3M™ Cold Shrink QT-III Silicone Rubber 3/C Cabinet Mount Termination Kit

With High-K Stress Relief

For 3-Conductor Copper Tape Shield Cables with or without Ground Wires

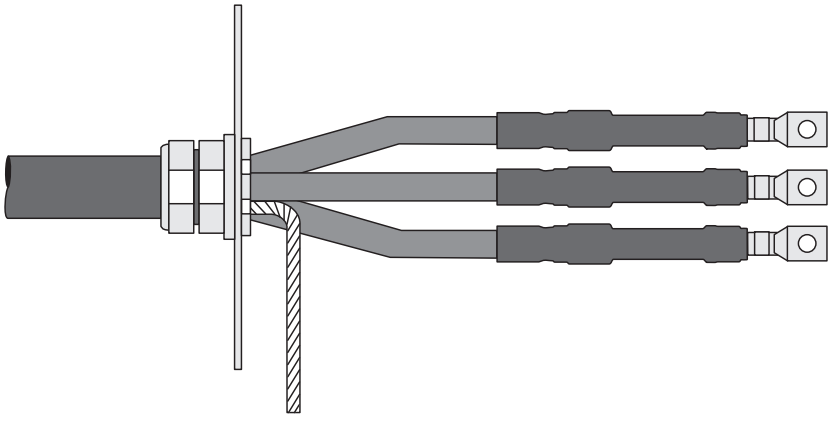
7600-T-3RJS Series

Instructions

IEEE Std. No. 48
Class 1 Termination

⚠ 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.



August 2013
78-8127-6973-1 Rev D

3M

Kit Contents

3 3M™ Cold Shrink Silicone Rubber Termination Assemblies
3 Silicone Rubber Phase Rejacketing Sleeve Assemblies
1 Roll Tinned Copper Ground Braid
3 Constant Force Springs
3 3M™ EMI Copper Foil Shielding Tape 1181 Strips, 1/2" x 10"
1 Roll Scotch® Super 33+™ Vinyl Electrical Tape
1 3M™ Cable Cleaning Preparation Kit CC-2
1 Instruction Sheet
6 Strips Scotch® Mastic Strip 2230 (included in bagged Termination Assembly.)

Note: Do Not use knives to open plastic bags.

Termination Application Ranges

Final determining factor is cable insulation diameter. Listed insulation ranges allow +0.10" (2.54 mm) for shielding.

Kit Number	BIL (kV)	Cable Insulation Range inch (mm)	3.3 kV (mm^2) IEC	3.3 kV (mm^2) JIS	6.6 kV (mm^2) JIS	6.6 kV (mm^2) IEC	10 kV (mm^2) IEC	15 kV (mm^2) IEC	20 kV (mm^2) IEC
7620-T-95-3-RJS	95	0.33–0.50 (8,40–12,7)	16–35	8–22	—	16–25	—	—	—
7621-T-95-3-RJS	95	0.50–0.70 (12,7–17,8)	50–95	38–60	—	35–70	10–50	16–25	—
7623-T-95-3-RJS	95	0.70–0.92 (17,8–23,4)	120–185	100–150	—	95–150	70–150	35–95	—
7624-T-95-3-RJS	95	0.92–1.18 (23,4–30,0)	240–300	200–250	—	185–300	185–300	120–185	—
7625-T-95-3-RJS	95	1.18–1.52 (30,0–38,6)	—	300–325	—	—	—	200–325	—
7621-T-110-3-RJS	110	0.50–0.70 (12,7–17,8	50–95	38–60	14–38	35–70	10–50	16–25	—
7622-T-110-3-RJS	110	0.70–0.92 (17,8–23,4)	120–185	100–150	60–100	95–150	70–150	35–95	—
7624-T-110-3-RJS	110	0.92–1.18 (23,4–30,0)	240–300	200–250	150–250	185–300	185–300	120–185	—
7625-T-110-3-RJS	110	1.18–1.52 (30,0–38,6)	—	300–325	300–325	—	—	200–325	—
7624-T-125-3-RJS	125	0.92–1.18 (23,4–30,0)	240–300	200–250	150–250	185–300	185–300	120–185	95–185
7625-T-125-3-RJS	125	1.18–1.52 (30,0–38,6)	—	300–325	300–325	—	—	200–325	240–300
7693-T-150-3-RJS	150	0.70–0.92 (17,8–23,4)	120–185	100–150	60–100	95–150	70–150	35–95	25–70
7694-T-150-3-RJS	150	0.92–1.18 (23,4–30,0)	240–300	200–250	150–250	185–300	185–300	120–185	95–185
7695-T-150-3-RJS	150	1.18–1.52 (30,0–38,6)	—	300–325	300–325	—	—	200–325	240–300
7696-T-150-3-RJS	150	1.53–1.81 (38,8–46,0)	—	—	—	—	—	200–325	300–400

