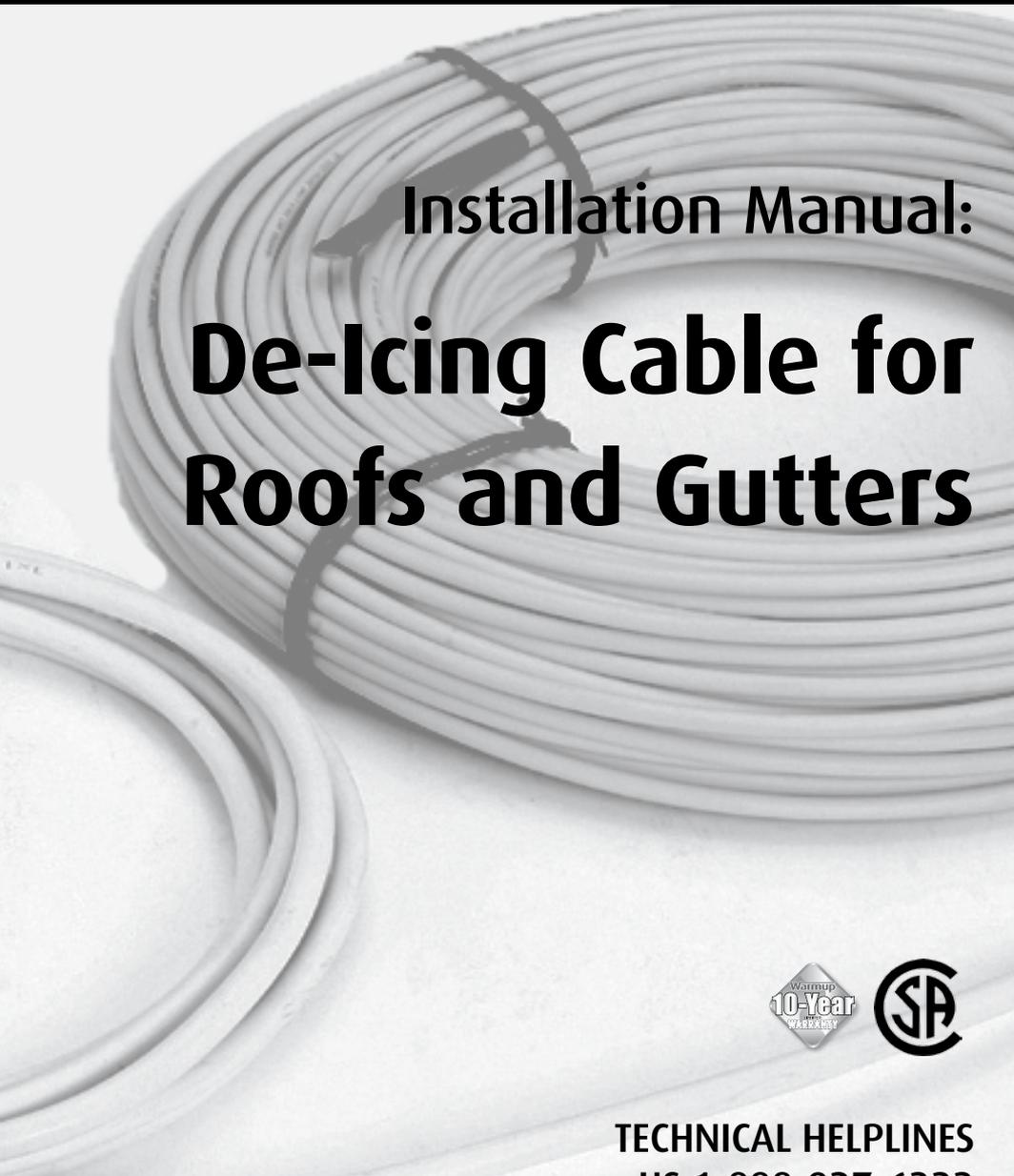


Warmup®

The world's best-selling electric floor heating brand™



Installation Manual: De-Icing Cable for Roofs and Gutters



IMPORTANT

Read this manual before attempting to install your heating system. Incorrect installation could damage the heating system and will invalidate your warranty.

