INSTALLATION GUIDELINES

1. Plan

- Design system and make a layout. For guidance, see attached layout and wiring diagram.

- Heating elements should be placed on top of the ice and water shield. Between the felt and waterproofing underlayment is also acceptable if there is sufficient insulated below (i.e., higher thermal insulation under than over the elements).

- In the valley, start ¾ up and go all the way to the eave edge. On large roofs use 3 strips of heating elements, 2 on each side and 1 under the flashing. The end of the element can be cut in an angle at the eave to fit with the edge line.

- On the overhang, the heating elements are placed horizontally on the roof. The lowest element may be bent 3” to 4” over the eave to avoid creation of icicles, if required. Nail the element 4” to 5” up from the edge and 1” to 2” below. Make sure not to nail on the bus braid. Add elements with about 3” spacing until above the wall. Then cover all the elements with roofing material including the bent- over drip edge. This is important because the elements are not designed to be exposed to weather.

- Tip for metal roof: Using the Heat Retainer pad over the heating elements greatly improves performance and operating cost.

- Installation should conform to local building codes, ordinances and trade practices.

2. Install

- Roll element out and cut to length according to layout.

- The element can be attached to the roof using the following alternatives:

  - Nail or screw at least 1 inch from edge of element using galvanized steel roof products; do not penetrate bus braids located on each side, should this occur, cut element, splice and seal properly.
  - Fasten element using weather proof poly tape and/or spot-glue with roofing adhesive.

NOTE: Avoid overlap or contact between heating elements. Do NOT puncture the bus braids.

3. Connect

- Connect extension wires to the heating element according to the drawing and electrical diagram. If fail safe wiring is required see how it is done in the diagram “Fail safe wiring”.

- Determine wire gauge versus load and length of wire from the element to the power supply. If the distance is longer than 15 feet, connect the extension wires to a terminal block and then route to the power supply using higher gauge wires as shown in the sample wiring diagram.

- Route the wires flat on the roof and down through the deck in conduit. Connect wires in parallel to the 24 volts, EPI-LX-R, power supply. Use only stranded tinned copper wires and do not twist ends when connecting to the interface board in the power supply.

- Distribute the load evenly; the maximum load per circuit is 450 watts or 34 feet (10m) of roof heating element, MEP-30-2-36W.

- The power supply must be installed in a well-ventilated area and wired in accordance with the National Electrical Code. Place the power supply vertical using rubber bumpers between back plate and wall for better cooling and quiet operation.

- Connect the line voltage to a two-pole on/off switch. Use stranded wires from the switch to the power supply.

- To make the system operational, connect two signal wires to TRG and ~24V on top of the power supply. The system will start when a switch makes contact between the two wires.

- The heating elements must be measured and amps noted by a certified electrician before being covered.

NOTE: This system is in the category of Safety Extra Low Voltage (SELV) and the heating elements must NOT be grounded.

4. Cover

- To be efficient the heating elements have to be in direct contact with the roofing material. If necessary fill the gaps with the approved heat retainer pad.

- Use the heat retainer pad wherever possible under metal roofs.

- When nailing through the metal sheet or other roofing materials, mark the position of the heating elements to avoid damaging the bus braids.

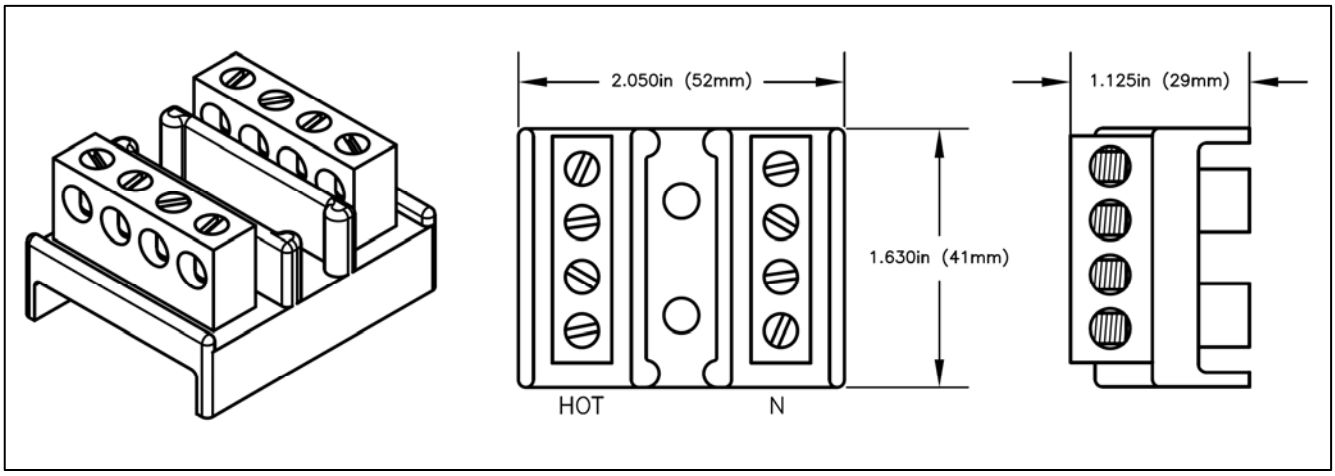
NOTE: Roof systems with a ventilated air space under the finished roofing are not designed to be heated.

These installation guidelines are general in nature. Specific project information is provided by the distributor.

To activate the product warranty; fill in the check list and return to:
Manufacturer 11147 Dorsett Road, St. Louis, MO 63043

T-BLOCK

Power Terminal Block



DESCRIPTION

The T-BLOCK is a two-pole, power terminal block that is used to junction the ProLine heating element extension wires for connection to the low voltage safety isolation power supply. This terminal block contains two tinned copper bars with screw terminals mounted to an electrical grade molded base. The terminals are a set screw lug type and can terminate a large range of wire sizes. Two holes are provided for mounting into an installer supplied junction box.

The power feed from a power supply is terminated on one of the four lugs on the HOT bar (HOT) and one of the four lugs on the NEUTRAL bar (N). Each heating element extension wire is terminated on one of the remaining lugs on the HOT bar and one of the remaining lugs on the NEUTRAL bar.

The terminal block is normally mounted in an installer supplied standard 2-gang junction box with a blank cover plate. This box is typically mounted in the wall at receptacle height or it can be mounted below the floor on a joist in a crawl space or basement ceiling, or it can be mounted above in an attic space. Multiple terminal blocks can be located in the same junction box but the box size will need to be increased by one gang per additional terminal board. Additionally, a maximum of four terminal blocks can be mounted in an optional TBE-4 terminal block enclosure.

