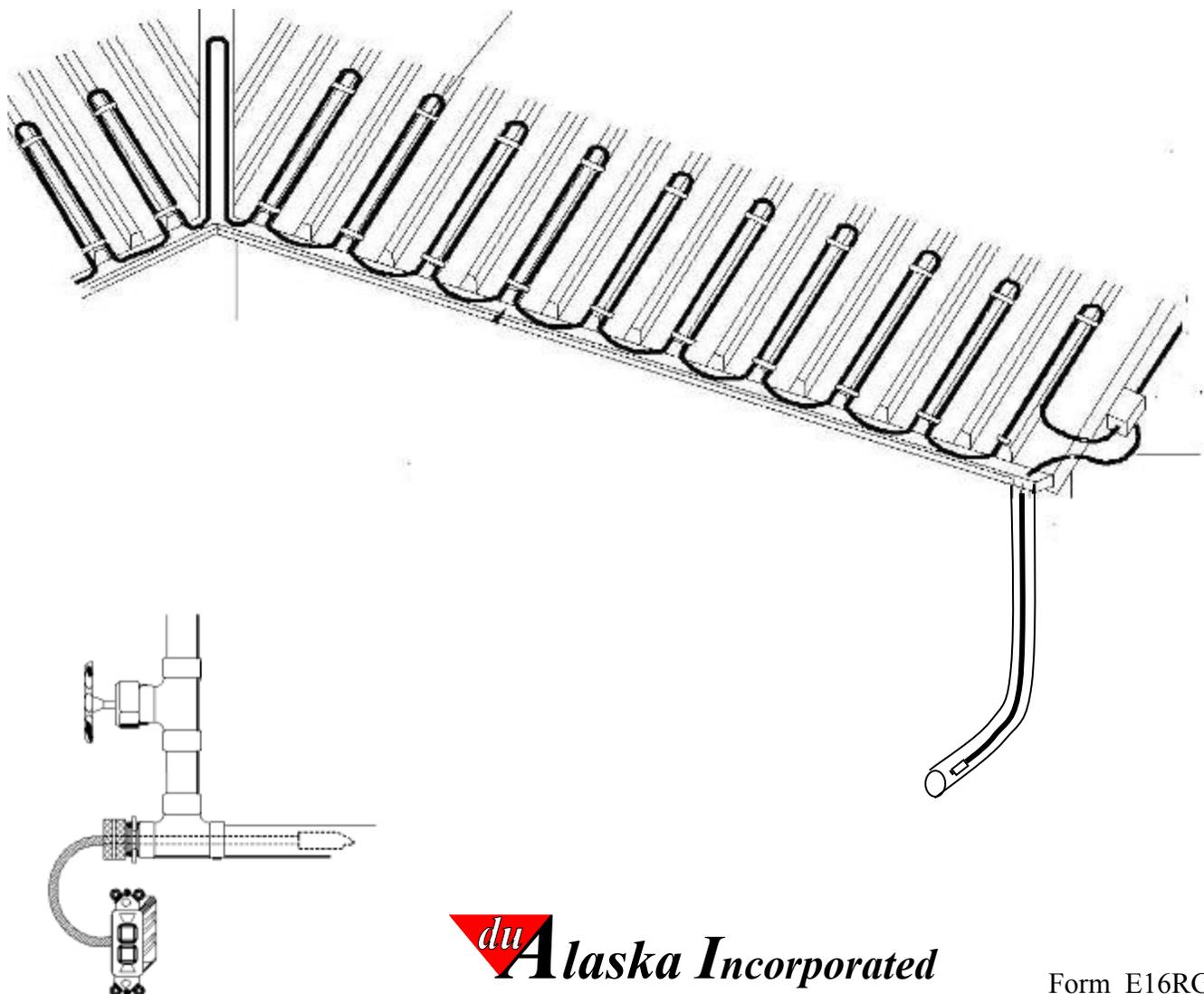


ARCTIC TRACE®

Installation Information

Roof, Gutter and Snow Melting De-Icing System

For Type E Series Heating Cable & Accessories



du Alaska Incorporated

Form E16RG

DESCRIPTION

Arctic Trace Roof and Gutter Heat Tracing Systems (E SERIES) heater cables provide a solution for ice dams that can build up and damage buildings and gutter systems. The cables' self-regulation feature provides additional benefits:

Lower Energy Consumption - the cable reduces its power output as the ice and snow disappear.

