL. - 4 STR.	8 SOL.-8 STR.	BG OR 5⁄8	B58CR	41⁄64	47⁄64
BC46-BB	6 SOL. - 4 STR.	6 SOL.-6 STR.	BG OR 5⁄8	B58CR	41⁄64	3⁄4
BC44	6 SOL. - 4 STR.	4 SOL.-4 STR.	BG OR 5⁄8	B58CR	41⁄64	51⁄64
BC24	2 SOL. - 2 STR.	8 SOL.-4 STR.	C	HBKC	3⁄4	63⁄64
BC22	2 SOL. - 2 STR.	2 SOL.-2 STR.	C	HBKC	3⁄4	1 3⁄64
BC202	1/0 SOL. - 2/0 STR.	8 SOL.-2 STR.	E or O	HO	15⁄16	1 5⁄16
BC2020-BB	1/0 SOL. - 2/0 STR.	1/0 STR.-2/0 STR.	E or O	HO	15⁄16	1 11⁄32
BC402	3/0 STR. - 4/0 STR.	6 SOL.-2 STR.	F or D3	HD	1 1⁄16	1 5⁄8
BC4020	3/0 STR. - 4/0 STR.	1/0 SOL.-2/0 STR.	F or D3	HD	1 1⁄16	1 5⁄8
BC4040	3/0 STR. - 4/0 STR.	3/0 SOL.-4/0 STR.	F or D3	HD	1 1⁄16	1 5⁄8

†† Does not meet IEE837
Tooling: Pg. E78-E102
Die Selector Chart: Pg. E107-E111

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MEETS IEEE 837 REQUIREMENTS

Pigtail Connectors

When connecting cable to ground rod for direct burial or in concrete, the connector shall be wrought copper with min. conductivity of 99% I.A.C.S., such as Thomas & Betts series GR12-306. Hex compression with die code embossing shall be used.

- Figure-8 connectors
- Hex compression intimately bonds cable directly to ground rod.
- Conforms to IEEE std. 837
- U.L. 467

Cat. No.	Cable Range	Ground Rod	Die Code for TBM14M, 13100A or TBM15I
GR12-306	One Cable: 3/0 to 6 AWG	½"	87H
	Two Cables: 2 to 6 AWG		
GR58-406	One Cable: 4/0 to 6 AWG	⅝"	87H
	Two Cables: 2 to 6 AWG		
GR34-4010	One Cable: 4/0 to 1/0 AWG	¾	99H

Tooling: Pg. E78-E102
Die Selector Chart: Pg. E107-E111

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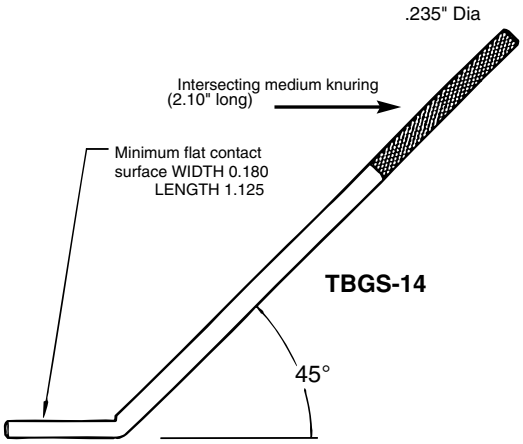
Structural Grounding Stud(s) – TYPE TBGS

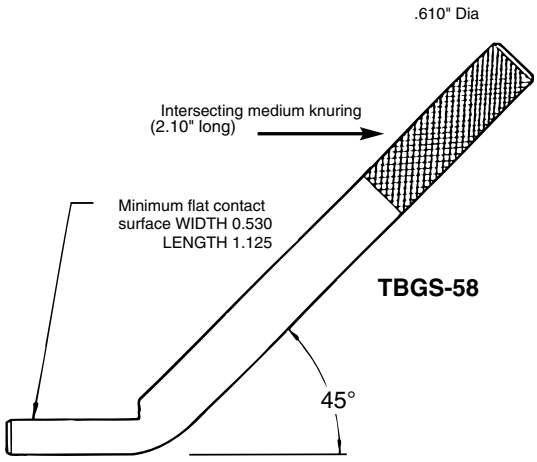
These ground studs may be welded to steel structures with minimal construction welding equipment and connected to grounding conductors with the appropriate Thomas & Betts grounding connectors. The knurled portion of the stud will ensure excellent mechanical pull-out and electrical continuity for the integrity of the grounding circuit.

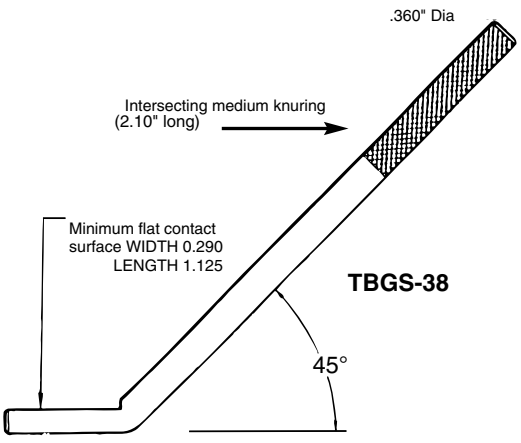
Cat. No.	Rod Size
TBGS-14	¼"
TBGS-38	⅜"
TBGS-58	⅝"
TBGS-34	¾"

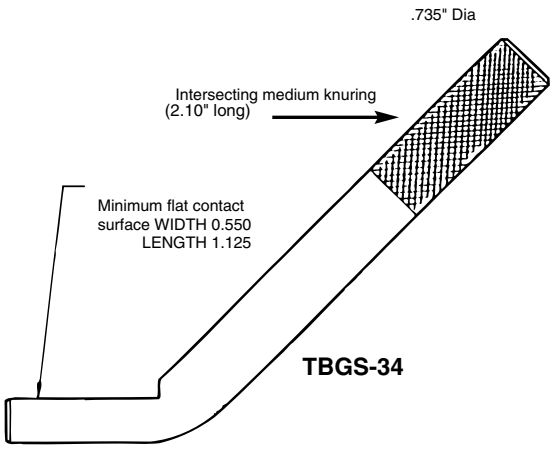
Specifications:

These studs are made of high strength steel and coated with corrosion resistant copper cyanide.









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MEETS IEEE 837 REQUIREMENTS

I Beam Ground Clamp

I-beam ground clamp for connecting ground cable to I-beam, or any 1" max. structural steel member without welding or drilling. Breakaway bolt head shears at predetermined torque to assure tight connection. Heavy duty compression lug provides excellent current carrying capabilities.

Surface of steel must be cleaned in accordance with the installation instruction sheet provided with the product.

Connector Material: High conductivity cast copper bright dip.

Clamp Material: Drop forged high grade steel, zinc plated.

Cat. No.	Wire Range	TBM15I Installing Tool, Die Code
IBG2-10	2 thru 1/0 AWG	71
BG20-40	2/0 thru 4/0 AWG	87

Hydraulic tooling with hex crimp dies.

Satisfies requirements of NEC250-81 and 250-91 for connecting to the grounding electrode system.

Material – Cast Copper

Finish – Electro-Tin Plated

Cast Copper Two Way Connector Applications – Heavy Duty

Cable Cat. No.	Die Size	Die Code
53504	8AWG	29
53505	6AWG	29
53506	4AWG	29
53507	2AWG	45
53508	1AWG	45
53509	1/0AWG	45
53510	2/0AWG	66
53511	3/0AWG	66
53512	4/0AWG	66
53513	250 kcmil	76
53515	350 kcmil	99
53518	500 kcmil	99
53523	750 kcmil	112

Use hydraulic tools with hex dies.

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MEETS IEEE 837 REQUIREMENTS

Ground Plates

Cat. No.	Figure	Cable Range	H	Dies
GP2250-2	1	2-250 kcmil	3⅝"	15G86R
GP2250-4	2	2-250 kcmil	4⅞₂"	15G126R
GP250500-2	1	250-500 kcmil	3⅝"	15G86R
GP250500-4	2	250-500 kcmil	4⅞₂"	15G126R

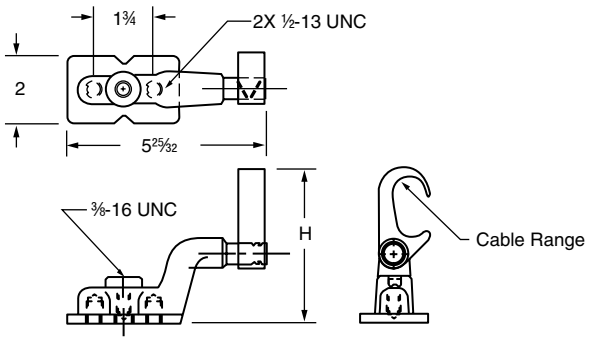

Figure 1

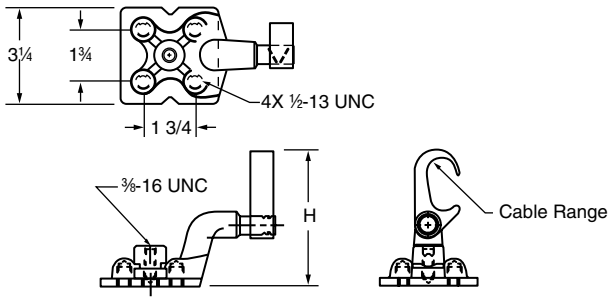

Figure 2

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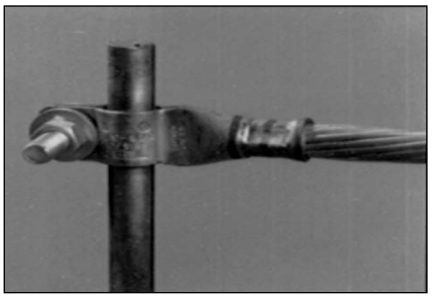
Cast Copper Connectors for Grounding



Ground Clamp

Cat. No.	Wire Size	Ground Rod Diameter (in.)	Rebar # (in.)	Bolt Size (in,)	Die Code
CC2C-45R	#2-#3 AWG	½ or ⅝	⅜	¼	33-Brown
CC1C-45R	#1 AWG	½ or ⅝	⅜	¼	37-Green
CC10C-56R	1/0 AWG	⅝ or 3¾	⅝	⅜	42-Pink
CC20C-56R	2/0 AWG	⅝ or 3¾	⅝	⅜	45-Black
CC40C-56R	4/0 AWG	⅝ or ¾	⅝	⅜	54-Purple

U.L. 467 – Approved for direct burial.

Crimps to cable, clamps to ground rod and rebar. Provides a permanent, reliable connection. Uses standard Color-Keyed® hand and hydraulic tools. Color-coded for easy installation die selection.

Material: High conductivity wrought copper

Furnish with stainless steel hardware, ¼" washers, bolts and nuts.

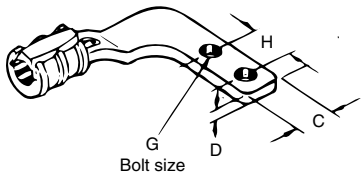
Cat. No.	Wire Range	Bolt Hole	Die Code No.*	Unit Quan.	Std. Pkg.	Wt. per 100	Hex Die Cat. No.	Hex Die Die Code No.	Inches L1	L2	D	C	H
53055FL	1/0-2/0 AWG	⅜"	66	2	10	75	*15534	66	4 3/32	3 21/32	9/32	1⅜	1
53065FL	4/0-250 kcmil	⅜	87H	2	10	112	**15506	87H	4½	4 3/32	5/16	1⅜	1

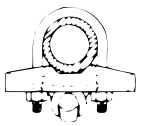
* TM14M, 13100A, TBM15I with hex crimp dies.
**TBM15I with hex crimp dies only.

