

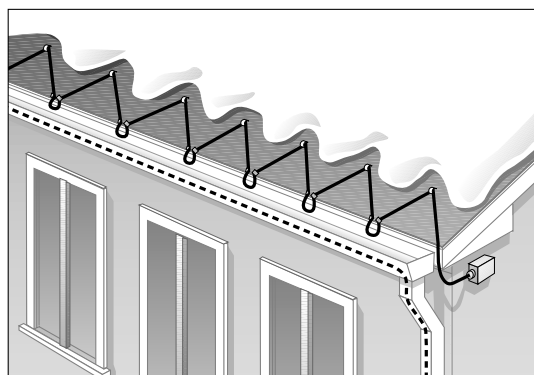
# Chromalox®

## *Installation, Operation* and **MAINTENANCE INSTRUCTIONS**

### SERVICE REFERENCE

DIVISION 4	SECTION RG
SALES REFERENCE (Supersedes PJ485)	PJ485-1
161-562406-001	
DATE	OCTOBER, 1998

## General Instructions for Only Roof and Gutter Snow and Ice Melting Applications for SRF-RG, Thermwire®-Melt, Safe-T-Melt Cables



**WARNING:** These instructions are intended for cable being installed in ordinary non-hazardous areas. Using these instructions, the braid is to be used as a grounding means and for physical protection only. **DO NOT INSTALL ROOF AND GUTTER PRODUCTS IN A HAZARDOUS AREA.**

### INSPECTION

1. Open package and visually check for breaks or nicks in the cable jacket. File claim with carrier if any damage is found.
2. Never energize the cable when it's coiled or on a reel. Test only when it is laid out straight.
3. After removing the cable from the carton or wrapping, check the insulation resistance of the unit from buss wires to braid with a 2500VDC megger to assure the cables have not been
4. The heating cables should be stored in their shipping cartons or on reels in a dry atmosphere until they are ready to be installed.

damaged during shipping and handling. **WARNING:** Any cable with an insulation resistance reading less than 20 megohms before installation should not be installed. Contact your local Chromalox representative.

### GENERAL

**WARNING:** Chromalox Roof and Gutter cables are designed for snow and ice melting on roofs, gutters and downspouts. They are not approved or listed nor should they be used for any other applications such as, but not limited to, in or around mobile homes, or similar applications for which this cable is not intended or suitably designed.

Before installation, make certain gutters and downspouts are free of leaves and other debris.

Electrical connections must be MADE in accordance with national and local codes by a qualified person. **(Ground fault protection is required. Verify with codes whether personnel protection, GFCI or equipment protection, EPD is required).**

**WARNING:** Hazard of Electric Shock. Disconnect all power before starting. All installations must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.

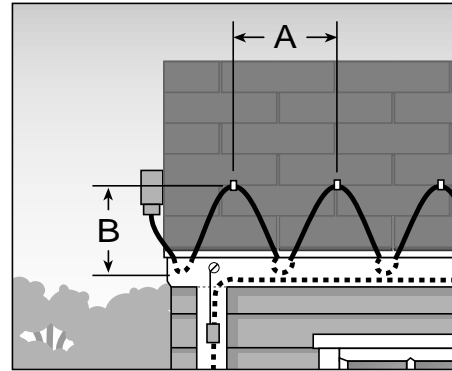
**WARNING:** Do not exceed the maximum circuit length as listed on this sheet or printed on the cable. Be sure to follow the instructions on this sheet as well as the individual kit installation instruction sheets. Failure to follow procedures might cause electrical shock, electrocution and/or fire.

## DESIGN

1. Walk the system to plan the layout of the heating cable.
2. Obtain the following roof information: roof edge length, roof overhang, total gutter length, total downspout length and breaker rating.
3. Calculate the amount of cable required.
  - A. Multiply the roof edge length by the spacing factor found in Table 1.
  - B. Add the total gutter length plus the total downspout length to the result obtained in Part A to determine the total length of cable required.
4. Calculate the number of circuits required. Divide the total length of cable required by the maximum heater length allowed for the breaker rating. Tables 2, 3 and 4 indicate maximum heater lengths depending upon the Chromalox Roof and Gutter product selected.
5. Branch-Circuit Sizing: The ampacity of the branch circuit conductor and the rating or setting of overcurrent devices shall not be less than 125% of the ampere load of the cable or units.

**Required Cable**

Table 1			
Roof Overhang	A	B	Spacing Factor
	Heating Width	Heating Height	
12"	2 ft	18"	2
24"	2 ft	30"	3
36"	2 ft	42"	4



**Maximum Allowable Circuit Lengths per Breaker Rating for 5W/Ft. Heating Cable**

	Table 2 — SRF-RG			Table 3 — Thermwire Melt			Table 4 — Safe-T-Melt	
	120V			120V			120V	
Start Up @ 0°F	15A	20A	30A	15A	20A	30A	10A	15A
Start Up @ -20°F	90 ft	120 ft	175 ft	90 ft	120 ft	175 ft	60 ft	100 ft
	75 ft	100 ft	150 ft	75 ft	100 ft	150 ft	60 ft	100 ft
	240V			240V			240V Not Available	
Start Up @ 0°F	15A	20A	30A	15A	20A	30A		
Start Up @ -20°F	135 ft	185 ft	275 ft	135 ft	185 ft	250 ft		
	120 ft	160 ft	250 ft	120 ft	160 ft	250 ft		

## INSTALLATION

1. The minimum installation temperature is -40°F (-40°C).
2. Locating the heating cable on the roof.
  - A. Loop the heating cable on the overhang area of the roof. The overhang area is the portion of the roof which extends beyond the building's outside wall. The heating cable loop should extend into the gutter to maintain a drainage path. It should also extend to a point 6 inches above the line where the wall joins the roof. The spacing of the loops should be at 2 foot intervals. The minimum bending radius is six times the minor diameter.
  - B. For flat roofs, the heating cable can be spaced as appropriate for creating drainage paths.
  - C. Secure the heating cable to the roof using Chromalox roof clip kits for specified roof and gutter product. Chromalox recommends using two clips to form the loop that extends over the gutter edge and one clip to form the loop at the top of the overhang. For flat roofs, secure the heating cable to the roof with a clip at 3 foot intervals. See clip instruction sheet for details.
  - D. It is recommended that a barrier (snow birds) or snow fence be mounted on the roof above the heating cable. This prevents damage to the heating cable system due to ice slides. If desired, the heating cable can be attached to the barrier with the Chromalox roof clips.
3. Locating the heating cable in gutters and downspouts.
  - A. Run the heating cable in and along the gutter. It is not necessary to attach the heating cable to the gutter bottom.
  - B. When running the heating cable into, or out of the gutter, use a Chromalox roof clip to prevent abrasion of the cable.

