

Roof Heating

SELF-REGULATING HEAT TRACE
CABLE AND LOW-VOLTAGE ELEMENT



Why ProLine Heat Trace Cable?

ProLine 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 ProLine Self-regulating Heat Cable vs. Other Cable Brands

Outer Jacket Quality

Typical Self-regulating Heat Cable

The outer jacket of typical self-regulating 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.

ProLine Self-regulating Heat Cable

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



ProLine Radiant Self-regulating Heat Cable

ProLine 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 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.



ProLine self-regulating heat cable and plug with GFCI.

ProLine Self-regulating Heat Cable

ProLine 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 -40°F.

The higher quality outer jacket also remains flexible at low temperatures, resulting in more reliable performance and easier installation when securing to various pipe trace applications.

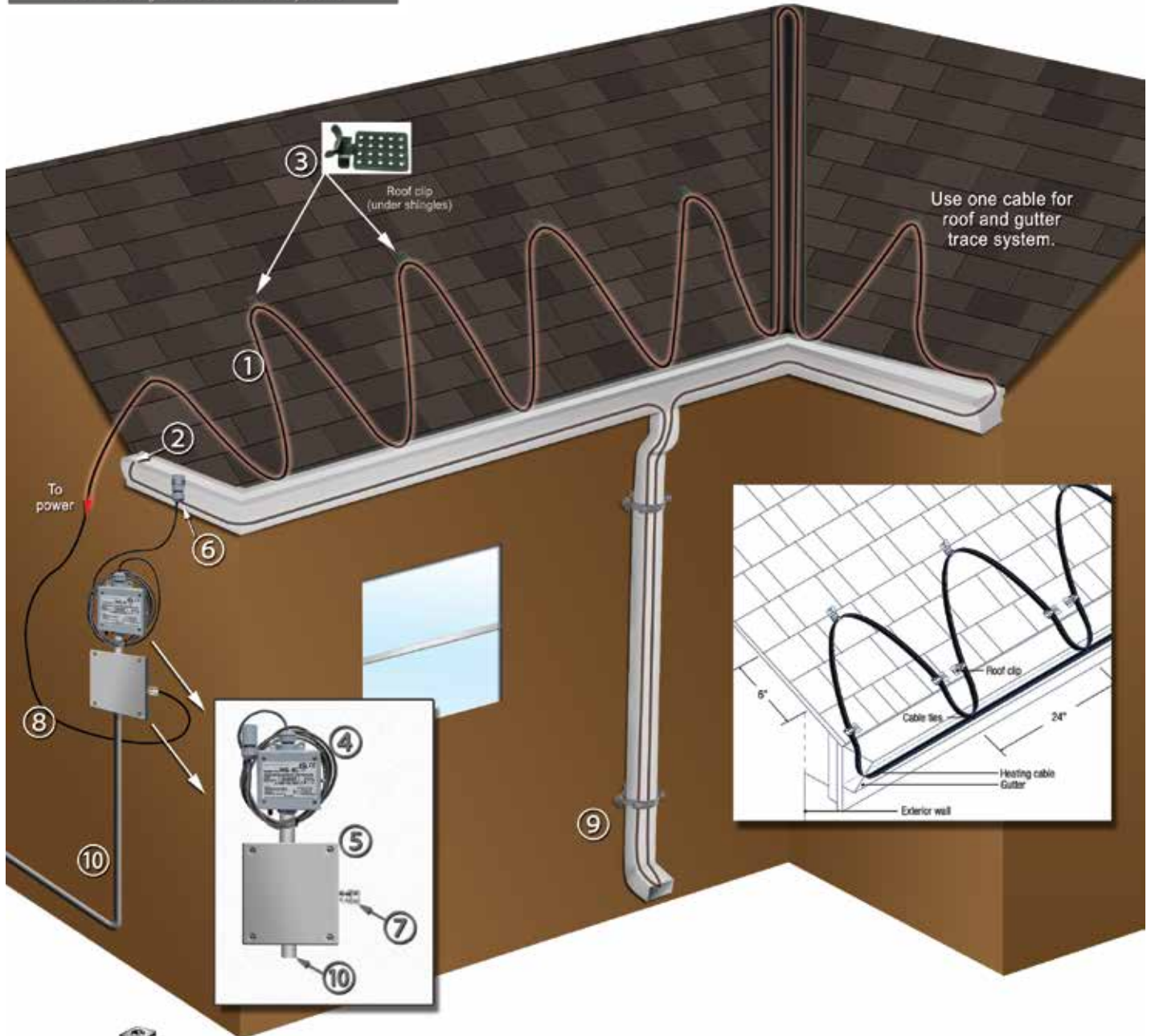
“In all the years I’ve been installing radiant heating systems, I’ve noticed that “bubbles” in the outer jacket of the cable almost always result in a point of failure. The superior outer jacket of ProLine’s self-reg cable helps to eliminate this problem.”

