

# **SERGE BARIL**

## **PIPE & ROOF DEICING**

### **HEAT TRACING CORD SETS**



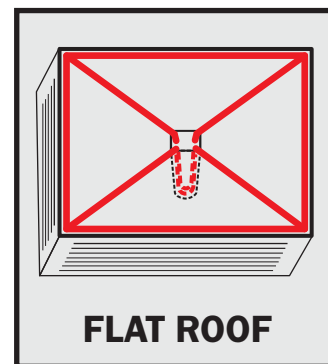
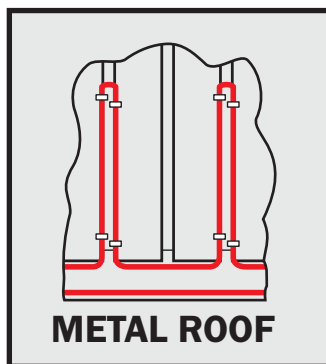
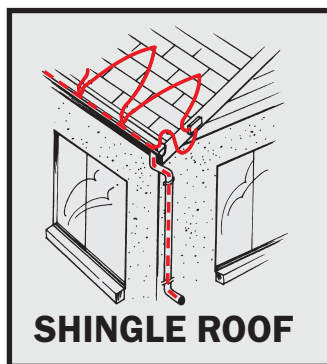
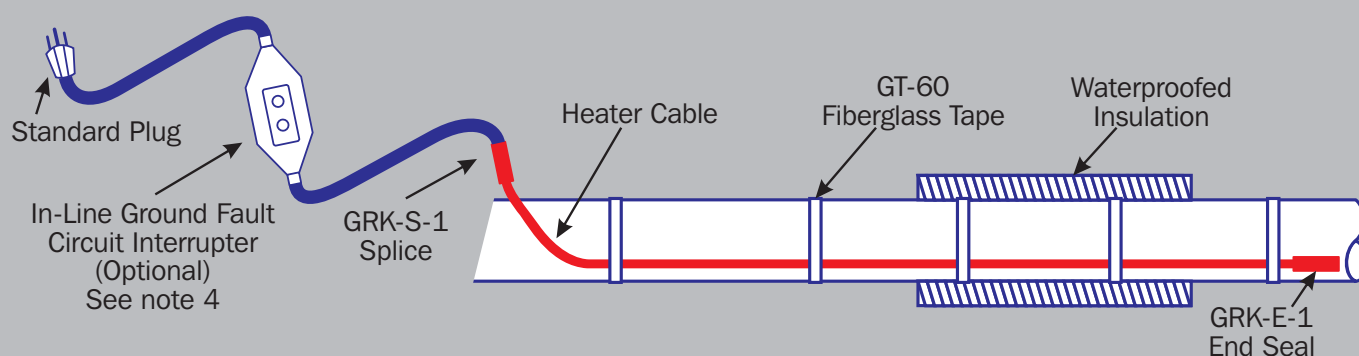
# PIPE AND ROOF DEICING KIT BAG

## GENERAL INFORMATION

The PRKB kit includes components to produce 1 cable set for pipe freeze protection and/or preventing the formation of ice dams on roofs and gutters. The CCA and FPS families of heating cables are suitable for:

- use on metal or plastic pipes but not on flexible vinyl tubing
- use in metallic and non-metallic gutters and downspouts
- use on shingle slate, metal, wood or flat roofs.

The self-regulating heating cables are designed to change their heat output with the surrounding temperature. As the temperature increases, the output of the cable decreases and vice versa. A pilot light in the plug indicates when power is applied to the cable.



## PRECAUTIONS

- 1) Heating cables must be installed in compliance with all national, state, provincial and local electrical codes. Check with your local inspector for specific details.
- 2) These instructions must be retained and made available to the user and transferred to future users.
- 3) Heating cables must not be energized in summer conditions.
- 4) It is mandatory, by the electrical code, that the circuit supplying the heating cable have ground fault protection. Consult an electrical inspector to determine the specific ground fault requirements for your application prior to installation.
- 5) Remove any old heating cable or insulation before installing the new cable.
- 6) Do not bend the cable to less than 5 times its diameter.
- 7) For further installation and testing instructions for the heating cable, please refer to the current edition of our manual HT-213.

# KIT CONTENTS

- 1 GRK-S-1 Splice kit:** to splice the power cord to the heat tracing cable (with installation instructions)
- 1 GRK-E-1 End seal kit:** for the heat tracing cable (with installation instructions)
- 1 POWER CORD** in one of the following versions:

## PRKB- XX-XX

- mA trip rating 6, 10, 19, 27 or other
- **Blank:** with Standard Plug
- **PGF** - On-Plug Ground Fault circuit interrupter
- **IGF** - In-line Ground Fault circuit interrupter with Standard Plug
- **SP** - Standard Plug w/o Ground Fault Interrupter  
(to be plugged into a GFI protected wall outlet)

- 1 LABEL** to be affixed to the power cord within 75 mm (3") of the plug and filled out as follows:

**SERGE BARIL & ASS.INC.**  
 5310 des Laurentides, Laval, QC, CANADA H7K 2J8  
**PIPE/ROOF APPLICATIONS TUYAU ET TOITURE**  
 For use with parallel heating cables / à être utilisées avec les câbles chauffants de type parallèle

Date	Cat. No.	Watts	Volts
			120

1. Refer to installation instructions (GRK-S & GRK-E) and appropriate brochures.  
*Se référer aux instructions d'installation (GRK-S & GRK-E) et aux brochures appropriées.*

2. Set Designation: 2E, 3A, 3C, *designation de l'ensemble*

---

Affix this Label to within 75 mm (3") of the Power Connection  
 Apposer cette étiquette à 75 mm (3") de la connexion  
 HT-450-121130

**Date:** Date of installation: **Year / Month / Day**

**Cat. No.:** The heat tracing cable part number printed on the cable:

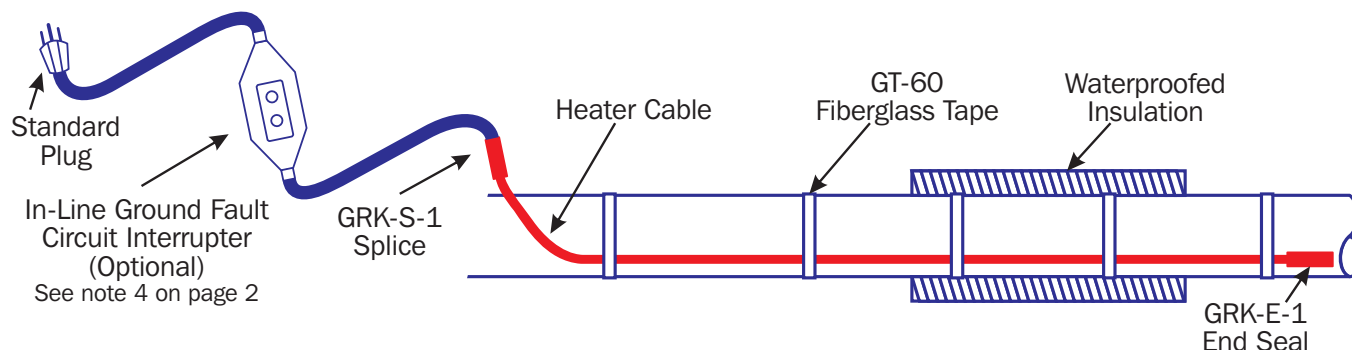
CCA Family:	<b>3CCA-1BA</b>	FPS Family:	<b>3FPS-1BT</b>
	<b>6CCA-1BA</b>		<b>5FPS-1BT</b>
	<b>8CCA-1BA</b>		<b>8FPS-1BT</b>
			<b>10FPS-1BT</b>

**Watts:** To get the total watts, multiply the watts/ft (m) for the specific application as listed below by the length in feet or meters of the heat tracing cable.

