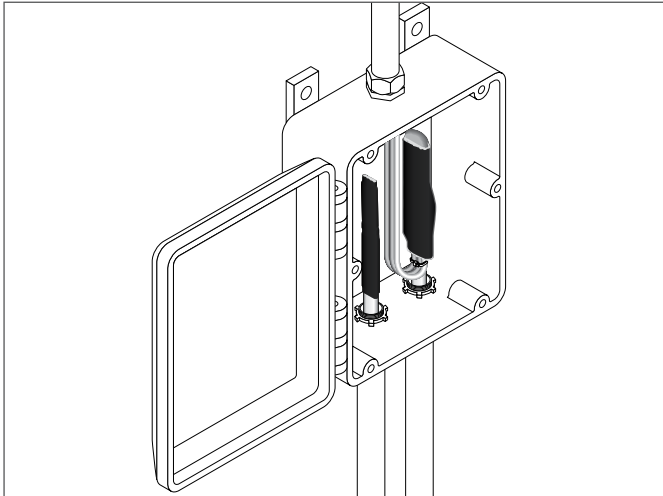


# Raychem EMK-XP

## ELECTROMELT POWER CONNECTION AND END SEAL KIT INSTALLATION INSTRUCTIONS



### APPROVALS



DE-ICING AND  
SNOW MELTING EQUIPMENT  
LISTED  
(EM2-XR ONLY)

### KIT CONTENTS

Item Qty Description

#### Power Connection

A	1	Black heat-shrinkable tube – 1 1/2 x 6 in (38 x 152 mm)
B	1	Heat-shrinkable cap
C	2	Clear yellow heat-shrinkable tubes – 1/2 x 2 3/4 in (13 x 70 mm)
D	1	Clear yellow heat-shrinkable tube – 1/2 x 2 in (13 x 51 mm)
E	2	“Electric Deicing and Snow Melting” labels
F	2	Black heat-shrinkable tubes – 1/8 x 3/4 in (3 x 19 mm)
G	5	Small non-insulated crimp connectors
H	5	Large non-insulated crimp connectors
I	1	Cable tie
J	1	Mastic sheet – 3 x 12 in (76 x 305 mm)

#### End Seal

A	1	Black heat-shrinkable tube – 1 1/2 in x 6 in (38 mm x 152 mm)
J	1	Mastic sheet – 3 in x 12 in (76 mm x 305 mm)
K	1	Black heat-shrinkable tube – 1 in x 3 in (25 mm x 76 mm)
L	1	Clear yellow heat-shrinkable tube – 1/2 in x 1 1/2 in (13 mm x 38 mm)

### DESCRIPTION

The ElectroMelt EMK-XP Power Connection and End Seal Kit is for use with ElectroMelt EM2-XR and EM3-XR heating cables for snow-melting and anti-icing applications. Materials for one power connection and one end seal are included. This kit is suitable for connecting the heating cable to 14 through 4 AWG (Cu only) power wires. Power wiring must meet NEC or CEC requirements and have a minimum temperature rating of 167°F (75°C).

These installation instructions should be used in conjunction with the ElectroMelt System Design Guide (H53393) and ElectroMelt System Installation and Operation Manual (H58086).

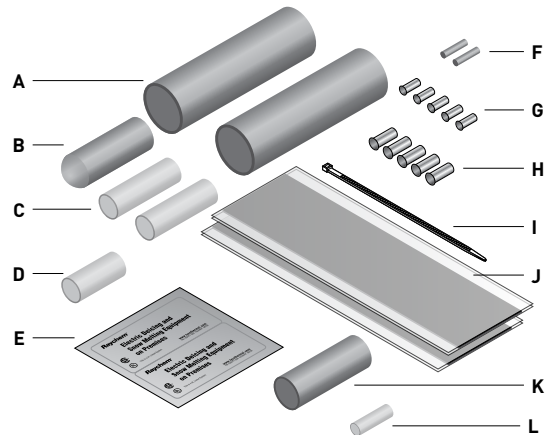
For technical support call Pentair Thermal Management at (800) 545-6258.

### TOOLS REQUIRED

- Needle-nose pliers
- Utility knife
- Heat gun or propane torch
- Wire strippers
- Ideal Crimp Tool Model 30-425
- Diagonal cutters

### ADDITIONAL MATERIALS REQUIRED

- EMK-XJB (Not shown) or equivalent UL Listed or CSA Certified weatherproof junction box suitable for the location. A minimum of 400 cubic inches are needed for 1 power connection and 1 end termination per junction box.



### WARNING:

This component is an electrical device that must be installed correctly to ensure proper operation and to prevent shock or fire. Read these important warnings and carefully follow all the installation instructions.

- To minimize the danger of fire from sustained electrical arcing if the heating cable is damaged or improperly installed, and to comply with the requirements of Pentair Thermal Management, agency certifications, and national electrical codes, ground-fault equipment protection must be used. Arcing may not be stopped by conventional circuit breakers.
- Approvals and performance are based on the use of Pentair Thermal Management-specified parts only. Do not substitute parts or use vinyl electrical tape.
- The black heating cable core is conductive and can short. It must be properly insulated and kept dry.
- Damaged bus wires can overheat or short. Do not break bus wire strands when scoring the jacket or core.
- Do not bury any of the components. Both the power connection and end seal must be

installed in a dry junction box.

- Heat-damaged components can short. Use a heat gun or torch with a soft, yellow, low-heat flame. Keep the flame moving to avoid overheating, blistering, or charring the heat-shrinkable tubes. Avoid heating other components. Replace any damaged part.
- Bus wires will short if they contact each other. Keep bus wires separated.
- Connection kits and heating cable ends must be kept dry before and during installation.
- Damaged heating cable can cause electrical arcing or fire. Use only plastic cable ties to secure the heating cable to the reinforcement. Do not use metal attachments such as tie wire.
- Do not attempt to repair or energize damaged heating cable. Remove damaged sections at once and replace them with a new length using the appropriate Raychem splice kit. Replace damaged connection kits.
- Megohmmeters operate at high voltage. This voltage is hazardous and possibly lethal. Read and follow all instructions included with the instrument you are using.

### CAUTION:

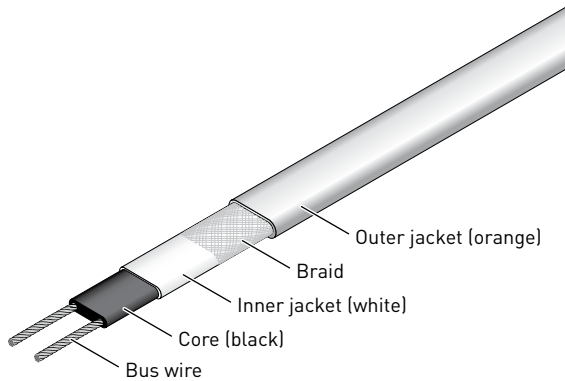
**HEALTH HAZARD:** Over heating heat-shrinkable tubes will produce fumes that may cause irritation. Use adequate ventilation and avoid charring or burning. Consult MSDS RAY4566 for further information.