For terminating or connecting continuous runs of copper cable to flat surfaces, i.e., cable trays, structures, and busbar.

The captivated "Keeper Bar" design extends the cable range, and helps hold cable prior to crimping, thereby facilitating installation. Saddles are marked with conductor size and die code. Conductor can be assembled to saddle with standard dies and hydraulic tools.

Material: High conductivity cast copper





FG2040R2 Series Connectors (for round posts)

Grid to Fence Grounding Clamps

Cat. No.	Ground Cable Range	Die Code	Steel & Alum. Line Post Range
FG2040R2	2/0-3/0-4/0	76	2"
FG2040R25	2/0-3/0-4/0	76	2½"
FG2040R3	2/0-3/0-4/0	76	3"
FG210R2	2-1-1/0	66	2"
FG210R25	2-1-1/0	66	2½"
FG210F3	2-1-1/0	66	3"

Install with hydraulic tooling with hex crimp dies.

These connectors bond copper conductors to steel or aluminum fence post or top rail of round fence posts. They provide a quick, dependable installation at low installed cost, and use no incendiary materials.

Material: U bolt – steel

Body – cast copper alloy

Tooling: Pg. E78-E102
Die Selector Chart: Pg. E107-E111

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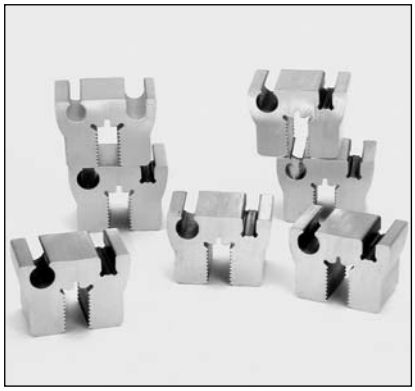
EZ Ground™ Compression Connectors

NEW



Features and Benefits

- ***Fast and easy installation***
- ***Superior low-resistance, high-conductivity connections***
- ***Uses conventional compression tools***
- ***Produces a permanent connection with any combination of copper from #6 to #2 solid or stranded copper conductor, to a ¼" copper bus bar***
- ***UL and CSA certified***

The unique patent pending design of Thomas & Betts new EZ-Ground Bus Bar Connector cuts your installation time in half, with results that are superior to conventional connectors.

Installation can be completed in less than two minutes with one easy crimp! The connector attaches directly to the bus, saving the labor-intensive process of drilling and tapping. The unique jaw interface of the EZ-Ground Bus Bar Connector grips the copper bus, resulting in a low-resistance, high-conductivity connection.

The EZ-Ground Bus Bar Connector can be used in OEM applications or telecom applications — cellular, PCS and others. It provides a continuous ground to the copper bus bar making it ideal for hut and tower applications. The design allows for installation in virtually any position horizontal or vertical, and it is suitable for inside and outside plant use.

Installation can be completed using any T&B compression tool that accepts U-shaped die sets and is rated 12 ton or higher. Made from pure wrought copper and pre-filled with oxide inhibitor, the EZ-Ground Bus Bar Connector has proven performance and quality.

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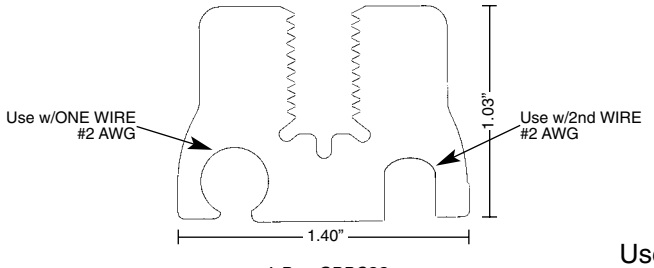
Bus Bar Connector

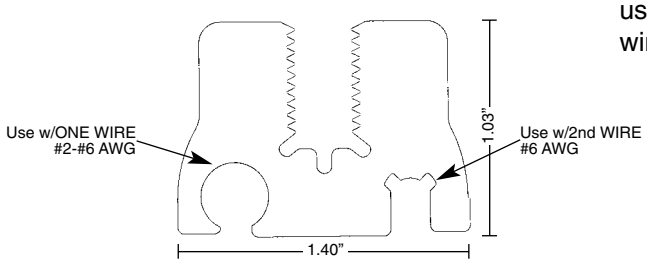
Cat. No.	Bus Bar (po)	Conductor Range	Standard Ctn.	UPC Code
GBBC22	¼	#2 AWG-#2AWG	1	783786-26587
GBBC26	¼	#6 AWG-#2AWG	1	783786-28500



¼ Bus GBBC22

Use this side of the connector when using only one wire.

Use this side of the connector only when using two wires.



¼ Bus GBBC26

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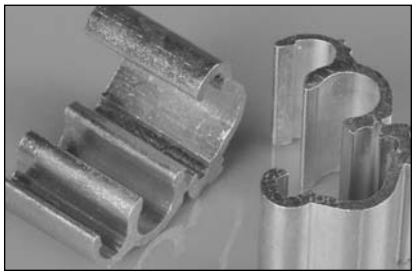

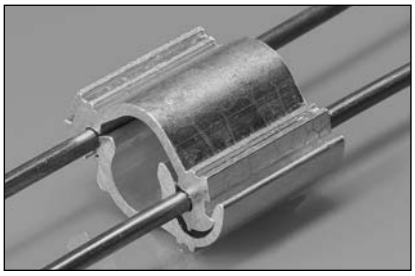

SnapTap™ Connector

Designed for bonding and grounding applications using copper, steel strand and ground rod, this unique connector can be easily installed using channel locks or pliers. It is a "snap" to assemble—no special tools are required. Made from high-strength aluminum alloy with tin plating, the connector has excellent electrical and mechanical characteristics. An electrically superior pressure fit connection is achieved in seconds without expensive tooling. The connector is also easy to disassemble requiring only a flat-head screwdriver to release the connected body.

The one-piece design keeps parts together minimizing loss of components prior to assembly. Simply separate the pieces and snap them in place for the installation. There is an audible "snap" indicating the connection is complete and that you have a proper installation.

Tested according to UL467, these connectors exceed performance requirements.

Cat. No.	Connector Description		Packaging		Standard Order Quantity
	Main	Branch	Inner Pack	Outer Pack	
JP62	No. 2 AWG Sol Copper	No. 6 AWG Sol Copper	20	200	200
JP66	No. 6 AWG Sol Copper	No. 6 AWG Sol Copper	20	200	200
JP146	¼" Steel Strand	No. 6 AWG Sol Copper	20	200	200
JP5166	5⁄16" Steel Strand	No. 6 AWG Sol Copper	20	200	200
JP386	⅜" Steel Strand	No. 6 AWG Sol Copper	20	200	200
JP126	½" Steel Strand	No. 6 AWG Sol Copper	20	200	200
JP126G	½" Ground Rod	No. 6 AWG Sol Copper	20	200	200
JP2614	¼" Steel Strand	Two-No. 6 AWG Sol Copper	20	200	200
JP26516	5⁄16" Steel Strand	Two-No. 6 AWG Sol Copper	20	200	200
JP2638	⅜" Steel Strand	Two-No. 6 AWG Sol Copper	20	200	200
JP2612G*	½" Ground Rod	Two-No. 6 AWG Sol Copper	20	200	200

Note: All Tooless Connectors are UL listed. Only items with (*) are CSA listed.

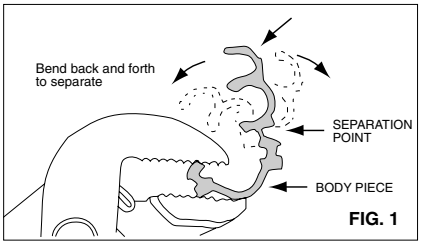

FIG. 1

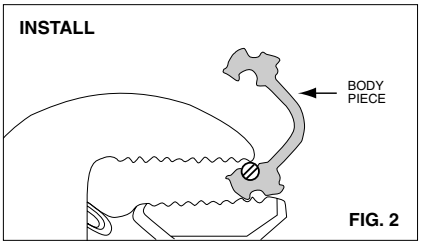

FIG. 2

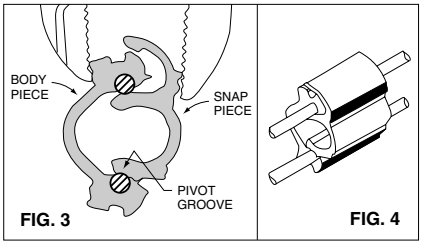

FIG. 3

FIG. 4

General Usage Instructions

Separate

No special tools required. Use ordinary parallel jaw pliers to separate the connector into two parts. Hold one side of connector with pliers and bend opposite side back and forth until parts separate. (see fig. 1)

Caution: Be careful not to pinch fingers or thumb when separating parts. Keep fingers out of bend path when bending part against plier jaws.

Installation

1. Strip the insulation from each conductor. Be careful not to nick the conductor ends with a wire brush or emery cloth if necessary.
2. Place each conductor into the grooves in BODY piece. Press conductors with pliers to align and seat into grooves. (see fig. 2)
3. Hold the conductors and BODY piece until it stops. Use parallel jaw pliers and grip the SNAP and BODY pieces as shown. (see fig. 3). Apply pressure until connector "snaps" into place. Visually inspect snap to verify full insertion. The connection is now complete. (see fig. 4)

Removal

The connector can be disassembled using a flat-head screwdriver to pry the SNAP piece from BODY piece.

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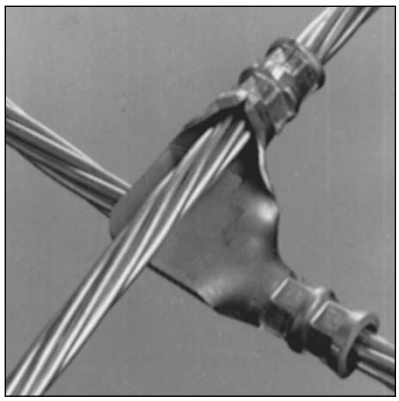

Cable to Cable or Rod

High conductivity wrought copper, one piece construction for cable to cable, cable to rod, "T" and "X" connections. Suitable for direct burial or in concrete.

- One piece construction.
- Connects cable to cable and cable to rod, "T" and "X" connections.
- Suitable for direct burial or in concrete.
- Replaces exothermic welds.
- Conforms to IEEE standard 837.
- U.L. 467.