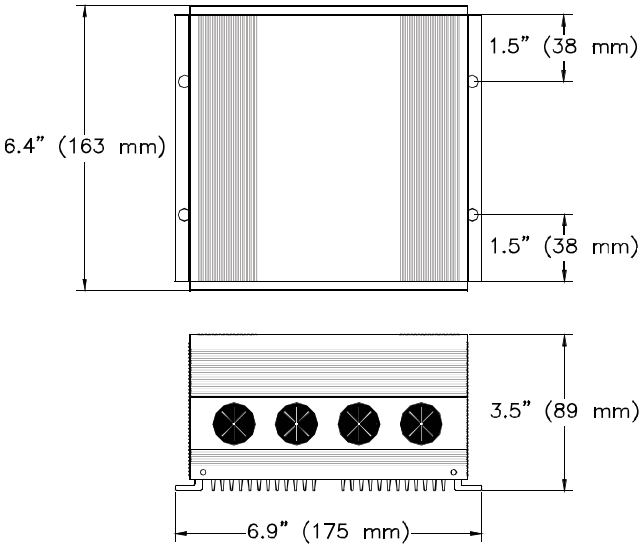
PRODUCT SPECIFICATIONS

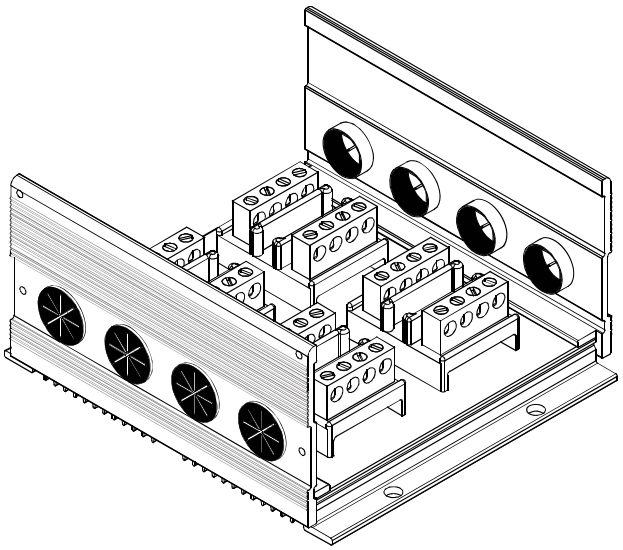
Dimensions	2-1/2” Long X 1-11/16” Wide X 1-1/4” High (63.5mm X 43mm X 32mm)
Supply voltage	24Vac to 30Vac
Lug Wire Range	#14 - #4 AWG copper or aluminum
Lug maximum fill	(1) #4 AWG or (2) #10 AWG or (3) #12 AWG or (4) #14 AWG

ORDERING INFORMATION

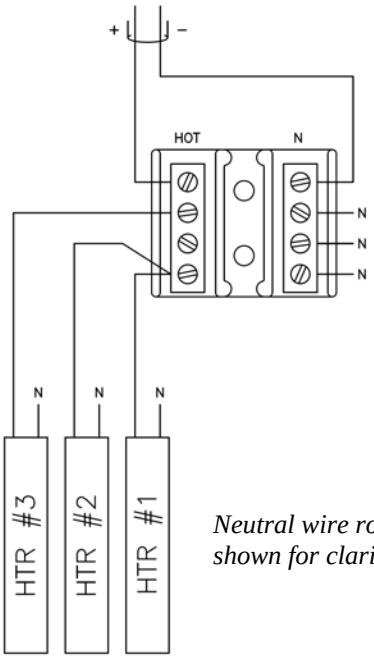
Description	Model Number	Approx. Wt.
Power Terminal Block, 24Vac, set screw lug terminals sized for #14 - #4 AWG wires, terminal assignments – 4 secondary hot and 4 secondary neutrals	T-BLOCK	0.15 lb (68 g)
Housing for T-BLOCK power terminal blocks (up to 4) enclosed in extruded aluminum profile w/ heat sink – for indoor use only	TBE-4	3.41 lb (1.55 kg)

TBE-4 TERMINAL BLOCK ENCLOSURE (OPTIONAL)





LOAD CONNECTION DATA



Neutral wire routing not shown for clarity

- Multiple short elements can be connected to a single terminal as shown with HTR #1 & 2 in the wiring diagram. Do not exceed the maximum element connection length as noted on the heating element data sheet.
- A single element can be connected to a single fuse as shown with HTR #3 in the wiring diagram. Do not exceed the maximum element connection length as noted on the heating element data sheet.
- Do not exceed the maximum extension wire length between the terminal board and heater strip as noted on the heating element data sheet.
- Use a MINIMUM of 10 AWG (6 mm^2) wire between the terminal block and the power supply.

APPROVALS / CERTIFICATIONS

ISO 9001:2008 REGISTERED FIRM

Intertek

RoHS COMPLIANT

Conforms to: CENELEC EN 61558-1, IEC 61558-1, IEC 61558-2-2, UL 5085-1, UL 5085-2-2, CSA C22.2 No. 66

ProLine Radiant Heat Solutions

12637 S. 265 W., Suite 100A
Draper, UT 84020, USA
866.676.9276 phone
801.948.7599 fax
www.prolineradiant.com

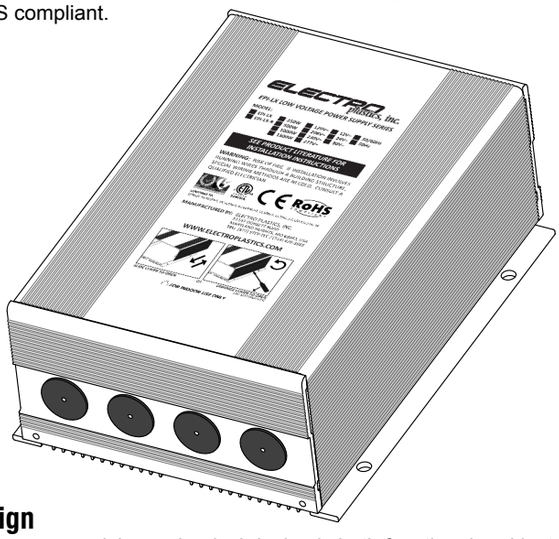
EPI-LX-R

Power Supply Series with Regulator

Low Voltage, High Efficiency

1 Description

The EPI-LX-R power supply series is built to the highest safety standard, with built-in circuit breakers on the primary and secondary sides. The load, which is divided into separate circuits to provide SELV (Safety Extra-Low Voltage), is connected to an interface board. Additionally, a built-in regular board serves as an intelligent switch to enable/disable the line voltage in such a way that switching/pulsing does not harm the power supply's toroidal coil(s). The interface and regulator boards are both RoHS compliant.



