



HVT-1590-G(SG)

15kV Class High Voltage Termination for
1/C PILC/VCLC Power Cable

ENERGY DIVISION

Suggested Installation Equipment (not supplied with kit)

- Cable preparation tools
- Tyco Electronics P63 cable preparation kit or cable manufacturer approved solvent
- Clean, lint-free cloths
- Non-conducting abrasive cloth, 120 grit or finer
- Electrician's tape
- Connector(s) and installation tools
- Tyco Electronics recommended torch

Safety Instructions

Warning: When installing electrical power system accessories, failure to follow applicable personal safety requirements and written installation instructions could result in fire or explosion and serious or fatal injuries.

To avoid risk of accidental fire or explosion when using gas torches, always check all connections for leaks before igniting the torch and follow the torch manufacturer's safety instructions.

To minimize any effect of fumes produced during installation, always provide good ventilation of confined work spaces.

As Tyco Electronics has no control over field conditions which influence product installation, it is understood that the user must take this into account and apply his own experience and expertise when installing product.

Kit Components

The following items are included in this kit:

- 1 Black stress control tube
- 1 Red non-tracking tube
- 1 Clear oil barrier tube
- 2 4.0" coated sealing tubes
- 1 Long black reinforcing tube
- 1 Strip stress relief material
- 1 Copper braid
- 3 Strips red sealant
- 1 Installation instruction
- 1 Roll spring
- 1 Black conductive tube
- 1 Strip adhesive-backed copper tape

Recommended Tyco Electronics Torches

Install heat-shrinkable cable accessories with a "clean burning" torch, i.e., a propane torch that does not deposit conductive contaminants on the product.

Clean burning torches include the Tyco Electronics FH-2629, FH-2649 (uses refillable propane cylinders) and FH-2618A (uses disposable cylinder).

Adjusting the Torch

Adjust regulator and torch as required to provide an overall 12-inch bushy flame. The FH-2629 will be all blue, the other torches will have a 3- to 4-inch yellow tip. Use the yellow tip for shrinking.

Regulator Pressure

FH-2618A	Full pressure
FH-2649	25 psig
FH-2629	15 psig

General Shrinking Instructions

- Apply outer 3- to 4-inch tip of the flame to heat-shrinkable material with a rapid brushing motion.
- Keep flame moving to avoid scorching.
- Unless otherwise instructed, start shrinking tube at center, working flame around all sides of the tube to apply uniform heat.

To determine if a tube has completely recovered, look for the following, especially on the back and underside of the tube:

1. Uniform wall thickness.
2. Conformance to substrate.
3. No flat spots or chill marks.
4. Visible sealant flow if the tube is coated.

Note: When installing multiple tubes, make sure that the surface of the last tube is still warm before positioning and shrinking the next tube. If installed tube has cooled, re-heat the entire surface.

Table 1

Kit	Nom cable range	Max lead sheath OD	Min insulation OD	Min Lug OD	Min lug barrel length
HVT-1591G/SG	#4AWG-2/0	0.95" (24mm)	0.60" (15mm)	0.50" (13mm)	1.50" (38mm)
HVT-1592G/SG	3/0-400 kcmil	1.25" (32mm)	0.85" (22mm)	0.65" (16mm)	1.50" (38mm)
HVT-1593G/SG	400-1000 kcmil	1.65" (42mm)	1.00" (25mm)	0.95" (24mm)	1.50" (38mm)
HVT-1594G/SG	1250-2000 kcmil	2.20" (56mm)	1.75" (45mm)	1.25" (32mm)	1.50" (38mm)

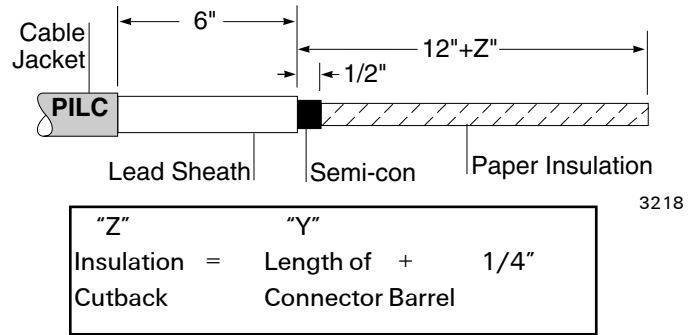
1. Prepare Cables

Prepare the cables as shown.

