nvent RAYCHEM JBM-100-L-A Wire Connector and Terminal Blocks Instruction Manual

Contents

nvent RAYCHEM JBM-100-L-A Wire Connector and Terminal Blocks

KIT CONTENTS

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C	1	Box plug, o-ring, and locknut
D	1	Cable lubricant
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F	3	Green/yellow tubes
G	1	Box with terminal blocks
H	1	Lid
I	1	Spanner
J	1	Strain relief
K	1	JBL-100-R Plug-in module

Power Connection, Powered Splice, Powered Tee, Dual Power Connection, Splice or Tee with Junction Box and Light

DESCRIPTION

The nVent RAYCHEM JBM-100-L-A is a Type 4X-rated connection kit. It is designed for use with RAYCHEM BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT, HTV-CT and VPL-CT industrial parallel heating cables. The kit can be used to connect one, two, or three heating cables to power, to connect two separate heat-trace circuits, or to splice or tee up to three heating cables. The kit includes a plug-in light module that indicates when power is supplied to the heating cable circuit.
Note: For two or more heating cables powered by a single circuit, the length of each heating cable should not exceed the maximum allowable circuit length published in the nVent RAYCHEM self-regulating cables design guide and the total current of all heating cables on the circuit should equal no more than 80% of the circuit breaker current rating.
This kit may be installed at temperatures as low as –40°F (–40°C). For easier installation store above freezing until just before installation.
For technical support call nVent at (800) 545-6258.

TOOLS REQUIRED

- Wire cutters
- Adjustable pliers

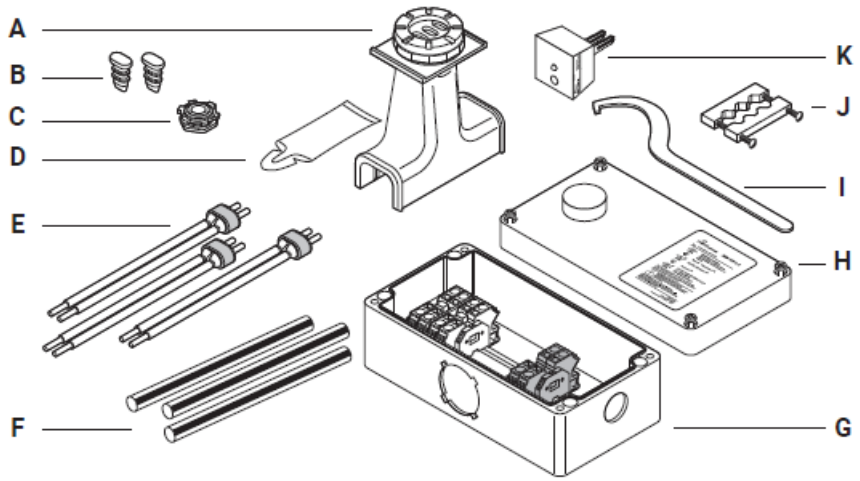
- Needle nose pliers
- Utility knife
- 1/4 in or smaller slotted screwdriver
- Marking pen
- Wire stripper (for VPL-CT)
- Large slotted screwdriver
- 3/8 in hex key (required for splice and tee connections)

ADDITIONAL MATERIALS REQUIRED

- Pipe strap
- GT-66 or GS-54 glass cloth tape

OPTIONAL MATERIALS

- Recommended conduit drain: JB-DRAIN-PLUG-3/4IN P/N 278621-000
- Small pipe adapter for 1 in (25 mm) and smaller pipes:
  Catalog number JBM-SPA P/N D55673-000



WARNING & CAUTION

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 of the installation instructions.

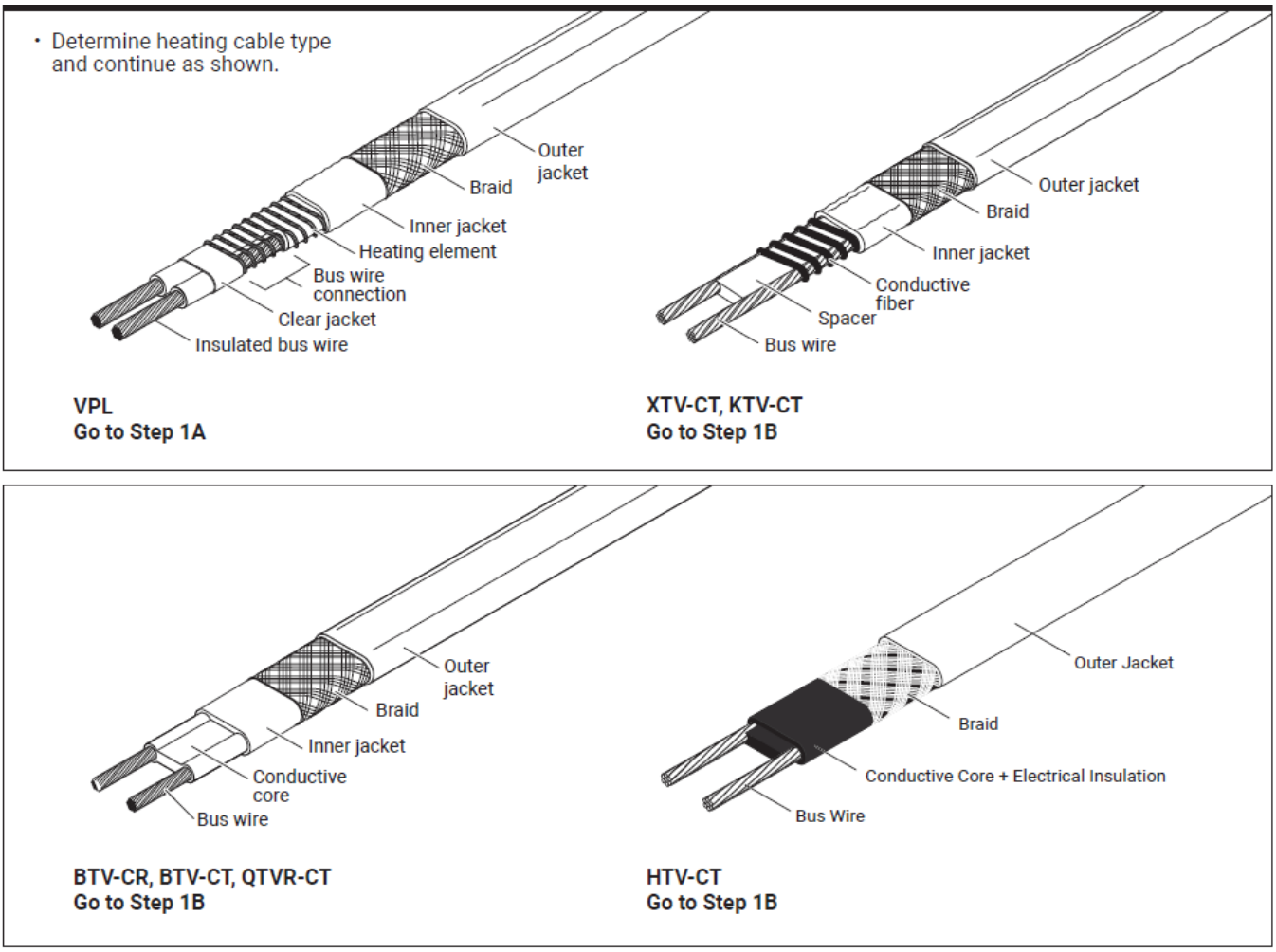
- To minimize the danger of fire from sustained electrical arcing if the heating cable is damaged or improperly installed, and to comply with the requirements of nVent, agency certifications, and national electrical codes, ground-fault equipment protection must be used. Arcing may not be stopped by conventional circuit breakers.
- The power connection may be powered by more than one circuit. Be sure all power sources are de-energized before opening box.
- Component approvals and performance are based on the use of nVent-specified parts only. Do not use substitute parts or vinyl electrical tape.
- The black heating cable core and fibers are conductive and can short. They 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.
- Keep components and heating cable ends dry before and during installation.
- Use only fire-resistant insulation materials, such as fiberglass wrap or flame-retardant foam.

