

# Roof Deicing

SELF-REGULATING HEAT CABLE



# Self-Regulating Heat Cable Comparison

Warmzone self-regulating heat cable features a more flexible outer jacket and more durable carbon core than other leading brands of self-reg cable. These features provide more consistent performance, longer lifespan, and easier installation in cold temperatures.

## Key Features of Warmzone Self-regulating Heat Cable vs. Other Cable Brands

### Outer Jacket Quality

#### Typical self-regulating heat cable

The outer jacket of typical self-reg cable tends to “bubble” or separate from the cable core when the cable is manipulated for turns. These irregularities create stress points on the cable that can result in water reaching the core, leading to erratic heating and eventual cable failure.



#### Other Leading Brands of Self-regulating Cable

The outer jacket of most self-regulating heat cable separates from the core at a typical bend radius of 2 inches.

#### Warmzone Self-regulating Heat Cable

Warmzone self-regulating heat cable features a higher quality outer jacket that does not “bubble”. This reduces the chances of water seepage and cable failure.



#### Warmzone Self-regulating Heat Cable

Warmzone self-regulating heat cable does not “bubble” at an even tighter bend radius of 1½ inches.

### Installation at Low Temperatures

#### Typical Self-regulating Heat Cable

Typical self-regulating cable has a minimum installation temperature of 32-40°F. This is because the carbon in the cable becomes brittle and can easily break when bent or manipulated at low temperatures.

The outer jacket also becomes stiff, making the securing of cable to the roof, gutter, or pipes difficult during cold weather installations. The outer jacket tends to “pucker” and pull away from the core when making bends, compromising the cable’s integrity and leading to cable failure. Therefore installing most self-regulating heat cable at temperatures below 40°F is not recommended.



*Warmzone self-regulating heat cable and plug with GFCI.*

#### Warmzone Self-regulating Heat Cable

Warmzone self-regulating cable features a higher quality carbon center that is more resilient in low temperatures, thereby allowing the cable to be safely installed at temperatures as low as 0°F.

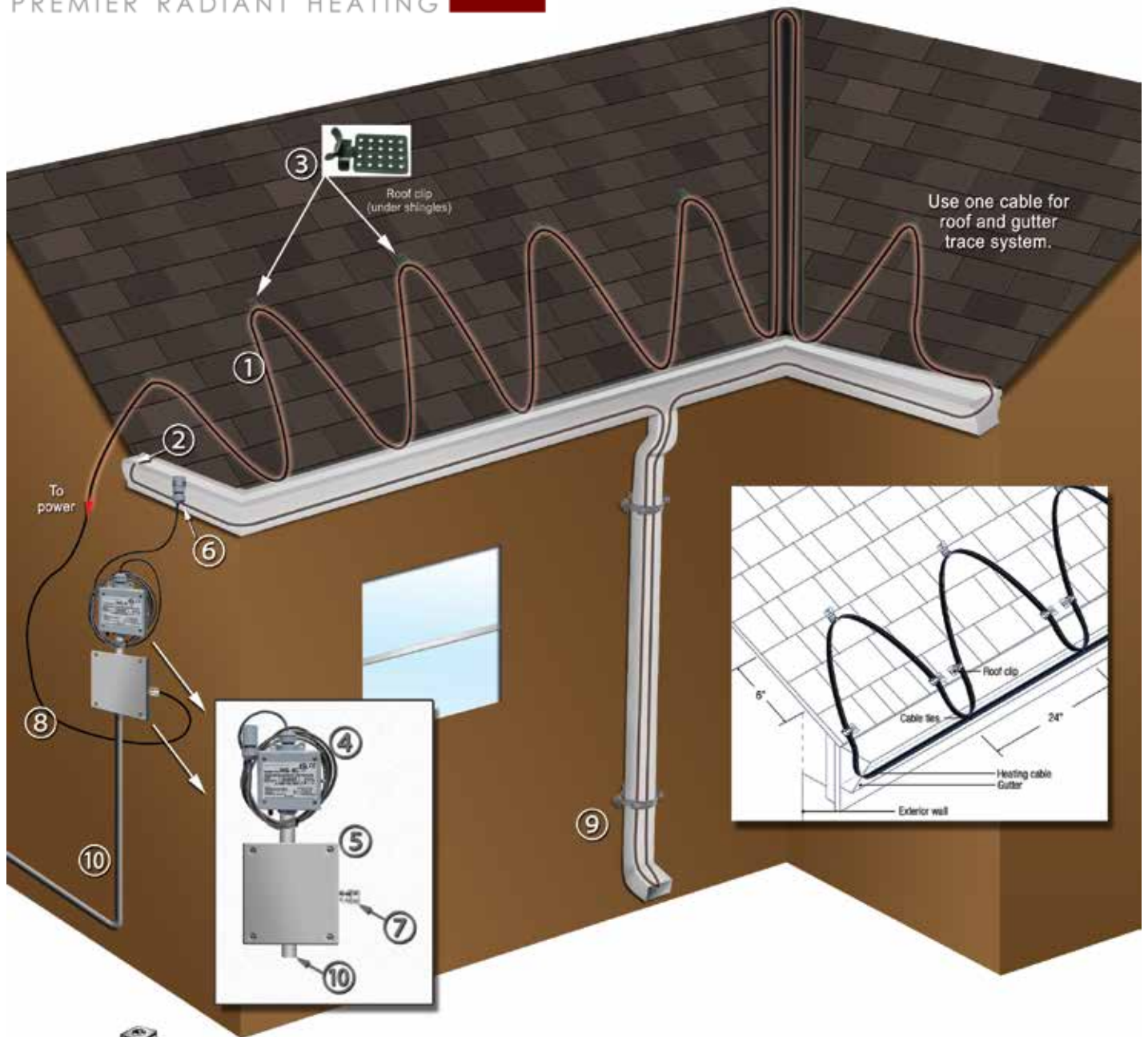
The higher quality outer jacket also remains flexible at low temperatures, resulting in more reliable performance and easier installation when securing to roofs, gutters, and pipes.