– Eric W., Licensed Contractor

Self-Regulating Heat Cable System Overview



Several roof heating options are available from ProLine Radiant. The illustration below shows the general layout of a self-regulating heat cable system, heating the roof edges, valley, gutter and downspout. For specific installation information please refer to the installation manual.



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

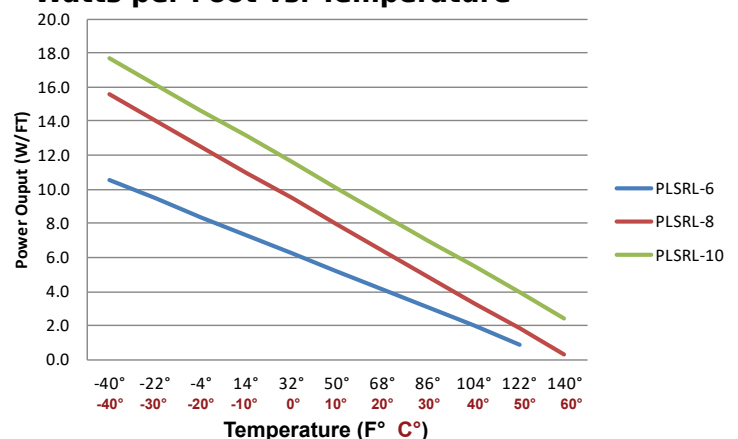


PLSRL Heat Trace Cable Data Sheet

PLSRL self-regulating heat cable is a popular choice for roof heating and gutter trace applications. The cable features a flexible outer jacket and durable carbon core, providing consistent performance, long lifespan, and easy installation in cold temperatures.

Technical Data for PLSRL Heat Cable	
Service voltage	110-120 V, 208-277 V
Maximum maintain or continuous exposure temperature (power on)	+149°F (65°C)
Maximum intermittent exposure temperature 1,000 hours (power on/off)	+185°F (85°C)
Minimum installation temperature	-40°F (-40°C)
Protective braid resistance	<18.2Ω/km
Bus wire gauge	16 AWG
Approvals	cULus; CE, ATEX, IECEx, EAC
Warranty	2 years (Not prorated)

Power Output Curves
Watts per Foot vs. Temperature



Maximum Length (feet) vs Circuit Breaker Size

Cable	Startup Temp.	120 V				240 V			
		15A	20A	30A	40A	15A	20A	30A	40A
PLSRL-6-1 and PLSRL-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	
PLSRL-8-1 and PLSRL-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	
PLSRL-10-1 and PLSRL-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	

PLSRL Cable Dimensions

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

ORDERING INFORMATION

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

Outer jacket

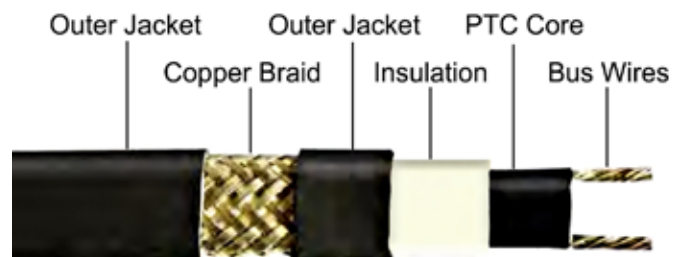
- C=Tinned copper braid (no outer jacket)
- R=Thermoplastic
- T=Fluoropolymer

Supply Voltage

- 1=110-120VAC; 2=208-277 VAC

Output Power (at 40°F)

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



PLSRL self-regulating heat cable.

Approvals:

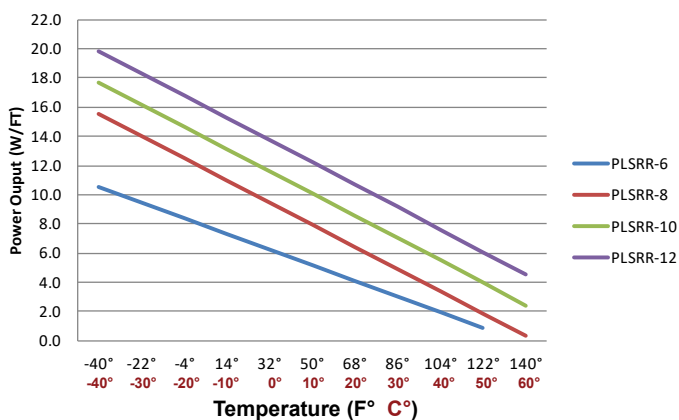


PLSRR Heat Trace Cable Data Sheet

PLSRR is self-regulating heat cable that is used for roof/gutter applications. The cable features a flexible, UV-stabilized thermoplastic elastomer overjacket that protects the 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. (ProLine's PLSRR heat trace cable features a NON-PRORATED 10-year warranty.)

