

3M™ Cold Shrink QT-III Silicone Rubber Skirted Termination Kits

With High Ampacity Ground Connection and High-K Stress Relief

For Tape Shield, Wire-Over-Tape Shield
and Longitudinally Corrugated (LC) Shield Cable

7652-S-HSG-4, 7653-S-HSG-4, 7654-S-HSG-4,
7655-S-HSG-4, 7656-S-HSG-4

Instructions

IEEE Std. No. 48

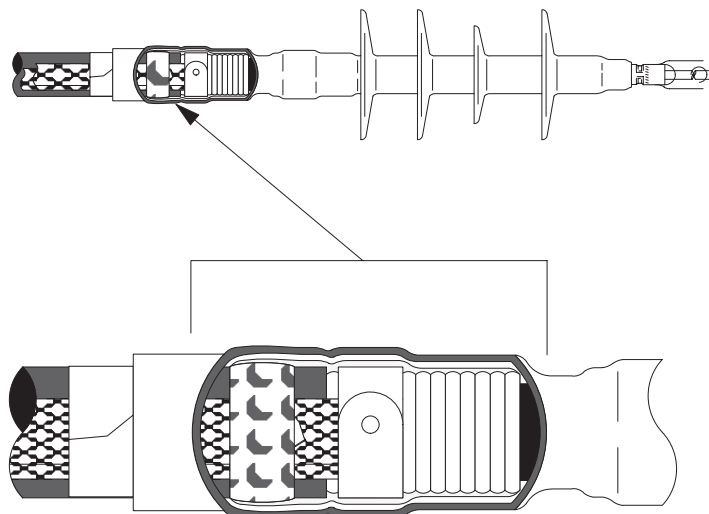
Class 1 Termination

25/28 kV Class

150 kV BIL

CAUTION

Working around energized systems may cause serious injury or death. Installation should be performed by personnel familiar with good safety practice in handling electrical equipment. De-energize and ground all electrical systems before installing product.



1.0 Kit Contents

- 1 High-K, Tracking Resistant, Silicone Rubber Termination
- 1 High Ampacity Ground Braid
- 1 Constant Force Spring
- 2 Strips Scotch® Mastic Strip 2230 (black with white release liners, bagged)
- 1 3M™ EMI Copper Foil Shielding Tape 1181 Strip, 1/2" x 10"
- 1 Instruction Sheet

NOTE: Do Not use knives to open plastic bags.

Kit Selection Table

NOTE: Final Determination Factor is cable insulation diameter.

Kit Number	Primary Insulation O.D. Range	Jacket O.D. Range	Conductor Size Range (AWG & kcmil)			
			5 kV	8 kV	15 kV	25/28 kV
7652-S-HSG-4	0.64" – 1.08" (16,3 – 27,4 mm)	0.97" – 1.48" (24,6 – 37,6 mm)	4/0 – 400 —	3/0 – 300 —	2 – 4/0 (35 – 120 mm²)	2 – 1/0 (35 – 50 mm²)
7653-S-HSG-4	0.72" – 1.29" (18,3 – 32,8 mm)	1.04" – 1.60" (26,4 – 40,6 mm)	300 – 500 —	250 – 500 —	2/0 – 300 (70 – 150 mm²)	2 – 4/0 (35 – 120 mm²)
7654-S-HSG-4	0.83" – 1.53" (21,1 – 38,9 mm)	1.12" – 1.87" (28,4 – 47,5 mm)	500 – 750 —	350 – 700 —	4/0 – 500 (120 – 240 mm²)	2/0 – 250 (70 – 150 mm²)
7655-S-HSG-4	1.05" – 1.80" (26,7 – 45,7 mm)	1.39" – 2.40" (35,3 – 61,0 mm)	700 – 1500 —	600 – 1250 —	500 – 1000 (240 – 500 mm²)	250 – 800 (150 – 400 mm²)
7656-S-HSG-4	1.53" – 2.32" (38,9 – 58,9 mm)	1.84" – 2.80" (46,8 – 71,1 mm)	1750 – 2000 —	1500 – 2000 —	1250 – 2000 (625 – 1000 mm²)	900 – 1750 (500 – 800 mm²)

Table 1

2.0 Prepare Cable

- 2.1 Check to be sure cable size fits within kit range as shown in Table 1.
- 2.2 Prepare cable using dimensions shown in Figure 1. **BE SURE TO ALLOW FOR DEPTH OF TERMINAL LUG.** If necessary to prevent metallic shield from unrolling, hold down edge with a single wrap of 3M™ EMI Copper Foil Shielding Tape 1181.