Cable type	Watts/ft (m) per application		
	METAL PIPE	PLASTIC PIPE	ROOF & GUTTERS
<b>3CCA-1BA</b>	3W/ft(10W/m)	1.8W/ft (6W/m)	N/A
<b>6CCA-1BA</b>	6W/ft (20W/m)	4.5W/ft (15W/m)	10W/ft (33W/m)
<b>8CCA-1BA</b>	8W/ft (26W/m)	6W/ft (20W/m)	13W/ft (43W/m)
<b>3FPS-1BT</b>	3W/ft (10W/m)	2W/ft (6.5W/m)	N/A
<b>5FPS-1BT</b>	5W/ft (16W/m)	3.8W/ft (12W/m)	9 W/ft (29W/m)
<b>8FPS-1BT</b>	8W/ft (26W/m)	5.8W/ft (19W/m)	13 W/ft (43W/m)
<b>10FPS-1BT</b>	10W/ft (33W/m)	6.8W/ft (22W/m)	N/A

# ON PIPE FREEZE PROTECTION HEATING CABLE CORD SETS

THE INFORMATION BELOW APPLIES TO BOTH **CCA** & **FPS** FAMILIES OF HEATERS



## THE PROBLEM:

Water supply pipe either not deep enough in the ground or installed on the surface, both leading to a potential pipe freeze-up.

## THE SOLUTION:

Installing the CCA family of heating cable on the outside of the pipe and covering it with adequate insulation. The pipe must be insulated with fiberglass or equivalent

insulation. The insulation must be covered with a waterproof jacket. Remember, wet insulation is conductive and worse than no insulation.

## OTHER TYPICAL APPLICATIONS:

- ▶ Pipe & tank freeze protection
- ▶ Maintain temperature in product pipelines
- ▶ Sprinkler freeze protection
- ▶ Hot water systems
- ▶ Drains, roofs & gutters
- ▶ Comfort and space heating

*NOTE: Please consult SBA for the appropriate publication for your application.*

## PRINCIPLE OF OPERATION:

The parallel bus wires apply voltage along the entire length of the heater cable. The conductive core provides an infinite number of parallel conductive paths permitting the cable to be cut to any length in the field with no dead or cold zones developing. The heater cable derives its self-regulating characteristic from the inherent properties of the conductive core material. As the core material temperature increases, the number of conductive paths in the core material decreases, automatically decreasing the heat output. As the

temperature decreases, the number of conductive paths increases, causing the heat output to increase. This occurs at every point along the length of the cable, adjusting the power output to the varying conditions along the pipe. The self-regulating effect prevents damage to even an empty pipe. As the cable self-regulates its heat output, it provides for the efficient use of electric power, producing more heat when and where it is needed, and also limiting the maximum sheath temperature of the cable.

## MAXIMUM EXPOSURE TEMPERATURE:

- Energized 150°F (65°C)
- De-energized 185°F (85°C)

*Exposure to temperature above 150°F (65°C) will shorten the life of your cable.*

*Before installing on hot water pipes, set the water heater thermostat below 150°F (65°C).*

## COMPONENTS:

**GT-60** Fiberglass tape 60ft (18m), with requirements established as follows:

Pipe size in inches/mm	< 2 (50)	3 (75)	4 (100)	6 (150)	8 (200)	10 (250)
Ft (m) of pipe per roll of GT	60 (20)	50 (15)	40 (12)	25 (7)	20 (6)	15 (5)

**GT-180** Fiberglass tape 180ft (55m).

**AT-150** Aluminum tape, 2in x 150ft (50mm x 45m) for plastic pipes.

**ETL-E** Electric trace label - one label every 10ft (3m) is recommended.

## STEP 1 DESIGN INFORMATION

The following information is required in order to determine the length and type of cable required:

- Diameter of the pipe
- Length of the pipe
- Minimum ambient temperature
- Number, type, and length of valves, if applicable
- Thickness of insulation based on fiberglass (for other types, consult your Serge Baril representative)
- Number of flanges and uninsulated supports, if applicable

Note: This design is for water pipes only and using fiberglass insulation. For process temperature maintenance or for use of other insulation materials consult our design guide (HT-201) for heat tracing of pipes and vessels.

## STEP 2 CHOICE OF CCA HEATER

**Table 1** provides the CCA heater cable selection to maintain 40°F (5°C) on a metal or plastic pipe with the use of fiberglass or equivalent insulation. It shows three types of installation and should be read as follows:

### METAL PIPES:

For the choice of CCA heater per pipe diameter and insulation thickness refer to **TABLE 1, COLUMN I**. For the length of heater required, see the formula at STEP-3. The cable uses components as listed on **page 4** and is attached at 1 ft (300 mm) intervals with fiberglass tape (GT-60). It is positioned as shown in **FIGURE 1**.

### PLASTIC PIPES:

**CAUTION:** Certain plastic pipe materials have low maximum allowable temperatures. Contact your local Serge Baril representative to verify if the use of an uncontrolled (no thermostat) heater application is appropriate or recommended given the specific pipe material and the rated maximum temperature.

### THERE ARE TWO CHOICES OF INSTALLATION FOR A PLASTIC PIPE:

#### 1. HEATER CABLE INSTALLED DIRECTLY ON THE PLASTIC PIPE

For the choice of CCA heater per pipe diameter and insulation thickness refer to **TABLE 1, COLUMN II**. For the length of heater required, see the formula at STEP-3.

The cable uses components as listed on **page 4** and is attached at 1 ft (300mm) intervals with fiberglass tape (GT-60). It is positioned, as shown in **FIGURE 1**.

#### 2. HEATER CABLE INSTALLED ON PLASTIC PIPE AND COVERED LENGTHWISE WITH ALUMINUM TAPE

The use of aluminum tape (AT-150) installed lengthwise on the heater helps dissipate the heat thus requiring fewer watts per foot. For the choice of CCA heater per pipe diameter and insulation thickness refer to **TABLE 1, COLUMN III**.

For the length of heater required, refer to the formula at STEP-3. The cable uses components as listed on **page 4**. It is positioned, as shown in **FIGURE 1**.