*Mark PILC cable if unjacketed.

Solvent clean and abrade lead sheath.

Note: To ensure an effective pressure seal, the minimum sealing surface length of the phase connector barrel is 1-1/2". (38mm).

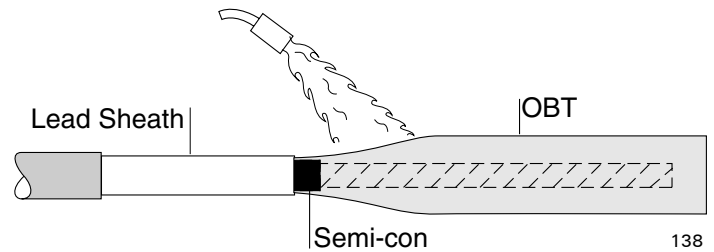


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2. Position OBT; Shrink in Place

Position the large Oil Barrier Tube (OBT) over the paper insulation to butt up against lead cutback. Shrink in place starting at the lead cutback. Work around the tube with a smooth brushing motion.

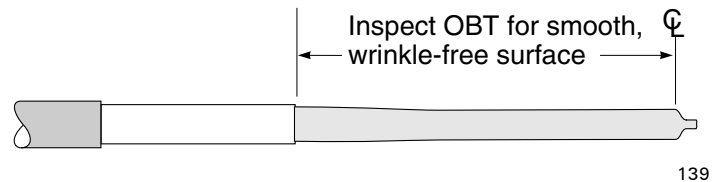
Note: To achieve a smooth wrinkle-free installation, use a reduced flame to install the thin-walled OBT. If the OBT "folds back" on itself, immediately eliminate the fold by gently pulling the OBT end.



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3. Inspect OBT

The OBT should have a smooth, wrinkle-free surface after shrinking. Reheat to smooth any wrinkled areas.

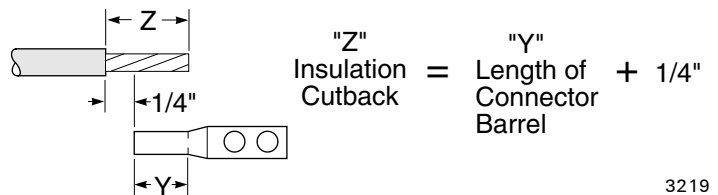


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4. Remove Insulation; Install Connector

Remove insulation together with oil barrier tubing equal to the depth of the connector barrel PLUS 1/4".

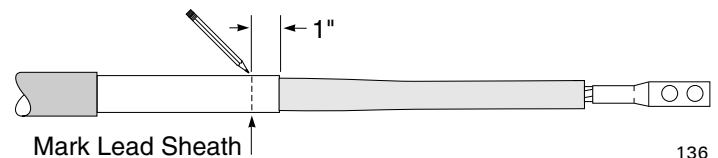
Install **oil blocked** connector using appropriate compression tool and dies.



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5. Mark Lead Sheath

Note: Make sure lead is thoroughly solvent-cleaned.



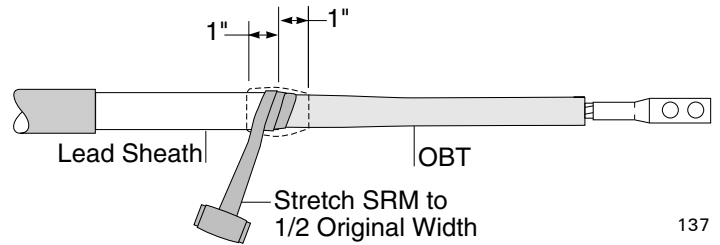
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6. Apply Stress Relief /Sealing Material (SRM) at Lead Sheath Cutback

Remove backing from one side of a *long strip* of SRM. Roll the SRM and remaining backing strip into a convenient size.