## INSTALLATION

- C. In downspouts, the heating cable must extend below the freezing level.
  - D. The heating cable can be looped in the downspout if it is convenient to do so, such as when a downspout is not at the end of a run. **Note:** Tee splices are not permitted and void agency approvals.
  - E. Use a Chromalox downspout hanger to protect the heating cable from damage caused by sharp gutter edges and to provide strain relief. See instruction sheet (PJ482) for details.
  - F. Protect any heating cable which protrudes past the lower opening of the downspout.
4. Installing the installation accessories.
- A. Install all end seals and splices prior to making power connections.
  - B. Use only Chromalox Installation Accessories. Refer to the appropriate product literature for the correct accessory catalog numbers for Power Connection Kit, Roof Clip Kit, Splice Connection Kit and Downspout Hanger Kit.
  - C. If these kits are not used, or if their instructions are not followed, then the installation will not comply with UL.
- D. Use only UL Listed weather-proof junction boxes for power connection.
5. Start-up requirements.
- A. The power connection kit contains two caution labels that must be visibly located. One must be at the circuit breaker panel, the other on or next to the ON/OFF control for the cable unit.
  - B. Prior to energizing the system, make sure the heating cable is free of mechanical damage (nicks, cuts, etc.) and thermal damage (solder, overheating, etc.). Visually check all power connections, splices and end seals. Perform 2500 VDC meggar check. The meggar check is performed at the power connection end of the cable between buss wire and the grounding braid. The minimum acceptable reading is 20 megohms. If the installation fails the meggar test, check end seals, splice connections and cable sheath for physical damage or areas where the grounding braid has come in contact with the buss wires or conductive core. If physical damage can not be found and end seals or splices are not the cause, then the complete circuit should be removed and replaced with new roof and gutter heating cable.

## SERVICE

- 1. Prior to the winter season, make sure gutters and downspouts are free of leaves and other debris.
  - 2. Chromalox recommends checking the insulation resistance of the heating cable sheath with a 2500 VDC meggar. This reading is taken at the power connection end of the cable between a buss wire and the grounding braid. The minimum acceptable reading is 20 megohms. The value should be recorded.
  - 3. The installation should be checked every Fall. The following checks should be done.
    - A. Meggar test (see #2 above for procedure).
    - B. Inspect heating cable and connections for signs of damage.
    - C. If physical damage is found, replace the damaged sections.
    - D. If the installation fails the meggar test and physical damage cannot be found, then the complete circuit should be removed and replaced with new roof and gutter heating cable.
- WARNING: Hazard of Severe Shock. Disconnect all power before servicing or replacing cable.**
- 4. Prior to repairs performed on roof, heating cable must be removed to prevent damage to cable. Cable must not be exposed to chemical sealants that may be applied to roof surface and must be stored away from area while sealants cure. Upon replacement of cable, inspect for signs of physical damage to cable and connections. Replace any damaged sections and connections.

### WARRANTY AND LIMITATION OF REMEDY AND LIABILITY

Chromalox warrants only that the Products and parts manufactured by Chromalox, when shipped, and the work performed by Chromalox when performed, will meet all applicable specification and other specific product and work requirements (including those of performance), if any, and will be free from defects in material and workmanship under normal conditions of use. All claims for defective or nonconforming (both hereinafter called defective) Products, parts or work under this warranty must be made in writing immediately upon discovery, and in any event, within one (1) year from delivery, provided, however all claims for defective Products and parts must be made in writing no later than eighteen (18) months after shipment by Chromalox. Defective and nonconforming items must be held for Chromalox's inspections and returned to the original f.o.b. point upon request. THE FOREGOING IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES WHATSOEVER, EXPRESS, IMPLIED AND STATUTORY, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Notwithstanding the provisions of this WARRANTY AND LIMITATION Clause, it is specifically understood that Products and parts not manufactured and work not performed by Chromalox are warranted only to the extent and in the manner that the same are warranted to Chromalox by Chromalox's vendors, and then only to the extent that Chromalox is reasonably able to enforce such warranty, it being understood Chromalox shall have no obligation to initiate litigation unless Buyer undertakes to pay all cost and expenses therefor, including but not limited to attorney's fees, and indemnifies Chromalox

against any liability to Chromalox's vendors arising out of such a litigation.

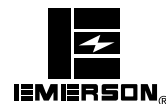
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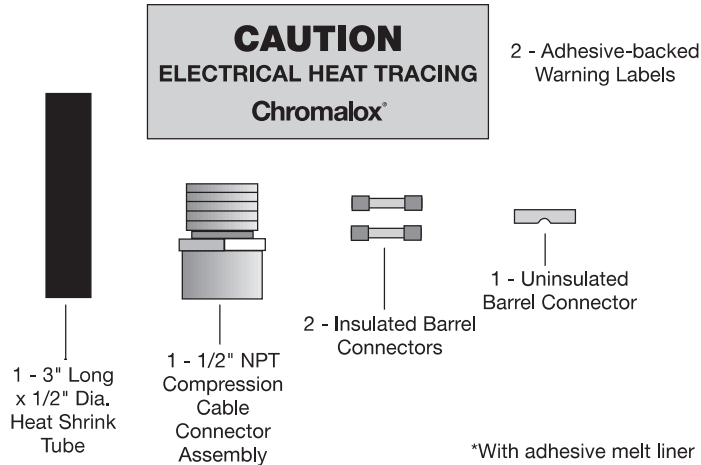
# Chromalox®

## Installation Instructions

### SERVICE REFERENCE

DIVISION 4	SECTION RG
SALES REFERENCE (Supersedes PJ478)	PJ478-1
161-511930-002	
DATE	OCTOBER, 1998

## RG-PK-1 Power Connection Kit

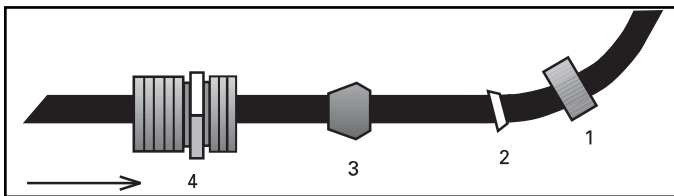


### GENERAL

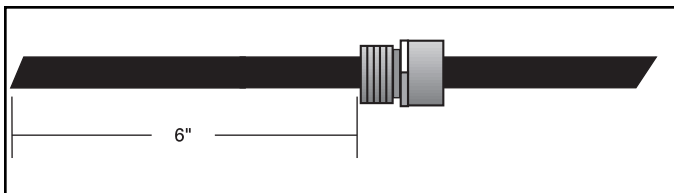
**WARNING:** Hazard of Electric Shock. Disconnect all power before starting. All installations must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.