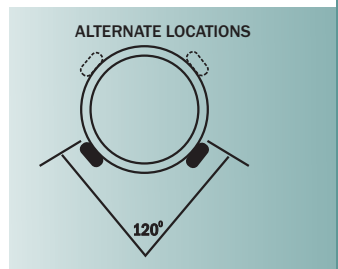
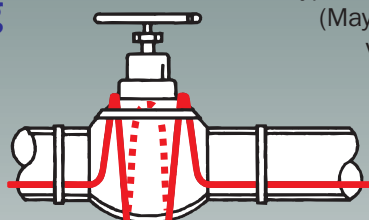


Figure 1

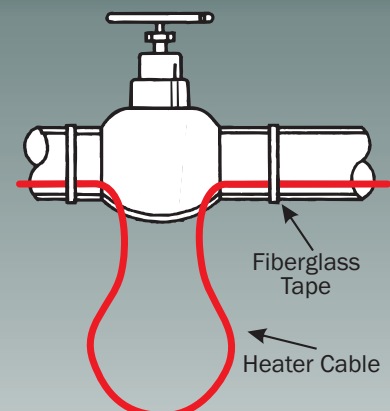
## TYPICAL INSTALLATION TIPS

### INSTALLATION ON VALVE

#### Self-regulating



Typical installation method.  
(May vary for different  
valve shapes)

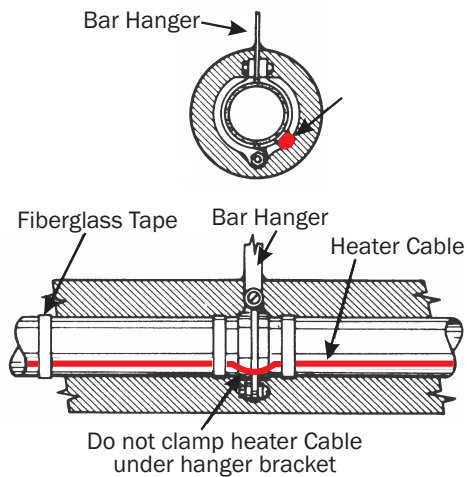


For a complete installation guide, please refer to:

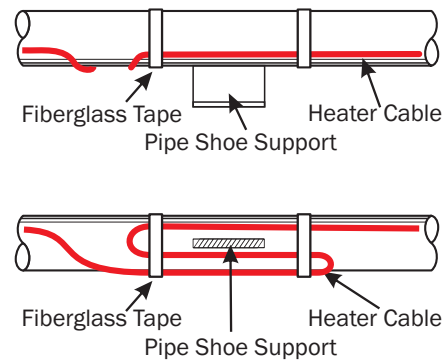
Serge Baril Heat Tracing Systems Installation and maintenance - Self Regulating Heater Cable (HT213).



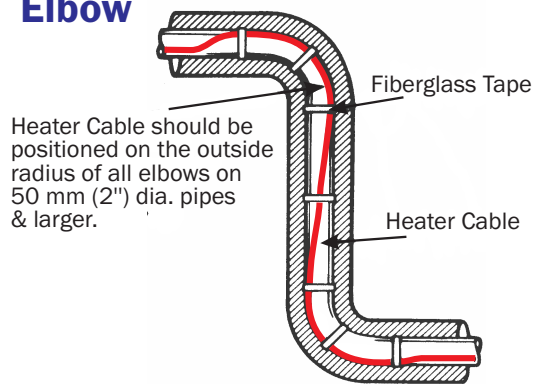
### Hangar support



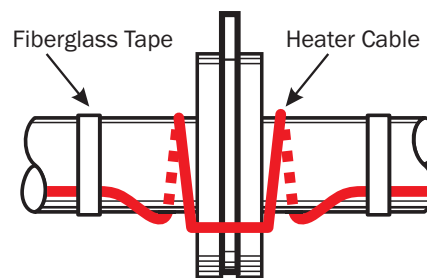
### Shoe support



### Elbow



### Flange



## STEP 3 LENGTH FORMULA

**TOTAL LENGTH OF HEATER REQUIRED = Pipe length (in ft or m) + 1 foot (0.3m) for the connection**  
add if applicable

- + 4x number of gate valves x length of valve in ft or m
- + 2x number of ball or butterfly valves x length of valve in ft or m
- + 2x number of flanges x diameter of pipe in ft or m
- + extra length for pipe supports

### ADVANTAGES:



- ▶ Cut to length for the project.
- ▶ Reduced electrical costs.
- ▶ Adjusts its power output where and when it is required.
- ▶ Very flexible, therefore easier to install.
- ▶ Can be used with or without thermostat.
- ▶ Can be installed on all types of water lines.

# Table 1 QUICK SELECTION GUIDE

KEY		A = 3CCA		B = 5CCA			C = 6CCA			D = 8CCA				
Insulation Thickness	Pipe Diameter (inch / mm)		Minimun Ambient Temperature											
			14°F / -10°C			-4°F / -20°C			-22°F / -30°C			-40°F / -40°C		
			I	II	III	I	II	III	I	II	III	I	II	III
1/2 inch 12 mm	1/2	12	A	A	A	A	A	A	A	B	A	A	B	A
	3/4	18	A	A	A	A	A	A	A	B	A	B	C	B
	1	25	A	A	A	A	B	A	B	B	A	B	D	B
	1 1/4	30	A	A	A	A	B	A	B	C	B	B	D	B
	1 1/2	38	A	A	A	B	B	B	B	D	B	C	2B	C
	2	50	A	B	A	B	C	B	B	2B	B	D	2C	D
	2 1/2	62	A	B	A	B	D	B	C	2B	D	D	2D	2B
	3	75	B	C	B	C	D	C	D	2C	2B	2B	2D	2B
	4	100	B	D	B	D	2C	D	2B	2D	2B	2C	3D	2D
6	150	B	2C	D	2B	2D	2C	2C	3D	2D	3C	4D	3C	
1 inch 25 mm	1/2	12	A	A	A	A	A	A	A	A	A	A	A	A
	1	25	A	A	A	A	A	A	A	A	A	A	B	A
	1 1/2	38	A	A	A	A	A	A	A	B	A	B	C	B
	2	50	A	A	A	A	A	A	B	B	B	B	C	B
	2 1/2	62	A	A	A	A	B	A	B	C	B	B	D	B
	3	75	A	A	A	A	B	B	B	D	B	C	D	C
	4	100	A	B	A	B	C	B	B	2B	D	D	2C	D
	6	150	B	B	B	B	D	C	D	2D	2B	2B	2D	2B
	8	200	B	D	B	D	2C	D	2B	2D	2B	2C	3D	2D
	10	250	B	2B	C	D	2D	2B	2C	3D	2D	2D	4C	3C
12	300	C	2B	D	2B	3C	2C	2D	4D	3B	2D	4D	3D	
1 1/2 inch 38 mm	1 1/2	38	A	A	A	A	A	A	A	A	A	A	B	A
	2	50	A	A	A	A	A	A	A	B	A	A	B	A
	4	100	A	A	A	A	B	A	B	C	B	B	D	B
	6	150	A	B	A	B	D	B	B	2C	C	D	2C	D
	8	200	A	B	B	B	2B	B	C	2C	D	D	2D	2B
	10	250	B	C	B	C	2B	D	C	2D	2B	2B	3C	2C
	12	300	B	D	B	D	2C	2B	2B	3C	2C	2C	3D	2D
	14	350	B	2B	B	D	2D	2B	2B	3C	2C	2D	3D	2D
16	400	B	2B	C	D	2D	2B	2C	3D	2D	2D	4D	3C	
2 inch 50 mm	2	50	A	A	A	A	A	A	A	A	A	A	B	A
	4	100	A	A	A	A	A	A	A	B	B	B	C	B
	6	150	A	A	A	A	B	B	B	D	B	B	2B	C
	8	200	A	B	A	A	D	B	B	2B	C	D	2C	D
	10	250	A	B	A	B	D	B	C	2C	D	D	2D	2B
	12	300	A	C	B	B	2B	C	D	2D	2B	2B	3C	2B
	14	350	A	C	B	B	2B	C	D	2D	2B	2B	3C	2C
16	400	B	D	B	D	2C	2B	2B	3C	2C	2C	3D	2D	
3 inch 75 mm	4	100	A	A	A	A	A	A	A	B	A	A	B	A
	6	150	A	A	A	A	B	A	A	B	B	B	D	B
	8	200	A	A	A	A	B	A	B	D	B	B	D	B
	10	250	A	B	A	B	C	B	B	D	B	C	2B	C
	12	300	A	B	A	B	D	B	B	2B	C	D	2C	D
	14	350	A	B	A	B	D	B	B	2B	D	D	2C	2B
	16	400	A	B	B	B	2B	C	C	2C	2B	D	2D	2B
	18	450	A	C	B	B	2B	C	C	2D	2B	2B	3C	2B
20	500	B	C	B	B	2B	D	C	2D	2B	2B	3C	2C	

