

# STEP® Snowmelt Installation Manual

Low Voltage System

FEEL  
THE FUTURE



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## **STEP® SNOWMELT SYSTEM**

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STEP® Snowmelt is a heating solution to melt snow and ice on entrances, walkways, driveways, ramps, patios, etc. The snow melt system eliminates shoveling snow and protects pedestrians from slippery ice or snow covered driveways and sidewalks.

STEP® Snowmelt systems consist of thin, flat and flexible heating elements that operate on low voltage (AC or DC) and are custom designed for each individual application. These durable, lightweight heating elements can be stapled or nailed through as long as the two embedded bus braids on each side of the element are not penetrated.

STEP® Snowmelt heating elements are powered by a 24V low voltage AC Power Supply or DC Controller. The heating elements, which can be cut to size on site are available in different widths and protected by a chemically, inherently inert and dielectric insulation. This liner protects against physical damages and aggressive materials and allows heating elements to be installed under concrete or other select surfaces.

STEP® (Self-regulating Technology of Electro Plastics) is heating elements made of a homogeneous, semi-conductive polymer, which by nature is self-regulating. This self-regulating, positive temperature coefficient (PTC), Nano-technology allows them to heat with maximum power in cold environments and use less electricity as their temperature increases. This minimizes power consumption and reduces operating costs by as much as 60% compared to conventional electric cable systems.

### **BENEFITS**

- STEP® Snowmelt is a flat, flexible and thin heating element.
- The heating element can be cut to length at the jobsite.
- The polymer material can be penetrated without affecting the conductivity, but the two conductors on each side must not be penetrated.
- The element is strong and durable.
- STEP® Snowmelt has the ability to self-regulate - as the material gets warmer, less electricity passes through the plastic - therefore it is extremely energy-efficient.
- The element acts on its whole surface as a sensor and cannot overheat.
- This heating system is very versatile and can be used for residential, commercial and industrial applications.
- Avoids shoveling snow, and keeps pedestrians safe.
- Low operating costs compared to alternative snow melting systems.

## **INSTALLATION GUIDELINES**

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### **IMPORTANT INSTALLATION GUIDELINES**

- Choose qualified personnel who are familiar with the STEP<sup>®</sup> Snowmelt heating system.
- Make sure that all materials used are approved for the specific application and have no adverse compatibility with the heating elements.
- The polymer material can be penetrated, but do not damage the two bus braids and lead wires on each side of the element.
- Use only components recommended by the manufacturer.
- Electrically check and measure the heating system before covering the heating elements.
- The installation shall be made in accordance with local codes, ordinances, trade practices, and manufacturers' instructions.
- Read and follow the installation instructions to assure that the calculations and the heating system installed are done according to the specified application.
- STEP<sup>®</sup> Labels shall be provided with the heating product and should be filled out and affixed in the place indicated:
  - CAUTION label is to be attached to the junction box.
  - WARNING label is to be attached to the service panel.

### **WARNING**

- HEATING ELEMENTS SHOULD NOT TOUCH, CROSS OR OVERLAP AT ANY POINT.
- DO NOT ENERGIZE ROLLED UP HEATING ELEMENTS.
- DO NOT NAIL OR STAPLE ANY METALLIC OBJECT THROUGH TERMINALS AND BUS BRAIDS.
- HEATING ELEMENT IS REQUIRED TO BE INSTALLED BY QUALIFIED PERSONNEL IN ACCORDANCE WITH LOCAL AND NATIONAL CODES SUCH AS NEC IN U.S., CEC IN CANADA.
- HEATING ELEMENT SHOULD BE TESTED AND MEASURED BEFORE BEING COVERED.
- READ AND FOLLOW ALL INSTRUCTIONS.

These installation instructions assume that the STEP<sup>®</sup> Snowmelt system has been designed by Electro Plastics, Inc. or a distributor of Electro Plastics, Inc. and is being installed according to the proposed Design Specifications, all Terms & Conditions of Sale, and Limited Warranty provided with a STEP<sup>®</sup> Snowmelt quotation.

For more information, contact Electro Plastics, Inc. at 877-783-7832 or the distributor that originally provided the quotation. You can also go to [www.stepheat.com](http://www.stepheat.com).

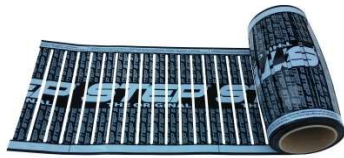
## BEFORE STARTING

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### DESIGN AND CALCULATIONS

- The installation shall be calculated and a layout made to determine the materials required.
- The more specific the layout, the easier the installation will be. Indicate for each area:
  - Exact measurements of the areas(s) to be heated.
  - Placement and number of strips of elements.
  - Length and wattage per element strip.
  - Location of power source, including electrical box, control and power supply(s).
  - Wire size and length according to load and distance to the power source.
  - Size of power supply or controller.
  - Load distribution on the interface board.

### SUPPLIED PARTS



**STEP® Heating Element**  
12V / 24V / 48V



**STEP® AC Power Supply**  
EPI-LX-R-500W to 1500W  
EPI-ELEC-2500W



**STEP® DC Controller**  
EPI-DC-3



**STEP® C&T Kit**  
Connectors (tinned copper)  
Sealant Tape



**Extension Wire**  
TCu12 or TCu10  
Stranded tinned copper



**STEP® T-BLOCK**  
Terminal Board  
2-Bar tinned copper



**STEP® TOOL-PRO**  
Recommended crimp  
tool for connectors



**Signal Wire (3-Con)**  
From thermostat to  
AC or DC Controller



**STEP® Touch**  
EPI-LX-TC – Thermostat  
EPI-LX-TS – External Sensor

## DESIGN AND CALCULATION

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### AC POWER SUPPLY

POWER SUPPLY	DIMENSIONS			PRIMARY CIRCUIT			SECONDARY CIRCUIT
Model	Height (inch)	Width (inch)	Depth (inch)	120 VAC	208 VAC	230 VAC	Amperage
<b>EPI-LX-R-500W</b>	14.4	7.0	3.5	10A	5A	5A	1 x 20A (24 VAC)
<b>EPI-LX-R-1000W</b>	22.4	7.0	3.5	15A	10A	10A	2 x 20A (24 VAC)
<b>EPI-LX-R-1500W</b>	28.4	7.0	3.5	20A	15A	15A	3 x 20A (24 VAC)
<b>EPI-ELEC-2500W</b>	22.4	7.0	3.5	25A	15A	15A	3 x 20A (48 VDC)

The EPI-LX-R power supply series are AC primary and operate on 24 VAC secondary.

- Each secondary circuit is maximum 500W.
- Design and continuous usage is 90%, i.e., 450 watts per circuit.

The EPI-ELEC is an electronic power supply with AC primary and 48 VDC secondary.

- Maximum design and continuous load per circuit is 960 watts.
- Maximum total load is 2250W.

### LOW VOLTAGE DC CONTROLLER

DC CONTROLLER	DIMENSIONS			CHANNELS	INPUT VOLTAGE	OUTPUT CIRCUIT BREAKER
Model	Height (inch)	Width (inch)	Length (inch)	No. off	Volts	Max. Amperage per Channel
<b>EPI-DC-M3</b>	9.25	6.9	3.5	1	12 – 48 VDC	1 x 25A

The DC Controller comes with three channels.