Fail-Safe Temperature Limiting - the cable will not overheat and melt or damage temperature sensitive roof coatings

Suitable for - roof de-icing, gutters and downspouts, snow melting, soil heating, pipe and vessel surface freeze protection.

COMPONENTS

606C Water Proof Cord Grip - provides a 1/2" MNPT watertight entry seal into a junction box (not included). It is recommended that a NEMA 3R, 4 or 4X box be used and mounted under an eave or other protected area. Each cord grip will terminate one heater cable.

660C Universal Roof Mounting Clips - are used for all types of installations. Clips come 25 to a box; order one box per eight feet of eave or one box for every 100 feet of cable installed on flat roofs (nails or screws not included).

A712 Adhesive Roof Clip - are used for holding roof Clip come 25 to a box. Order adhesive separately for your specific roof and gutter requirements.

HSC8-4 Heat Shrink End Cap Kit - provides a waterproof seal at the end of each heater cable circuit. Each kit contains 1 seal.

C14880 Power Connection Kit - provides a cord type power connection with GFCI safety. Each kit contains 1 GFCI with 15' pig tail, Soderless connectors and heat shrink.

C33120SP Junction Box - provides a 4 gang weather proof power connection junction box. Each kit includes 1 junction box, 1 clear cover, 1 GFCI including on/off switch (Components ship unassembled).

208C Junction Box - provides a 2 gang NEMA 4X power connection junction box. Each kit includes 1 junction box with cover, DIN terminals.

GIT-3A Automatic Gutter Ice Melting Control - computerized ice melting control that senses both moisture and temperature, ice melting below 38°F while moisture is present. Operation continues a period of time there after to insure complete melting. Control includes ice melting sensor and water proof junction box for power connection.

330C Aluminum Foil Tape - may be used to secure the heater cable to the bottom of the gutter. Each roll of tape will accommodate 46M (150') of gutter. Gutter must be clean for foil tape to adhere properly. As an alternate, the cable may be laid loose in the bottom of the gutter without being secured with foil tape.

INSTALLATION INSTRUCTIONS

1. Before installing heater cable, allow it to warm up to room temperature. Keep grommets and shrink tube warm until needed. (*Keep inside of jacket pocket.*)
2. Clear all gutters and downspouts of debris. (*Protect hands with gloves.*)
3. Remove any sharp edges that could damage the heater cable.
4. Mount weatherproof junction box in a sheltered area.
5. Start heater cable installation at the junction box, leaving a drip loop where the cable exits the junction box.
6. Terminate heater cable per instructions and connect to power wiring with cord or junction box options.
7. It is recommended that the heater cable be megger tested between bus wires and ground braid after installation to verify cable integrity. Heater cable should have a minimum insulation resistance of 20 megohms when tested with at least a 500VDC megger.



8. The circuit breaker can be used to turn the heater cable off and on. Optionally, an automatic snow or ice detector may be used to control the cable.
9. Two copies of a caution notice indicating the presence of electric deicing and snow melting equipment on the premises are included in the power connection/entry seal kits. One notice must be posted at the circuit breaker panel and the other notice posted next to the control device. Both notices must be clearly visible.