Design

The power supply's mechanical design is both functional and installation friendly. This slim and congenial design is made from extruded aluminum profiles providing a high performance cooling structure as well as an enclosure eliminating air sound. Sound is also reduced by the high quality winding of the coils themselves, thus making the power supply essentially silent. All vibrating parts are isolated, thereby eliminating transmittal of noise to the building structure.

Surge

Traditional power supplies / transformers have a high starting current which creates a surge that is many times higher than a nominal current. The larger EPI-LX-R power supplies have a unique parallel connection that reduces the surge by one third for a 1500 VA power supply and one half for a 1000 VA power supply. For optimal performance, an HID (High Intensity Discharge) circuit breaker should be used to address the high inrush current of the EPI-LX-R power supply series and to avoid nuisance tripping in the service panel. For certain areas (particularly residential applications), NEC requires AFCI circuit breakers on 120 VAC systems. To simplify wiring, use 230 VAC models. models.

Controls

Controls are to be chosen carefully, as power supplies started up often in quick succession will be ruined as a result of the large amount of heat developed in the primary coil. The heat developed in the power supply increases by I^2R, so when the starting current occurs, the heat developed can be up to 1000 times normal. A power supply is not ruined by the load but by the starting current which generates an abundant amount of heat. This causes the insulation in the transformer to be destroyed. To ensure long life and maximum efficiency, use only recommended controls for the EPI-LX-R power supply series.

Derating of Power Supplies and Wires

Power Supplies that are exposed to high ambient temperatures above 77°F (25°C) must be derated, i.e., the maximum permitted load must be reduced. It is also very important not to bundle up wires carrying high amps as they will overheat, thereby inhibiting the ability to carry the intended current.

2 Supplied Parts

1. One (1) power supply
2. Four (4) mounting screws
3. Four (4) bumpers
4. One (1) shielded signal cable (3 conductor, 20 AWG)
   - *Length = 20 ft (6 m)*

3 Installation Guidelines

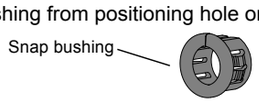
To ensure optimum conditions and a long service life for the EPI-LX-R power supply it is important to:

- Mount the power supply in a vertical position (with load wires routing from bottom panel) so that heat is dissipated effectively.
- Never put a power supply where the ambient temperature is higher than 77°F (25°C), unless specified otherwise on the power supply's rating plate.
- The power supply must not be in contact with flammable materials, as it is completely normal for power supplies to heat up, and it is not unusual for the surface of the enclosure on a power supply to be hot to the touch.
- The power supply must not be covered with an insulating material.
- It is preferable not to place the power supply in 'quiet' areas, such as bedrooms and reading rooms, as the magnetization of the iron core may generate a low noise which could be annoying.
- Avoid placing the power supply on large surfaces, which may transmit vibration; good mounting points are concrete pillars, brick walls and steel girders.
- Do not place the power supply in the vicinity of monitors and television screens, as it can affect the picture's positions.
- The power supply must be positioned so that it can easily be accessible for servicing and repairs.

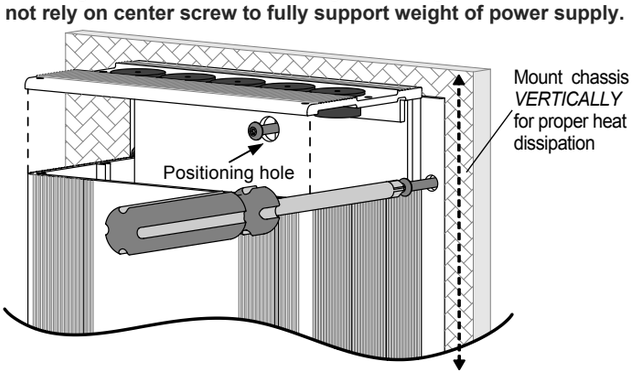
4 Installation Procedure

The installation must be carried out by an electrician and comply with electrical codes.

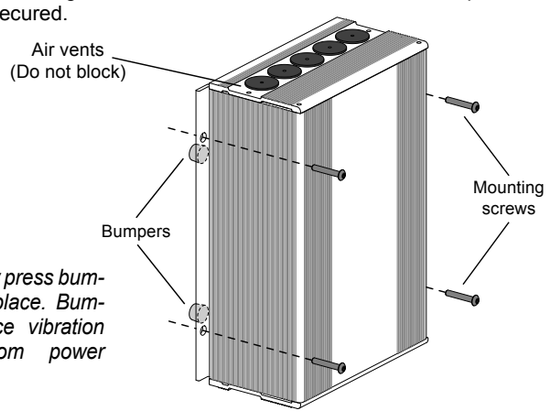
1. Turn off power at the main electrical panel to avoid electrical shock. If needed, unhinge and remove cover of power supply.
2. Remove snap bushing from positioning hole on power supply.



3. Mark a point, centered in the upper region of the mounting location. Drive a screw (with head diameter less than positioning hole) partially into centered point. Screw head should be offset enough so as to hang power supply.
4. Hang power supply on center screw and align power supply accordingly. The center screw is a temporary placehold while mounting screws and bumpers along outer flanges are secured. **Do not rely on center screw to fully support weight of power supply.**

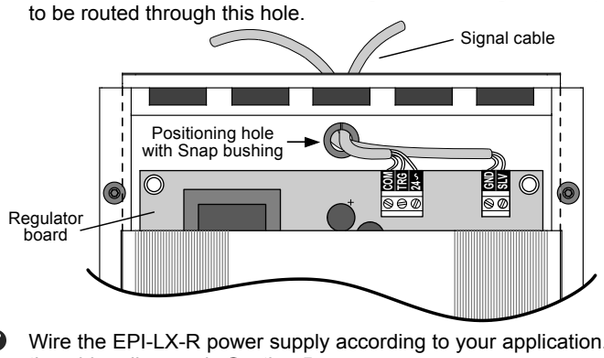


5. Attach bumpers to underside of power supply along outer flanges as shown below. Secure power supply to mounting surface with included mounting screws. Remove center screw once power supply is secured.



