

TRM SR-ACC-SPL/TEE

Self Regulating Cable Splice and Tee Kit

Installation Instruction Manual

Kit Contents:



Item	Quantity	Description
A	1	Clamp Tie
B	1	Black Cloth Tape (6" long)
C	1	Heat Shrink Tubing (8" x 1")
D	3	Cable Ties
E	5	Mastic Strips (1 1/2" x 1/2")
F	3	Heat Shrink Tubing (1" x 1/2")
G	6	Heat Shrink Tubing (1" x 1/8")
H	2	Heat Shrink Cap
I	2	Insulated Bus Wire Crimps
J	1	Heat Shrink For Ground (1" x 1/2")
K	1	Uninsulated Braid Crimp

WARNING:

Electric Shock Hazard. You **MUST** disconnect all power before installing or servicing heating cable and accessories. A qualified electrician must perform installation and servicing of heating cables and accessories. Heating cables must be grounded in accordance with the National Electrical Code. Failure to comply with this code can result in personal injury or property damage.

**Product
Certifications:**



Thermal Resources Management (TRM)
175 Idema Road, Markham,
ON, Canada, L3R 1A9
Tel: 1-905-940-4737
Fax: 1-905-940-4731
Ryan@TRMheatingcables.com
www.TRMheatingcables.com

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Assembly Tools Required:

Utility knife, scissors, side cutters, needle-nose pliers, linesman pliers, channel lock pliers, crimping tool, flathead screwdriver, heat gun, measuring tape/ruler.

Important notes:

- 1) All electrical wiring including GFCI (ground fault circuit interrupters) must be installed in compliance with the National and Local Electrical Codes by qualified person(s)
- 2) Article 426 of ANSI/NFPA 70 of the National Electrical Code (NEC Section 62 of CAN/CSA-C22.1, Canadian Electrical Code, Part 1 (CEC)) Governs the installation of these heat tracing systems
- 3) TRM SR-ACC-SPL/TEE (Splice and Tee Kit) is suitable for use with TRMSR heating Cables
- 4) Cables should be terminated into certified junction boxes that are appropriate for the cable termination location
- 5) Use 30-mA ground fault protection on each heating cable circuit for maximum protection
- 6) The black heating cable core is conductive and can short. It must be properly insulated and kept dry
- 7) Keep ends of heating devices and kit components dry before and during installation work
- 8) The conductive layer of this heating device must have a suitable grounding/earthing terminal
- 9) Do not break braid or bus wire strands when scoring the jacket or conductive core. Damaged bus wires can overheat or short out
- 10) Keep bus wires separated. Bus wires will short if they touch each other
- 11) Replace damaged components. Components damaged by heat can short.
- 12) Utilize a heat gun with a low heat flame, do not use a torch with a blue flame as that would melt/compromise the heat shrink tubing. Charring or burning the heat shrink tubing can produce fumes that may cause irritation to skin,, eyes, nose, and throat
- 13) Do not heat up components of this kit (except for the heat shrink tubes)
- 14) When installing this cable, only use fire-resistant insulation materials such as fiberglass wrap
- 15) Do not twist the cable during installation

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	Maximum Circuit Lengths											
			120V					240V				
Cable Selection	Start-Up Temperature		Breaker Sizes									
	F	C		15A	20A	30A	40A		15A	20A	30A	40A
TRM BR SR	50	10		225	265	265	265		450	530	530	530
5W	32	0		225	265	265	265		450	530	530	530
	14	-10		180	235	265	265		360	470	530	530
	-22	-30		125	165	245	265		245	325	490	530
TRM BR SR	50	10		150	200	210	210		300	400	420	420
8W	32	0		125	175	210	210		250	350	420	420
	14	-10		110	150	210	210		220	300	420	420
	-22	-30		85	115	175	210		170	230	350	420

Controls and GFI:

TRM SR can function safely without the use of controls, but it is strongly recommended to utilize thermostats or controllers to maximize the efficiency of the cables while simultaneously minimizing electrical costs.