WARNINGS

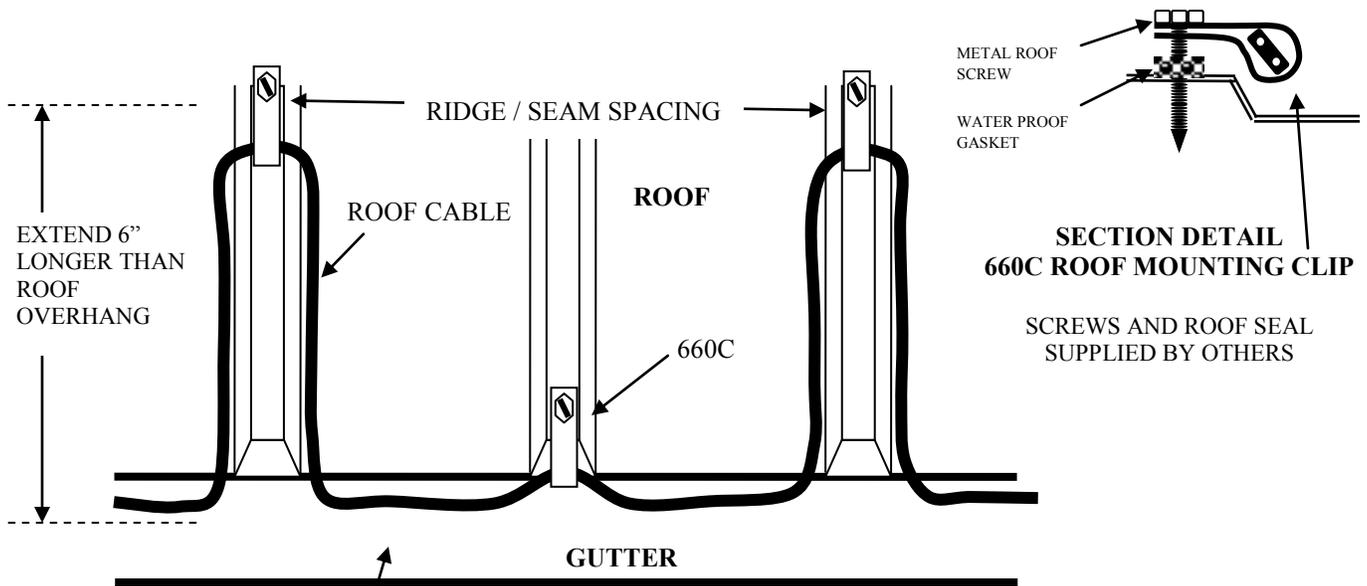
- **Article 426 of the National Electric Code requires that all outdoor electric deicing and snow-melting equipment be provided with branch circuit ground-fault equipment protection.**
- **Moisture must be kept away from the live electrical parts of the cable or electrical faults will develop.**
- **If nuisance tripping of ground-fault breakers occurs due to condensation in the junction box, electrical connections should be moisture proofed by use of a coating or sealant.**
- **The cables ground braid must be connected to electrical ground for proper protection through circuit breakers. All electrical connections should be made by a licensed electrician.**
- **Do not twist bus wires together – this will result in a short circuit and damage the cable.**
- **Damaged heater cables must be repaired or replaced.**
- **Avoid laying ladders against the heater cable.**
- **Before energizing the circuit each season, make sure that the gutter system and downspouts are free of leaves and debris.**

Metal Roof—Metal roofing materials such as standing seam or corrugated, as well as tile/concrete roofing materials that have distinct ridges or grooves, must be properly addressed when installing heat tracing. Metal roofs in particular pose an avalanche potential that could damage the heating cable if it were installed in a serpentine pattern. To combat this, the cable is installed parallel to the standing seams or along the length of a corrugation.

