# STEP warmfloor®

## A Unique Heating System

*...for over 30 years*

**Can be operated with solar and wind power!**



## Safe • Efficient • Maintenance-Free

# Product Catalog

# General Information & Benefits

## Comfort, safety and efficiency combined in a maintenance-free heating system

STEP Warmfloor® is a radiant heating system that has been developed for well-being, safety and energy efficiency. The priority is in the quality, ease of utilization and longevity of the product.

- Increase comfort and quality of life
- Save energy through low power consumption
- Heating elements cover 60-70% of floor area
- Ideal for new construction and remodeling due to thinness of product
- Safe and cannot overheat due to self-regulating properties
- Can be used as primary or supplementary heat
- Operates on low voltage, normally 24 volts, AC or DC
- The material cannot overheat and is maintenance-free
- Reduces circulation of dust and allergens
- Compatible with most floor coverings

## Energy Efficient Electric Underfloor Heating

With rising prices of oil, gas and electricity, it is important to choose the right heating system for your application. Oil and gas are subject to price fluctuations, while electricity can be controlled by the source of energy used. Environmental concerns are forcing changes and the use of alternative energy such as solar panels and wind mills.

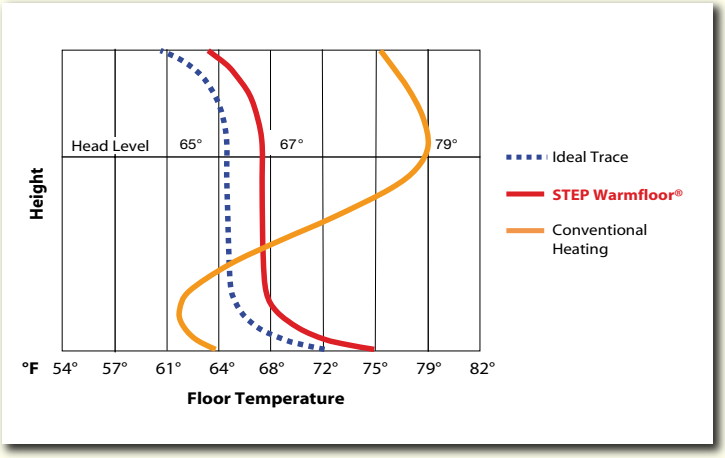
## Health and Safety

STEP Warmfloor® generates a comfortable warmth that is evenly distributed over the entire floor area. The heat distribution in a room is optimal when the temperature is higher at foot level than at head level. Dust is not burned or blown around to aggravate people with allergies and respiratory problems.

Concentration and well-being increase when the heat is properly distributed in a room. Surveys in schools show that a reduction in temperature of 7˚F (4˚C) in the room will increase the learning capacity of students by 10%. International Ministries of Health have determined that the ideal floor temperature for children is between 67˚F and 79˚F (19˚C and 26˚C) and should not exceed 82˚F (28˚C). STEP Warmfloor® maintains an average temperature of 75˚F (24˚C).

The system is fail-safe when properly installed. By nature of the self-regulating semi-conducting material, it cannot overheat. Also, the heating elements are connected to a low voltage power supply that has circuit breaker protection for extra safety. Furthermore, there is no mechanical room and dangerous storage of gas or fuel as with boilers or furnaces.

All materials used in the STEP Warmfloor® system materials are environmentally friendly. The semi-conductive polymer material is ecologically safe; it does not produce hazardous gases and is biodegradable in sunlight. Electromagnetic field values are below the accepted ICNIRP levels.



# General Information & Benefits

## Why choose STEP Warmfloor®?

1. STEP Warmfloor® is designed to cover a large surface (60-70%) and consequently this even heat distribution makes it 2.5 more efficient than electric cables and 2.08 more than water tubing systems.

2. STEP Warmfloor® is a flexible, strong homogeneous heating element made of PTC nanotechnology semi-conductive polymer. The element is self-regulating which means that when the ambient temperature increases, the electrical resistance increases and the consumption of electricity decreases.

3. Because STEP Warmfloor® is self-regulating, it will not overheat and it can be placed under most floorcoverings including hardwood.

4. Also STEP Warmfloor® can be placed closer to the floor surface compared to other heating systems. With less mass to heat, the system reacts faster to temperature changes.