CHEMTREC 24-hour emergency telephone:  
(800) 424-9300

Non-emergency health and safety information:  
(800) 545-6258.

## Power Connection Installation and Assembly for ElectroMelt Snow-melting and Anti-icing System

### HEATING CABLE CONSTRUCTION

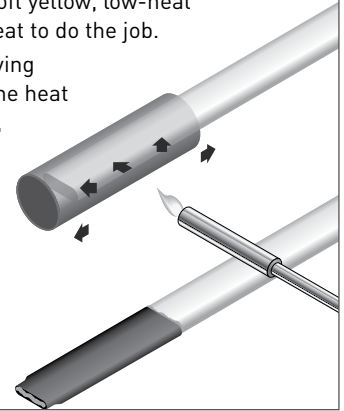


EM2-XR and EM3-XR Heating Cables

1

#### Instructions for using a heat gun or torch:

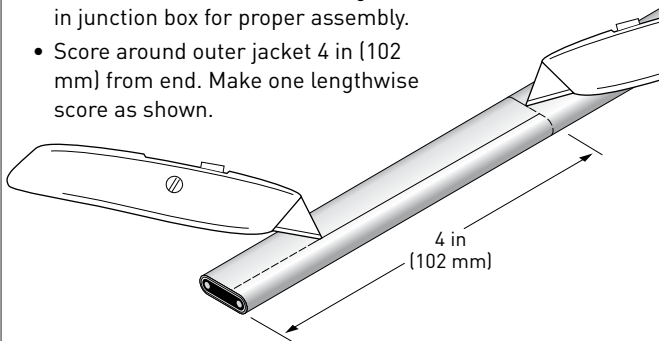
- Read important warnings on page 1 and follow safety precautions provided with heat gun or torch.
- When using a torch use a soft yellow, low-heat flame. Apply just enough heat to do the job.
- Keep torch or heat gun moving continuously to distribute the heat evenly to avoid overheating, blistering or charring the heating cable and heat-shrinkable tubes.
- Replace any heat-damaged parts.



2

**WARNING:** Do not cut into braid or inner jacket. This could result in a short circuit.

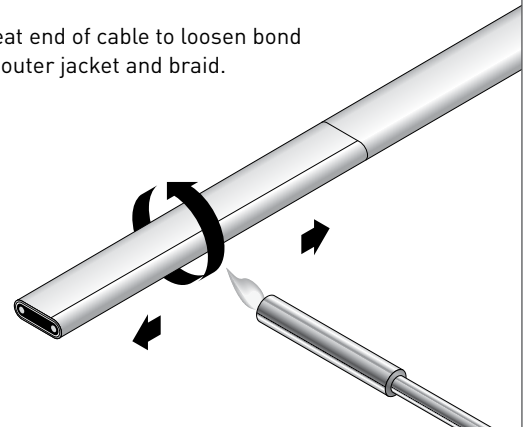
- Allow 12 in (305 mm) of heating cable in junction box for proper assembly.
- Score around outer jacket 4 in (102 mm) from end. Make one lengthwise score as shown.



3

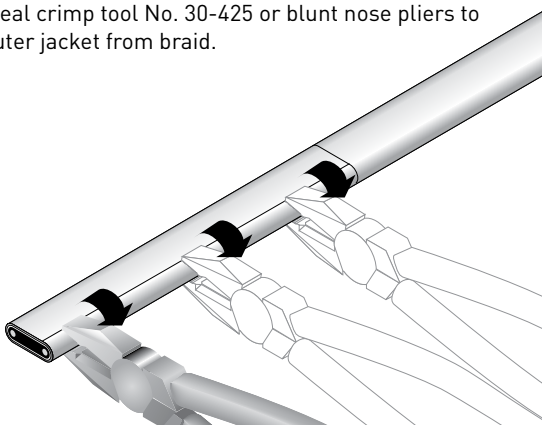
**Note:** See Step 1 for proper heating techniques.

- Gently heat end of cable to loosen bond between outer jacket and braid.



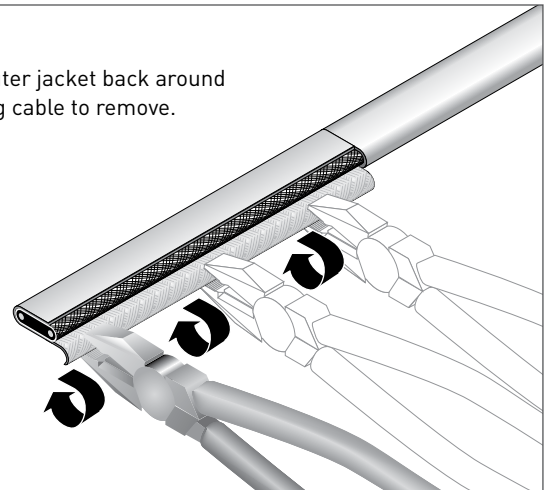
4

- Use Ideal crimp tool No. 30-425 or blunt nose pliers to pull outer jacket from braid.



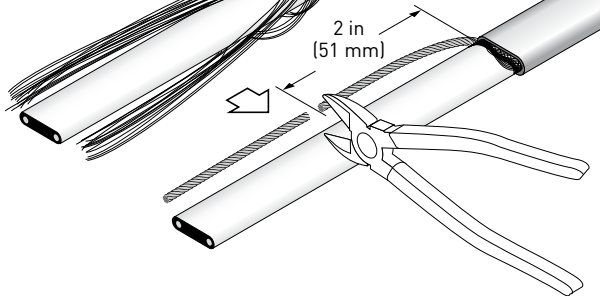
5

- Roll outer jacket back around heating cable to remove.



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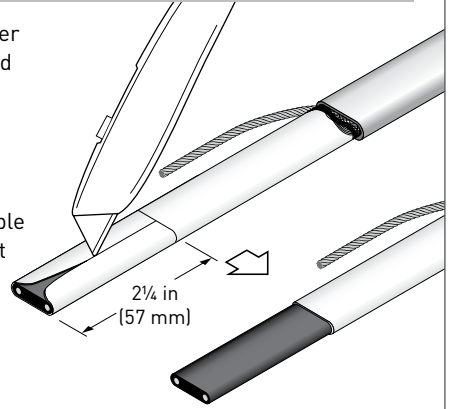
- Unravel braid and twist into a pigtail.
- Trim braid.