## Maximum heater length on a 15A Breaker/120V

Heater	Start-up Temp.			Heater	Start-up Temp.			Heater	Start-up Temp.			Heater	Start-up Temp.		
		15A				15A				15A				15A	
	°F / °C	ft	m		°F / °C	ft	m		°F / °C	ft	m		°F / °C	ft	m
3CCA	40 / 5	221	67	5CCA	40 / 5	178	54	6CCA	40 / 5	165	50	8CCA	40 / 5	134	41
	-4 / -20	203	62		-4 / -20	147	45		-4 / -20	128	39		-4 / -20	103	31
	-22 / -30	185	56		-22 / -30	134	41		-22 / -30	117	36		-22 / -30	94	29
	-40 / -40	170	52		-40 / -40	123	38		-40 / -40	108	33		-40 / -40	86	26

# HEAT TRACING CORD SETS FOR ROOF & GUTTER DEICING AND DRAINS

## THE PROBLEM:



### EXPLANATION

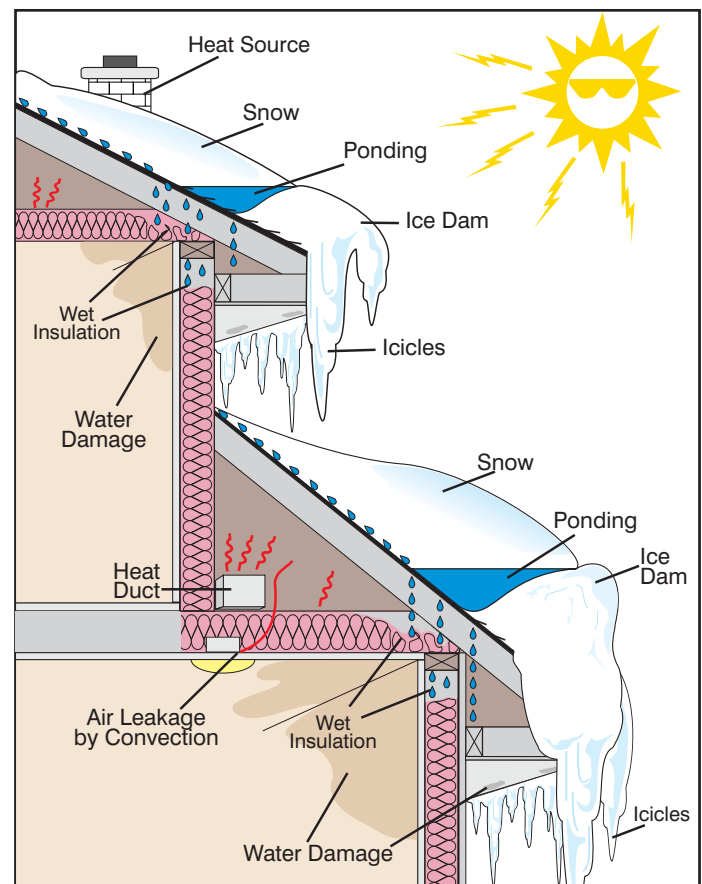
In cold weather, heat from the house rises and eventually heats the attic area. Ceiling insulation, while needed to reduce heating requirements in the house, does not prevent but only delays this build-up of heat in the attic. Snow on the roof acts as a good insulator creating a temperature differential between the attic and the outside. The temperature of the attic increases compared to the outside temperature. This allows the underside of the snow on the roof to gradually melt and form water droplets. These will flow down the roof forming ice dams by freezing as they reach the unheated cold roof edge (over the eaves, outside the walls). These water droplets may eventually freeze in the gutters, climb over the ice-filled gutter and form major, dangerous icicles.

As this ice builds-up, it creates a bigger dam. The ice forms a barrier and melted water accumulates behind this ice dam and may leak inside the wall space, under the shingles and into the building, causing water damage.

*"The roof is leaking!" ... not really, what has happened is the ice build-up stopped the flow of water down the roof and allowed it to leak into the house.*

## ICE FORMATION ON THE EDGE OF THE ROOF

Leading to  
**WATER INGRESS IN THE HOUSE**



## THE SOLUTION:



Serge Baril roof & gutter de-icing system offers the best way to help prevent ice dams and icicles using a self-regulating heating cable that provides a continuous drain path for melted ice and snow from the roof through the gutters and downspouts to the drain.

**RELATIVELY EASY -**

**JUST KEEP THE FLOW OF WATER  
DIRECTED OFF THE ROOF.**

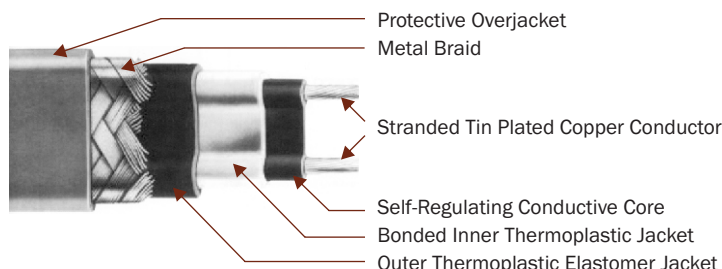
**KEEP THE PATH OPEN!**



# CABLE SELECTION

Serge Baril CCA or FPS heating cables provide a solution for ice dams that can build up and damage buildings and gutters. The self-regulation feature of the cables provides additional benefits:

- **Lower energy consumption** - the cable reduces its power output as the ice and snow disappear.
- **Fail safe temperature limit** - the cable cannot overheat and melt or damage temperature sensitive roof coatings.