5. STEP Warmfloor® operates on low voltage, AC or DC. It is normally connected to a 24 volt power supply, but can also be run by solar panels or wind mills.

6. STEP Warmfloor® offers programs that calculate heat requirements and energy consumption for the specific project and in comparison with other heating systems.

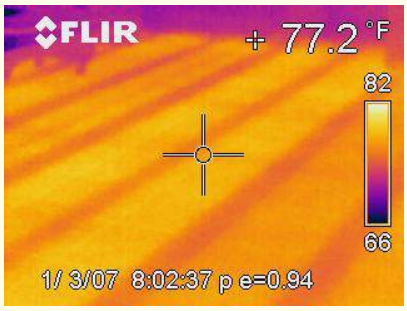



**Figure 1** **Convection**

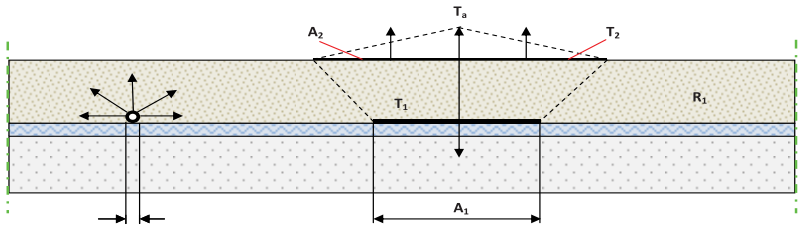



Figure 1 shows a cross sectional area of a floor with a cable or tubing and STEP Warmfloor® flat element

Where:

- $R_1$ is thermal resistance of floor
- $T_1$ is the temperature of heating element
- $T_2$ is the temperature of floor surface
- $T_a$ is the ambient temperature
- $A_1$ is the surface area of heating element
- $A_2$ is the surface area of heat generated from heating element

| | |
|---|---|
| A typical total heating installation with the STEP Warmfloor® system requires: | 4.5 W/ft$^2$ |
| To give the same heat output, an Electric Cable system would require: 2 ft$^2$ / 0.78 ft$^2$ = 2.5 times more wattage, which would be 4.5 W/ft$^2$ x 2.5 = | 11.25 W/ft$^2$ |
| While a Water Tubing system would require: 2 ft$^2$ / 0.96 ft$^2$ = 2.08 times more wattage, which would be 4.5 W/ft$^2$ x 2.08 = | 9.36 W/ft$^2$ |

## Material and Installation

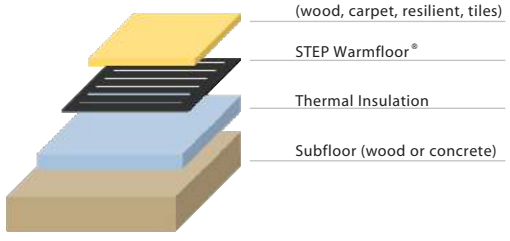
STEP Warmfloor® can be installed in new construction, residential and commercial, and is ideal for renovation projects because of the thinness of the material (1.2 mm). Other applications include snowmelt and roof de-icing.

The heating system can be used as the primary heat source of a building (this will require a heat loss calculation). It is essential to eliminate cold floors under tile or stone in bathrooms, entries and kitchens. It can also be installed when additions are made or the existing heating system is insufficient.

The heating elements come in a roll and can be cut to the desired length on site. Because of the self-regulating properties, the elements can be installed under most floor coverings, including wood, laminate, tile, stone and carpet.

STEP Warmfloor® comes in different sizes and conductivities. The wattage per square foot (square meter) is calculated according to the element type, spacing between element strips and voltage.

**Installation Example**




# Product Information

## STEP® Residential - 12” (30 cm) — EP-30-25W-24V

This heating element is designed to provide healthy, even and comfortable warmth in a home. This element is ideal for both new construction and renovation.

STEP® Residential can be used as primary or supplementary heating and can be installed under most floor coverings, including tile, stone, wood, laminate and carpet. For total heating a heat loss calculation is required.

STEP® Residential is essential for taking away the chill of cold floors and can be used for very small to large areas. For even heat distribution, maintain spacing between element strips at 2-3 inches (5-7.5 cm).