For further information or for design assistance with controls and/or sensors that work in concert with our SR cable, please call TRM directly

Circuit protection depends on the breaker size being used and the start-up temperature. NEC 1999 requires the use of ground fault protection breakers for heating cable. The above chart shows the maximum circuit length for a given breaker rating. To determine the number of circuits required for each pipe, divide the total cable (circuit) length by the maximum circuit length found in the chart. Round up to the next higher number.

- The multiplier for power output (w/ft) for 5W TRM BR type cables for 208VAC operation is .85
- The multiplier for power output (w/ft) for 8W TRM BR type cables for 208VAC operation is .89

•The heating circuit lengths calculations would also change for 208VAC operation, the multiplier for AL type cables would be 0.93, and the multiplier for BR type cables would be .92

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Applications

Commercial Construction

- Cooling Towers
- Chilled Water and Plumbing Pipes
- Sump Discharge Pipes
- Wet Sprinkler System
- Exposed P-traps
- Roof and Gutter Deicing
- Heat Loss Replacement

Industrial

- Water Treatment Facilities
- Vessel Freeze Protection
- Safety Shower Lines

Approvals

Certified for ordinary areas

SR Cable Construction

Standard

A. Buss Wires

Twin 16 AWG copper buss wires provide good current capability

B. Matrix

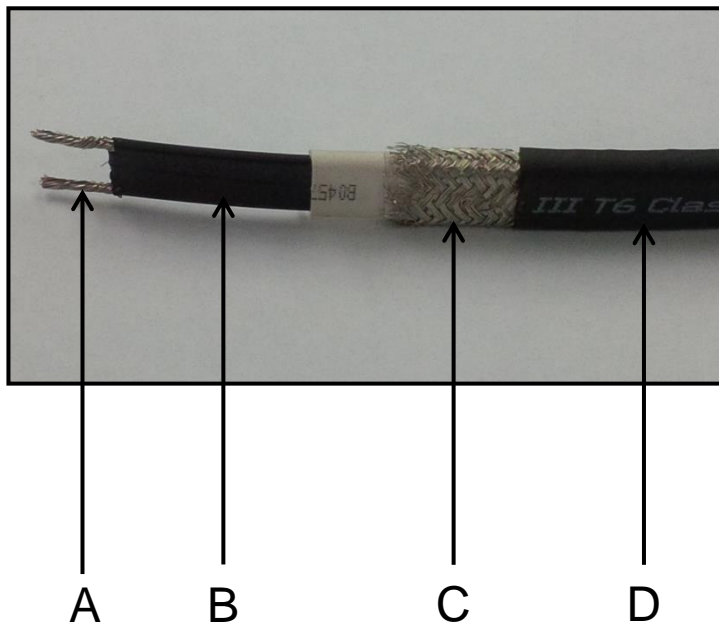
A semi-conductive polymer core whose electrical resistance varies with temperature. When process temperature drops, the core's heat output increases; conversely, as process temperature rises, heat output decreases

C. Tinned Copper Braid

The braid covering the jacket provides an effective ground path and mechanical Protection

D. Jacket

The flame retardant insulation jacket is a polyolefin material with excellent water resistance. It also resists certain mildly corrosive Chemicals



Description

Thermal Resources Management brand SR cable is ideal for keeping metal and plastic pipes warm in commercial construction, institutional buildings and some industrial freeze protection applications. TRM SR cable is constructed of a self-regulating polymer core that varies its output along its entire length, saving energy and eliminating hot spots along the pipe. Parallel construction makes it easier to install than zone or series types of cable since it can be cut to length at any point on the pipe. It can be single overlapped without overheating the cable.

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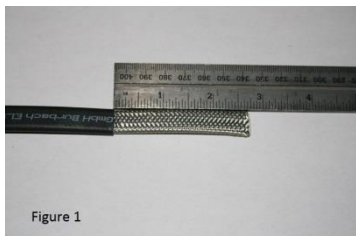


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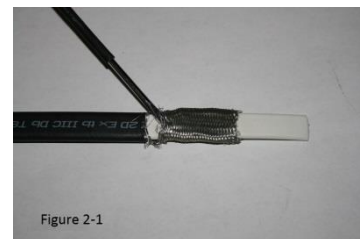
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1.) **Figure 1:** Slice completely around the black outer jacket 2 3/4" from the cables end, being careful not to cut braid or inner jacket. Then, bend the cable where sliced to break jacket, and peel off.