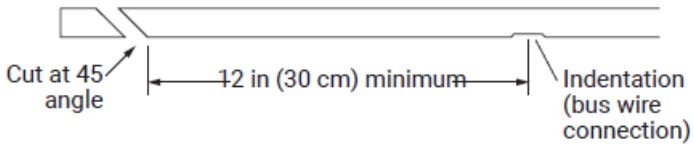
CAUTION

HEALTH HAZARD: Prolonged or repeated contact with the sealant in the core sealer may cause skin irritation. Wash hands thoroughly. Overheating or burning the sealant will produce fumes that may cause polymer fume fever. Avoid contamination of cigarettes or tobacco. Consult MSDS VEN 0058 for further information. CHEMTREC 24-hour emergency telephone: (800) 424-9300 Non-emergency health and safety information: (800) 545-6258.

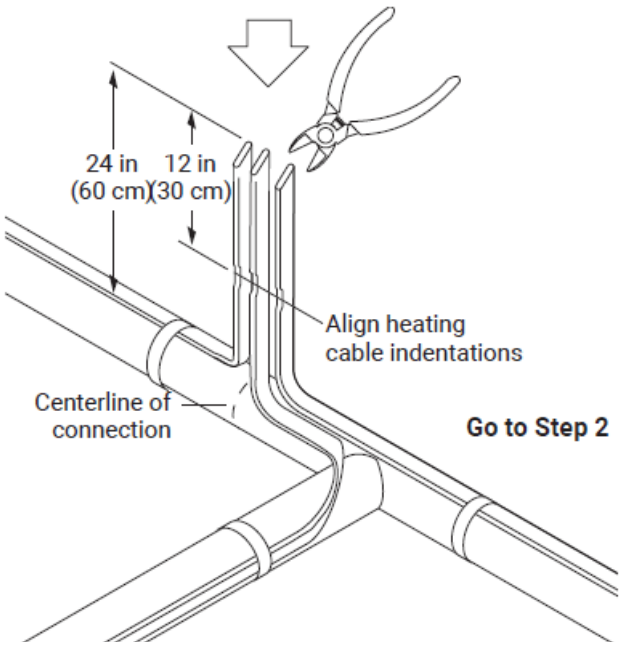
HEATING CABLE TYPES

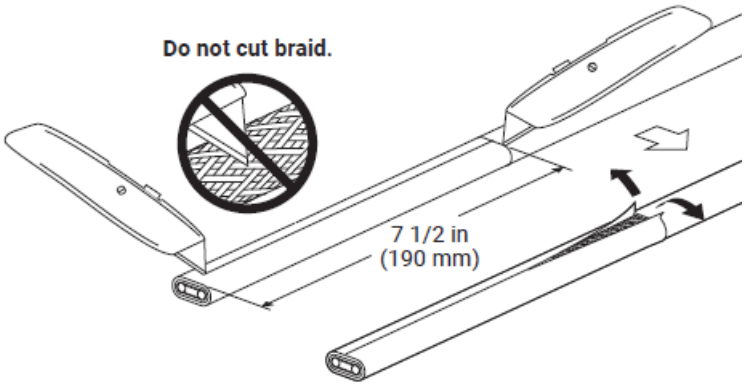


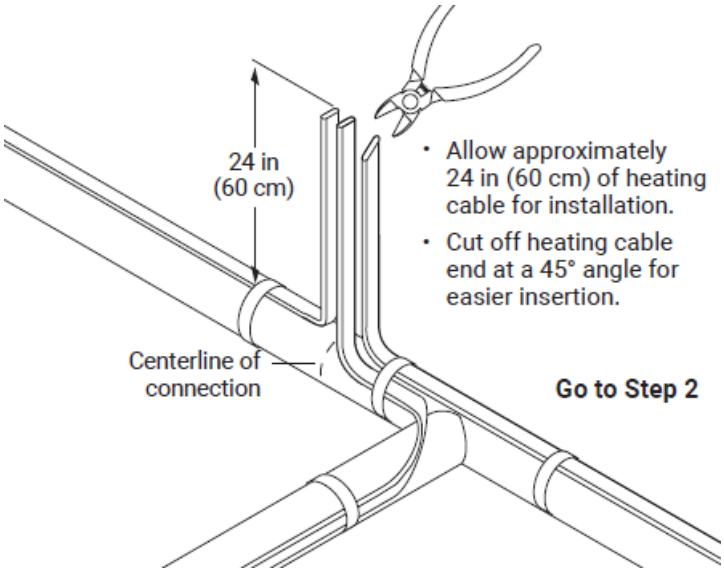
- Cut each heating cable 12 in (30 cm) from the center of the first indentation, cut at a 45° angle.



- After heating cable has been cut, align indentations. Allow approximately 24 in (60 cm) of heating cable for installation.

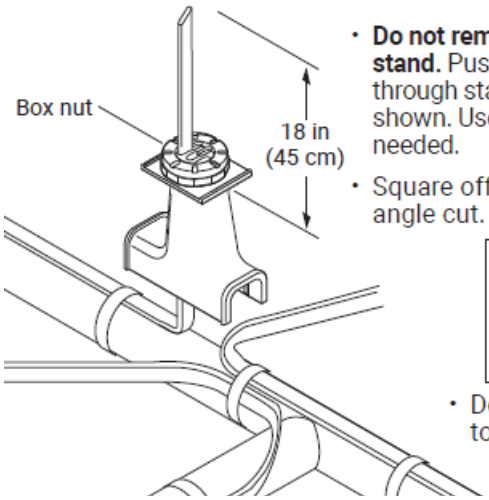




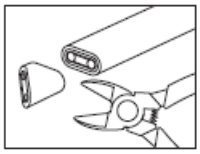


- Allow approximately 24 in (60 cm) of heating cable for installation.
- Cut off heating cable end at a 45° angle for easier insertion.

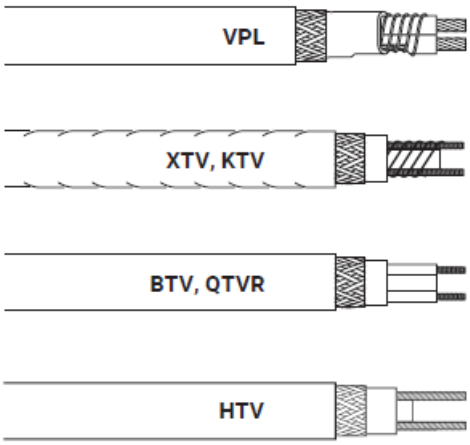
Complete steps 2 through 6 for each heating cable before going on to the next length of heating cable.



- **Do not remove box nut from stand.** Push heating cable through stand and nut as shown. Use cable lubricant if needed.
- Square off cable end with 90° angle cut.



- Do not attach stand to pipe until step 8.



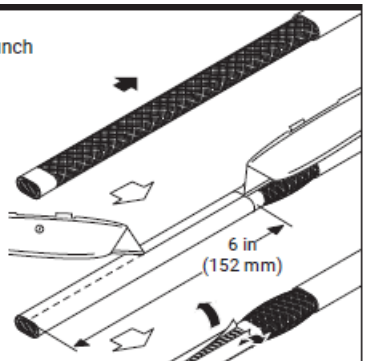
Go to Step 5A

Go to Step 5B

Go to Step 5C

Go to Step 5D

- Push braid back and bunch as tight as possible.