Table 1 - OUS Sizing

Kit Number	BIL (kV)	Cable Insulation Range [inch (mm)]	CONNECTOR SIZE RANGE (AWG and kcmil)									
			5 kV		8 kV		15 kV		25/28 kV		35 kV	
			100%	133%	100%	133%	100%	133%	100%	133%	100%	133%
7620-T-95-3-RJS	95	0.33–0.50 (8,40–12,7)	8–2	6–4	6–4	6–4	–	–	–	–	–	–
7621-T-95-3-RJS	95	0.50–0.70 (12,7–17,8)	1–3/0	2–2/0	2–2/0	2–2/0	–	–	–	–	–	–
7623-T-95-3-RJS	95	0.70–0.92 (17,8–23,4)	4/0–350	3/0–350	3/0–350	3/0–350	–	–	–	–	–	–
7624-T-95-3-RJS	95	0.92–1.18 (23,4–30,0)	400–500	400–500	400–500	400–500	–	–	–	–	–	–
7625-T-95-3-RJS	95	1.18–1.52 (30,0–38,6)	700–1000	700–1000	700–1000	700–1000	–	–	–	–	–	–
7621-T-110-3-RJS	110	0.50–0.70 (12,7–17,8	1–3/0	2–2/0	2–2/0	2–2/0	2–1	–	–	–	–	–
7622-T-110-3-RJS	110	0.70–0.92 (17,8–23,4)	4/0–350	3/0–350	3/0–350	3/0–350	1/0–4/0	2–3/0	–	–	–	–
7624-T-110-3-RJS	110	0.92–1.18 (23,4–30,0)	400–500	400–500	400–500	400–500	250–350	4/0–350	–	–	–	–
7625-T-110-3-RJS	110	1.18–1.52 (30,0–38,6)	700–1000	700–1000	700–1000	700–1000	500–750	500–750	–	–	–	–
7624-T-125-3-RJS	125	0.92–1.18 (23,4–30,0)	400–500	400–500	400–500	400–500	250–350	4/0–350	–	–	–	–
7625-T-125-3-RJS	125	1.18–1.52 (30,0–38,6)	700–1000	700–1000	700–1000	700–1000	500–750	500–750	–	–	–	–
7693-T-150-3-RJS	150	0.70–0.92 (17,8–23,4)	4/0–350	3/0–350	3/0–350	3/0–350	1/0–4/0	2–3/0	1–1/0	–	–	–
7694-T-150-3-RJS	150	0.92–1.18 (23,4–30,0)	400–500	400–500	400–500	400–500	250–350	4/0–350	2/0–250	1–4/0	1–3/0	–
7695-T-150-3-RJS	150	1.18–1.52 (30,0–38,6)	700–1000	700–1000	700–1000	700–1000	500-750	500-750	350-500	250-500	4/0-500	1/0-350
7696-T-150-3-RJS	150	1.53–1.81 (38,8–46,0)	—	—	–	–	–	1000	750	500-750	500-750	350-750

Table 2 - North America Sizing

1.0 Prepare Cable

1.1 Determine phase (core) length required for correct phase spacing and bolted terminal lug connections ([A] + [B], Figure 1, according to the longest phase to be connected). Allow for dimension [C] as needed.

Note: Individual phase length and separation dimensions vary according to specific installation and equipment design requirements. They must, therefore, be determined by the installer and must conform to accepted engineering practices.

1.2 Strip back cable jacket and armor according to equipment entrance bushing and cabinet configuration requirements.

1.3 Remove bedding (inner sheath), if present, and any remaining core fillers. Secure each copper tape shield end with a temporary band of vinyl tape (① *Figure 1*).