TECHNICAL HELPLINES

US: 1-888-927-6333

Canada: 1-888-592-7687

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PRODUCT SPECIFICATION AND DETAILS

The Warmup Roof & Gutter Snow Melting/De-Icing Cable has been designed for the purpose of preventing ice buildup [i.e. ice dams] on roofs, gutters and downspouts. When properly installed and operated, this product creates a path for melted snow/ice to drain from the roof to the ground. The cable has a constant wattage output of 5.5 Watts/ft (18 Watts/m).

Ensure you connect the WRGH De-Icing Cable to either a 120V or 240V, as indicated on the product label, weatherproof outlet with proper grounding. **NEVER ALLOW THE CABLES TO OVERLAP. NEVER SHORTEN THE HEATER CABLE.** Any attempt to alter the cable will void the warranty. The cold lead CAN be cut/extended to suit the location of the electrical power connection box.

CONSTRUCTION AND SELECTION OF ROOF & GUTTER DE-ICING CABLES

The Warmup Roof & Gutter De-Icing cable consists of a twin conductor resistance heating element insulated with Fluoropolymer and Polyolefin-based compound, which makes the heating cable totally safe. A metallic sheath is provided to give additional mechanical strength and provide ground path. A final outer jacket of Zero Halogen Polyolefin based compound is given to make it sturdier and provide corrosion protection. The heating cable starts with a 16ft cold lead which can be trimmed as need to perform the connection to the junction box or controller.

Multiple cables can be combined into a single controller for larger installations. Do not 'daisy-chain' the cables, only connect in parallel to the contactors.

See the Sizing Guide below to ensure you have the correct size cable(s) for your project.

Warmup Roof & Gutter De-icing Cable Sizing Guide

	Length (ft)	Heaters	Resistance (Ω)	Wattage (W)	Amps (A)
120 VOLT	28	WRGH-D-120V-18W/150	92.3	150	1.3
	62	WRGH-D-120V-18W/350	41.4	350	2.9
	88	WRGH-D-120V-18W/475	30.0	475	4.0
	156	WRGH-D-120V-18W/850	16.9	850	7.1
	219	WRGH-D-120V-18W/1200	12.0	1200	10.0
240 VOLT	93	WRGH-D-240V-18W/500	114.3	500	2.1
	176	WRGH-D-240V-18W/950	60.0	950	4.0
	250	WRGH-D-240V-18W/1300	44.4	1300	5.4
	312	WRGH-D-240V-18W/1700	33.8	1700	7.1
	437	WRGH-D-240V-18W/2400	24.0	2400	10.0
	625	WRGH-D-240V-18W/3400	16.9	3400	14.2

IMPORTANT INSTRUCTIONS BEFORE INSTALLATION OF THE CABLE

1. It is important to plan how the cable will be arranged BEFORE the cable is laid (see pg 4). The tracer pattern must be arranged so that it routes melted water from "warm areas" (where ice on the roof usually melts first) to "cold areas". See table 2 page 9 for to estimate the cable length you need.
2. Before installing the De-Icing Cable, allow it to warm up to room temperature. The cables should not be energized above 50°F (10C).
3. Check the continuity, resistance and insulation resistance of the De-Icing Cable before and after installing. Resistance value should match the value shown in the Sizing Guide above. A tolerance of -5% to +10% is allowed. Insulation resistance must be more than 10 megohms.