NOTE: When preparing wire over tape shield cable, cut the shield wires to the same length as the metallic shield, 1 1/2" (38 mm).

Provide additional exposed conductor distance to account for growth during crimping of ALUMINUM lugs or connectors as follows:

Aluminum Lug and Connector Growth Allowance	2 - 350 1/4" (6 mm)	400 - 650 1/2" (13 mm)	750-1000 3/4" (19 mm)	1250 – 2000 Field Determined
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NOTE: It is imperative to remove all remnants of the semi-con layer, even if the semi-con layer comes off as one layer. There should not be any remaining black areas, or particles, on the cable insulation layer.

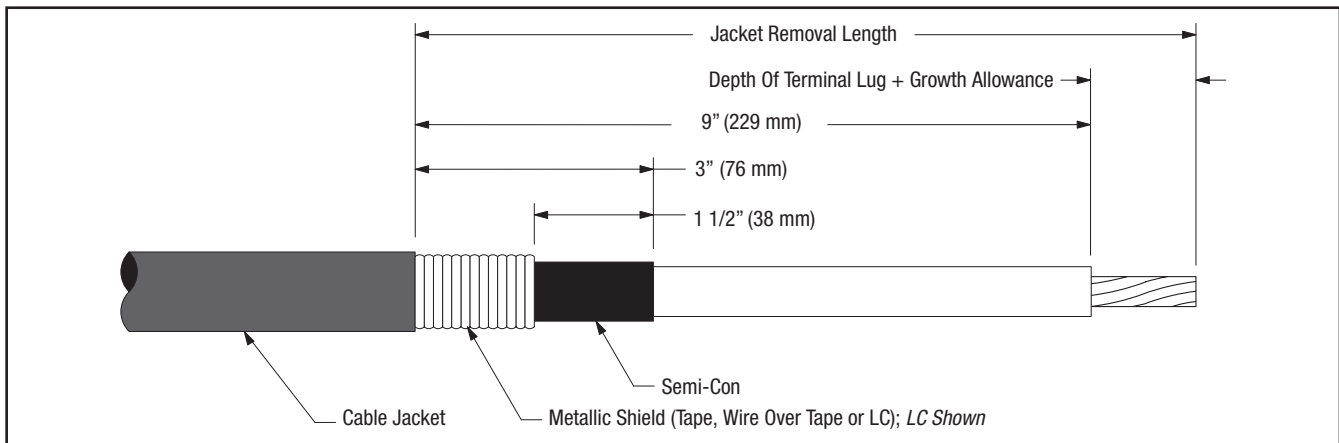


Figure 1

3.0 Install High Ampacity Ground Braid

- 3.1 Select a Scotch® Mastic Strip 2230 from kit and remove white release liners. Using light tension, apply a SINGLE WRAP of mastic around the cable jacket 1/4" (6 mm) from cut edge (Figure 2). Cut off excess.

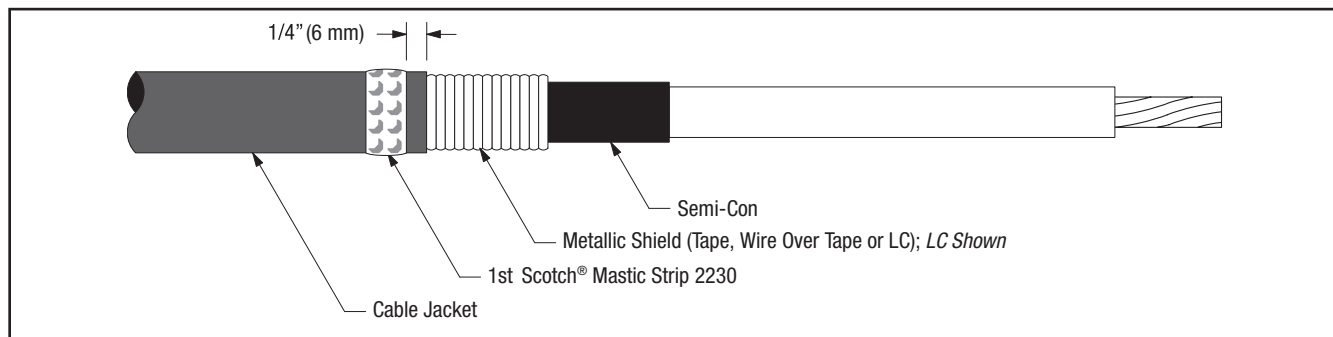


Figure 2

- 3.2 Position pre-formed high-amp ground braid with the “U” section over the metallic shield directly adjacent to cable jacket cut edge. Please Note: The ground braid needs to make full contact with the metallic tape shield. Position one tail of ground braid, extending over cable jacket with solder block over mastic strip (Figure 3). Secure high-amp ground braid to cable jacket 4 1/2" (114 mm) from cable semi-con edge using vinyl tape (Figure 3).