7

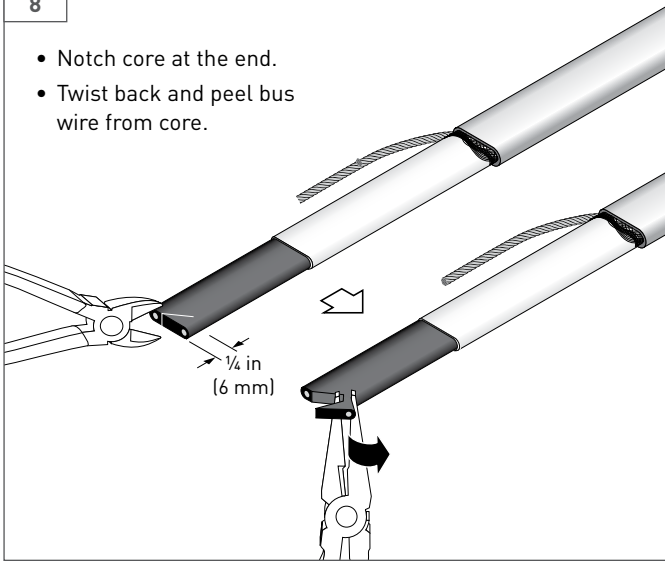
**⚠ WARNING: Do not cut or damage bus wires. Damaged wires can overheat or short.**

- Lightly score inner jacket around and down as shown.
- Bend heating cable to break jacket at score.
- Peel off jacket.



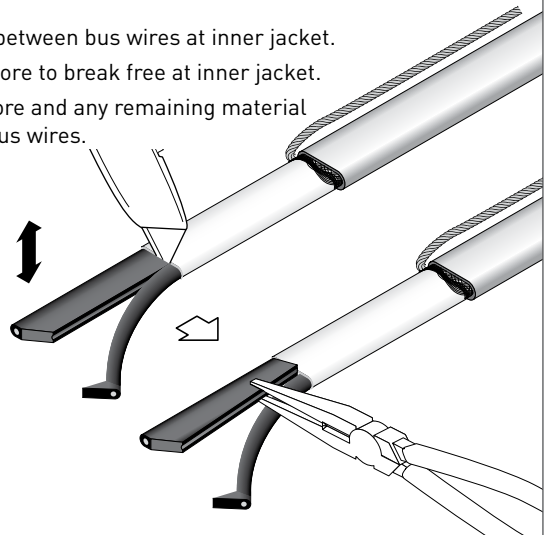
8

- Notch core at the end.
- Twist back and peel bus wire from core.



9

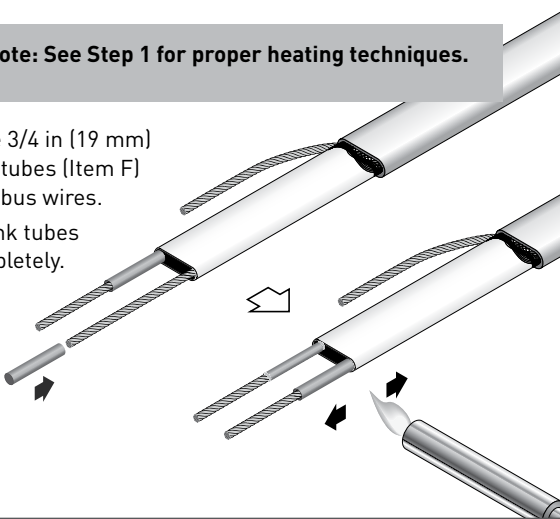
- Score between bus wires at inner jacket.
- Bend core to break free at inner jacket.
- Peel core and any remaining material from bus wires.



10

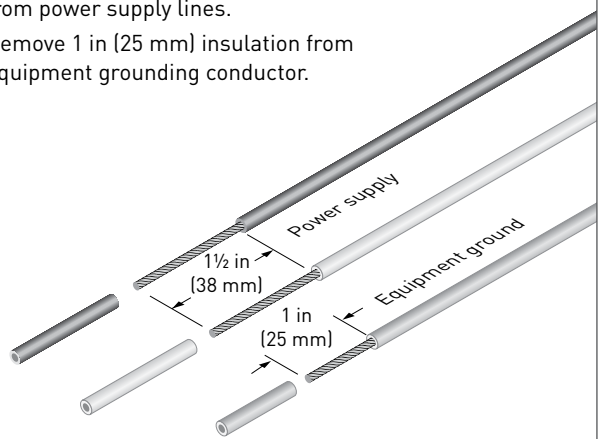
**🔪 Note: See Step 1 for proper heating techniques.**

- Slide 3/4 in (19 mm) long tubes (Item F) over bus wires.
- Shrink tubes completely.



11

- Remove 1 1/2 in (38 mm) insulation from power supply lines.
- Remove 1 in (25 mm) insulation from equipment grounding conductor.



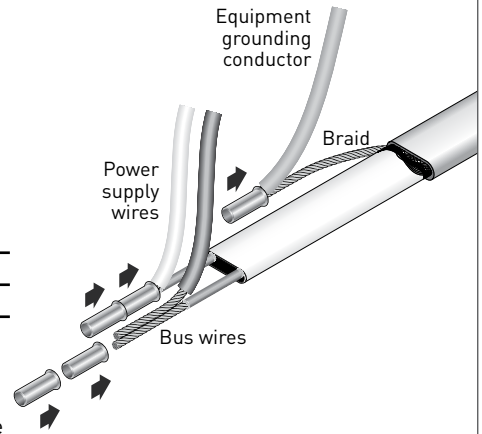
12

**⚠ WARNING: Shock and Fire Hazard**  
**Improper crimp connections can cause overheating and a danger of shock and fire. Carefully follow the crimping instructions in Step 13 to ensure a proper electrical connection.**  
**Do not substitute crimps or wire nuts. Component approvals and performance are based on Pentair Thermal Management-specified parts only.**

- Select the correct crimp connectors for the gauge of power supply wire used (see table).