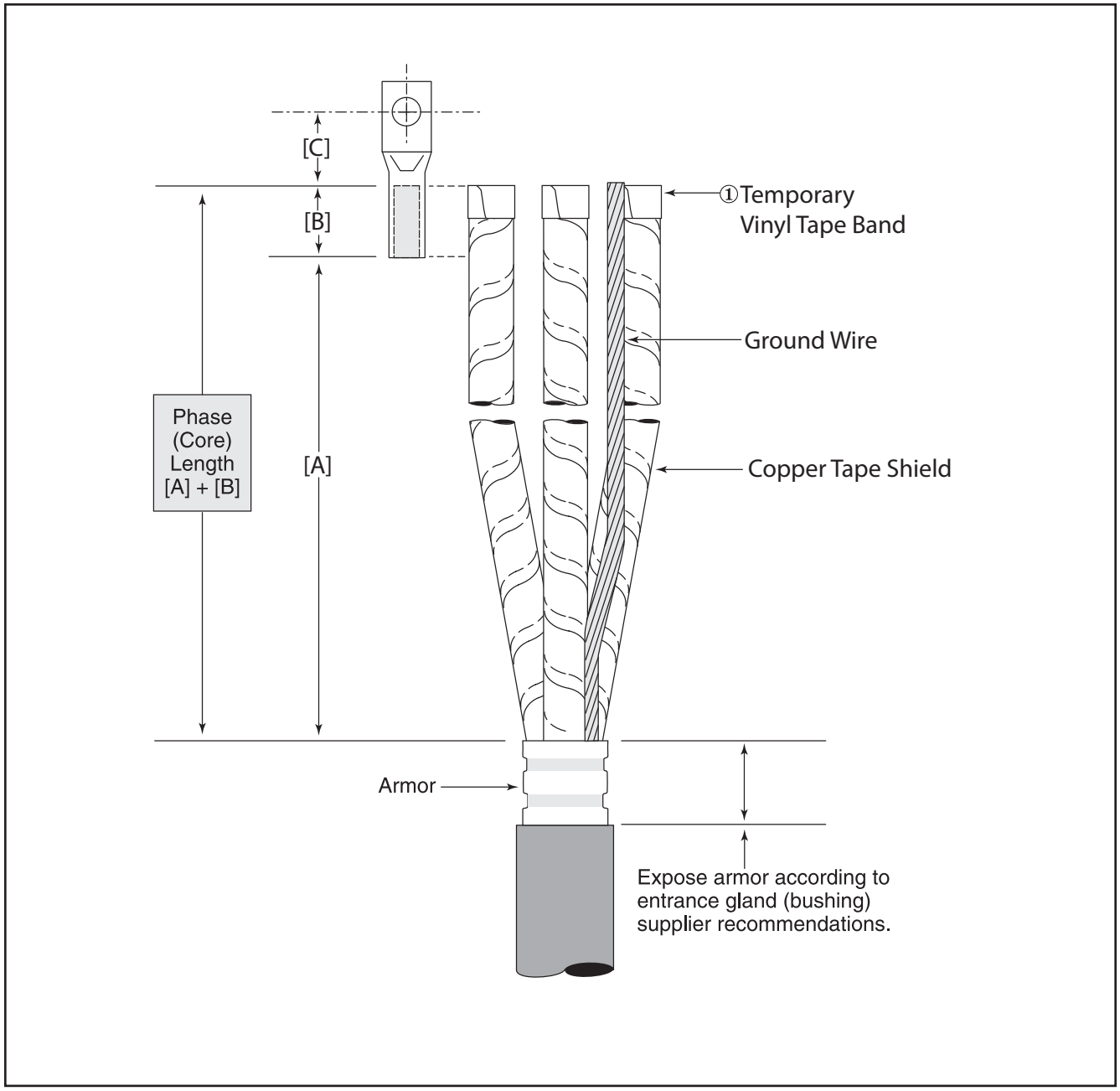


Figure 1

2.0 Attach Metallic Shield Grounding Braids

2.1 Cut supplied tinned copper grounding braid into three equal 2' (610 mm) lengths. Expand each braid end for a distance of 2" (51 mm) (② *Figure 2*).

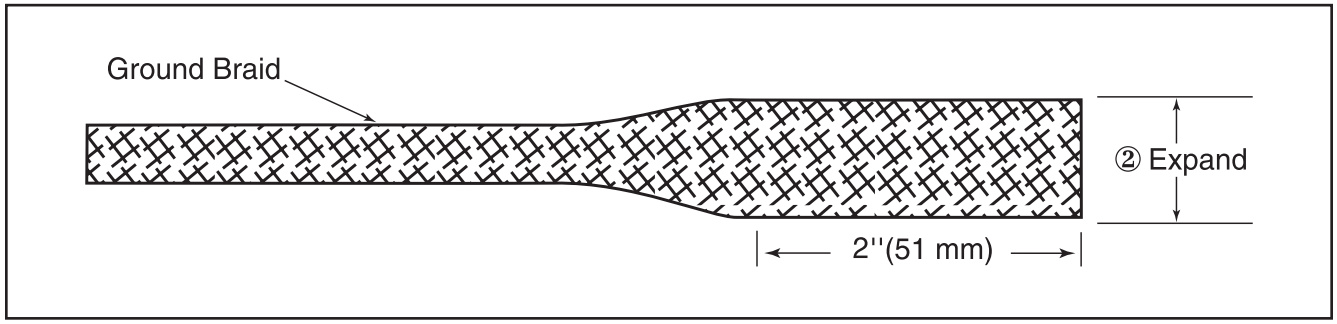


Figure 2

2.2 Attach shield ground braids:

A. Position each expanded ground braid end over phase shielding as shown in Figure 3.

B. Using bands of Scotch® Super 33+™ Vinyl Electrical Tape, secure upper braid end to copper tape shielding 8" (203 mm) beyond cable breakout point.

C. Connect expanded ground braid ends to copper tape shields using supplied constant-force springs. Following application, cinch (twist with hand) each spring to tighten.

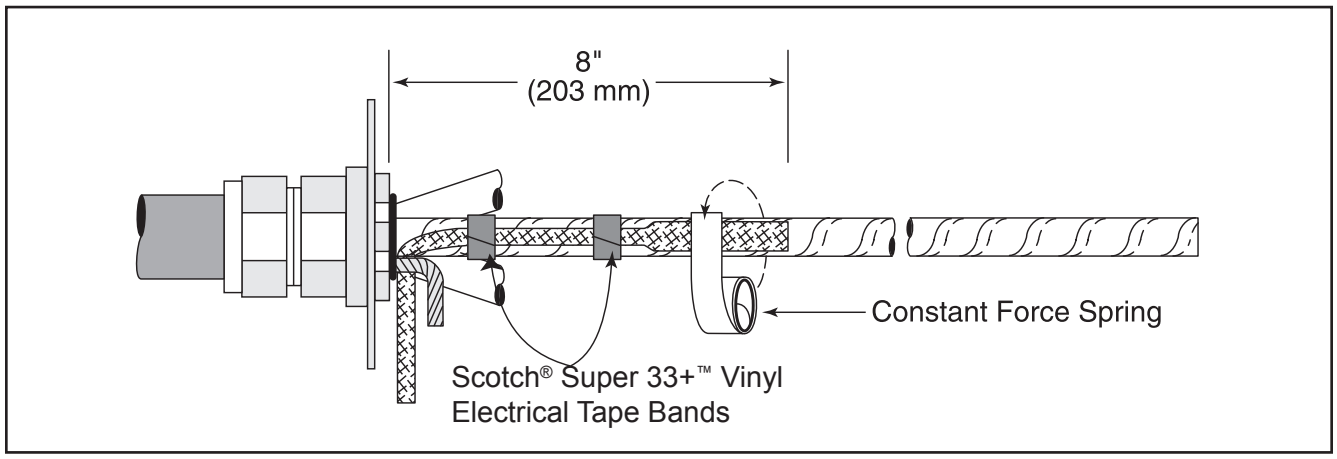


Figure 3

2.3 Apply two highly stretched half-lapped layers Scotch® Super 33+™ Vinyl Electrical Tape over constant force springs and ground strap ends (③ *Figure 4*).