NOTE: Position vinyl tape with care, it also serves as a marker for positioning the termination.

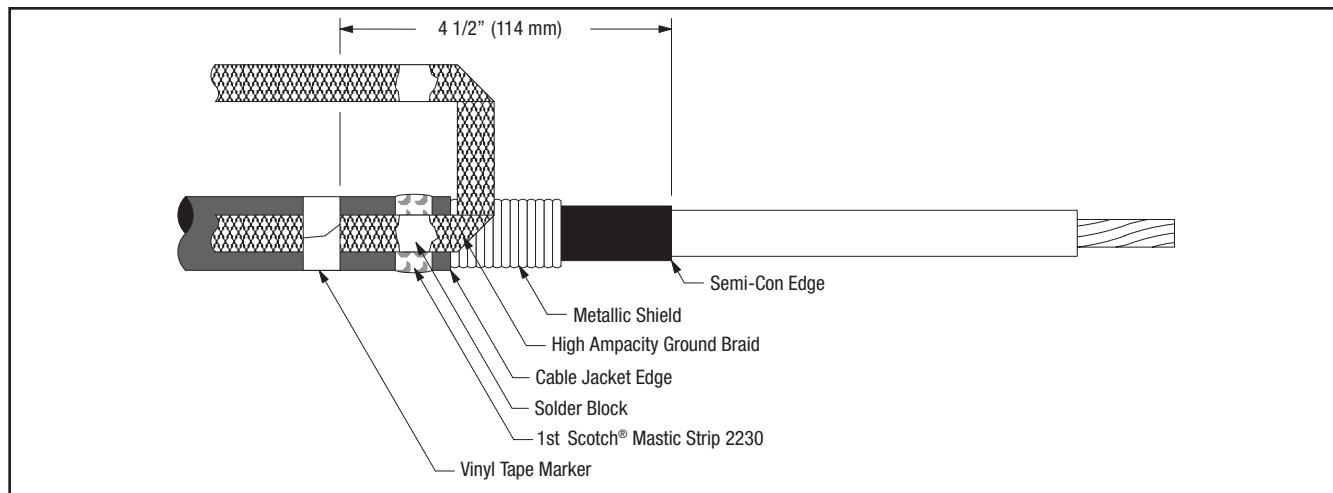


Figure 3

- 3.3 Wrap the high-amp ground braid around the metallic cable shield and secure in place with constant force spring. Cinch (tighten) the spring after wrapping the final turn. Position the high-amp ground braid tail (with solder block over mastic strip) over the cable jacket and parallel to the first ground braid tail (Figure 4).

3.4 Select second Scotch® Mastic Strip 2230 from kit and remove white release liners. Apply a second SINGLE WRAP of mastic over solder block on high-amp ground braid and previously applied mastic. If high-amp ground braids overlap on cable jacket be sure to apply mastic between the solder block of the high-amp ground braids. Secure ground braid to cable jacket 4 1/2" (114 mm) from cable semi-con edge using vinyl tape. Apply tape directly over previously applied marker tape (Figure 4).