Cat. No.	Cable to Cable Range				Ground Rod	Rod to Cable		
	Main	Die Code	Branch	Die Code		Die Code	Cable	Die Code
GG21-21	#2 or #1	45	#2 or #1	45	–	–	–	–
GG10-10	1/0	54	1/0	54	–	–	–	–
GG2030-21	2/0 or 3/0	60	#2	45	–	–	–	–
GG2030-10	2/0 or 3/0	60	1/0	54	–	–	–	–
GG2030-2030	2/0 or 3/0	60	#1	50	–	–	–	–
GG40250-21	4/0 or 250	71	#2 #1	45 50	½" ⅝"	71 80H	#2 or #1 #2 or #1	45 50
GG40250-10	4/0 or 250	71	1/0	54	½" ⅝"	71 80H	1/0	65
GG40250-2030	4/0 or 250	71	2/0 or 3/0	60	½" ⅝"	71 80H	2/0 or 3/0 2/0 or 3/0	60 60
GG40250-40250	4/0 or 250	71	4/0 or 250	71	½" ⅝"	71 80H	4/0 or 250 4/0 or 250	71 71
GG500-40250	500 kcmil	87	4/0 or 250	71	⅝" ¾"	80H 87H	500 500	87 87
GG500-500	500 kcmil	87	500	87	¾"	87	500	87
GG500-350	500 kcmil	87H	350	80H	⅝" ¾"	87H	350	80H
GG500-2030	500 kcmil	87H	2/0 or 3/0	60	⅝" ¾"	87H	2/0 or 3/0	60
GG350-350	350 kcmil	80H	350	80H	–	–	–	–

Tooling: Pg. E78-E102
Die Selector Chart: Pg. E107-E111

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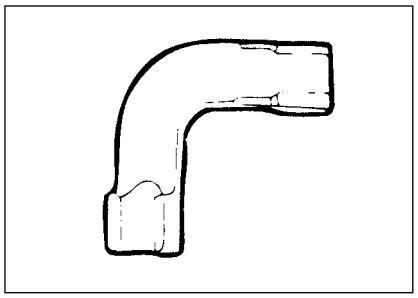
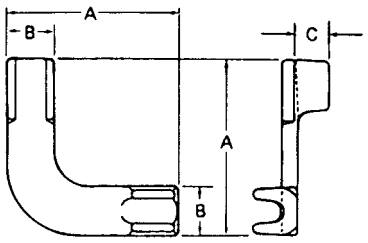
EZ Ground™ Compression Connectors

Type GRD — Cable to Cable Connector





- *For Copper cable to cable ground grid connections*
- *Cast of high conductivity bronze alloy*
- *Suitable for direct burial*

	Conductor Size									Installation Information			Dimensions (in.)		
	Main				Tap										
Cat. No.	max.	min.	max. (mm²)	min. (mm²)	max.	min.	max. (mm²)	min. (mm²)	Ground Rod	Hyd. Tool	Die	No. Crimps	A	B	C
GRD2	1	2	42.4	33.6	1	2	42.4	33.6	—	JB12HA	B09CH	1	2 1/2	11/16	11/16
GRD20	2/0	1/0	67.4	53	2/0	1/0	67.4	53	—	JB12HA	B10CH	1	3	13/16	7/8
GRD420	250 kcmil	4/0	126.6	107	2/0	1/0	67.4	53	5/8	JB12HA	B12CH	2	3 5/8	1 1/16	1 3/16
GRD40	250 kcmil	4/0	126.6	107	250 kcmil	4/0	126.6	107	5/8	JB12HA	B12CH	2	3 5/8	1 1/16	1 3/16

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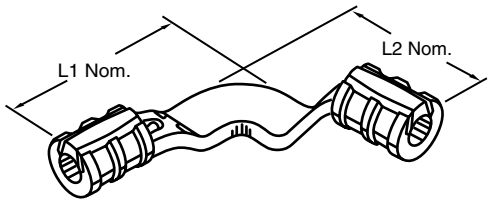
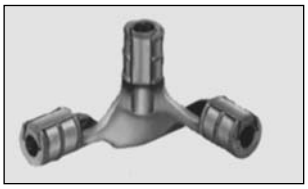


Grounding Grid Connectors Heavy Duty Cast Copper††

Cat. No.	Rod to Cable Range: Rod Size (in.)	Rod to Cable Range: Cable Range	Cable to Cable Range: Main	Cable to Cable Range: Branch	Rod to Cable Installing Die Code for TBM14M, 13100A or TBM15I: Rod Barrel	Rod to Cable Installing Die Code for TBM14M, 13100A or TBM15I: Cable Barrel	Overall Dimension (in.): L1	Overall Dimension (in.): L2
53055	–	–	1/0-2/0 AWG	1/0-2/0 AWG	–	66	3⅞	3⅞
53059†	½-⅝	2-1 AWG	4/0-250 kcmil	2-1 AWG	87H	54H	4⁵⁄₃₂	4⁹⁄₁₆
53060†	½-⅝	1/0-2/0 AWG	4/0-250 kcmil	1/0-2/0 AWG	87H	87H	4⁷⁄₁₆	4⁵⁄₁₆
53065†	½-⅝	4/0-250 kcmil	4/0-250 kcmil	4/0-250 kcmil	87H	87H	4⁷⁄₁₆	4⁵⁄₁₆
53069†	¾	1/0-2/0 AWG	300-350 kcmil	1/0-2/0 AWG	106H	66	4¹⁹⁄₃₂	4¹⁹⁄₃₂
53071†	¾	4/0-250 kcmil	300-350 kcmil	4/0-250 kcmil	106H	106H	5¼	4²⁵⁄₃₂
53073†	1	1/0-2/0 AWG	500 kcmil	1/0-2/0 AWG	125H	66	4¹³⁄₁₆	4⅞
53075†	1	4/0-250 kcmil	500 kcmil	4/0-250 kcmil	125H	87H	6⁹⁄₁₆	5
53080†	1	500 kcmil	500 kcmil	500 kcmil	125H	125H	5³⁄₁₆	5³⁄₁₆

Cat. No. 15500 adapter as required for all 15,500 Series dies, not for 15600 Series.
† Ground rods 4/0-250 wire barrels suitable for ½" smf ⅝" rod
500 kcmil wire barrels suitable for 1" rods
300-500 kcmil wire barrels suitable for ⅝" rods
Hydraulic tools only
†† Does not meet IEE837



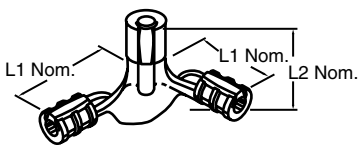
For connecting perpendicular runs of stranded copper cable to ground rod.

Material: Heavy duty cast copper

Two Cables to Ground Rod††

Cat. No.	Cable Size: Main	Cable Size: Tap	Ground Rod Dia.	TBM15I Die for Cable Code	Overall Dim. (in.): L1	Overall Dim. (in.): L2	TBM15I Die for Ground Rod Code
53065-58GR	250 or 4/0	250 or 4/0	⅝" & ½"	87H	4¹⁵⁄₁₆	3¼	87H
53065-34GR	250 or 4/0	250 or 4/0	¾	87H	4¹⁵⁄₁₆	3¾	106H

Installs with Hydraulic Tools with hex crimp dies.
†† Does not meet IEEE837



Copperweld* Conductors & Rebar – for Use with Cast Copper Connectors

Cable Size	Reinforcing Rod Size	Copper Weld Conductor Size
2, 1 AWG	–	3 #8 or 3 #6
1/0, 2/0 AWG	#3	⅜ (7 #8) or ⁷⁄₁₆ (7 #7)
4/0, 250 kcmil	#4	⁷⁄₁₆ (19 #9) or (7 #5)
300-350	#5	²¹⁄₃₂ (19 #8) or ⅝ (7 #4)
500 kcmil	#6	¹³⁄₁₆ (19 #6)

* Reg. Trademark Copperweld Corporation
U.L. Listed for use with cast copper connectors.
Tooling: Pg. E78-E102
Die Selector Chart: Pg. E107-E111

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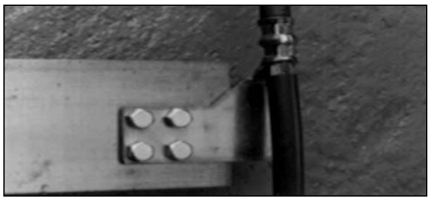
Cast Copper Connectors for Grounding

Rise Cable Flag Connector 600V Applications

Material: High Conductivity Wrought Copper

Finish: Plain

Riser cable flag connectors provide a low cost method of connecting directly to bus bar, eliminating an interface connection. All bolt holes are ⅜" on 1" centers.



Riser cable flag connectors provides a low cost method of connecting directly to bus bar, eliminating an interface connection. All bolt holes are ⅜" on 1" centers.

Material: High Conductivity Wrought Copper

T&B Cat. No.	Fig. No.	Cable Size	Color Key	Die Code	No. Of Crimps	Material THK. (in.)	Dimensions (in.) A	B	C
GFL2-1	1	#2-#1 150/24 175/24	PINK	42	1	3/32	3 5/8	4	2 5/16
GFL10-20	1	1/0 2/0 AWG 225/24 275/24	BLACK ORANGE BLACK BLACK	45 50 45 45	1	3/32	3 5/8	4	2 5/16
GFL40-250	1	4/0-250 kcmil 325/24 450/24 550/24	RED	71	2	5/32	4 1/4	4 1/4	2 7/16
GFL350	1	350 kcmil 650/24 775/24	N/A	80	2	5/32	4 1/4	4 1/2	2 3/8
GFL500[1]	1	500 kcmil 925/24	BROWN	94	2	5/32	5 1/4	4 7/8	2 3/8
GFL750[1,2]	2	750 kcmil 1100/24 1325/24 1600/24	BLACK	106	4	5/32	8 5/8	4 3/4	2 5/8

NOTES:

1. TBM15I only.
2. Both "U" barrels must be crimped to a single, continuous out length of conductor. It is not to be used as a splice.

Installing tools: T&B Cat. No. TBM15I, TBM15BSCR, 13100A, TBM14M, and TBM14BSCR hydraulic tools only.

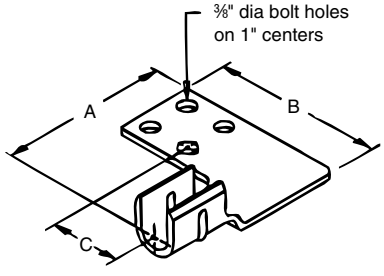


Figure 1

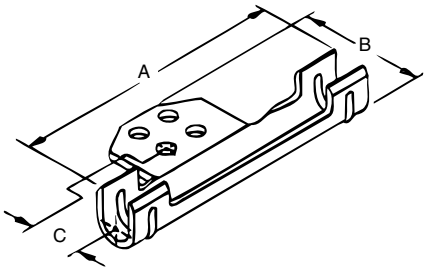


Figure 2

Tooling: Pg. E78-E102
Die Selector Chart: Pg. E107-E111

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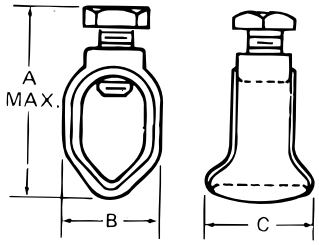
Ground Rod Clamps and Ground Rod Accessories



JABH

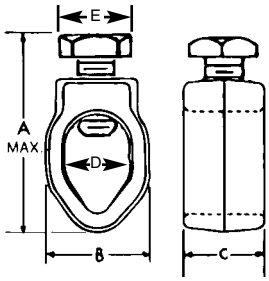
- *Cast of high strength corrosion resistant copper alloy*
- *Both hex head and socket set screws available*
- *Long bearing surface of clamp on ground wire secures ground connection*
- *U.L. Listed for direct burial*

Type JAB – Ground Rod Clamps

Cat. No. Socket Set Screw	Cat. No. Hex Head Bolt	Nominal Rod Dia. (in.)	Nominal Rod Dia. (mm)	Wire Range max.	Wire Range min.	Wire Range max. (mm²)	Wire Range min. (mm²)	Dimensions (in.) A (max.) Socket Screw	A (max.) Hex Bolt	Screw Thread Size UNC-2A	B	C	D
JAB12*	JAB12H	½	12.7	2 str.	10 sol.	33.6	5.2	1 19/32	2 3/32	7/16-14	27/32	7/8	19/32
JAB58	JAB58H	5/8	15.8	1/0 str.	8 sol.	53.4	8.3	1 27/32	2 13/64	7/16-14	29/32	1	11/16
JAB34	JAB34H	¾	19.0	3/0 str.	8 sol.	53.4	8.3	2	2 11/32	7/16-14	11/16	1	51/64
—	JAB34C	¾+⅝	15.8 to 19.0	3/0 str.	8 sol.	95.0	8.3	—	2 11/32	7/16-14	1⅛	1 1/32	13/16
JAB1	JAB1H	1	25.0	4/0 str.	8 sol.	107.1	8.3	2¼	3	7/16-14	1 11/32	1 1/16	1