2.) **Figure 2-1:** Carefully push braid back (away from the end of cable) to loosen and spread apart as shown



2.) **Figure 2-2:** Bend the cable and push the braid until there is enough room between the bottom of the cable and the braid to fit a screwdriver

2.) **Figure 2-3:** Bend the cable over and hold in left hand while keeping it pinned between your screwdriver and your right thumb as shown. Slowly pull the cable back and out of the braid. The heating cable must be bent as shown, so it can be pulled through the braid opening



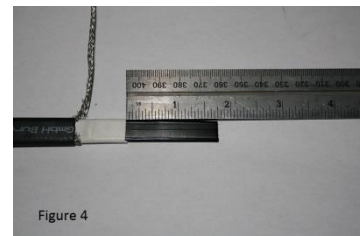
3.) **Figure 3:** Twist together braid and put off to one side as shown.

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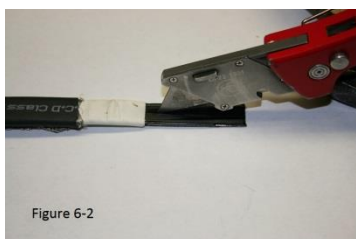
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4.) **Figure 4:** Score the inner jacket of cable 1 $\frac{3}{4}$ " from the cable's end. Bend cable to break jacket at score, then peel off



5.) **Figure 5:** Shave off the outer matrix material from conductor with a utility knife. Repeat on opposite side of cable for the second conductor

6.) Using either a pair of scissors (**Figure 6-1**) or a utility knife (**Figure 6-2**) make a cut through the centre matrix material 1 $\frac{3}{4}$ ", down to where the inner jacket begins (**Figure 6-3**).



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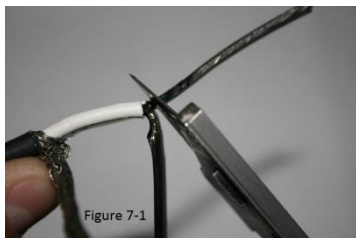


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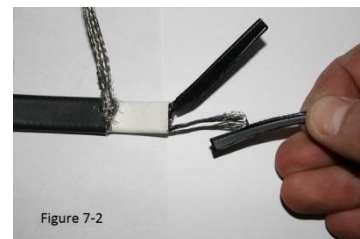
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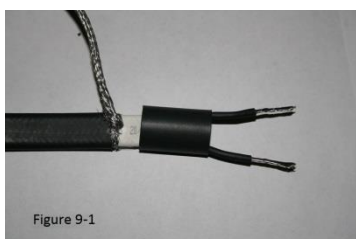
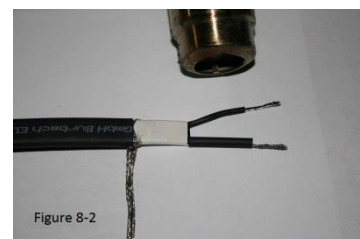
7.) **Figure 7-1:** using a utility knife, cut the matrix material around the base of each conductor. Be careful not to cut the conductor

7.) **Figure 7-2:** Once cut is done from 7-1, carefully peel off the matrix material from the conductors



8.) **Figure 8-1:** Slip black heat shrink tubes (G) onto conductors up to the inner jacket

8.) **Figure 8-2:** Shrink tubing by moving heat source side to side continuously. Be careful not to leave the heat source on one area for very long



9.) **Figure 9-1:** Centre the black heat shrink (F) over the end of cable as shown

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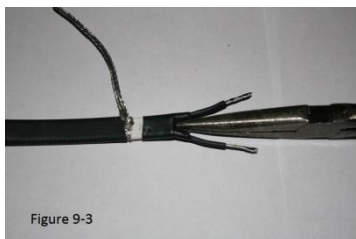
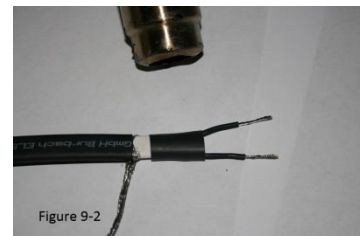
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9.) Figure 9-2: Heat the tube evenly until it shrinks and adhesive flows out of both ends.