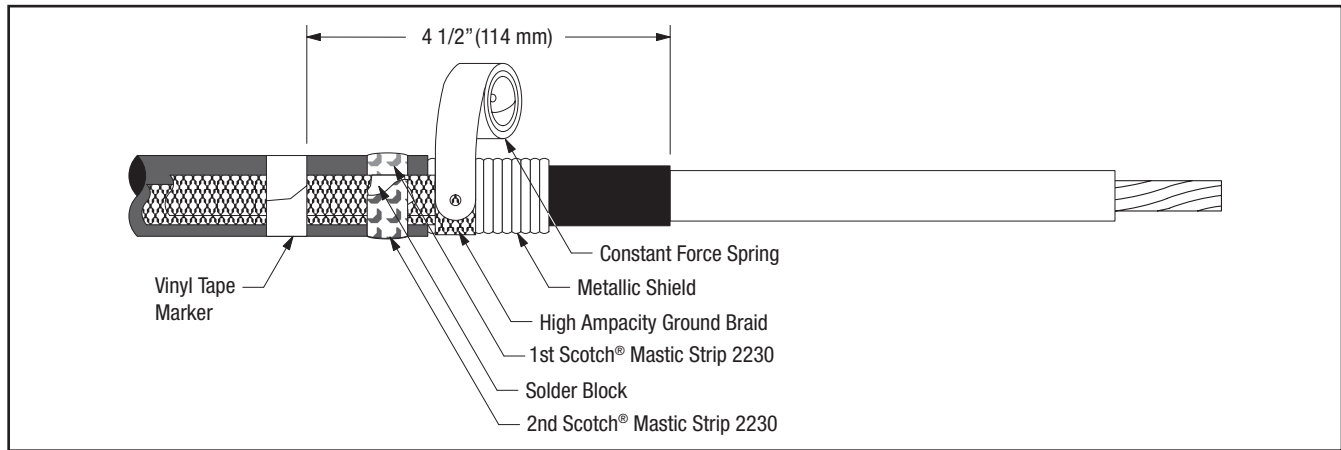


Figure 4

3.5 Wrap two half-lapped layers of electrical grade vinyl tape around mastic seal, constant force spring and exposed metallic shield (Figure 5).

NOTE: Take care not to cover exposed semi-con insulation shield. A minimum of 1" (25 mm) must be exposed.

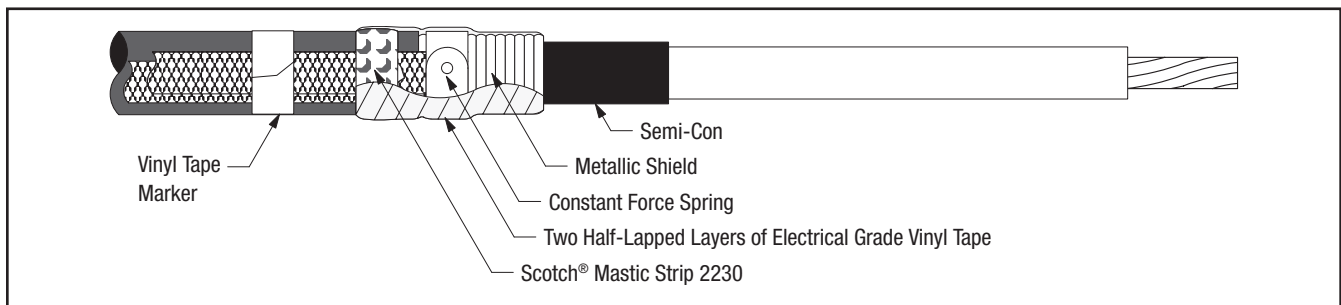


Figure 5

4.0 Install Lug or Connector

4.1 Check to insure 3M™ Cold Shrink QT-III Termination Assembly fits over the selected lug or connector. If lug or connector (Figure 6) will not fit through the termination core, clean the insulation (per Step 5.0) and slide termination on cable before installing lug or connector. **DO NOT REMOVE CORE AT THIS TIME.**

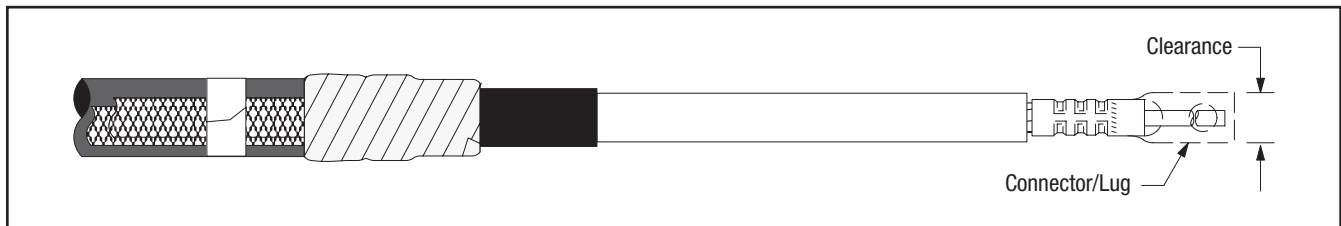


Figure 6

NOTE: Refer to pages 6 – 8 for 3M™ connector and lug crimping information.

NOTE: For Aluminum Conductors - Thoroughly wire brush conductor strands to remove aluminum oxide layer. Immediately insert conductor into lug or connector barrel as far as it will go.