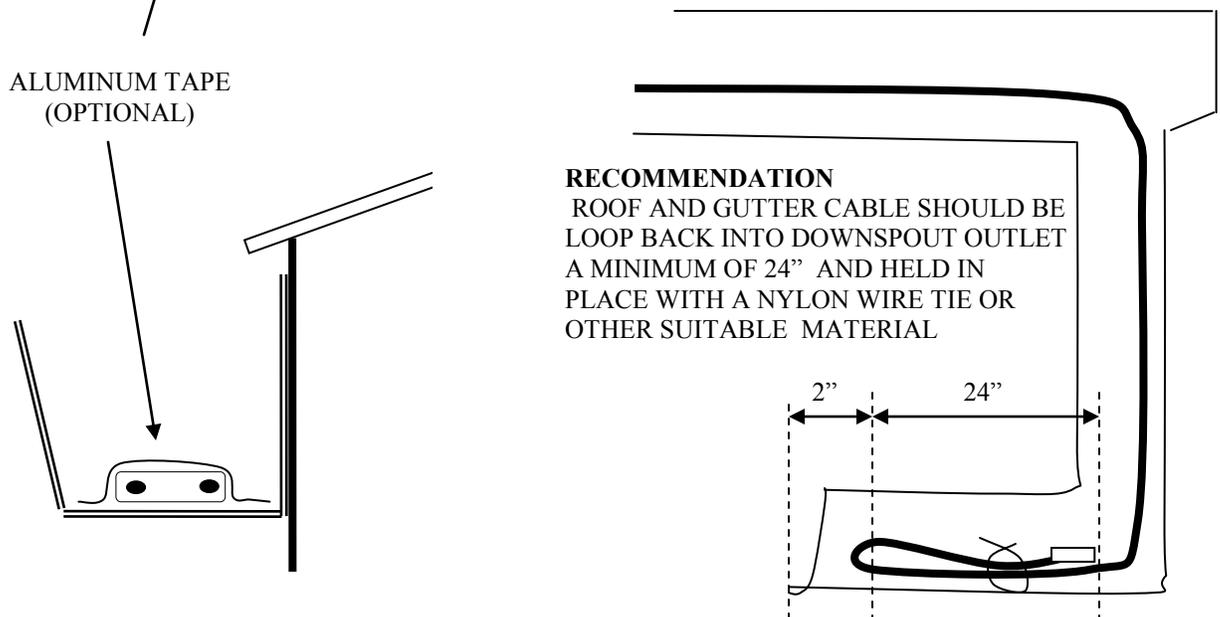
The partial sketch below depicts E series roof and gutter cable as it would be installed on a corrugated metal roof. This method would also be used on standing seam or tile roofs. Fasten with sheet metal screw using neoprene sealing washer. If washers are not available, coat screw and upslope edge of clip with silicone sealant. Exact cable spacing may vary depending on the rib design of the roof. Typically trace every other rib.

Any number of other attachment methods may be used for holding the heating cable in place. Whichever method is used should take into consideration the integrity of the roof and the heating cable.

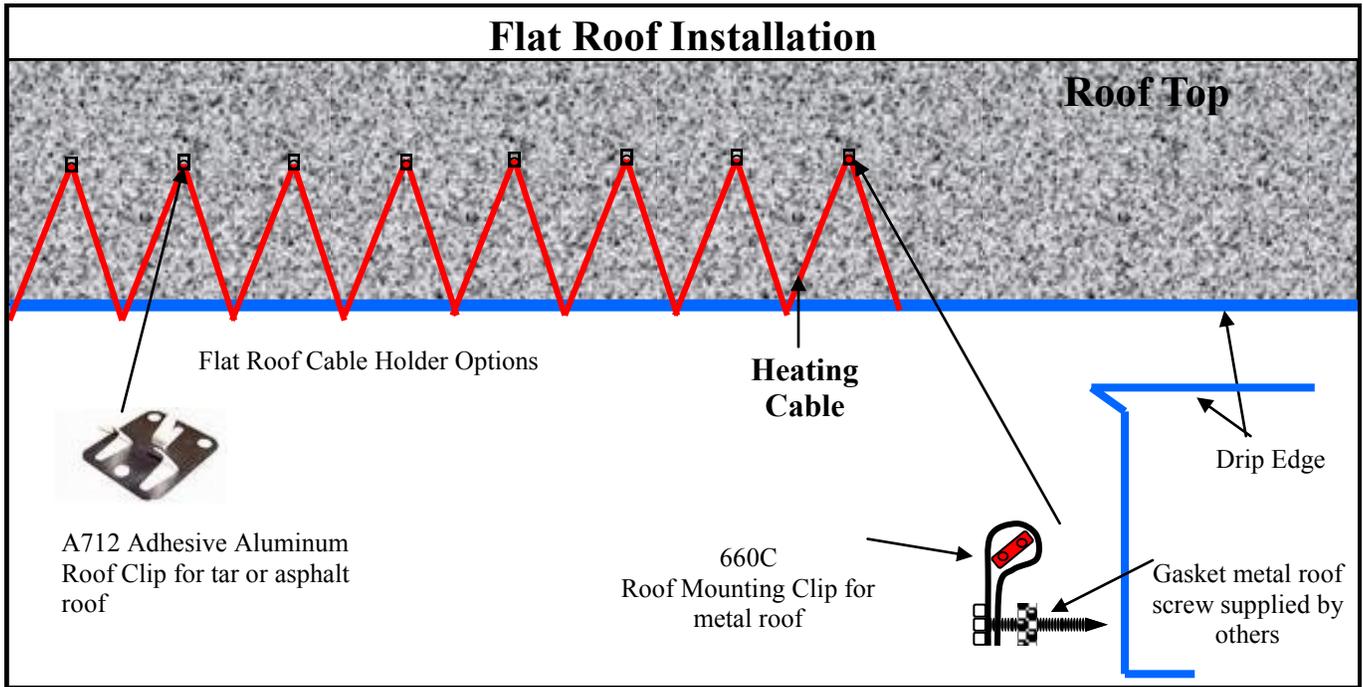
How far up the roof the heating cable should travel may be determined by measuring the distance as shown below. The heating cable should loop past the point where an imaginary line extending up from the inside wall would pass through the roof or ridges in the roofing material. This spacing, combined with the desired level of protection, will determine what multiplier to use to determine the footage of cable required.



