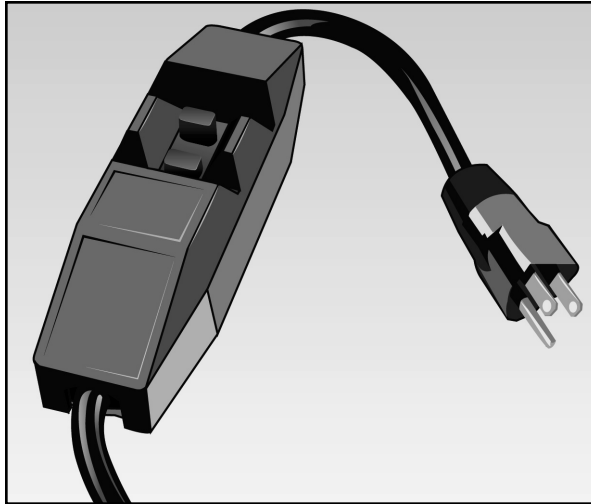


## Installation Instructions

### SERVICE REFERENCE

DIVISION 4	SECTION RT
SALES REFERENCE	PJ493
161-511931-005	
DATE	JUNE, 2005

## TW-GFI-CS Plug In Cordset with GFI



### GENERAL

The TW-GFI-CS is a plug-in cordset with ground-fault protected power connection kit for use with Thermwire heating cables. This kit properly installed with Chromalox Thermwire heating cable, complies with NEC requirements for ground-fault protection of equipment. It is not designed to protect personnel against electric shock hazards. To determine which Thermwire heating cable is suitable for your application, please refer to Product Data Sheet, PDS TW (PJ319) or call Chromalox at 1-800-443-2640.

### ⚠ WARNING

**ELECTRIC SHOCK HAZARD. Disconnect all power before installing or servicing heating cable and accessories. A qualified person must perform installation and service of heating cable and accessories. Heating cable must be effectively grounded in accordance with the National Electrical Code. Failure to comply can result in personal injury or property damage.**

### INSTALLATION

Apply appropriate footage of Thermwire heating cable, as required, to the piping or roofing system to be heated before splicing the cable to the cordset unit (See PJ485 General Instructions for Roof & Gutter Snow and Ice Melting Applications, or PJ438 General Instructions for Pipe Heat Tracing). Remember to leave enough heating cable free to facilitate the splicing.

#### Maximum Cable Footage Allowed:

TW3-1C Wrap	200 ft
TW6-1C Wrap	85 ft
TW6-1CR Melt	75 ft

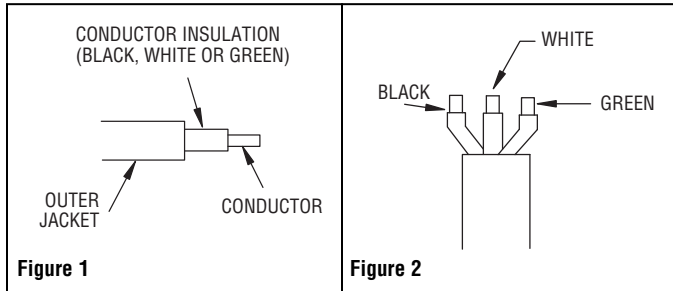
#### TW-GFI-CS Kit Contents:

Cord Set w/ 27 mA GFI.....	1
Insulated Barrel Connector .....	2
Uninsulated Barrel Connector.....	1
3 Inch Heatshrink Tube 1/2.....	1
5 Inch Heatshrink Tube 1/2.....	2
4 Inch Woven Braid .....	1
6 Inch Heatshrink Tube 3/4.....	2
1/2 Inch Heatshrink End Cap.....	1

## INSTALLATION (cont'd.)

### To Prepare Power Cord:

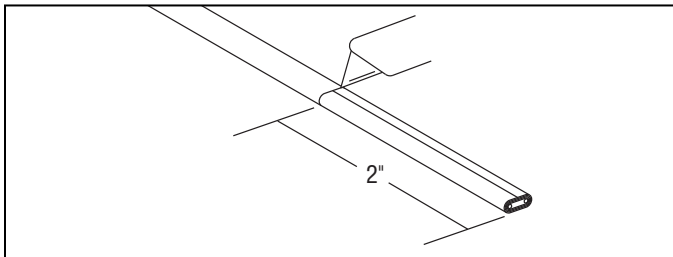
Remove strain relief covers from the rear of the plug unit. Lay wire to be stripped against the strip gauge and mark the strip length on the outer jacket. Carefully cut around the outer jacket and conductors, and prepare as noted in Figures 1 & 2.