** Not CSA listed*

*Add suffix **P** to Cat. No. for tin plated clamp.*



- *A dependable ground connection offered at a substantial saving*
- *Cast of high strength corrosion-resistant copper alloy*
- *Hex head bolts*
- *Simplified compact design will make a lasting, trouble-free connection*
- *U.L. Listed for direct burial*

Type G — Budget Line Ground Clamps

Cat. No.	Nominal Rod Dia. (in.)	Nominal Rod Dia. (mm.)	Wire Range max.	Wire Range min.	Wire Range max. (mm²)	Wire Range min. (mm²)	Dimensions (in.) A (max.) Bolt	Screw Thread Size UNC-2A	B	C	D	E
G3*	3/8	9.5	4 str.	10 sol.	21.1	5.2	1⅜	5/16–18	11/16	½	27/64	3/8
G4	½	12.7	2 str.	10 sol.	33.6	5.2	–	3/8–16	27/32	3/8	37/64	½
G5‡	5/8	15.8	2 str.	10 sol.	33.6	5.2	–	3/8–16	29/32	3/8	43/64	½
G6	¾	19.0	2 str.	10 sol.	33.6	5.2	–	3/8–16	1 1/16	3/8	13/16	½

** Not U.L. Listed*

‡ RUS Listed

*Add suffix **P** to Cat. No. for tin plated clamp.*

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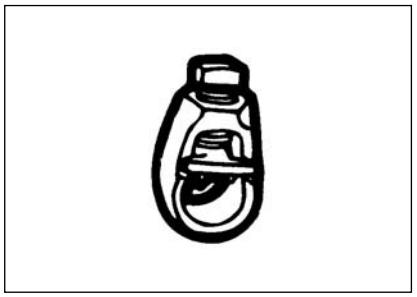
Ground Rod Clamps and Ground Rod Accessories



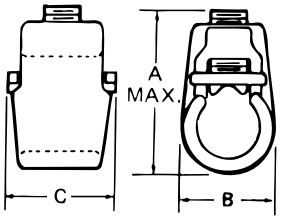
- *Cast of high strength corrosion-resistant copper alloy; two types of screws available; type GG has a socket set screw; type GGH has a hex head bolt*
- *Floating pressure bar distributes pressure evenly over a large area of the ground wire*
- *Axial groove keeps wire and rod in perfect alignment*

Types GG and GGH — Heavy Duty Ground Rod Clamps

Cat. No.* Socket Set Screw	Cat. No.* Hex Head Bolt	Nominal Rod Dia. (in.)	Nominal Rod Dia. (mm)	Wire Range max.	Wire Range min.	Wire Range max. (mm²)	Wire Range min. (mm²)	Dimensions (in.) A (max.) Socket Screw	Dimensions (in.) A (max.) Hex Bolt	Dimensions (in.) Screw Thread Size UNC-2A	Dimensions (in.) B	Dimensions (in.) C
GG12	GG12H	½	12.7	2 str.	8 sol.	33.6	8.3	1 13/64	1 13/16	7/16–14	27/32	15/16
GG58	GG58H	⅝	15.8	2 str.	8 sol.	53.6	8.3	1 51/64	2 7/32	7/16–14	61/64	15/16
—	GG34H	¾	19.0	4/0 str.	8 sol.	120.6	8.3	—	3	½–14	1⅜	1¼

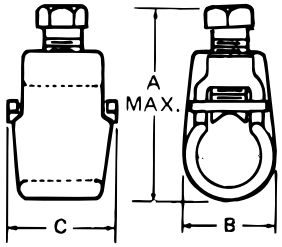
** Add suffix **P** to catalogue number for tin plated clamp.*
GG34H has no pressure bar or axial groove.

Socket Size = .219

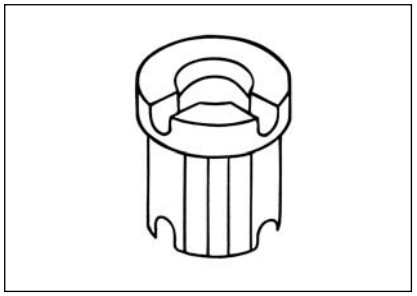


Type GG

Width Across Flats = ½"



Type GGH



- *Drive-on design provides easy tool free installation, high reliability compression fit connection, and room for one or two ground leads*
- *High strength copper alloy provides increased tensile strength and long term corrosion resistance for direct burial applications*
- *U.L. 486A and U.L. 467 Listed*
- *RUS Listed*

Type DGC — Drive-On Ground Clamps

Cat. No.	Ground Rod Size	Ground Wire Size
DGC58-44‡	⅝ (.555–.565)	1 or 2–#4 sol.
DGC58-66‡	⅝ (.555–.565)	1 or 2–#6 sol.
DGC58-46	⅝ (.555–.565)	1–#4 sol. 1–#6 sol.

‡ RUS Listed

Thomas&Betts

Blackburn®
Ground Clamps

Waterpipe Ground Clamps

Cat. No.	Ground Wire Size	Water Pipe Size
2-TB	#6, #4, #2	½", ¾", 1" or rebar 4-10
3-TB	#6, #4, #2	1¼", 1½" or 2"
4	#6, #4, #2	2½", 3" or 3½"
5-TB	#6, #4, #2	4", 4½" or 5"
6	#6, #4, #2	6"

Malleable iron. #6 – #2 AWG ground wire.

Waterpipe Ground Clamps

Cat. No.	Ground Wire Size	Water Pipe Size
3902	#4-4/0 AWG	½" – 1"
3903	#4-4/0 AWG	1¼" – 2"
3904	#4-4/0 AWG	2½" – 3½"
3905-TB	#4-4/0 AWG	4" – 5"
3906-TB	#4-4/0 AWG	6"
3907	#4-4/0 AWG	8"
3908	#4-4/0 AWG	10"
3909-TB	#4-4/0 AWG	12"
3902BU*	#4-4/0 AWG	½" to 1"
3903BU*	#4-4/0 AWG	1¼" to 2"
3904BU*	#4-4/0 AWG	2½ to 3½"
3905BU*	#4-4/0 AWG	4" to 5"
3906BU*	#4-4/0 AWG	6"
3907BU*	#4-4/0 AWG	8"
3908BU*	#4-4/0 AWG	10"
3909BU*	#4-4/0 AWG	12"

*UL Listed for Direct Burial

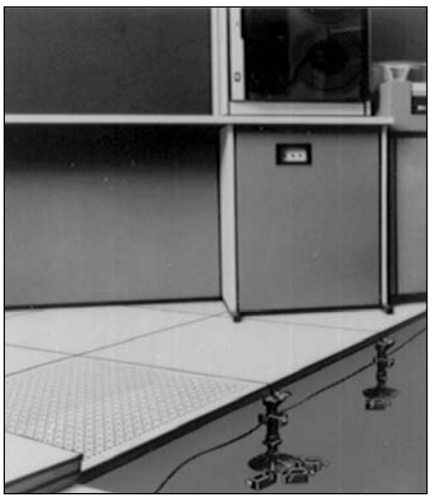
Color-Keyed®
Ground Clamps

High conductivity wrought copper construction. Compresses #8 AWG through 4/0 AWG cable and clamps onto pedestal posts up to 1" diameter square and 1¼" round. Can be used as an "X" or "T" configuration cable to post.

Material: High Conductivity Copper

Signal Reference Grid Connector

Cat. No.	Conductor Range	Installing Tools and Die Codes TBM14M and TBM15I: Die Cat. No.	Die Code	Color Code
SRG8-4	#8	15527	29	Grey
	#6 to #4	15528	33	Brown
SRG2-1	#2 & #1	15508	42	Pink
SRG10-20	1/0 & 2/0	15530	50	Orange
SRG30-40	3/0 & 4/0	15511	54	Purple



Secures signal reference grid wire to raised-floor support posts.

- *Range-taking design: accepts #8 to #4 AWG grid wire; fits 1" round and ¾" square trade size support posts.*
- *Lay-in feature means no kinks or bends.*
- *Quick, easy installation.*
- *Only one screw to tighten.*
- *Allows grid wire to make direct, low resistance contact with support posts.*

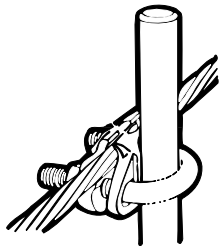
Material: Stamped steel, zinc plating.

Signal Reference Grid Clamp

Cat. No.		Description	Wire Range
3900		¾" Square to 1" Round	#8-#4
3900BP	(Bulk Pack)	¾" Square to 1" Round	#8-#4

U.L. File No. E-3060
Approved for grounding and bonding per U.L. 467.

Blackburn®
Ground Clamps

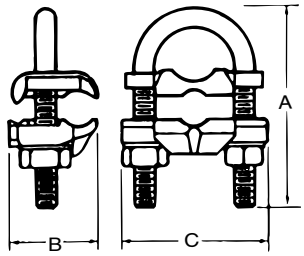


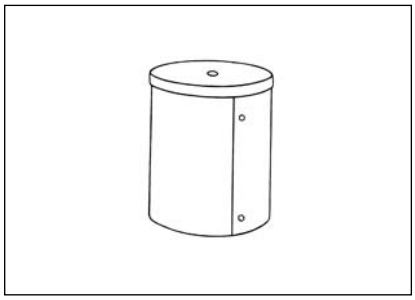
- *U.L. 467 Listed for direct burial.*
- *For connecting copper or copper clad steel grounding conductor to ground rod or pipe.*
- *Excellent for connecting multiple electrodes with a single cable as in substation grounding.*
- *All components are cast or forged from copper alloy.*
- *Specially designed spacer provides proper alignment between cable and electrode and affords more positive contact area.*

U-Bolt Ground Clamps

	Conductor Range (cu)		Nominal Rod Size (in.)		IPS Pipe Size (in.)		Dimensions (in.)		
Cat. No.	max.	min.	max.	min.	max.	min.	A	B	C
GUV584	4	8	¾"	⅝"	⅜"	–	2 13/16	1 9/16	2¼
GUV5821	2/0	4	¾"	⅝"	⅜"	–	2 13/16	1 9/16	2¼
GUV5825	250	2/0	¾"	⅝"	⅜"	–	21 13/16	1 9/16	2¼
GUV784	4	8	1"	⅞"	¾"	½"	2¾	1 9/16	2⅝
GUV7821	2/0	4	1"	⅞"	¾"	½"	2¾	1 9/16	2⅝
GUV7825	250	2/0	1"	⅞"	¾"	½"	2¾	1 9/16	2⅝
GUV1184	4	8	1¼"	1⅛"	1"	–	3 5/16	1 9/16	2¾
GUV11821	2/0	4	1¼"	1⅛"	1"	–	3 5/16	1 9/16	2¾
GUV1384	4	8	1½"	1⅜"	1¼"	–	3 7/16	19 9/16	2 15/16
GUV13821	2/0	4	1½"	1⅜"	1¼"	–	3 7/16	1 9/16	2 15/16
GUV13825	250	2/0	1½"	1⅜"	1¼"	–	3 7/16	1 9/16	2 15/16
GUV1584	4	8	1⅞"	1⅝"	1½"	–	3 15/16	19 9/16	3 3/16
GUV15821	2/0	4	1⅞"	1⅝"	1½"	–	3 15/16	1 9/16	3 3/16
GUV15825	250	2/0	1⅞"	1⅝"	1½"	–	3 15/16	1 9/16	3 3/16
GUV204	4	8	2⅜"	2"	2"	–	4 7/16	1 9/16	3 11/16
GUV2021	2/0	4	2⅜"	2"	2"	–	4 7/16	1 9/16	3 11/16
GUV2025	250	2/0	2⅜"	2"	2"	–	4 7/16	1 9/16	3 11/16
GUV21221	2/0	4	2⅞"	2½"	2½"	–	4 15/16	1 9/16	4 3/16
GUV21225	250	2/0	2⅞"	2½"	2½"	–	4 15/16	19 9/16	4 3/16
GUV3021	2/0	4	3½"	3"	3"	–	5 9/16	1 9/16	4 13/16
GUV3025	250	2/0	3½"	3"	3"	–	5 9/16	1 9/16	4 13/16
GUV31221	2/0	4	4"	3½"	31½"	–	6 1/16	1 9/16	5½
GUV4021	2/0	4	4½"	4"	4"	–	6 5/16	1 9/16	5 11/16
GUV4025	250	2/0	4½	4"	4"	–	6 5/16	1 9/16	5 11/16

* For tin plating add suffix P to Cat. No. Contact factory for price and availability.
U.L. does not list tin plated bronze grounding devices.