*“In all the years I’ve been installing roof heating systems, I’ve noticed that “bubbles” in the outer jacket of the cable almost always result in a point of failure. The superior outer jacket of Warmzone’s self-reg cable helps to eliminate this problem.”*

*– Eric W., Roofing Contractor*



# Self-Regulating Heat Cable System Overview



Roof Deicing



- ① Self-regulating heat cable
- ② End seal (termination) kit
- ③ Roof cable clips, manufactured for superior performance (under shingles)
- ④ Snow sensor or thermostat (WS-8 sensor with inline sensor shown)
- ⑤ Mulberry or Bell weatherproof junction box
- ⑥ Remote sensor (secured with Minerallac clamp)
- ⑦ Power connection kit
- ⑧ Drip loop (prevents water from trailing into the junction box)
- ⑨ Double or single downspout hanger
- ⑩ Conduit to home

# RoofHEAT

SELF-REGULATING HEAT CABLE



## Self-regulating Roof Heat and Gutter Trace Cable

Most roof deicing applications are best served by using Warmzone's self-regulating heat cable. The heat cable can be installed in gutters and downspouts to keep structures safe from ice damage and frost erosion.

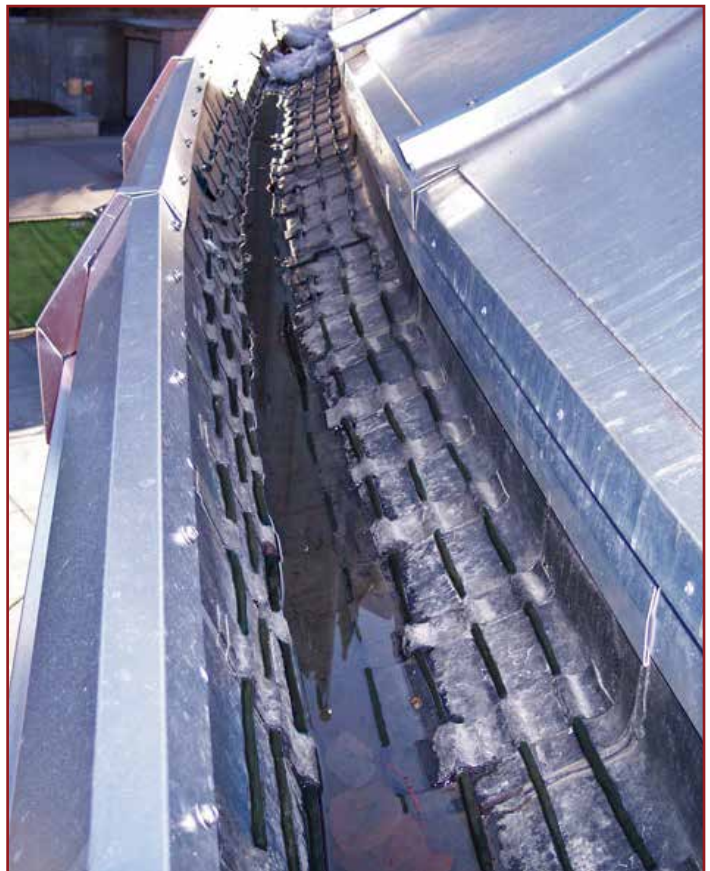
The self-regulating heat cable features an irradiated conductive core that increases its heat output as the ambient temperature falls, and decreases its output when the temperature rises.