### Ordering Information

| | |
|---|---|
| **Heating Element Type** | Positive Temperature Coefficient (PTC) semi-conductor polymer<br>**EP-30-25W-24V** **Width:** 12” (305 mm)<br>**Length:** Cut to order **Max. Element Length:** 57 ft (17,6 m) |
| **Specifics** | **Weight:** 0.23 lb/ft (0,34 kg/m) **Thickness:** 3/64” (1,2 mm) |

| Maximum Total Element Length Per Power Supply | Power Supply 24V | Connector Kit Per Element Strip |
|---|---|---|
| 28 ft (8,5 m)<br>57 ft (17,6 m)<br>115 ft (35,2 m)<br>173 ft (53,0 m) | 250VA<br>500VA<br>1000VA<br>1500VA | 2 Crimp Connectors<br>&<br>Sealant Tape (C&T) |

**Output Wattage (at 24 VAC):**
7.8 W/ft (25,5 W/m) @ 68ºF (20ºC)

**Nominal Resistance @ 68°F (20°C):**
75 Ω/ft (23 Ω/m)

## STEP® Commercial - 12” (30 cm) — EP-30-29W-24V

This heating element is designed to provide healthy and comfortable warmth in an office, warehouse, factory, etc. The element can be used in new construction and for renovation.

STEP® Commercial can be installed in concrete or over the concrete slab and can go under most floorcoverings. It does not create drafts and blow dust around. The heat stays where you need it - at the body level and not in the ceiling.

STEP® Commercial is maintenance-free and does not require a mechanical room or dangerous storage of gas or fuel.

### Ordering Information

| | |
|---|---|
| **Heating Element Type** | Positive Temperature Coefficient (PTC) semi-conductor polymer<br>**EP-30-29W-24V** **Width:** 12” (305 mm)<br>**Length:** Cut to order **Max. Element Length:** 50 ft (15,2 m) |
| **Specifics** | **Weight:** 0.23 lb/ft (0,34 kg/m) **Thickness:** 3/64” (1,2 mm) |

| Maximum Total Element Length Per Power Supply | Power Supply 24V | Connector Kit Per Element Strip |
|---|---|---|
| 25 ft (7,6 m)<br>50 ft (15,2 m)<br>100 ft (30,5 m)<br>150 ft (45,7 m) | 250VA<br>500VA<br>1000VA<br>1500VA | 2 Crimp Connectors<br>&<br>Sealant Tape (C&T) |

**Output Wattage (at 24 VAC):**
9.0 W/ft (29,5 W/m) @ 68ºF (20ºC)

**Nominal Resistance @ 68°F (20°C):**
65 Ω/ft (20 Ω/m)

## STEP® 9-Inch (23 cm) — EP-23-22W-24V

This heating element is designed for areas that require more narrow elements, 9” (23 cm) instead of 12” (30 cm) due to available width.

STEP® 9-Inch (23 cm) has a higher wattage than STEP® Residential; the heat output is equivalent to STEP® Commercial. This element is installed in applications that require more heat output due to a higher heat loss, e.g. on stairs, in tub edges, in shower benches, etc.

This heating element can also be installed under the subfloor when spacing between joists is too narrow.

### Ordering Information

| | |
|---|---|
| **Heating Element Type** | Positive Temperature Coefficient (PTC) semi-conductor polymer<br>**EP-23-22W-24V** **Width:** 9” (230 mm)<br>**Length:** Cut to order **Max. Element Length:** 66 ft (20,1 m) |
| **Specifics** | **Weight:** 0.18 lb/ft (0,27 kg/m) **Thickness:** 3/64” (1,2 mm) |

| Maximum Total Element Length Per Power Supply | Power Supply 24V | Connector Kit Per Element Strip |
|---|---|---|
| 33 ft (10,0 m)<br>66 ft (20,1 m)<br>132 ft (40,2 m)<br>198 ft (60,4 m) | 250VA<br>500VA<br>1000VA<br>1500VA | 2 Crimp Connectors<br>&<br>Sealant Tape (C&T) |

**Output Wattage (at 24 VAC):**
6.8 W/ft (22 W/m) @ 68ºF (20ºC)

**Nominal Resistance @ 68°F (20°C):**
85Ω/ft (26 Ω/m)

## STEP® RV - 12” (30 cm) — EP-30-36W-24V

This heating element is designed to provide heated floors in RV/s, motorhomes, boats, etc.