Supply wire gauge	Crimp connector size
8 – 14 AWG	Ideal 411 (small, Item G)
4 – 6 AWG	Ideal 412 (large, Item H)

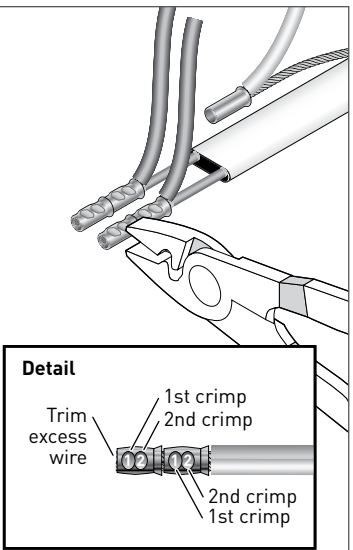
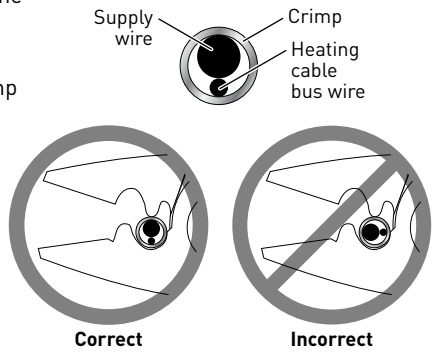
- Connect power supply wires to bus wires. Use two crimps for each connection and crimp twice on each connector (see Step 13).
- Use one crimp connector to attach equipment grounding conductor to heating cable braid (see Step 14).



13

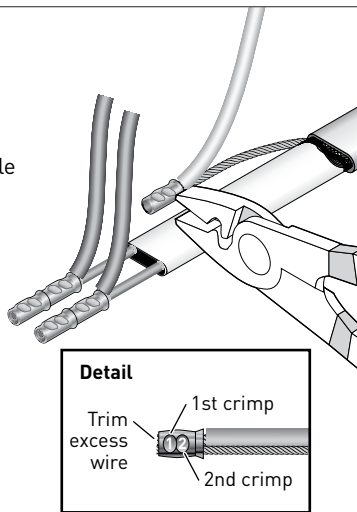
- Use the correct crimp tool (Ideal 30-425) when making the connections.
- To make the proper crimp connection, position the heating cable bus wire directly below the larger supply wire.
- Position the supply wire and bus wire in the crimp connectors and crimp tool exactly as shown.
- Crimp each connector twice (see detail).

**Conductor position in crimp**



14

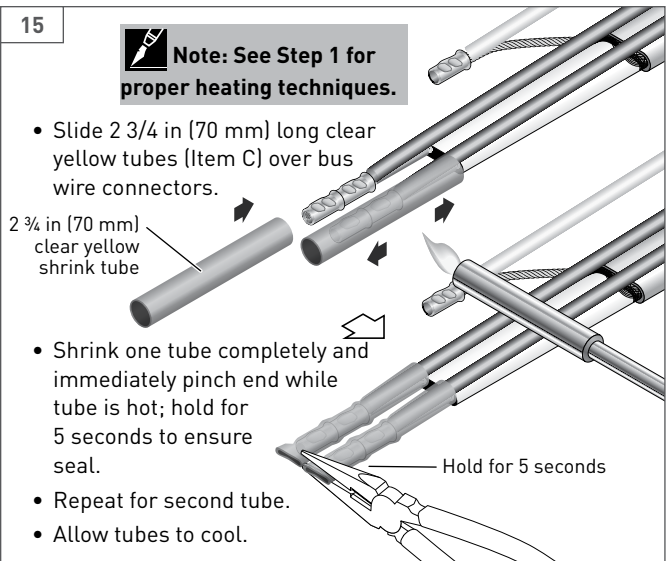
- Use only one crimp connector to attach equipment grounding conductor to heating cable braid (see detail).



15

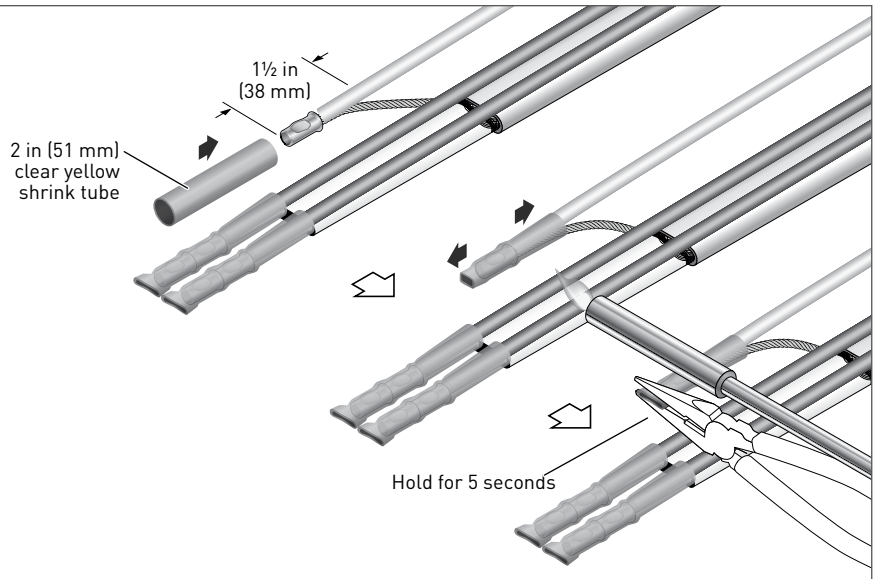
**⚡ Note: See Step 1 for proper heating techniques.**

- Slide 2 3/4 in (70 mm) long clear yellow tubes (Item C) over bus wire connectors.
- Shrink one tube completely and immediately pinch end while tube is hot; hold for 5 seconds to ensure seal.
- Repeat for second tube.
- Allow tubes to cool.



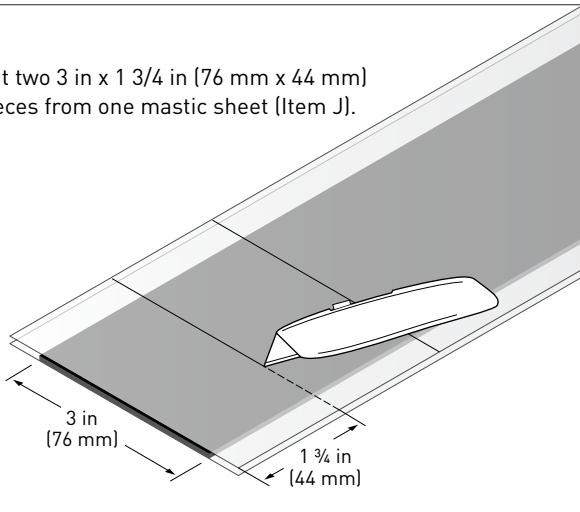
16

- Slide 2 in (51 mm) long clear yellow tube (Item D) over braid wire/ground connector.
- Shrink tubes completely and immediately pinch end while tube is still hot; hold for 5 seconds to ensure seal.
- Allow tubes to cool.