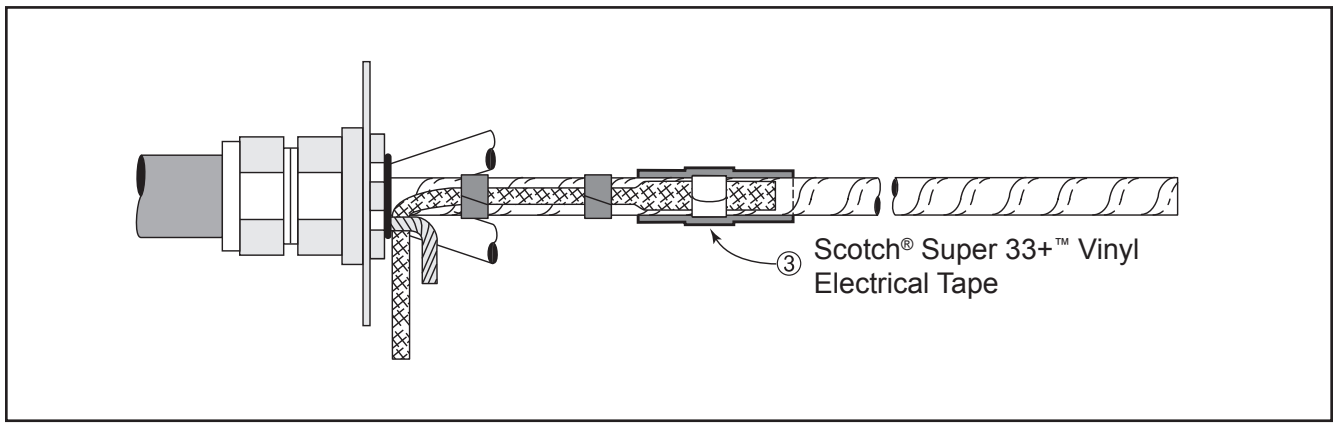


Figure 4

3.0 Install Silicone Rubber Rejacketing Sleeves

3.1 From the chart below, determine the correct [A] dimension (Figure 5) for the termination product being installed.

Kit Number	Dimension [A]
7620-T-95-3-RJS	6.75” (171 mm)
7621-T-95-3-RJS 7623-T-95-3-RJS 7624-T-95-3-RJS 7625-T-95-3-RJS	5.50” (140 mm)
7621-T-110-3-RJS 7622-T-110-3-RJS 7624-T-110-3-RJS 7625-T-110-3-RJS	8.5” (216 mm)
7624-T-125-3-RJS 7625-T-125-3-RJS	7.0” (178 mm)
7693-T-150-3-RJS 7694-T-150-3-RJS 7695-T-150-3-RJS 7696-T-150-3-RJS	12.0” (305 mm)

3.2 Place a vinyl tape marker on each cable phase leg at dimension [X] (① *Figure 5*).

Note: [X] = [A] (From chart above) + [B] (Lug barrel depth). Allow for crimp growth when using aluminum lugs.

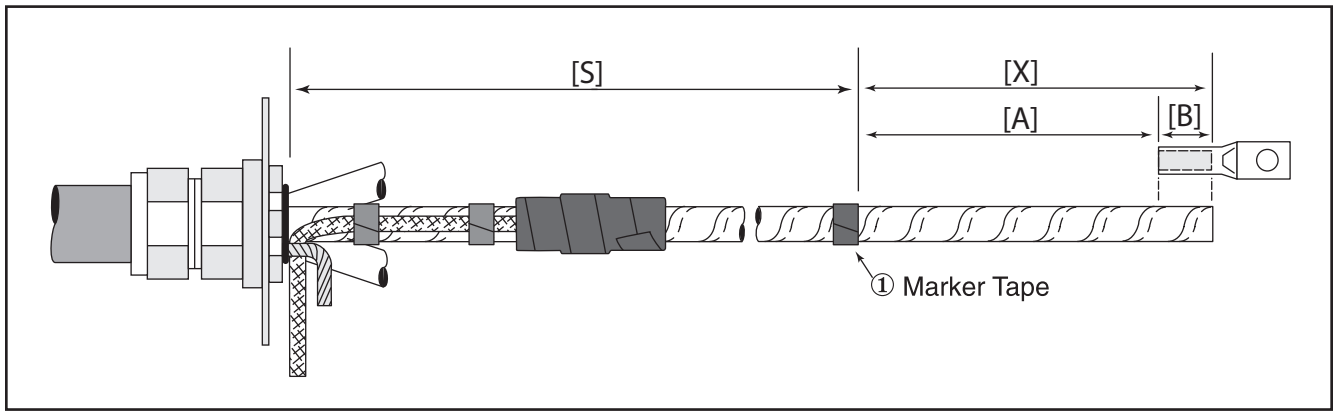


Figure 5

3.3 Determine required phase rejacketing sleeve length ([S]-1" (25 mm) *Figure 5*).

3.4 Using scissors, trim rejacketing sleeve assembly to length required (*Figure 6*). Cut tubing and inner braid together.