**NOTE: ALL ELEMENTS MUST BE CONNECTED IN PARALLEL.**

## DESIGN AND CALCULATION

### ELEMENT TYPE AND WATTAGE

ELEMENT DATA at 24 VOLTS @ 32°F					LISTED CLASS 1
Width	Element Type Model	Ohms /ft.	Linear W/ft.	Density W/sqft.	Max. length in feet @ 450W
12"	<b>MEP-30-70W</b>	24	24.0	24.0	18
9"	<b>MEP-23-80W</b>	21	27.0	36.0	16

ELEMENT DATA at 48 VOLTS @ 32°F					LISTED CLASS 1
Width	Element Type Model	Ohms /ft.	Linear W/ft.	Density W/sqft.	Max. length in feet @ 1000W
12"	<b>VMEP-30-25-48</b>	61	36.6	36.6	26
12"	<b>VMEP-30-15-48</b>	107	22.0	22.0	43

### WIRE GAUGE AND LENGTH

Minimize voltage drop by planning the wire runs as short as possible. Use larger wire gauge for more power output. Refer to the following chart for maximum secondary wire length, both wires included, per circuit in feet.

Load Watts	Wire Gauge and Wire Length (feet)					
	14 AWG	12 AWG	10 AWG	8 AWG	6 AWG	4 AWG
60W-24V	40	63	100	159	252	401
90W-24V	27	42	67	106	168	268
120W-24V	20	32	50	80	126	201
150W-24V	16	26	40	64	101	161
180W-24V	14	21	34	53	84	134
210W-24V	12	18	29	46	72	115
240W-24V	10	16	25	40	63	101
270W-24V	9	14	23	36	56	90
300W-24V	8	13	20	32	51	81
330W-24V	8	12	19	29	46	73
360W-24V	7	11	17	27	42	67
390W-24V	7	10	16	25	39	62
420W-24V	6	9	15	23	36	58
450W-24V	6	9	14	22	34	54
960W-48V	5	20	40	65	100	160

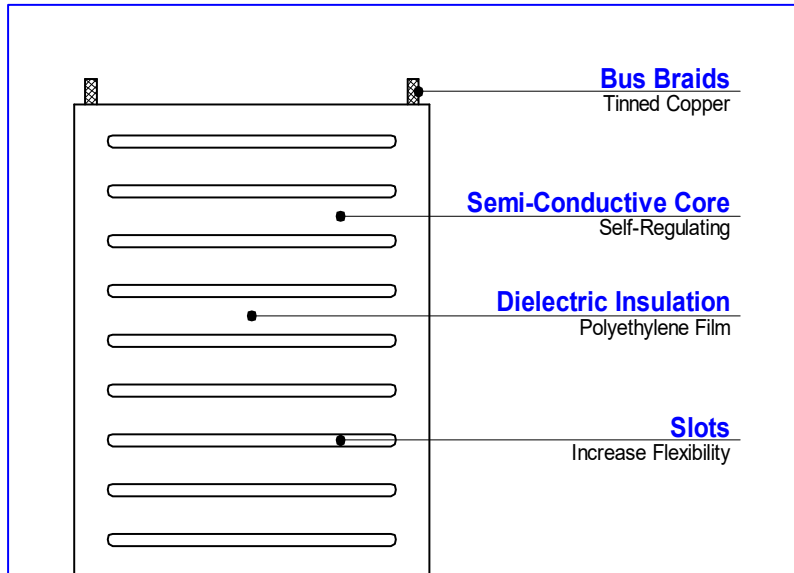
To simplify distribution to the elements use a terminal block when you have multiple elements.

Keep each terminal block to maximum 90% of rated power circuit wattage and then calculate the appropriate wire size used to run to the power supply.

## PRODUCT SPECIFICATIONS

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### CONSTRUCTION



The STEP<sup>®</sup> Snowmelt heating elements are designed to prevent ice and snow on walkways and driveways. The element is constructed of two parallel bus braids embedded in semi-conductive PTC polymer.

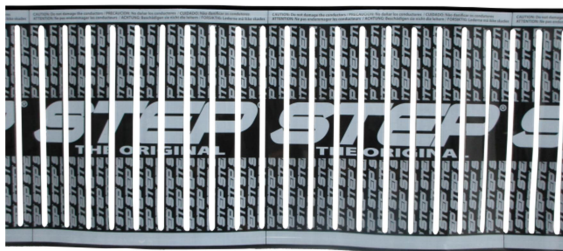
A polymeric dielectric liner is applied at the time of manufacturing so that the liner is thermally fused to the heating element. This creates a heating element that features a solid and homogeneous construction which is chemically inert.

### APPLICATION

Snow and Ice Prevention System

Suitable for ice and snow prevention on concrete, stone or asphalt walkways and driveways, commercial and residential. The element is not made to be exposed to weather.

Depending on the application, the 12" and 9" wide elements come with slots or protected in a vinyl enclosure.





## PRODUCT SPECIFICATIONS

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### HEATING ELEMENT MODELS

<b>Model MEP</b>	Positive Temperature Coefficient (PTC) semi-conductive polyethylene		
Dimensions	Width:	Weight:	
	MEP-30-70W-24V:	12" (30 cm)	0.21 lb/ft (0.32 kg/m)
	MEP-23-80W-24V:	9" (23 cm)	0.17 lb/ft (0.25 kg/m)
	Thickness: 3/64" (1.2 mm)		
	Length: cut to order with a standard spool length of 174ft (53m)		
Output wattage	70W »24 W/ft (78.7 W/m) @ 32°F (0°C)		
	80W »27 W/ft (88.6 W/m) @ 32°F (0°C)		
	Watt density:		
	MEP-30-70W-24V: 24 W/ft <sup>2</sup> (258 W/m <sup>2</sup> ) @ 32°F (0°C)		
	MEP-23-80W-24V: 36 W/ft <sup>2</sup> (387 W/m <sup>2</sup> ) @ 32°F (0°C)		
Supply voltage	24V AC or DC		
Bus braid	15 AWG tinned copper flat braid		
Dielectric liner	Thermally bonded to heating element		
Minimum bending radius	3/32" (2.5mm) @ 40°F (4°C)		
Maximum exposure temperature	176°F (80°C)		
Minimum exposure temperature	-40°F (-40°C)		
Chemical Compatibility	The MEP element is resistant to most chemicals and adhesives.		
<b>Model VMEP</b>	Positive Temperature Coefficient (PTC) semi-conductive polyethylene		
Dimensions	Width:	Weight:	
	VMEP-30-25-48V:	13" (33 cm)	0.52 lb/ft (0.78 kg/m)
	VMEP-30-15-48V:	13" (33 cm)	0.52 lb/ft (0.78 kg/m)
	Thickness: 3/32" (2.5 mm)		
	Length: custom made and pre-connected to order		
Output wattage	25 »36.6 W/ft (120.0 W/m) @ 32°F (0°C)		
	15 »22.0 W/ft (72.2 W/m) @ 32°F (0°C)		
	Watt density:		
	VMEP-30-25-48V: 36.6 W/ft <sup>2</sup> (394 W/m <sup>2</sup> ) @ 32°F (0°C)		
	VMEP-30-15-48V: 36.6 W/ft <sup>2</sup> (394 W/m <sup>2</sup> ) @ 32°F (0°C)		
Supply voltage	48V DC		
Chemical Compatibility	The VMEP element comes prewired in a sealed vinyl enclosure for maximum mechanical and chemical protection.		

