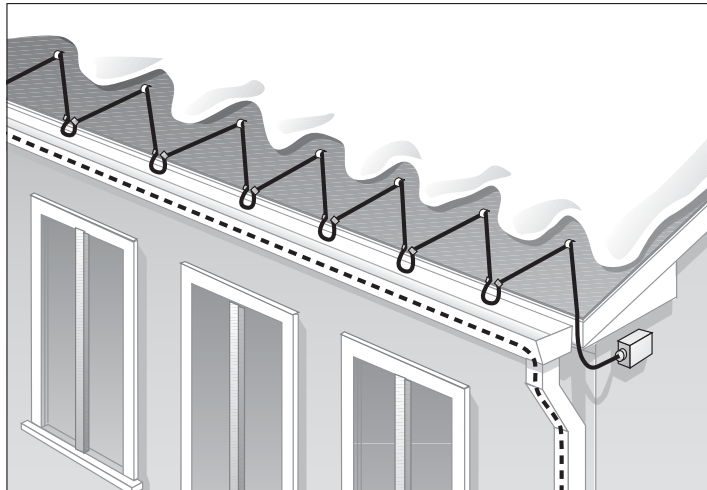


Installation, Operation

MAINTENANCE INSTRUCTIONS

General Instructions for Only Roof and Gutter Snow and Ice Melting Applications.



WARNING: These instructions are intended for cable being installed in ordinary non-hazardous areas. Using these instructions, the braid is to be used as a grounding means and for physical protection only. **DO NOT INSTALL ROOF AND GUTTER PRODUCTS IN A HAZARDOUS AREA.**

INSPECTION

1. Open package and visually check for breaks or nicks in the cable jacket. File claim with carrier if any damage is found.
2. Never energize the cable when it's coiled or on a reel. Test only when it is laid out straight.
3. After removing the cable from the carton or wrapping, check the insulation resistance of the unit from buss wires to braid with a 2500VDC megger to assure the cables have not been damaged during shipping and handling.

⚠ WARNING

ELECTRIC SHOCK HAZARD. Verify insulation resistance is 20 megohms or greater before installing. Contact Protherm if cable is less than 20 megohm.

4. The heating cables should be stored in their shipping cartons or on reels in a dry atmosphere until they are ready to be installed.

GENERAL

⚠ WARNING

FIRE HAZARD. Do not use roof and gutter cable for pipe freeze protection in or around mobile homes. Do not exceed the maximum circuit length described in these installation instructions. Failure to comply could result in fire or personal injury.

Before installation, make certain gutters and downspouts are free of leaves and other debris.

Electrical connections must be MADE in accordance with national and local codes by a qualified person. (Ground fault protection is required. Verify with codes whether personnel protection, GFCI or equipment protection, EPD is required).

⚠ WARNING

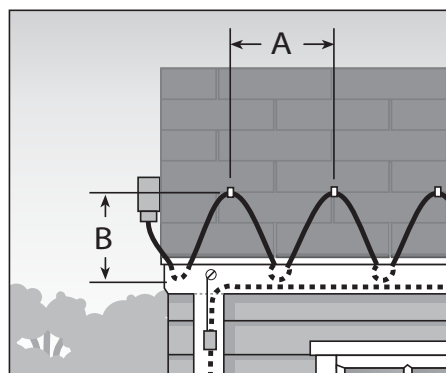
ELECTRIC SHOCK HAZARD. Disconnect all power before installing or servicing heating cable and accessories. A qualified person must perform installation and service of heating cable and accessories. Heating cable must be effectively grounded in accordance with the National Electrical Code. Failure to comply can result in personal injury or property damage.

DESIGN

1. Walk the system to plan the layout of the heating cable.
2. Obtain the following roof information: roof edge length, roof overhang, total gutter length, total downspout length and breaker rating.
3. Calculate the amount of cable required.
 - A. Multiply the roof edge length by the spacing factor found in Table 1.
 - B. Add the total gutter length plus the total downspout length to the result obtained in Part A to determine the total length of cable required.
4. Calculate the number of circuits required. Divide the total length of cable required by the maximum heater length allowed for the breaker rating. Tables 2, 3 and 4 indicate maximum heater lengths depending upon the Protherm Roof and Gutter product selected.
5. Branch-Circuit Sizing: The ampacity of the branch circuit conductor and the rating or setting of overcurrent devices shall not be less than 125% of the ampere load of the cable or units.