**NOTE:** All electrical wiring including GFCI (Ground Fault Circuit Interrupters), must be done according to National Electrical or local codes by a qualified person.

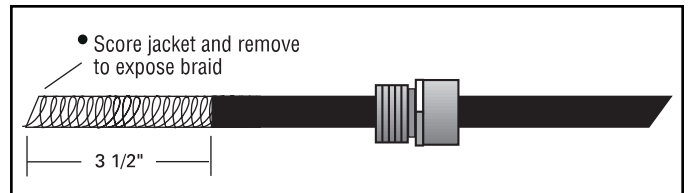
**CAUTION:** Do not damage the braid or the base cable insulation.



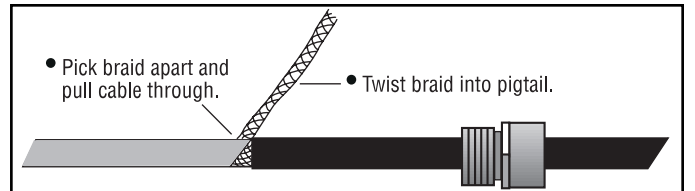
- Slide the four (4) components of the nylon cable connector onto the heating cable in the order shown.



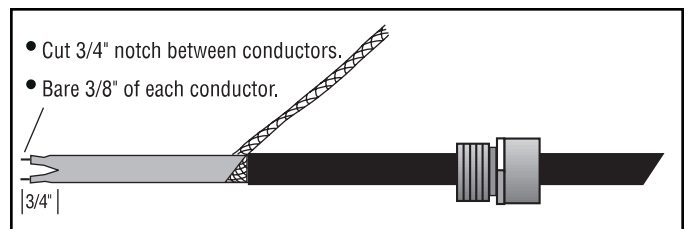
- Assemble the connector and tighten, leaving six inches of cable extending through the connector.
- Score the cable outer jacket 3-1/2" from the cable end. Remove the jacket to expose the braid.



- Pick the braid apart near the outer jacket and pull the cable through the opening in the braid. Twist the braid into a pigtail.

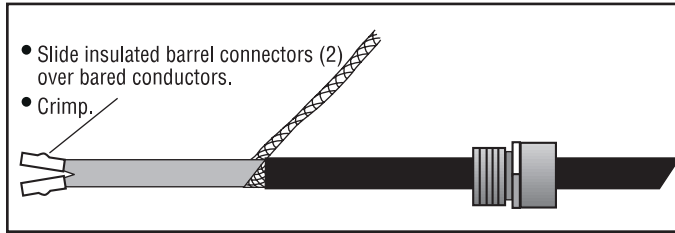


- Using standard electrical cutters, cut a 3/4" long notch out of the cable, between the two conductor wires. Bare a 3/8" length of each conductor by stripping off the outside insulation and the inner black core material.

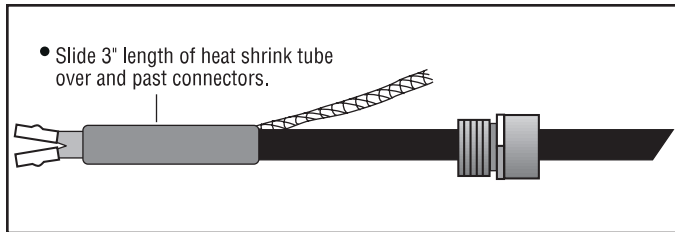


## GENERAL

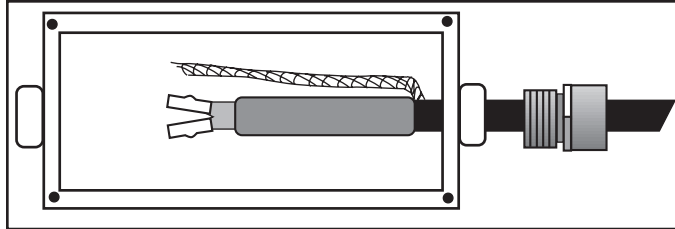
6. Slide one end of each of the two insulated barrel connectors over the bare portion of the conductors. Crimp the barrel connectors on using a crimping tool.



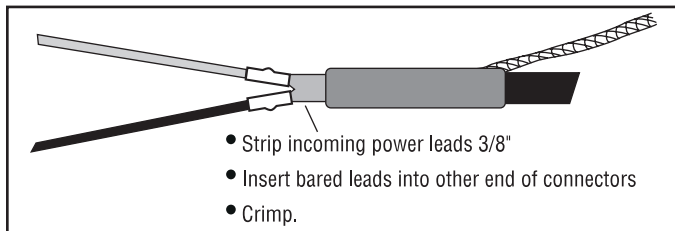
7. Slide a 3" length of heat shrink tubing over and past the barrel connectors.



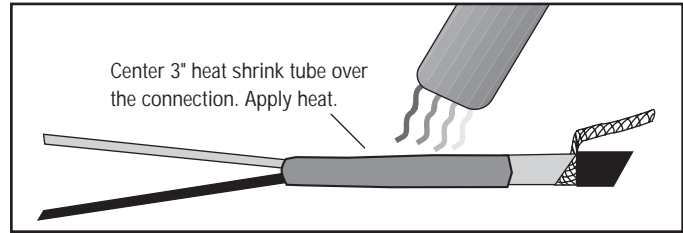
8. Insert entire assembly into NEMA 4 or 4X Electrical Junction Box. Junction box should be protected from weather if possible.



