Cable Length Calculations

**Sloped, Standard, Non-Standing-Seam Roof**

Determine the amount of cable required using the following calculation:

\[ \text{Total Length} = A + B + C \]

- \(A\) = Roof Edge Length. Determine roof edge length by multiplying the length of the roof edge by the spacing factor found in Table 1. The roof overhang determines the spacing.
- \(B\) = Gutter Length
- \(C\) = Downspout Length. The downspout length is two times (2X) the downspout height, because the cable will trace down and loop back up the downspout.

**Table 1**

<table>
<thead>
<tr>
<th>Roof Overhang</th>
<th>Roofing Width</th>
<th>Roofing Height</th>
<th>Spacing Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 ft</td>
<td>2 ft</td>
<td>1 ft</td>
<td>2</td>
</tr>
<tr>
<td>20 ft</td>
<td>2 ft</td>
<td>1 ft</td>
<td>2</td>
</tr>
<tr>
<td>30 ft</td>
<td>2 ft</td>
<td>1 ft</td>
<td>2</td>
</tr>
</tbody>
</table>

**Sloped, Standard, Standing-Seam Roof**

Determine the amount of cable required using the following calculation:

\[ \text{Total Length} = A + B + C \]

- \(A\) = Roof Edge Length. Determine roof edge length by multiplying two times the number of seams by the spacing height found in Table 2. The spacing height is 24 inches for standing seam roofs. The roof overhang and seam spacing determine the spacing height. If the seams are less than 24 inches apart, use every other seam.
- \(B\) = Gutter Length
- \(C\) = Downspout Length. The downspout length is two times (2X) the downspout height, because the cable will trace down and loop back up the downspout.

**Table 2**

<table>
<thead>
<tr>
<th>Roofing Width</th>
<th>Gutter Length</th>
<th>Downspout Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 ft</td>
<td>2 ft</td>
<td>24 in.</td>
</tr>
<tr>
<td>20 ft</td>
<td>2 ft</td>
<td>24 in.</td>
</tr>
<tr>
<td>30 ft</td>
<td>2 ft</td>
<td>24 in.</td>
</tr>
</tbody>
</table>

**Flat Roofs**

Determine the amount of cable required using the following calculation:

\[ \text{Total Length} = A + B + C + D \]

- \(A\) = Roof Perimeter
- \(B\) = Sum of the valley lengths
- \(C\) = Number of valleys X 1 foot
- \(D\) = Standing or non-standing seams X 1 foot

**Edge-Cutter**

Determine the amount of cable required using the following calculation:

\[ \text{Total Length} = A + B + C \]

- \(A\) = Roof Edge Length
- \(B\) = Gutter Length
- \(C\) = Downspout length. The downspout length is two times (2X) the downspout height, because the cable will trace down and loop back up the downspout.

**Maximum Circuit Length for Roof and Gutter Cable**

To calculate the number of circuits required, divide the total length of cable required by the maximum circuit length allowed for the breaker rating. Consult Table 3.

**Table 3**

<table>
<thead>
<tr>
<th>Amps</th>
<th>120-Volt</th>
<th>240-Volt</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1000 ft</td>
<td>500 ft</td>
</tr>
<tr>
<td>15</td>
<td>750 ft</td>
<td>375 ft</td>
</tr>
<tr>
<td>20</td>
<td>500 ft</td>
<td>250 ft</td>
</tr>
</tbody>
</table>
**Cable Length Calculations**

**Sloped, Standard, Non-Standing-Seam Roof**

Determine the amount of cable required using the following calculation:

\[
\text{Total Length} = A + B + C
\]

- **A** = Roof Edge Length. Determine roof edge length by multiplying the length of the roof edge by the spacing factor found in Table 1. The roof overhang determines the spacing.
- **B** = Gutter Length
- **C** = Downspout Length. The downspout length is two times (2X) the downspout height because the cable will trace down and loop back up the downspout.