## PRINCIPLE OF OPERATION

The parallel bus wires apply voltage along the entire length of the heater cable. The conductive core provides an infinite number of parallel conductive paths permitting the cable to be cut to any length in the field with no dead or cold zones developing. The heater cable derives its self regulating characteristic from the inherent properties of the irradiated cross linked conductive polymer core material. As the core material temperature increases, the number of conductive paths in the core material decreases, automatically decreasing the heat output. As the temperature decreases, the number of conductive paths increases, causing the heat output to increase. As the cable self-regulates its heat output, it provides for the efficient use of electric power, producing more heat when and where it is needed, also limiting the maximum sheath temperature of the cable. Four jackets provide extra dielectric strength, moisture resistance, protection from impact or abrasion damage, and flame retardancy. The inner

thermoplastic jacket is extruded over and bonded to the core material to prevent moisture penetration and wicking along the core. A waterproof thermoplastic elastomer outer jacket is then extruded over the inner jacket for dielectric protection and additional moisture resistance. A tinned copper braid is installed over the second jacket providing a continuous ground path and mechanical protection. A flame retardant, UV stabilized polyolefin overjacket on the CCA cables is then extruded over the braid. On the FPS heaters, the outer jacket is a fluoropolymer to provide more corrosion protection.

Both 6CCA and 5FPS self-regulating gutter and roof de-icing cables are rugged, industrial grade heaters that have a bonded inner jacket for enhanced moisture and dielectric protection. All heating cable components are UL listed, CSA certified for use as part of the system to provide roof and gutter de-icing.

- **For most applications, use: 6CCA-1BA (120 V) with polyolefin overjacket.**
- **For highly corrosive or hazardous areas, use: 5FPS-1BT (120 V) with fluoropolymer overjacket.**

## POWER OUTPUT

These self-regulating heating cables will develop a nominal power output of 10 to 12 W/ft (33 to 40 W/m) in snow and ice and 5 W/ft (16 W/m) in open air.

The maximum exposure temperature of all roof, gutter

and downspout materials should be verified, especially when dealing with non-metallic materials such as vinyl. The heater selection should be in accordance with these temperatures.

## ADVANTAGES:



- ▶ **Cut to length for the project.**
- ▶ **Reduced electrical costs.**
- ▶ **Adjusts its power output where and when it is required.**
- ▶ **Very flexible, therefore easier to install.**
- ▶ **Can be used with or without thermostat.**
- ▶ **Can be installed on all types of roofs.**

## MAXIMUM HEATER LENGTH ON A 15A DEDICATED CIRCUIT

**Caution:** Both the National and Canadian Electrical Codes require the use of a ground fault protection device (GFPD) at all times in conjunction with the installation of all heat tracers.

### HEATER LENGTH FOR HIGHLY CORROSIVE

Catalog Number	Maximum heater length	
	Start temp. °F / °C	FT / m
<b>6CCA-1BA</b> 120 V	20 / -7	102 / 31
	0 / -18	90 / 27
	-20 / -29	80 / 24
	-40 / -40	70 / 21

Catalog Number	Maximum heater length	
	Start temp. °F / °C	FT / M
<b>5FPS-1BT</b> 120 V	20 / -7	123 / 37
	0 / -18	110 / 34
	-20 / -29	100 / 30
	-40 / -40	91 / 28

### GENERAL NOTES:

1. Before installing the cable, allow it to warm up to room temperature. Keep grommets and shrink tubes warm until used (keep inside of jacket pocket, etc.)
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 the weatherproof junction box in a sheltered area. The junction box may be positioned to install the cables in different directions and thus reduce scrap.
5. Start the cable installation at the junction box, thus leaving a drip loop where the cable exits the junction

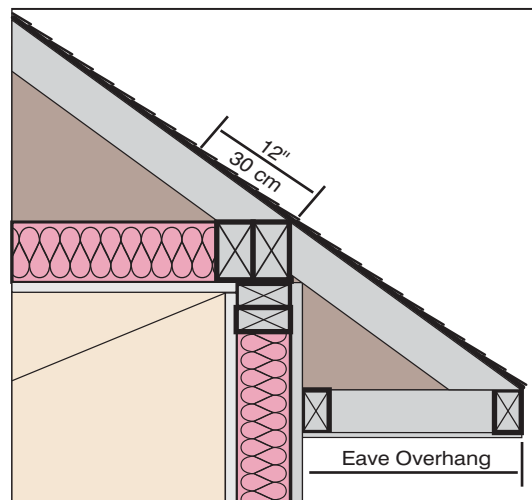
## SERGE BARIL OFFERS THE SOLUTION FOR A WIDE RANGE OF APPLICATIONS SUCH AS:

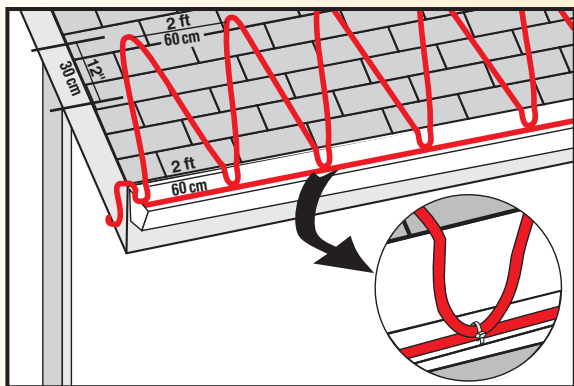
### SHINGLE ROOF

#### STEP 1. HEATER ON ROOF

Install the 6CCA heater looped up and down 12" (30 cm) beyond the eave overhang (see sketch) to the edge of the roof and to the bottom of the gutter to prevent ice build-up over the gutter. Cable spacing between the loops is normally 2 ft (60 cm). The amount of cable to be used will be affected by the depth of the eave overhang as shown in **TABLE I** below. This table provides the total number of feet or meters of cable required per foot or meter of roof edge.

The cable must be looped down over the edge of the roof and tied to the cable in the gutter using UV resistant cable ties. This is to help prevent the ice from bridging over the gutter.