Lightly score inner jacket around and down as shown.

- Peel off inner jacket.

- Unwind heating element, cut and remove as shown.

- Lightly score clear jacket around and down as shown.

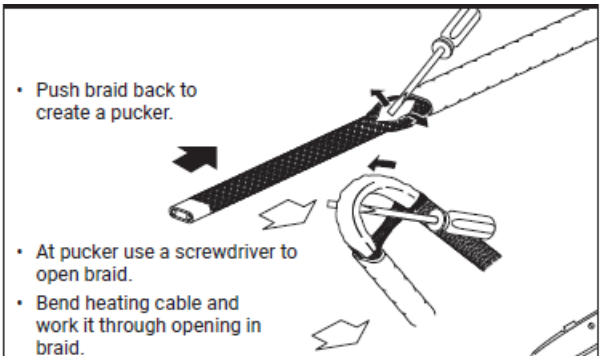
- Bend heating cable to break jacket at the score then peel off jacket.

- Push braid forward. Use a screwdriver to open braid.

- Bend heating cable and work it through opening in braid.

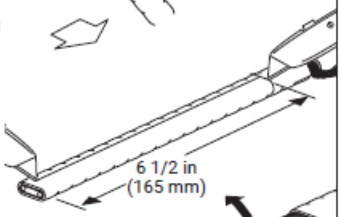
- Remove insulation from ends of bus wires.
- Pull braid tight to make pigtail.

- Push braid back to create a pucker.

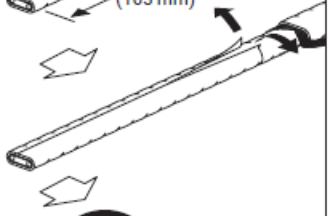


- At pucker use a screwdriver to open braid.
- Bend heating cable and work it through opening in braid.

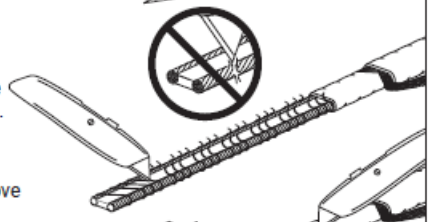
- Lightly score inner jacket around and down as shown.



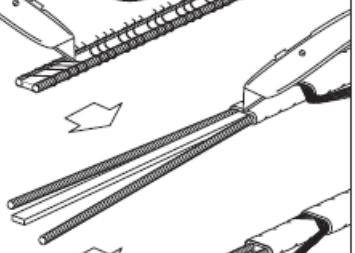
- Peel off inner jacket.



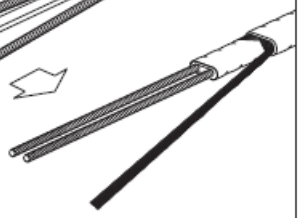
- Cut and remove all fiber strands.

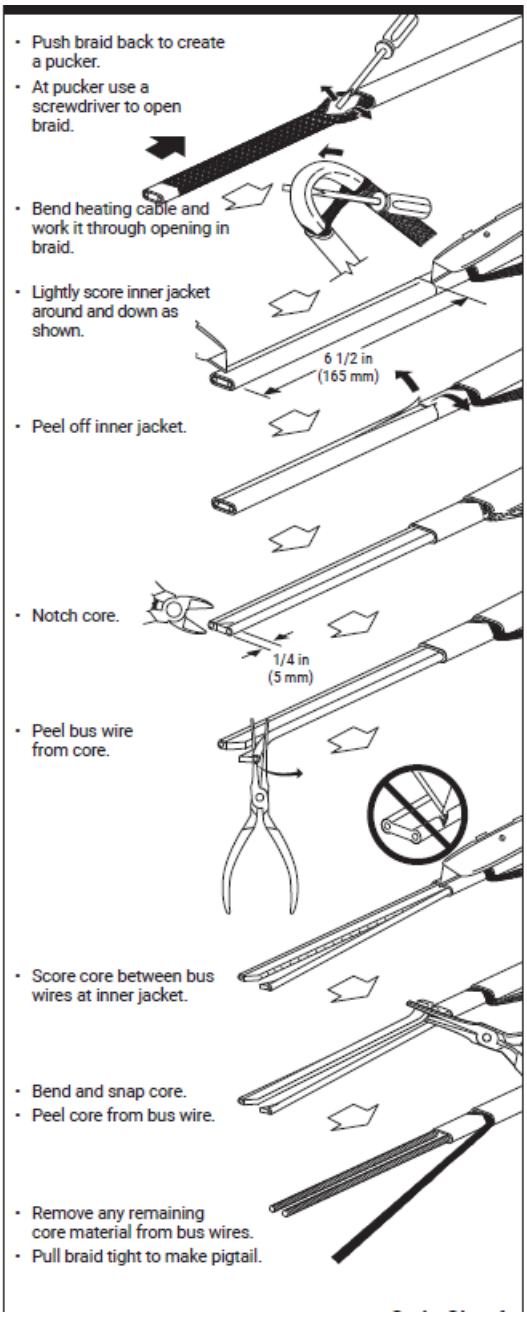


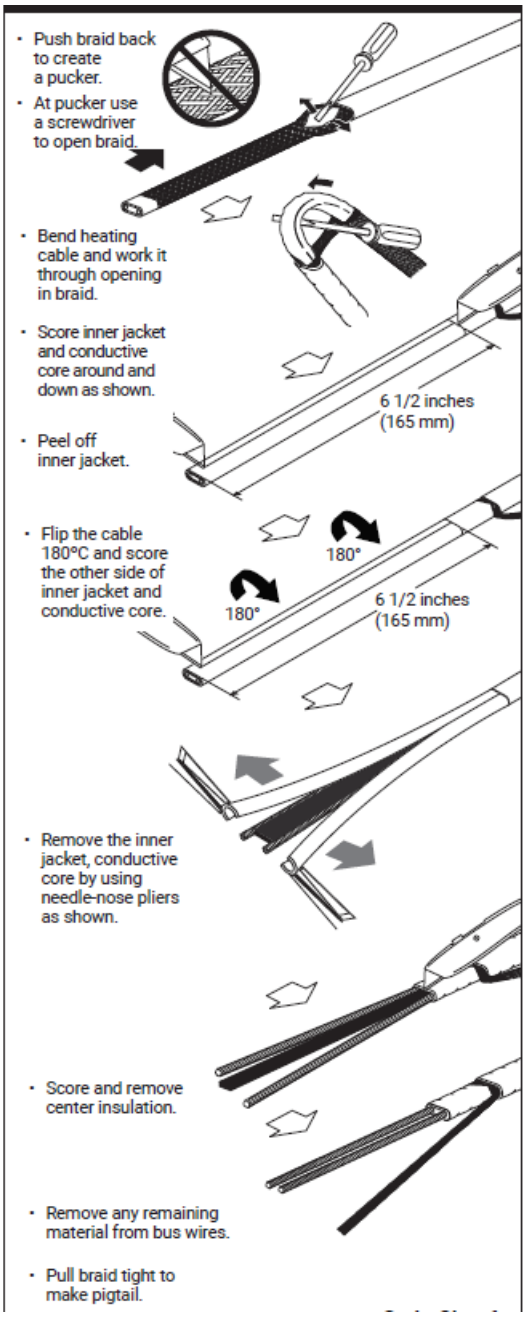
- Score and remove center spacer.