***NOTE:** Carefully press bumpers firmly into place. Bumpers will reduce vibration transmitted from power supply chassis.*

6. Reinsert snap bushing into positioning hole. The signal cable(s) are to be routed through this hole.

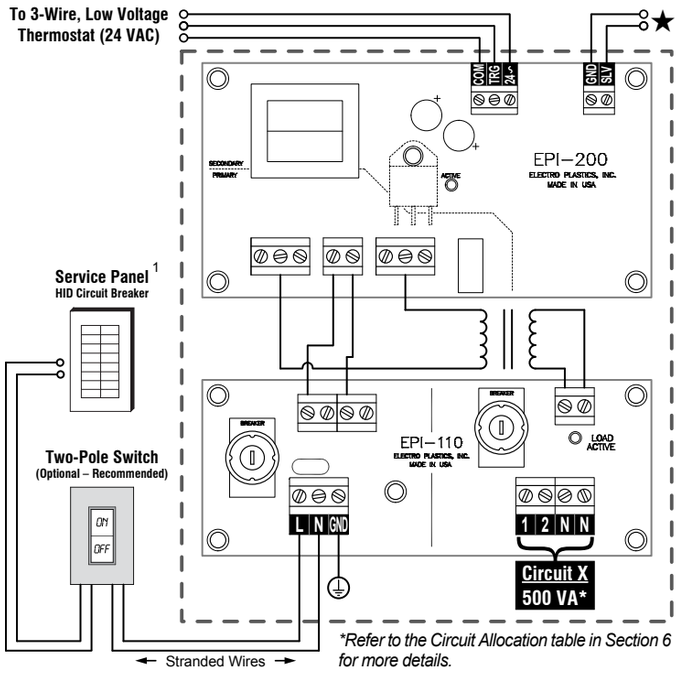


7. Wire the EPI-LX-R power supply according to your application. See the wiring diagram in Section 5.
8. Apply power to the EPI-LX-R power supply.

5 Wiring Diagram

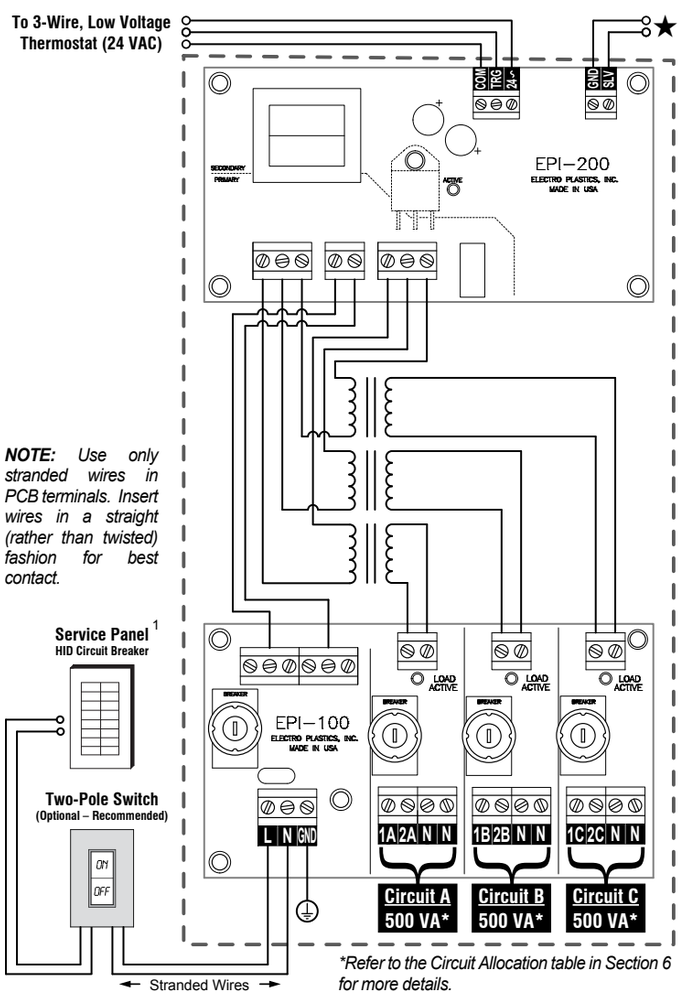
The EPI-LX-R power supply series has 2 types of PCB interface boards.

5.1 EPI-110 + EPI-200 PCB ▸ EPI-LX-R (500 VA) Wiring Diagram



**Refer to the Circuit Allocation table in Section 6 for more details.*

5.2 EPI-100 + EPI-200 PCB ▸ EPI-LX-R (1000, 1500 VA) Wiring Diagram



***NOTE:** Use only stranded wires in PCB terminals. Insert wires in a straight (rather than twisted) fashion for best contact.*

**Refer to the Circuit Allocation table in Section 6 for more details.*

[1] Use HID (High Intensity Discharge) circuit breaker or equivalent in service panel. For certain areas, NEC requires AFCI circuit breakers on 120 volt systems. To simplify wiring, use 230 volts.

★ ***NOTE:** Up to 20 power supplies can be connected to one thermostat.*

6 Product Specifications

Circuit Allocation

Model	Circuit I.D.				Maximum Output	Max. Capacity Per Circuit	
	X	A	B	C		Constant Load	Variable Load*
EPI-LX-R-500	✓				1 x 500 VA	80%	90%
EPI-LX-R-1000		✓	✓	✗	2 x 500 VA	80%	90%
EPI-LX-R-1500		✓	✓	✓	3 x 500 VA	80%	90%

✓ *= Circuit applicable* ✗ *= Circuit not applicable*

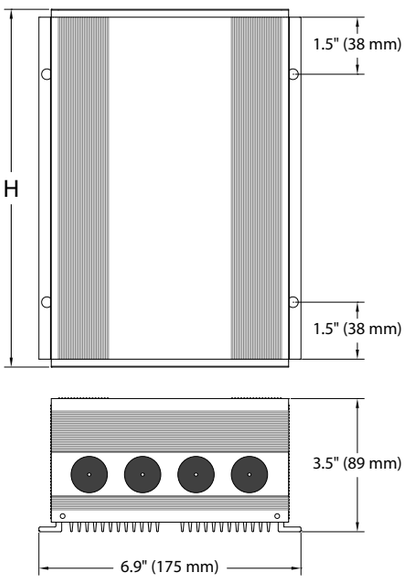
**Variable load refers to a PTC type of draw (e.g. the self-regulating heating elements) as the load will draw less after startup for continuous duty cycles.*