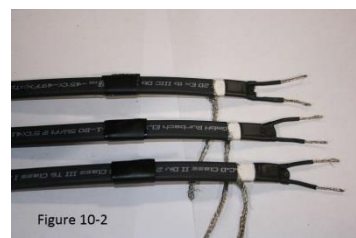
9.) Figure 9-3: While tubing is still hot; pinch the end of the tube between the two conductors with needle nose pliers, and hold for 10 seconds to ensure seal.

9.) Figure 9-4: Repeat steps 1 through 9 for remaining two cables.



10.) Figure 10-1/10-2: Remove paper from mastic strip (E). Wrap a piece of mastic around the outer jacket on each heating cable, 2" down from the end of the outer jacket. (If needed, each mastic strip can be stretched to accommodate thicker types of heating cable)

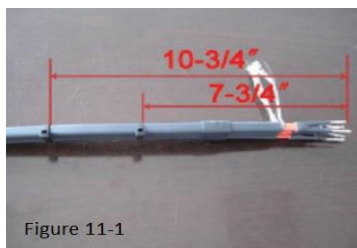
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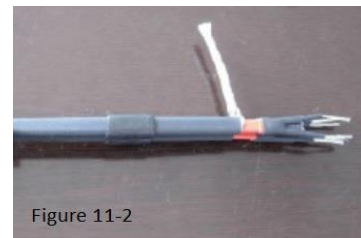
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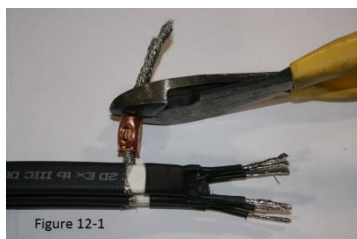
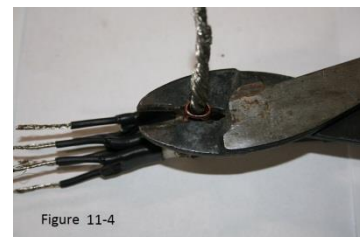
11.) **Figure 11-1:** Carefully align each heating cable on top of one another, pressing mastic strips together. Fasten with a cable tie (D) at 7 3/4" and 10 3/4" from the end of the cable as shown.

11.) **Figure 11-2:** Twist together each of the cables ground braids



11.) **Figure 11-3:** Slide uninsulated crimp (K) over braid to within 1/2" of heating cable.

11.) **Figure 11-4:** Crimp braid as shown, at least twice, using a crimping tool.



12.) **Figure 12-1:** Cut off the excess braid.

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12.) Figure 12-2: Position the braid crimp connector as shown. Ensure crimp connector lays flat.



13.) Figure 13-1: Slide the black heat shrink tube (J) over uninsulated braid crimp (K).

13.) Figure 13-2: Heat tube evenly until it shrinks and adhesive flows out of both ends.



13.) Figure 13-3/13-4: Immediately after shrinking, pinch the end of the tube with a pair of pliers and hold until the end stays sealed

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Figure 14-1

14.) **Figure 14-1/14-2:** Fold the crimped braid back on top of the heating cables. Then wrap the black cloth tape (B), around the crimp and heating cables. Ensure to cover the crimp completely.

14.) **Figure 14-1/14-2:** Fold the crimped braid back on top of the heating cables. Then wrap the black cloth tape (B), around the crimp and heating cables. Ensure to cover the crimp completely.



Figure 14-2

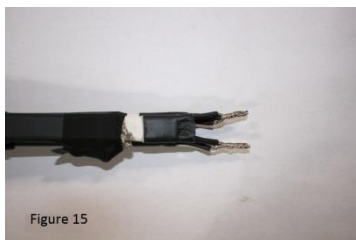
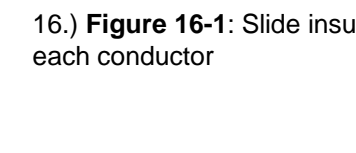


Figure 15

15.) **Figure 15:** Take one conductor from the same side of each cable and twist the wires together as shown. Be careful not to twist together conductors from the same cable.