**IMPORTANT:** When cutting and stripping outer jacket, if accidental cutting of conductor insulation occurs, cut through injured cord and repeat stripping process.

### To Prepare Heating Cable:

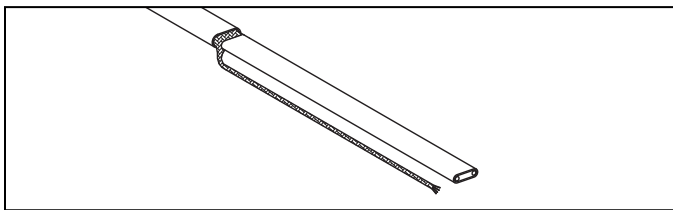
1. For Thermwire Melt TW6-1CR: Score the outer insulation 1-1/2 inches from the end of the cable. Lightly cut the outer jacket up the center to the end of heating cable and remove the outer jacket from the cable.



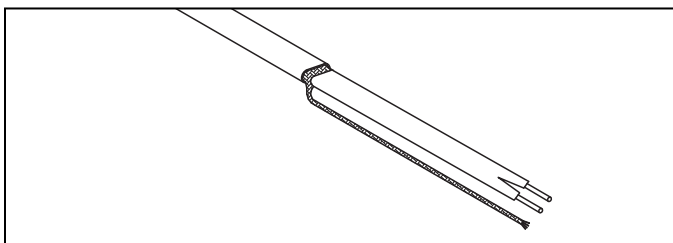
### ⚠ WARNING

**ELECTRIC SHOCK HAZARD. Do not cut metal braid. The twisted braid must be effectively grounded in accordance with the National Electrical Code to eliminate electric shock hazard.**

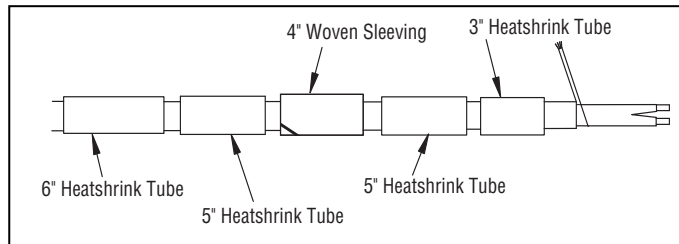
- 2a. For Thermwire Melt TW6-1CR: Unravel braid back to the outer-jacket. Straighten the braid and twist into pigtail.
- 2b. For Thermwire Wrap TW3-1C and TW6-1C: Unravel 2 inches of braid and twist strands into pigtail.



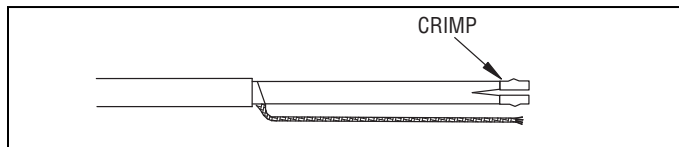
3. For ALL Cables: Using standard electrical cutters, cut a 3/4" long notch out of the cable, between the two conductor wires. Bare a 3/8" length of each conductor by stripping off the outside insulation and the inner black core material.



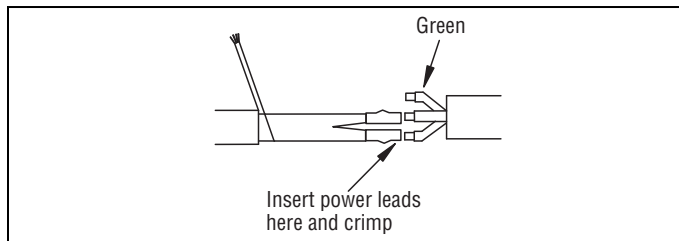
4. Slide one of the 6" length of heat shrink tubing over and past the barrel connectors. In the same manner, slide on one 5" length heat shrink, 4" woven braid sleeving, then the second 5" length heat shrink and lastly the 3" heat shrink tubing.