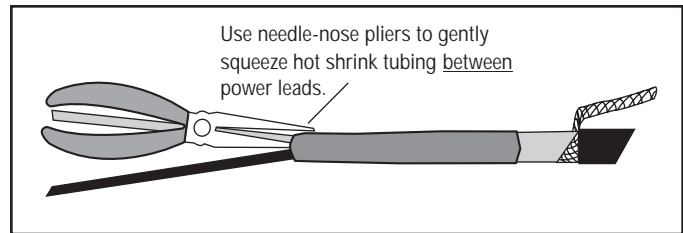
9. Strip the incoming power leads and ground wire to expose a 3/8" length of bare conductor. Insert the bared portion of the power leads into the other end of the insulated barrel connectors and crimp them.



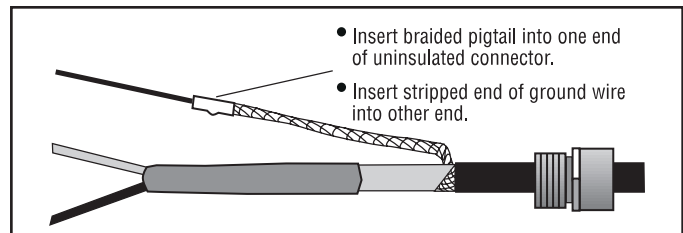
10. Center the 3" length of heat shrink tubing over the connection. Apply heat evenly to shrink tubing around the heating cable, barrel connectors and power leads.



11. While the shrink tubing is still hot, gently squeeze the shrink tubing between the power leads with needle-nose pliers and hold until cool. The shrink tubing must remain visibly sealed when the pliers are removed. If the tubing does not remain sealed, reheat the tubing and try again.



12. Insert the end of the braided pigtail into one end of the uninsulated (silver) barrel connector and crimp it. Insert the stripped end of the ground wire into the other end of the barrel connector and crimp it.



13. Carefully push the connected wires into the power termination box and secure the cover. Screw the 1/2" compression cable connector into the power termination box to form a water-tight seal.

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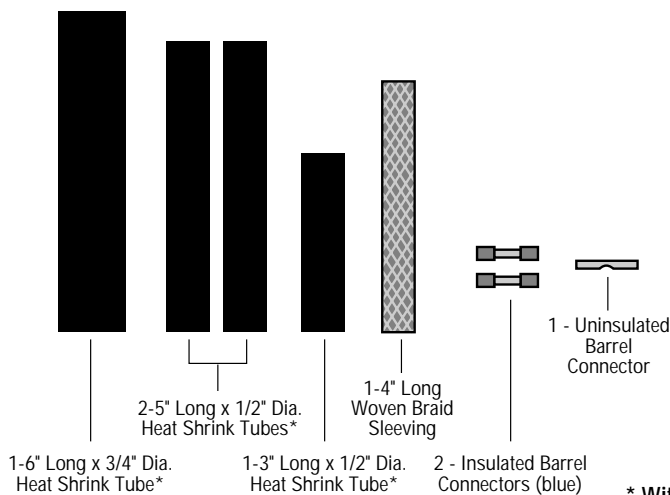
# Chromalox®

## Installation Instructions

### SERVICE REFERENCE

DIVISION 4	SECTION RG
SALES REFERENCE (Supersedes PJ479-1)	PJ479-2
161-511930-003	
DATE	NOVEMBER, 1998

## RG-SK-1 Roof and Gutter Cable Splice Kit (386214)



\* With adhesive melt liner.



### INSTALLATION

**WARNING: Hazard of Electric Shock. Disconnect all power before starting. All installations must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.**

**Note:** All electrical wiring, including GFCI (Ground Fault Circuit Interrupters), must be done according to National Electrical or local codes by a qualified person.

- Slide the splice kit parts on to the two cable pieces in the order shown.

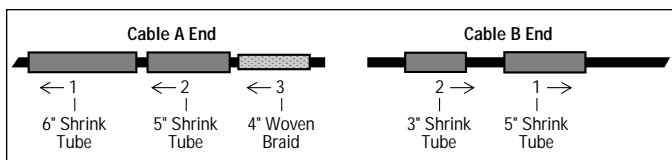


Figure 1

- Score the outer jacket 2" from the end of the cable. Remove the jacket to expose the braid.

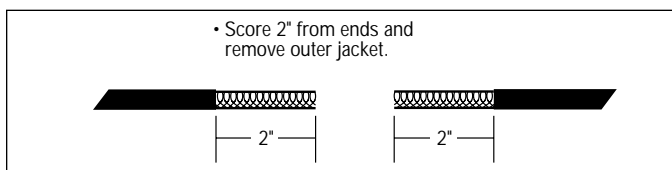


Figure 2

**CAUTION:** Do not damage the braid or the base cable insulation.

- For both cables, pick the braid apart near the outer jacket and pull the cable through the opening in the braid. Twist the braid into a pigtail.
- Using standard electrical cutters, cut a 3/4" long notch out of both cables, 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.

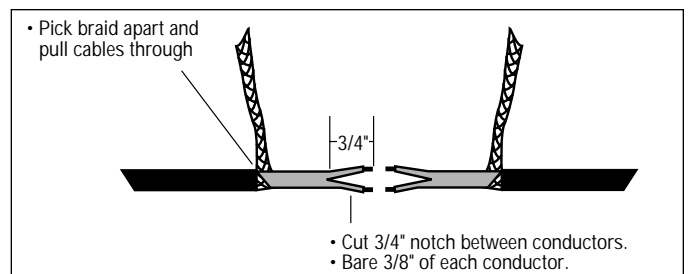


Figure 3

- Slide one end of each of the two blue insulated barrel connectors over the bare conductors. Crimp on with a crimping tool.

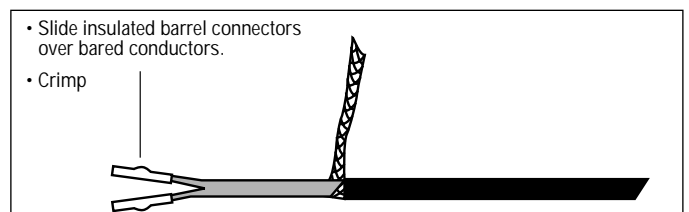


Figure 4

## INSTALLATION

6. Insert the bared ends of the conductors of the other cable into the uncrimped ends of the insulated barrel connectors. Crimp on.

