

Grounding and Bonding Product Guide



The Bonding Network

Standards



ANSI/TIA-607-C; November 2015

- Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
- Standards and Publications are adopted by TIA in accordance with the American National Standards Institute (ANSI) patent policy



ANSI/NECA/BICSI 607-2011; 2011

- Standard for telecommunications bonding and grounding planning and installation methods for commercial buildings
- National Electrical Installation Standards (NEIS™) are designed to improve communication among specifiers, purchasers, and suppliers of electrical construction services. This standard has been prepared by BICSI®/NECA® under joint jurisdiction of BICSI and NECA, and approved by consensus ballot in accordance with the requirements of ANSI. This publication is intended to comply with the edition of the National Electrical Code (NEC®) in effect at the time of publication.



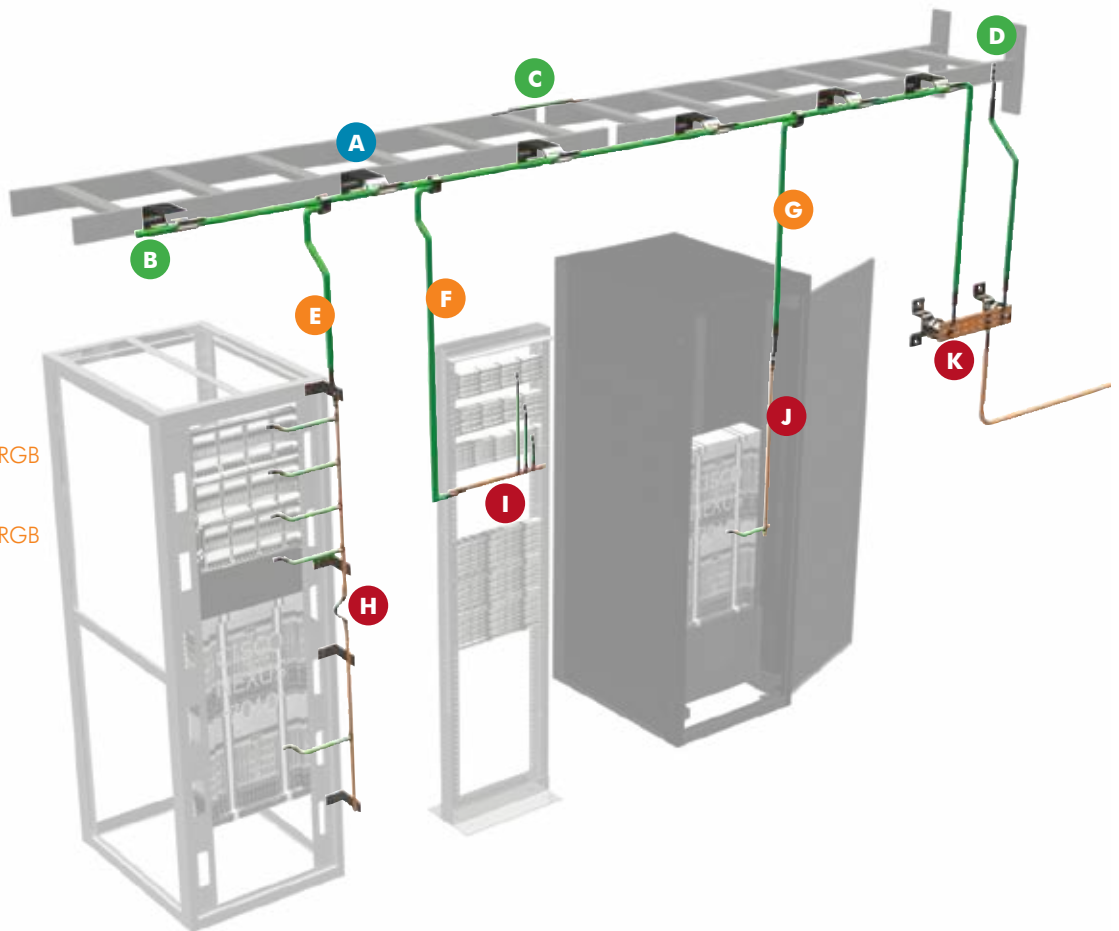
NEC Article 250

- This article covers general grounding and bonding requirements and practices within electrical installations

The above standards differ; refer to the specified standard to ensure compliance for product selection and installation.