Ground Electrode Boxes

Cat. No.	Description	Wt/ 100 lb.	Wt/ 100 kgs.	Standard package
51628	Pregalvanized steel	1180	536.3	5
51629	Hot dip galvanized	1200	545.4	5

14 gauge steel. 10 inches diameter, 12 inches depth.

F

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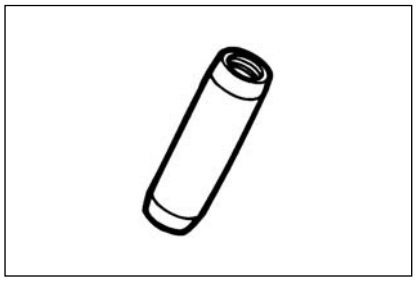
Ground Rod Clamps and Ground Rod Accessories

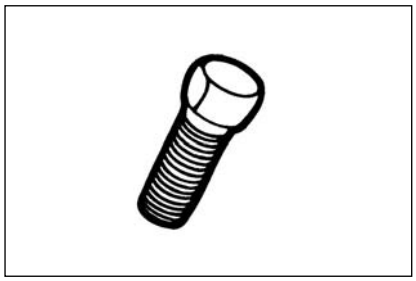


- ***Threaded couplings are of high strength, corrosion-resistant alloy; streamlined design reducesdriving friction; couplings are tapped so that they may be used on all standard threaded sectional rods***

Type C — Sectional Ground Rod Couplings

Cat. No.	Size (Nominal Diameter)	Thread Size
50C	½"	½"–13 UNS
50LC*†	½" L	9⁄16"–12 UNS
60C*‡	⅝"	⅝"–11 UNS
70C*	¾"	¾"–10 UNS
80C*	1"	1"–8 UNS

**U.L. Listed 467 (425H).*
† CSA lists rods ½" and larger, 10' and longer.
‡ RUS Listed.

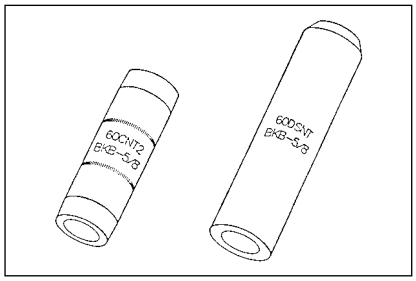


- ***Driving Studs of high strength steel may be used with all standard threaded couplings***

Type DS — Driving Studs

Cat. No.	Size (Nominal Diameter)	Thread Size
50DS	½"	½"–13 UNS
50LDS*†	½" L	9⁄16"–12 UNS
60DS*‡	⅝"	⅝"–11 UNS
70DS*	¾"	¾"–10 UNS
80DS*	1"	1"–8 UNS

**U.L. Listed 467 (425H).*
†CSA lists rods ½" and larger, 10' and longer.
‡REA Listed.



Threadless Coupling
- ***For joining non-threaded, sectional, copper bonded, steel ground rods***
- ***Coupling is manufactured of a high strength, corrosion resistant, copper alloy***

Threadless Driving Cap
- ***Prevents "mushrooming" of ground rod while driving to insure proper fit of coupling***
- ***Driving cap is manufactured of high strength, hardened steel***

Threadless Couplings and Driving Cap

Cat. No.	Description	Dimensions (in.) Length	Diameter
50LCNT*	½" L Threadless Coupling	3.0	.78
60CNT2*	⅝" Threadless Coupling	2.5	.69
70CNT*	¾" Threadless Coupling	3.0	.97
60DSNT	⅝" Threadless Driving Cap	4.0	.88

**U.L. Listed.*

See the new ground rod driver in the Installation Tools section, pg. E100.

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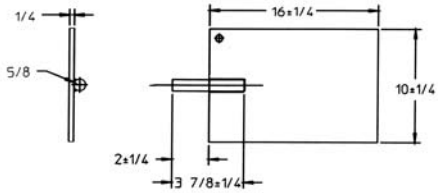
Ground Plates

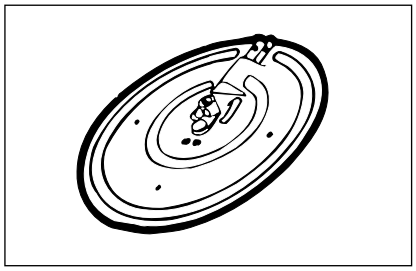


- *¼" thick, hot-dipped galvanized*
- *Can be as efficient as two ground rods (2-10' x ⅝")*
- *Must be buried at least 600mm (24") below finish grade level according to CEC Rule 10-702*

Galvanized Ground Plates

Cat. No.	Description	Conductor Range
1016TB	Galvanized ground plates	8 sol. to 1/0 str.
1016BTB	Galvanized ground plates with JAB58H connector	8 sol. to 1/0 str.

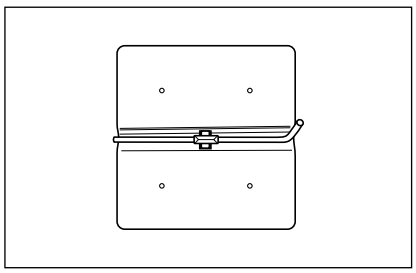
‡ *RUS Listed.*



- *More efficient than butt wrapping poles*
- *Made of electrolytic sheet copper*
- *Built-in high pressure connector for ground lead, or supplied with #6 AWG copper pigtail pre-attached*
- *Plates are grooved for trapping moisture*

Type GP – Copper Pole Bottom Ground Plates for Multigrounded Neutral Construction

Cat. No.	Pigtail Wire Range min.	Pigtail Wire Range max.	Pigtail Wire Range min. (mm²)	Pigtail Wire Range max. (mm²)	Diameter of Plate (in.)	Diameter of Plate (mm)
GP100				7½		191
GP110	8	2 sol.	6.3	25.6	10	254
GP114				14		356
GP1003	#6 AWG solid CU Pigtail with 18" conductor		—	—	7½	191
GP1008	#6 AWG solid CU Pigtail with 18" conductor		—	—	7½	191
GP1108	#6 AWG solid CU Pigtail with 18" conductor		—	—	10	254



- *Installed on butt end of utility poles to provide an economical, low resistance neutral ground.*
- *Installed cost considerably less than butt-wrapped poles. Plate portion fabricated of .025" pure copper.*
- *PBGW connector is eye-bolt type, cast of corrosion resistant aluminum bronze alloy, with silicon bronze nut and lock washer. Riveted all copper terminal lug is an integral part of the PBH, and provides the means of connection to the grounding conductor.*

Type PB — Copper Pole Ground Plates

Cat. No.	Wire Range max.	Wire Range min.	Finished Size	Surface Area sq. in.
PBGW	2/0 str.	10 sol.	7 x 7⅝	56
PBH‡	4 str.	14 sol.	7 x 7⅝	56

‡ *RUS Listed.*

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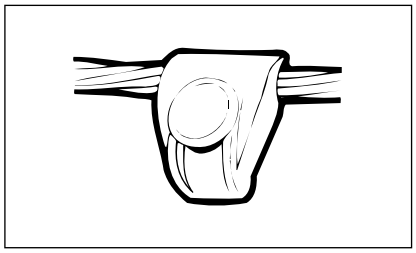
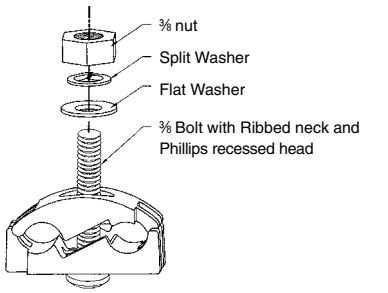


- *Bolt has square shank to prevent turning and allow clamp to be tightened with one wrench*
- *GTC 23 and 24 are two-piece clamps for connecting ground lead cable to flat metal surface; ideal for grounding substations on tower footings*
- *Castings are of high strength, corrosion resistant copper alloy*
- *GTC 13 and 14 are economical one-piece clamps which perform the same function as two-piece clamps except the under pad support is omitted and conductor is connected directly to tower*
- *Add suffix L to Cat. No. for ½" channel thickness*



For use with aluminum or copper conductors. In aluminum or galvanized steel cable tray. Ribbed neck on the bolt prevents rotation during tightening if .440 dia. hole is used

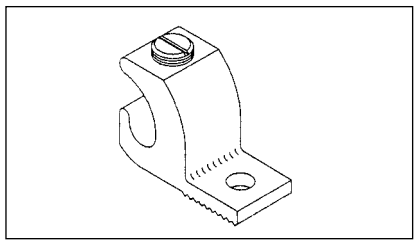


Figure 1

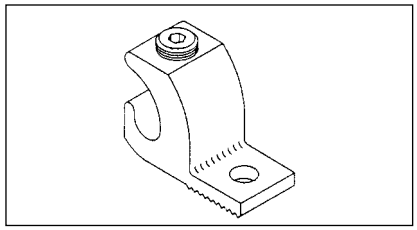
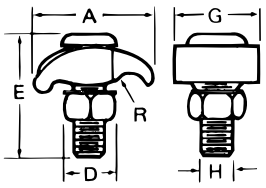


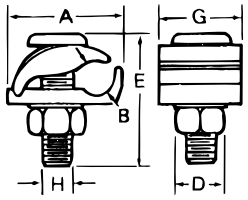
Figure 2

Type GTC – Tower Ground Clamps

Cat. No.	Conductor Range max.	Conductor Range min.	max. (mm²)	min. (mm²)	Channel Thickness	Dimension (in.) A	B	D	E	G	H	R
GTC13	2/0 str.	4 sol.	67.4	21.1	¼	1 15/32	—	9/16	1 21/32	13/32	⅜	7/32
GTC14	250 kcmil	2/0 str.	126.6	67.4	¼	1 15/16	—	¾	1 15/16	1 13/32	½	5/16
GTC23	2/0 str.	4 sol.	67.4	21.1	¼	1 41/64	7/16	9/16	1 21/32	1 3/32	⅜	—
GTC24	250 kcmil	2/0 str.	126.6	21.1	¼	1 61/64	⅝	¾	1 15/16	1 ⅜	½	—



Type GTC 13 and 14



Type GTC 23 and 24

CTG250 Wide Range Tower Ground Clamp

Cat. No.	Wide Range (2 sides)	Height	Width	Depth	Nut (Flats)
CTG250	#2 sol. (.258 Dia.) 250 kcmil (.575 Dia.)	1.95	2.00	1.13	.560

Tin plate body
Galvanized hardware

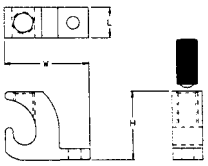
NEW

Lay-in Lug Connector

These grounding connectors are manufactured with high strength 6061-T6 aliminum alloy to insure both maximum strength and conductivity. Dual rated for both copper and aluminum conductor. The open-faced design allows the installer to quickly lay-in the grounding conductor as a jumper to multiple conduits with no break in the ground conductor.