Remove the remaining backing strip and tightly wrap SRM around the lead cutback. Continue wrapping to the mark on the lead sheath, then back onto the OBT for 1" as shown.

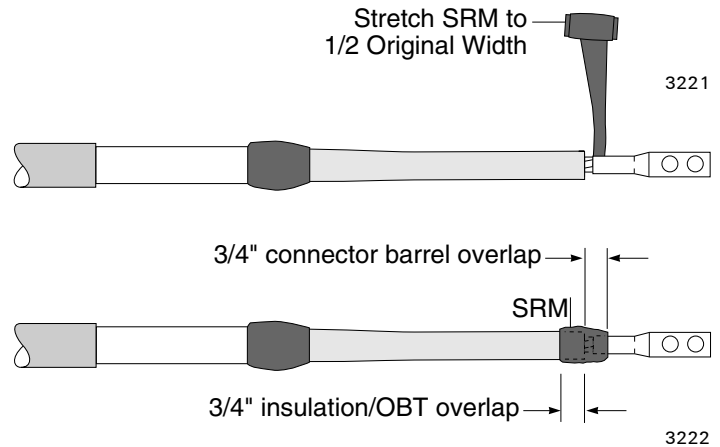
Note: Apply a maximum thickness of 1/8" of SRM over the lead sheath to prevent excessive diameter buildup.



7. Apply SRM Over Lug

Note: Prior to installing SRM, make sure the lug barrel is thoroughly solvent-cleaned.

Removing the remaining backing strip, fill in the gap between the end of the connector and insulation with SRM stretched to half its original width. Continue with two highly stretched layers for 3/4" onto the connector barrel and 3/4" onto the OBT/insulation.



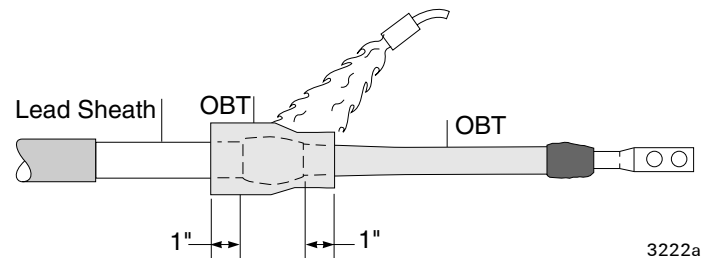
8. Position First Seal Reinforcing Tube; Shrink in Place

Except for the HVT-1594G/SG

Note: The HVT-1590-G(SG) kits have two sizes of seal reinforcing tube. The larger diameter tube should be used to reinforce the seal at the lead sheath, and the smaller diameter used to reinforce the seal at the connector. The HVT-1594G/SG kit seal reinforcing tubes are both the same size.

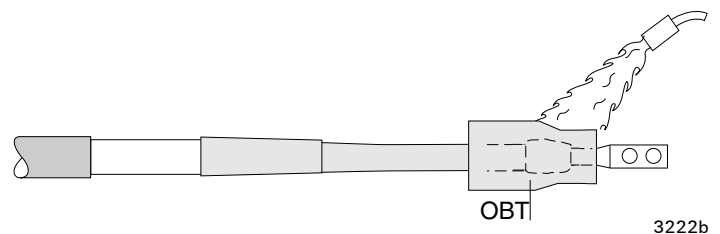
Preheat lead sheath until just too hot to touch.

Position seal reinforcing tube centrally over the SRM, extending 1.0" beyond SRM onto the lead sheath and 1.0" onto the OBT. Starting at connector end, shrink down.