IMPORTANT INSTRUCTIONS BEFORE INSTALLATION OF THE CABLE (cont'd)

4. Do NOT install the cables to remove ice dams that have already formed or to clear the roof of ice and snow.
5. Do NOT use the cable for any other purpose [i.e. pipes or sidewalks]. Warmup offers other snow melting products designed for these purposes. Call 1-888-927-6333 (US) or 1-888-592-7687 (CA) for more information.
6. Do NOT use De-Icing cables with wooden gutters or downspouts.
7. The de-icing cable should **NEVER OVERLAP OR CROSS AT ANY TIME**. This could cause the cable to overheat, causing damage.
8. Cable installation should only be done at between 32°F-81°F (0°C-27°C). Below 32°F shingles are brittle and may break. Above 81°F (27°C), shingles may be warm and may tear.
9. In general, apply cables along the roof line; in valleys; in problem areas such as sky lights and dormers and nearby gutters/downspouts.
10. **Start cable installation at the junction box**, leaving a drip loop where the cable exits at the junction box.
11. Use only recommended types of clips (which will not damage the cables) to attach the cable.
12. Do not attempt to staple or nail the cable or attach the cable with materials such as glue, caulk or adhesive. Use the P-clips provided to secure the wire. Other methods for specific roof types are available. Consult this manual or call Warmup for further guidance.
13. To attach the cable properly, it must lie flat in the gutter. To do this, uncoil the cable so that it is not twisted or tangled.
14. Use the P-clips provided to fasten the cable to the bottom of each drip loop you have formed.
15. Keep the cable in the gutter tight and off the bottom of the gutter to prevent heat loss.
16. If you are treating only the gutters for ice problems, use a "double run" of cable in the gutter and downspouts.
17. The recommended distance between clips is about 3ft, although this will vary depending on the length of cable on the roof slope. Make sure to use a clip at every turn of the cable, and call Warmup with any questions.
18. Roof & Gutter De-icing Cables should be connected to a Ground Fault Circuit Interrupter (GFCI). Consult a qualified electrician.

WARNING!

The heating cable must NOT be shortened or cut in any manner or subjected to strain at the cable/splice point.

Connecting the cable to the mains should be undertaken only by an authorized electrician.

IMPORTANT INSTRUCTIONS BEFORE INSTALLATION OF THE CABLE (cont'd)

21. Clear all gutters and downspouts of combustible debris such as leaves, pine needles, seeds or windblown trash (protect hands with gloves) and remove any sharp edges that could damage the De-Icing cable.
22. For easy reference, fix a label at the power distribution board indicating the location of the De-Icing Cables installed.
23. Keep the power leads conduit separate from the sensor cable conduit when applicable. See selection of controls or call Warmup.
24. The cables should be connected to a Ground Fault Circuit Interrupter (GFCI) or equivalent having a rated residual operating current not exceeding 30mA. Consult a qualified electrician.

CONTROLLING YOUR ROOF & GUTTER CABLE INSTALLATION

The Warmup WRGH Roof & Gutter De-Icing Cable works most effectively with an automatic thermostat and sensing device. The sensor monitors for moisture and temperature to maintain the required temperature. For outdoor mounted controls, use the DS-series of automatic controllers, or for indoor-mounted devices, select the ETOG module with ETOR roof sensor(s).

When using the WRGH-Kits from Warmup, no control device is necessary. Simply plug into an outdoor rated outlet supplied by a GFCI breaker of the appropriate voltage.

ELECTRICAL PROVISIONS FOR THE SYSTEM

The electrical connections to the De-Icing Cables shall be in accordance with the National Electrical Code (in the USA) or Canadian Electrical Code (in Canada).