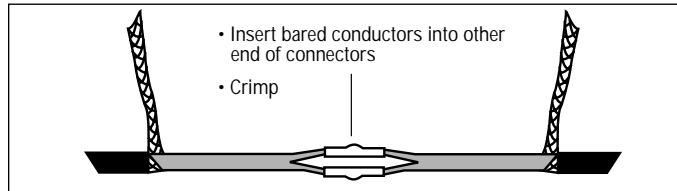


Figure 5

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

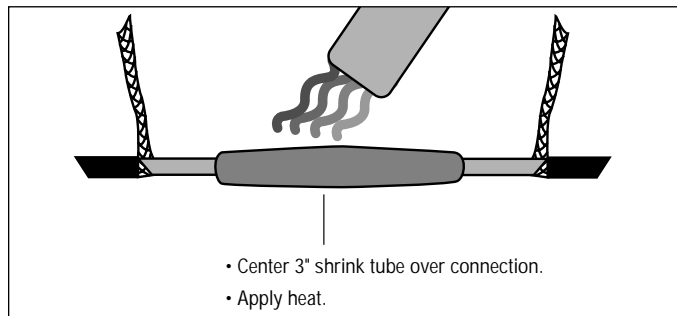


Figure 6

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

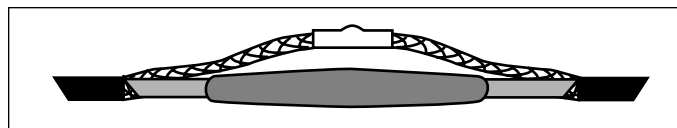


Figure 7

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

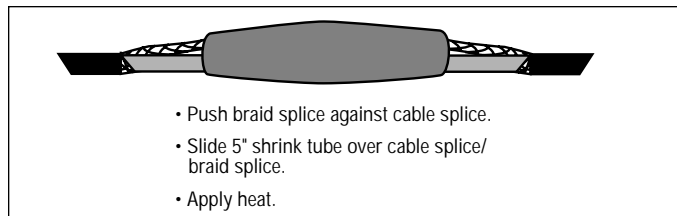


Figure 8

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.

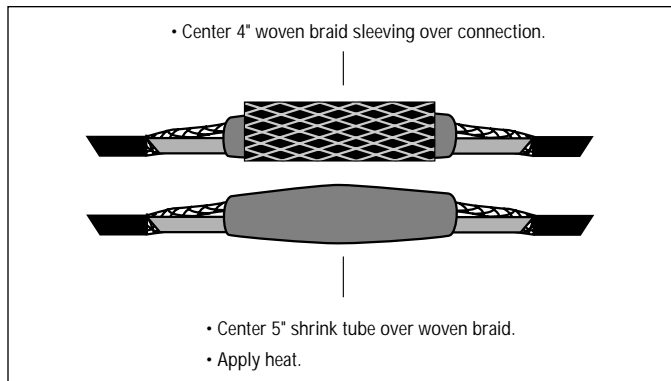


Figure 9

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

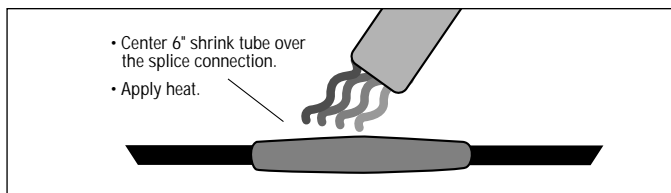


Figure 10

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 reapply heat and squeeze again with pliers.

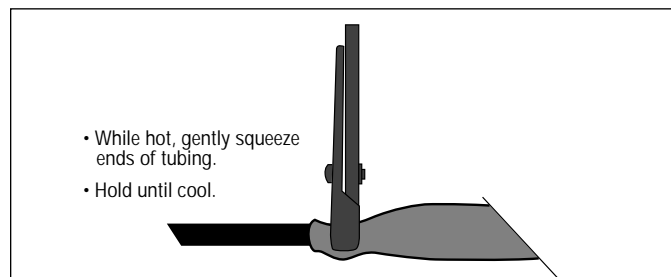


Figure 11

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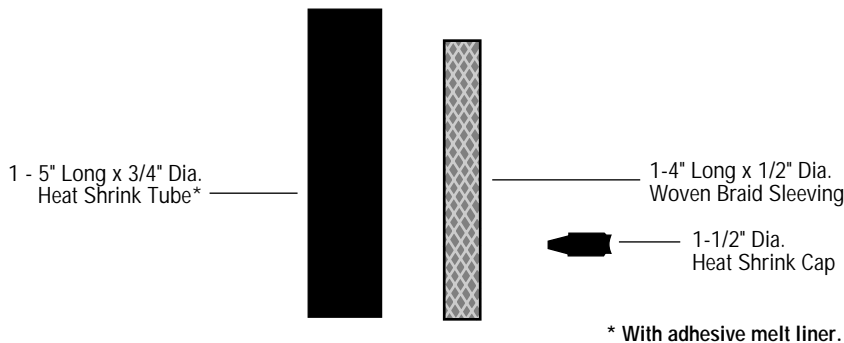
# Chromalox®

## Installation Instructions

### SERVICE REFERENCE

DIVISION 4	SECTION RG-EK
SALES REFERENCE (Supersedes PJ480-2)	PJ480-3
161-511930-004	
DATE	OCTOBER, 1998

## RG-EK-1 Roof and Gutter Cable End Seal Kit (386257)

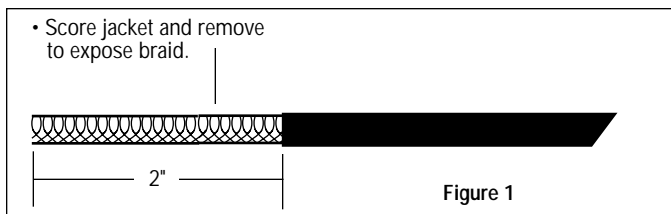


### INSTALLATION

**WARNING:** Hazard of Electric Shock. Disconnect all power before starting. All installations must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.

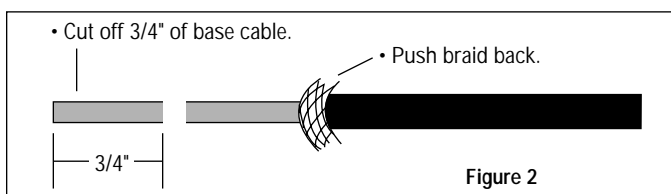
**Note:** All electrical wiring, including GFCI (Ground Fault Circuit Interrupters), must be done according to National Electrical or local codes by a qualified person.