### Features and Benefits

- Will not overheat or burnout when overlapped
- Superior quality outer jacket and carbon core
- Features advanced technology that results in highly effective, energy efficient operation
- Can be cut to length in the field
- Fully automated
- Maintenance free
- Protects roofs by preventing ice dams and ice buildup

Several roof heating options are available. Warmzone roof and gutter deicing systems are compatible with the following standard materials:

- |                        |                          |
|------------------------|--------------------------|
| <b>Roof Materials:</b> | <b>Gutter/Downspout:</b> |
| • Shake / Shingle      | • Metal                  |
| • Rubber / Tar         | • Plastic                |
| • Wood / Metal         | • Wood                   |



*Self-regulating heat trace cable installed in the gutters of a large commercial facility.*



*Heated roof valley and edges.*



*Warmzone pre-terminated self-regulating heat cable with and without a ground fault circuit interrupter (GFCI).*

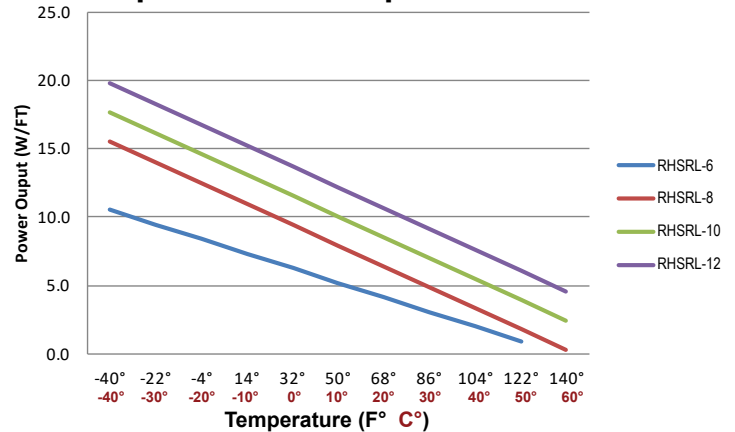


# RHSRL Heat Trace Cable Data Sheet

Warmzone's RHSRL self-regulating heat cable is the cable of choice for roof heating and gutter trace applications. The UL listed cable features a flexible outer jacket and durable carbon core, providing consistent performance, long lifespan, and easy installation in cold temperatures.

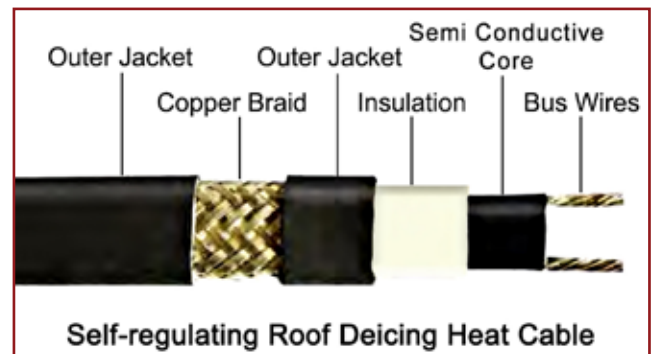
Technical Data for RHSRL Heat Cable	
Service voltage	110-120V, 220-277V
Maximum maintain or continuous exposure temperature (power on)	+149°F (65°C)
Maximum intermittent exposure temperature 1000 hours (power on/off)	+185°F (85°C)
Minimum installation temperature	-40°F (-40°C)
Protective braid resistance	<.006Ω/ft.
Bus wire gauge	16AWG
Approvals	cUL, ATEX, IECEx
Warranty	2 years (Not prorated)

## Power Output Curves Watts per Foot vs. Temperature



## RHSRL Cable Dimensions

Type	Dimensions	Minimum Bend Radius
RHSRL-CR	10.9 x 6.0mm	1.4 inches (36mm)