INSTALLING YOUR ROOF & GUTTER HEATING CABLE

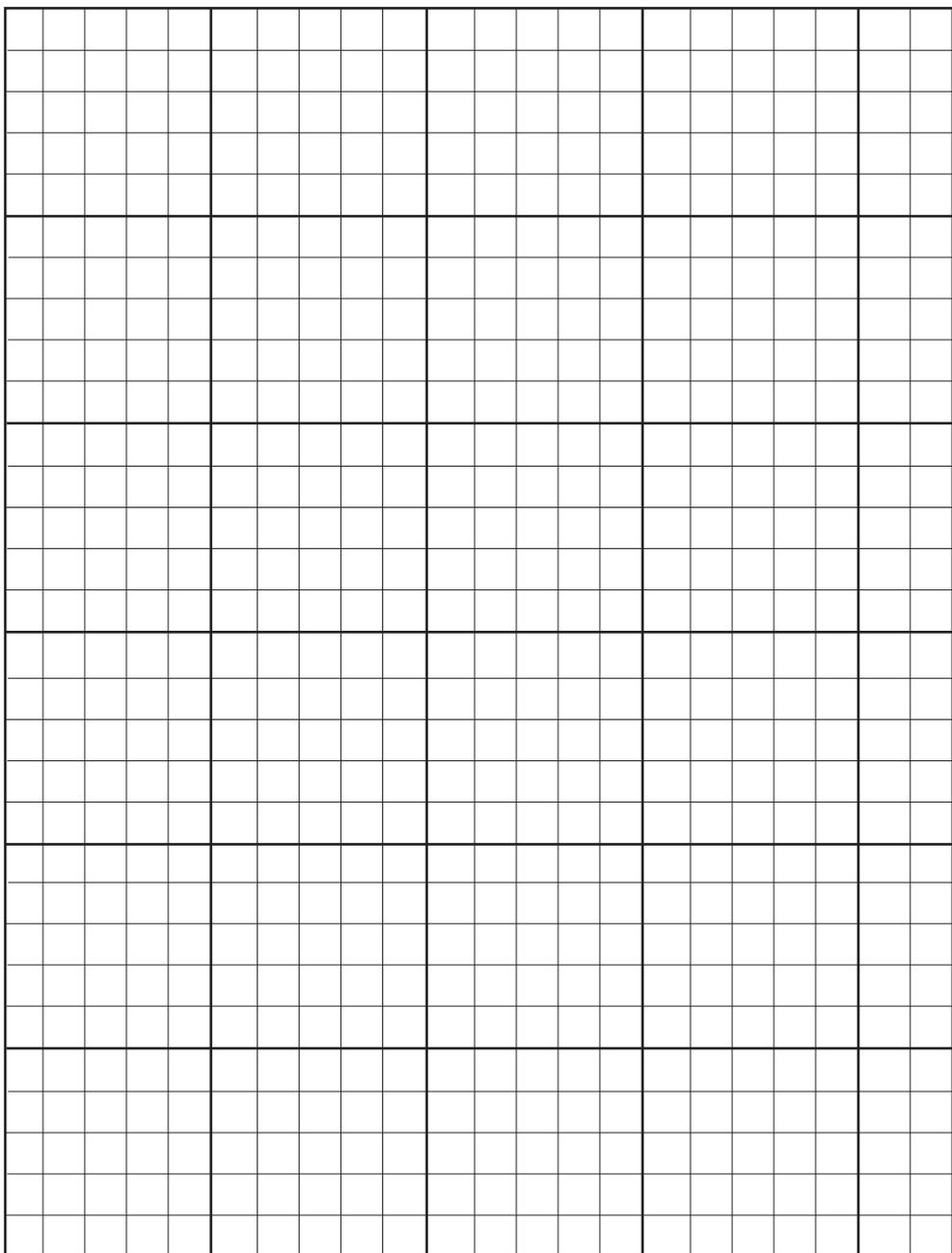
Choose a starting point - Select the starting point of your system by locating the desired placement of the outdoor electrical outlet (WRGH Kits) or the junction box routing to the controller (WRGH cable). Make sure to use caution and avoid high traffic areas, restrict general access to the cable and stay away from windows, doors and other obtrusions.

Plan the pattern on your roof - There are multiple methods for applying the cable to the roof and gutters as further described in this manual. We recommend you plan a written route for the cable to ensure the most efficient path and installation method for the heating cable.

Note that the heating cable is specifically intended for problem areas and does not need to be installed on all areas of the roof. In some instances, on high-pitched roofs (over 40 degree slope) and on roofs with minimal overhang, no cable on the actual roof line may be required. However, always ensure to create a path for the ice to melt from the roof to the ground, placing cable on the roof, in the gutters and in the downspouts as necessary. Extend the cable about 1' out of the bottom of the downspout (surface) or about 1' below the frost line. As a reference, the frost line in cold areas is typically 20" to 30" deep.