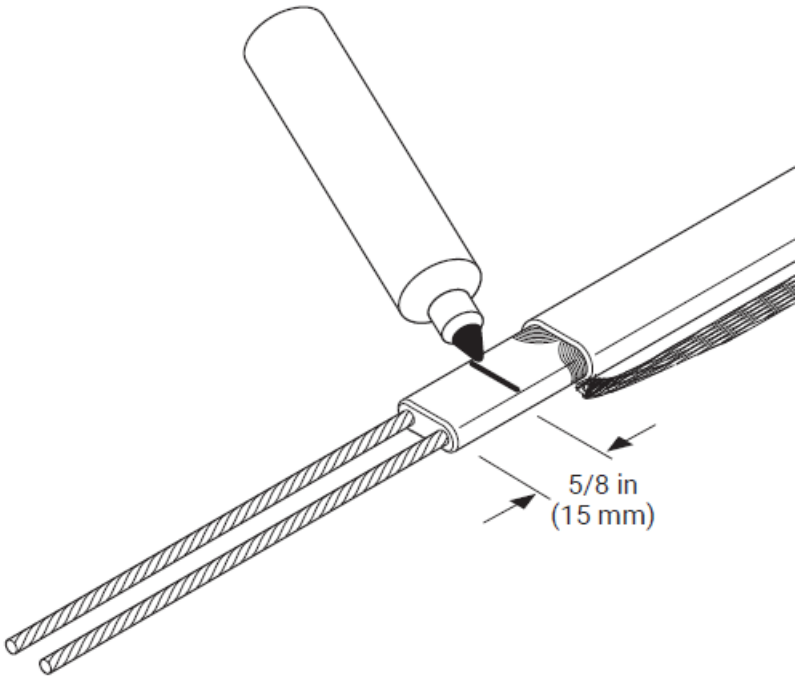
- Remove any remaining fiber material from bus wires.
- Pull braid tight to make pigtail.

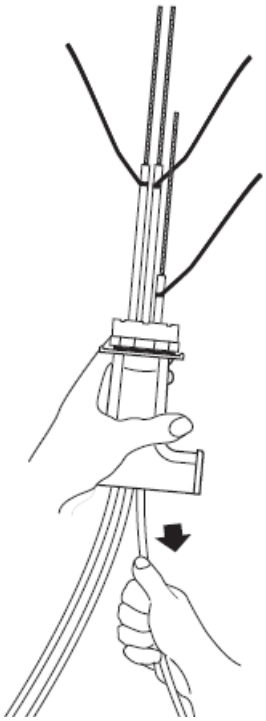



Push braid back to create a pucker.
At pucker use a screwdriver to open braid.
Bend heating cable and work it through opening in braid.
Lightly score inner jacket around and down as shown.
6 1/2 in (165 mm)
Peel off inner jacket.
Notch core.
1/4 in (5 mm)
Peel bus wire from core.
Score core between bus wires at inner jacket.
Bend and snap core.
Peel core from bus wire.
Remove any remaining core material from bus wires.
Pull braid tight to make pigtail.

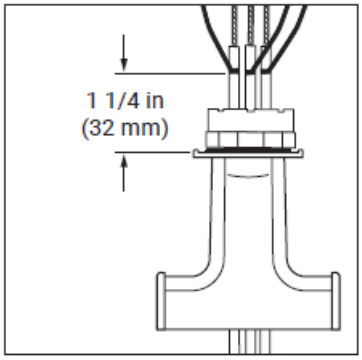

Push braid back to create a pucker.
At pucker use a screwdriver to open braid.
Bend heating cable and work it through opening in braid.
Score inner jacket and conductive core around and down as shown.
6 1/2 inches (165 mm)
Peel off inner jacket.
Flip the cable 180°C and score the other side of inner jacket and conductive core.
180°
180°
6 1/2 inches (165 mm)
Remove the inner jacket, conductive core by using needle-nose pliers as shown.
Score and remove center insulation.
Remove any remaining material from bus wires.
Pull braid tight to make pigtail.

- Mark the jacket as shown.



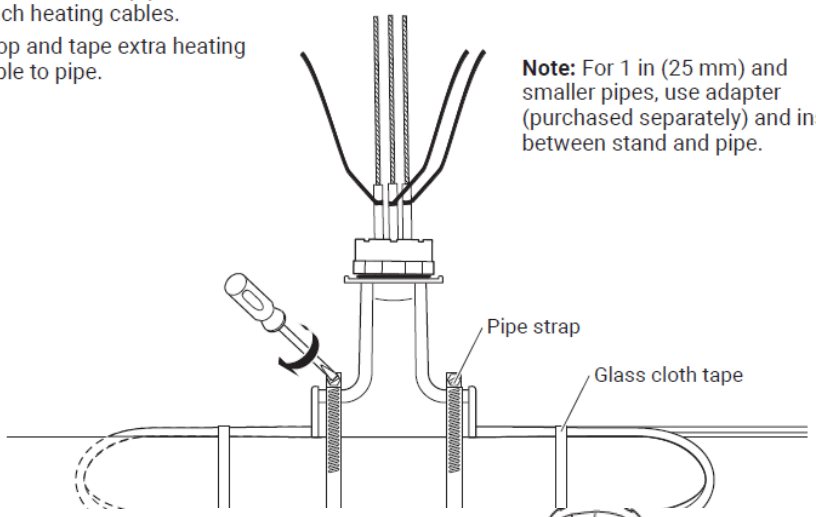


- Pull heating cable back into stand as shown. Use cable lubricant if needed.

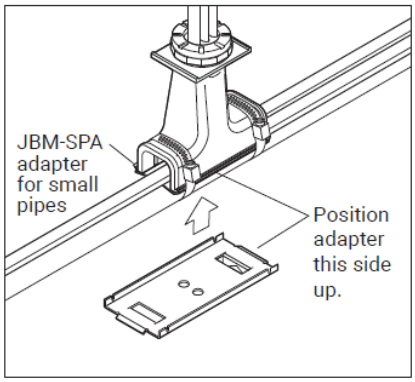


- Repeat steps 2 through 7 for other heating cables before continuing to step 8.

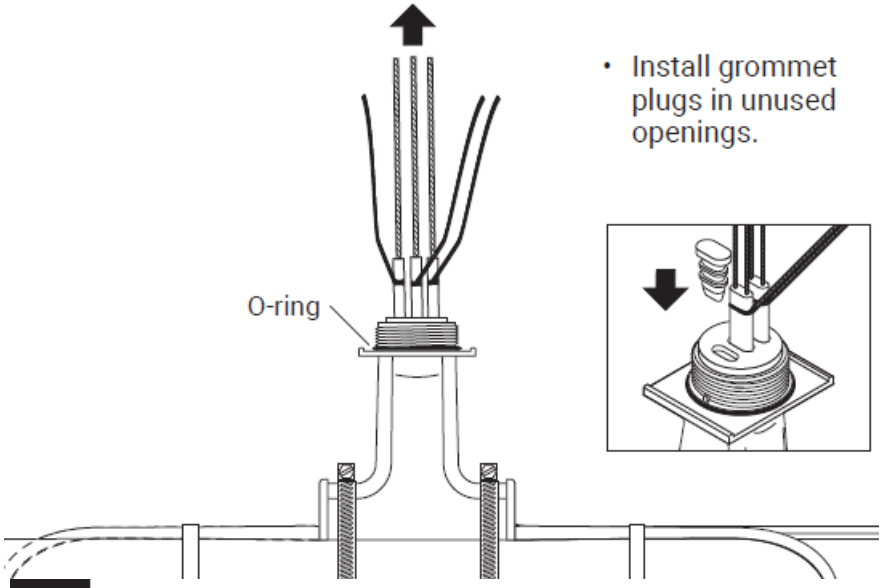
- Fasten stand to pipe. Do not pinch heating cables.
- Loop and tape extra heating cable to pipe.