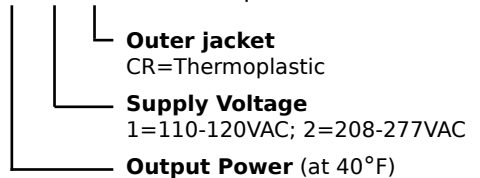


## Maximum Length (feet) vs Circuit Breaker Size

Cable	Startup Temp.	120 V				240 V			
		15A	20A	30A	40A	15A	20A	30A	40A
RHSRL-6-1 and RHSRL-6-2	50°F (+10°C)	230	270	270	270	460	540	540	540
	32°F (0°C)	230	270	270	270	460	540	540	540
	14°F (-10°C)	180	210	270	270	360	420	540	540
	0°F (-18°C)	140	190	270	270	285	380	540	540
	-20°F (-29°C)	125	165	250	270	250	330	500	540
RHSRL-8-1 and RHSRL-8-2	50°F (+10°C)	150	200	210	210	300	400	420	420
	32°F (0°C)	150	200	210	210	300	400	420	420
	14°F (-10°C)	140	150	205	210	280	300	410	420
	0°F (-18°C)	100	130	200	210	200	265	400	420
	-20°F (-29°C)	85	115	175	210	175	235	350	420
RHSRL-10-1 and RHSRL-10-2	50°F (+10°C)	120	160	180	180	240	315	360	360
	32°F (0°C)	105	140	170	180	210	280	340	360
	14°F (-10°C)	95	125	165	180	190	250	330	360
	0°F (-18°C)	80	110	160	180	160	215	325	360
	-20°F (-29°C)	70	95	140	180	145	190	285	360
RHSRL-12-1 and RHSRL-12-2	50°F (+10°C)	80	140	150	150	160	270	310	310
	32°F (0°C)	75	130	145	150	150	260	290	310
	14°F (-10°C)	70	115	142	150	140	230	285	310
	0°F (-18°C)	60	80	140	150	120	160	280	310
	-20°F (-29°C)	50	65	110	150	105	140	225	310
-40°F (-40°C)	45	60	90	140	90	125	190	280	

## ORDERING INFORMATION

RHSRL- □ - □ - □ For example: RHSRL-6-2-CR



**Example:** RHSRL-6-2-CR =  
6 watt, 208-277V,  
Thermoplastic outer jacket



*Warmzone self-regulating heat cable.*

### Approvals:

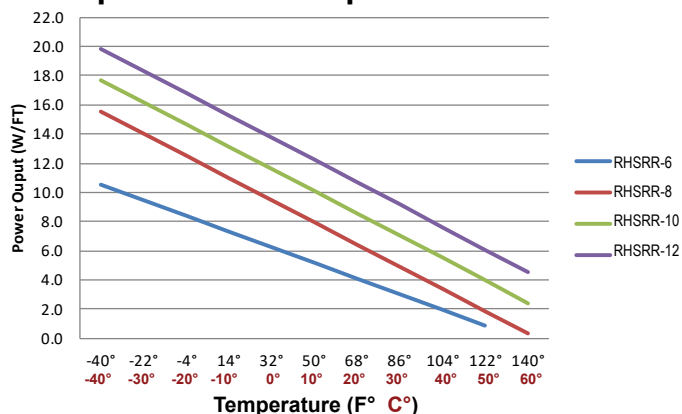


# RHSRR Heat Trace Cable Data Sheet

RHSRR is self-regulating heat cable that can be used for roof / gutter heating and pipe tracing applications. The cable features a flexible, UV stabilized thermoplastic elastomer overjacket that protects the durable carbon core for wet applications and exposure to the sun. The parallel heating cable is designed for a variety of industrial applications and environments, including explosion-hazardous and nonhazardous areas, and can be used for plastic or metal pipe freeze protection and temperature maintenance of pipes, tanks, and valves. The cable includes a NON-PRORATED 10-year warranty.

Technical Data for RHSRR Heat Cable	
Service voltage	110-120V, 220-277V
Maximum maintain or continuous exposure temperature (power on)	+149°F (65°C)
Maximum intermittent exposure temperature 1000 hours (power on/off)	+185°F (85°C)
Minimum installation temperature	-40°F (-40°C)
Protective braid resistance	<.006Ω/ft.
Bus wire gauge	16AWG
Approvals	cULus, hazardous, CSA, ATEX, IECEx
Warranty	10 years (Not prorated)
Certifications	Class I, Div.2 Groups A, B, C, D Class II, Div.2 Groups E, F, G Class III

## Power Output Curves Watts per Foot vs. Temperature

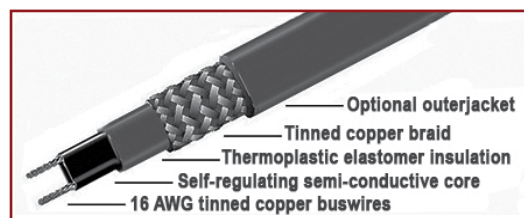


## RHSRR Cable Dimensions

Type	Dimensions	Minimum Bend Radius
RHSRR-CR	12.6 x 6.0mm	1.4 inches (36mm)