PLANNING YOUR LAYOUT

Draw a plan showing the layout and location of the snow melting cables below and keep it for future reference.



INSTALLATION INSTRUCTIONS FOR THE ROOF & GUTTER DE-ICING CABLE

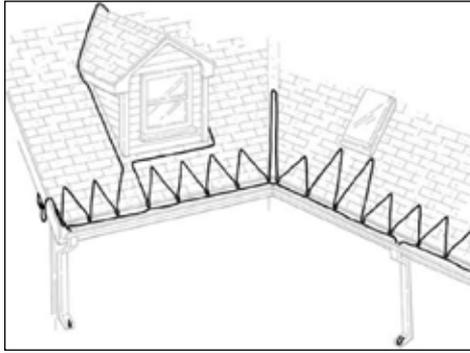


FIGURE 1: Typical pattern along roof line and in gutters/downspouts.

TIP: If you will be working directly on the roof during the installation, you may want to mark the cable pattern with chalk before attaching the cable. If working from a ladder, you will probably want to lay out the pattern as you attach the cable with the clips. Making a drawing of your roof and your planned pattern on paper is recommended.

Pattern for the roof line: The cable laid along the roof line is arranged in a triangular pattern (see Figure 2). The cable **MUST** extend above the overhang into the warm section of the roof. To determine the height of the triangles, measure the depth of the overhang. The triangle heights are measured by the number of shingle rows from the roof edge (based on the standard 5½ inch tab shingles). Using Table 1 (see following page), determine the height of each triangle. Using this method, the triangles will extend at least one shingle row (5½ inches) into the warm roof area.

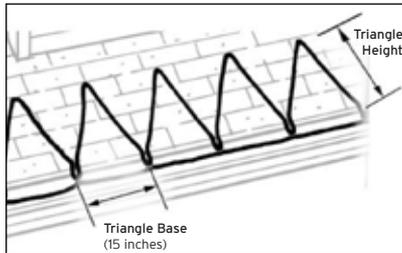


FIGURE 2: Triangle pattern along the roof line.

Pattern for the sky lights: Problem sky light areas are also treated with the "triangle pattern" approach. However, the height of the triangles may need to be greater than those along the roof line. Increase the triangle height so that it extends to one shingle row (5½ inches) below the sky light. The triangle base is maintained at 15 inches (see Figure 3).

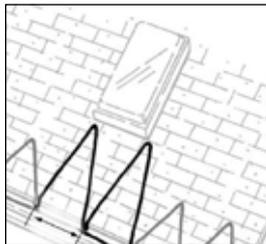


FIGURE 3: Triangle pattern near sky light

Table 1 - Triangle Heights for Various Overhangs

OVERHANG (inches)	TRIANGLE HEIGHT (shingle rows)	OVERHANG (inches)	TRIANGLE HEIGHT (shingle rows)
Less than 12	3	42-48	9
12-18	4	48-54	10
18-24	5	54-60	11
24-30	6	60-66	12
30-36	7	66-72	13
36-42	8		

Pattern for valleys: If a valley exists in a problem area of your roof, you must route cable up and back down the valley a minimum of 3 feet, as shown in Figure 4. Extend the cable higher if the warm area of your roof is higher.

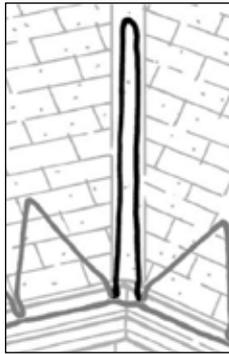


FIGURE 4: Cable pattern in a valley

Pattern for dormers: To treat a problem dormer area, the cable should be arranged up and around the dormer as shown in Figure 5.