4.2 Position connector or lug and crimp according to manufacturer's directions. Remove excess oxide inhibitor and sharp crimp flashings following crimping.

5.0 Clean Cable Insulation and Lug or Connector Barrel Using Standard Practice

- 5.1 Wipe the cable insulation with an approved solvent (such as 3M™ Cable Cleaning Solvent CC Series). **DO NOT ALLOW SOLVENT TO TOUCH SEMI-CON INSULATION SHIELD!**
- 5.2 If abrasive must be used:
 - a. Use on insulation only. **DO NOT USE ABRASIVE ON SEMI-CON INSULATION SHIELD!**
 - b. Use only aluminum oxide abrasive; grit 120 or finer.
 - c. Be careful not to reduce the cable insulation diameter below that allowed by the kit.

6.0 Install Termination

- 6.1 Slide the termination body onto the cable and remove core. Pull while unwinding, counter-clockwise, starting with the loose end (Figure 7). Make sure the termination body (not the core) is butted up to the edge of the vinyl tape marker previously applied (Figure 7).

NOTE: Once the termination body makes contact over the mastic seal area, there is no need to continue supporting the assembly. DO NOT PUSH OR PULL ON THE TERMINATION ASSEMBLY WHILE UNWINDING THE CORE.

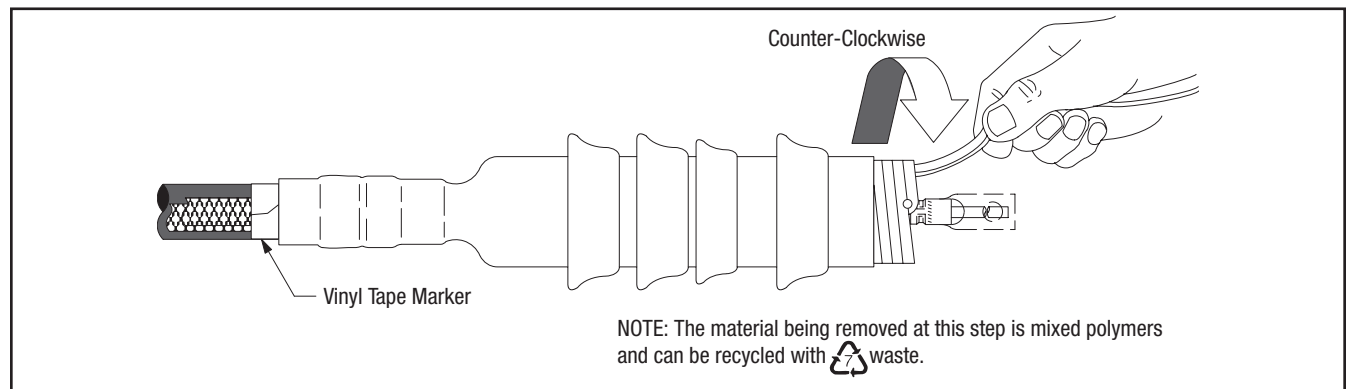
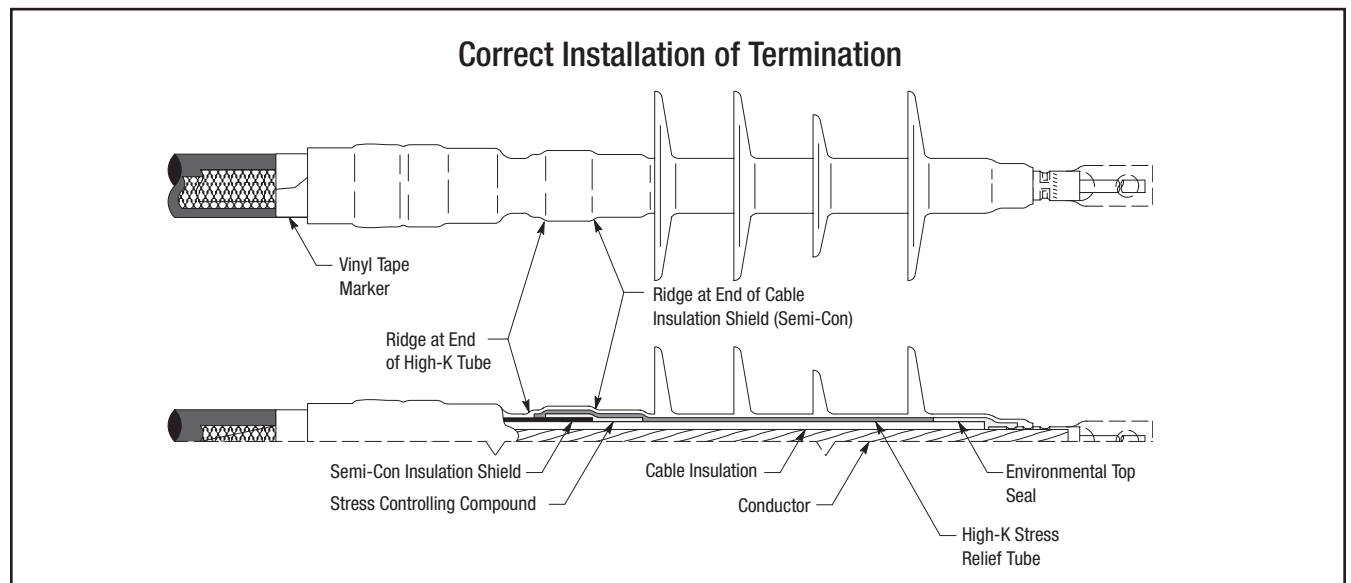
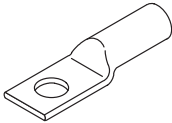
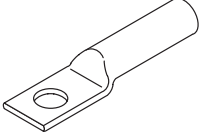
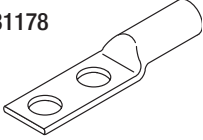