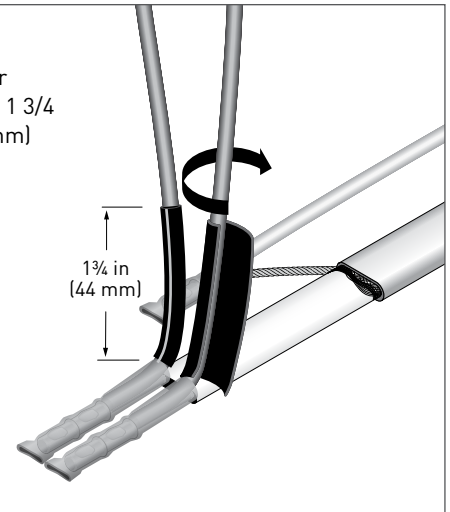
17

- Cut two 3 in x 1 3/4 in (76 mm x 44 mm) pieces from one mastic sheet (Item J).



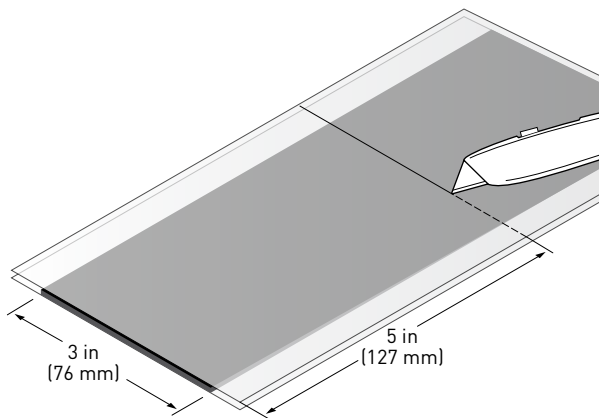
18

- Wrap each power wire with a 3 in x 1 3/4 in (76 mm x 44 mm) piece of mastic.



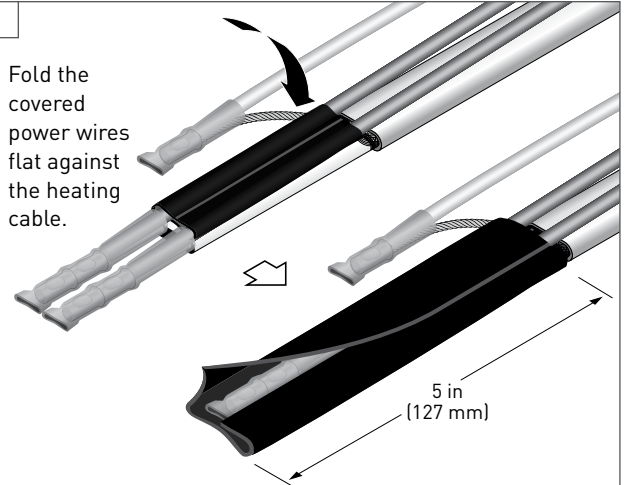
19

- Cut a 3 in x 5 in (76 mm x 127 mm) piece from one mastic sheet (Item J).



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- Fold the covered power wires flat against the heating cable.



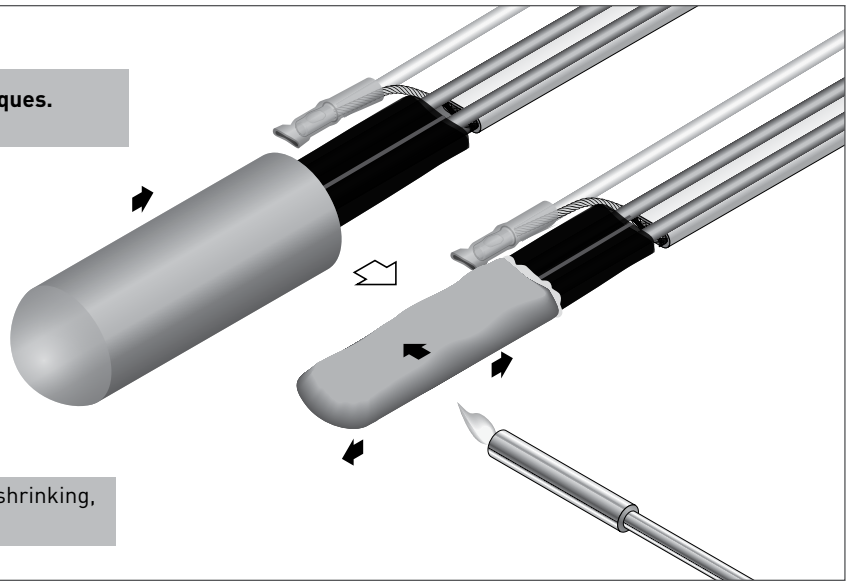
- Use the 3 in x 5 in (76 mm x 127 mm) mastic sheet to cover the first mastic sheet, bus wires, and wire connectors. Do not cover outer jacket with mastic.

21

 **Note:** See Step 1 for proper heating techniques.

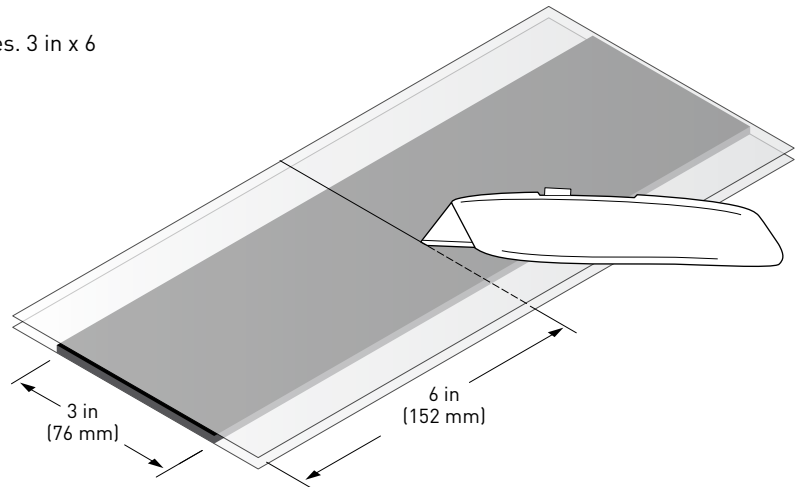
- Position the heat-shrinkable cap (Item B) over the second mastic sheet. Push it all the way down.
- Heat the cap until it shrinks completely.