STEP® RV has a higher wattage output than the standard residential elements, as these types of applications normally have higher heat losses.

STEP® RV is normally connected to a 24V power supply, but it can also run on solar or wind power. If the system is connected to 12V, the element will give ¼ the maximum power - 11 W/ft (36 W/m) x (12)2 / (24)2 = 2.75 W/ft (9 W/m).

### Ordering Information

| | |
|---|---|
| **Heating Element Type** | Positive Temperature Coefficient (PTC) semi-conductor polymer<br>**MEP-30-36W-24V** **Width:** 12” (305 mm)<br>**Length:** Cut to order **Max. Element Length:** 40 ft (12,2 m) |
| **Specifics** | **Weight:** 0.23 lb/ft (0,34 kg/m) **Thickness:** 3/64” (1,2 mm) |

| Maximum Total Element Length Per Power Supply | Power Supply 24V | Connector Kit Per Element Strip |
|---|---|---|
| 20 ft (6,1 m)<br>40 ft (12,2 m)<br>81 ft (24,7 m)<br>122 ft (37,2 m) | 250VA<br>500VA<br>1000VA<br>1500VA | 2 Crimp Connectors<br>&<br>Sealant Tape (C&T) |

**Output Wattage (at 24 VAC):**
11.0 W/ft (36 W/m) @ 68ºF (20ºC)

**Nominal Resistance @ 68°F (20°C):**
50 Ω/ft (16 Ω/m)

# Product Information

## STEP® Snowmelt - 12” (30 cm) — MEP-30-70W-24V

This heating element is designed to melt snow and ice on entrances, walkways, driveways, ramps, patios, etc. The snowmelt expectations have to be determined for a snow free area ratio. Drainage is as important as melting; determine where the melted snow/ice has to go to.

STEP® Snowmelt is protected by a chemically inert and dielectric insulation to ensure that the heating element is protected against alkalis and salts.

### Ordering Information

| | |
|---|---|
| **Heating Element Type** | Positive Temperature Coefficient (PTC) semi-conductor polymer<br>**MEP-30-70W-24V** **Width:** 12” (305 mm)<br>**Length:** Cut to order **Max. Element Length:** 18 ft (5,5 m) |
| **Specifics** | **Weight:** 0.23 lb/ft (0,34 kg/m) **Thickness:** 3/64” (1,2 mm) |

| Maximum Total Element Length Per Power Supply | Power Supply 24V | Connector Kit Per Element Strip |
|---|---|---|
| 18 ft (5,5 m)<br>37 ft (11,3 m)<br>56 ft (17,0 m) | 500VA<br>1000VA<br>1500VA | 2 Crimp Connectors<br>&<br>Sealant Tape (C&T) |

**Output Wattage (at 24 VAC):**
24 W/ft (78,8 W/m) @ 32°F (0°C)

**Nominal Resistance @ 32°F (0°C):**
24 Ω/ft (7 Ω/m)

## STEP® Snowmelt - 9” (23 cm) — MEP-23-80W-24V

This heating element is designed to keep stairs free from snow and ice.

STEP® Snowmelt is protected by a chemically inert and dielectric insulation to ensure that the heating element is protected against alkalis and salts.

This heating element is designed for areas that require more narrow elements, 9” (23 cm) instead of 12” (30 cm) due to available width.

### Ordering Information

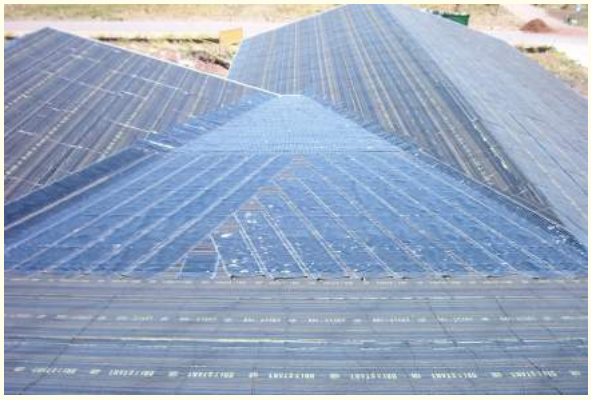
| | |
|---|---|
| **Heating Element Type** | Positive Temperature Coefficient (PTC) semi-conductor polymer<br>**MEP-23-80W-24V** **Width:** 9” (230 mm)<br>**Length:** Cut to order **Max. Element Length:** 16 ft (4,9 m) |
| **Specifics** | **Weight:** 0.18 lb/ft (0,27 kg/m) **Thickness:** 3/64” (1,2 mm) |