Note: Inner polyester braid should extend approximately 3" (76 mm) beyond rejacketing tube end before cutting. There is no need for termination-end braid exposure.

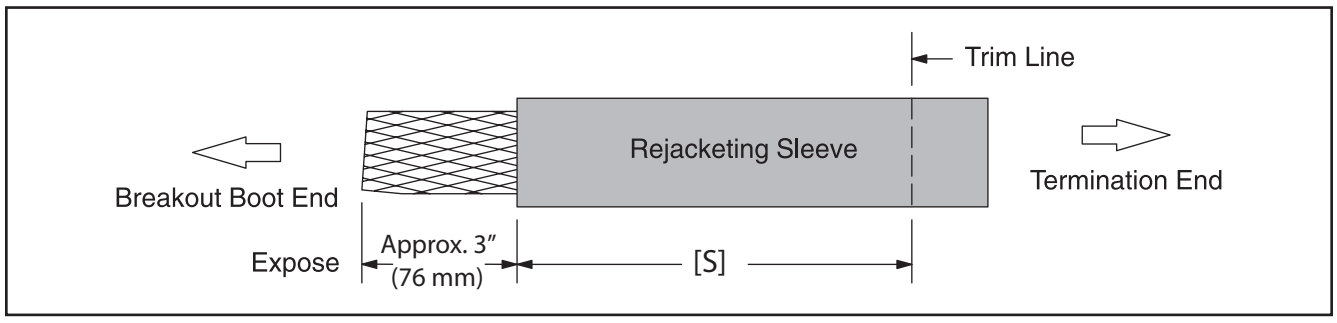


Figure 6

3.5 Guide one rejacketing sleeve assembly over each cable phase leg (*Figure 7*).

Push sleeve assembly from above. Continuously guide the free end maintaining sleeve-to-cable-core alignment.

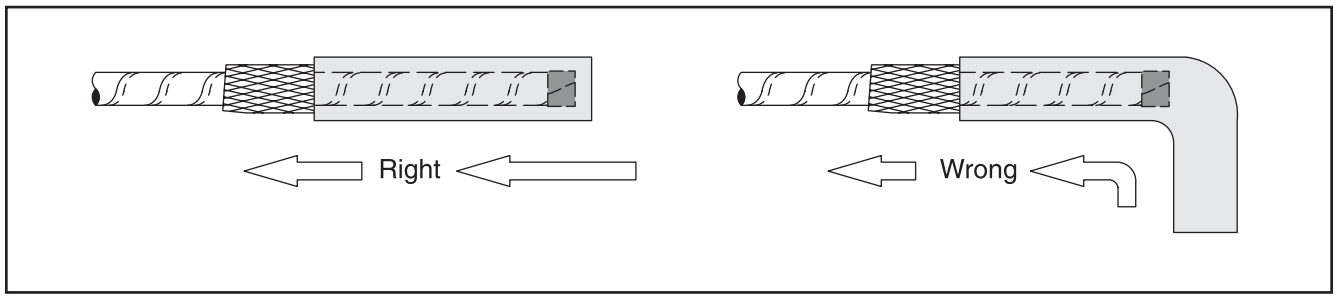


Figure 7

3.6 Slide rejacketing sleeve until inner polyester braid is within 2" (51 mm) of desired final location (near cable entrance gland).

3.7 Fold outer silicone tubing back on itself for 1" (25 mm) and trim off exposed polyester braid (*Figure 8*).

Note: Do not damage silicone tubing while cutting. Sleeve assembly may be rotated to ease trimming. When doing so, rotate in the direction of the cable copper tape shield wrap.

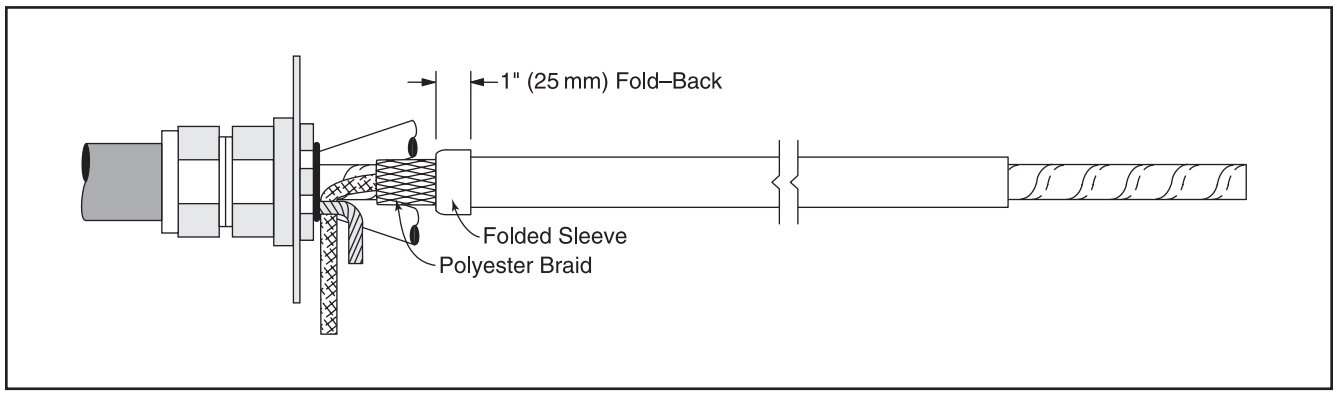


Figure 8

3.8 Slide rejacketing sleeve assembly into desired final position. Pull folded sleeve section down onto cable phase shielding.