**Table 1**

<table>
<thead>
<tr>
<th>Downspout Length (ft)</th>
<th>Gutter Height (ft)</th>
<th>Roof Edge Length (ft)</th>
<th>Spacing Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>7.11</td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>7.11</td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td>25</td>
<td>7.11</td>
<td>24</td>
<td>4</td>
</tr>
</tbody>
</table>

**Sloped, Standard, Standing-Seam Roof**

Determine the amount of cable required using the following calculation:

\[
\text{Total Length} = A + B + C
\]

- **A** = Roof Edge Length. Determine roof edge length by multiplying the length of the roof edge by the spacing factor found in Table 2. (number of seams to be traced X tracing height). The roof overhang and seam spacing determine the tracing height. If the seams are less than 24 inches apart, trace every other seam.
- **B** = Gutter Length
- **C** = Downspout Length. The downspout length is two times (2X) the downspout height because the cable will trace down and loop back up the downspout.

**Table 2**

<table>
<thead>
<tr>
<th>Downspout Length (ft)</th>
<th>Gutter Height (ft)</th>
<th>Roof Edge Length (ft)</th>
<th>Spacing Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>7.11</td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>7.11</td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td>25</td>
<td>7.11</td>
<td>24</td>
<td>4</td>
</tr>
</tbody>
</table>

**Flat Roofs**

Determine the amount of cable required using the following calculation:

\[
\text{Total Length} = A + B + C + D
\]

- **A** = Roof Perimeter
- **B** = Sum of the Valley Lengths
- **C** = Number of Drains X 1 foot
- **D** = Standing Seam X 1 foot

**Edge-Cutter**

Determine the amount of cable required using the following calculation:

\[
\text{Total Length} = A + B + C
\]

- **A** = Roof Edge Length
- **B** = Gutter Length
- **C** = Downspout Length. The downspout length is two times (2X) the downspout height because the cable will trace down and loop back up the downspout.

**Maximum Circuit Length for Roof and Gutter Cable**

To calculate the number of circuits required, divide the total length of cable required by the maximum heater length allowed for the breaker rating. Consult Table 3.

**Table 3**

<table>
<thead>
<tr>
<th>Circuit Length</th>
<th>120-Volt</th>
<th>240-Volt</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 ft</td>
<td>300 ft</td>
<td>300 ft</td>
</tr>
<tr>
<td>50 ft</td>
<td>350 ft</td>
<td>350 ft</td>
</tr>
<tr>
<td>60 ft</td>
<td>400 ft</td>
<td>400 ft</td>
</tr>
<tr>
<td>70 ft</td>
<td>450 ft</td>
<td>450 ft</td>
</tr>
<tr>
<td>80 ft</td>
<td>500 ft</td>
<td>500 ft</td>
</tr>
</tbody>
</table>
# Chromalox Precision Heat and Control

## Cable & Clips Roof De-Icing System

### Roof Valleys

Ice dams may form at the valley on a roof where two different slope rates meet. To maintain a continuous path for melt water, run the heating cable down the valley as shown in the accompanying illustration. Trace two-thirds up each valley with a double roll of heating cable. The heating cable must extend around the gutter. If you do not have gutter, the heating cable should extend over the edge 2 to 3 inches to form a drip loop.

### Roof Intersection

Attach a loop of heating cable two-thirds of the way up the slope to the adjacent wall. Position the closest heating cable approximately 3 inches on the wall. Position the second heating cable 6 inches from the first.

### Gutter

Ice may accumulate in gutters and on the roof edge. To maintain a continuous path for melt water to run off, make the heating cable as follows:

1. Ice standard gutters up to 6 inches wide, use one run of heating cable. In gutters 6 to 12 inches wide, use two parallel runs of heating cable.
2. Continue heating cable down inside the downspout.
3. Standard attachment method is #1 aluminum tags. However, mechanical attachment may not be necessary.

### Downspouts

Ice may form in downspouts and prevent melt water from escaping from the roof. To maintain a continuous path for melt water runoff, run the heating cable inside the downspout hangers as shown here:

- If the downspout exits underground, extend the heating cable into a heated area or before the frost line. Leave clips loose and attach the downspout at the bottom. If the downspout exits near the ground, allow water to run off the ground and build up around the downspout, eventually draining into the downspout at the end at the bottom of the cable.

### Alternative Attachment Method

The heating cable may also be attached with UV-resistant cable ties in a bracket, rod, or cable net used to support the heating cable and then attached to the roof in such a way as to support the weight of the heating cable.