**IMPORTANT:** If cap starts to slide off end while shrinking, pull it back in place and hold until it cools.



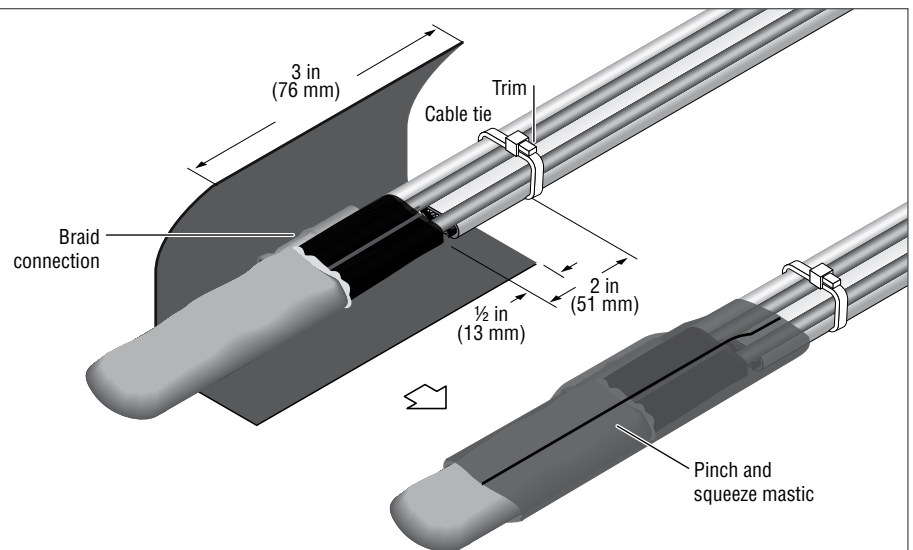
22

- Cut second mastic sheet (Item J) into two pieces. 3 in x 6 in (76 mm x 152 mm)



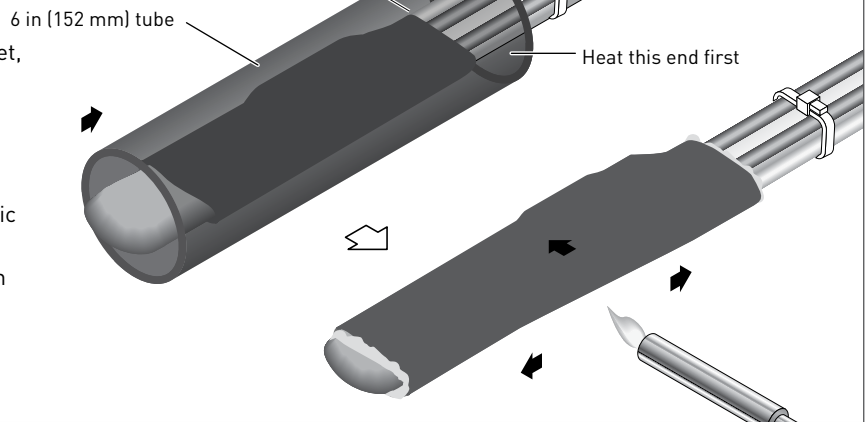
23

- Secure all wires 2 in (51 mm) from end of outer jacket using cable tie (Item I).
- Position braid connection next to cap.
- Wrap braid connection and 1/2 in (13 mm) of outer jacket with 3 in x 6 in (76 mm x 152 mm) mastic sheet (Item J).




 **Note:** See Step 1 for proper heating techniques.

- Position the 6 in (152 mm) long heat-shrinkable tube (Item A) over the mastic sheet, 1/2 in (13 mm) from end of mastic sheet.
- Begin heating tube at end near cable tie.
- Heat until tube is recovered completely and adhesive or mastic flows from ends.
- Continue to heat center section to melt mastic inside but do not blister or burn tube.
- Allow the connection to cool before placing in junction box.

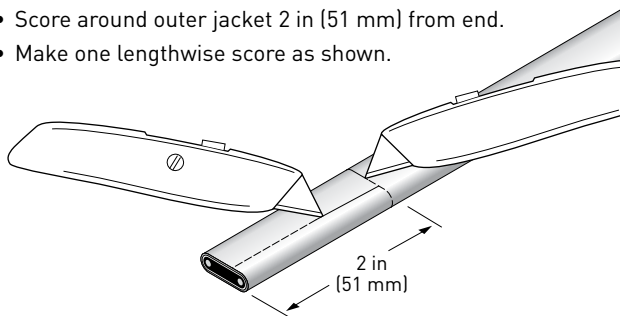


### End Seal Installation Instructions

1

 **WARNING:** Do not cut into braid or inner jacket. This could result in a short circuit.

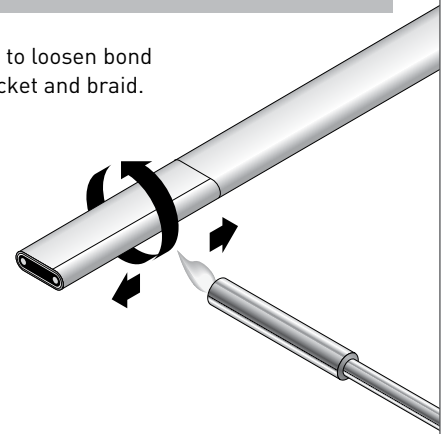
- Allow 12 in (305 mm) of heating cable in junction box for proper assembly.
- Score around outer jacket 2 in (51 mm) from end.
- Make one lengthwise score as shown.



2

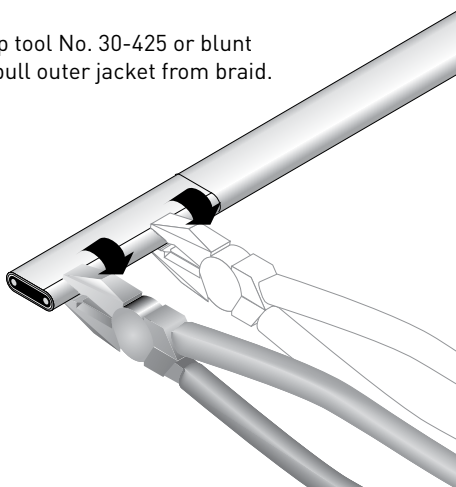
 **Note:** See Step 1 for proper heating techniques.

- Gently heat cable to loosen bond between outer jacket and braid.