Note: Rejacketing sleeve upper end should now align with upper edge of previously installed marker tape (② Figure 9). Minor tube adjustments can be made as needed.

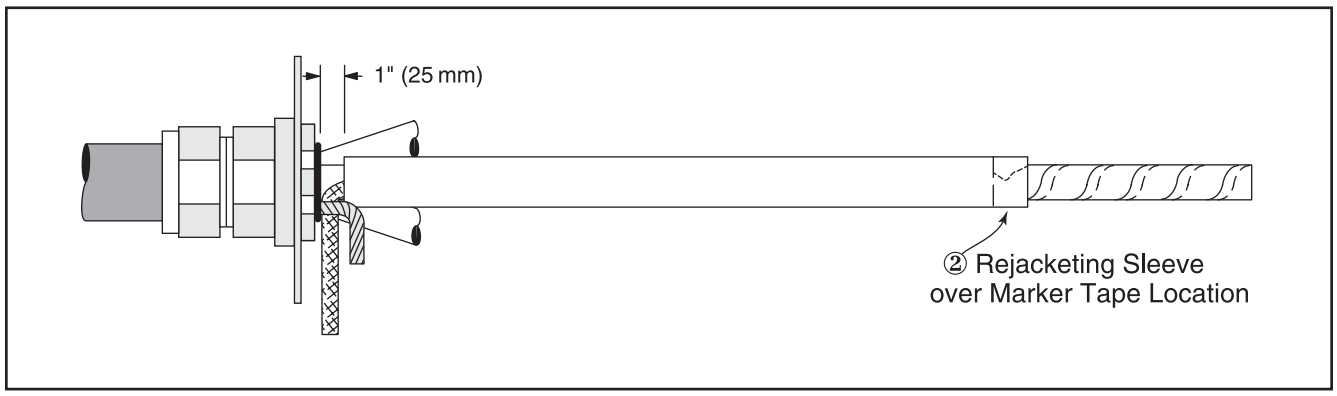
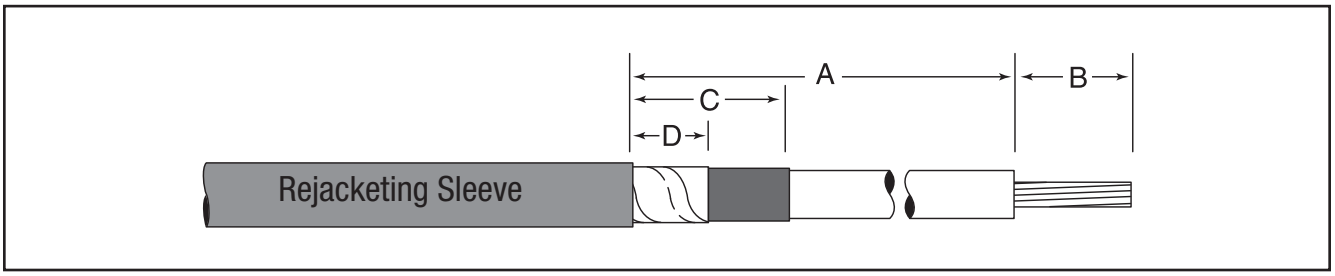


Figure 9

4.0 Install 3M™ Cold Shrink QT-III Silicone Rubber Termination Assemblies

4.1 Prepare cable phase legs according to dimensions shown (*Figure 10*).

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.



Kit Number	Dimension A	Dimension B	Dimension C	Dimension D
7620-T-95-3-RJS	6.75” (171 mm)	Lug Depth*	2.0” (51 mm)	1.0” (25 mm)
7621-T-95-3-RJS 7623-T-95-3-RJS 7624-T-95-3-RJS 7625-T-95-3-RJS	5.50” (140 mm)	Lug Depth*	2.5” (64 mm)	1.25” (32 mm)
7621-T-110-3-RJS 7622-T-110-3-RJS 7624-T-110-3-RJS 7625-T-110-3-RJS	8.5” (215 mm)	Lug Depth*	2.5” (64 mm)	1.25” (32 mm)
7624-T-125-3-RJS 7625-T-125-3-RJS	7” (179 mm)	Lug Depth*	1.5” (38,1 mm)	0.75” (19.1 mm)
7693-T-150-3-RJS 7694-T-150-3-RJS 7695-T-150-3-RJS 7696-T-150-3-RJS	12” (305 mm)	Lug Depth*	2.5” (64 mm)	1.25” (32 mm)
*Allow for crimp growth when using aluminum lugs and connectors.				

Figure 10

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

4.2 Secure cable copper tape shield ends with 3M™ EMI Copper Foil Shielding Tape 1181 Strip (*Figure 11*).

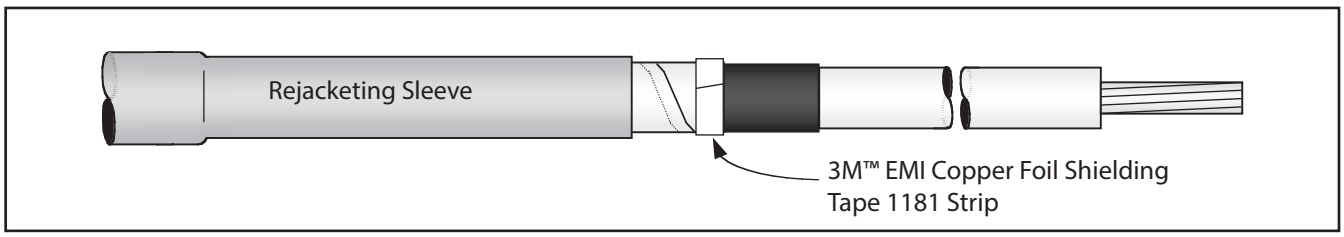


Figure 11

4.3 Secure rejacketing sleeve with two half-lapped layers of Scotch® Super 33+™ Vinyl Electrical Tape (*Figure 12*). Start taping 0.75" (19 mm) over rejacketing sleeve, extend 0.25" (6 mm) over cable metallic shield and return to starting point.