Note: For 1 in (25 mm) and smaller pipes, use adapter (purchased separately) and install between stand and pipe.



- Remove box nut.



- Install grommet plugs in unused openings.

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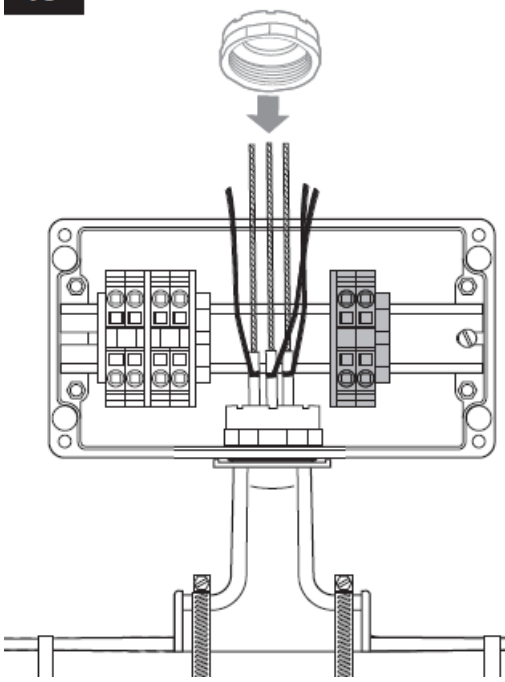
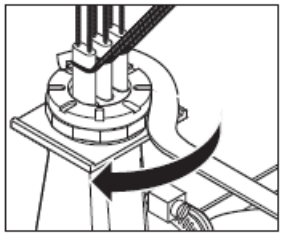
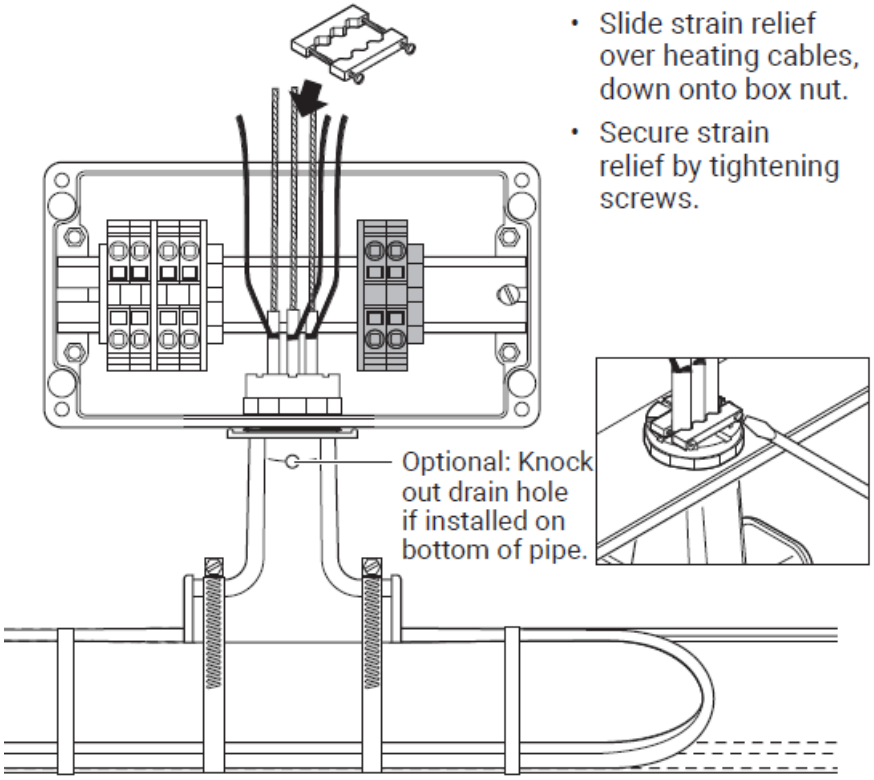


- Place junction box onto stand. Align key ways in large box hole with alignment feature on stand.
- Put box nut back onto stand.
- Tighten box nut with spanner.

Torque = 22 +/- 2 Nm

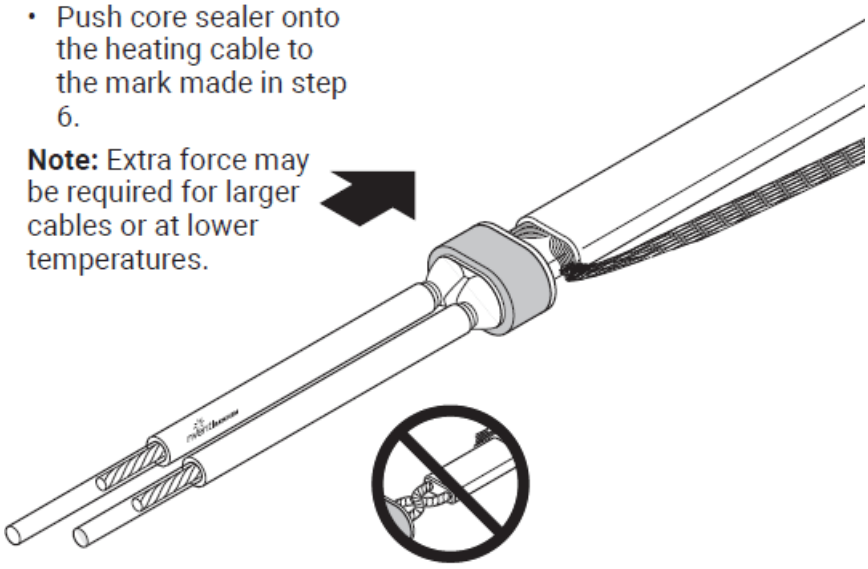




- Slide strain relief over heating cables, down onto box nut.
- Secure strain relief by tightening screws.

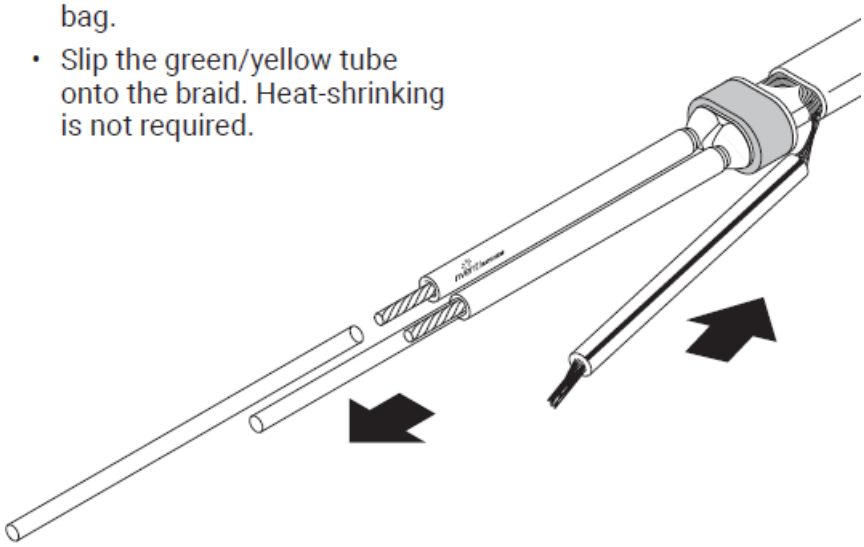
- Push core sealer onto the heating cable to the mark made in step 6.

Note: Extra force may be required for larger cables or at lower temperatures.