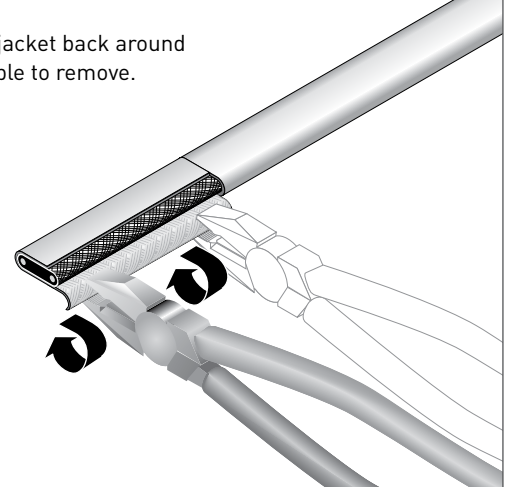
3

- Use Ideal crimp tool No. 30-425 or blunt nose pliers to pull outer jacket from braid.



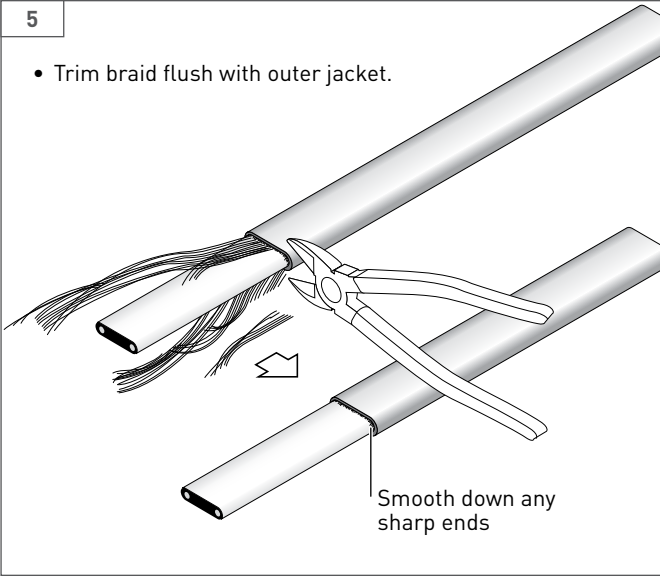
4

- Roll outer jacket back around heating cable to remove.



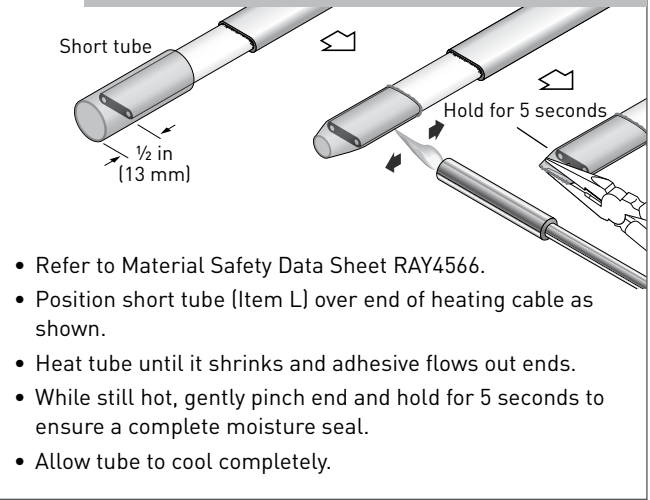
5

- Trim braid flush with outer jacket.



6

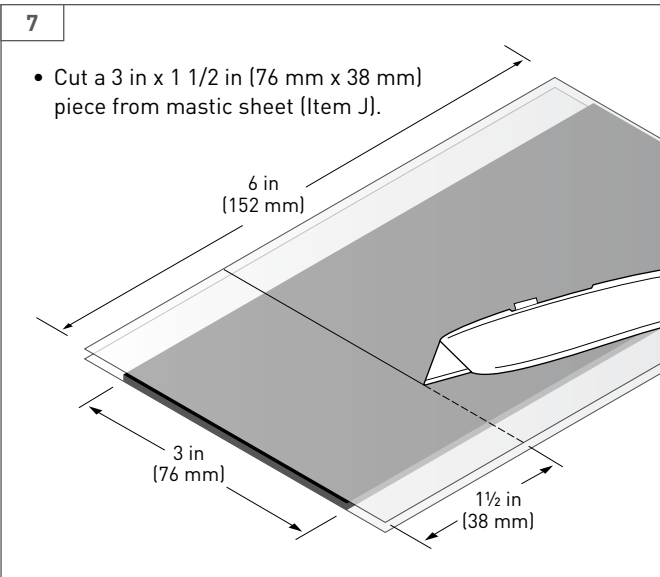
**Note:** Heat-shrinkable tubing must be installed to prevent electrical short. See Step 1 for proper heating techniques.



- Refer to Material Safety Data Sheet RAY4566.
- Position short tube (Item L) over end of heating cable as shown.
- Heat tube until it shrinks and adhesive flows out ends.
- While still hot, gently pinch end and hold for 5 seconds to ensure a complete moisture seal.
- Allow tube to cool completely.

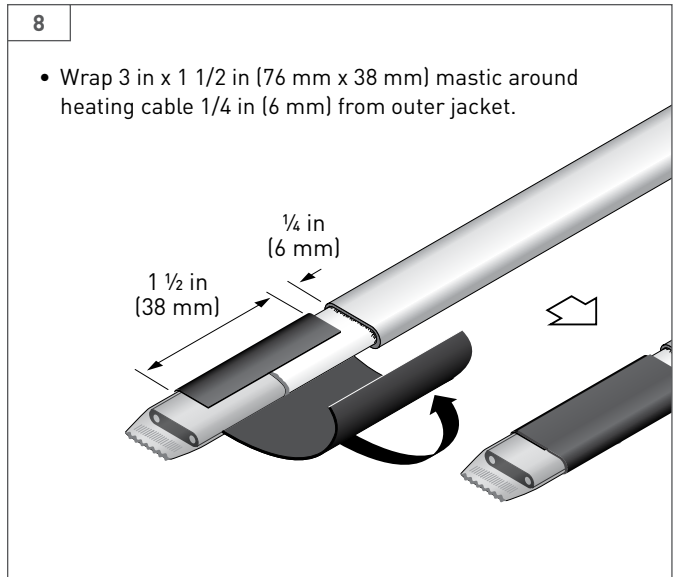
7

- Cut a 3 in x 1 1/2 in (76 mm x 38 mm) piece from mastic sheet (Item J).



8

- Wrap 3 in x 1 1/2 in (76 mm x 38 mm) mastic around heating cable 1/4 in (6 mm) from outer jacket.