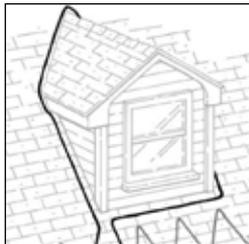


FIGURE 5: Cable pattern around a dormer

INSTALLATION INSTRUCTIONS FOR THE ROOF & GUTTER DE-ICING CABLE (cont'd)

Pattern for other special roof areas - Other problem roof areas not previously described may also be treated with the de-icing cable to prevent ice dam formation. Triangles - similar to those used for the roof line can also be used to treat these special areas.

In treating these special problem areas, the height of the triangles may be greater than those used at the roof edge. Keep the triangle based at 15 inches, but increase the triangle height so it extends at least one shingle row (5½ inches) into the warm roof section.

Triangle heights must NOT exceed 5 feet. The clips provided with the kit are not designed to attach triangles this large. For problem areas that are more than 5 feet from the roof edge, commercial grade de-icing cable should be installed by a professional installer.

ROUTING OF CABLES IN DOWNSPOUTS USING CABLE CLIPS

“Along run” downspouts - For downspouts that are along the run of the roof line being treated, the cable must be routed down and back up the inside of the downspout. Do NOT wrap the cable around the downspout or otherwise attempt to attach it to the outside.

Remember: to avoid overheating the cable and increasing the risk of fire or electric shock, no part of the downspout may pass through a building.

You must first determine the total length of cable needed to go down and back up the downspout. It is important to measure as accurately as possible because the cable must be flush with the end of the downspout. Several methods for determining the length may be used. One is to tie a small weight (such as washer) to a string and lower it into the downspout. Once the string passes through the bottom of the downspout, mark the string as needed to record the length of the downspout. You will need twice this length of cable. (*Note: for accurate results, use a string that does NOT stretch when the small weight is attached.*)

Alternatively, you could also use a tape to measure each section of the downspout. To calculate the total cable needed, add the measurements in each section and multiply by 2.

Lastly, if it is not possible to use either of these above methods, you may use the cable itself to estimate the length of cable needed in the downspout. However, to avoid snagging or cutting the cable on sharp edges, take care when pulling the cable into and removing it from the downspout. Inspect the cable for damage and do NOT use a cable that has been damaged.

Once you know the length of the cable needed, the next step is to install clips and feed the cable into the downspout. Use the clips as a spacer on the cable every 6 inches so that the cable does not touch itself in the downspout. You must tighten the spacers before the cable is installed in the downspout. You may do this with your fingers or pliers. If you use pliers, squeeze gently and use care to avoid pinching, crimping, cutting into or otherwise damaging the cable. Do NOT hammer to tighten the clips. Pull the cable into the downspout using a weight string.



Warmup Roof Clips NAM-ROOF-CLIP

“End of run” downspouts - If a downspout exists at the end of the run of the roof line being treated, the cable must be routed down the inside of the downspout. **There is no need to route it back up. Do NOT wrap the cable around the downspout or attempt to attach it to the outside.**

Pull cable into downspouts using weighted string. Be sure the run of the cable is flush with the end of the downspout and that no cable is extended out at the end of the downspout. **Remember to avoid overheating the cable and increasing the risk of fire or electric shock.**

NO part of the downspout may pass through a building.

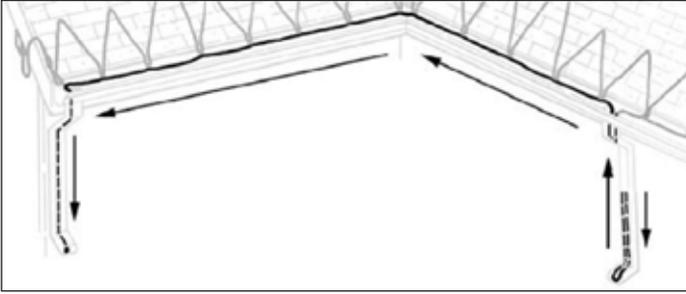


FIGURE 6a: Cable routed back along the roof line in the gutter and downspouts.