Technical Data for PLSRR Heat Cable	
Service voltage	110-120 V, 208-277 V
Maximum maintain or continuous exposure temperature (power on)	+149°F (65°C)
Maximum intermittent exposure temperature 1,000 hours (power on/off)	+185°F (85°C)
Minimum installation temp.	-40°F (-40°C)
Protective braid resistance	<18.2Ω/km
Bus wire gauge	16 AWG
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



Roof Deicing

ORDERING INFORMATION

PLSRR-□ - □ - □ For example: PLSRR-8-2-CR

Outer jacket

- C=Tinned copper braid (no outer jacket)
- R=Thermoplastic
- T=Fluoropolymer

Supply Voltage

1=110-120VAC; 2=208-277 VAC

Output Power (at 40°F)

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



Cutaway view of ProLine self-regulating heat cable.

Maximum Length (feet) vs Circuit Breaker Size

Cable	Startup Temp.	120 V				240 V			
		15A	20A	30A	40A	15A	20A	30A	40A
PLSRR-6-1 and PLSRR-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
PLSRR-8-1 and PLSRR-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
PLSRR-10-1 and PLSRR-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
PLSRR-12-1 and PLSRR-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

Approvals:



PLSRR Dimensions and Bend Radius

Type	Dimensions	Minimum Bend Radius
PLSRR-C	11.0 x 4.4 mm	1-inch (26 mm)
PLSRR-CR	12.6 x 6.0 mm	1.4 inches (36 mm)
PLSRR-CT	12.0 x 5.4 mm	1.25 inches (32 mm)

Pre-Assembled Heat Trace Cable

ProLine pre-assembled (pre-terminated) self-regulating heat cable is the premier solution for quick, easy installation for roof and gutter heating and pipe trace applications. The 120 volt pre-assembled plug-and-play kits come with the option of a standard power cord with or without a GFCI power plug. The termination, power connection, splice, tee, and end seal kit reduces installation time and requires no special skills or tools.

PLSRT-1 120 V Pre-Assembled Heat Cable

ProLine PLSRT-120 pre-assembled self-regulating heating cable is designed for commercial metal and plastic pipe protection and roof and gutter deicing applications. The 120-volt heating cables are available in 6, 12, 18, 24, 50, 75, 100, 125 and 150-foot lengths, and each comes assembled with a 6-foot power cord and plug. (Optional GFCI plus available.)

PLSRT-1 heating cables may be used on:

- Roofs made from all types of standard roofing materials, including shake, shingle, rubber, tar, wood, metal, and plastic.
- Gutters made from standard materials, including metal and plastic.
- Downspouts made from standard materials, including metal and plastic.



ProLine 120 V pre-terminated self-regulating heat cable.

PLSRT-1 General Specifications (110-120 V)

Nominal cable width	½-inch (12.7 mm)
Nominal cable thickness	.24-inch (6.1 mm)
Bus wire gauge	16 AWG
Circuit breaker size	15 amps
Plug rating	15 amps
Maximum exposure temperature	150°F (65°C)
Minimum installation temperature	-40°F (-40°C)
Voltage rating	110-120 V (For 208-277 V, please call)
Protective braid resistance	< 18.2Ω/km
Cold lead length	6 feet with plug
Electrical classification	Non-hazardous; ordinary areas
Exposure to chemicals	None
Warranty	2-years

General Instructions

Install only in accessible locations; do not install behind walls or where the cable would be hidden.

Do not run the heating cable through walls, ceilings, or floors.

Connect only to ground-fault protected outlets that have been installed in accordance with all prevailing national and local codes and standards and are protected from rain and other water.

General Usage Guidelines

- ProLine Radiant pre-terminated heating cables are not intended for use on flexible vinyl tubing (such as garden hoses).
- The heating cables should not be used inside any pipes.
- PLSRT pre-assembled heat cable is not intended for freeze protection of liquids other than water or for use in locations classified as 'hazardous'.
- Use a minimum of ½-inch fire-resistant, waterproof thermal insulation when installing the PLSRT heat cable on pipes.
- Never use the heat cable on pipes that may exceed 150°F (65°C).
- Do not use an extension cord with the heat cable.