## Maximum Length (feet) vs Circuit Breaker Size

Cable	Startup Temp.	120 V				240 V			
		15A	20A	30A	40A	15A	20A	30A	40A
RHSRR-6-1 and RHSRR-6-2	50°F (+10°C)	230	270	270	270	460	540	540	540
	32°F (0°C)	230	270	270	270	460	540	540	540
	14°F (-10°C)	180	210	270	270	360	420	540	540
	0°F (-18°C)	140	190	270	270	285	380	540	540
	-20°F (-29°C)	125	165	250	270	250	330	500	540
	-40°F (-40°C)	110	145	220	270	220	295	440	540
RHSRR-8-1 and RHSRR-8-2	50°F (+10°C)	150	200	210	210	300	400	420	420
	32°F (0°C)	150	200	210	210	300	400	420	420
	14°F (-10°C)	140	150	205	210	280	300	410	420
	0°F (-18°C)	100	130	200	210	200	265	400	420
	-20°F (-29°C)	85	115	175	210	175	235	350	420
	-40°F (-40°C)	80	105	155	210	155	210	315	420
RHSRR-10-1 and RHSRR-10-2	50°F (+10°C)	120	160	180	180	240	315	360	360
	32°F (0°C)	105	140	170	180	210	280	340	360
	14°F (-10°C)	95	125	165	180	190	250	330	360
	0°F (-18°C)	80	110	160	180	160	215	325	360
	-20°F (-29°C)	70	95	140	180	145	190	285	360
	-40°F (-40°C)	60	85	125	170	125	170	255	340
RHSRR-12-1 and RHSRR-12-2	50°F (+10°C)	80	140	150	150	160	270	310	310
	32°F (0°C)	75	130	145	150	150	260	290	310
	14°F (-10°C)	70	115	142	150	140	230	285	310
	0°F (-18°C)	60	80	140	150	120	160	280	310
	-20°F (-29°C)	50	65	110	150	105	140	225	310
	-40°F (-40°C)	45	60	90	140	90	125	190	280



## ORDERING INFORMATION

RHSRR-□ - □ - □ (RHSRR-8-2-CR)

**Outer jacket**  
CR=Thermoplastic

**Supply Voltage**  
1=110-120VAC;  
2=208-277VAC

**Output Power (at 40°F)**

**Example:** RHSRR-8-2-CR = 8 watt,  
208-277V,  
Thermoplastic outer jacket

## Approvals:



# Self-Regulating Roof Heating Cable



**Above:** Example of gutter damage caused by heavy ice buildup. **Right:** House with roof deicing system installed at roof's edge.

Warmzone roof deicing systems can save you money in the long run by eliminating costly roof repairs and water damage. Warmzone's self-regulating heat cable and low-voltage systems are easy to customize and install.

## RHSR RoofHeat Cable Accessories

### JSR14 - Roof clips

- A** Roof clips - 50 per bag

### JSR12 - End seal kit

- A** Heat shrinkable tubes (2)
- B** Woven braids (2)
- C** Heat shrink end caps (2)

### JSR15 - Downspout hanger kit

- A** Hanger bracket
- B** Clamp ties

### JSR10 - Splice / tee kit

- A** Clamp tie
- B** Mastic strips (1½" long x 1" wide)
- C** Heat-shrinkable tube (8" long x 1" diameter)
- D** Heat-shrinkable tube (1" long x ⅛" diameter)
- E** Heat-shrinkable tube (1" long x ½" diameter)
- F** Uninsulated braid crimp
- G** Cable ties
- H** Insulated bus wire crimps
- I** Black cloth tape (6" long)
- J** Heat-shrinkable cap
- K** Heat-shrinkable tube for ground

### JSR00 - Power connection kit - with single end seal kit (JSR12)

- A** Black cloth tapes (6" long x 1" width)
- B** Plug-in ground-fault equipment protection device
- C** Black heat-shrinkable tube (8" long x ¾" diameter)
- D** Black heat-shrinkable tube (5" long x ¾" diameter)
- E** Black heat-shrinkable tube (1" long x ⅛" diameter)
- F** Black heat-shrinkable tube (1" long x ½" diameter)
- G** Black heat-shrinkable tube (1½" long x ⅓" diameter)
- H** Uninsulated braid crimp
- I** Uninsulated bus wire crimps
- J** Mastic strips
- K** Clamp ties
- L** Warning labels
- M** Deicing/snowmelt equipment labels



# Self-Regulating Heat Cable Specs

## Technical Data

Service voltage	110-120, 208-277 V
Maximum maintain or continuous exposure temperature (power on)	149°F (65°C)
Maximum intermittent exposure temperature 1,000 hours (power on or off)	-40° to 185°F (-40° to 85°C)
Minimum installation temperature	-40°F (-40°C)
Protective braid resistance	< 18.2Ω/km
Bus wire gauge	16 AWG
Approvals	CSA; ordinary and hazardous
Certifications	Class I, Div.2 Groups A,B,C,D Class II, Div.2 Groups E,F,G Class III



For information about Warmzone roof heating cable accessories, refer to the information on page 25.

For additional information, please contact a Warmzone representative at 888.488.9276.