Room Scenario

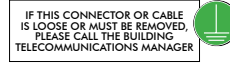
- A** TEBC Bracket for Ladder
HGBTEBCBRKL10
- B** TEBC 12ft with double lug
HGRKTD144DB
- C** Ladder tray jumper
HGRKTD9D
- D** Ladder to TGB Conductor
HGRKTD60DB
- E** Conductor with C-Tap to 76" RGB
HGRKTD60C46
- F** Conductor with C-Tap to 19" RGB
HGRKTD60C46
- G** Conductor with C-Tap to 36" RGB
HGRKTD60C46
- H** 76" x 3/4" RGB Busbar
HBBBVR76KT
- I** 19" Horizontal RGB
HBBBHR19KT
- J** 36" x 3/4" RGB Busbar
HBBBVR36KT
- K** 10" x 2" TGB Busbar
HBBB14210A



Grounding Kits

All Ground Conductor Kits Include:

Lug and Tap	Accessories
LUG Traceable, crimped, die indexed 7, long barrel, inspection window	LABELS Caution label applied at both ends; circle ground reflective sticker
TAP C-tap, H-tap	ANTIOXIDANT 0.5oz tube Penetrox



Lug Hole Mounting Dimensions

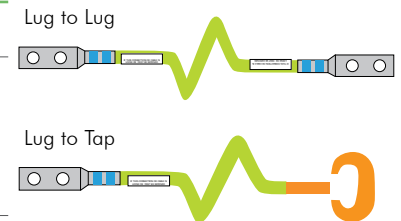
Lug Style	Hole Diameter	Hole Spacing
S	0.25"	—
D/DN	0.25"	0.625"
DA	0.25"	0.75"
DB	0.25"	1.0"

Standard Ground Conductor Kit Applications

Application	Lug	Length (in)	Lug	Tap	Catalog No.
Rack busbar suppressor to rail	HGBL06D	30"	HGBL06S		HGRKTD30S
Front to rear rail jumper	HGBL06D	30"	HGBL06DN		HGRKTD30DN
Front to rear rail jumper	HGBL06D	45"	HGBL06DN		HGRKTD45DN
Rack busbar to wall busbar	HGBL06DA	144"	HGBL06D		HGRKTD45DN
Fiber armor bond	HGBL06D	30"	HGBKS25		HGRKTD30KS25
Horizontal busbar to conductor	HGBL06DA	60"		HYC4C6	HGRKTD45DN
Rack rail to conductor	HGBL06D	60"		HYC4C6	HGRKTD45DN

Custom Ground Conductor Kits

Kit Base	Lugs	Lengths (in)	Taps
HGRKT	S = HGBL06S D = HGBL06D DA = HGBL06DA DB = HGBL06DB	30" 45" 60" 90" 144"	YH6 = HYH6C6C C46 = HYC4C6 YC4 = HYC4L12



Contact Customer Service for available configurations.

Jumper Kits

Type	Contents	Material	Catalog No.
Ladder Tray	(1) 9" #6 conductor with long barrel lugs crimped on both ends, stainless steel hardware, labeled, antioxidant	Copper	HGRKTD9D
Ladder Tray	(10) mechanical lay-in terminals, (5) 9" #6 conductors, stainless steel hardware, labels	Aluminum	HGRKTKA9KA5
Wire Basket	(10) copper split bolts, (5) 9" #6 conductors, stainless steel hardware, labels	Copper	HGRKTWB5