Cat. No.	Fig. No.	Cond. Range AWG in.	Cond. Range AWG (mm²)	Stud Size in.	Stud Size (mm)	Dimensions H in.	H (mm)	W in.	W (mm)	L in.	L (mm)
LL414	1	4-14	16-1.5	.22	5.59	.78	19.81	.38	9.65	1.07	27.18
LL1014	1	1/0-14	50-1.5	.27	6.86	1.17	29.72	.60	15.24	1.50	38.10
LL306	2	3/0-6	70-16	.33	8.38	1.56	39.62	.80	20.32	2.00	50.80
LL2506	2	250-6	120-16	.33	8.38	1.79	45.47	.80	20.32	2.20	55.88

90°C Rating (486B Listed)



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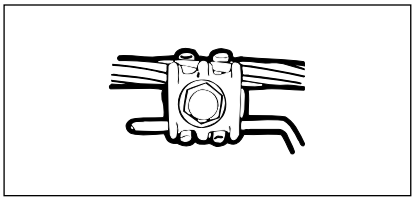
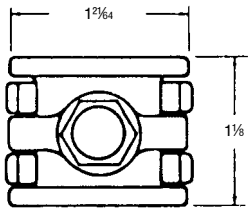


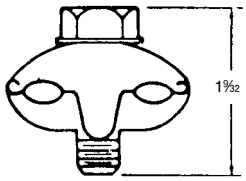
- *For all combinations of aluminum, copper and Steel conductors*
- *Cast of high strength bronze alloy*
- *Furnished with silicon bronze bolt and lock-washer—lockwasher minimized loosening of installed clamp*
- *Parallel groove design; no need to remove bolt for installation*
- *Only one size for all requirements from No. 8 solid copper to 1/0 ACSR or 2/0 copper*

Bronze Jumper Clamps

Cat. No.	Max. Plated Groove	Min. Plated Groove	Max. Unplated Groove	Min. Unplated Groove
K1	1/0 ACSR 2 SCG amerductor 7/16 galv. strand	6 ACSR 12 SCG amerductor 8 solid iron	2/0 str. copper 7/16 Copperweld* 2A Copperweld*	8 solid copper 9½ D Copperweld* etc.

** Trademark of Copperweld Steel Co.*
Plated with plating removed from one groove.
For use with alumum, amerductor, or galvanized steel strand to copper or copper bonded steel wires.





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Service Post Connectors

Application

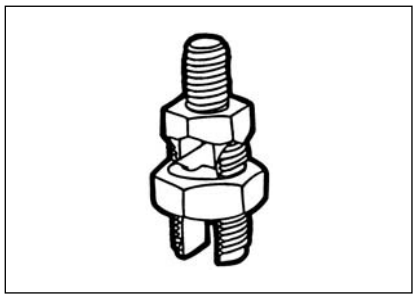
The Blackburn line of Service Post Connectors are designed for applications including steel structure, fence post or transformer grounding involving one or two cables. Service Posts can also be used to tap one or two cables from bus bar.

Construction & Ratings

Bolts used in the Service Post are machined from high conductivity bronze alloy while the nuts are cold-formed from high strengh, corrosion resistant copper alloy. Pressure bars are copper through 4/0 size, while copper alloy is used for 350 kcmil size and above. Bolts and nuts are of the traditional Blackburn hex design for easy installation.

Service Post Connectors are available in sizes accommodating AWG copper conductor ranges of #12 _ 500 kcmil stranded (4 mm2 - 240 mm2) and #12-#2 solid (4 mm2 - 35 mm2). Both short and long stud versions are available.

The line includes single conductor and double conductor connectors.



- *For copper to copper connections*
- *For grounding of steel structures, fence posts or transformers using one or two cables*
- *For tapping one or two cables from bus bar*
- *Hex design bolts are machined from high conductivity bronze alloy*
- *Nuts and pressure bars are cold-formed from high-strength copper or copper alloy*
- *UL 486A and UL 467 Listed*

Type DS — Service Post Connectors, Short Stud

Cat. No. Double Conductor	Cat. No. Single Conductor	Conductors Stranded max.	Conductors Stranded min.	AWG mm² Solid max.	AWG mm² Solid min.	Maximum Diameter Range (in.)	Stud Size
SP0DS	SP0SS	8 6mm²	12 4mm²	8 10mm²	12 4mm²	.146–.080	¼–20 x ½
SP1DS	SP1SS	7 10mm²	10 6mm²	6 10mm²	10 6mm²	.170–.102	¼–20 x ½
SP2DS	SP2SS	5 16mm²	10 6mm²	4 16mm²	10 6mm²	.217–.102	5/16–18 x ⅝
SP3DS	SP3SS	3 25mm²	10 6mm²	2 35mm²	10 6mm²	.271–.102	⅜–16 x ⅝
SP4DS	SP4SS	1 35mm²	8 6mm²	2 35mm²	8 10mm²	.332–.128	⅜–16 x ⅝
SP5DS	SP5SS	1/0 50mm²	2 35mm²	2 35mm²	— —	.385–.259	½–13 x ¾
SP6DS	SP6SS	2/0 70mm²	2 35mm²	2 35mm²	— —	.443–.258	½–13 x ¾
SP8DS	SP8SS	4/0 95mm²	1 35mm²	— —	— —	.570–.289	⅝–11 x 1
SP9DS	SP9SS	350 150mm²	1/0 70mm²	— —	— —	.715–.373	⅝–11 x 1
SP10DS	SP10SS	500 240mm²	3/0 95mm²	— —	— —	.840–.464	¾–10 x 1¼

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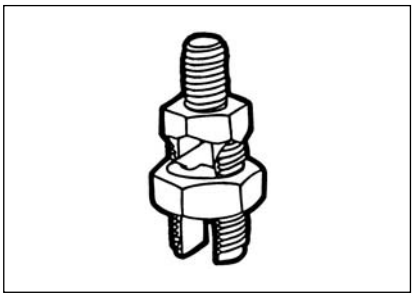

- *For copper to copper connections*
- *For grounding of steel structures, fence posts, transformers using one or two cables*
- *For tapping one or two cables from bus bar*
- *Hex design bolts are machined from high conductivity bronze alloy*
- *Nuts and pressure bars are cold-formed from high-strength copper or copper alloy*
- *U.L. 486A and U.L. 467 Listed*
- *Pressure bars are copper through 4/0 size; copper alloy is used for 350 kcmil size and above*
- *Available in sizes accommodating AWG copper conductor ranges of #12–500 kcmil stranded (4mm²–240mm²) and #12–#2 solid (4mm²–35mm²)*
- *Line includes single conductor and double conductor connectors*

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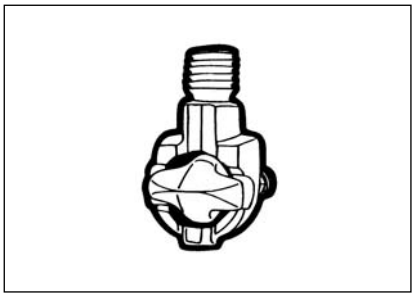
Type SP — Service Post Connectors, Long Stud

Cat. No. Double Conductor	Cat. No. Single Conductor	Conductors Stranded max.	Conductors Stranded min.	AWG mm² Solid max.	AWG mm² Solid min.	Maximum Diameter Range (in.)	Stud Size
SP0DL	SP0SL	8 6mm²	12 4mm²	8 10mm²	12 4mm²	.146–.080	¼–20 x 1
SP1DL	SP1SL	7 10mm²	10 6mm²	6 10mm²	10 6mm²	.170–.102	¼–20 x1
SP2DL	SP2SL	5 16mm²	10 6mm²	4 16mm²	10 6mm²	.217–.102	5/16–18 x 1
SP3DL	SP3SL	3 25mm²	10 6mm²	2 35mm²	10 6mm²	.271–.102	⅜–16 x 1⅛
SP4DL	SP4SL	1 35mm²	8 6mm²	2 35mm²	8 10mm²	.332–.128	⅜–16 x 1⅛
SP5DL	SP5SL	1/0 50mm²	2 35mm²	2 35mm²	—	.385–.259	½–13 x 1¼
SP6DL	SP6SL	2/0 70mm²	2 35mm²	2 35mm²	—	.443–.258	½–13 x 1¼
SP8DL	SP8SL	4/0 95mm²	1 35mm²	—	—	.570–.289	⅝–11 x 1½
SP9DL	SP9SL	350 150mm²	1/0 70mm²	—	—	.715–.373	⅝–11 x 1½
SP10DL	SP10SL	500 240mm²	3/0 95mm²	—	—	.840–.464	¾–10 x 1¾

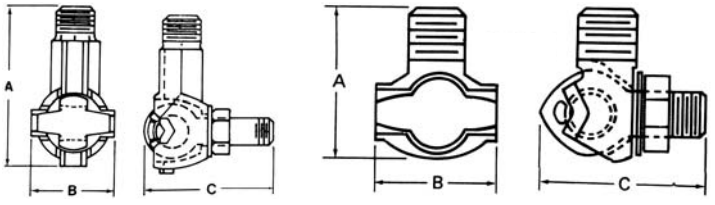


- *Transformer Grounding Connectors are cast of high conductivity bronze; ½"–13 stud fits all standard EEI-NEMA distribution transformers*
- *Eye bolt on TTC2 rotates to accommodate cable in either vertical or horizontal direction*
- *One size connector to handle full range of grounding conductors from #8 through 2/0 str.*
- *No special tools required*

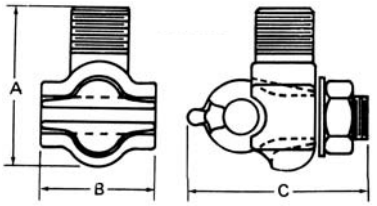
Type TTC — Transformer Tank Ground Connectors

Cat. No.	Conductor Range max.	Conductor Range min.	Conductor Range max. (mm²)	Conductor Range min. (mm²)	Stud Thread Size UNC-2A	Dimensions (in.) A	Dimensions (in.) B	Dimensions (in.) C
TTC2	2/0 str.	8 sol.	67.4	8.3	½"–13	1 51/64	1 9/64	1 21/32
TTC3	1 str.	10 sol.	42.4	5.2	½"–13	1⅜	1 3/64	1 9/16
TTC4‡	1 str.	10 sol.	42.4	5.2	½"–13	1¼	⅞	1⅜
TTC2P‡	2/0 str.	8 sol.	67.4	8.3	½"–13	1 51/64	1 9/64	1 21/32
TTC3P*	1 str.	10 sol.	42.4	5.2	½"–13	1⅜	1 3/64	1 9/16
TTC4P*	1 str.	10 sol.	42.4	5.2	½"–13	1¼	⅞	1⅜

‡ *RUS Listed.*
* *Tin Plated.*



TTC2 *TTC4*



TTC3

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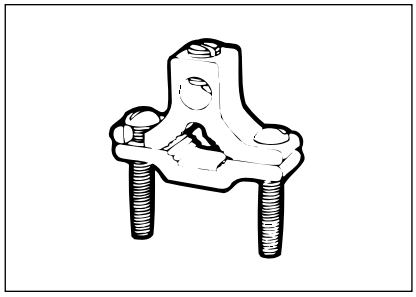
Mechanical Grounding Connectors

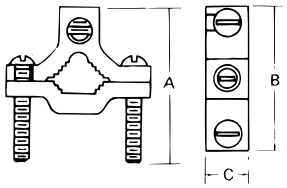


- *For connecting grounding conductor to either steel or copper pipe, rod or tubing*
- *Tin plated for corrosion resistance*
- *For use with copper or aluminum conductor*

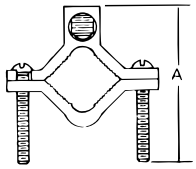
Aluminum Water Pipe Clamp

Cat. No.	Water Pipe Size	Conductor Range max.	Conductor Range min.	Dimensions (in.) A	B	C	Steel Clamp Screw	Aluminum Wire Screw
AJ	½-1	1/0 str.	#14 sol.	2½	2¼	⅝	¼-20	7/16-20 slot
AJ-2	1½-2	250 kcmil	#6	3⅜	3¾	⅞	5/16-18	11/16-20 socket
AJ-2124	2½-4	250 kcmil	#6	5 9/16	6 5/16	⅞	⅜-16	11/16-20 socket