# INSTALLATION

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## 1. PLAN

- When deciding on a snowmelt system it is essential to decide on the purpose of the system and how effective the system should be. Should the ground be completely dry or is it acceptable with some snow slush on the ground shortly after a snowfall. ASHRAE classifications split snowmelt systems into three groups:
  - Snow free ratio 0: Designed not to melt snow while it is falling, but afterwards.
  - Snow free ratio 0.5: 50% of snow is melted while falling, the rest afterwards.
  - Snow free ratio 1: All snow and ice is melted while falling.
- When designing a snowmelt system it is essential to know the area conditions; snowfall days, temperature, surface type, heat loss to ground, atmospheric loss and perimeter insulations. These are some of the parameters needed to create snowmelt solutions according to expectations.
- An on demand deicing system may be favorable in places with few snowfall days. Areas with frequent snowfall may benefit from the thermal bed concept which is a low power deicing system that is switched on prior to frost and will keep a positive ground temperature all winter. Thereby snow will start melting immediately at snowfall and the concrete is protected from cracking.
- Wherever underlying soils are susceptible to frost, pavements will suffer damaging effects from frost heave and spring breakup. There are different techniques to reduce frost action, such as:
  - Remove frost-susceptible soil and using thick base courses to spread the load during spring thaw.
  - Provide adequate drainage for free water through ditching.
  - Maintain the soil above freezing temperatures by placing heating elements in the upper soil or pavement section.
- Installation should conform to local building codes, ordinances, and trade practices.

## 2. INSTALL

- Heating elements should be installed in ambient temperatures between 40°F and 140°F (4°C and 60°C).
- Lay the MEP elements or the VMEP mats onto an even layer of granular material or concrete slab and secure them in place to prevent displacement of panels.
- Avoid heating elements to overlap or touch each other. DO NOT puncture the bus braids.
- Apply subsequent lifts, pavement or soil layers taking care not to damage the MEP elements or the VMEP mats.
- Refer to the applicable recommended flooring option according to the system design.

## **INSTALLATION**

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### **3. CONNECT**

- For the MEP element, connect extension wires to the heating element according to the drawing and electrical diagram. If fail safe wiring is required, refer to instructions in the diagram "Fail Safe Wiring".
- The VMEP mats come pre-connected. Calculate required wire length according to distance to the power supply.
- Determine wire gauge versus load and length of wire from the element to the power supply. The wire gauge for a circuit fully loaded is 10 AWG by default but if the distance is longer than 14 feet for 24 volts system or 40 feet for the 48V system, connect the extension wires to a terminal block and then route to the power supply using higher gauge wires as shown in Wiring Diagram. Insure that wiring is done according to the National Electrical Code.
- Route the wires through the ground in a conduit. Connect wires in parallel to the 24 volt AC power supply or 24 - 48 volt DC controller. Use only stranded tinned copper wires, and do not twist wire ends when connecting to the interface board in the supply.
- Distribute the load evenly; the maximum load per circuit is 450 watts for 24V and 960 watts for 48V systems.
- The power supply must be installed in a well-ventilated area and wired in accordance with the NEC. Place the power supply vertically using rubber bumpers between the back heat sink 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 the three signal wires COM, TRG and ~24V from the interface board terminals to the thermostat. The system will switch on when the thermostat calls for heat.
- The heating elements must be measured and the amp draw noted by a certified electrician before being covered. The warning label must be placed in the service panel and the caution label on the electrical box, or on the low-voltage power supply.

NOTE: This system is low voltage and the heating elements must NOT be grounded.

### **4. COVER**

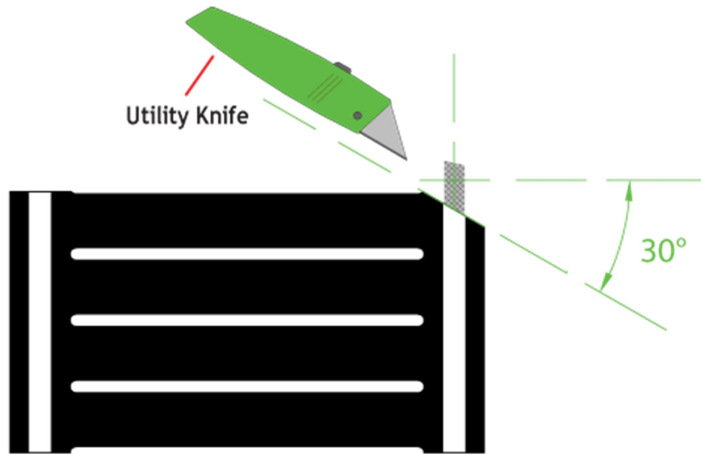
- The heating elements should be placed on top of gravel and compacted sand. Then secured in a way that the elements do not shift position when concrete is poured.
- If a reinforcement mesh is used, take care that the no conductive material is in direct contact with the heating elements.
- Do not pour more than 8 inches of concrete over the heating elements. If more is needed consult manufacturer or a thermic engineer.

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

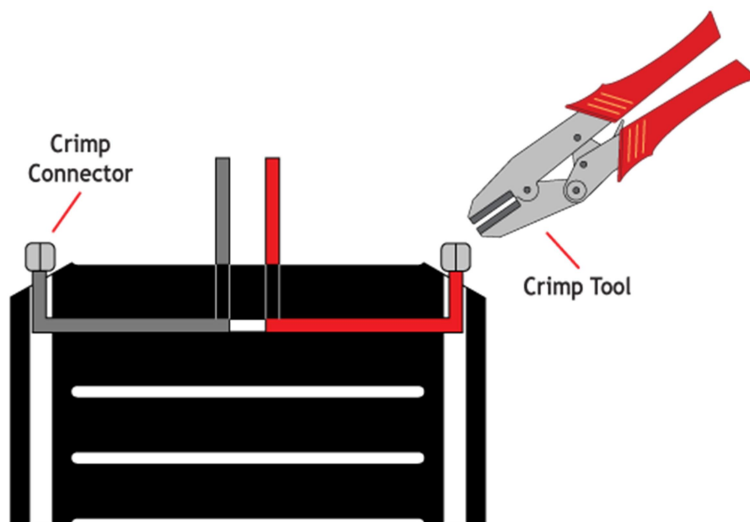
## INSTALLATION

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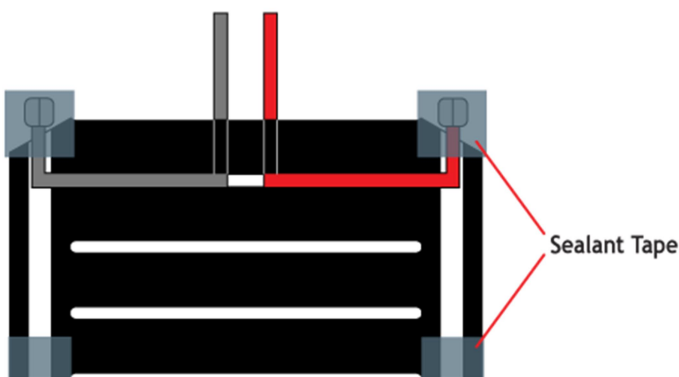
### HOW TO MAKE CONNECTIONS



- **Expose the bus braid** by making an angled score in the plastic, front and back along the bus braid with a utility knife. Bend the element where the cuts are 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 braid. Repeat on the other side.



- **Make a strain relief connection** by weaving each stranded tinned copper extension through the first slot. Strip the wire end, and join it to the bus braid inside the recommended tinned copper crimp connector. Crimp the joint using the recommended crimp tool. Using components not recommended by the manufacturer will void the warranty.



- **Seal all connections** by using the recommended sealant tape on the connector side of the element. Fold the tape and press together overlapping element, connector and wire to form a flat and smooth splice. Also use the recommended sealant tape to cover the bus braid at the opposite end of the element.