Note: Do not fully cover the Copper Tape Shield or 3M™ EMI Copper Foil Shielding Tape 1181 Strips. BE SURE TO LEAVE PART OF THE COPPER TAPE SHIELD EXPOSED.

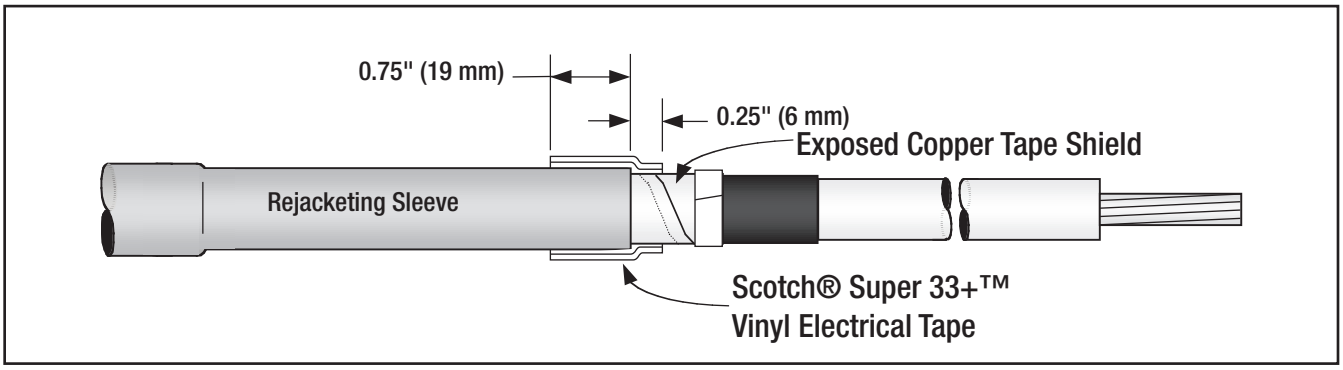


Figure 12

4.4 Place a termination installation marker tape at position [M] (*Figure 13*).

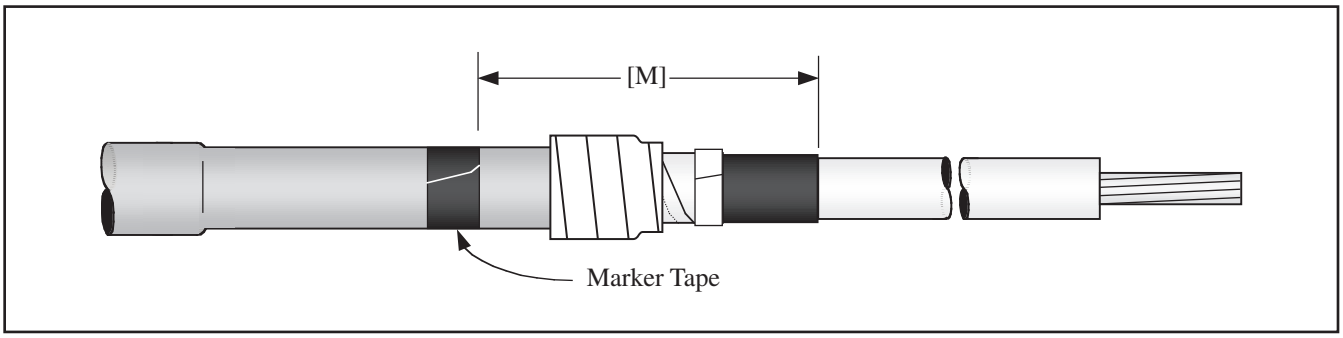


Figure 13

Kit Number	Dimension [M]
7620-T-95-3-RJS	4” (102 mm)
7621-T-95-3-RJS 7623-T-95-3-RJS 7624-T-95-3-RJS 7625-T-95-3-RJS	5” (127 mm)
7621-T-110-3-RJS 7622-T-110-3-RJS 7624-T-110-3-RJS 7625-T-110-3-RJS	5” (127 mm)
7624-T-125-3-RJS 7625-T-125-3-RJS	4” (102 mm)
7693-T-150-3-RJS 7694-T-150-3-RJS 7695-T-150-3-RJS 7696-T-150-3-RJS	5” (127 mm)

4.5 Install terminal lugs.

Note: Special Case – When lug spade dimension is larger than inside diameter of white plastic termination core, position termination assemblies over cable phase legs prior to installing lugs.

Remove inner red shipping core from each termination assembly by pulling and unwinding the loose red core ribbon. Position one termination over each cable phase leg. Each termination assembly must be positioned with its loose white core ribbon end directed toward the open (cut) end of the cable. **DO NOT REMOVE CORE AT THIS TIME.** Continue with lug installations.

(a.) For Aluminum Conductors - Thoroughly wire brush conductor strands to remove aluminum oxide layer. Immediately insert conductor into terminal lug barrel as far as it will go.