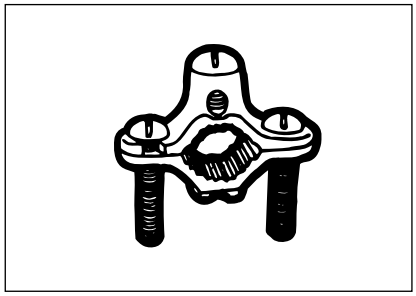
U.L. listed for both copper and aluminum conductors to steel pipe and copper water tubing



Type AJ



Type AJ2

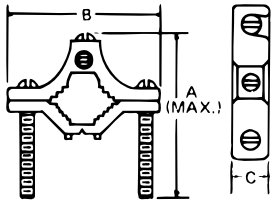


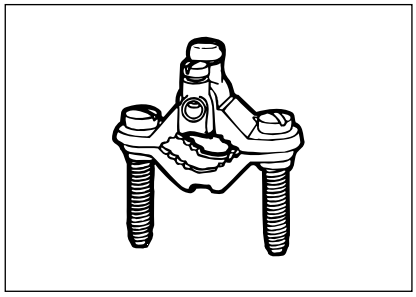
- *Similar to above but lighter in construction*

Budget Price Cast Bronze Clamp

Cat. No.	Water Pipe Size	Conductor Range max.	Conductor Range min.	Dimensions (in.) A	B	C
JJR	½ to 1	#4 str.	#10 sol.	2 15/32	25/32	17/32

*Add suffix **C** to Cat. No. to specify plating.*





- *Budget price clamps*
- *Made of die cast zinc alloy with zinc plated screws*
- *Model BJA for use with armored cable*

Die Cast Clamps

Cat. No.	Water Pipe Size	Conductor Range max.	Conductor Range min.
BJ-1	½"-1"	#2 str.	#10 sol.
BJA*	½"-1"	#6 AWG	#8 AWG

** Not U.L. Listed*

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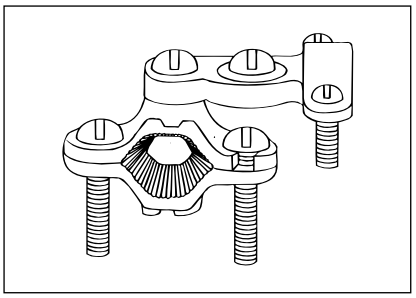
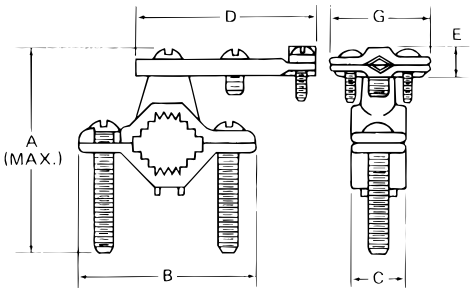


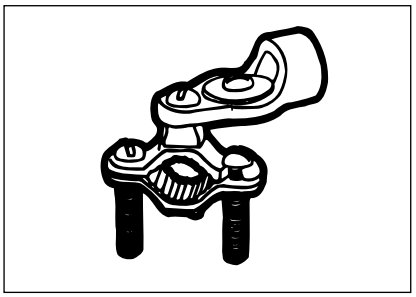
- *For connecting armored cable to water pipe*
- *Clamping portion similar to standard "J" clamp*
- *Special pressure bar grips armor or outer cable insulation to lessen chances of grounding conductor being pulled out*
- *Zinc plated screws*

Cast Bronze Clamps

Cat. No.	Water Pipe Size	Conductor Range max.	Conductor Range min.	Dimensions (in.) A	B	C	D	E	G
JA	½ to 1	#6 sol.	#10 sol.	2¾	2 11/32	25/32	2 9/32	15/32	1⅜
JA-2	1¼ to 2	#6 sol.	#10 sol.	3¾	3½	13/16	2 9/32	15/32	1⅜
JA-2124	2½ to 4	#6 sol.	#10 sol.	6	6 5/16	1	2 9/32	15/32	1⅜

*Add suffix **C** to Cat. No. to specify plating.*



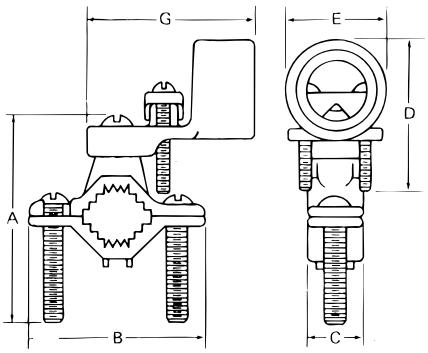


- *For grounding rigid conduit systems*
- *Continuity from rigid conduit system to ground provided by cast bronze threaded conduit hub*
- *Hub swings 360° for easy alignment*
- *Heavy brass washer provides protection for clamped grounding conductor*
- *Zinc plated screws*
- *Cast bronze pipe clamping portion identical to that used in "JA" clamp*

Cast Bronze Clamps for Conduit

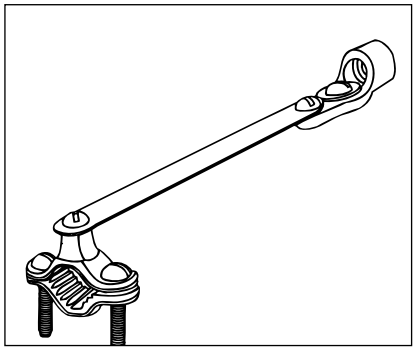
Cat. No.	Conduit Size	Water Pipe Size	Conductor Range max.	Conductor Range min.	Dimensions (in.) A	B	C	D	E	G
JP-12	½	½ to 1	#6 sol.	#10 sol.	2¾	2 11/32	23/32	1 9/64	1	2½
JP-212	½	1¼ to 2	#6 sol.	#10 sol.	3¾	3½	13/16	1 9/64	1	2½
JP-212412	½	2½ to 4	#6 sol.	#10 sol.	6	6 5/16	1	1 9/64	1	2½
JP-34	¾	½ to 1	#2/0 str.	#10 sol.	2¾	2 11/32	23/32	2 5/16	1¼	2 3/16
JP-234	¾	1¼ to 2	#2/0 str.	#10 sol.	3¾	3½	13/16	2 5/16	1¼	2 3/16
JP-212434	¾	2½ to 4	#2/0 str.	#10 sol.	6	6 5/16	1	2 5/16	1¼	2 3/16
JP-1	1	½ to 1	#3/0 str.	#10 sol.	2¾	2 11/32	23/32	2 5/16	1½	2⅜
JP-21	1	1¼ to 2	#3/0 str.	#10 sol.	3¾	3½	13/16	2 5/16	1½	2⅜
JP-21241	1	2½ to 4	#3/0 str.	#10 sol.	6	6 5/16	1	2 5/16	1½	2⅜

*Add suffix **C** to Cat. No. to specify plating.*



Thomas&Betts

Blackburn®
Mechanical Grounding Connectors

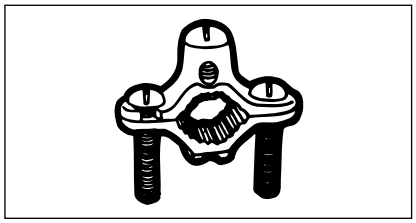


- *For grounding rigid conduit systems*
- *Same features as "JP" clamp plus ease of alignment afforded by flexible copper strap*
- *Strap helps protect conduit system from water system vibrations*
- *Zinc plated screws*

Cast Bronze Clamps with Copper Strap

Cat. No.	Conduit Size	Water Pipe Size	Conductor Range max.	Conductor Range min.
JPS-12	½"	½"-1"	6 sol.	10 sol.
JPS-34	¾"	½"-1"	2/0 str.	10 sol.
JPS-1	1"	½"-1"	3/0 str.	10 sol.

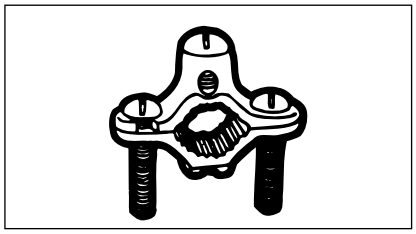
*Add suffix **C** to Cat. No. to specify plating.*



- *U.L. 467 Listed for direct burial*
- *High strength, high conductivity copper alloy (over 80% copper)*
- *To connect copper ground wire to water pipe, copper tubing, or ground rods*

Cast Bronze Ground Clamps

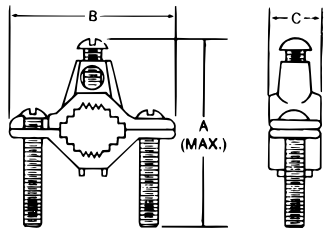
Cat. No.	Water Pipe Size	Conductor Range
JD	½"-1"	#2 str.-#10 str.
J2D	1¼"-2"	#2 str.-#10 str.



- *For connecting grounding conductor to water pipe or copper tube*
- *Cast of high strength, highly conductive copper alloy*
- *Screws plated for corrosion resistance*
- *UL listed*

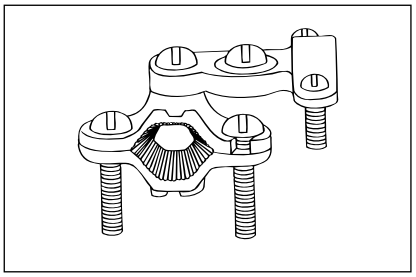
Type J – Cast Bronze Ground Clamps

Cat. No.	Water Pipe Size	Conductor Range max.	Conductor Range min.	Dimensions (in.) A (max.)	B	C
J	½ to 1	2 str.	10 sol.	2¾	2 1/32	23/32
J2BB	1¼ to 2	2 str.	10 sol.	3¾	3½	13/16
J2124	2½ to 4	4 str.	10 sol.	6	6 5/16	1
J6	4¼ to 6	4 str.	10 sol.	7¼	8⅛	1



Blackburn®

Mechanical Grounding Connectors



- *Pipe clamping portion identical to "JA" clamp*
- *Pressure bar type conduit hub adjusts to fit ½" or ¾" EMT or ½" rigid conduit*
- *Hub swings 360° for ease of alignment*
- *Brass washer provides positive contact with grounding conductor*
- *Zinc plated screws*

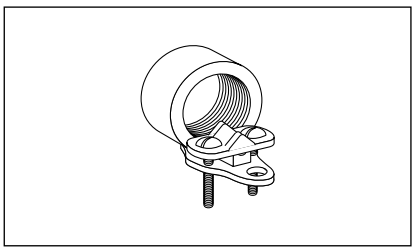
Type JPT – Cast Bronze Clamps for Conduit

Cat. No.	Conduit Size	Water Pipe Size	Conductor Range max.	Conductor Range min.
JPT		½" to 1"		
JPT2	½" or ¾" EMT ½" Rigid	1¼" to 2"	6 sol.	10 sol.
JPT4		2½" to 4"		

Conduit Hubs

Cat. No.	Ground Wire Size AWG	Conduit Size
3930	#8 to #2	½" Conduit
3940	#8 to #2	¾" Conduit
3950	#8 to #3/0	1" Conduit
3951	#8 to #4/0	1¼" Conduit
3960	#8 to #4	Armored Wire

Material: Malleable iron



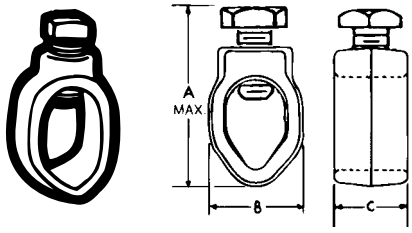
- *Rugged cast bronze threaded hub*
- *Provides positive connection between rigid conduit and water system in conjunction with "J" clamp*

Type CH – Bronze Conduit Hubs

Cat. No.	Conduit Size (in.)	Conductor Range max.	Conductor Range min.
CH12	½	6 sol.	10 sol.
CH34	¾	2/0 str.	10 sol.
CH1	1	3/0 str.	10 sol.