| Maximum Total Element Length Per Power Supply | Power Supply 24V | Connector Kit Per Element Strip |
|---|---|---|
| 16 ft (4,9 m)<br>33 ft (10,1 m)<br>50 ft (15,2 m) | 500VA<br>1000VA<br>1500VA | 2 Crimp Connectors<br>&<br>Sealant Tape (C&T) |

**Output Wattage (at 24 VAC):**
27 W/ft (88,5 W/m) @ 32°F (0°C)

**Nominal Resistance @ 32°F (0°C):**
21Ω/ft (6,4 Ω/m)

## STEP® Roof Deicing - 12" (30 cm) — MEP-30-36W-24V



This heating element is designed to solve problems with snow buildup and ice damming on roofs, valleys and eaves. Drainage is as important as melting; determine where the melted snow/ice has to go to.

STEP® Roof Deicing is protected by a chemically inert and dielectric insulation so that the heating element can be installed under all types of roofing materials, including metal roofs.

STEP® Roof Deicing is lightweight and flexible and is malleable to fit around various bends and creases associated with roofing.

### Ordering Information

| | |
|---|---|
| **Heating Element Type** | PPositive Temperature Coefficient (PTC) semi-conductor polymer<br>**MEP-30-36W-24V** **Width:** 12" (305 mm)<br>**Length:** Cut to order **Max. Element Length:** 34 ft (10,4 m) |
| **Specifics** | **Weight:** 0.23 lb/ft (0,34 kg/m) **Thickness:** 3/64" (1,2 mm) |

| Maximum Total Element Length Per Power Supply | Power Supply 24V | Connector Kit Per Element Strip |
|---|---|---|
| 34 ft (10,4 m)<br>69 ft (21,0 m)<br>103 ft (31,4 m) | 500VA<br>1000VA<br>1500VA | 2 Crimp Connectors<br>&<br>Sealant Tape (C&T) |

**Output Wattage (at 24 VAC):**
13.0 W/ft (42,6 W/m) @ 32°F (0°C)

**Nominal Resistance @ 32°F (0°C):**
44 Ω/ft (13 Ω/m)

## STEP® Roof Deicing - 9" (23 cm) — MEP-23-36W-24V

This heating element is designed to solve problems with snow buildup and ice damming on roofs, valleys and eaves.

STEP® Roof Deicing is protected by a chemically inert and dielectric insulation so that the heating element can be installed under all types of roofing materials, including metal roofs.

This heating element is designed for areas that require more narrow elements, 9" instead of 12" (30 cm) due to available width.

### Ordering Information

| | |
|---|---|
| **Heating Element Type** | Positive Temperature Coefficient (PTC) semi-conductor polymer<br>**MEP-23-36W-24V** **Width:** 9" (229 mm)<br>**Length:** Cut to order **Max. Element Length:** 34 ft (10,4 m) |
| **Specifics** | **Weight:** 0.21 lb/ft (0,29 kg/m) **Thickness:** 3/64" (1,2 mm) |

| Maximum Total Element Length Per Power Supply | Power Supply 24V | Connector Kit Per Element Strip |
|---|---|---|
| 34 ft (10,4 m)<br>69 ft (21,0 m)<br>103 ft (31,4 m) | 500VA<br>1000VA<br>1500VA | 2 Crimp Connectors<br>&<br>Sealant Tape (C&T) |

**Output Wattage (at 24 VAC):**
13 W/ft (43 W/m) @ 32°F (0°C)

**Nominal Resistance @ 32°F (0°C):**
44 Ω/ft (13 Ω/m)

# Product Information

## STEP® Gutter Deicing - 3" (7 cm) — MEP-7-30W-24V

This heating element is designed to solve problems with snow buildup, ice damming and creation of icicles. Drainage is as important as melting; determine where the melted snow/ice has to go to.