9. Position Second Seal Reinforcing Tube; Shrink in Place

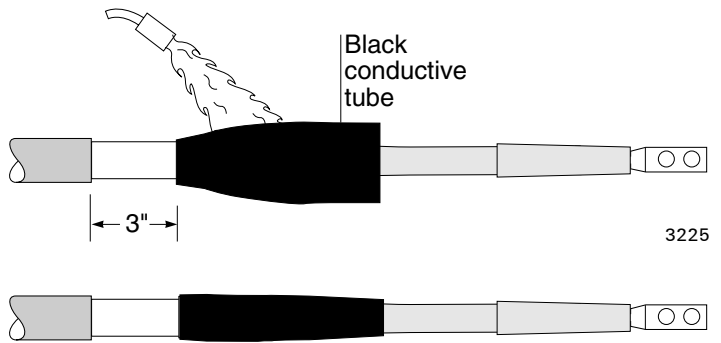
Preheat lug until just too hot to touch. Position seal reinforcing tube centrally over the previously applied SRM. Shrink down starting at the lug end.



10. Position Black Conductive Tube; Shrink in Place

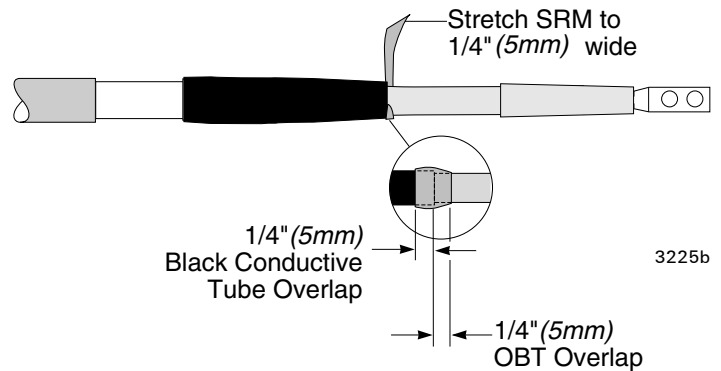
Position the black conductive tube 3" from jacket cutback or equivalent mark as shown.

Begin shrinking at the lead end and work the torch with a smooth brushing motion around the tube towards the connector end.



11. Apply SRM at End of Black Conductive Tube

Remove backings from the *short angle-cut piece* of SRM. Place tip of SRM at end of black conductive tube and tightly wrap to fill step. Overlap black conductive tube and OBT as shown. Taper SRM down to meet OBT.

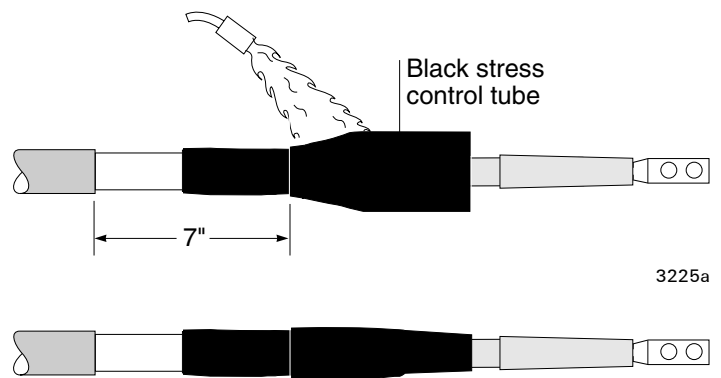


12. Position Black Stress Control Tube; Shrink in Place

Position the black stress control tube 7" from jacket cutback or equivalent mark.

Begin shrinking at the lead sheath end and work the torch with a smooth brushing motion around the tube towards the connector end.

Examine tube to make sure it is tight and without wrinkles. Reheat if necessary.

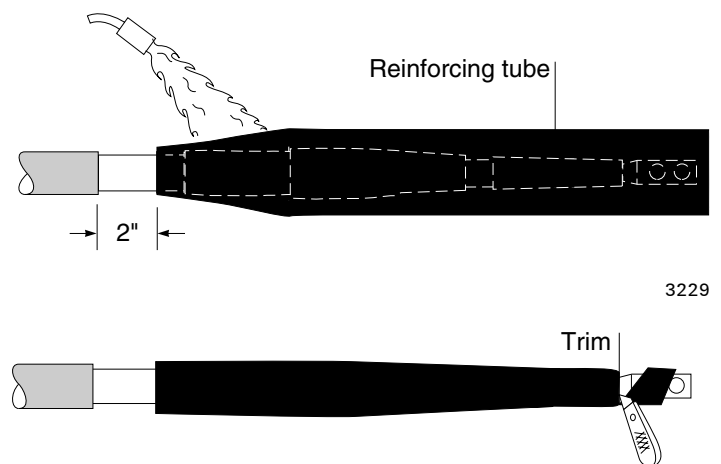


13. Position Black Reinforcing Tube; Shrink in Place

Position the long black reinforcing tube 2" from jacket cutback or equivalent mark. When properly positioned, begin shrinking at the lead end and work towards the connector end using a smooth brushing motion around the tube.