(b.) Ensure that each lug face is parallel to equipment bushing or lug connection interface (Figure 14).

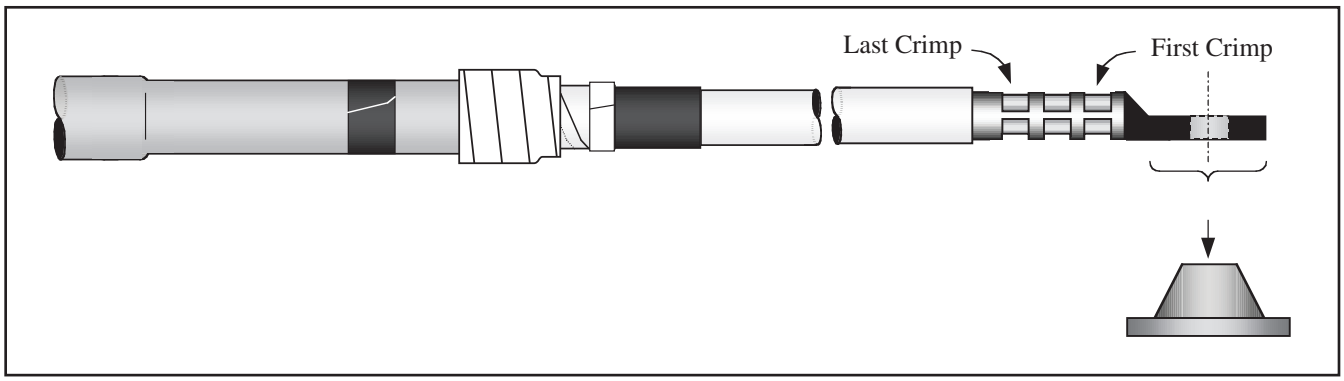


Figure 14

(c.) Crimp terminal lug according to manufacturer's recommendations. Start at the upper end as shown (*Figure 14*). Remove all traces of oxide inhibitor that may have come out of lug barrel during crimping.

(d.) If abrasive must be used:

1. Use on insulation only. **DO NOT USE ABRASIVE ON SEMI-CON INSULATION SHIELD!**
2. Use only aluminum oxide abrasive; grit 120 or finer.
3. Be careful not to reduce the cable insulation diameter below that allowed by the kit.

(e.) Thoroughly clean primary insulation and lug barrel area using a solvent wipe from supplied 3M™ Cable Cleaning Preparation Kit CC-2.

Note: DO NOT ALLOW SOLVENT TO TOUCH SEMI-CON INSULATION SHIELD.

4.6 Install 3M™ Cold Shrink QT-III Silicone Rubber Termination assemblies.

(a.) Remove the inner red shipping core from the termination assembly by pulling and unwinding the loose red core end.

(b.) Position the termination assembly with the loose white core ribbon directed toward the terminal lug.

(c.) Align the base of the termination (not the plastic core) with the installation marker tape as shown (*Figure 15*).

(d.) To install, pull loose core end, while unwinding counter-clockwise around the cable. (*Figure 15*)

Note: Once the termination body makes contact, there is no need to continue supporting the assembly. DO NOT PULL OR PUSH ON THE ASSEMBLY WHILE UNWINDING.

(e.) Remove the installation marker tape.

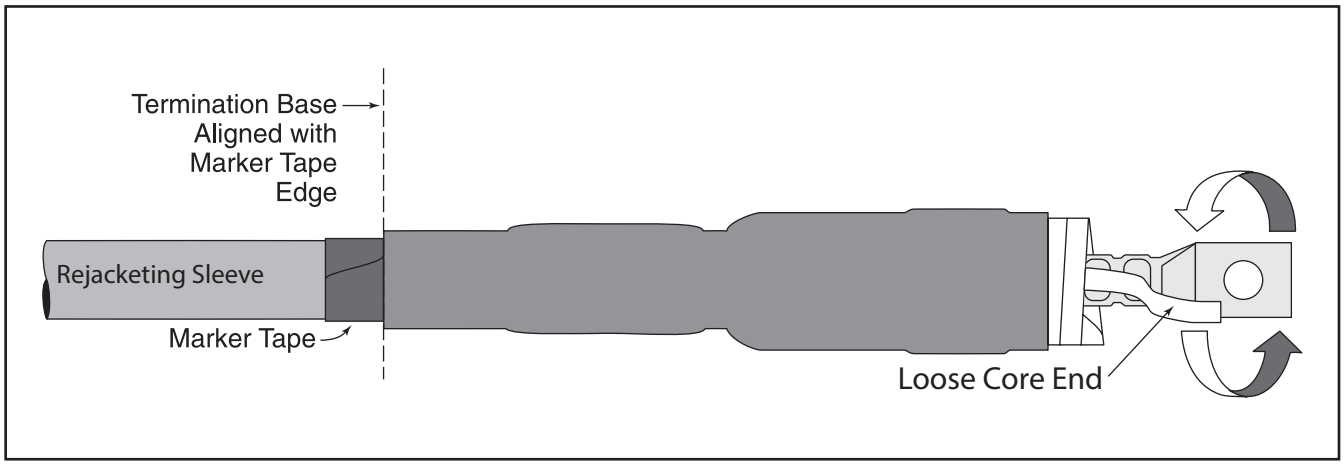


Figure 15

4.7 Connect shield braid tails and cable ground wire (if applicable) to system ground (earth) according to normal practice.

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