Busbar Kits

Type	Contents	Material	Catalog No.
Horizontal 19"	Busbar, insulators, stainless steel hardware, 60" #6 AWG conductor, ESD Port, Antioxidant	Copper	HGRKTHC
		Tin-plated	HGRKTHT
Vertical 36"	Busbar, insulators, stainless steel hardware, 60" #6 AWG conductor, ESD Port, Antioxidant	Copper	HGRKTV C
		Tin-plated	HGRKTV T
SBB/TGB	2" x 10", insulators, stainless steel hardware, (1) #6 lug, (1) #2 lug, (2) 2/0 lug, (1) 4/0 lug, Antioxidant	Copper	HGRKTTGB10A
MBB/TMGB	4" x 16", insulators, stainless steel hardware, (1) #6 lug, (1) #2 lug, (2) 2/0 lug, (1) 4/0 lug, Antioxidant	Copper	HGRKTTMGB16H

Compression Lugs

- Solid copper construction and tin plated
- UL Listed 90° C, 600V to 35kV
- Die Index Traceable
- UL and CSA Listed



Lug Reference

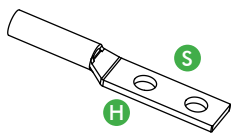
Hole Diameter: Lug Number 38 = $3/8" = 0.375"$

Window: Inspect Wire

Barrel Length: Long Series

Die Index: Match with Traceable Die

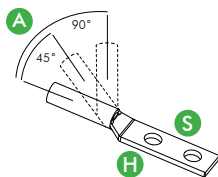
Standard Lugs



Style	Single		Double			
H Hole	0.25"	0.375"	0.25"	0.25"	0.375"	0.25"
S Spacing			0.625"	0.75"	1"	1.5"

Gauge	Qty	Color	Die Index						
#6	50	Blue	7	HGBL06S		HGBL06D	HGBL06DA	HGBL06DB	HGBL06DK
#4	50	Gray	8	HGBL04S		HGBL04D	HGBL04DA	HGBL04DB	
#2	25	Brown	10	HGBL02S	HGBL02SA	HGBL02D	HGBL02DA	HGBL02DB	
#1	25	Green	11	HGBL01S	HGBL01SA	HGBL01D	HGBL01DA	HGBL01DB	
1/0	10	Pink	12	HGBL10S	HGBL10SA	HGBL10D	HGBL10DA	HGBL10DB	
2/0	10	Black	13		HGBL20SA	HGBL20D	HGBL20DA	HGBL20DB	
3/0	10	Orange	14		HGBL30SA		HGBL30DA	HGBL30DB	
4/0	10	Purple	15					HGBL40DB	
250kcmil	5	Yellow	16					HGBL250DB	
300kcmil	5	White	17					HGBL300DB	
350kcmil	5	Red	18					HGBL350DB	
500kcmil	5	Brown	20					HGBL500DB	
600kcmil	5	Green	22					HGBL600DB	
750kcmil	5	Black	24					HGBL750DB	

Angled Lugs



Style	Single		Double			
H Hole	0.25"	0.25"	0.25"	0.25"	0.375"	0.25"
S Spacing			0.625"	0.625"	1"	1.5"
A Angle	45°	90°	45°	90°	90°	90°

Gauge	Qty	Color	Die Index						
#6	50	Blue	7	HGBL06SF	HGBL06SN	HGBL06D45	HGBL06D90	HGBL06DB90	HGBL06DKN
#4	50	Gray	8	HGBL04SF		HGBL04D45	HGBL04D90	HGBL04DB90	
#2	25	Brown	10	HGBL02SF		HGBL02D45	HGBL02D90	HGBL02DB90	
1/0	10	Pink	12			HGBL10D45	HGBL10D90	HGBL10DB90	

Busbars

- For all connections to busbars, oxidation must be scrubbed away and the application of an antioxidant is required.
- Add "TP" to the end of any busbar Catalog Number for 99% Copper Tin Plated.