When cool to the touch, trim excess tubing from the lug area as shown. Use a sharp knife and make a single clean cut.

Note: After trimming, remove any sealant adhesive to the exposed connector.



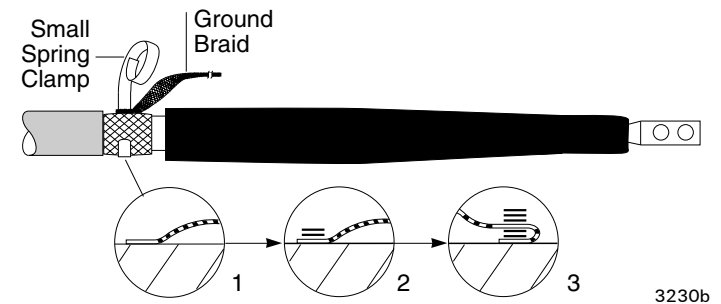
14. Apply Mesh

Wrap 2 layers of 2" wide tinned copper mesh around lead sheath as shown.



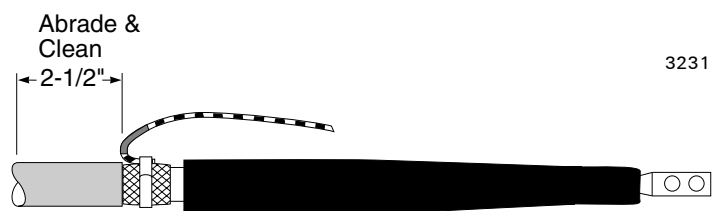
15. Install Ground Braid

(1) Place the moisture blocked end of the ground braid on the copper mesh as shown. (2) Attach the braid to the lead sheath by placing two wraps of the spring clamp over the braid. (3) Fold the braid back over the spring clamp wraps. Continue to wrap the remaining clamp over the braid. Tighten clamp by twisting it in the direction it is wrapped and secure with copper foil tape provided.



16. Install Red Moisture Sealant

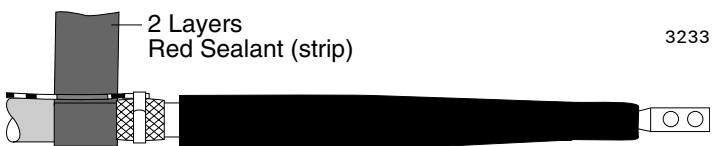
Lift ground braids away from the PILC cable jacket. Using an approved solvent, abrade and clean the jacket for 2-1/2" below the jacket cutback point.



Remove the backing from the red sealant. Using light tension, wrap two layers of red moisture sealant onto the jacket under the braid.



Lay the braid back over the jacket and press moisture blocked section of braid into the red sealant. Using light tension, wrap two more layers of red sealant over the braid and first two layers of sealant.

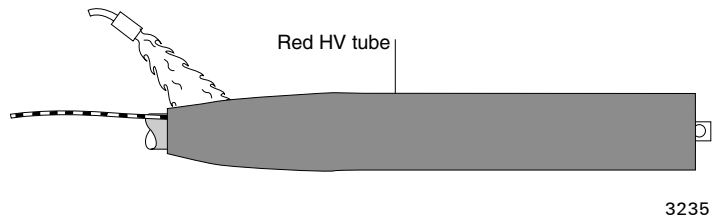


Using light tension, wrap one layer of red sealant as shown.



17. Position Red HV Tube: Shrink in Place

Position the red HV tube at the bottom edge of the red sealant on the jacket. Begin shrinking at the ground end and work toward the connector.