16.) **Figure 16-1:** Slide insulated bus wire crimps (I) over each conductor

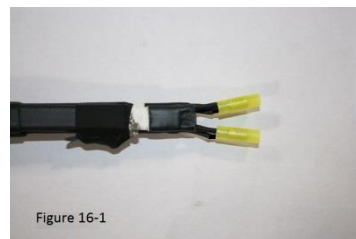


Figure 16-1



Figure 16-2

16.) **Figure 16-2:** Using a crimping tool, crimp each set of conductors together

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17.) **Figure 17-1:** Slide heat shrink cap (H) over each set of bus wire crimps.



17.) **Figure 17-2/17-3:** Apply heat from the end of the cap evenly until it shrinks and adhesive flows out. If adhesive does not appear, additional heat is needed.

17.) **Figure 17-2/17-3:** Apply heat from the end of the cap evenly until it shrinks and adhesive flows out. If adhesive does not appear, additional heat is needed.



18.) **Figure 18-1:** If the adhesive seals from the heat shrink tubes (F) melt while shrinking cap, pinch again with needle nose pliers as shown.

18.) **Figure 18-2:** Ensure the heat shrink tube is completely sealed between the two conductors and that there are no visible gaps.



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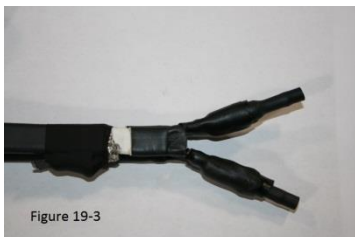
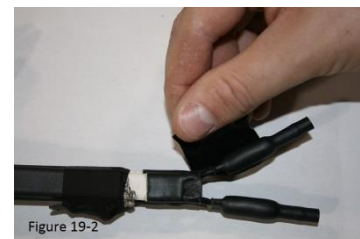
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19.) **Figure 19-1:** Remove release paper from mastic strip (E) and stretch the width (1" side) of the mastic strip as shown. (Stretching the strips is necessary because the width cannot fully wrap around each of the heat shrink caps).

19.) **Figure 19-2/19-3:** Wrap a stretched mastic strip around each of the heat shrink caps as shown. Press mastic strip into itself to ensure a good grip



19.) **Figure 19-2/19-3:** Wrap a stretched mastic strip around each of the heat shrink caps as shown. Press mastic strip into itself to ensure a good grip

20.) **Figure 20:** Squeeze the mastic strips together and hold for 5 seconds.



21.) **Figure 21-1:** Slide the heat shrink tube (C) over cables. Place the edge of heat shrink $\frac{1}{2}$ " past the edge of the mastic strips on each cable.

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21.) Figure 21-2: Starting at the point shown, apply heat to tube while working your way toward the end of the cable



21.) Figure 21-3: When heating, work the heat gun side to side to ensure an even distribution of heat along the tube.

21.) Figure 21-4: Shrink the start of the tube completely, until adhesive appears at the bottom and you can see the shape of the mastic strips underneath. Continue to heat the tube completely. Make sure to keep heating after the tube has shrunk, to melt the adhesive and the mastic strips inside the tube.



22.) Figure 22-1: Immediately after shrinking, pinch the end of the tube with pliers until the end seals.

22.) Figure 22-2/22-3: If the width of the pliers isn't wide enough to pinch the entire tube, pinch a second time at the end of the cable.



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22.) Figure 22-2/22-3: If the width of the pliers isn't wide enough to pinch the entire tube, pinch a second time at the end of the cable.

22.) Figure 22-4/22-5: Ensure the end of the heat shrink is completely sealed with adhesive.



22.) Figure 22-4/22-5: Ensure the end of the heat shrink is completely sealed with adhesive.

23.) Figure 23: After the heat shrink has cooled, fold over the connection end and fasten it with the third cable tie.



Refer to applicable application instruction manual(s)
for installation and testing instructions and
guidelines

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