1. Score the outer jacket 2" from the end of the cable. Remove the jacket to expose the braid.



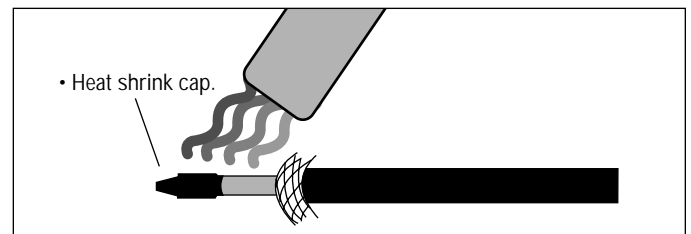
**CAUTION:** Do not damage the braid or the base cable insulation.

2. Push the braid back, and cut off the end 3/4" of the base cable.

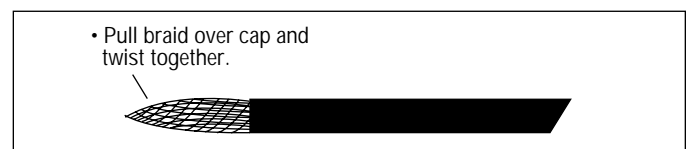


**WARNING:** Do not connect the buss wires together. Keep braid out of heat shrink cap.

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



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



## INSTALLATION

5. 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.

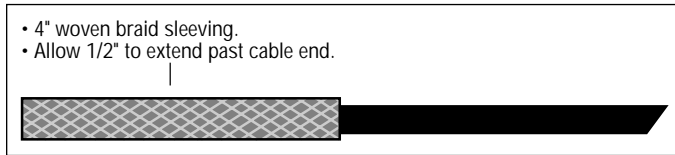


Figure 5

6. Slide the 5" heat shrink tubing over the woven braid piece, allowing 1/2" to extend past the end of each end of the woven sleeving.

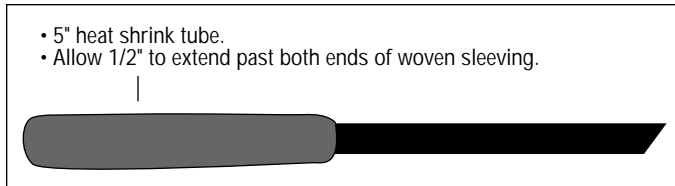


Figure 6

7. Apply heat evenly to the heat shrink tube until it shrinks around the cable.

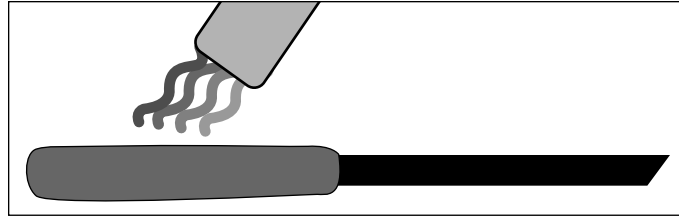


Figure 7

8. 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, then repeat steps 7 and 8.

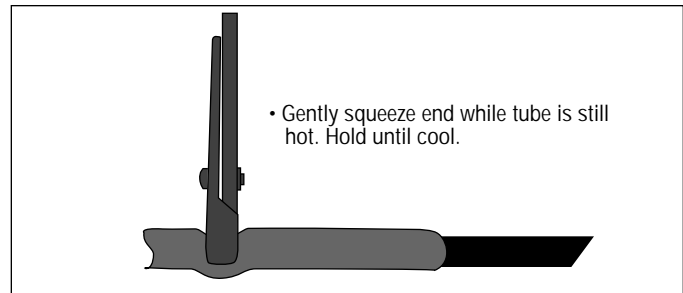


Figure 8

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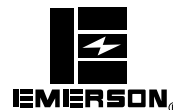
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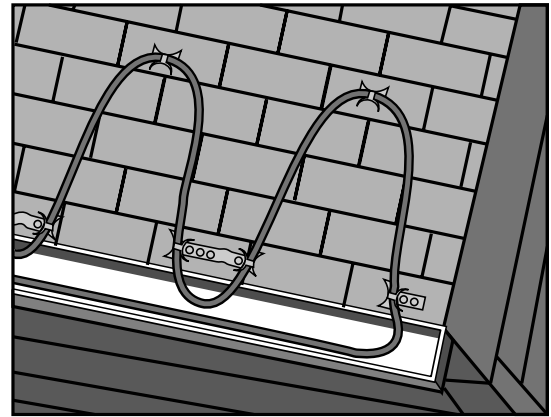
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## Installation Instructions

### SERVICE REFERENCE

DIVISION 4	SECTION RCK
SALES REFERENCE (Supersedes PJ481-1)	PJ481-2
161-511930-005	
DATE	SEPTEMBER, 1998

## RCK-1 Roof Cable Clips



The RCK-1 Roof Cable Clip is used to attach Chromalox heating Cable to most types of roof surfaces. This kit contains 5 double clips, which is enough for approximately seven linear feet of roof edge.

### INSTALLATION

**WARNING: Hazard of Electric Shock. Disconnect all power before starting. All installations must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.**

**Note:** All electrical wiring, including GFCI (Ground Fault Circuit Interrupters), must be done according to National Electrical or local codes by a qualified person.

1. Plan the layout of the roof clips according to the installation instructions supplied with the cable. One double clip is used to secure the heating cable looped at the roof edge (this assures a drainage channel to the gutter). A single clip is used to fasten the cable at the top of the saw tooth layout arrangement.

Single clips are made by snapping the double clip in two at the scored indentation.

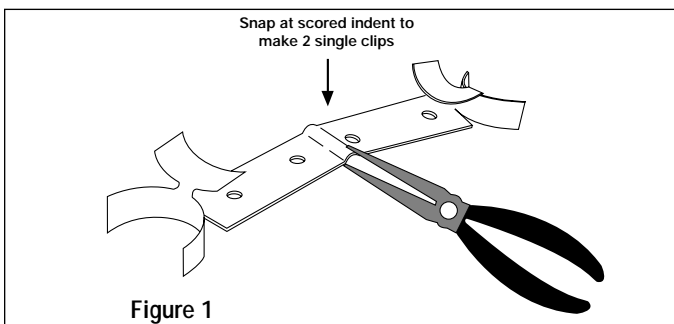


Figure 1

2. Fasten the clips to the roof with roofing nails or screws. Apply water sealing material around the nail/screw to prevent water leakage.