Product Classification

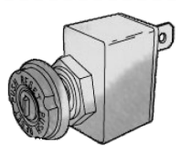
Model	Primary Voltage	Secondary Voltage	Frequency
EPI-LX-R-500	120 VAC	24 VAC	60 Hz
	208 VAC	24 VAC	60 Hz
	230 VAC	24 VAC	50/60 Hz
EPI-LX-R-1000	120 VAC	24 VAC	60 Hz
	208 VAC	24 VAC	60 Hz
	230 VAC	24 VAC	50/60 Hz
EPI-LX-R-1500	120 VAC	24 VAC	60 Hz
	208 VAC	24 VAC	60 Hz
	230 VAC	24 VAC	50/60 Hz

Dimensions & Weight

Model	Height "H"		Weight	
	in	mm	lb	kg
EPI-LX-R-500	14.375	365	17	7.7
EPI-LX-R-1000	22.375	568	28	12.7
EPI-LX-R-1500	28.375	721	41	18.6



Replacement Circuit Breaker



Snap Action Miniature C.B.
(Type MB1)

Model MB1-XX-PH
(where XX = Amps)

Current Ratings:
5A, 10A, 15A, 20A, 25A

(AC/DC) Voltage:
250 VAC (maximum)
32 VDC (maximum)

Interrupting Capacity:
1000 A @ 250 VAC
2000 A @ 125 VAC
200 A @ 32 VAC

Circuit Breaker Designation

Model	Primary Circuit Breaker			Secondary Circuit Breaker
	120 VAC	208 VAC	230 VAC	24 VAC
EPI-LX-R-500	10A	5A	5A	1 x 25A
EPI-LX-R-1000	15A	10A	10A	2 x 25A
EPI-LX-R-1500	20A	15A	15A	3 x 25A

Ordering Information

Model		Voltage		Frequency
	,		,	

(Example) → EPI-LX-R-500 , 120/24V , 60Hz

7 Technical Specifications

Power supply type: Low voltage dry type isolation power supply
Primary voltage: 120, 208, or 230 VAC
Secondary voltage: 24 VAC
Frequency: 60 Hz (50/60 Hz for 230 VAC models)
Efficiency: 96%
Insulation class: B (130°C)
Circuit protection: Circuit breakers on primary and on secondary
Enclosure: For indoor use only ⌂
Wire gauge (EPI-100/110 PCB): 10 to 12 AWG (2.5 to 4 mm²)
Wire gauge (EPI-200 PCB): 14 to 20 AWG (0.5 to 2.5 mm²)
Maximum signal load: 2.5 A / 24 VAC
Maximum control (per master signal): 20 EPI-LX-R power supplies linked via GND and SLV terminals on each EPI-200 PCB

☑ Warranty & Approvals

Manufacturer warrants this product, excluding circuit breakers, to be free from defects in the workmanship or materials, under normal use and service, for a period of ten (10) years from the date of purchase by the consumer. If during the warranty period the product is determined to be defective, Manufacturer (at its sole discretion) shall repair or replace it. Please refer to the Terms & Conditions of Sale, located at www.warmzone.com for complete details.

ISO 9001:2008 REGISTERED FIRM · Intertek · CE · RoHS COMPLIANT

Conforms to: CENELEC EN 61558-1, IEC 61558-1, IEC 61558-2-2, UL 5085-1, UL 5085-2-2, CSA C22.2 No. 66

☎ Customer Assistance

For any questions regarding product installation or operation, contact us at: ProLine Radiant

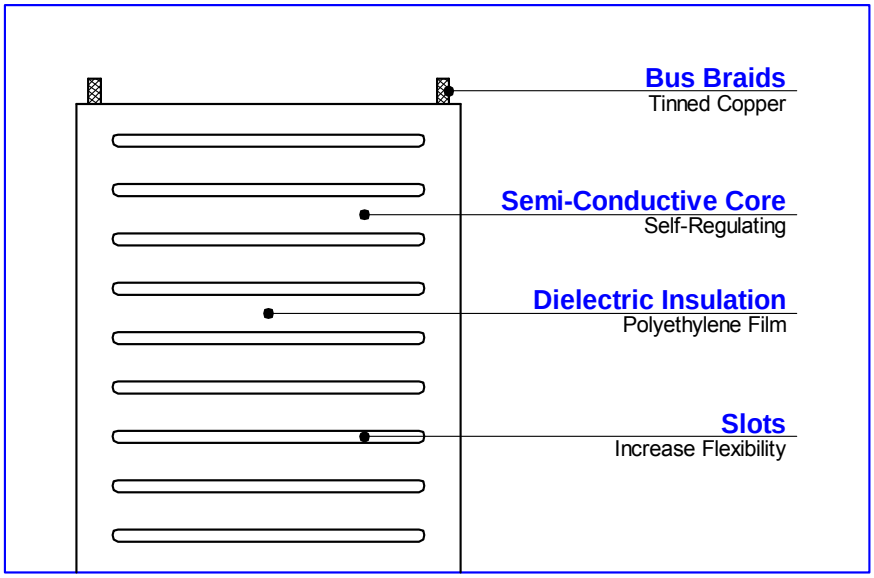
12637 S. 265 W., Suite 100A
Draper, UT 84020, USA
www.prolineradiant.com

Phone: (801) 948.7600
Toll-free: (866) 676.9276
Fax: (801) 948.7599
E-mail: sales@prolineradiant.com

MEP-23-2-36W-24V
Self-Regulating Heating Element
For Roof De-icing

ISO 9001 REGISTERED

Construction



The MEP-23-2-36W-24V Roof De-icing™ heating element is designed to prevent ice damming on roofs. The heating element is constructed of two parallel bus braids embedded in a semi-conductive polymeric heating element.

A polymeric dielectric jacket is applied at the time the heating element is manufactured so that the jacket is thermally joined to the heating element. This creates a heating element that features a solid or homogeneous construction which is chemically inert.

NOTE: Slots are optional.