GUTTER AND DOWNSPOUT

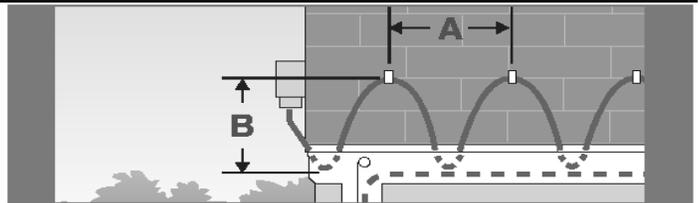


Flat Roof Installation



How much Heating Cable do I need?

- 1) To calculate the amount of Heating Cable needed, multiply the roof edge length to be heat traced by the spacing factor. The spacing factor, the feet of cable required per foot of roof edge, is determined by the roof overhang, heating width (A) and heating height (B). Please see illustration and example on this page:



EXAMPLE

MEASURE ROOF EDGE LEDGE

Assume Roof Edge Length is 100 ft.

Assume that the Roof Overhang for your application is 24 inches. Using the chart in Step 1 (left), you should install the cable with a heating Width (A) of 2 feet and a Heating Height (B) of 30 inches. The Spacing Factor (from table) would be 3. **Multiply Roof Edge Length (100 ft.) x Spacing Factor (3) = 300 ft.**

MEASURE GUTTERS

Assume Gutter Length is 100 ft.

Gutter Length = 100 ft.

MEASURE DOWNSPOUTS

Assume Downspout Length is 12 ft.

Downspout Length x 2 = 12 ft. x 2 = 24 ft.

Total Cable Length = 300 ft. + 100 ft. + 24 ft. = 424 ft.

- 2) Add the total gutter length and twice total downspout length to the figure calculated in step 1 to get the total length of cable required.
- 3) Determine how many circuits are required. Divide the total length of cable by the maximum heater length per circuit (see Specifications). Round that number up (for example, 2.1 to 3) to get the total number of circuits.

To select the **circuit breaker size** and **number of circuits**, assume that your ambient start-up temperature is 0°F, you are using 120 V cable, and you are using 30A circuit breakers. The maximum circuit length (from table) would be 175 feet.

Divide the total Cable Length (in this example 424 ft.) by the max. Circuit Length (in the is example 175 ft.) to determine the number of circuits.

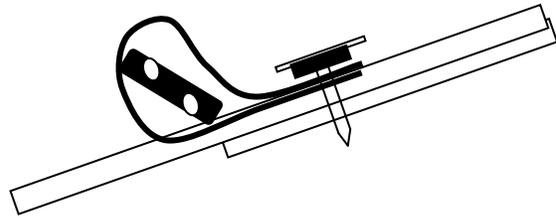
FORMULA

Roof Edge Length x Spacing Factor
 + Total Gutter Length
 + (2 x Total Downspout Length)
 = Total Cable Length

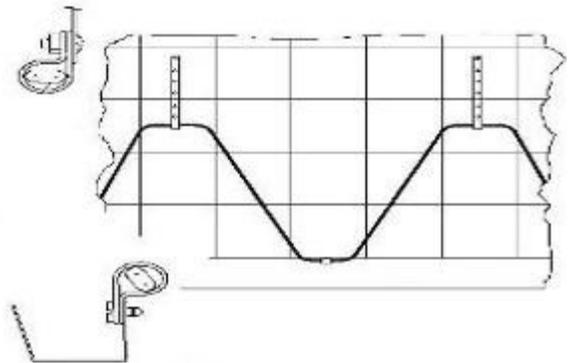
Total Cable Length 424 ft.	= 2.4 circuits (round up to 3 circuits)
Max Circuit Length 175 ft.	