**TABLE I: CABLE LENGTH PER FT (M) OF ROOF EDGE**  
Cable spacing is 2 ft (60 cm)

Eave Overhang		Loop Height		Feet (m) of cable/ Foot (m) of roof
inches	cm	inches	cm	
12	30	24	60	3
24	60	36	90	4
36	90	48	120	5
48	120	60	150	6

## STEP 2. HEATER IN GUTTER

The gutter requires a length of heater along the bottom to keep the flow of water to the drain. For gutters larger than 6" (15 cm), multiple runs of heater cable are recommended. It is preferable to tie the cable

### NO GUTTERS?

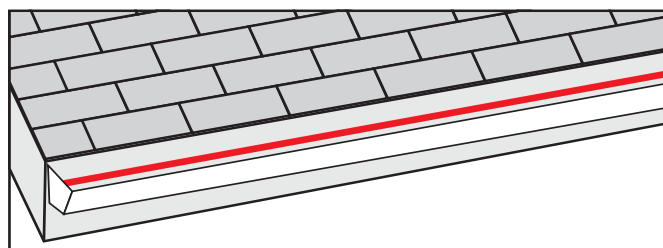
- 1) Install the cable on the roof as shown above leaving loops protruding about 3" (7.5 cm) over the edge of the roof.

down with the use of aluminum tape (AT-150) in order to keep the cable flat and on the bottom of the gutter. This also helps dissipate the heat along the bottom of the gutter providing wider coverage.

- 2) A heat tracing cable can also be installed longitudinally under the drip lip of the roof. This could help prevent the built-up of ice and icicles along the edge of the roof.

### TRACING GUTTERS ONLY?

This may well be adequate and could prove to be a good first step if there are no obvious ice dams forming on the roof. If this does not suffice, the roof can be heat traced following the above procedure at a later date.

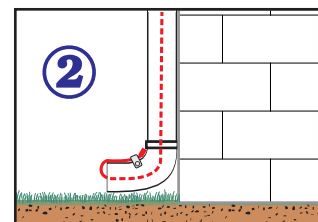
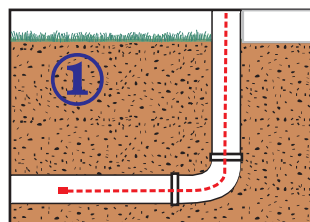


## STEP 3. DOWNSPOUT

The downspouts which serve to lead the water to the ground or drain must also be heat traced. The cable is looped down and back, unless the downspout is on the end of circuit with the cable terminating at the bottom.

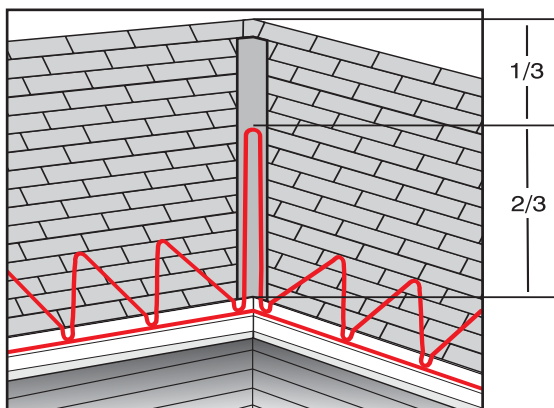
For the downspouts use a GRK-DH (downspout hanger), sold separately, to support the heating cable where it enters / exits a downspout. One hanger is required for each downspout.

*If the cable is terminated at the bottom, the end should protrude some distance into the ground drainage under the frost line (see sketch 1) to prevent freezing or tied to the exterior of the downspout (see sketch 2).*



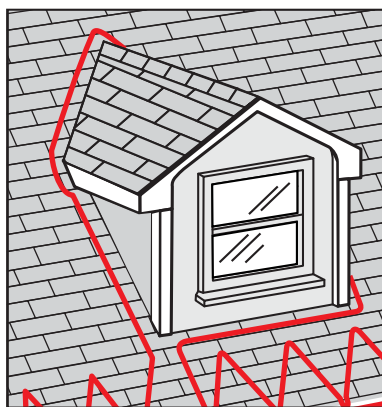
## STEP 4. ROOF VALLEYS

Install the cable up to two thirds the height of the valley and back down.



## STEP 5. DORMERS OR SKYLIGHTS

Install the cable all around the perimeter of the dormer or skylight.



## STEP 6. CABLE LENGTH CALCULATION

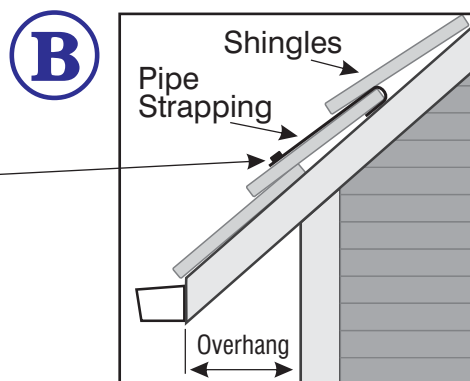
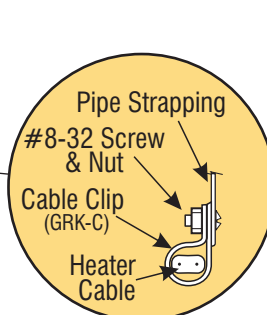
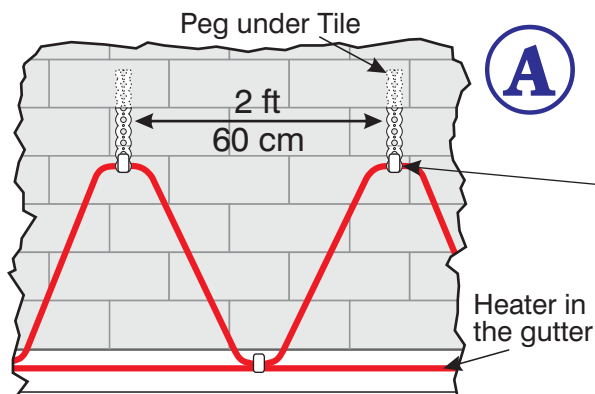
**TABLE II: TOTAL CABLE REQUIREMENTS: SLOPED SHINGLE ROOF**

<b>Roof</b>	_____ X _____ = _____
	Roof length Cable multiplier (from Table I)
<b>Dormers</b>	_____ X _____ = _____
	Quantity Perimeter
<b>Valleys</b>	_____ X _____ = _____
	Quantity 2/3 up and 2/3 down
<b>Gutters</b>	_____ X _____ = _____
	Length 1 pass / 6" (15 cm) width
<b>Downspouts</b>	_____ X _____ = _____
	Quantity Length x 2 (or 1 if end of circuit)
<b>Connections</b>	_____ X _____ = _____
	Quantity 2 ft (60 cm)
	<b>Cable length</b> = _____
	Cable length x 5% = _____
	<b>Total cable length</b> = _____

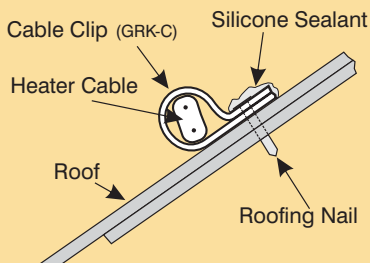
## ROOF ATTACHMENT

GRK-C roof clips can be used in conjunction with pipe strapping nailed directly into the shingles of a new roof (see sketch A). For existing structures, bend the top

edge of the pipe strapping before slipping it under the tile or shingle. Push up and pull back down to have the bent edge hook onto the top of the tile (see sketch B).