Figure 7

- 6.2 Connect ground braids to system ground according to standard practice.



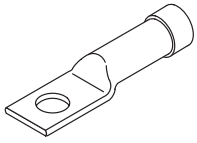
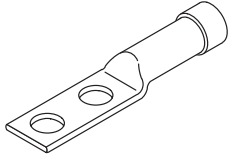
Tooling Index

Lug and Crimping Information for 3M™ Scotchlok™ Copper Lugs										
30014 thru 30045 One hole 			31036 thru 31068 One hole-long barrel 				31145 thru 31178 Two hole — long barrel 			
Crimping Tool-Die Sets (Minimum Number Of Crimps)										
Cable Size AWG/ kcmil	Stud Size (in.)	3M™ Scotchlok™ Copper Lug Number	Burndy Corporation				Thomas & Betts Corporation			Square D Co. Anderson Div.
			MD6	MY29	Y34A	Y35, Y39, Y45*, Y46*	TBM 5	TBM 8	TBM 15	VC6-3, VC6-FT**
6	10 1/4 5/16	30014 30015 30016	—	6AWG(1)	—	U5CRT(1)	Blue(1)	Blue(1)	—	(1)
4	10 1/4 3/8	30018 30019 30021	W161(1)	4AWG(1)	A4CR(1)	U4CRT(1)	Grey(1)	Grey(1)	—	(1)
2	1/4 5/16 3/8	30022 30023 30024	W162(2)	2AWG(1)	A2CR(1)	U2CRT(2)	Brown(1)	Brown(1)	33(1)	(2)
1	5/16 3/8	30027 30028	—	1AWG(1)	A1CR(1)	U1CRT(2)	Green(1)	Green(1)	37(1)	(2)
1/0	5/16 3/8	30031 30032	W163(2)	1/0(1)	A25R(1)	U25RT(1)	Pink(2)	Pink(2)	42H(2)	(1)
2/0	3/8 3/8	30036 31036	W241(2) W241(3)	2/0(1) 2/0(2)	A26R(1) A26R(2)	U26RT(2) U26RT(3)	Black(2) Black(3)	Black(2) Black(3)	45(1) 45(2)	(1) (2)
3/0	1/2 1/2	30041 31041	W243(2) W243(3)	3/0(1) 3/0(2)	A27R(1) A27R(2)	U27RT(2) U27RT(3)	Orange(2) Orange(3)	Orange(2) Orange(3)	50(1) 50(2)	(2) (3)
4/0	1/2 1/2 1/2	30045 31045 31145	BG(3) BG(4) BG(4)	4/0(1) 4/0(2) 4/0(2)	A28R(2)	U28RT(2) U28RT(3) U28RT(3)	Purple(2) Purple(3) Purple(3)	Purple(2) Purple(3) Purple(3)	54H(2) 54H(3) 54H(3)	(2) (3) (3)
250	1/2 1/2	31049 31149	W166(4)	250(2)	A29R(2)	U29RT(3)	Yellow(2)	Yellow(2)	62(2)	(2)
300	1/2 1/2	31053 31153	—	—	A30R(2)	U30RT(3)	—	White(3)	66(3)	(3)
350	1/2 1/2	31056 31156	—	—	A31R(2)	U31RT(3)	—	Red(4)	71H(4)	—
400	1/2 1/2	31060 31160	—	—	A32R(2)	U32RT(3)	—	Blue(4)	76H(4)	—
500	1/2 5/8 1/2	31066 31067 31166	—	—	A34R(2)	U34RT(3)	—	Brown(4)	87H(4)	—
600	1/2 1/2	31068 31168	—	—	—	U36RT(3)	—	Green(4)	94H(4)	—
750	1/2	31172	—	—	—	Y39, Y45, Y46 U39RT(5)	—	—	106H(4)	—
1000	1/2	31178	—	—	—	Y45: S44RT(6) Y46: P44RT(6)	—	—	125H(4)	—