### Membrane Roof

Create attachment strips using the same material as that of the roof. Apply the strips to the roof underneath the cable net using the appropriate means for the roof material (e.g., tears for shingles, solder for copper adhered for membrane sheath). Allow a small loop in the middle of the strips through which UV-resistant cable ties are inserted to secure the heating cable.

### Membrane Roof

Create attachment strips using the same material as that of the roof. Apply the strips to the roof underneath the cable net using the appropriate adhesive for the membranes sheath. Allow a small loop in the middle of the strips through which UV-resistant cable ties are inserted to secure the heating cable. Use at least one attachment point for every 5 to 10 feet of unsupported heating cable and at every point where the cable changes direction.

### Standing Seam Roof

- Draw the heating cable together at the bottom of the cable loop in the gutter using UV-resistant cable ties.

### Membrane Roof

- Draw the heating cable together at the bottom of the cable loop in the gutter using UV-resistant cable ties.

### Notes

- Do not cut, crimp, cut, or otherwise damage the heating cable. This could cause the system to fail, creating electrical shock or the hazard.
- Do not apply adhesives or other chemicals directly to the heating cable. Many adhesives will not stick to the outer jacket. This could cause the attachment to fail, resulting in inadequate drain paths.
- Provide enough strength to support the heating cable on the roof plus load from snow fluid collects on the system. If the attachment method is not strong enough, then the heating cable could come off and fail off.

## Edge-Cutter® Roof De-Icing System

### Method 1: Dual Flashing

**Control**
- GIF-3 Controller with GFI Protection
- GIT-4 Controller with GFI Protection
- Heat Trace Panels
- APS-4C and SC-40C with CIT-1 and GIT-1 for Large Distributed Systems

### Method 2: Flat Flashing

**Control**
- GIF-3 Controller with GFI Protection
- GIT-4 Controller with GFI Protection
- Heat Trace Panels
- APS-4C and SC-40C with CIT-1 and GIT-1 for Large Distributed Systems

### Controls

- GIT-4 Controller with GFI Protection
- Heat Trace Panels
- APS-4C and SC-40C with CIT-1 and GIT-1 for Large Distributed Systems

### Available Items

<table>
<thead>
<tr>
<th>Model</th>
<th>Color</th>
<th>Length</th>
<th>Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLF-EC Flat Flashing</td>
<td>Black</td>
<td>6 ft</td>
<td>12</td>
</tr>
<tr>
<td>PLF-EC Flat Flashing</td>
<td>Black</td>
<td>6 ft</td>
<td>16</td>
</tr>
</tbody>
</table>

*Note: When Edge-Cutter® flashing is to be used with sheet metal, it is applied between the roofing sheets. Use roll roofing, sheet metal, shingles, aluminum, steel, and even slate and the roof substrates, and fastened using screws or adhesives, depending on the applications and building materials.
### Roof and Gutter De-icing Quick Install Guide

**Method 1** Dual Flashing

- **PLD-EC** Flat Flashing
- **PLD-EC** Angled Flashing

**Method 2** Flat Flashing

- **PLD-EC** Flat Flashing
- **PLD-EC** Angled Flashing

**Controls**

- GIT-4 Controller with GFI Protection
- **weatherTRACE** Freeze Protection
- **APS-4C and SC-40C with CIT-1 and GIT-1** for Large Distributed Systems

#### Roof Valleys

- Ice dams may form at the valley on a roof where two different slopes meet. To maintain a continuous path for melt water to run off, fasten the heating cable as follows:

  1. In standard gutters up to 8 inches wide, use one run of heating cable. In gutters 8 to 12 inches wide, use two parallel runs of heating cable.
  2. When inserting the cable, fasten the heating cable down to the valley as shown in the accompanying illustration.

#### Downspouts

- Ice may form in downspouts and prevent melt water from escaping out of the roof. To maintain a continuous path for melt water runoff, run the heating cable inside the downspout as shown here.

#### Membrane Roof

- Create attachment strips using the same material as that of the roof. Apply the strips to the membrane underneath the cable run using the appropriate adhesive for the roof material (i.e., tar for shingles, solder for copper adhesive for membrane sheets). Allow a small loop in the middle of the strips through which UV-resistant cable ties are inserted to secure the heating cable.