GRK-C roof clips may have to be surface mounted as shown. Please assure a complete seal by using silicone or other appropriate sealing agent.



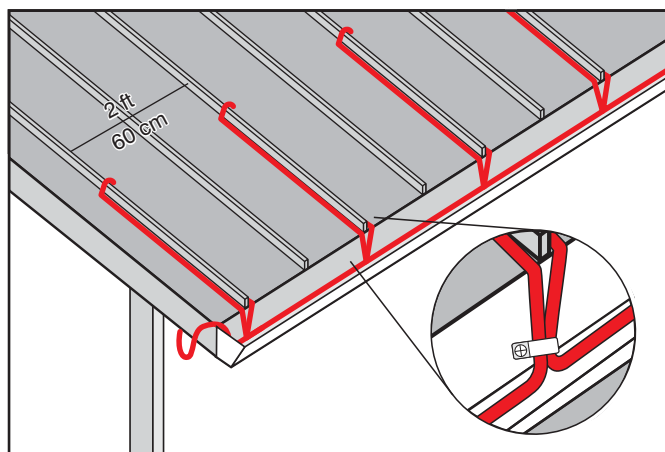
**An alternative solution:** A bead of adhesive (not furnished) should run along the pipe strapping for a length of 3" (76 mm) prior to slipping the strapping up under the tile. **Do not use an excessive amount so as to leave a visible blob of adhesive on the outer edge of the tile.** The adhesive bead should be large enough to deform and smear along the surface of the tile underneath. Allow the adhesive to cure to full bonding strength before attempting to install the cable and clips.

## METAL ROOF

Using the same logic as above, we basically have to guide a water droplet down the roof. The droplet should therefore meet a cable as it comes down. As such, we have to trace each second rib as shown on the drawing but not more than 2 ft (60 cm) between traces.

### CABLE REQUIREMENTS ON ROOF

The cable requirements for the loop on the roof are calculated as follows: the eave overhang plus 1½ ft (45 cm) which allows for extra cable to cover the portion of the roof inside the wall space plus the loop down to the gutter, multiplied by the number of ribs (2 traces on every second rib is equivalent to one trace per rib), plus the length of roof. See formula below.



**FORMULA:** (Eave overhang + 1 ½ ft (45 cm)) x number of ribs + length of roof.

Other cable requirements are as per **TABLE II**

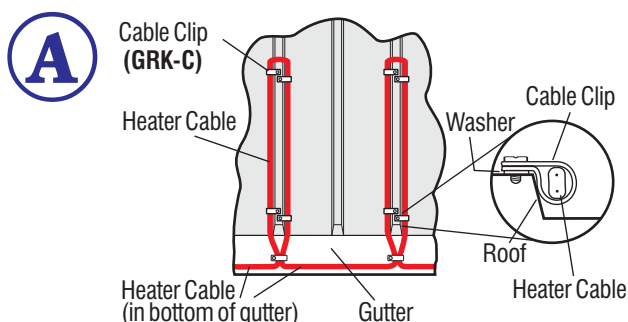
**SAVING:** Because the loops at the edges of the roof have to be brought down to the bottom of the gutter, we can thus save the cable in the bottom of the gutter by attaching the loops together using UV protected Ty-raps and tie the cable down with the use of the aluminum tape (AT-150) in order to keep the cable flat in the bottom of the gutter. This also helps to dissipate the heat along the bottom of the gutter (see sketch A).

### NOTES:

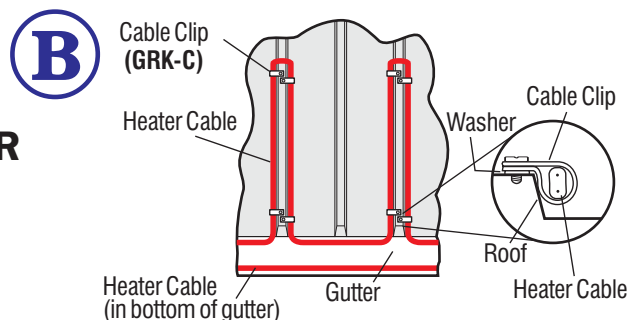
- 1) Every second rib is to be traced but not beyond a spacing of 2 ft (60 cm).
- 2) All the rest of applications such as dormers, gutters, downspouts are as per requirements for a shingle roof above.

## ROOF ATTACHMENT

Use GRK-C clips making sure to use self-sealing screws or other appropriate sealing mechanism to prevent water ingress. A typical rib cross-over is shown below.