Blackburn®

Grounding Conduit Hubs



Type G

- *A dependable ground connection offered at a substantial saving; cast of high strength corrosion-resistant copper alloy.*
- *Hex head bolts.*
- *Simplified compact design will make a lasting, trouble-free connection.*

3840

3849

3826

3844

For armored and unarmored wire

Swivel cable tray clamps for aluminum and steel trays with regular or reinforced flanges.

- *Serrations and biting teeth on clamping saddle provides a high quality bond between conduit and clamp.*
- *½" to 6" sizes that can be clamped to any position in a 90° arc.*
- *Hardened steel screws bite into tray and provide positive bond.*
- *Malleable iron hub and steel u-bolt accepts conduit from any angle.*

Blackburn Budget Line Ground Clamps

Cat. No.	Nominal Rod Dia. (in.)	Nominal Rod Dia. (mm)	Wire Range max.	Wire Range min.	Wire Range (mm²)	Wire Range max. (mm²)	Dimensions (in.) min. Bolt	A (max.) UNC-2A	Thread Size B	C	D
G3*	⅜	9.5	4 str	10 sol	21.1	5.2	1⅜	5/16-18	1/16	½	27/64
G4	½	12.7	2 str	10 sol	33.6	5.2	—	⅜-16	27/32	⅜	37/64
G5#	⅜	15.8	2 str	10 sol	33.6	5.2	—	⅜-16	29/32	⅜	45/64
G6	¾	19.0	2 str	10 sol	33.6	5.2	—	⅜-16>	1 1/16	⅜	13/16

* Not U.L. Listed

REA ListedAdd

Add suffix **P** to Cat. No. for tin plated clamp. Request pricing.

Ground Clamp

Cat. No.	Material	Water Pipe, Copper Tubing Size	Grd. Rod Size
3826†	M.I.	½", ¾"	½"-1"
3846†	Bronze	½", ¾"	½"-1"
3849•	Brass	½"-1" O.D.	
3840*	M.I.	½", ¾" or 1"	

† For unarmored copper wire #6, #4.

• For copper and aluminum conductors; for 14 thru 2 cu. unarmored copper wire—corrosive and outdoor use. U.L. approved for direct burial.

* #8 thru #4 AWG. Not CSA Certified

Ground Clamps for K&L Grade Copper Tubing Only

Cat. No.	Ground Wire Range	Water Pipe & Ground Rod Size/Desc.
3844*	#8-#4	½"-1"
3888†	#8-#4	½"-1" also rebar 4-10

* With Steel Screws

** With Bronze Screws, Not CSA Certified—or U.L.

† U.L. approved for direct burial. Silicon Bronze Screws.

Swivel Tray Clamp

Cat. No.	Conduit Size
6209	½"-¾"
6211	1"-1¼"
6214	1½"-2"
6216	2½"-3"
6218	3½"-4"

F

Blackburn®

Thomas&Betts

 www.tnb.com

Blackburn®
Flexible Braid

** Certified C22.2 No. 41 Grounding & Bonding Equipment. Listed UL467 and UL486A Grounding & Bonding Equipment.*

Flexible Braids – Type FB

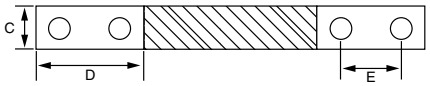
Flexible Braids				Dimensions			
					C	D	E
Cat. No.†	Circular Mils	Bolt Hole	No. of Braids in Ferrule	Thickness	Width	Ferrule Length	Distance Ctr. to Ctr.
FBB12-1*	24000	¼	1	0.140	0.625	0.750	N/A
FBC12-1*	48000	7⁄16	1	0.148	1.000	1.300	N/A
FBD12-1*	76800	7⁄16	1	0.200	1.000	1.300	N/A
FBD12*	76800	7⁄16	1	0.200	1.000	2.500	1.25
FB2D12-1*	153600	7⁄16	2	0.250	1.250	1.500	N/A
FB2D12*	153600	7⁄16	2	0.250	1.250	2.500	1.25
FB3D12-1*	230400	7⁄16	3	0.350	1.250	1.500	N/A
FB3D12*	230400	7⁄16	3	0.350	1.250	2.500	1.25
FBXD12-1*	105600	9⁄16	1	0.250	1.250	1.500	N/A
FBXD12*	105600	9⁄16	1	0.250	1.250	2.500	1.25
FB2XD12-1*	211200	9⁄16	2	0.350	1.250	1.500	N/A
FB2XD12	211200	9⁄16	2	0.350	1.250	2.500	1.25
FB3XD12-1*	316800	9⁄16	3	0.400	1.250	1.500	N/A
FB3XD12*	316800	9⁄16	3	0.400	1.250	2.500	1.25
FBE12-1*	168000	9⁄16	1	0.500	1.250	2.500	N/A
FBE12*	168000	9⁄16	1	0.250	1.250	3.500	1.75
FB2E12-1*	336000	9⁄16	1	0.500	1.250	2.500	N/A
FB2E12*	336000	9⁄16	2	0.500	1.250	3.500	1.75
FB3E12	504000	9⁄16	3	0.750	1.250	3.500	1.75
FB4E12	672000	9⁄16	4	1.000	1.250	3.500	1.75
FBF12	230400	9⁄16	1	0.300	1.500	3.500	1.75
FB2F12	460800	9⁄16	2	0.450	1.500	3.500	1.75
FB3F12	691200	9⁄16	3	0.600	1.625	3.500	1.75
FB4F12	921600	9⁄16	4	0.750	1.625	3.500	1.75
FBG12	307200	9⁄16	1	0.380	1.500	3.500	1.75
FB2G12	614400	9⁄16	2	0.630	1.625	3.500	1.75
FB3G12	921600	9⁄16	3	0.850	1.625	3.500	1.75
FB4G12	1228800	9⁄16	4	1.000	1.880	3.500	1.75

† Catalog number shown in 12" lengths. Standard lengths offered in 6, 12, 18, 24, 30, and 36 inches (end to end). Change the 12 in the above catalog numbers to the desired length. (-1) indicates 1 bolt hole per ferrule.

See amperage tables on page F117 as a reference for grounding and bonding, or continuous current applications.

FB4 series is not listed/certified.

For custom flexible braids, contact Customer Service.



- *Tin-plated copper braids and ferrules for high conductivity and corrosion resistance.*
- *Flexible copper braids for use in substation and grounding applications.*
- *Flexible braids allow for linear expansion, equipment vibration, and offset connections.*

Flexible Braid in a Roll – 10 foot minimum

Cat. No.	Circular Mils.	Thickness (in.)	Width (in.)
FBBRL	24000	0.140	0.625
FBCRL	48000	0.148	1.000
FBDRL	76800	0.200	1.000
FBXDRL	105600	0.250	1.250

Ferrules or lugs not included.

Blackburn®
Flexible Braid Selection Guide

Minimum Size Flexible Braid for Continuous Current Applications

Cat. No.	Circular Mils	Amperage Capacity	Cat. No.	Circular Mils	Amperage Capacity
FBB12-1	24000	95	**FBE12-1**	16800	340
FBC12-1	48000	145	**FBE12**	16800	340
FBD12-1	76800	190	**FB2E12-1**	336000	530
FBD12	76800	190	**FB2E12**	336000	530
FB2D12-1	153600	330	**FB3E12**	504000	700
FB2D12	153600	630	**FB4E12**	672000	805
FB3D12-1	230400	470	**FBF12**	230400	360
FB312	230400	470	**FB2F12**	460800	600
FBXD12-1	105600	235	**FB3F12**	691200	820
FBXD12	105600	235	**FB4F12**	921600	1000
FB2XD12-1	211200	400	**FBG12**	307200	415
FB2XD12	211200	400	**FB2G12**	614400	700
FB3XD12-1	316800	600	**FB3G12**	921600	960
FB3XD12	316800	600	**FB4G12**	1228800	1200

Grounding and Bonding Applications

Minimum Size Conductors for Bonding Raceways and Equipment

Rating or Setting of Overcurrent Device in Circuit Ahead of Equipment, Conduit, Etc. Not Exceeding—Amperes	Copper Wire Circular Mils
200	26 240 (6 AWG)
300	41 740 (4 AWG)
400	52 620 (3 AWG)
500	66 360 (2 AWG)
600	83 690 (1 AWG)
800	105 600 (1/0)
1 000	133 100 (2/0)
1 200	167 800 (3/0)
1 600	211 600 (4/0)
2 000	250 000
2 500	350 000
3 000	400 000
4 000	500 000
5 000	700 000
6 000	800 000

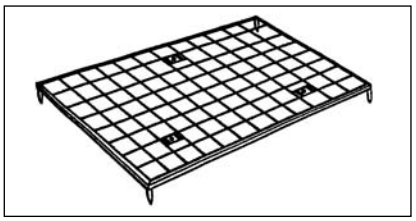
Based on table 16 C.E.C.

Minimum Size of Bare Copper Grounding Conductor

Maximum Available Short Circuit Current Amperes	Maximum Fault Duration with Exothermic Weld, Compression or Bolted Joint 0.5 Seconds Circular Mils	1.0 Second Circular Mils
5 000	26 240	41 740
10 000	52 620	83 690
15 000	83 690	105 600
20 000	105 600	167 800
25 000	133 100	211 600
35 000	211 600	250 000
40 000	211 600	300 000
50 000	250 000	350 000
60 000	300 000	500 000
70 000	350 000	600 000
80 000	400 000	600 000
90 000	500 000	700 000
100 000	500 000	700 000

Based on table 51 C.E.C.
Size calculated in accordance with IEEE No. 80.

Blackburn®
Grounding Accessories

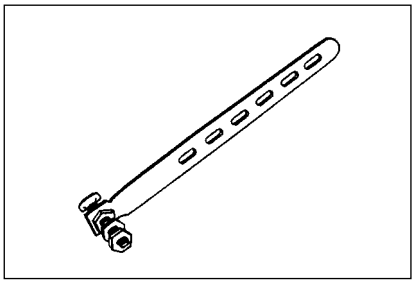


- *To reduce risk and prevent build up of dangerous potential differences between high voltage equipment or structures and the user standing on the ground surface. CEC Rule 36-308*

Metallic Gradient Control Mat

Cat. No.	Description	Wt/100 lb	Wt/100 kg	Standard package
64663	Mat with connectors	3000	1363	1
64660	Mat without connectors	2900	1318	1

4 ft. x 6 ft. hot dip galvanized mat is made from 6"x6" welded mesh, 1/4" diameter. Silicone bronze connector, bolt, nut and lockwasher.



Type FJ

- *For connecting to steel pipe or copper water tube*
- *Accommodates 3/8", 1/2", 3/4", 1", 1 1/4", pipe sizes and 1/2", 3/4", 1, 1 1/4", copper water tube sizes*
- *Accommodates copper ground wire #18 through #12*
- *Specially designed "T" bolt*
- *22 gauge soft copper strap with unique locking slots*
- *Hex head nuts may be tightened with standard wrench or special telephone company hex head driver*

Type FJ Flexible Ground Clamp

Cat. No.	Copper Ground Wire Size max.	Copper Ground Wire Size min.	Pipe Size (in.) max.	Pipe Size (in.) min.	Copper Tube Size (in.) max.	Copper Tube Size (in.) min.
FJ	12	18	1 1/4	3/8	1 1/4	1/2