ProLine Radiant 120 V pre-terminated self-regulating heat cable with and without a ground fault circuit interrupter (GFCI).



Roof Deicing Control Options

Self-regulating Heat Trace Cable

In addition to ProLine's industry leading self-regulating heat trace cable and professional system design/layout, users also have several activation device/controller options to ensure optimum performance of the roof deicing system.

WS-8C Aerial Mount Sensor (WS-8C) - 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 (WS-115) - 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-115R Outdoor Surface Sensing Thermostat (WS-115R) - 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-115 and 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 and 40°F - 110°F.
- 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.

Industrial Electronic Thermostat (WS-IET) - The IET is a microprocessor-based temperature controller designed to provide on/off control for commercial heating, cooling, air conditioning and refrigeration applications. Its comprehensive functionality makes the IET one of the most versatile temperature controls available.

The IET features a lockable front-panel touchpad and a Liquid Crystal Display (LCD) for viewing the temperature and status of other functions. The digital display and keypad allow precise temperature settings.

When not in the programming mode, the display provides a constant readout of the sensor temperature. Annunciators on the liquid crystal display indicate when the relay is energized. The IET is also equipped with diagnostic programs that check for hardware, software or system problems and display different error codes to indicate the problem and its location.



Roof Heating

Cable Accessories and Connections

PLSR12 - End seal kit

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

VHBPAD - Pad for metal roof

- A** Double-sided 3x2-inch VHB Pad for metal roofs - (25 per package)

PLSR14 - Roof clips

- A** Roof clips - 50 per bag

PLSR15 - Downspout hanger kit

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

PLSR10 - Splice / tee kit - with single end seal 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

PLSR00 - Power connection kit - with single end seal kit

- A** Black-shrinkable tube (2) (5½" long x ⅛" diameter)
- B** Green-shrinkable tube (6" long x ¼" diameter)
- C** Black heat-shrinkable tube (1" long x ½" diameter)
- D** Seal fitting and black grommet
- E** Mounting bracket for piping
- F** Gasket
- G** Lock nut
- H** Grommet
- I** Wire nuts (3)
- J** Labels (4)



PLSR Cable Accessories and Controls

Item Number	Description
PLSR00-Power	Power connection kit
PLSR08	Plug-in cord set, 120 V GFCI, 100 ft. maximum run length
PLSR10	Splice / tee kit
PLSR12	End seal kit (2 end seals)
PLSR14	Roof clips - 50/bag
VHBPAD	3"x2" pad - 25/pack
PLSR15	Downspout hanger kit
WS-115	Air sensing NEMA 4X outdoor thermostat 120/240 V
WS-115R	Surface sensing NEMA 4X outdoor thermostat
WS-8C	Aerial mounted snow switch with remote moisture sensor (30 amps; 120-277 V)
WS-IET	Industrial electronic temperature controller



Commercial offices with the low-voltage roof heating system installed to heat the roof valleys and along the roof edges.



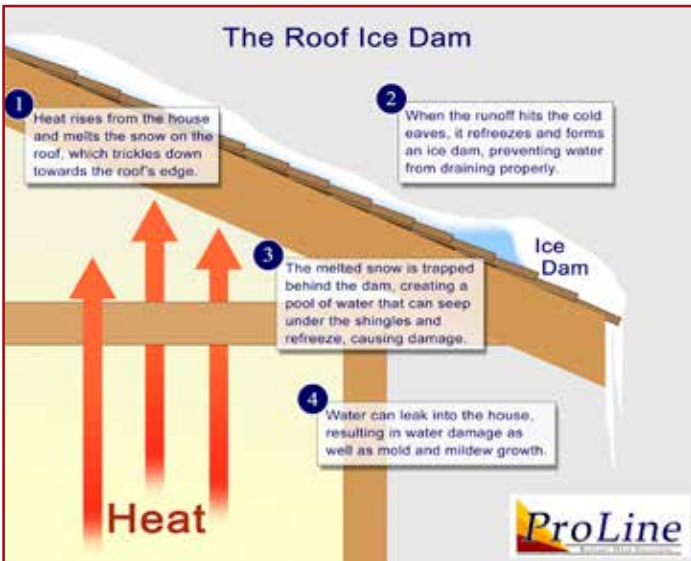
Low-Voltage Roof Deicing Systems



ProLine's Industry Leading Roof Deicing System

ProLine'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. The element can be nailed or stapled under shingles and metal roofs for quick, discreet, easy installation. The heating element is protected by one layer of polyethylene for resistance against water and a second layer of polypropylene to protect against chemicals and can be installed under all types of roofing materials.