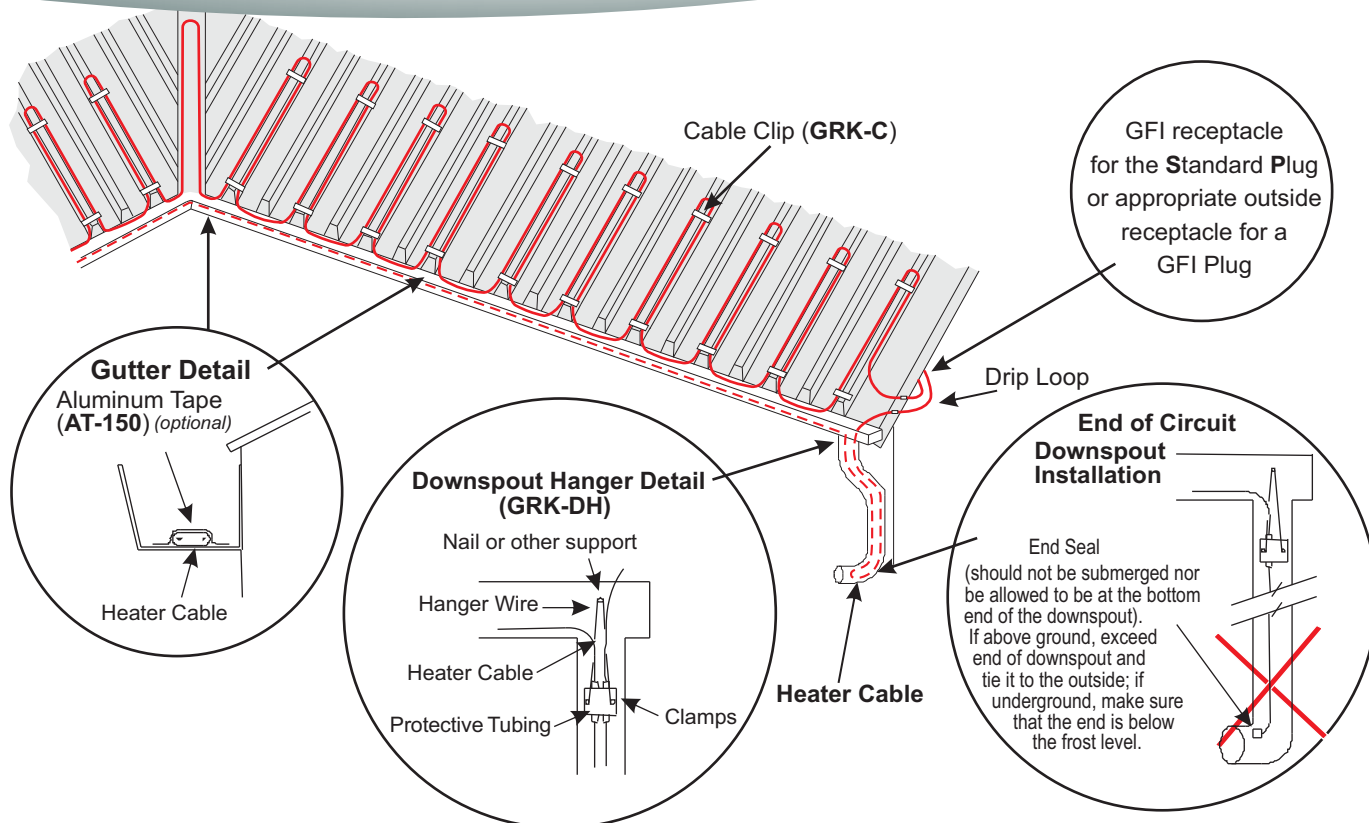
OR



Fasten with sheet metal screw using neoprene sealing washers. If washers are not available, coat the screw and the upslope edge of the clip with silicone sealant.

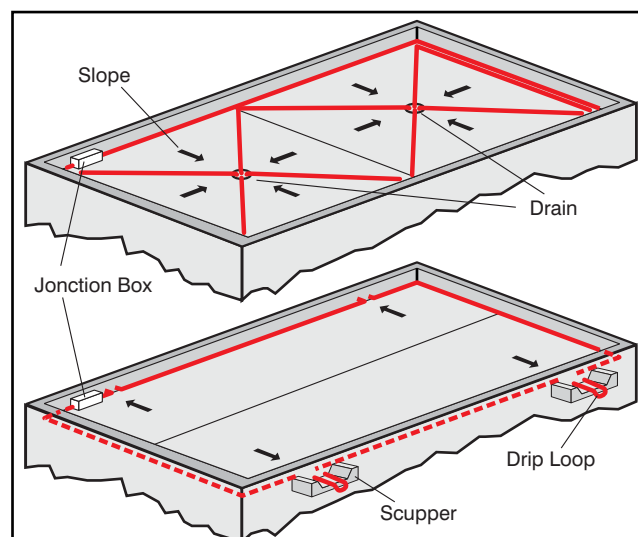
The exact cable spacing may vary depending on the rib design of the roof. Typically trace every other rib.





## FLAT ROOF

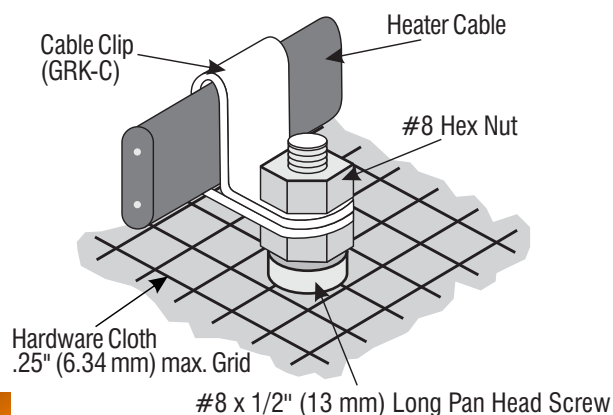
The principle is to keep a pathway open for the flow of water to the drain. There is generally a slope towards a central drain or towards an edge. Run the heat tracing cables from all corners to the drain making sure that the loops are bent into the drain. It is good practice to have one cable go down into the drain to prevent freezing. Lay heat tracers all along the perimeter.



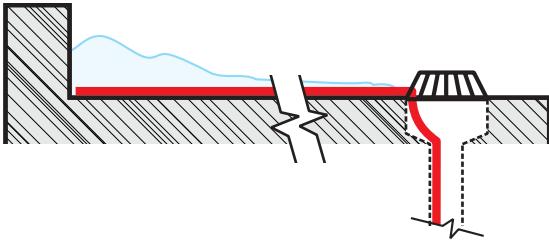
## ROOF ATTACHMENT

Use fiberglass or other appropriate sheet material to glue to the roof while having the GRK-C clips attached underneath this sheet as shown.

Adhesive (not furnished) should be used to bond the 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.



# DRAINS



Simply put one length of cable into the full length of the drain to be freeze protected.

## TESTING THE SYSTEM

**FOR PIPE INSTALLATION** Once the installation is complete, apply power to the heating cable. Wait about one hour, and then turn on a water tap supplied by the protected pipe and test the temperature of the water. It should feel warm almost immediately as the water heated by the cable flows through the pipe.

**FOR ROOF INSTALLATION** Once the installation is complete, apply power to the heating cable. The surface of the cable will feel warm after 15 minutes.

**OPERATION** Energise the cable/control upon the arrival of cold weather in the fall and de-energize the cable in spring. Ensure power is removed from the heating cable in summer.

**MAINTENANCE** Check the cable annually for damage, such as nicks or cuts possibly caused by animals or other activity before energizing the heating cable. Check any ground fault protection devices for proper operation.

## TEN YEAR EXTENDED WARRANTY SELF REGULATING HEATER CABLE

### SCOPE:

Serge Baril offers an extension of our regular 1 year warranty on all self-regulating heating cables for a period of up to 10 years from the date of manufacture.

This extended warranty includes all terms, conditions and limitations of the basic warranty with the following additions:

1. Heating Cable Extended Warranty Acceptance form has been signed and returned to Serge Baril for registration.
2. Heating cable failure is defined as having a 20% loss in power output.
3. Warranty is void if product is installed on or with materials containing plasticizers, such as commonly used in vinyl tapes or vinyl insulations. The cables must have been installed according to the manufacturer's installation instructions by an approved installer.

### PROCEDURE:

1. In the event of a claim, a "claim information sheet" must be completed and returned with all cable that has been removed.
2. Serge Baril will provide replacement cable at normal price levels for the initial replacement.
3. Upon examination of the returned cable and the determination that the cable is defective, Serge Baril will issue a credit for the defective cable.

# OUR WORLD IS ELECTRICAL HEAT TRACING



## APPROVALS:



AVAILABLE AT:

## GENERAL NOTE:

The above are general suggestions for applications of our cables and are not meant to replace the normal requirements of local, construction, electrical, or other codes. The installer must verify the conformity to all applicable codes or standards.

We are pleased to offer suggestions on the use of our various products, nevertheless, there are no warranties given except such expressed warranties offered in connection with the sale of a particular product. There are no implied warranties of merchantability or of fitness for a particular purpose given in connection with the sale of any goods. In no event shall Serge Baril be liable for consequential, incidental or special damages. The buyer's sole and exclusive remedy and the limit of Serge Baril's liability for any loss whatsoever shall not exceed the original purchase price paid to SBA for the product or products for which a claim is made.

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