* Y45 and Y46 accept all Y35 dies ("U" series). For Y45 use PT6515 adapter. For Y46 use PUADP adapter.

** Anderson VC6-3 and VC6-FT require no die set.

Tooling Index

Lug and Crimping Information for 3M™ Scotchlok™ Copper/Aluminum Lugs															
40016 thru 40079 One hole 								40132 thru 40178 Two hole 							

Cable Size AWG/ kcmil	Stud Size (in.)	3M™ Scotchlok™ Lug Number	Crimping Tool-Die Sets (Minimum Number Of Crimps)												
			Burdny Corporation					Thomas & Betts Corporation				Square D Co. Anderson Div.		ITT Blackburn Co.	Kearny Nat'l Div.
			MD6	MY29	Y34A	Y35, Y39, Y45*, Y46*	Y1000**	TBM 5	TBM 8	TBM 12	TBM 15	VC6-3** VC6-FT**	VC8C**	OD58	TYPE 0
6	5/16	40016	W161(1)	6AWG(1)	A6CAB(1)	U6CABT(1)	(1)	Grey(1)	Grey(1)	-	29(1)	(1)	-	BY19(3)	J(3)
4	5/16	40020	W162(3)	4AWG(1)	A4CAB(1)	U4CABT(1)	(1)	Green(2)	Green(2)	-	37(1)	(1)	-	BY53(3)	P(3)
2	3/8	40024	W163(3)	2AWG(1)	A2CAB(1)	U2CABT(1)	(1)	Pink(2)	Pink(2)	-	42H(2)	(1)	-	BY23(3)	1/2(3)
	1/2	40025	W163(3)	2AWG(1)	A2CAB(1)	U2CABT(1)	(1)	Pink(2)	Pink(2)	-	42H(2)	(1)	-	BY23(3)	1/2(3)
1	3/8	40028	W163(3)	1AWG(1)	A1CAR(1)	U1CART(1)	(1)	Gold(2)	Gold(2)	-	45(1)	(1)	-	BY23(3)	1/2(3)
	1/2	40029	W163(3)	1AWG(1)	A1CAR(1)	U1CART(1)	(1)	Gold(2)	Gold(2)	-	45(1)	(1)	-	BY23(3)	1/2(3)
1/0	3/8	40032	W241(3)	1/0(1)	A25AR(1)	U25ART(1)	(1)	Tan(2)	Tan(2)	-	50(1)	(1)	-	BY25(3)	5/8-1(3)
	1/2	40033	W241(3)	1/0(1)	A25AR(1)	U25ART(1)	(1)	Tan(2)	Tan(2)	-	50(1)	(1)	-	BY25(3)	5/8-1(3)
	3/8	40132	W241(3)	1/0(1)	A25AR(1)	U25ART(1)	(1)	Tan(2)	Tan(2)	-	50(1)	(1)	-	BY25(3)	5/8-1(3)
2/0	1/2	40037	BG(4)	2/0(1)	A26AR(2)	U26ART(2)	(1)	Olive(2)	Olive(2)	-	54H(2)	(2)	-	BY31C(3)	5/8-1(3)
	1/2	40137	BG(4)	2/0(1)	A26AR(2)	U26ART(2)	(1)	Olive(2)	Olive(2)	-	54H(2)	(2)	-	BY31C(3)	5/8-1(3)
3/0	1/2	40041	W166(4)	3/0(1)	A27AR(2)	U27ART(2)	(1)	Ruby(2)	Ruby(2)	-	60(2)	(2)	-	-	737(3)
	1/2	40141	W166(4)	3/0(1)	A27AR(2)	U27ART(2)	(1)	Ruby(2)	Ruby(2)	-	60(2)	(2)	-	-	737(3)
4/0	1/2	40045	W660(4)	4/0 (2)	A28AR(2)	U28ART(2)	(1)	-	White(4)	-	66(4)	(2)	-	BY35C(4)	840(4)
	5/8	40046	W660(4)	4/0 (2)	A28AR(2)	U28ART(2)	(1)	-	White(4)	-	66(4)	(2)	-	BY35C(4)	840(4)
	1/2	40145	W660(4)	4/0 (2)	A28AR(2)	U28ART(2)	(1)	-	White(4)	-	66(4)	(2)	-	BY35C(4)	840(4)
250	1/2	40049	W249(3)	-	A29AR(2)	U29ART(2)	(1)	-	-	71H(4)	71H(2)	(3)	-	-	-
	5/8	40050	W249(3)	-	A29AR(2)	U29ART(2)	(1)	-	-	71H(4)	71H(2)	(3)	-	-	-
	1/2	40149	W249(3)	-	A29AR(2)	U29ART(2)	(1)	-	-	71H(4)	71H(2)	(3)	-	-	-
300	1/2	40053	-	-	A30AR(2)	U30ART(2)	(1)	-	-	76H(4)	76H(2)	(3)	-	-	-
	1/2	40153	-	-	A30AR(2)	U30ART(2)	(1)	-	-	76H(4)	76H(2)	(3)	-	-	-
350	1/2	40056	-	-	-	U31ART(2)	(1)	-	-	87H(4)	87H(3)	(3)	-	-	-
	5/8	40057	-	-	-	U31ART(2)	(1)	-	-	87H(4)	87H(3)	(3)	-	-	-
	1/2	40156	-	-	-	U31ART(2)	(1)	-	-	87H(4)	87H(3)	(3)	-	-	-
400	1/2	40160	-	-	-	U32ART(4)	(1)	-	-	94H(4)	94H(4)	-	(2)	-	-
500	5/8	40067	-	-	-	U34ART(4)	(1)	-	-	106H(4)	106H(3)	-	(2)	-	-
	1/2	40166	-	-	-	U34ART(4)	(1)	-	-	106H(4)	106H(3)	-	(2)	-	-
600	1/2	40170	-	-	-	U36ART(4)	(1)	-	-	-	115H(3)	-	(3)	-	-
750	5/8	40073	-	-	-	U39ART(4)	(1)	-	-	-	125H(4)	-	(3)	-	-
	1/2	40172	-	-	-	U39ART(4)	(1)	-	-	-	125H(4)	-	(3)	-	-
1000	5/8	40079	-	-	-	S44ART(4)	(1)	-	-	-	140H(4)	-	(3)	-	-
	1/2	40178	-	-	-	S44ART(4)	(1)	-	-	-	140H(4)	-	(3)	-	-