Busbars

Includes	Height	Length	Thickness	Hole Size	0.25"	0.25"	0.375"	Catalog No.
				Hole Space	0.625"	0.75"	1"	
Insulators, mounting hardware	0.75"	19"	0.25"		5	2		HBBBHR19KT
								
Insulators, mounting hardware	.75"	36"	0.25"		8		2	HBBBVR36KT
								
Insulators, mounting hardware, 8" braid	.75"	76"	0.25"		16			HBBBVR76KT
								
Insulators, bracket	2"	10"	0.25"		8			HBBB14210A
								
Insulators, bracket	2"	24"	0.25"		9	9		HBBB14224B
								
Insulators, bracket	4"	16"	0.25"				8	HBBB14416G
								
Insulators, bracket	4"	16"	0.25"			8	8	HBBB14416H
								
Insulators, bracket	4"	20"	0.25"			17	17	HBBB14420J
								

Note: Lug mounting dimensions are color coded to assist in pairing lugs to busbars.

Compression Taps



Thin Wall C-Taps

Qty	Run-Tap Stranded	Run-Tap Stranded	Run-Tap Stranded	Length	Color Code	No. Ribs	Die Index	HW Series (No. of crimps)	HU Series (No. of crimps)	Catalog No.
25	6-6	–	–	1.18"	Brown	1	10	HW2CVT(2)	HUC4	HYC4L12
25	4-4	2-6	–	1.18"	Pink	1	12	HW25VT (2)	HUC2	HYC2L12
10	2-4	1-6	–	1.75"	Black	2	13	HW26VT (2)	HUC1	HYC1L12
10	2-2	1-4	1/0-4	1.75"	Orange	2	14	HW27VT(3)	HU25	HYC25L12
5	1-1	1/0-2	2/0-2	1.75"	Purple	2	15	HW28VT(3)	HU26	HYC26L12
5	1/0-1/0	2/0-2	3/0-2	1.75"	Yellow	2	16	HW29VT(3)	–	HYC27L12

Direct Burial C-Taps

Qty	Run-Tap Stranded	Run-Tap Stranded	Run-Tap Stranded	Length	Die Index	HW Series (No. of crimps)	HU Series (No. of crimps)	Catalog No.
10	6-6	4-6	–	0.625"	BG	HWBG (2)	HUBG (2)	HYC4C6
10	4-4	4-6	–	0.625"	BG	HWBG (2)	HUBG (2)	HYC4C4
10	2-4	2-6	–	0.75"	C	HWCC (2)	HUC (2)	HYC2C4
10	2-2	–	–	0.75"	C	HWCC (2)	HUC (2)	HYC2C2
5	2/0-6	2/0-4	2/0-2	0.875"	0	–	HU0	HYC26C2
5	2/0-2/0	–	–	0.875"	0	–	HU0	HYC26C26
1	4/0-6	4/0-4	4/0-2	1.07"	D3	–	HUD3	HYC28C2
1	4/0-2/0	–	–	1.07"	D3	–	HUD3	HYC28C26
1	4/0-4/0	–	–	1.07"	D3	–	HUD3	HYC28C28

H-Taps

Qty	Run-Tap Stranded	Run-Tap Stranded	Run-Tap Stranded	Length	Color Code	Die Index	HW Series	HU Series	Catalog No.
1	6-6	–	–	0.6"	Orange	BG	HWBG	HUBG	HYH6C6C
1	2-2,4,6	4-4,6	–	0.75"	Brown	C	HWCC	HUC	HYH2C2C
1	4/0-2,6	2/0-2,6	1/0-2,6	0.9"	Purple	654	–	HU654	HYH292C
1	4/0-4/0,2	3/0-3/0,2	2/0-2/0,2	0.9"	Purple	654	–	HU654	HYH2929
1	500-250,1/0	350-250,1/0	4/0-1/0	1.0	Brown	1104	–	HU1104	HYH3429
1	500-500,4/0	350-350,4/0	–	1.0	Brown	1104	–	HU1104	HYH3434
1	750-4/0,1/0	650-4/0,1/0	500-4/0,1/0	0.95	Yellow	K-R	–	HUKR	HYH3931
1	750-750,350	650-650,350	500-350	1.25	Yellow	K-R	–	HUKR	HYH3939