## RHSR Cable Accessories and Controls

Item Number	Description
JSR00-Roof	Power connection kit
JSR03-Aluminum	Aluminum application tape
JSR03-Fiberglass	Fiberglass application tape
JSR08	Plug-in cord set, 120 V GFCI, 125 ft. maximum run length
JSR10	Splice / tee kit
JSR12	End seal kit
JSR12L	End seal with light (can be used at beginning or end)
JSR14	Roof clips - 50/bag
JSR-14IR	Insulated roof clips - 50/bag
JSR15	Downspout hanger kit
WS-115	Air sensing NEMA 4 outdoor thermostat 120/240 V
WS-115R	Surface sensing NEMA 4 outdoor thermostat
WS-8C	Aerial mounted snow switch with remote moisture sensor (30 amps; 120-277 V)

## WARMZONE ROOF HEATING CABLE ORDERING INFORMATION

### Pre-Terminated Self-Regulating Cable (Pipe, Roof and Gutter)

Item Code	Description	Length (feet)	Output @ 50°F	Voltage
RHSR-120-50	Pre-terminated self-regulating heat cable	50	6W/ft.	120
RHSRT-120-75	Pre-terminated self-regulating heat cable	75	6W/ft.	120
RHSRT-120-100	Pre-terminated self-regulating heat cable	100	6W/ft.	120
RHSRT-120-50 GF	Pre-terminated self-regulating heat cable with ground fault protection	50	6W/ft.	120
RHSRT-120-75 GF	Pre-terminated self-regulating heat cable with ground fault protection	75	6W/ft.	120
RHSRT-120-100 GF	Pre-terminated self-regulating heat cable with ground fault protection	100	6W/ft.	120

### Self-Regulating Cable (Pipe, Roof and Gutter)

RHSR-120-5	Self-regulating heat cable	250'/500'/1000 ft.	5W/ft.	120
RHSR-120-8	Self-regulating heat cable	250'/500'/1000 ft.	8W/ft.	120
RHSR-120-10	Self-regulating heat cable	250'/500'/1000 ft.	10W/ft.	120
RHSR-120-12	Self-regulating heat cable	250'/500'/1000 ft.	12W/ft.	120
RHSR-240-5	Self-regulating heat cable	250'/500'/1000 ft.	5W/ft.	208-277
RHSR-240-8	Self-regulating heat cable	250'/500'/1000 ft.	8W/ft.	208-277
RHSR-240-10	Self-regulating heat cable	250'/500'/1000 ft.	10W/ft.	208-277
RHSR-240-12	Self-regulating heat cable	250'/500'/1000 ft.	12W/ft.	208-277
*Cut fee	*Cut fee for non 250/500/1000-foot rolls			





## Roof and Gutter Trace Controls

### Self-regulating Heat Trace Cable

ProLine Radiant roof deicing systems are custom designed to best serve the needs of each specific installation. In addition to the custom heating cable layout, users also have activation device/controller options for operating the system.

**WS-8C Aerial Mount Sensor** - The WS-8C activation device is designed for gutter, downspout, and roof ice melting and small satellite antenna deicing. The totally sealed, low voltage, remote-mount precipitation sensor allows the user to install the small sensor head in a downspout, the back of a gutter, or at the end of an antenna boom, up to 10 feet away from the unit so that the main controller can be installed in a more convenient outdoor location.

The unit is housed in a two gang PVC enclosure. The overall dimensions of the WS-8C are 4¾" (120 mm) x 7" (178 mm) x 2¾" (70 mm). The unit weighs 2 pounds. The user may access all electronics by removing the four front cover screws.



**WS-115 Outdoor Ambient Sensing Thermostat** - The WS-115 ambient sensing thermostat is designed to sample temperature changes in the air. The WS-115 can be used in a wide range of heating applications and can serve as a high limit backup for "sensitive" applications. The NEMA 4X rain-tight enclosure provides adequate protection in most environments. The WS-115 thermostat has a temperature range of 40°F to 110°F and can handle up to 22 amps at 277 VAC.



#### WS-115 Features

- Rugged weather resistant enclosure made of corrosion resistant materials for long life.
- Stainless steel remote bulb provides rapid response to temperature change.
- Low mass, high surface area of stainless steel coiled sensor provides rapid response to temperature change.
- Large, readily visible dial with 0°F - 120°F temperature range and 40°F - 110°F.
- Multi-positional mounting offers flexibility in either new or existing installations.
- One control for both heating and cooling applications.

**WS-115R Outdoor Surface Sensing Thermostat** - The WS-115R surface sensing thermostat samples temperature changes in the surface. The sensor is typically used as a line sensing control for pipes, vessels and other types of electric heat tracing applications. Suitable for use in agricultural, industrial and commercial environments. The NEMA 4X rain-tight enclosure provides adequate protection in most environments.



#### WS-115R Features

- Rugged weather resistant enclosure made of corrosion resistant materials for long life.
- Stainless steel remote bulb provides rapid response to temperature change.
- Low mass, high surface area of stainless steel coiled sensor provides rapid response to temperature change.
- Large, readily visible dial with 0°F - 120°F temperature range.
- Multi-positional mounting offers flexibility in either new or existing installations.
- One control for both heating and cooling applications.
- Complies with NEC 547 and NEMA 4X requirements.