STEP® Gutter Deicing is protected by a chemically inert and dielectric insulation so that the heating element can be installed directly in the gutter and in the downspout.

This element can be used in the downspout to drain the water that would otherwise freeze in the gutters.

### Ordering Information

| | |
|---|---|
| **Heating Element Type** | Positive Temperature Coefficient (PTC) semi-conductor polymer<br>**MEP-7-30W-24V** **Width:** 3" (76 mm)<br>**Length:** Cut to order **Max. Element Length:** 40 ft (12,2 m) |
| **Specifics** | **Weight:** 0.06 lb/ft (0,09 kg/m) **Thickness:** 3/64" (1,2 mm) |

| Maximum Total Element Length Per Power Supply | Power Supply 24V | Connector Kit Per Element Strip |
|---|---|---|
| 40 ft (12,2 m)<br>80 ft (24,4 m)<br>120 ft (36,6 m) | 500VA<br>1000VA<br>1500VA | 2 Crimp Connectors<br>&<br>Sealant Tape (C&T) |

**Output Wattage (at 24 VAC):**
11 W/ft (36 W/m) @ 32°F (0°C)

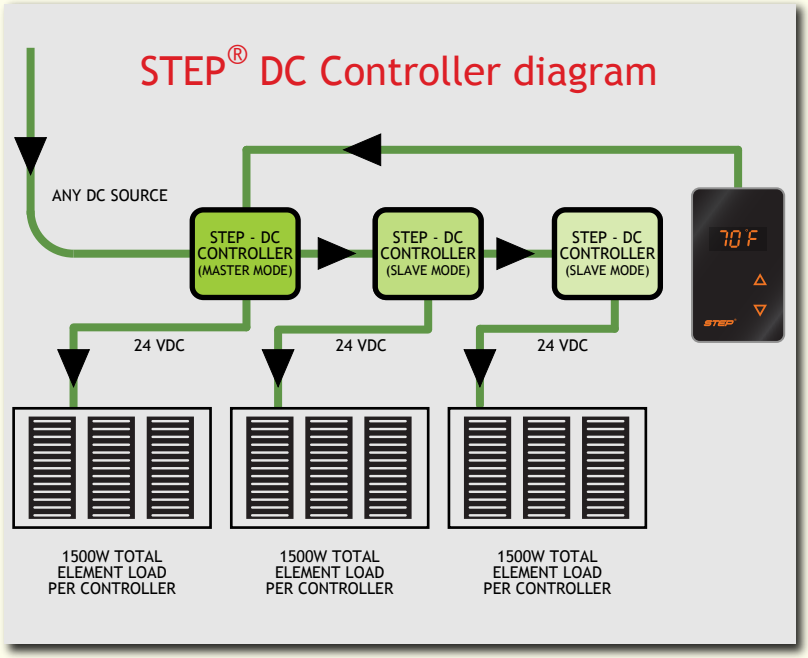
**Nominal Resistance @ 32°F (0°C):**
53 Ω/ft (16 Ω/m)

## STEP® DC Controller

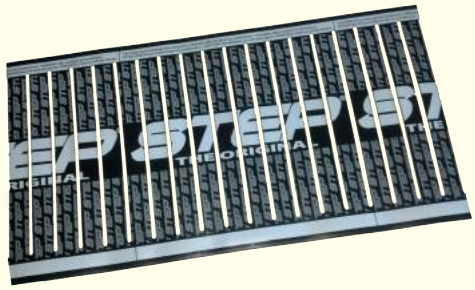
The STEP® DC Controller allows the use of STEP Warmfloor® in off-grid situations (residential & commercial buildings, vessels and RV's) and thermostatic control with all DC sources.

Designed to save money and energy, The STEP® DC Controller allows you to choose your comfort level and features easy zoning and smart home integration without transformers.

One thermostat can control unlimited STEP® DC Controllers.