If at this point you find that you have an excess of cable, you may route the cable back up the downspout to take up this excess. Alternatively, triangles on the roof can be made larger (up to 5 feet in length) or cable loops in valleys can be extended.

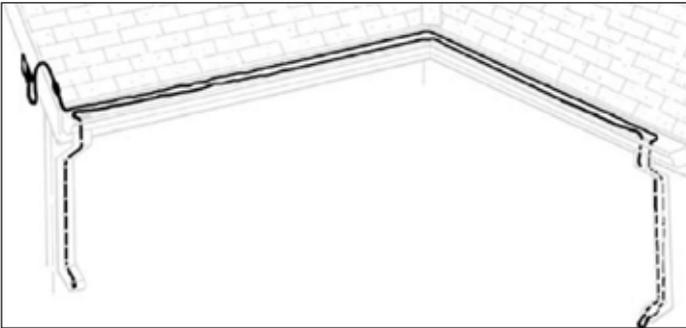


FIGURE 6b: Cable routed back along the roof line in the gutter and downspouts.

If you have a shortage of cable (the end of the cable does NOT reach to the bottom of the downspout), you may to reduce the height of the triangles on areas of the roof that are less susceptible to ice dams.

When transferring from gutter to downspout, in-line or at end-of-run, always use a WARMUP Downspout Hanger clip to prevent the cable from chafing against the sharp sheet metal edges of the gutter. Refer to the specific instructions to apply such clip.

The above instructions assume ‘residential’ type gutters and spouts between 4” and 6” wide. For roof draining larger than that and applications that may require above normal melting, please consult a Warmup representative and discuss your options with Commercial grade Self Regulating Cable.

WARNING!

**To reduce the risk of fire, electric shock or ice dam formation,
do NOT cut splice or alter the de-icing cables in any way.
The cable length CANNOT be changed.**

FINAL INSTALLATION STEP

Check to be sure that the cable has NOT been removed from its intended position. The heated portion of the cable MUST be positioned entirely on the roof and MUST NOT touch, cross over or overlap itself.

Place the labels for the Circuit Breaker / Fuse Panel near the appropriate circuit breaker / fuse so that they are clearly visible to current and future users.

Table 2 - Estimating the cable length you need

AREA	WHAT TO MEASURE	HOW TO CALCULATE
Along Roof	Overhang (A) and Length of Roof (B)	Length of roof (B) x Overhand Multiplier (see below)
Dormer	Distance around dormer (C)	Number of dormers x Distance around dormers (C)
Valley	Number of valleys (D)	Number of valleys (D) x 6 feet (1.8m)
Downspout	Number of downspouts Length of downspouts (E)	Number of downspouts x Length of downspouts (E) x 2

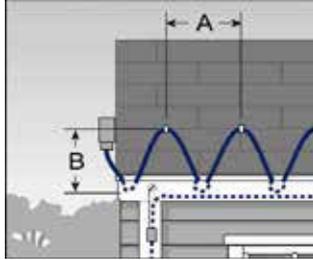


Table 3 - Overhang Multiplier

ROOF OVERHANG		MULTIPLIER FOR ROOF WITH GUTTERS	MULTIPLIER FOR ROOF WITHOUT GUTTERS
Inches	Centimeters		
Less than 12	Less thn 30	4.0	3.0
12	30	4.0	3.0
24	60	5.3	4.3
36	90	6.8	5.8
48	120	8.1	7.1
60	150	9.6	8.6
72	180	11.2	10.2



WARRANTY - Roof & Gutter De-icing cables

Warmup provides a 10-Year Warranty (from date of purchase) for the Snow Melting Mats and Cables for the material and workmanship under normal operating conditions.

In case of defective material, Warmup's obligation will be limited to the repair or supply of new material, free of charge to the customer.

The Warranty does NOT cover installations made by unqualified personal or faults caused by incorrect design by others; misuse; damage caused by others; damage in transit; incorrect installation and any other subsequent damage that may occur. Cost related to repair/replacement will be fully chargeable to the customer if the damage is due to any of the above reasons.