H-Taps with Covers

Qty	Run-Tap Stranded	Run-Tap Stranded	Run-Tap Stranded	Length	Color Code	Die Index	HW Series	HU Series	Catalog No.
1	2-2,4,6	4-4,6	–	0.75"	Brown	C	HWCC	HUC	HYH2CWC
1	4/0-2,6	2/0-2,6	1/0-2,6	0.9"	Purple	654	–	HU654	HYH29WC
1	4/0-4/0,2	3/0-3/0,2	2/0-2/0,2	0.9"	Purple	654	–	HU654	HYH2929WC

Covers for H-Taps

Qty	H-Tap Size	Color Code	Clear Cover	Black Cover
1	HYH6C	Orange	HCCFBGFR	HCFBGFR
1	HYH2C	Brown	HCCF0FR	HCF0FR
1	HYH29	Purple	HCCFDFR	HCFDFR
1	HYH34	Brown	HCCFN	HCFN
1	HYH39	Yellow	HCCFR	HCFR

Tools

	Compression	Contents	Die Type	Catalog No.
	6 ton	Automatic compression tool, (2) 18V lithium batteries, charging station, carrying case	HW Series	HPAT600LI
	9,000lb	Manual compression tool, built in BG die, 24" handles	HW Series	HMD7
	8,000lb	Manual compression tool, metal carrying case with die holders	HX Series	HOVR840
	12 ton	Automatic compression tool, (2) 18V lithium batteries, charging station, carrying case	HU Series	HPAT750LI
	12 ton	Manual compression tool, 24" handles, carrying case	HU Series	HY750CHSXT
	6,000lb	Manual compression tool, #6 to 4/0 lug dies integrated in tool head, 26" handles	Integrated	HMRC840

Tool Dies

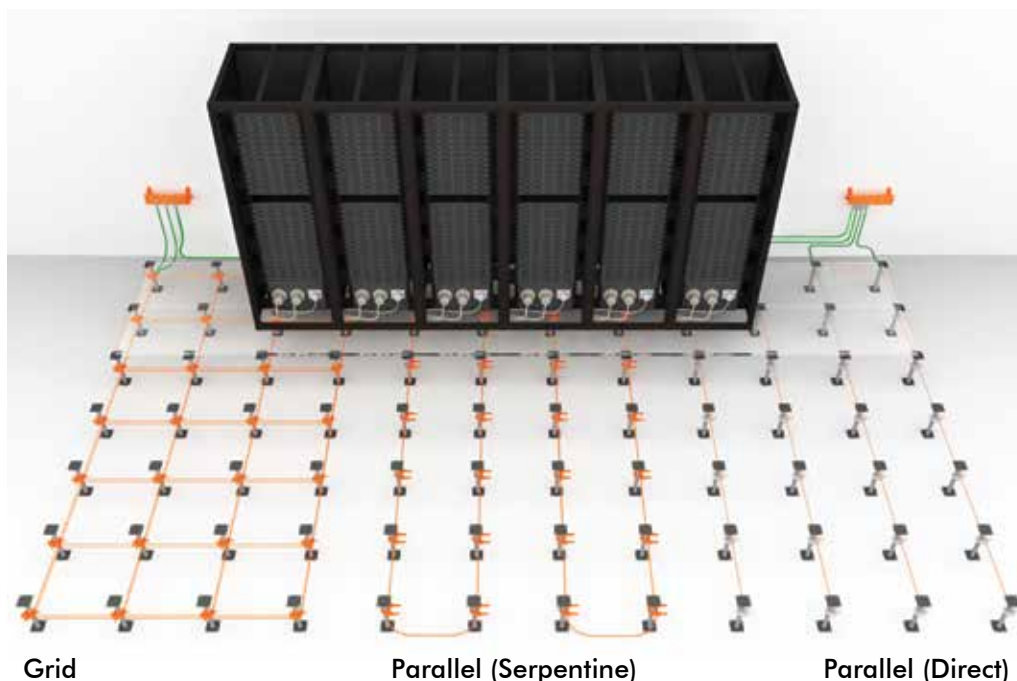
HW Series				HX Series				HU Series			
9 pt. font size				9 pt. font size				9 pt. font size			
											