## STEP Warmfloor® - System Components

| | | |
|---|---|---|
|  | **Heating Element** | Patented low voltage (24V, AC/DC), PTC (Positive Temperature Coefficient) heating elements are made of a self-regulating, semi-conductive polymer.<br><br>Different widths are available and the elements can be cut to length on the job site. |
|  | **Power Supply** | SELV (Safety Extra Low Voltage) isolating power supply. 120 / 208 / 230 VAC primary and 24 VAC secondary. Extruded aluminum profile enclosure w/ heat sink. Primary and secondary circuit protection. RoHS compliant interface & regulator board. For indoor use only. Patented.<br><br>EPI-LX available in 250W and 500W only<br><br>EPI-LX-R available in 250W, 500W, 1000W and 1500W |
| 1.  2.  | **Thermostat and External Sensor** | 1. EPI-LX-TC thermostat can be used with all STEP® radiant heating systems in conjunction with the EPI-LX-R power supply series. The low-voltage (24V) thermostat can control unlimited power supplies or DC controllers<br><br>2. EPI-LX-TS is an external temperature sensor that can be used for interior or snowmelt temperature readings. |
|  | **Extension Wire** | #14, #12 or #10 AWG stranded tinned copper (TCu) PVC insulated wire, 300 VAC, 105°C. Used to extend heating element bus braid wires to EPI-LX / EPI-LX-R power supply.<br><br>Color Code: "-B" indicates black and "-R" indicates red<br>Spool Length: XXX = 100, 150, 250 or 500 feet |
| 1.  2.  | **Accessories** | 1. Connector & tape kit. Includes (10) CON-DB Crimp Connectors, (1) 15" long piece of TAPE-1 Sealant Tape and an installation brochure. One kit can connect and seal five heating element strips to extension wires.<br><br>2. Used to crimp CON-DB crimp connector. TOOL-PRO crimp tool is required as it is specially designed to properly crimp CON-DB crimp connector. |

# Installation Guidelines

## 1. Plan

- Design the system and make a layout. Elements should be placed in open areas away from conductive materials, plumbing and fixed fittings.
- Proper thermal insulation with no voids is **required** in the floor and by the perimeter.
- Installation should conform to local building codes, ordinances and trade practices.

## 2. Install

- Roll the element out on the floor and cut to length according to layout. Lay the element strips side by side following the recommended spacing.
- The element can be attached to the subfloor using the following alternatives:
  - Staple element at least 1 inch from edge with staples no larger than 3/8 inch. If staple hits a bus braid, cut the element, splice and seal properly.
  - Use only approved tape and apply perpendicular to the direction of element.
  - Cement mortar or latex-modified mortar can be used for leveling or when installing tile or underlayment.

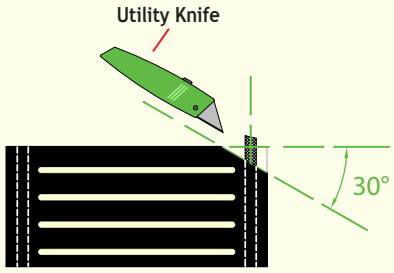
NOTE: Do NOT use non-approved tape or adhesive based products (premix thin-set, primer, leveler or equivalent) to adhere the element. Avoid contact between elements. Do NOT puncture bus braids.

## 3. Connect

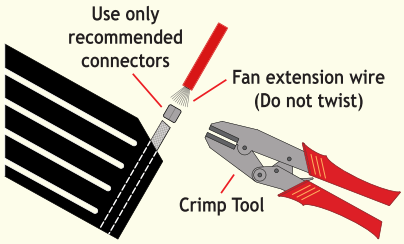
- Connect extension wires to the elements according to the drawings and electrical diagram. Determine wire gauge versus load.
- Route the wires flat on the floor, up or through the wall in conduits, under the baseboard or below the subfloor. Connect wires in parallel to the 24 volt power supply. Use 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.
- The EPI-LX / EPI-LX-R power supply must be installed in a well-ventilated area and wired in accordance with the National Electrical Code. Place the power supply in a way that it does not vibrate and give resonance in the building structure.
- Connect the line voltage to a two-pole on/off switch. Use stranded wires from the switch to the EPI-LX / EPI-LX-R power supply. For control options, see the STEP Handbook™.
- To simplify wiring and circuit breakers, use 230 volts. For certain areas, NEC requires AFCI circuit breakers on 120 volt systems.
- The heating elements must be measured and amps noted by a certified electrician before being covered.