* Y45 and Y46 accept all Y35 dies ("U" series). For Y45 use PT6515 adapter. For Y46 use PUADP adapter.

** Anderson VC6-3, VC6-FT, VC8C and Burndy Y1000 require no die set.

Tooling Index

Crimping Information for
3M™ Stem Connectors
Copper/Aluminum



Conductor Size AWG & kcmil		3M™ Connector Number	Crimping Table For 3M™ Stem Type Connector				
			Recommended Crimping Tools				
Stranded	Solid		Manufacturer	Mech. Tool	Die (Minimum No. Crimps)	Hydraulic	Die (Minimum No. Crimps)
2, 1 4 1/0	1, 1/0 2 2/0	SC0001 SC0002 SC0010	Burndy	MD6	BG(4), W243(4)	Y35, Y39, Y45*	U25ART(2), U243(2)
			Kearny	0-51, 0-52	5/8-1 (4)	12, 20, 40, Ton	5/8-1(4)
			T & B	TBM 5	Tan(2)	-	-
			T & B	TBM 8	Olive(2)	TBM 15	50(2)
			Anderson	-	-	VC6	(2)
2/0 3/0 4/0	3/0 4/0 -	SC0020 SC0030 SC0040	Burndy	MD6	W669(0) 840(5)	Y35, Y39, Y45*	U28ART(2)
			Kearny	0-51, 0-52	840(5)	WH-1, WH-2	840(2)
			T & B	TBM 8	White(4)	TBM 15	66H(3)
			Anderson	-	-	VC6	(2)

* Y45 and Y46 accept all Y35 dies ("U" series). For Y45 use PT6515 adapter. For Y46 use PUADP adapter.

** Anderson VC6 is dieless and does not require a die set.

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