Lugs	Die	Taps	Die	Lugs	Die	Taps	Die	Lugs	Die	Taps	Die
HW5CRT	#6	HWCC	C	HX5CRT	#6	HXBG	BG	HU5CRT	#6	HU1105	1105
HW4CRT	#4	HW0	0	HX4CRT	#4			HU4CRT	#4	HU1104	1104
HW2CRT	#2	HW28K	CUTOFF	HX2CRT	#2			HU2CRT	#2	HU654	654
HW1CRT	#1	HWBG	BG	HX1CRT	#1			HU1CRT	#1	HU997	997
HW25RT	1/0	HW2CVT	10	HX25RT	1/0			HU25RT	1/0	HUC4	C4
HW26RT	2/0	HW25VT	12	HX26RT	2/0			HU26RT	2/0	HUC2	C2
HW27RT	3/0	HW26VT	13	HX27RT	3/0			HU27RT	3/0	HUC1	C1
HW28VT	4/0	HW27VT	14					HU28RT	4/0	HUC25	C25
HW29VT	250kcmil	HW28VT	15					HU29RT	250kcmil	HUC	C
HW30VT	300kcmil	HW29VT	16					HU30RT	300kcmil	HU0	0
HW31VT	350kcmil							HU31RT	350kcmil	HUBG	BG
HW34VT	400kcmil							HU34RT	400kcmil	HUC25	26
								HU36RT	500kcmil		
								HU39RT	750kcmil		

Tool Accessories

	Description	Contents	Catalog No.
	Torque Wrench	30–150 in-lb, carrying case and certificate of calibration	HBT30150
		150–750 in-lb, carrying case and certificate of calibration	HBT150750
	Case	Die tree for use with HW and HX series dies, holds 6 sets*	HWDIETREE
		Die case for use with HW and HX series dies, holds 12 sets*	HWIECASE
		Die case for use with HU series dies, holds 15 sets*	HUIECASE

*Dies not included

Clamps



Grid

Parallel (Serpentine)

Parallel (Direct)

Raised Floor Pedestal Clamps

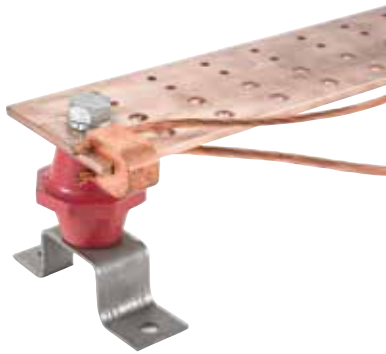
	Pedestal	Wire Range	Configuration	Hardware	Install Torque	Catalog No.
	0.75"-1.5" Square 0.75"-1.875" Round	#6 – 4/0AWG	Grid or Parallel	Stainless Steel 1/2"	120in-lb Conductor 180in-lb Clamp	HGBGXP1828RF
	1.0"-1.25" Round	#4 – 2/0AWG	Parallel	Silicon Bronze 9/16"	240in-lb	HGBGP1526G1
	0.75"-1.0" Round or Square	#8 – 2AWG	Parallel	Silicon Bronze 9/16"	240in-lb	HGBGRF4C3

Note: Torque values may differ based on the Grounding and Bonding Standard selected.
The Mesh Bonding Network shall have a support attached at a maximum of 3' (36") intervals.

Pipe Clamps

	I.P.S. Pipe Diameter	Height	Width	Conductor Range	U-Bolt Size	Nut Size	Catalog No.
	1.0"	2-7/8"	2-5/8"	#4-2/0	3/8"	9/16"	HGBGAR1526
	1.5"	3-1/2"	3"	#4-2/0	3/8"	9/16"	HGBGAR1726
	2.0"	4"	3-1/4"	#4-2/0	3/8"	9/16"	HGBGAR1826
	2.5"	4-1/4"	3-3/4"	#4-2/0	3/8"	9/16"	HGBGAR1926
	3.0"	5"	4-1/4"	#4-2/0	3/8"	9/16"	HGBGAR2026
	3.5"	5-5/8"	4-3/4"	#4-2/0	3/8"	9/16"	HGBGAR2126
	4.0"	6-1/4"	5-3/8"	#4-2/0	3/8"	9/16"	HGBGAR2226
	5.0"	6-3/8"	5-7/8"	#4-2/0	3/8"	9/16"	HGBGAR2426
	6.0"	8-13/16"	8-3/8"	2-250kcmil	1/2"	3/4"	HGBGAR8629

Note: All pipe clamps secure the grounding conductor to the pipe in a parallel or perpendicular manner.