# INSTALLATION

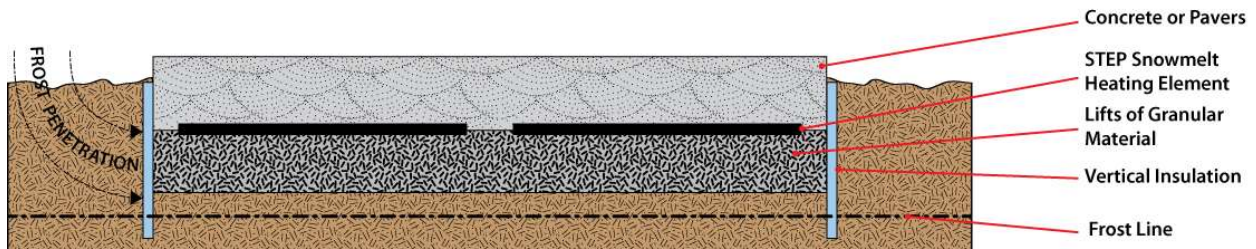
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## SYSTEM DESIGN

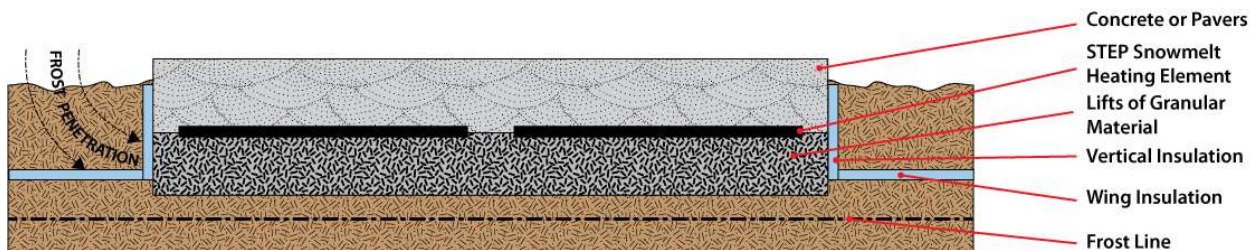
STEP® Thermal Bed system is designed for continuous duty on 24 volts and will melt ice or snow provided the substrate has been continuously heated. This maintenance heat keeps the ground temperature constant and reduces the expansion and contraction in substrates.

- Place a low water absorption and high compressive strength insulation, e.g. "Styrofoam\*Hi" or equivalent, vertical along the walls of a trench or foundation to protect against frost penetration.
- Care should be taken to prevent vehicles and heavy equipment from bearing directly on the vertical insulation.
- Make sure that the insulation is properly butted together to avoid the transfer of heat / cold migration and transfer of moisture.

### Thermal Bed Concept



### Thermal Bed with Wing Insulation

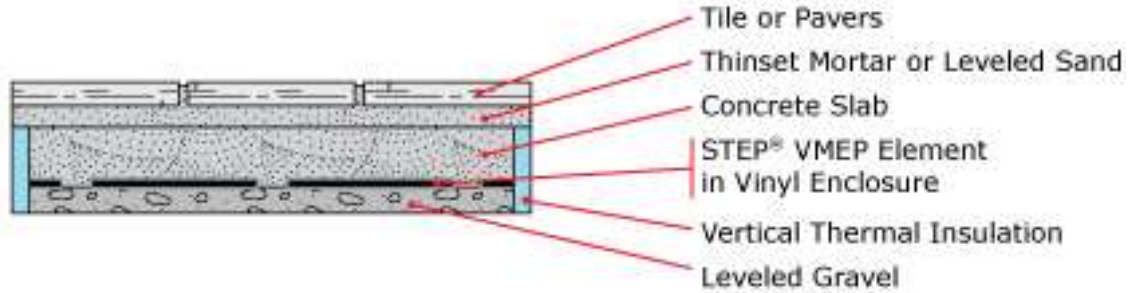


# INSTALLATION

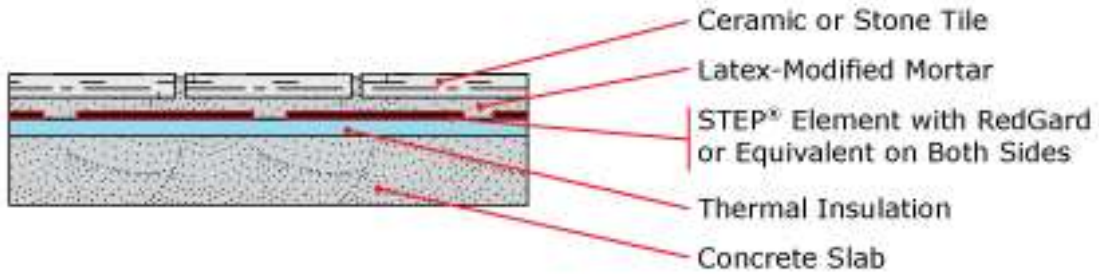
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## FLOORING OPTIONS