Required Cable

Table 1			
Roof Overhang	A	B	Spacing Factor
	Heating Width	Heating Height	
12"	2 ft	18"	2
24"	2 ft	30"	3
36"	2 ft	42"	4



Maximum Allowable Circuit Lengths per Breaker Rating for 5W/Ft. Heating Cable

	Table 2 — SRF-RG			Table 3 — Thermwire Melt			Table 4 — Safe-T-Melt	
	120V			120V			120V	
Start Up @ 0°F	15A	20A	30A	15A	20A	30A	10A	15A
Start Up @ -20°F	90 ft	120 ft	175 ft	90 ft	120 ft	175 ft	60 ft	100 ft
	75 ft	100 ft	150 ft	75 ft	100 ft	150 ft	60 ft	100 ft
	240V			240V			240V Not Available	
Start Up @ 0°F	15A	20A	30A	15A	20A	30A		
Start Up @ -20°F	135 ft	185 ft	275 ft	135 ft	185 ft	250 ft		
	120 ft	160 ft	250 ft	120 ft	160 ft	250 ft		

INSTALLATION

1. The minimum installation temperature is -40°F (-40°C).
2. Locating the heating cable on the roof.
 - A. Loop the heating cable on the overhang area of the roof. The overhang area is the portion of the roof which extends beyond the building's outside wall. The heating cable loop should extend into the gutter to maintain a drainage path. It should also extend to a point 6 inches above the line where the wall joins the roof. The spacing of the loops should be at 2 foot intervals. The minimum bending radius is six times the minor diameter.
 - B. For flat roofs, the heating cable can be spaced as appropriate for creating drainage paths.
 - C. Secure the heating cable to the roof using Protherm roof clip kits for specified roof and gutter product. Protherm recommends using two clips to form the loop that extends over the gutter edge and one clip to form the loop at the top of the overhang. For flat roofs, secure the heating cable to the roof with a clip at 3 foot intervals. See clip instruction sheet for details.
 - D. It is recommended that a barrier (snow birds) or snow fence be mounted on the roof above the heating cable. This prevents damage to the heating cable system due to ice slides. If desired, the heating cable can be attached to the barrier with the Protherm roof clips.
3. Locating the heating cable in gutters and downspouts.
 - A. Run the heating cable in and along the gutter. It is not necessary to attach the heating cable to the gutter bottom.
 - B. When running the heating cable into, or out of the gutter, use a Protherm roof clip to prevent abrasion of the cable
 - C. In downspouts, the heating cable must extend below the freezing level.
 - D. The heating cable can be looped in the downspout if it is convenient to do so, such as when a downspout is not at the end of a run. Note: Tee splices are not permitted and void agency approvals.
 - E. Use a Protherm downspout hanger to protect the heating cable from damage caused by sharp gutter edges and to provide strain relief. See instruction sheet (PJ482) for details.
 - F. Protect any heating cable which protrudes past the lower opening of the downspout.
4. Installing the installation accessories.
 - A. Install all end seals and splices prior to making power connections.
 - B. Use only Protherm Installation Accessories. Refer to the appropriate product literature for the correct accessory catalog numbers for Power Connection Kit, Roof Clip Kit, Splice Connection Kit and Downspout Hanger Kit.
 - C. If these kits are not used, or if their instructions are not followed, then the installation will not comply with UL.
 - D. Use only UL Listed weather-proof junction boxes for power connection.
5. Start-up requirements.
 - A. The power connection kit contains two caution labels that must be visibly located. One must be at the circuit breaker panel, the other on or next to the ON/OFF control for the cable unit.
 - B. Prior to energizing the system, make sure the heating cable is free of mechanical damage (nicks, cuts, etc.) and thermal damage (solder, overheating, etc.). Visually check all power connections, splices and end seals. Perform 2500 VDC meggar check. The meggar check is performed at the power connection end of the cable between buss wire and the grounding braid. The minimum acceptable reading is 20 megohms. If the installation fails the meggar test, check end seals, splice connections and cable sheath for physical damage or areas where the grounding braid has come in contact with the buss wires or conductive core. If physical damage can not be found and end seals or splices are not the cause, then the complete circuit should be removed and replaced with new roof and gutter heating cable.

SERVICE

1. Prior to the winter season, make sure gutters and downspouts are free of leaves and other debris.
2. Protherm recommends checking the insulation resistance of the heating cable sheath with a 2500 VDC meggar. This reading is taken at the power connection end of the cable between a buss wire and the grounding braid. The minimum acceptable reading is 20 megohms. The value should be recorded.
3. The installation should be checked every Fall. The following checks should be done.
 - A. Meggar test (see #2 above for procedure).
 - B. Inspect heating cable and connections for signs of damage.
 - C. If physical damage is found, replace the damaged sections.
 - D. If the installation fails the meggar test and physical damage cannot be found, then the complete circuit should be removed and replaced with new roof and gutter heating cable.

⚠ WARNING

ELECTRIC SHOCK HAZARD. Disconnect all power before installing or servicing heating cable and accessories. A qualified person must perform installation and service of heating cable and accessories. Heating cable must be effectively grounded in accordance with the National Electrical Code. Failure to comply can result in personal injury or property damage.

4. Prior to repairs performed on roof, heating cable must be removed to prevent damage to cable. Cable must not be exposed to chemical sealants that may be applied to roof surface and must be stored away from area while sealants cure. Upon replacement of cable, inspect for signs of physical damage to cable and connections. Replace any damaged sections and connections.