Irreversible Connectors

Irreversible Busbar and I-Beam Connectors provide a high level of bonding security and are as permanent as welding.

Typical Busbar Connector Applications

- TGB to GE
- TGB to TBB
- TGB to beam steel
- TGB to TGB
- TGB to mesh BN

Busbar Connectors

	Quantity	Dimensions	Wire 1	Wire 2	Die	Catalog No.
	1	1.5" x 1.37" x 0.81"	#2	#6	HU1105	HYG14B2TC2C6C
	1	1.5" x 1.37" x 0.81"	#2	#2	HU1105	HYG14B2TC2C2C
	1	1.5" x 1.37" x 0.81"	1/0-4/0	–	HU1105	HYG14BTC28
	1	1.5" x 1.37" x 0.81"	#2-2/0	–	HU1105	HYG14BTC26

Note: Individually packaged, Penetrox applied, compatible with 0.25" thick busbars.

Typical I-Beam Connector Applications

- Steel beam to TBB
- Steel beam to TGB
- Steel beam to TMGB



I-Beam Connectors

	Quantity	Steel Flange		Flange I Range	Die	Catalog No.
	1	Standard	 STANDARD BEAMS (FLANGE ANGLED)	0.250" – 0.338"	HU1105	HYGIBS338
	1			0.338" – 0.400"	HU1105	HYGIBS400
	1			0.400" – 0.462"	HU1105	HYGIBS462
	1			0.462" – 0.500"	HU1105	HYGIBS550
 WIDE FLANGE BEAMS (FLANGE PARALLEL)	1	Wide		0.250" – 0.338"	HU1105	HYGIBW338
	1			0.338" – 0.400"	HU1105	HYGIBW400
	1			0.400" – 0.462"	HU1105	HYGIBW462
	1			0.462" – 0.500"	HU1105	HYGIBW550

Note: Includes heavy duty lug mounting hardware: (2) 0.42" threaded studs, (2) flat washers, (2) lock washers, (2) hex nuts.
Hole spacing for heavy duty HYGHA lugs.

Heavy Duty Lugs

	Quantity	Conductor Size	Hole Size	Spacing	Die Index	Die	Catalog No.
	1	#2	0.56"	1.75"	11	HU1CRT	HYGHA02
	1	1/0	0.56"	1.75"	14	HU27RT	HYGHA25
	1	2/0	0.56"	1.75"	15	HU28RT	HYGHA26
	1	3/0	0.56"	1.75"	16	HU29RT (2)	HYGHA27

Note: Individually packaged, Penetrox filled, compatible with HYGIB I-beam connectors.

Mechanical Connectors

Terminals

	Qty	Minimum	Maximum	Material	Mount Hole Diameter	Torque (in lb)	Catalog No.
	100	#14	#6	Aluminum	0.25"	45	HGBKA6U
	100	#14	#4	Aluminum	0.22"	35	HGBBGBL4
	100	#14	#6	Copper	0.19"	45	HGBKLU35
	100	#14	#4	Copper	0.22"	35	HGBCL501

On-Rail Terminal

	Qty	Minimum	Maximum	Material	Mount Hole Diameter	Hole Spacing	Catalog No.
	1	#14	2/0	Aluminum	0.31"	0.625"	HGBKARB