CAUTION: CONTACT DUALASKA FOR CABLE SELECTION AND PLACEMENT REQUIREMENTS FOR ANY SEVERE ROOF EDGE DE-ICING WITH ICE THICKNESS THAT EXCEEDS 5" IN WINTER

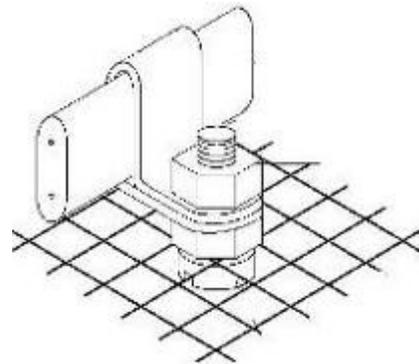
Asphalt / Shake Shingle Roof—All shingle roofs (fiberglass, cedar shake, flat tile or concrete shingle) can utilize heating cable installed in a serpentine pattern as detailed in this sketch. Fasten with nail, coat nail head and upslope edge of clip with silicone sealant.



Tile Roof—Use perforated pipe strapping to attach the clips to the roof. For new construction, the strapping should be secured to the wooden substructure by means of pegging or nailing as the roof tiles are installed. For existing tile roofs, a bead of adhesive (not furnished) should run along the perforated strapping for a length of 76mm (3”) prior to slipping the strapping up under the tile. **Do not use an excessive amount so as to leave a visible blob of adhesive on the outer edge of the tile.** The adhesive bead should be large enough to deform and smear along the underneath surface of the tile. Allow the adhesive cure to full bonding strength before attempting to install the cable and clips



Flat Roof—Adhesive (not furnished) should be used to bond clips studs to the flat surface. The roof surface should be clean at the bonding locations. Do not penetrate flat roofs with screws or nails as leaks may develop. Allow the adhesive to cure to full bonding strength before attempting to install the cable and clips.



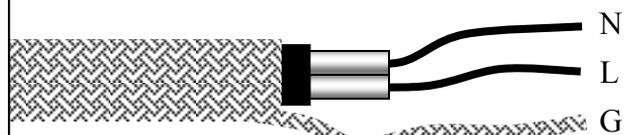
Snow and Ice Cable Control—All roof and gutter snow and ice melting systems should be controlled to turn the heating cable on and off as conditions warrant. There are three basic means to activate a roof and gutter system:

Manual On/Off Switch— Part # C33120SP Economical and simple to install; re-quires diligence on the part of the operator.

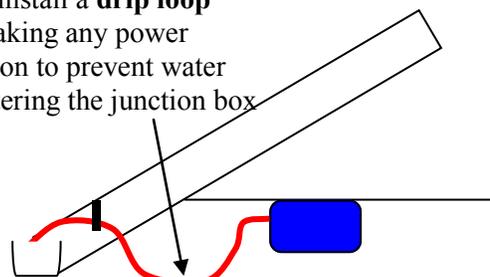
Ambient Sensing Control— Part # TRD115 Turns system on and off based on ambient temperature. Heating cable will frequently be energized during no required times.

Automatic Control— Part # GIT-3A Roof or gutter-mounted ice sensor turns system on when moisture is detected and temperatures are in the range when freezing can occur on roof overhangs or in gutters.

POWER CONNECTION CAN BE CORD TYPE OR WATER PROOF JUNCTION BOX



Always install a **drip loop** when making any power connection to prevent water from entering the junction box