#### Alternative Attachment Method

- The heating cable may also be attached with UV-resistant cable clips in a bracket, rod, or cable used to support the heating cable and then attached to the roof in such a way as to support the weight of the heating cable.

#### Gutters

- Ice may accumulate in gutters and on the roof edge. To maintain a continuous path for melt water to run off, note the heating cable as follows:

  1. In standard gutters up to 8 inches wide, use one run of heating cable. In gutters 8 to 12 inches wide, use two parallel runs of heating cable.
  2. When inserting the cable, fasten the heating cable down inside the downspout.
  3. Standard attachment method is with aluminum tags. However, mechanical attachment may not be necessary.

#### Downspouts

- Ice may form in downspouts and prevent melt water from escaping from the roof. To maintain a continuous path for melt water runoff, run the heating cable inside the downspout as shown here.

#### Membrane Roof

- Create attachment strips using the same material as that of the roof. Apply the strips to the membrane underneath the cable run using the appropriate adhesive for the membranes sheet. Allow a small loop in the middle of the strips through which UV-resistant cable ties are inserted to secure the heating cable.

#### Alternative Attachment Method

- The heating cable may also be attached with UV-resistant cable clips in a bracket, rod, or cable used to support the heating cable and then attached to the roof in such a way as to support the weight of the heating cable.

#### Gutter & Roof De-icing Products & Accessories

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft-Repairing Heating Cable</td>
<td>BM-160</td>
<td>12 V, 15 W/m in snow and ice, 5 W/m in fire area. (Standard coated cable. Optional non-stick cable or standard SBN-160.)</td>
</tr>
<tr>
<td>Soft-Repairing Heating Cable</td>
<td>SBN-160</td>
<td>12 V, 15 W/m in snow and ice, 5 W/m in fire area. (Alternative coated cable. Optional non-stick cable or standard SBN-160.)</td>
</tr>
<tr>
<td>Plenum Connection</td>
<td>PL-5K</td>
<td>Power transformer into plastic box with two red and blue and two &quot;Warning Electric Trace&quot; adhesive labels.</td>
</tr>
<tr>
<td>Junction Box</td>
<td>PL-JB</td>
<td>Labeled for TACM 48 parallel loops with two (1/2 in. NPT) conduit hubs.</td>
</tr>
<tr>
<td>Galv Box</td>
<td>RG-25</td>
<td>Materials for use with connection.</td>
</tr>
<tr>
<td>End Cap Kit</td>
<td>CG-1</td>
<td>Warranties for use and connection.</td>
</tr>
<tr>
<td>Roof Clip</td>
<td>RC-25</td>
<td>Clips the cable to the roofing material. Two per kit.</td>
</tr>
<tr>
<td>Downspout Hangers</td>
<td>BD-2</td>
<td>Hangers to support cable in gutter and downspout. One per pack.</td>
</tr>
<tr>
<td>Aluminum Ties</td>
<td>AT-1</td>
<td>Hangers to support cable in gutter and downspout. One per pack.</td>
</tr>
</tbody>
</table>
**Cable Length Calculations**

**Sloped, Standard, Non-Standing-Seam Roof**

Determine the amount of cable required using the following calculation:

\[ \text{Total Length} = A + B + C \]

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- **B** = Gutter Length
- **C** = Downspout Length. The downspout length is two times (2X) the downspout height because the cable will trace down and loop back up the downspout.

**Flat Roofs**

Determine the amount of cable required using the following calculation:

\[ \text{Total Length} = A + B + C + D \]

- **A** = Roof Perimeter
- **B** = Sum of the Standing-Seam Lengths
- **C** = Number of Drains X 1 foot
- **D** = Downspout Length.

**Edge-Cutter**

Determine the amount of cable required using the following calculation:

\[ \text{Total Length} = A + B + C \]

- **A** = Roof Edge Length
- **B** = Gutter Length
- **C** = Downspout length. The downspout length is two times (2X) the downspout height because the cable will trace down and loop back up the downspout.

**Maximum Circuit Length for Roof and Gutter Cable**

To calculate the number of circuits required, divide the total length of cable required by the maximum circuit length allowed for the breaker rating. Consult Table 3.