Split Bolt Connectors

	Qty	STR Min Run and Tap	STR Max Run and Tap	SOL Max Run and Tap	Material	Bolt Size	Length	Torque (in lb)	Catalog No.
	50	#8	#6	#6	Copper	7/16"	1.14"	165	HGBKS17
	50	#8	#4	#4	Copper	1/2"	1.20"	165	HGBKS20
	50	#6	#3	#2	Copper	19/32"	1.50"	275	HGBKS22
	25	#6	#2	#1	Copper	5/8"	1.54"	275	HGBKS23
	25	#4	1/0	2/0	Copper	3/4"	1.77"	385	HGBKS25
	10	#2	2/0	3/0	Copper	7/8"	1.94"	385	HGBKS26
	10	#1	3/0	4/0	Copper	1 1/8"	1.86"	500	HGBKS27
	5	#1	250kcmil	4/0	Copper	1 1/8"	2.07"	650	HGBKS29

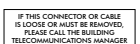
Split Bolt Covers

	Qty	Size Minimum	Size Maximum	Color	Catalog No.
	1	HGBKS17	HGBKS20	Black	HGBSC4
	1	HGBKS22	HGBKS23	Black	HGBSC2
	1	HGBKS25	HGBKS26	Black	HGBSC20

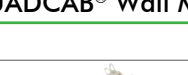
ShieldBond Connector

	Qty	Description	Catalog No.
	100	ShieldBond connector kits for cable jackets. Each kit includes brass screw and nut, (2) retaining washers, (1) gripping. Install tool included.	BC285SB100

Installation Accessories

Description	Qty	Catalog No.	Description	Qty	Catalog No.
 ESD port for 4mm banana plug; 0.5oz Penetrox; ESD Label; (2) #12-24 TFS; (2) M6 stainless TFS	10	HGBESDKT10	 ESD cloth bracelet; 6ft cord; 4mm banana plug	1	HGBESDBC
 1/4" belleville washer	50	HGB25CNWH	 ESD metal bracelet; 6ft cord; 4mm banana plug	1	HGBESDBM
 3/8" belleville washer	50	HGB38CNWH	 3/16" drill bit for steel material and 1/4" thread forming screw	1	HGB025DBS
 #12-24 x 3/4" stainless steel screws	50	HGB1224ST	 Wire brush for power drill	1	HGBCWB2
 M6 x 16mm stainless steel screws	50	HGBM6ST	 2" x 4" abrasive pad	6	HGB24AP
 ESD label	25	HGBESDLBL	 8oz bottle Penetrox	1	HGBP8A
 Ground label	25	HGBGNDLBL	 0.5oz tube Penetrox	50	HPENEA0550
 Ground wire label	25	HGRKTLBL	 Serrated paint piercing washer	50	HGB25PPW

Braided Jumper

	Qty	Length	Width	Hole Size	Hole Spacing	Catalog No.
	10	6"	0.5"	1/4"	—	HGBBD6S10
	10	9"	0.5"	1/4"	—	HGBBD9S10
	1	12"	0.94"	3/8"	1.25"	HGBBD12
	1	18"	0.94"	3/8"	1.25"	HGBBD18
	1	24"	0.94"	3/8"	1.25"	HGBBD24

QUADCAB® Wall Mount Cabinet Ground Kit

Description	Catalog No.
 Ground bar with (6) 1/4"-20 male studs (2) 1/4"-20 carriage bolts and isolating hardware (2) ground straps (6) 1/4"-20 nuts with star washers	REKGB

Conductor Brackets

Description	Qty	Catalog No.
 TEBC bracket for ladder rack, aluminum painted black	10	HGBTEBCBRKL10
 TEBC bracket for wire tray, aluminum painted black	10	HGBTEBCBRKW10
 Insulated TEBC bracket for extruded AL ladder, stainless steel	1	HGBTEBCBRKR

Insulated Halo Bracket

Description	Qty	Catalog No.
 Stainless steel bracket, insulator, UV Rated cable holding clips for 0.25", 0.31", 0.38", 0.50", 0.56", 0.75" and 0.88" cables	1	HGBSETH

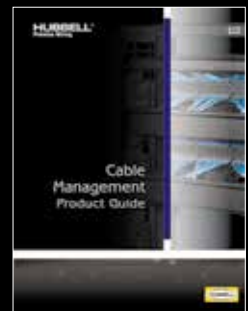
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