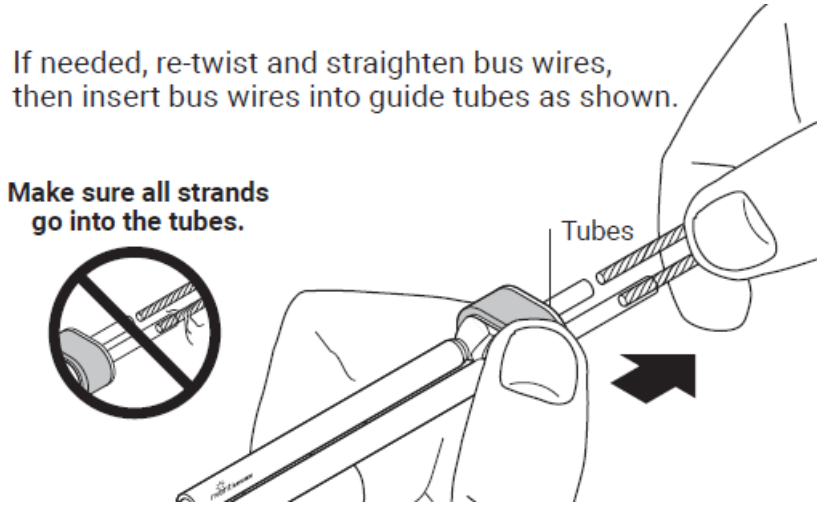
Make sure the bus wires do not kink, bunch, or crossover.

- Remove the guide tubes and dispose of them in a plastic bag.
- Slip the green/yellow tube onto the braid. Heat-shrinking is not required.

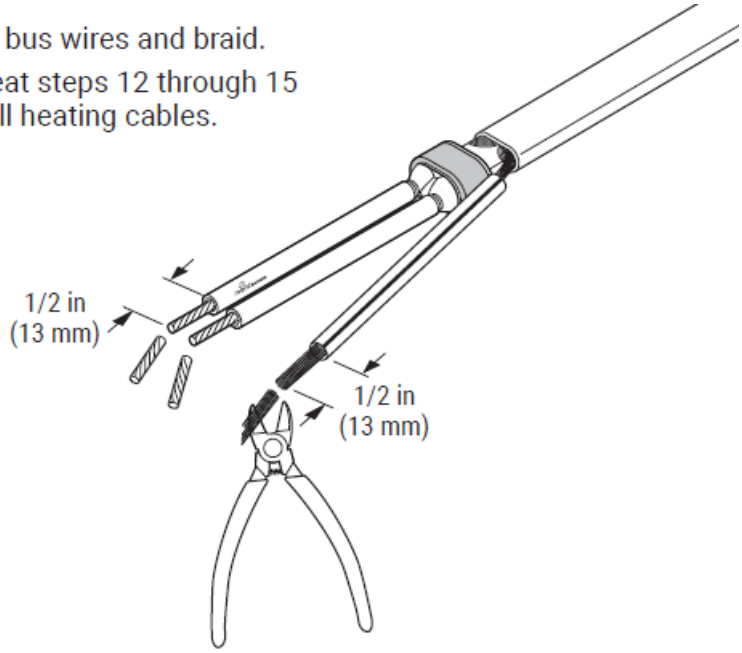


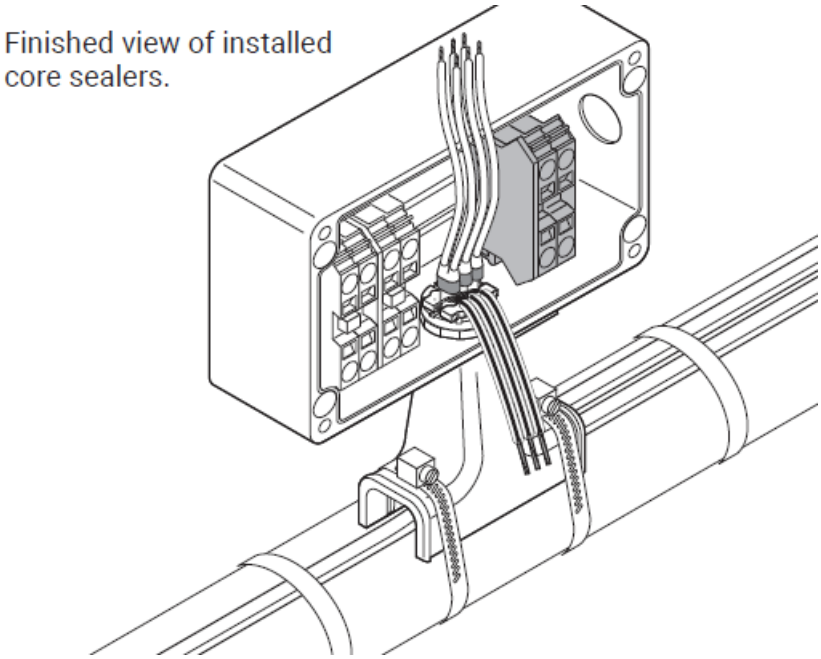
CAUTION: Health Hazard. Wash hands after contact with sealant. Consult material safety data sheet VEN 0058.

- If needed, re-twist and straighten bus wires, then insert bus wires into guide tubes as shown.



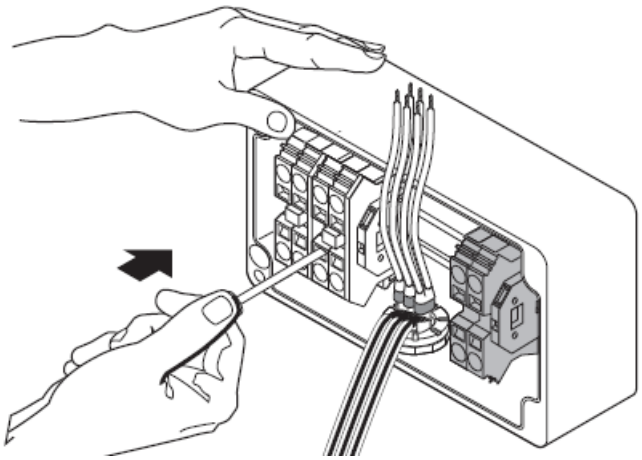
- Trim bus wires and braid.
- Repeat steps 12 through 15 for all heating cables.



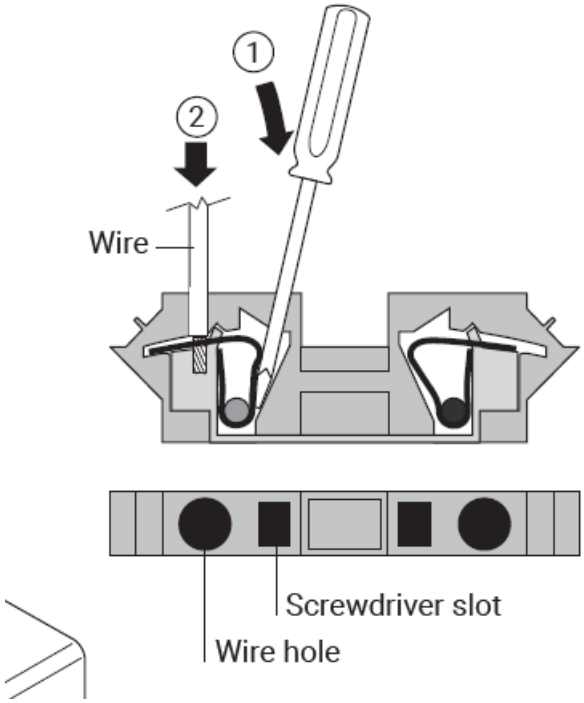


This kit uses spring clamp style terminals. Terminals use a steel spring to clamp the wire to provide improved vibration resistance, reduced maintenance and faster installation.