Roof Deicing



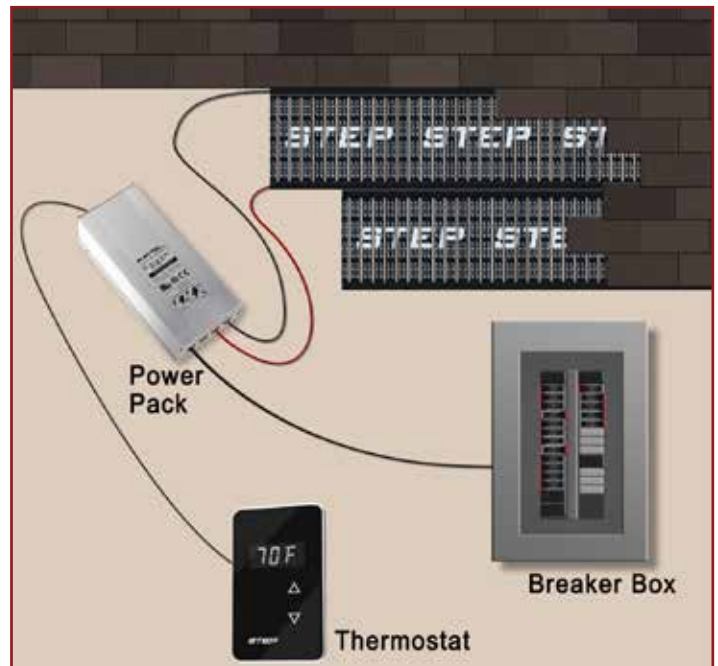
How ice dams form on roof edges.



Heating element being installed under a metal roof at a public library.



ProLine low-voltage roof heating element installed in roof valley.



Overview of ProLine low-voltage roof heating system with element being installed under the shingles.

Low-voltage Roof Deicing System

Automated Roof Deicing System

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** - Because the radiant heating system has no moving parts, it is reliable and 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** - ProLine Radiant'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.
- **Durable** - The product is extruded polyethylene and carbon black.
- **Energy Efficient** - The roof heating system requires minimal power consumption. For even greater energy savings when heating metal roofs, use a heat retention mat.

Heating Element Technical Data

Heating technology	Positive temperature coefficient (PTC) semi-conductive polymer
Width	12 inches (305 mm); Also available in widths of 3, 9 inches.
Thickness	3/64 inch (1.2 mm)
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

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



PROLINE LOW-VOLTAGE ROOF HEAT ORDERING INFORMATION

Heating Element

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

Power Supply

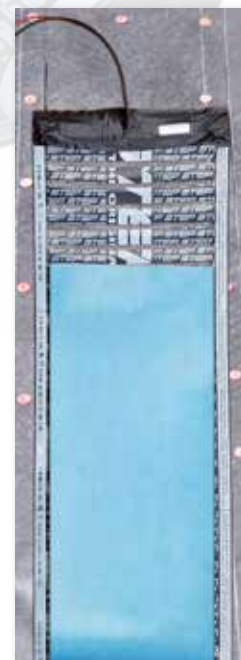
Item Code	Description	Amperage	Voltage
PL-LX-R-250	Power supply w/regulator, 250 W	1 x secondary circuit 25A	120, 240
PL-LX-R-500	Power supply w/regulator, 500 W	1 x secondary circuit 25A	120, 208-240
PL-LX-R-1000	Power supply w/regulator, 1000 W	2 x secondary circuit breakers	120, 208-240
PL-LX-R-1500	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
PL-T-Block	Terminal block 2-bar
PL-TBE-4	Terminal enclosure
PL-TBE-6	Terminal enclosure
MEP-C&T	Factory connections with 7' of 12 AWG
C&T-10	Connector and 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, 12 AWG. (Priced per foot.)
TCU10-Black/White	Tinned copper wire, 10 AWG. (Priced per foot.)
PL-3-Conductor	Signal wire from power supply. (Priced per foot.)
PL-TOOL	Crimp tool
PL-TAPE-10	Roll of double coated tape - 3 inches x 30 feet
PL-TAPE-5	Roll of double coated tape - 3 inches x 15 feet
PL-HRP	Heat retention pad. (Priced per 100 square feet.)



ProLine low-voltage heating element with heat retention pad being installed on roof of commercial facility.

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Roof Deicing



Shoveling and cutting down heavy, dangerous ice and icicles from the roof of a commercial facility.



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