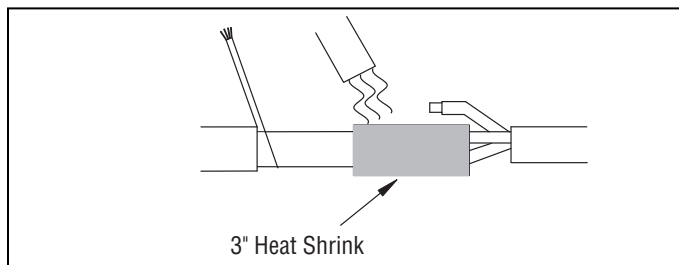
5. Slide one end of each of the two insulated barrel connectors over the bare portion of the heating cable conductors. Crimp the barrel connectors on, using a crimping tool.



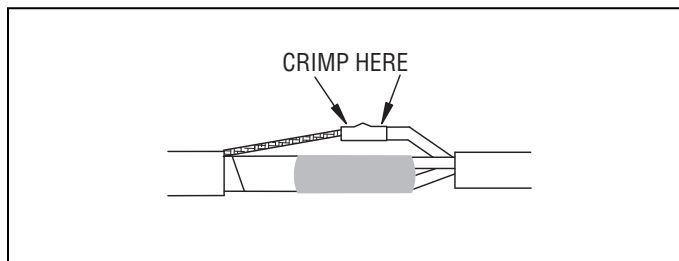
6. Insert the bared ends of the conductors of the power cord into the uncrimped ends of the insulated barrel connectors. Crimp on.



7. Center the 3" shrink tube over the insulated barrel connector, being careful to keep the braid pigtailed out from under the shrink tube. Apply heat evenly until the tube shrinks down around the cables and connectors. The adhesive should flow from both ends. Allow the tubing and the adhesive to cool before going onto the next step.



8. Insert the braid pigtail of one cable into one end of the uninsulated barrel connector and crimp it on. Insert the ground wire (green) into the other end of the uninsulated barrel connector. Crimp on.

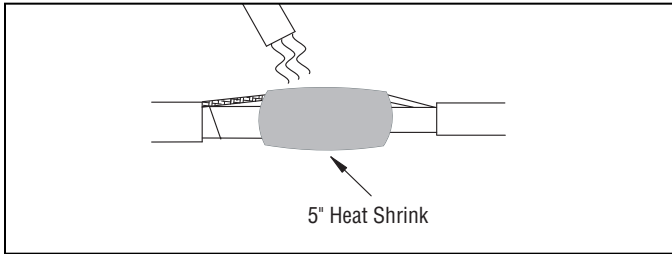


### ⚠ WARNING

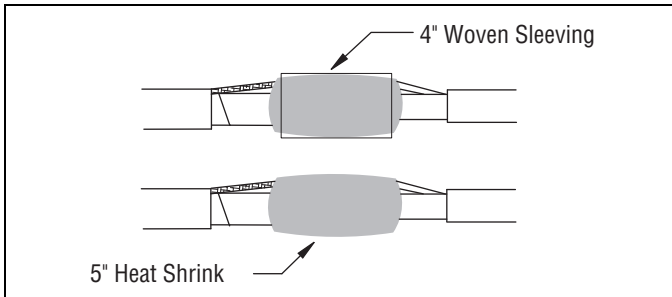
**ELECTRIC SHOCK HAZARD. The twisted braid must be effectively grounded in accordance with the National Electrical Code to eliminate electric shock hazard.**

## INSTALLATION (cont'd.)

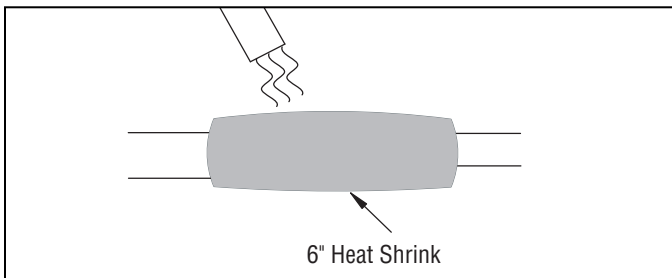
9. Push the ground braid splice against the insulated cable splice. Center the 5" heat shrink tube over the braid splice / cable splice. Apply heat until the tube shrinks down around the connection. Allow to cool.



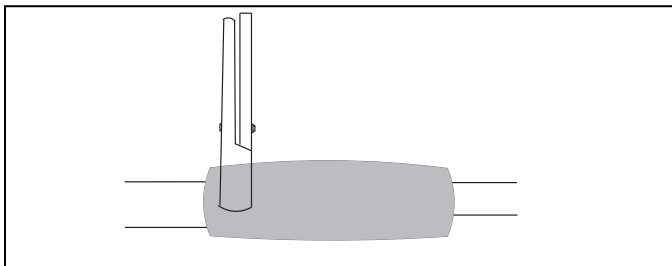
10. Center the 4" woven braid sleeving over the splice connection and then center the 5" length of 3/4" heat shrink tube over the woven sleeving. Apply heat evenly until the tube shrinks. Allow to cool.