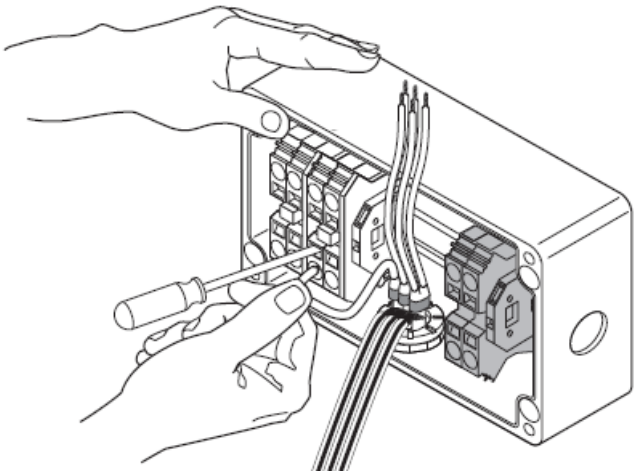
To connect wires, firmly insert a slotted screwdriver into the square hole (1) to open the spring. When fully inserted, the screwdriver will lock into place, allowing you to remove your hand and insert the wire into the round hole (2). Remove the screwdriver to clamp the wire. The wire is held securely against the bus bar for low contact resistance over time without the need to periodically retighten screws.



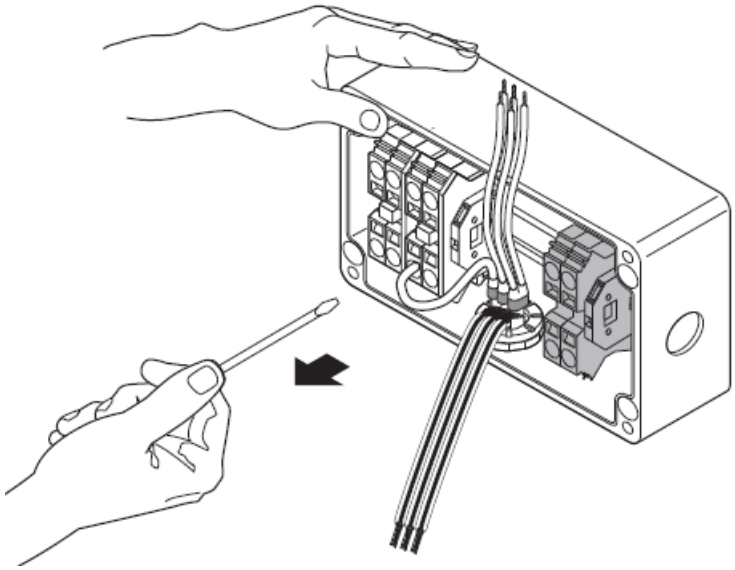
- Refer to wiring diagram, step 18A, 18B, or 18C.
- Push screwdriver FIRMLY into square hole.



WIRE Screwdriver slot Wire hole

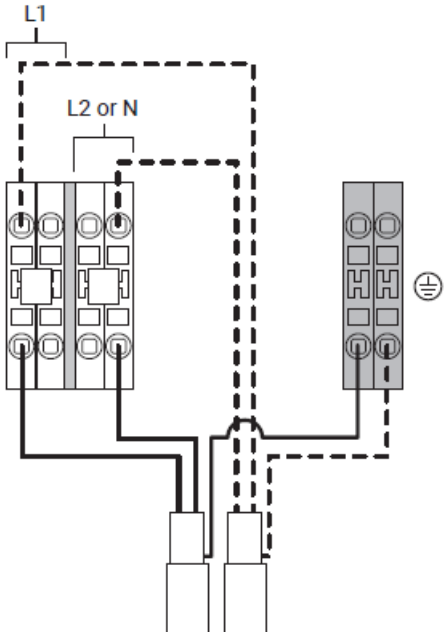


- Insert wire into round hole.
- Use green terminal for braid and ground wires.

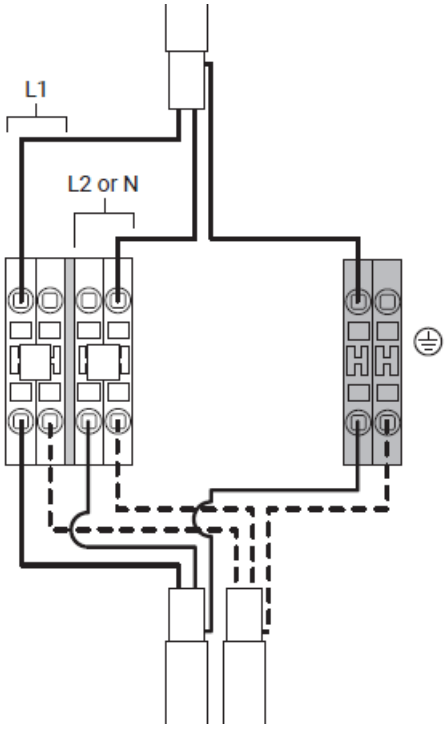


- Remove screwdriver.
- Repeat for all connections.

Splice Wiring

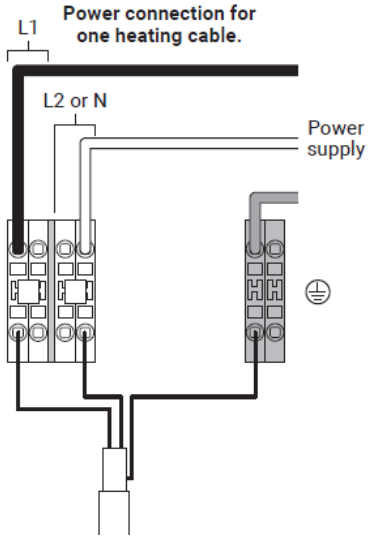


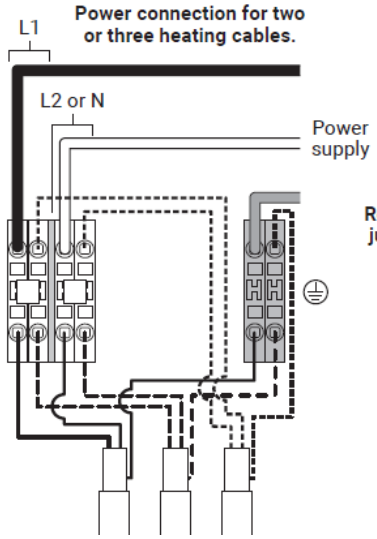
Tee Wiring

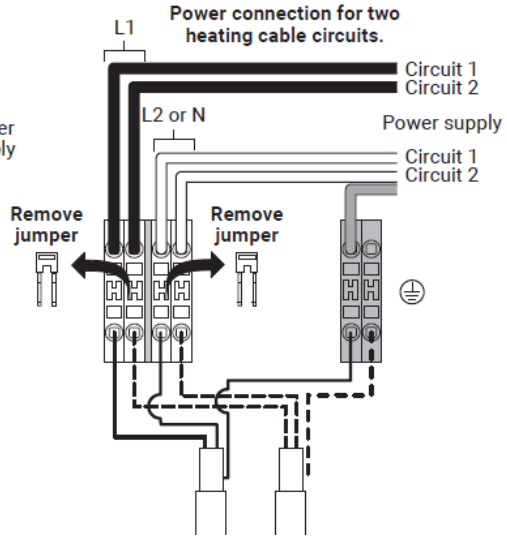


Power Connection Wiring

WARNING: Shock or fire hazard. When the power connection is energized by two circuits, the L1 and L2 jumpers must be removed to prevent an electrical short.