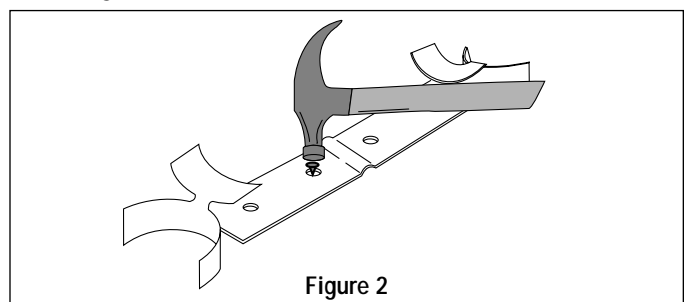


Figure 2

**Note:** Fasten the clips to the roof *before* installing the heating cables.

3. After installing the clips on the roof, thread the heating cable around the clips. Use extra clips in any location where the heating cable is susceptible to excess stress or movement.

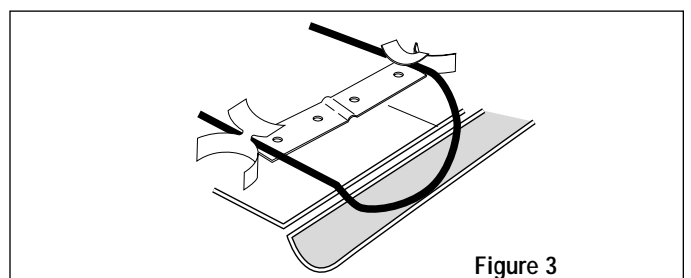
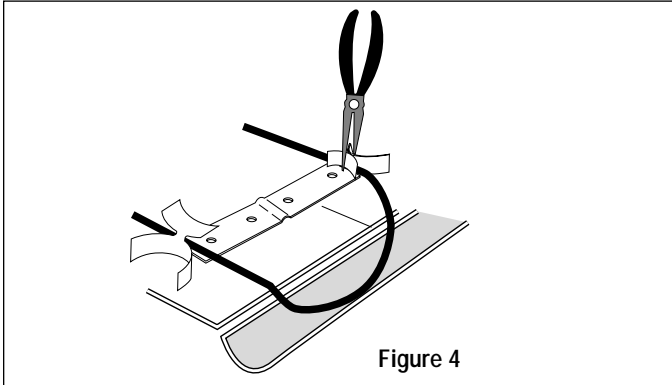


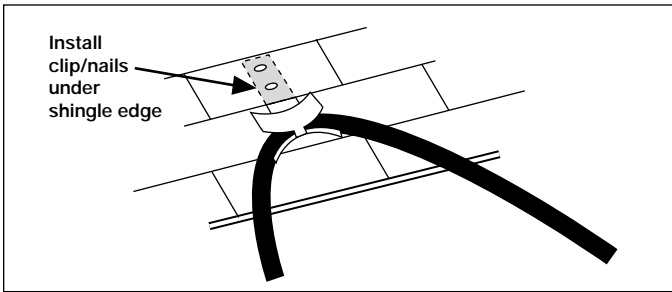
Figure 3

## INSTALLATION

- Using pliers, close the clips firmly about the cable, being careful not to crush the cable.



## SINGLE CLIP INSTALLATION



**Note:** Use Aluminum tape to hold cable in place in gutters.

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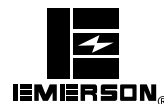
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# Chromalox®

## Installation Instructions

### SERVICE REFERENCE

DIVISION 4

SECTION RDK

SALES  
REFERENCE

(Supersedes PJ482-1)

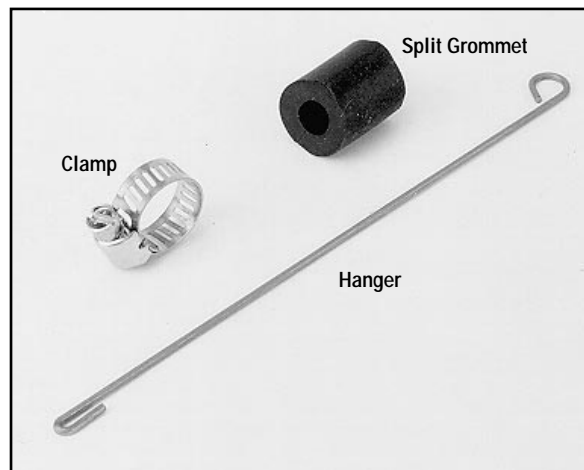
PJ482-2

161-511930-006

DATE

OCTOBER, 1998

## RDK-1 Downspout Hanger Kit



The RDK-1 Downspout Hanger Kit is used to suspend and prevent damage to Chromalox Roof and Gutter Heating Cable as it enters gutter downspout. This kit contains material for one downspout entrance.

### INSTALLATION

**WARNING:** *Hazard of Electric Shock. Disconnect all power before starting. All installations must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazards.*

**Note:** All electrical wiring, including GFCI (Ground Fault Circuit Interrupters), must be done according to National Electrical or local codes by a qualified person.

1. Place the split grommet around the heating cable where the downspout hanger will be placed.

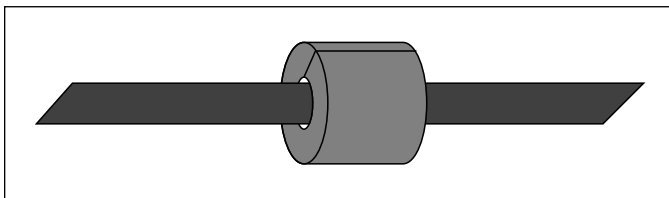


Figure 1

2. The wire hanger has a 180° hairpin bend at one end and a loop bend at the other end. Center the hairpin end of the wire hanger along the grommet. Slide the clamp over the wire hanger and into the bend of the hanger.