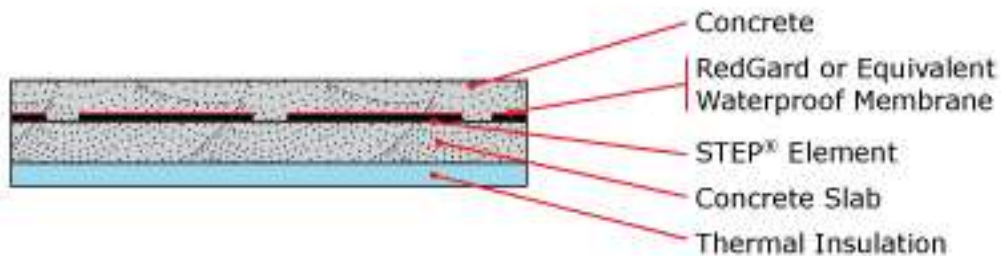
### Outdoor Option 1 – On Gravel



### Outdoor Option 2 – On Concrete Slab



### Two Pour Concrete – With Thermal Insulation



# INSTALLATION

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## MEP ELEMENT



**INSTALLATION**

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**VMEP ELEMENT**





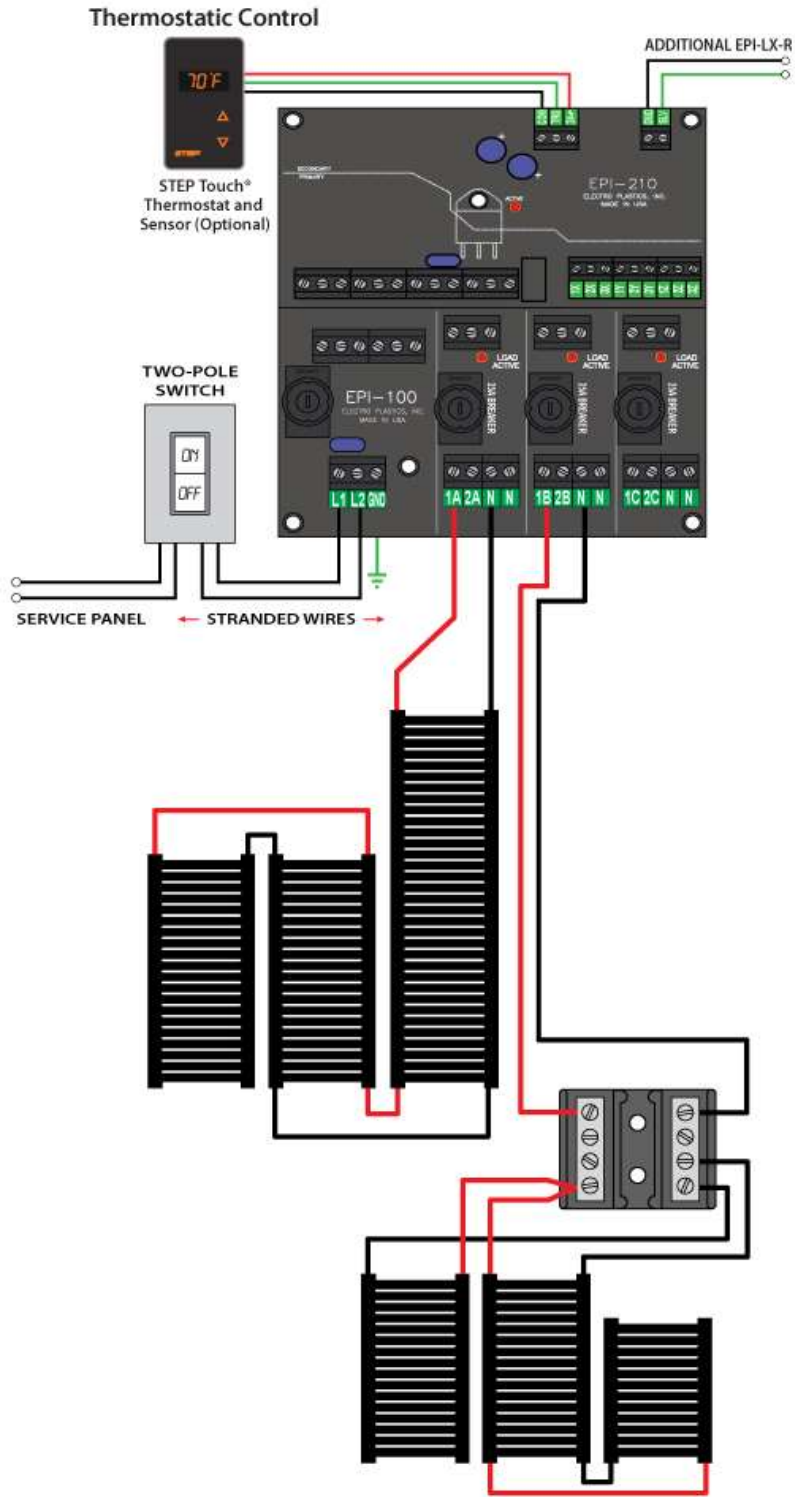
# ***ELECTRICAL GUIDELINES***

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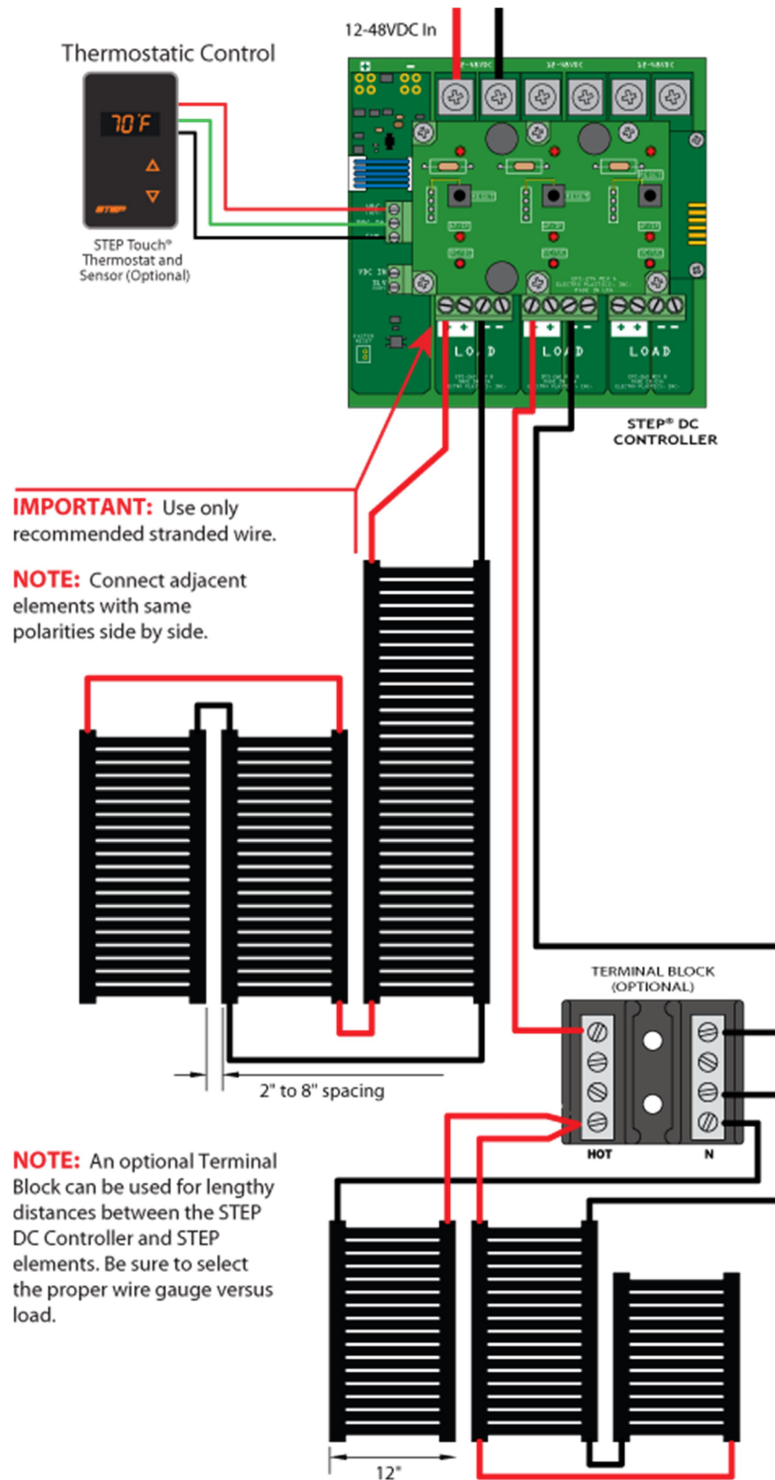
## **LOW VOLTAGE ELECTRIC RADIANT HEATING EQUIPMENT**

- 1. Scope.** This installation instruction covers electric radiant heating equipment and associated components operating at  $\leq 30$  volts rms or 42 volts peak, or direct current  $\leq 60$  volts.
  
- 2. Low Voltage Heating Equipment.**
  - (A) **General.** A low voltage heating system shall consist of a low voltage isolating power supply, heating elements, and associated components that are all identified for the use. The output circuits of the power supply are rated for 25 amperes maximum and operate at 30 volts (42.4 volts peak) ac maximum or 60 volts dc maximum under all load conditions.
  
  - (B) **Class 2.** Listed Class 2 equipment shall be rated in conformance with Chapter 9, Table 11(A) or Table 11(B).
  
  - (C) **Alternate Energy Sources.** Listed low voltage heating equipment shall be permitted to be supplied directly from an alternate energy source such as solar photovoltaic (PV) or wind power. When supplied from such a source, the source and any power conversion equipment between the source and the heating equipment and its supply, shall be listed and comply with the applicable section of the NEC for the source used.
  
- 3. Listing Required.** Low voltage heating systems shall comply with (A) and (B).
  - (A) **Listed System.** Low voltage heating systems shall be listed as a complete system. The heating portion of the product, power supply, interconnecting wiring, and fittings shall be listed for the use as part of the same identified heating system.
  
  - (B) **Assembly of Listed Parts.** The listed system and approved system components shall be installed in accordance with the low voltage heating product manufacturer's instructions.
  