# RoofHEAT

STEP Low-voltage Roof Deicing Systems



## Low-Voltage Roof Deicing System

Warmzone's innovative low-voltage roof deicing systems feature a unique, self-regulating, semi-conductive polymer heating element that is very thin and can be cut on site and discreetly nailed or stapled under shingles for quick, easy installation. The heating element is polypropylene fused during fabrication to achieve water proofing.



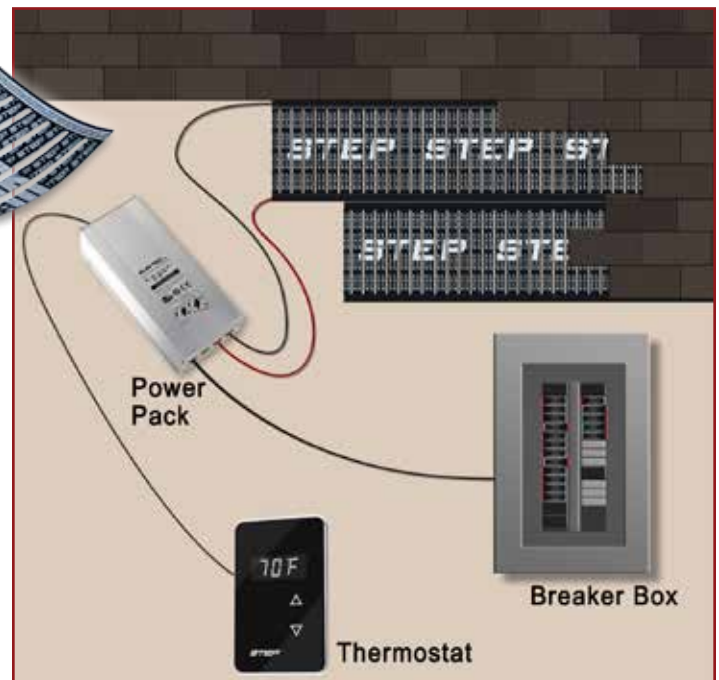
*Warmzone low-voltage roof heating element installed in roof valley.*



The thin polymer heating element comes in widths of 3, 9 and 12-inches and can be nailed or attached with fasteners or screws under a variety of roofing materials, including shingles and metal.

The fully automated maintenance-free roof deicing system is one of the most advanced and efficient roof deicing systems available. The PTC nano-technology allows the elements to heat with maximum power in cold environments and use less electricity as they warm up. This minimizes power consumption and can reduce roof deicing costs by 30 to 60 percent compared to conventional cable systems.

Roof Deicing



*Overview of Warmzone low-voltage roof heating system, with element being installed under the shingles at the building's edge.*



# Low-voltage Roof Deicing System

## Automated Roof Deicing System

### How it Works

Warmzone's roof deicing systems involve three main components: the polymer heating element, a step-down transformer, and an activation device (i.e., an aerial-mount snow switch and/or temperature sensor) that automatically triggers the system when weather conditions warrant.

The transformer is responsible for a specific section of the deicing system, and can step down from high voltage to low voltage (60 V or less). It is the source for monitoring the power and output to the system's heating element to ensure safe, accurate performance of the roof deicing system.

The activation device/snow sensor (typically mounted at the roof's edge) signals the control panel when weather conditions warrant. The sensor detects moisture and temperature, so when snow begins to fall and the temperature is below the set point (usually 39°F), the sensor signals the controller, which then sends power to the heating element to warm the roof.

### Features and Benefits

- **Extremely Thin Profile** - The flexible heating element is just 3/64-inch, allowing for simple, discreet installation under roofing.

- **Self Regulating** - When the ambient temperature rises, the electrical resistance increases and the consumption of electricity decreases, preventing the element from overheating and ensuring energy-efficient operation.

- **Maintenance Free** - The system has no moving parts and is maintenance free.

- **Easy Installation** - Roll out the flexible heating element and cut to size while on the job site for a perfect fit.

Unlike many other roof heating systems, the low-voltage polymer heating element can be nailed or stapled through, simplifying the installation process.

- **Versatile** - Warmzone's low-voltage system can be safely installed under most roofing materials, including metal.

- **Power Options** - The system operates on 24 volts (AC/DC) and can also be connected to a wind or solar power supply.

- **Protective Polypropylene Fabrication** - The product is polypropylene fused during fabrication to achieve water proofing.