11. Center the 6" heat shrink over the splice connection. Apply heat evenly until the tube shrinks down around the cable and the adhesive melts.

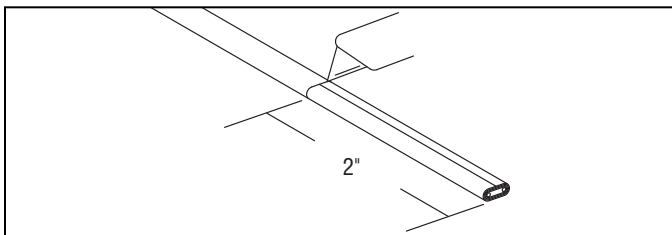


12. While the tubing is still hot, gently squeeze each end of the tubing with pliers and hold until cool. Each end must remain visibly sealed when the pliers are removed. If the tube does not remain sealed re-apply heat and squeeze again with pliers.

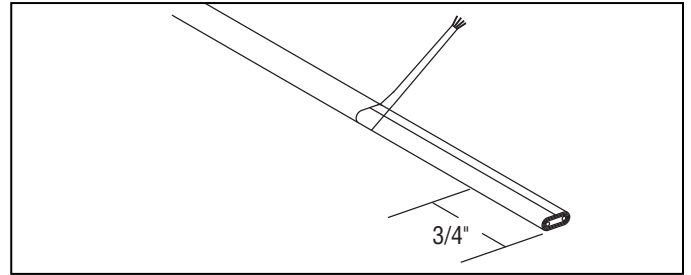


### To terminate non-powered end:

13. For Thermwire Melt TW6-1CR: Score the outer jacket 2" from the end of the cable. Remove the jacket to expose the braid.



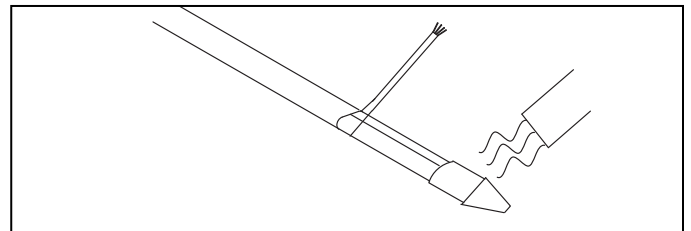
14. For all cables: Push the braid back and cut off 3/4" of the base cable.



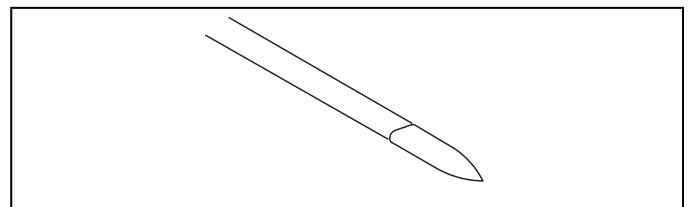
## ⚠ WARNING

**ELECTRIC SHOCK HAZARD. Do not cross connect two conductors from two heating cables together nor connect two conductors of one heat cable together as either will cause a short circuit. Failure to comply can result in personal injury or property damage.**

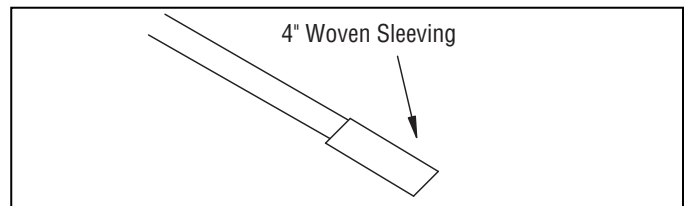
15. Slide the heat shrink cap over the end of the cable. Apply heat evenly until it shrinks around the cable.



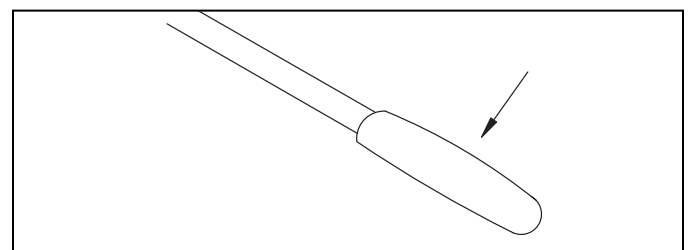
16. Pull the pushed back braid over the sealed end cap and twist the braid together.