- 4. Low Voltage Circuits.**
  - (A) **Ground.** Secondary circuits shall not be grounded.
  
  - (B) **Isolation.** The secondary circuit shall be insulated from the branch circuit by an isolating transformer, provided as part of the listed assembly.
  
- 5. Provisions.**
  - (A) **Fixed Electric Space Heating Equipment.** Installation shall be made in accordance with NEC 424, Chapter V, Electric Space Heating Cables, or Chapter IX, Electric Radiant Heating Panels and heating Panel Sets, except as noted in 424.100-424.102.
  
  - (B) **Fixed Outdoor Electric Deicing and Snow Melting Equipment.** Installation shall be made in accordance with NEC Article 426, except as noted in 424.100-424.102.

# AC POWER SUPPLY WIRING DIAGRAM



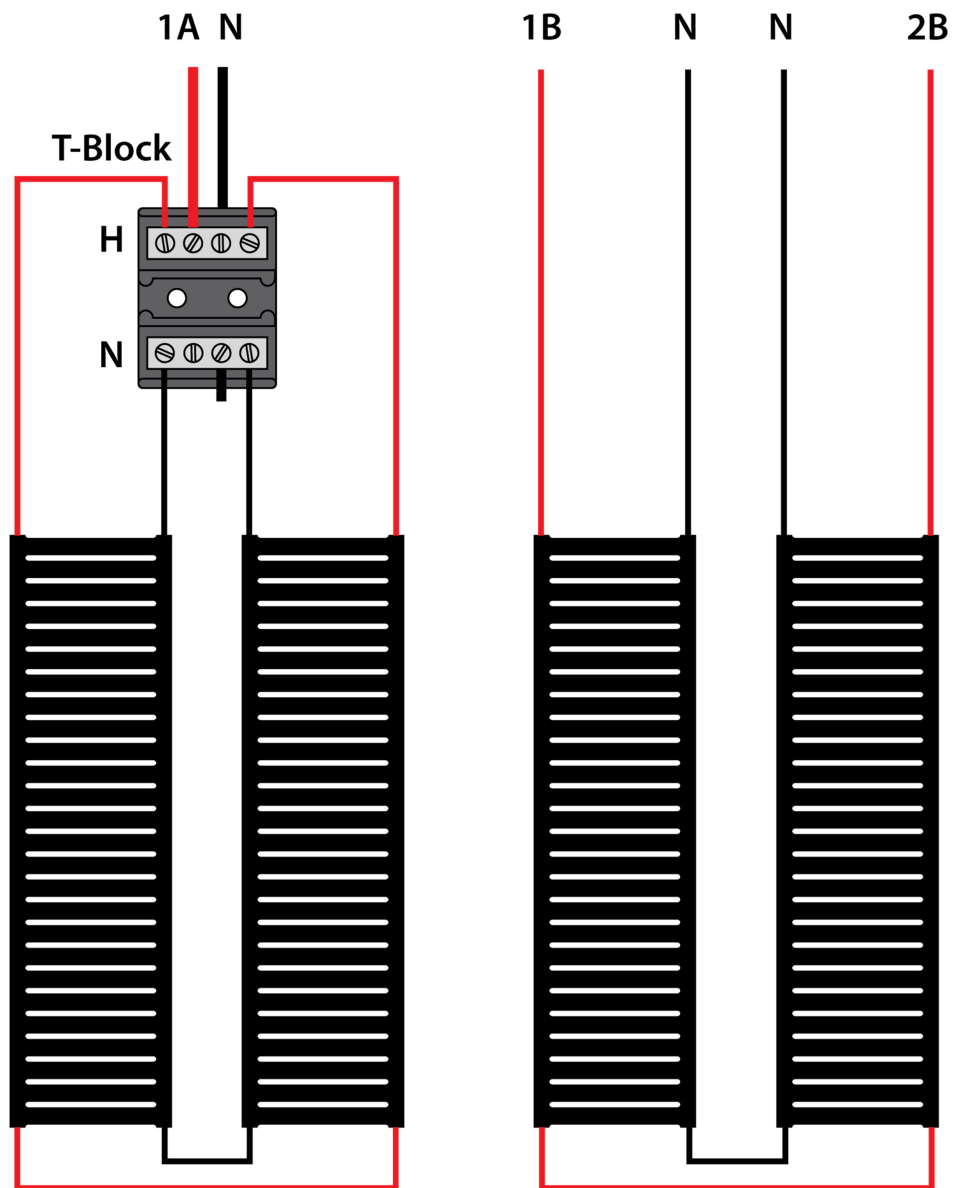
## DC CONTROLLER WIRING DIAGRAM



## FAIL SAFE WIRING

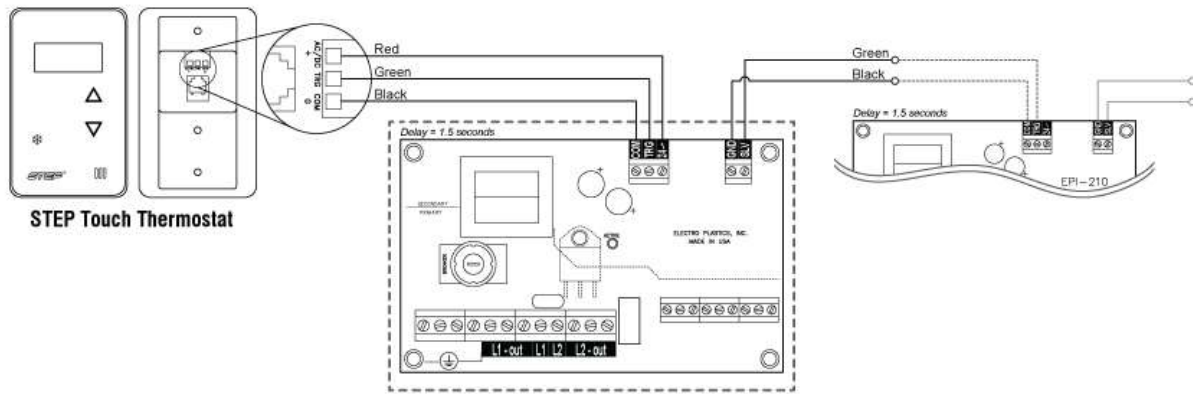
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- The Fail Safe Wiring method is used whenever there may be a risk of damaging the bus braids located on each side of the heating elements.
- Supplying electricity from both ends of an element eliminates the possibility of arcing from a damaged bus braid.
- Not only is this wiring method safer, it reduces voltage drop and makes the element more powerful.



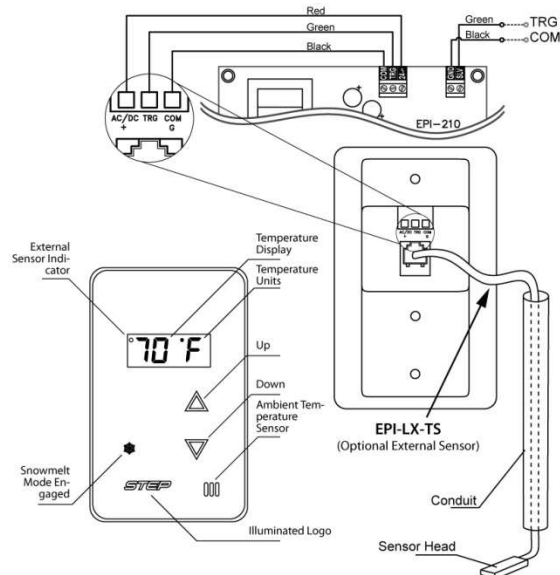
## CONTROLS

### STEP TOUCH®



- The microprocessor on the controller of the STEP® Power Supply has a “soft” start electronic relay which serves as an intelligent switch to enable/disable the line voltage in such a way that switching/pulsing does not harm the electrical components.
- Used with the external sensor on “Snow Melt” mode, the pulsing operation of the controller provides the maximum level of energy efficiency.