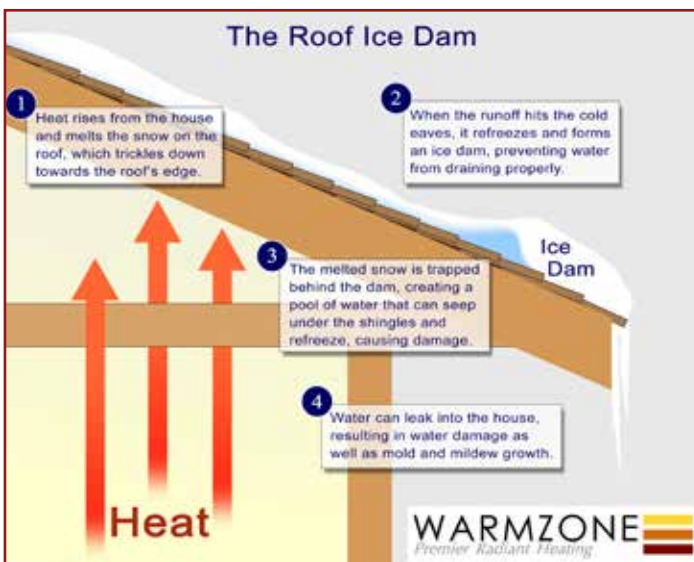
- **Energy Efficient** - The roof heating system requires minimal power consumption. For even greater energy savings when heating metal roofs, use a heat retention mat.



*Mountain cabin with low-voltage roof deicing system installed at the roof edges.*



# RoofHeat STEP Roof Deicing System Specs



Heating element being installed under shingles.

Roof Deicing

Illustration: How ice dams form on roofs.



## RoofHeat STEP Power Supply Technical Data

Low-voltage dry type isolation power supply
Extruded aluminum profile enclosure with heat sink
120, 208, 240 VAC primary and 24 VAC secondary
Primary and secondary circuit protection
RoHS compliant interface board
2-year warranty

## Heating Element Technical Data

Heating technology	Positive temperature coefficient (PTC) semi-conductive polymer
Width	12 inches (305mm); Also available in widths of 3, 9 inches.
Thickness	3/64 inch (1.2mm)
Length	Cut to order (maximum per strip: 32 feet (9.75 meters))
Secondary draw per foot	24 volts @ 68°F (20°C): 45 amps 24 volts @ 32°F (0°C): 54 amps
Warranty	10 years
Approvals	ETL listed; hazardous
Certifications	Class I, Div.2 Groups A,B,C,D Class II, Div.2 Groups F,G Class III

# WARMZONE ROOFHEAT STEP ORDERING INFORMATION



## Heating Element

Item Code	Description (width)	Output @ 68°F	Output @ 32°F	Voltage
MEP-30-36W	12-inch wide heating element	11.0 W/ft.	13 W/ft.	120, 208-240
MEP-30-70W	12-inch wide heating element	21.3 W/ft.	24 W/ft.	120, 208-240
MEP-23-36W	9-inch wide heating element	11.0 W/ft.	13 W/ft.	120, 208-240
MEP-23-80W	9-inch wide heating element	24.0 W/ft.	27 W/ft.	120, 208-240
MEP-7-30W	3-inch wide heating element	9.5 W/ft.	11 W/ft.	120, 208-240

## Power Supply

Item Code	Description	Amperage	Voltage
EPI-LX-250	Power supply	1 x secondary circuit 25A	120, 240
EPI-LX-500	Power supply	1 x secondary circuit 25A	120, 240
EPI-LX-R-250	Power supply w/regulator, 250 W	1 x secondary circuit 25A	120, 240
EPI-LX-R-500	Power supply w/regulator, 500 W	1 x secondary circuit 25A	120, 208-240
EPI-LX-R-1000	Power supply w/regulator, 1000 W	2 x secondary circuit breakers	120, 208-240
EPI-LX-R-1500	Power supply w/regulator, 1500 W	2 x secondary circuit breakers	120, 208-240



## Controls

Item Code	Description	Voltage
PL-EPI-LX-TC	Thermostat with sensor	120, 208-240

## Accessories

Item Code	Description
T-Block	Terminal block 2-bar
TBE-4	Terminal enclosure
TBE-6	Terminal enclosure
C&T-10	Connector & tape kit (10 pieces per pack.)
CON-DB	Connector DB TCU. (Priced per piece.)
TAPE-R	Sealant tape - roll
TCU14-Black/White	Tinned copper wire, 14 AWG. (Priced per foot.)
TCU12-Black/White	Tinned copper wire, 14 AWG. (Priced per foot.)
TCU10-Black/White	Tinned copper wire, 14 AWG. (Priced per foot.)
3-Conductor	Signal wire from power supply. (Priced per foot.)
TOOL-PRO	Crimp tool
TAPE-Poly-10	Roll of double coated tape - 3 inches x 30 feet
TAPE-Poly-5	Roll of double coated tape - 3 inches x 15 feet
HT-Thermal-.085	Polyurethane padding. (Priced per square foot.)