17. Slide the 4" woven braid sleeving over the end of the cable, allowing at least 1/2" to extend past the end of the cable.

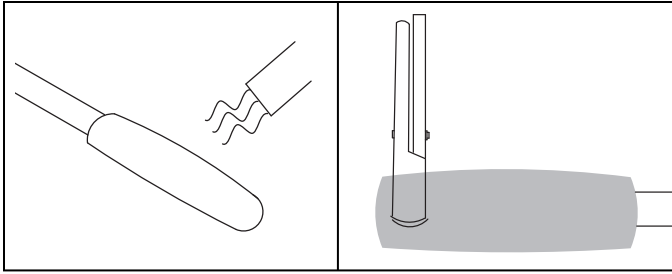


18. Slide the 6" heat shrink tubing over the woven braid piece, allowing 1/2" to extend past the end of the woven sleeving.



## INSTALLATION (cont'd.)

19. While the shrink tubing is still hot, gently squeeze the end of the shrink tube with pliers and hold until cool. The end must remain visibly sealed when the pliers are removed. If the tube does not remain sealed, reapply heat and squeeze again with pliers.



**If cable is being installed on piping,** apply heating cable to the pipe and apply thermal insulation in accordance with PJ438.

**If cable is being installed on roof & gutter system,** secure heating cable to roof, gutter and any downspouts with the approved Chromalox accessories in accordance with PJ485.

20. Secure the device to the wall near the plug receptacle. Use clamp ties to provide strain relief and to avoid physical damage to the ground-fault equipment protection device.

21. Plug heating cable into a 15-A, 120 Vac grounded outlet (approved for wet locations if applicable). Make sure ELCI device and the power connection splice will not be exposed to standing water.

## TESTING

### Megger Testing:

Megger testing should be performed before first use and periodically thereafter. Unplug assembly. Using a 2500 Vdc megohmmeter (500 Vdc minimum), check the insulation resistance between the blades of the plug and the ground pin. Reading should be at least 20 meg-ohms regardless of cable length.

If low reading occurs, cable and insulation should be inspected for signs of damage. If damage is found, the damaged portion of the cable must be removed and new section of heating cable should be splice in using approved Thermwire splice kits. **DO NOT** attempt to repair damaged heating cable. If no signs of physical damage can be found, replace the entire heating cable circuit.

### To Test GFI Unit:

1. Plug unit into a 120 VAC outlet.
2. Press reset button, light indicator should appear.
3. Press test button, light should disappear.
4. Press reset button again for use.

**DO NOT USE UNIT IF ABOVE TEST FAILS.**

## CAUTION

1. If the ELCI (Equipment Leakage Current Interrupter) fails to trip when the Test Button is pressed, or fails to reset, the device is defective and should be returned for replacement or repair by the supplier.

2. If the ELCI tests properly without any power cord attached, but trips each time the equipment cord is connected, then the equipment (heating cable) has a ground fault and needs to be repaired or replaced. **DO NOT BYPASS THE ELCI IF THIS CONDITION OCCURS. A REAL EQUIPMENT HAZARD MAY EXIST.**

### IMPORTANT:

1. The ELCI will provide protection against ground faults when used with a 2-wire outlet receptacle and a 3-wire to 2-wire adapter. It is always desirable, where possible, to use a 3-wire grounded receptacle because a ground provides additional protection against electrical damage. The adapter should be of the type that can be grounded to the outer mounting plate screw.
2. The ELCI does not sense ground faults in the input conductors, therefore, it is recommended that if any extension cords are used, they should be connected between the ELCI's output and the equipment being powered.

### CAUTION:

1. Equipment Leakage Current Interrupters do not protect against electrical shock resulting from contact with both line and neutral wires of the electrical circuit and electric shock resulting from ground fault.
2. **DO NOT USE** where water could enter the ELCI case.
3. Test frequently and before use to ensure correct operation
4. Do not use as an OFF/ON switch.

### Limited Warranty:

Please refer to the Chromalox limited warranty applicable to this product at <http://www.chromalox.com/customer-service/policies/termsforsale.aspx>.

**Chromalox**<sup>®</sup>  
PRECISION HEAT AND CONTROL

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