### THERMOSTAT AND SENSOR



EPI-LX-TC: Low-voltage Thermostat and EPI-LX-TS: External sensor

## **WARRANTY REGISTRATION AND COVERAGE**

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### **LIMITED WARRANTY**

Electro Plastics' limited warranty is valid from date of original purchase, as follows (not included in this warranty are OEM and specialty products):

- 20 years for the STEP Warmfloor<sup>®</sup> Heating Elements.
- 10 years for the STEP<sup>®</sup> Snowmelt and Deicing Heating Elements.
- 10 years for the STEP<sup>®</sup> Transformer Coils in the Power Supplies.
- 3 years for the Interface Electronics in the Power Supplies.
- 3 years for the STEP<sup>®</sup> Controls

Electro Plastics sole obligation under its warranty shall be, at its option, to either issue a credit for the purchase price, or repair or replace any article or part thereof, which is proved to be other than as warranted. For this warranty to be valid, a copy of the STEP<sup>®</sup> Labels shall be delivered to ELECTRO PLASTICS, INC., with a diagram indicating to which branch circuit the system is connected, the location of the element strips, the routing of the wires and their different measurements, voltage, amperage, elements and wire length. Electro Plastics warrants the products to be free from defects in material or manufacturing and to perform under normal use. For the warranty to be valid, qualified personnel who are familiar with the construction and operation of the system must install the equipment and a certified electrician has to verify and measure the STEP<sup>®</sup> elements BEFORE they are covered.

### **Exclusions**

Electro Plastics shall not be responsible for any loss or damage that may arise due to:

- Non-compliance with installation and/or usage of the STEP<sup>®</sup> elements and accessories as recommended. It shall be Buyer's and End User's duty to read and follow carefully the STEP<sup>®</sup> Installation Manual. Technical assistance services, e.g. design and layout are to be used as GUIDELINES ONLY, as each application is specific to local conditions and construction
- Dissatisfaction due to improper Installation of the floor covering. All floor covering shall be installed in conformance with the manufacturer's instructions and shall conform to all applicable trade practices, local codes and manufacturer's specifications.
- Usage of inadequate or non-specified materials with the STEP<sup>®</sup> heating system or products.
- Any and all defects, deficiencies or failures resulting from improper handling of the product; e.g., cuts made to the STEP<sup>®</sup> elements, or the wires, etc.
- Tampering with the STEP<sup>®</sup> heating system or products; e.g., removing, altering or overloading the circuit breakers, overcurrent protectors, etc.
- Installation of merchandise with obvious visible defects.

### **How to claim this warranty**

In order to obtain warranty service, Buyer shall return the unit to the dealer from whom the unit was originally purchased, with a dated sales receipt. The dealer will forward the unit to Electro Plastics. Upon receipt of the defective unit, paperwork and explanation of application, Electro Plastics will inspect and test the unit in order to determine the reason for the alleged failure. If it is determined that the unit was properly installed and failed during normal use, as a result of a manufacturing defect, Electro Plastic will repair or replace the unit, or issue a credit or refund of the purchase price, at its sole discretion. The warranty period for any replacement unit will fulfill the warranty of the original unit and will not be extended.

## WARRANTY REGISTRATION AND COVERAGE

### Limitations

Under no circumstances will Electro Plastics be liable for labor or other charges related to the installation and use of the STEP<sup>®</sup> heating system or products. This warranty does not cover labor or removal or reinstallation of the product and is void on any product installed improperly, or in an improper environment, overloaded, misused, abused or altered in any manner. THE WARRANTIES STATED HEREIN ARE EXCLUSIVE OF ALL OTHER WARRANTIES, WRITTEN OR ORAL, STATUTORY EXPRESS OR IMPLIED, INCLUDING ANY WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, NONE OF WHICH SHALL APPLY TO THE SALE OF THE COMPANY'S PRODUCTS HEREUNDER. THIS WARRANTY ALSO EXCLUDES INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY WARRANTY ON THE PRODUCTS. Products which are replaced by Electro Plastics in accordance with the foregoing shall become the property of Electro Plastics and shall be returned to it by the purchaser f.o.b. point of shipment. The maximum liability of this warranty is limited to the replacement or repair or purchase price of the defective unit. If a unit is returned and found that no defect exists, or that the user misused the unit, Electro Plastics will inform the user. If the user chooses to have the unit repaired (if possible), labor and shipping charges will apply.

### Limitation of Liability

ELECTRO PLASTICS SHALL NOT BE LIABLE FOR ANY LOSS, CLAIM, EXPENSE OR DAMAGE CAUSED BY, CONTRIBUTED TO OR ARISING OUT OF THE ACTS OR OMISSIONS OF BUYER OR THIRD PARTIES, WHETHER NEGLIGENT OR OTHERWISE, IN NO EVENT SHALL ELECTRO PLASTICS' LIABILITY FOR ANY CAUSE OF ACTION WHATSOEVER EXCEED THE COST OF THE PRODUCT GIVING RISE TO THE CLAIM, WHETHER BASED IN CONTRACT, WARRANTY, INDEMNITY OR TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHERWISE. IN NO EVENT SHALL ELECTRO PLASTICS BE LIABLE OR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL OR OTHER SUCH INDIRECT DAMAGES (INCLUDING, WITH-OUT LIMITATION, LOSS OF REVENUES, PROFITS OR OPPORTUNITIES), WHETHER ARISING OUT OF OR AS A RESULT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE

## WARRANTY REGISTRATION CARD

Ref. No. ....

### CUSTOMER INFORMATION

Owner's Name \_\_\_\_\_

Address \_\_\_\_\_

City / State / Zip \_\_\_\_\_

Phone \_\_\_\_\_

Email \_\_\_\_\_

### PURCHASE AND PROJECT INFORMATION

Purchased From \_\_\_\_\_ Date \_\_\_\_\_

Address \_\_\_\_\_

Product Purchased:  Snowmelt  
 Deicing

Heating Elements Installed on :  Deck / Ramp  
 Driveway  
 Pathway

Heating Elements Installed under:  Concrete  
 Stone  
 Other

Type of Project:  New Construction  
 Renovation Project

To activate warranty complete and return this warranty registration card signed with a complete checklist and layout showing element distribution as installed to: 11147 Dorsett Road, Maryland Heights, MO 63043, U.S.A.

# REGISTRATION AC POWER SUPPLY

Ref. No. ....

Page ..... of .....