Instruction Sheet P/N HSC8-4 HEAT SHRINK End Cap

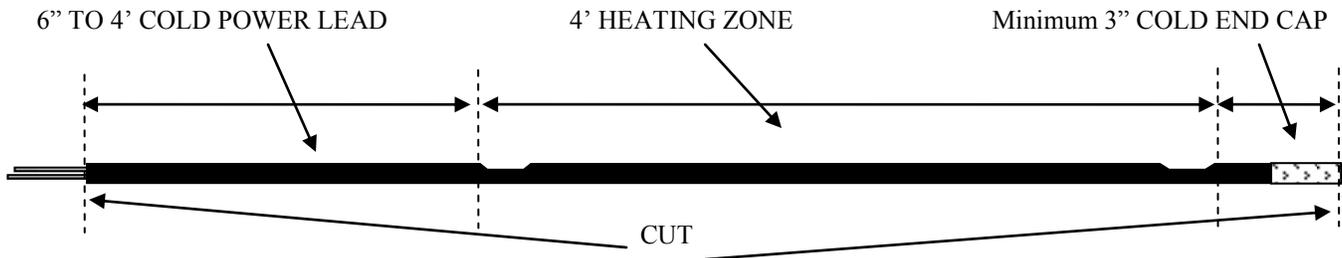
WATER RESISTANT END CAP FOR
INDOOR/OUTDOOR APPLICATION
SNOW ICE RAIN AND
HOSE DOWN



Package to include: 1 each heat shrink end cap

Arctic Trace® heating cables are constructed with multiple heating zones of various lengths depending on the voltage and watt per foot output. During assembly when a heating zone is cut, that length of heat cable becomes a cold lead and will not have a heating output. When making power connection or terminating the end of the heating cable care should be taken to assure the heating part of the cable contacts the process area to be heated. Heating zone spacing can be identified by a slight depression on the heating cables edge.

EXAMPLE



1. Cut the **E Series** Heat Trace to length at 90° angle with sharp tool.
2. Inspect cut to insure that the carrier wires do not contact the heading element, metal braid or themselves. If they do, perform step 1 again.
3. Push end cap over heating cable.
4. Shrink end cap using a hot air heat gun. (Do Not Use Open Flame)
5. Begin heating end seal from the crimped end.
6. Heat around the circumference of the end seal. (Keep heat source moving constantly around the circumference of the insulator to ensure uniform shrinkage of the insulator.)
7. Continue heating around end seal. Move heat gun around the end seal until it is completely recovered.
8. Installation is complete when the end seal conforms to the heat cable and sealant flow is apparent on the heat cable.
9. We recommend you perform a dielectric resistance test with a 500vdc meg-ohm meter (Megger) between the bus wires and ground. The minimum resistance reading should be 20 meg-ohms. If short is present discard End Cap and repeat all steps above. When wire passes test it may then be installed. If problem cannot be corrected do not use or connect wire to voltage.
10. Install the heating cable taking care not to damage End Cap.

HSC8-4 NOT RECOMMENDED FOR SUBMERSION



One Year Limited Warranty

du Alaska hereby warrants to the original purchasing consumer that its Arctic Trace heating cable is free from defects in material and workmanship for a period of one (1) year from the date of original installation. du Alaska's obligation under the terms of this limited warranty shall be limited to repairing or replacing, at du Alaska's option, free of charge, F.O.B. from its factory, any part or parts of the Arctic Trace heating cable which in its sole judgment is found to be defective; and providing further that the claim be made within one (1) year from the date of original installation and said part or parts be returned as directed by du Alaska at the time the claim is made.

All information concerning the product supplied by du Alaska is furnished upon the express condition that the customer shall make its own assessment to determine the product's suitability for a particular purpose.

WARRANTY EXCLUSIONS. *Except as expressly stated herein and to the fullest extent permitted by law, we shall not be liable for direct, indirect, incidental, consequential or other types of damages arising out of resulting from the purchase or use of the product. This Limited Warranty is in lieu of all other warranties, express or implied, specifically including, but not limited to, implied warranties of merchantability or fitness for a particular purpose.* The remedies under this warranty are only as set forth herein (except as to the extent they are required by any applicable laws) and du Alaska neither assumes nor authorizes anyone to assume for it any other obligations. Some states do not allow the exclusion or limitations of incidental or consequential damages, so the foregoing limitations or exclusions may not apply to you. In such states, liability shall be limited to the extent allowed by state law. We do not warrant this product against normal wear and tear, unauthorized modifications or alterations, improper use, improper maintenance, accident, misuse, negligence, theft, loss or damage from outside causes.

du Alaska Incorporated
6706 Greenwood Street
Anchorage, Alaska 99518

Phone: (907) 522-3004 Fax: (907) 349-1023

E-mail: dualaska@alaska.net www.arctictrace.com