Applications

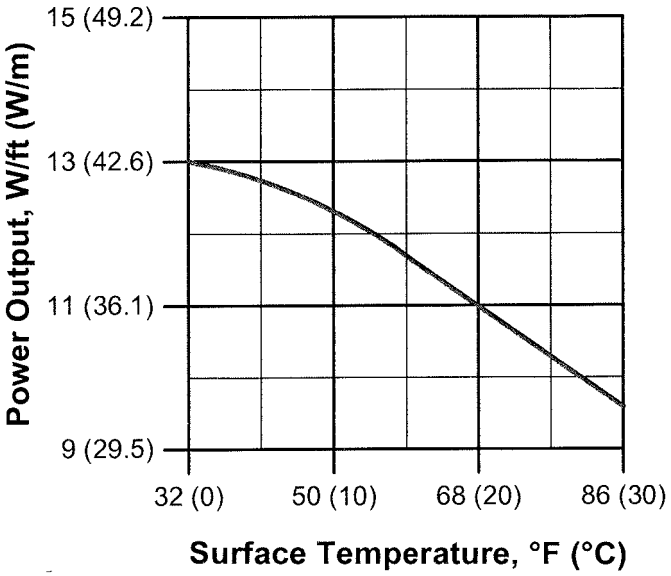
Icing Prevention Systems	Suitable for icing prevention on metal, vinyl and shingle roofs, commercial and residential.
Interior Surface Mount	Heating elements can be sandwiched between the waterproofing underlayment and roofing material. Under metal roofs it is recommended to apply a layer of Heat Retention Membrane. It improves performance and saves energy. The element is not made to be exposed to weather.

Product Specifications

Heating element type	Positive Temperature Coefficient (PTC) semi-conductive polyethylene
Dimensions	Width: 9” (230 mm) Thickness: 3/64” (1.2 mm) Length: cut to order with a 174 Ft (53 m) maximum shipping spool length Weight: 0.21 lb./ft. (0.3 kg/m)
Output wattage	12.3 W/Ft (40 W/m) @ 50°C (10°C) – see power output curve Watt density 16 W/Ft (172 W/m^2) @ 50°F (10°C)
Supply voltage	24Vac or dc
Bus braid	15 AWG tinned copper flat braid
Dielectric jacket	1 - 2 mil Mylar film, thermally bonded to heating element
Minimum bending radius	3/32” (2.5mm) @ 32°F (0°C)
Maximum exposure temperature	176°F (80°C)
Chemical Compatibility	The MEP element is resistant to chemicals and adhesives; it may be placed under ice and water shield.

Power Output Curve

MEP-23-2-36W-24V



Electrical Data

Amperage draw @ 50°F (10°C) when powered at 24Vac	0.51 A/Ft (1.7 A/m)
Nominal resistance @ 50°F (10°C)	47 Ω/Ft (14 Ω/m)
Maximum continuous element length (requires a single 25A circuit breaker):	34 Ft(10.4m)

Extension wire lengths:

Heater element length:	4 Ft (1.2m)	8 Ft (2.4m)	12 Ft (3.7m)	16 Ft (4.9m)	24 Ft (7.3m)	34 Ft (10.4m)
Max. extension wire length:12 AWG 4 mm^2	85 Ft (31m)	42 Ft (15m)	28 Ft (10m)	21 Ft (7m)	14 Ft (5m)	10 Ft (3m)
Max. extension wire length:10 AWG 6 mm^2	125Ft (47m)	67 Ft (23m)	45 Ft (15m)	33 Ft (11m)	22 Ft (7m)	15 Ft (5m)

Approvals / Certifications

C ETL US — Conforms to ANSI/UL STD 1693
Certified to CAN/CSA-C22.2 (power supply)

ABS Certificate No. 04-HS-445756-1-PDA

CE — EN60335-1: 1995
EN60355-2-30: 1997

ProLine Radiant Heat Solutions

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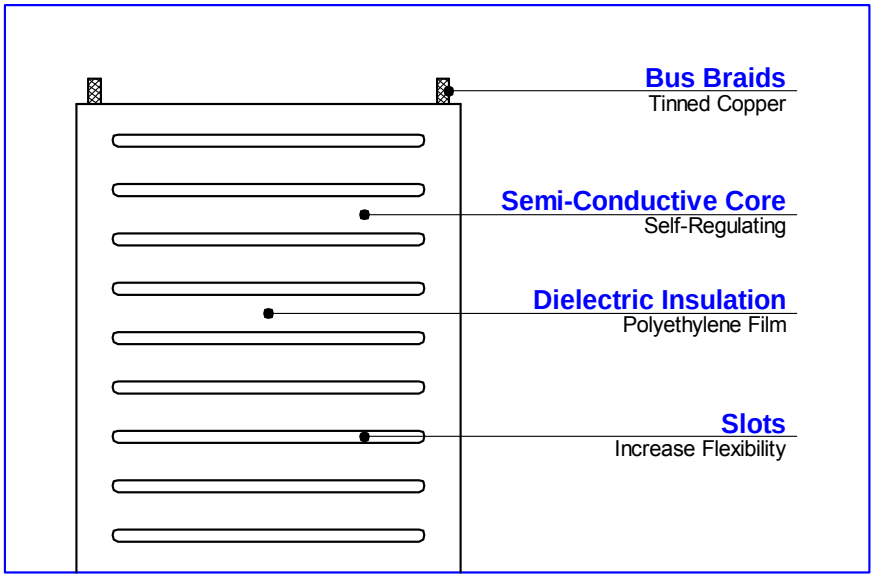
Draper, UT 84020, USA
866.676.9276 phone
801.948.7599 fax
www.prolineradiant.com

06-2011

MEP-30-2-36W-24V
Self-Regulating Heating Element
For Roof De-icing

ISO 9001 REGISTERED

Construction



The MEP-30-2-36W-24V Roof De-icing™ heating element is designed to prevent ice damming on roofs. The heating element is constructed of two parallel bus braids embedded in a semi-conductive polymeric heating element.

A polymeric dielectric jacket is applied at the time the heating element is manufactured so that the jacket is thermally joined to the heating element. This creates a heating element that features a solid or homogeneous construction which is chemically inert.

NOTE: Slots are optional.

Applications

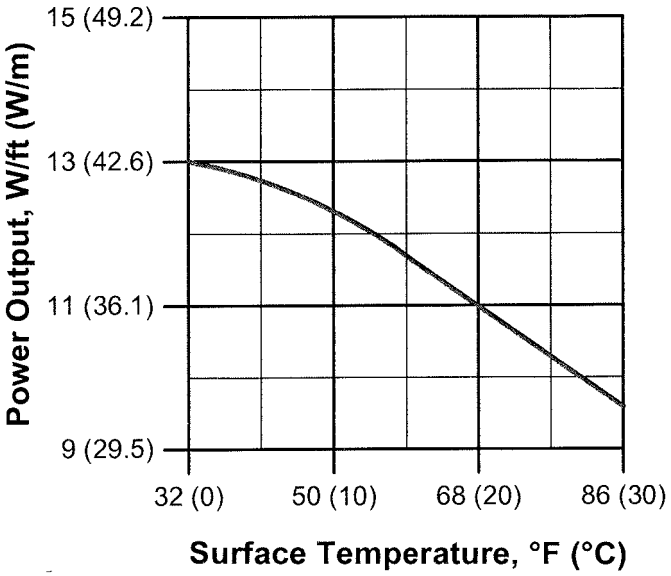
Icing Prevention Systems	Suitable for icing prevention on metal, vinyl and shingle roofs, commercial and residential.
Interior Surface Mount	Heating elements can be sandwiched between the waterproofing underlayment and roofing material. Under metal roofs it is recommended to apply a layer of Heat Retention Membrane. It improves performance and saves energy. The element is not made to be exposed to weather.