Control :

Thermostat

External Sensor

AC Power Supply Model No.:

EPI-LX-R-.....W/24Vac

EPI-ELEC-.....W/48Vdc

STEP® Element Model No. :

MEP-.....-.....W-24V

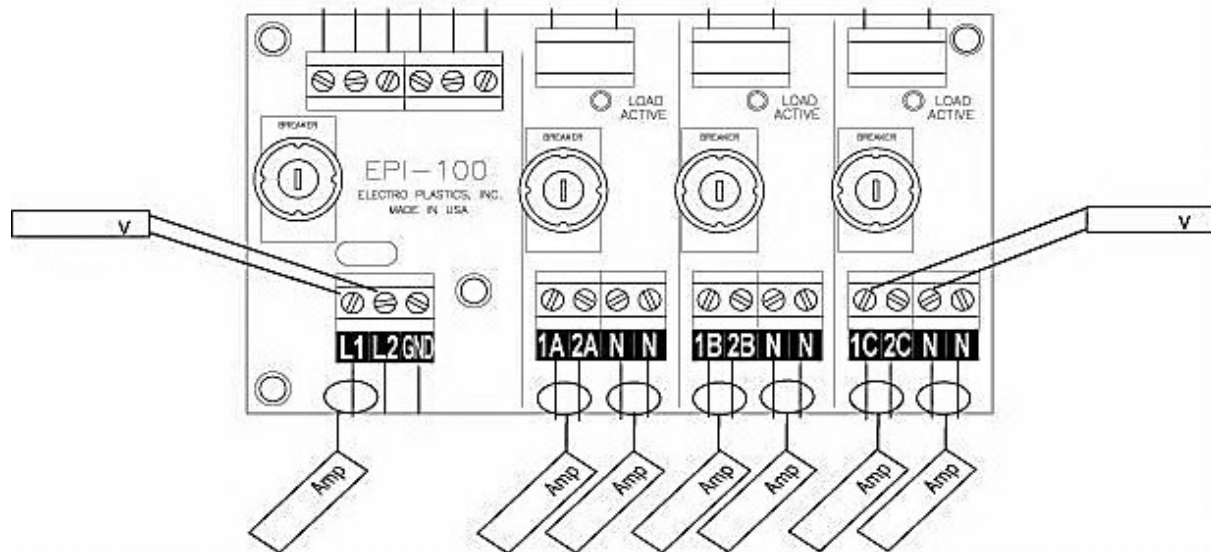
VMEP--.....-.....W-48V

..... Linear Feet

Total Length Installed :

## MEASUREMENT INSTRUCTIONS

Measure primary and secondary volts and amps at the transformer terminals. One sheet per transformer.



Installed / measured by:

Date:

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature



# REGISTRATION DC CONTROLLER

Ref. No. ....

Page ..... of .....

Control :  Thermostat  External Sensor

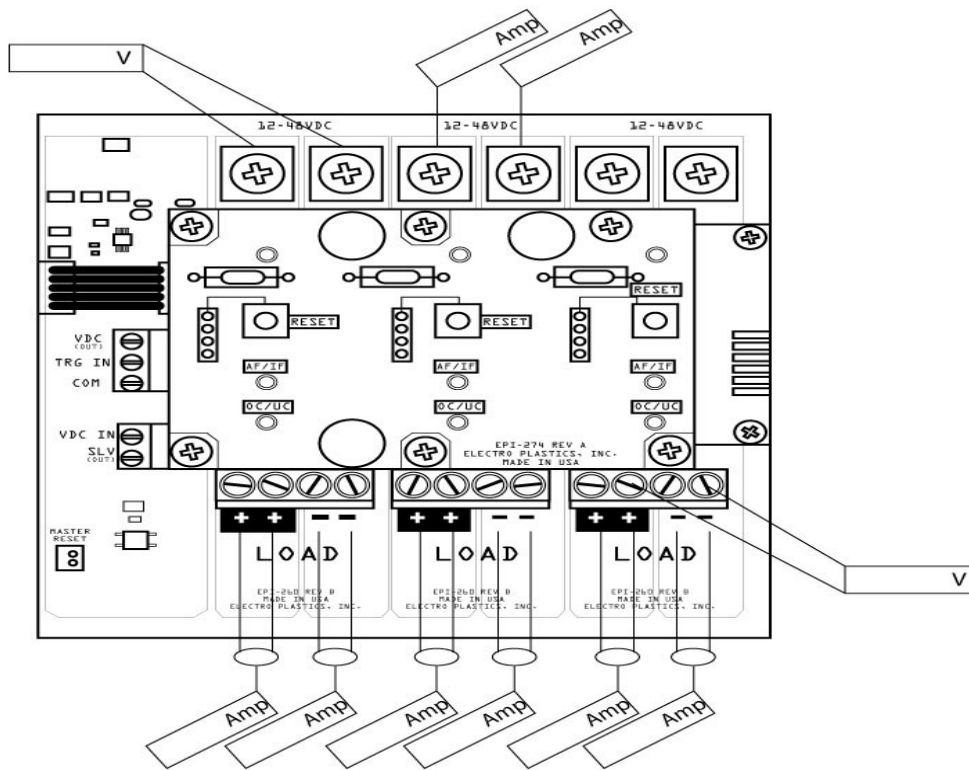
DC Controller Model No.:  EPI-DC-M3

STEP® Element Model No. :  MEP-.....-.....W-24V  VMEP--.....-.....W-48V

Total Length Installed : ..... Linear Feet

## MEASUREMENT INSTRUCTIONS

Measure input and output volts and amps at the DC controller terminals.



Installed / measured by:

Date:

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

## **TROUBLESHOOTING**

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If the following procedures do not solve and relieve the problems encountered, please check with our Technical Service Department.

### **POWER SUPPLY**

#### **Problem:**

#### **Solution:**

##### **1. Power Supply/DC Controller will not start:**

**a)** No current

- Reset circuit breaker in service panel and switch on line voltage branch circuit.

**b)** Current is present

- Reset mini circuit breaker in power supply, push plunger in until it stays in.

**c)** PC Board in AC Power Supply or DC Controller has current

- Make sure the thermostat settings are correct and that the thermostat calls for heat. Set the temperature to maximum and wait a couple of minutes for the system to turn on.
- If this does not work, eliminate thermostat; disconnect thermostat cable from PCB (printed circuit board) and put a jump wire from terminal TRG to 24. The load active should now be lit and the system is on. The fault is in the thermostat cable or its connections.

##### **2. Power Supply becomes hot:**

**a)** Poor ventilation

- Power supply should be mounted vertical for the cooling fins to extract heat from the enclosure and it must be placed in a well-ventilated area.

**b)** High voltage conditions

- For 24V magnetic transformers, a service technician can rewire 120V and 208V power supplies to accept higher voltage (call customer service for guidance). Electronic power supplies have regulated output.

**c)** High transformer temperature

- Power supply must be de-rated; decrease load.

# TROUBLESHOOTING

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## HEATING ELEMENT

### **Problem:**

#### **1. Insufficient temperature:**

**a)** Thermostat setting

**b)** A section is not melting snow

**c)** A strip is not melting snow

**d)** Low supply voltage

### **Solution:**

- The thermostat is connected to an external sensor which is normally placed between the heating elements in the ground. Set temperature to about 40°F. If snow is not melting increase the temperature and adjust to local conditions. It may take some snowfalls to find the minimum temperature at which snow is melting.
- Reset circuit breaker for this section.
- Measure the volts and amps for this element at the terminal.
- If the voltage is correct and there is no amps the connection between the power supply and heating element is broken.
- If the voltage is correct and the amp reading is low the heating element has been damaged by chemicals or salt etc.
- If the element strip is partly melting snow while other parts on the same element length is cold the element is mechanically damaged.
- If electricity is not available at the time of trouble shooting disconnect the strip from the terminal and measure the resistance.
- Then call customer service for evaluation of the measurements.
- Some regions or locations may have a low supply voltage and some may take electricity from sub-panels with reduced voltage. This results in a proportionally lower heat output. It is possible to boost up the voltage so the elements can pull more amps but this requires engineering.



## APPROVALS AND CERTIFICATIONS



UL 1693 3<sup>rd</sup> Edition  
CSA-C22.2 No. 130-16  
UL 5085-1 & 2  
CSA-C22.2 No. 66.1 & 2-06



UL 823  
ANSI/ISA 12.12.01-2000



EN 60355-2-96-2009  
EN 61558-2-2:2007