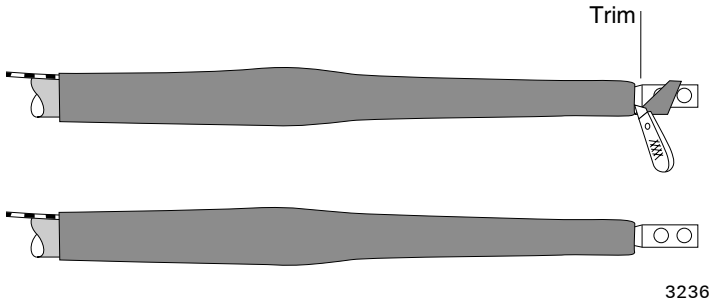
18. Trim Red HV Tube

Note: Allow tube to cool enough to touch before proceeding.

Trim excess tubing from the lug area as shown. Again, be sure to use a sharp knife and make a clean cut to prevent splitting of the outer tube.

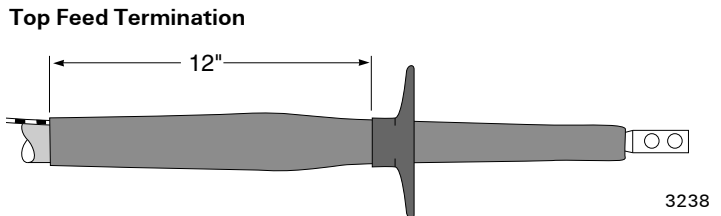
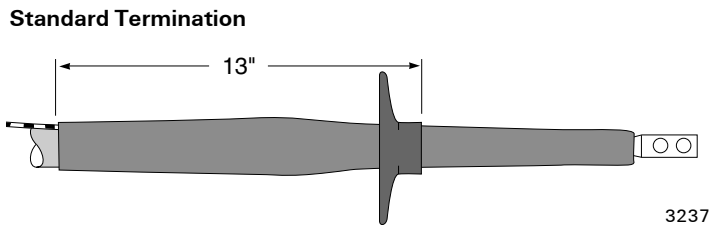
Indoor termination is complete.

Remaining instructions apply to outdoor terminations only.



19. Outdoor Terminations Only. Position Skirt; Shrink in Place

Position the first skirt as shown and shrink in place. Hold the edge of the skirt lightly with pliers. Brush flame tip around outside of skirt collar. Only the collar will shrink.

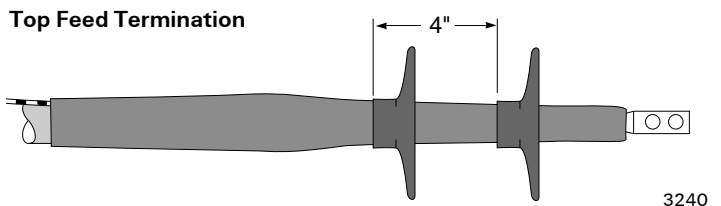
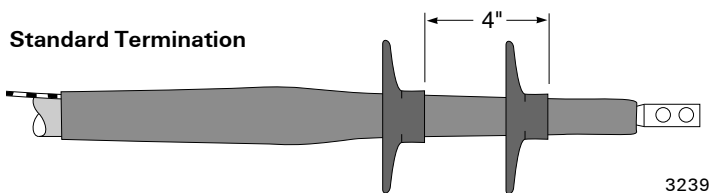


20. Install Remaining Skirt

Position the remaining skirt and shrink in place.

Check that the skirts have been evenly shrunk and appear symmetrical with no tilt or sag.

Outdoor termination is complete.



The Information contained in these installation instructions is for use only by installers trained to make electrical power installations and is intended to describe the correct method of installation for this product. However, Tyco Electronics has no control over the field conditions which influence product installation. It is the user's responsibility to determine the suitability of the installation method in the user's field conditions. Tyco Electronics' only obligations are those in Tyco Electronics' standard Conditions of Sale for this product and in no case will Tyco Electronics be liable for any other incidental, indirect or consequential damages arising from the use or misuse of the products. Raychem is a trade mark of Tyco Electronics Corporation.