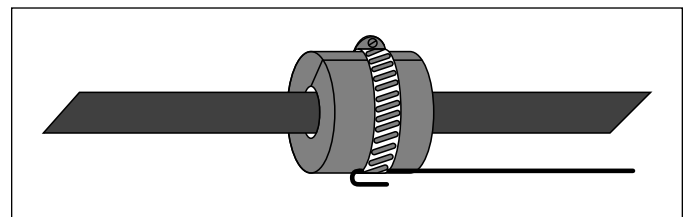


Figure 2

3. Tighten the clamp until the hanger and cable are firmly held in place.

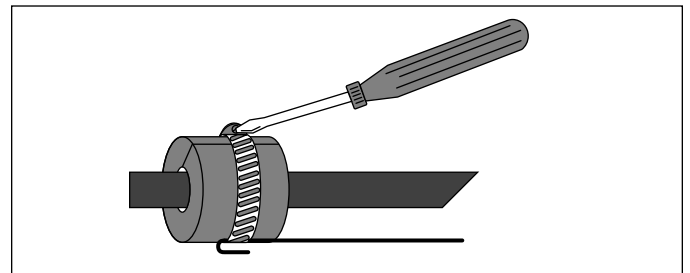


Figure 3

## INSTALLATION

4. Attach the hanger assembly to the roof by driving a roofing nail or screw through the looped end of the hanger.

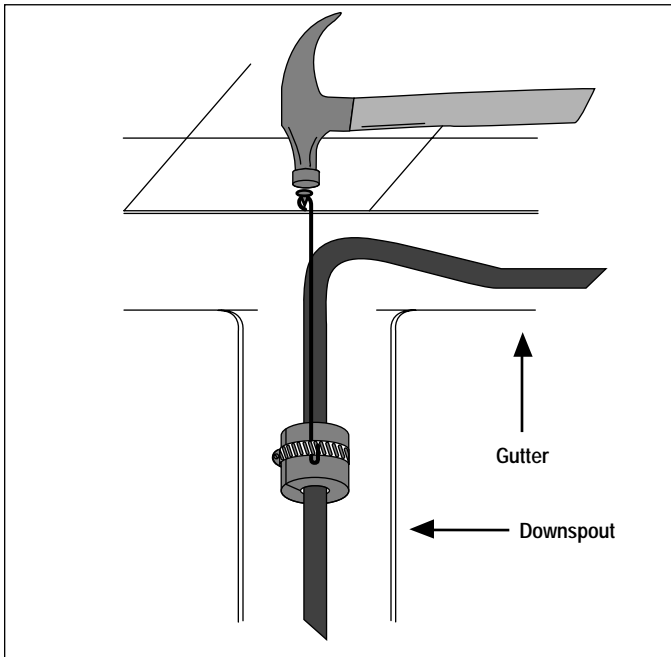


Figure 4

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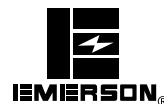
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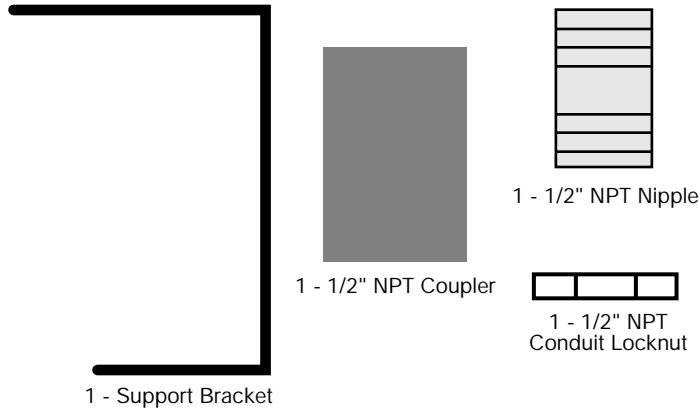


# Chromalox®

## Installation Instructions

### Heating Cable Junction Box Mounting Bracket Kit

SERVICE REFERENCE	
DIVISION	SECTION PG
SALES REFERENCE (Supersedes PJ484)	PJ484-1
161-511930-008	
DATE	SEPTEMBER, 1998



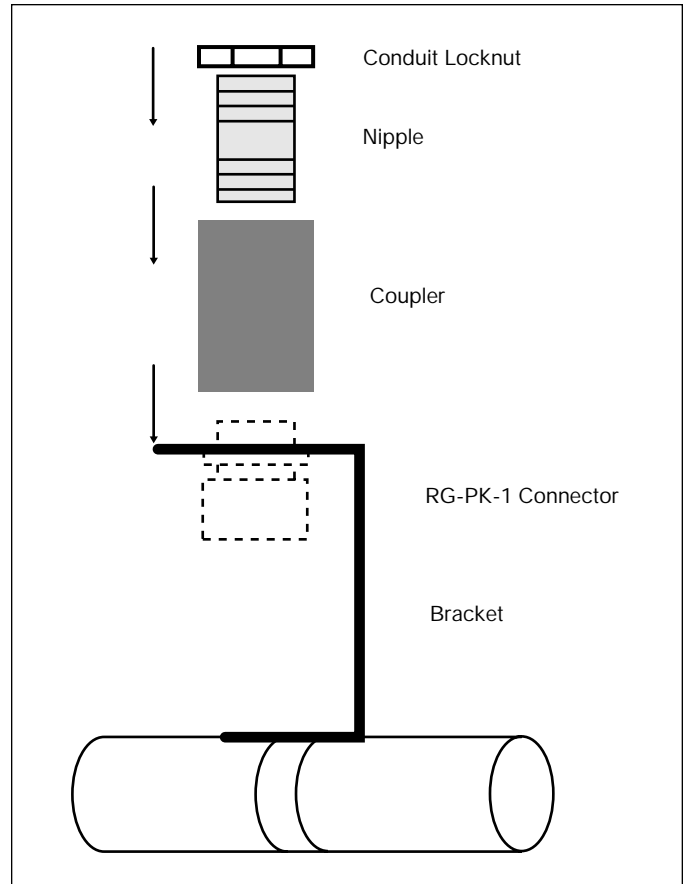
#### GENERAL

This mounting bracket assembly is used in conjunction with an RG-PK-1 power connection kit to support a standard 1/2" NPT junction box for pipe tracing applications. It is not required for roof and gutter de-icing applications.

This instruction sheet should be used in conjunction with instruction sheet PJ-478, RG-PK-1 and instruction sheet PJ-438, General Instructions for pipe tracing.

**WARNING: Hazard of Electric Shock. Disconnect all power before installing.**

1. The mounting bracket is seated on the pipe at a 12 o'clock position. Secure with a pipe strap.
2. The cable connector assembly (dashed object) from the RG-PK-1 kit is inserted into the opening on top of the mounting bracket.
3. Screw the coupler onto the connector assembly threads, achieving a snug fit.
4. Screw the nipple into the top of the coupler. Hand tighten.



5. Fasten the conduit locknut onto the nipple.
6. Confirm that all components are securely fastened in order to ensure system integrity. The mounting bracket is now ready for supporting a junction box.

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