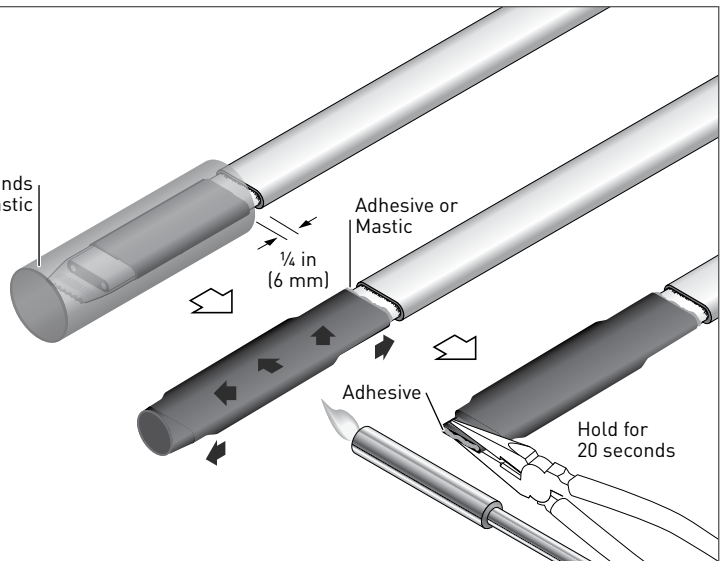


9

**Note:** See Step 1 for proper heating techniques.

- Position 3 in (76 mm) long heat-shrinkable tube (Item K) over the mastic and position 1/4 in (6 mm) from outer jacket.
- Heat the tube until adhesive or mastic flows out ends.
- Remove heat source and immediately pinch end with needle-nose pliers for 20 seconds to ensure a complete moisture seal.
- Allow tube to cool completely.

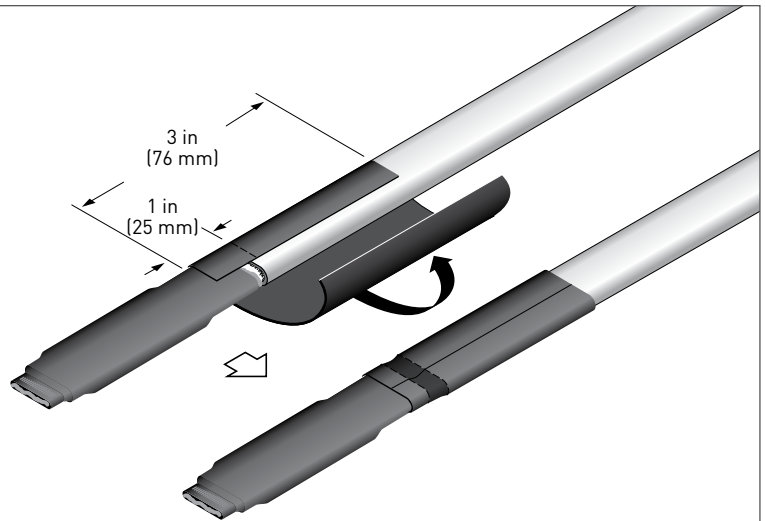
Outer tube extends past inner mastic






10

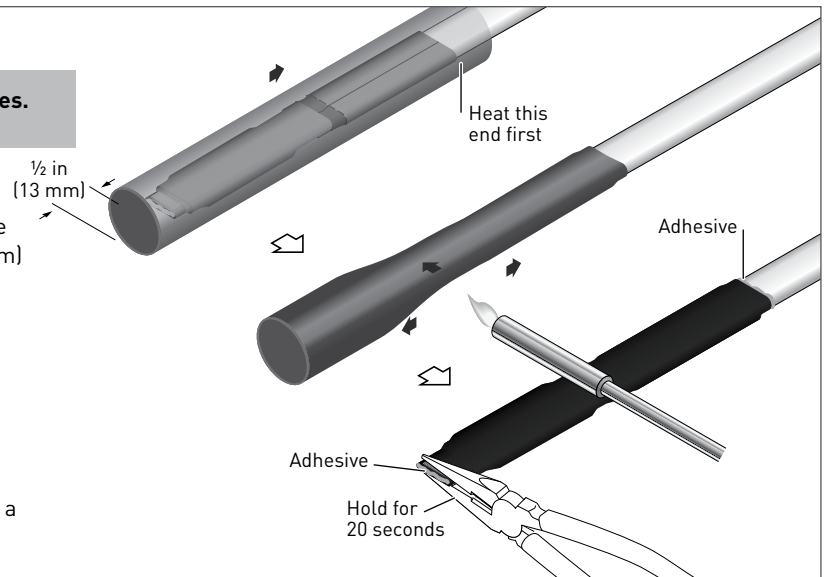
- Wrap remaining 3 x 4 1/2 in (76 mm x 114 mm) mastic sheet (Item J) around outer jacket with 1 in (25 mm) overlapping the recovered heat-shrinkable tubing.



11

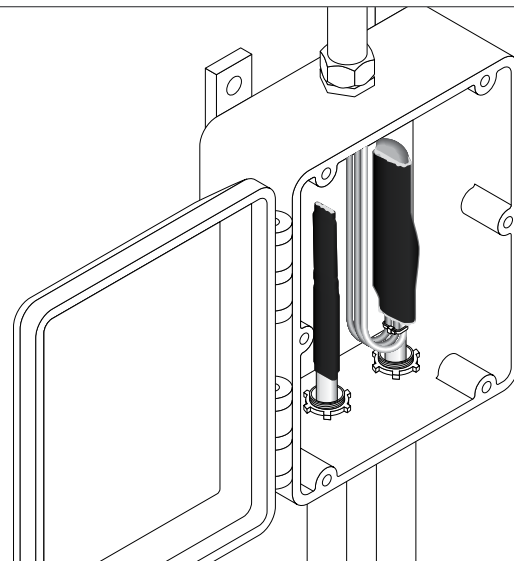
 **Note: See Step 1 for proper heating techniques.**

- Slide the 6 in (152 mm) long heat-shrinkable tube (Item A) over end. Position tubing so 1/2 in (13 mm) extends beyond pinched end of inner tube.
- Begin heating tube at end next to mastic sheet.
- Heat the tube until it is completely recovered and adhesive or mastic flows out ends.
- Continue to heat center section to melt mastic inside but do not blister or burn tube.
- Remove heat source and immediately pinch end with needle-nose pliers for 20 seconds to ensure a complete moisture seal.



12

- Allow end seal to cool completely. Position end seal so it does not come in contact with power connection.
- Route heating cable so that power connection and end seal are in same junction box. Use an EMK-XJB junction box or agency certified equivalent. A minimum of 400 cubic inches are needed for 1 power connection and 1 end termination per junction box.
- Apply "Electrical Deicing and Snow Melting" label (Item E) on junction box cover. Place second label near installation where applicable.
- Leave these installation instructions with the end user for future reference.





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