

Design and Installation Guidelines for Roof and Gutter Applications

PREPARATION

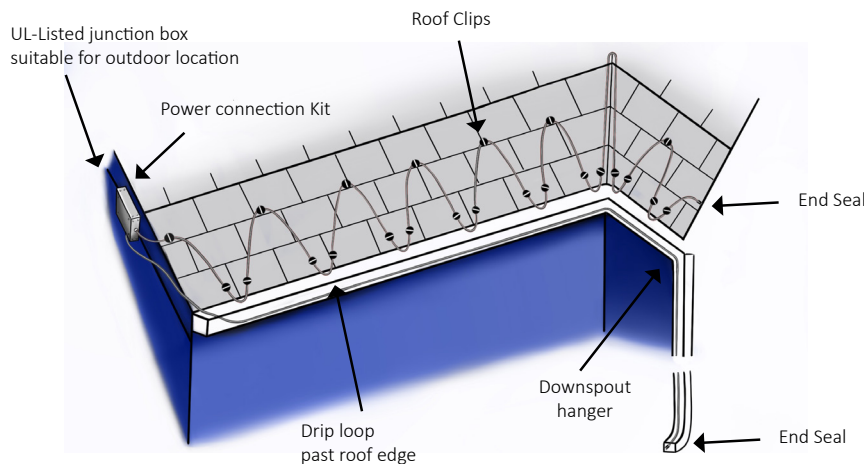
1. Verify you are using the correct heating cable and components.

<p>Heating cable: LSR05-11 or CRG05-11 (120 volt) LSR05-21 or CRG05-21 (208, 240, 277 volt)</p> <p> LSR05-1RG or CRG05-1RG (120 Volt) LSR05-2RG or CRG05-2RG (208, 240, 277 volt)</p>	<p>(UL-Listed de-icing and snow melting equipment when used with associated kits and installed per manufacturer's instructions.)</p> <p>(CSA Certified Roof De-Icing when used with associated kits and installed per manufacturer's instructions.)</p>
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Power connection kit with end seals:	PCA-RG2 (LSR05 & CRG 05)
End seal kit only (5 per kit):	ESA-RG
Roof clips (25 per kit):	RC-RG
Downspout hanger:	DS-RG

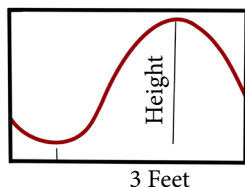
2. Visually inspect components for in-transit or handling damage and perform continuity and insulation resistance (megger) tests on the heating cable.

INSTALLATION



1. Install components in accordance with roof and gutter component installation instructions.

2. Spacing:

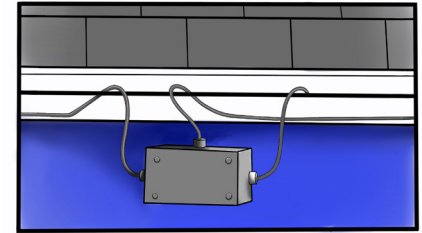


Height: Heater should extend high enough up the roof to extend over the heated part of the building.

3. Roof-edge heating cable usage chart (does not include heating cable for gutter and downspouts):

Eave overhang	Feet of heating cable (per foot of roof edge)
12"	1' 6"
24"	2' 6"
36"	3' 6"
48"	4' 6"

- Using the roof clips, make sure the heating cable forms a drip loop at the roof edge, which extends past the roof edge, forming a drainage path off the roof.
- Install downspout hangers above all downspouts, to help support the heating cable in those locations.
- Extend the heating cable past the bottom of the downspouts just far enough to form a small drip loop. End seals at these locations should be tucked back up inside the downspout.
- Tees and splices are made by using the power connection kits.



Circuit Breaker Sizing			Max. Cable Length (feet)	
			120 Volt	208 to 277 Volt Cable
			LSR05-11T / CRG05-11T	LSR05-21T / CRG05-21T
15 amp	If started at:	32° F	100	160
		0° F	90	145
		-20° F	75	130
20 amp	If started at:	32° F	130	210
		0° F	120	190
		-20° F	100	170
30 amp	If started at:	32° F	190	320
		0° F	175	290
		-20° F	155	260

TESTING BEFORE OPERATION:

1. After all components have been installed, but prior to hookup of power wires to heating cable bus wires, perform an insulation resistance (megger) test using a 2500 VDC megger. Reading should be at least 20 megohms.

NOTES:

1. Section 426-53 of the National Electric Code requires ground fault protection for all electric de-icing and snow melting applications. This ground fault protection must be at a level of protection greater than that which is provided by a standard circuit breaker. Since a 5 ma trip GFI may result in a nuisance trip, a trip level of 30 ma is recommended.
2. Part 1, Section 10 of the Canadian Electrical Code requires grounded metal structures used for support or on which the cable is installed. Do not install heater closer than 13 mm to any exposed combustible surface.
3. Two copies of a caution notice indicating the presence of electric de-icing and snow-melting equipment on the premises are packed with this unit. One notice must be posted at the fuse or circuit-breaker panel and the other on or next to the on/off control for the cable unit. Both notices must be clearly visible.
4. Protect all cable that is exposed and /or protrudes past the lower opening of the downspout.
5. Use only watertight construction or enclosure Type 3, 3S, 4, 4X, 6, or 6P junction box when installing.
6. Install cable at -40°C or above using a minimum bend radius of ¼ inch.
7. Some roof slopes may require the use of a snow/ice fence to prevent damage to the heating cable from snow and ice slides.
8. For gutters wider than 6 inches, use two runs of heating cable in the gutter.
9. Make certain the gutters and downspouts are free of leaves and other debris prior to the winter season

WARNING:

The contents of the component kit must be installed correctly to ensure proper operation and to prevent shock or fire. Read these important warnings and carefully follow all the installation instructions.

- To minimize the danger of fire from sustained electrical arcing if the heating cable is damaged or improperly installed, use a ground fault protection device. Arcing may not be stopped by conventional circuit breakers.
- Component approvals and performance are based on the use of specified parts only. Do not substitute parts or use vinyl electrical tape.
- The black heating-cable core is conductive and can short. It must be properly insulated and kept dry.
- Bus wires will short if they contact each other. Keep bus wires separated.
- Heat-damaged components can short. Use a heat gun or a torch with a soft yellow low-heat flame; not a blue focused flame. Keep the flame moving to avoid overheating, blistering, or charring the heat-shrink tubes. Avoid heating other components. Replace any damaged parts.
- Leave these installation instructions with the user for future reference.