If used as a power connection

- Install conduit and fittings as shown. To minimize loosening due to vibration, use flexible conduit.
- Pull in power and ground wires, strip off 1/2 in (13 mm) of insulation, and terminate.

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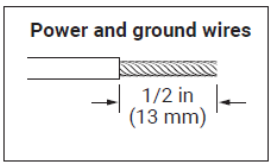
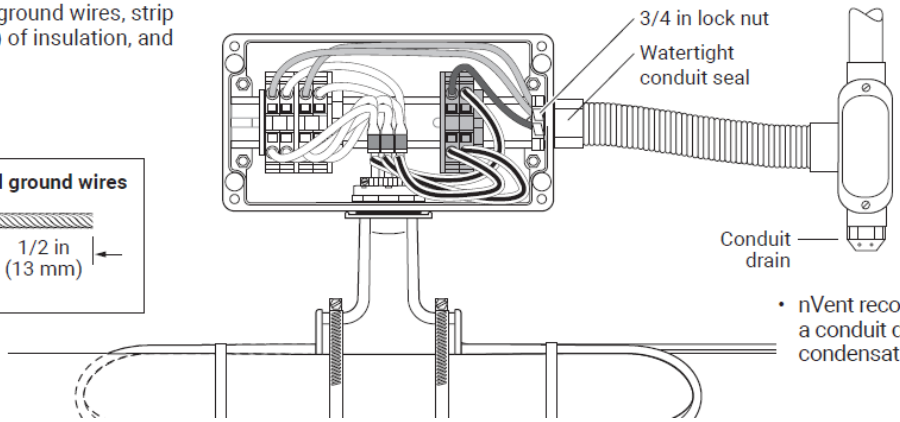


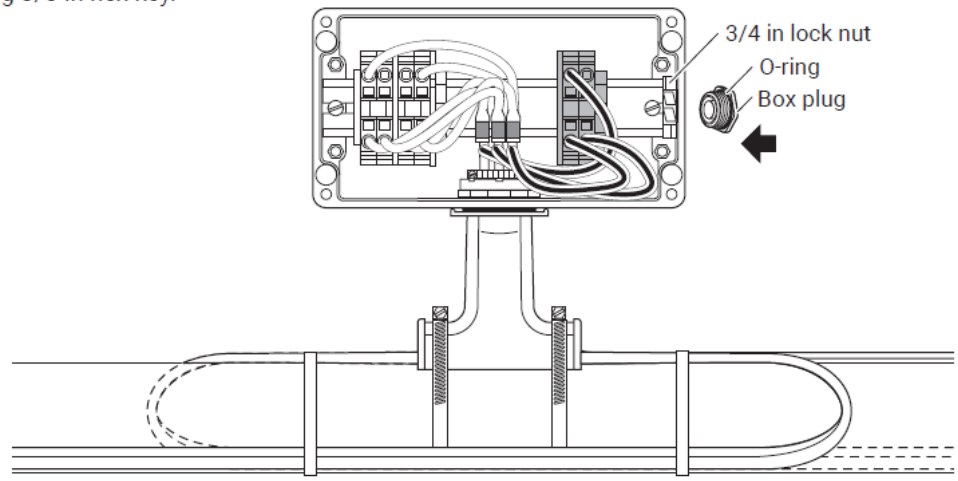


Make sure conductors are not exposed.

- nVent recommends the use of a conduit drain to prevent water condensation build-up.

If used as a splice or tee connection

- Install box plug using 3/8 in hex key.



Plug in the light module in the terminal blocks marked L and N as shown here. (For simplicity the connected wires in the terminal blocks are not shown in this step.)

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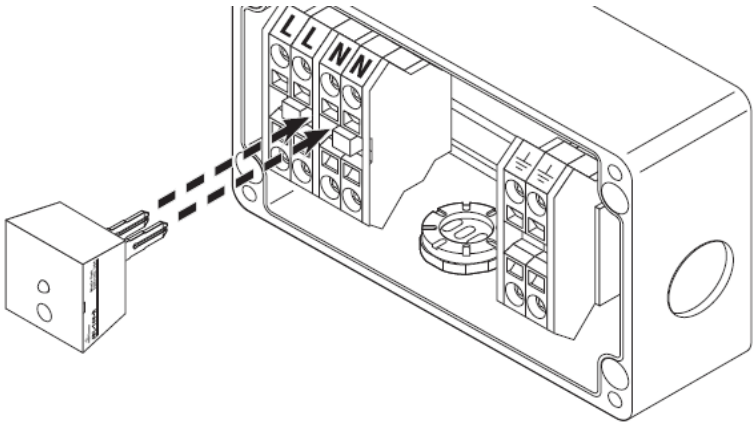
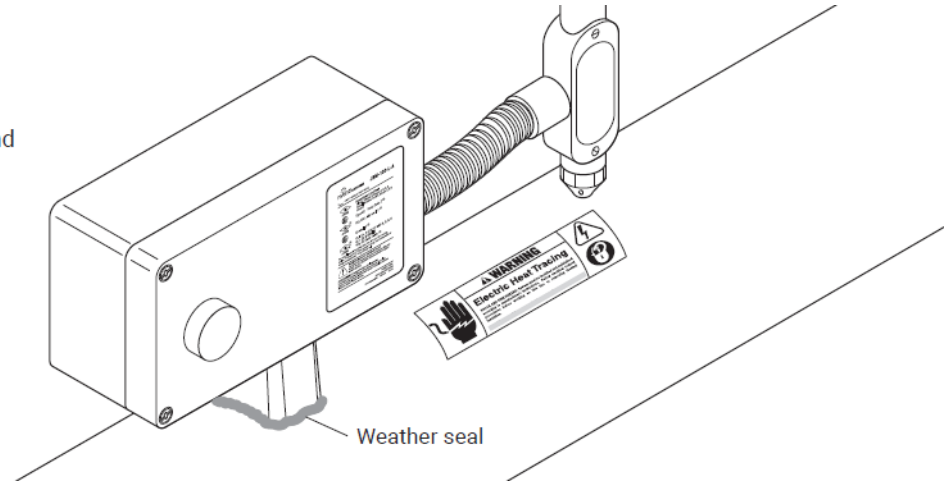
- Plug in the light module in the terminal blocks marked L and N as shown here.
  (For simplicity the connected wires in the terminal blocks are not shown in this step.)



- Install lid. Torque = 1.02 to 1.47 Nm
- Apply insulation and cladding.
- Weather-seal the stand entry.
- Leave these instructions with the end user for future reference.



WARNING: Explosion Hazard- Substitution of Components May Impair Suitability for Class I Division 2 (Zone 2)

WARNING: Explosion Hazard- Do not disconnect equipment unless power has been switched off or the area is known to be Non-Hazardous.

North America

- Tel +1.800.545.6258
- Fax +1.800.527.5703
- thermal.info@nVent.com

Europe, Middle East, Africa

- Tel +32.16.213.511
- Fax +32.16.213.604
- thermal.info@nVent.com

Asia Pacific

- Tel +86.21.2412.1688
- Fax +86.21.5426.3167
- cn.thermal.info@nVent.com

Latin America

- Tel +1.713.868.4800
- Fax +1.713.868.2333
- thermal.info@nVent.com

Documents / Resources

	nvent RAYCHEM JBM-100-L-A Wire Connector and Terminal Blocks [pdf] Instruction Manual JBM-100-L-A Wire Connector and Terminal Blocks, JBM-100-L-A, Wire Connector and Terminal Blocks

References

- Electrical Heat Tracing | Heat Tracing | nVent RAYCHEM