Product Specifications

Heating element type	Positive Temperature Coefficient (PTC) semi-conductive polyethylene
Dimensions	Width: 12” (305 mm) Thickness: 3/64” (1.2 mm) Length: cut to order with a 174 Ft (53 m) maximum shipping spool length Weight: 0.27 lb./ft. (0.4 kg/m)
Output wattage	12.3 W/Ft (40 W/m) @ 50°C (10°C) – see power output curve Watt density 12 W/Ft (129 W/m^2) @ 50°F (10°C)
Supply voltage	24Vac or dc
Bus braid	15 AWG tinned copper flat braid
Dielectric jacket	1 - 2 mil Mylar film, thermally bonded to heating element
Minimum bending radius	3/32” (2.5mm) @ 32°F (0°C)
Maximum exposure temperature	176°F (80°C)
Chemical Compatibility	The MEP element is resistant to chemicals and adhesives; it may be placed under ice and water shield.

Power Output Curve

MEP-30-2-36W-24V



Electrical Data

Amperage draw @ 50°F (10°C) when powered at 24Vac	0.51 A/Ft (1.7 A/m)
Nominal resistance @ 50°F (10°C)	47 Ω/Ft (14 Ω/m)
Maximum continuous element length (requires a single 25A circuit breaker):	34 Ft(10.4m)

Extension wire lengths:

Heater element length:	4 Ft (1.2m)	8 Ft (2.4m)	12 Ft (3.7m)	16 Ft (4.9m)	24 Ft (7.3m)	34 Ft (10.4m)
Max. extension wire length:12 AWG 4 mm^2	85 Ft (31m)	42 Ft (15m)	28 Ft (10m)	21 Ft (7m)	14 Ft (5m)	10 Ft (3m)
Max. extension wire length:10 AWG 6 mm^2	125Ft (47m)	67 Ft (23m)	45 Ft (15m)	33 Ft (11m)	22 Ft (7m)	15 Ft (5m)

Approvals / Certifications

C ETL US — Conforms to ANSI/UL STD 1693
Certified to CAN/CSA-C22.2 (power supply)

ABS Certificate No. 04-HS-445756-1-PDA

CE — EN60335-1: 1995
EN60355-2-30: 1997

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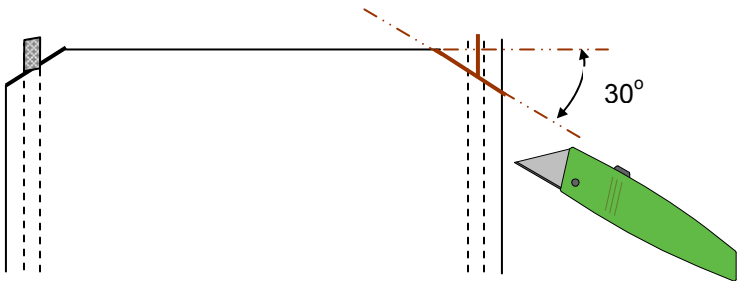
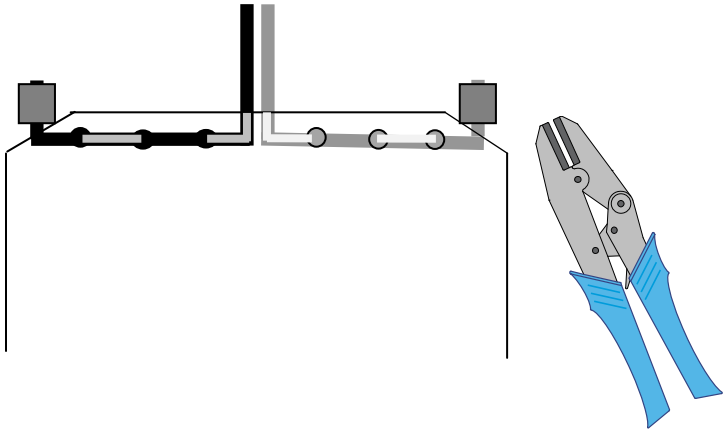
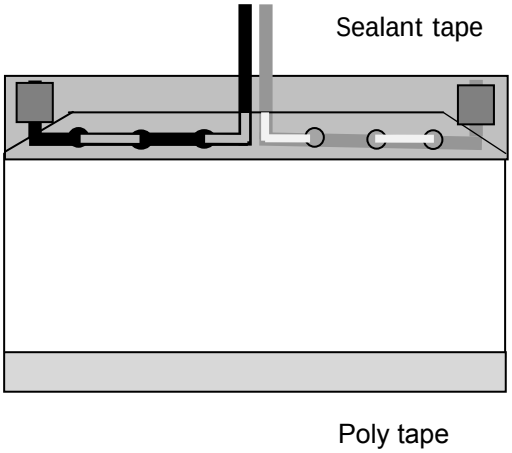
How to attach extension wires



• **Expose the bus braid** by making a score in the plastic front and back, and on the bus braid with a utility knife. Bend the element where the cut is made and pull off the corners to remove the surplus of plastic. **Make sure that the bus braid is not cut or damaged**; should this occur, re-cut the element and re-strip the bus braids. Repeat on other side.