Warmup is under no circumstances liable for consequential damages or losses including without limitations the loss or profit arising from any cause whatsoever. The guarantee is a material warranty only and does NOT cover field labor. **A qualified electrician MUST connect the heating system.**

The Warranty is void if there is any payment default and if data is not filled in correctly.

EXCLUSIONS

Warmup, Inc. shall in no event be liable for incidental or consequential damages, including but not limited to extra utility expenses or damages to property. This Warranty is null and void if:

- 1) The covering over the heater(s) is damaged, lifted, replaced, drilled into or repaired.
- 2) The heater fails due to damage caused during installation, unless damage is caused directly by an employee of Warmup. It is therefore essential to check that the heater is working (as specified in the installation manual) prior and during installation.
- 3) Damage as a result of floods, fires, winds, lightning, accidents, corrosive atmosphere or other conditions beyond the control of Warmup, Inc.
- 4) Use of components or accessories is not compatible with Warmup heaters.
- 5) Warmup products are installed outside the United States.
- 6) Parts not supplied or designated by Warmup, Inc.
- 7) Damage or repair required as a result of any improper use, maintenance, operation or servicing.
- 8) Failure to start due to interruption and/or inadequate electrical service.
- 9) Any damage caused by frozen or broken pipes in the event of equipment failure.
- 10) Changes in the appearance of the product that does not affect its performance.
- 11) The owner, or his/her designated representative, attempts to repair the product without receiving prior authorization from Warmup. Upon notification of a repair problem, Warmup, Inc. will issue an Authorization to Proceed under the terms of this Warranty. If Warmup is required to inspect or repair any defects caused by any exclusions referenced above, all work will be fully chargeable at Warmup's inspection and repair rates then in effect.

WARMUP, INC. DISCLAIMS ANY WARRANTY NOT PROVIDED HEREIN, INCLUDED ANY IMPLIED WARRANTY OF THE MERCHANTABILITY OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. WARMUP, INC. FURTHER DISCLAIMS ANY RESPONSIBILITY FOR SPECIAL, INDIRECT, SECONDARY, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING FROM OWNERSHIP OR USE OF THIS PRODUCT, INCLUDING INCONVENIENCE OR LOSS OF USE. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE FACE OF THIS DOCUMENT. NO AGENT OR REPRESENTATIVE OF WARMUP, INC. HAS ANY AUTHORITY TO EXTEND OR MODIFY THIS WARRANTY UNLESS SUCH EXTENSION OR MODIFICATION IS MADE IN WRITING BY A CORPORATE OFFICER.

DUE TO DIFFERENCES IN BUILDING AND FLOOR INSULATION, CLIMATE AND FLOOR COVERINGS, WARMUP, INC. MAKES NO REPRESENTATION THAT THE FLOOR TEMPERATURE WILL ACHIEVE ANY PARTICULAR TEMPERATURE OR TEMPERATURE RISE. UL STANDARD LISTING REQUIREMENTS LIMIT THE HEAT OUTPUT OF WARMUP UNDERTILE HEATING, AS SUCH, USERS MAY OR MAY NOT BE SATISFIED WITH THE FLOOR WARMTH THAT IS PRODUCED. WARMUP DOES WARRANT THAT ALL HEATERS WILL PRODUCE THE RATED WATT OUTPUT LISTED ON THE HEATER NAMEPLATE, WHEN OPERATED AT THE RATED VOLTAGE.

TERMS AND CONDITIONS

Shipping Discrepancies:

Incoming materials should be inventoried for completeness and for possible shipping damage. Any visible damages or shortages must be noted prior to accepting the material. Any discrepancy concerning type or quantity of material shipped, must be brought to the attention of your Warmup® reseller within 15 days of the shipping date entered on the packing slip for the order.

Miscellaneous:

The terms of this Limited Warranty are exclusive and supersede any other warranty or terms and conditions relating to the subject matter whether included in a purchase order for this product or in any other document or statement.

Register your Warmup warranty at
www.warmup.com or www.warmup.ca

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