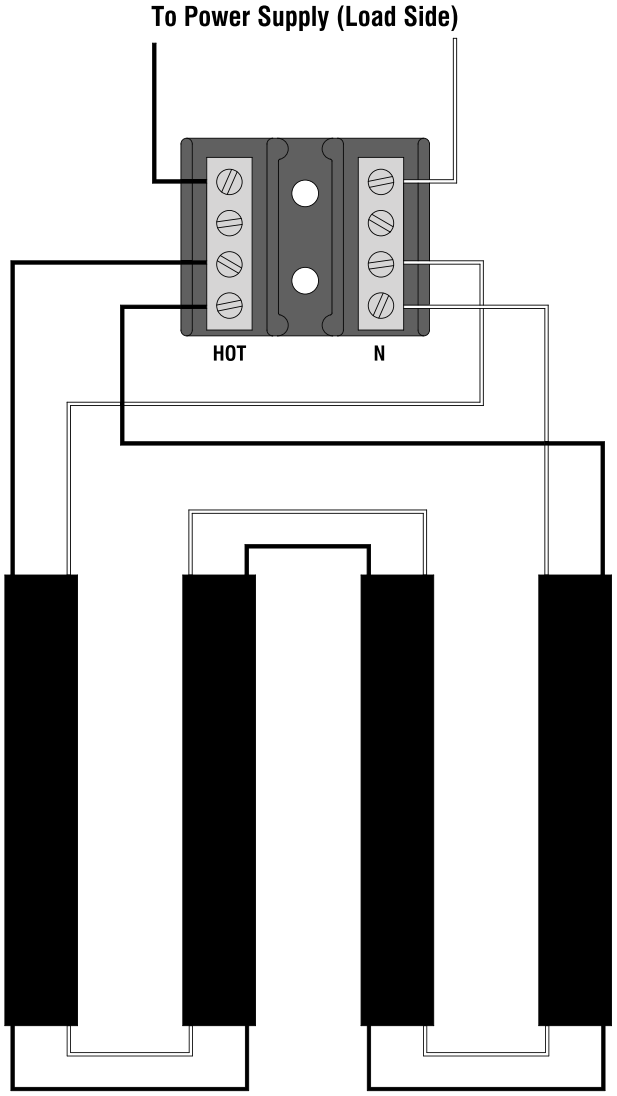


• **Make a strain relief connection** by punching three holes with a hand tool or drill. Weave the stranded tinned copper extension wire in the holes. Strip the wire (fan, do not twist the wire braids) and insert with the bus braid in the recommended tinned copper connector. Crimp the joint using the recommended tinned copper connectors and crimp tool. Repeat on other side. Using components not recommended by the manufacturer will void the warranty.



• **Seal the connections** by using the recommended sealant tape on the connector side of the element. Cut two pieces of tape lightly longer than the width of the element. Enclose the wires and strain relieve connections with the two tapes and firmly press them together overlapping the element to form a flat and smooth splice. Use weather resistant poly-tape to cover the opposite end of the element.

Fail Safe Wiring



- The Fail Safe Wiring method is used whenever there may be a risk of damaging the bus braids located on each side of the heating elements. Also, supplying electricity from both end reduces voltage drop.

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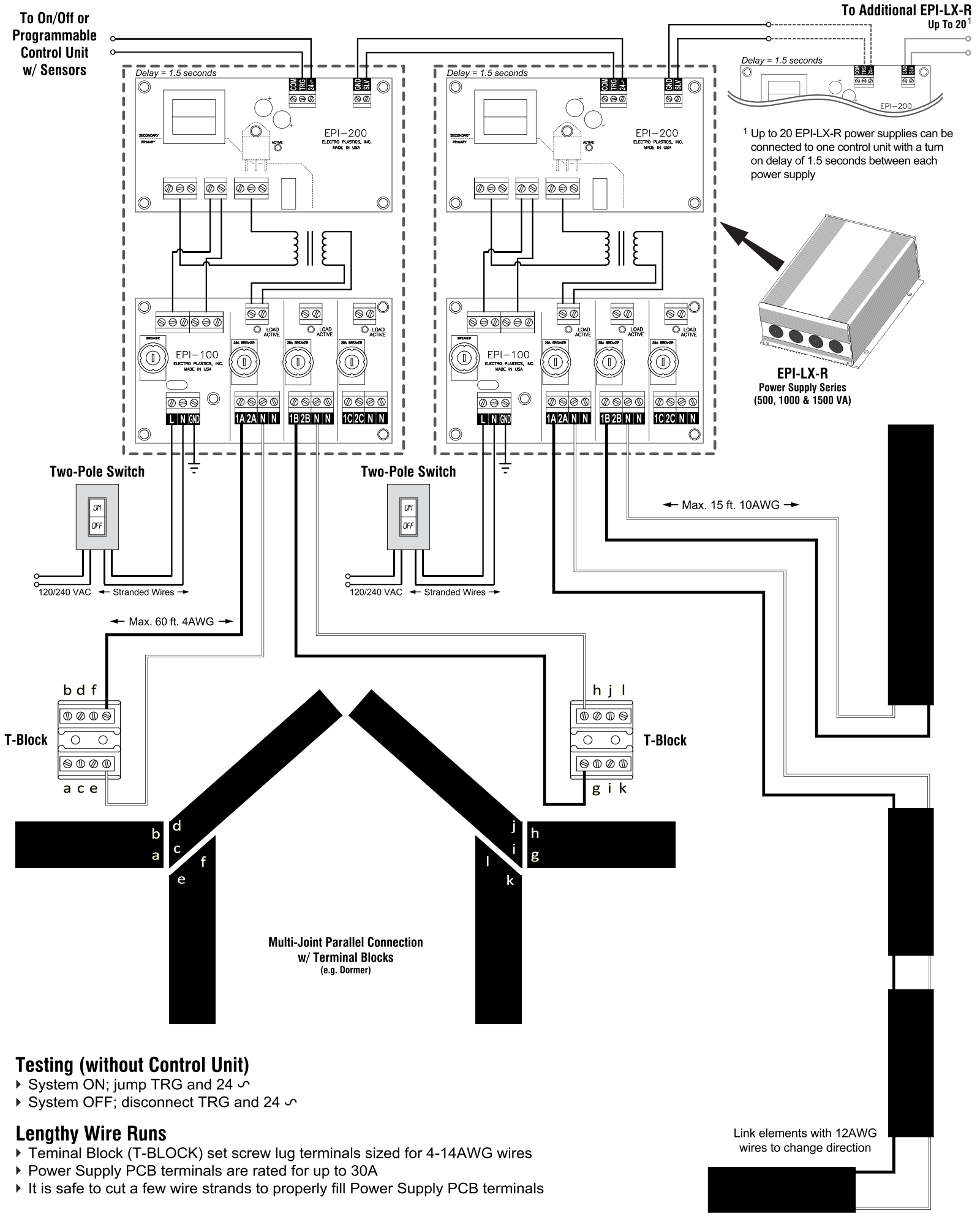
Roof De-Icing Wiring Diagram



Testing (without Control Unit)

- System ON; jump TRG and 24 ⏦
- System OFF; disconnect TRG and 24 ⏦

Lengthy Wire Runs

- Teminal Block (T-BLOCK) set screw lug terminals sized for 4-14AWG wires
- Power Supply PCB terminals are rated for up to 30A
- It is safe to cut a few wire strands to properly fill Power Supply PCB terminals