## 4. Cover

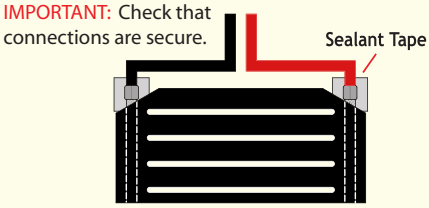
- Level the floor using proper mortar, underlayment or cement backer boards. Do NOT place conductive material or aggressive adhesive in direct contact with the heating elements.
- To be efficient, the heating elements have to be in direct contact with the finished flooring, with no air gaps. In bathrooms, showers and wet areas, the heating elements should be installed under a waterproof membrane.
- The heating elements provide a safe and even low temperature and can go under most floor coverings. Follow manufacturer's instructions.




- **Expose the bus braid** by making an angled score in the plastic, front and back, and along the bus braid above the angled score 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.

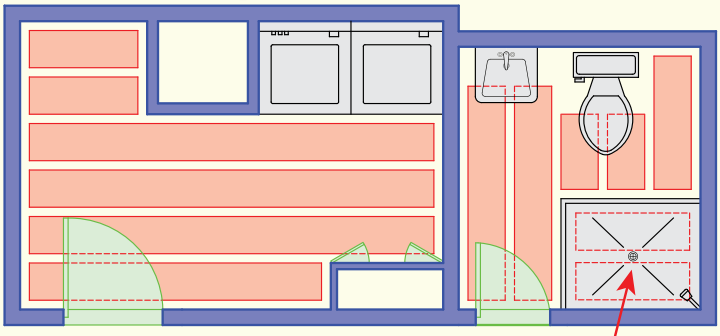



- **Connect the bus braid to an extension wire**, (PVC insulated, stranded tinned copper wire, 105°C, 300 volts). Crimp the joint using the recommended tinned copper connectors and crimp tool. Using components not recommended by the manufacturer will void the warranty.




- **To differentiate the polarities supplied to the element**, use two different wire colors (black and red). Insulate the connections using recommended sealant tape. Fold tape and press together overlapping element, connector and wire to form a flat and smooth splice.

## Example Layout



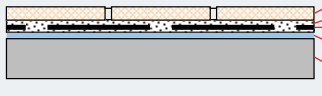
NOTE: STEP Warmfloor® is a low voltage system and can be installed in wet areas under a waterproof membrane. For installation details, refer to the STEP Handbook™ on our website at www.warmfloor.com.

These installation guidelines are general in nature to the STEP Warmfloor® product. For more information refer to the STEP Handbook™ on our website at www.warmfloor.com.

# Installation Guidelines

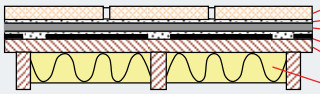
## Flooring Installation Options

**TILE** - *In thin-set or light concrete*



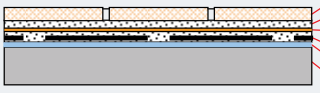
Ceramic Tile
Latex-Modified Mortar
STEP® Element
Thermal Insulation / Wedi or equivalent
Concrete Slab

**TILE** - *Under cement board*



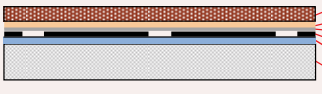
Ceramic Tile
Latex-Modified Mortar
Cement Backer Unit
STEP® Element
Wood Subfloor
Insulation between Joists

**TILE** - *Under waterproof membrane*



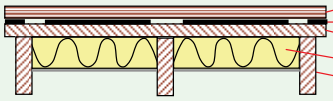
Ceramic Tile
Cement Mortar
Waterproof Membrane / Kerdi, RedGard or equivalent
STEP® Element
Thermal Insulation
Concrete Slab

**CARPET** - *Fail safe wiring required*



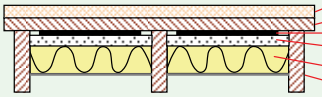
Carpet Stretch-in
Proper Carpet Cushion
PE Film
STEP® Element
Thermal Insulation
Concrete Slab

**WOOD** - *Nail down or floating floors*



Hardwood / Floating Floor
STEP® Element
Plywood Subfloor
Insulation
Joist

**BETWEEN JOISTS** - *Fail safe wiring required*

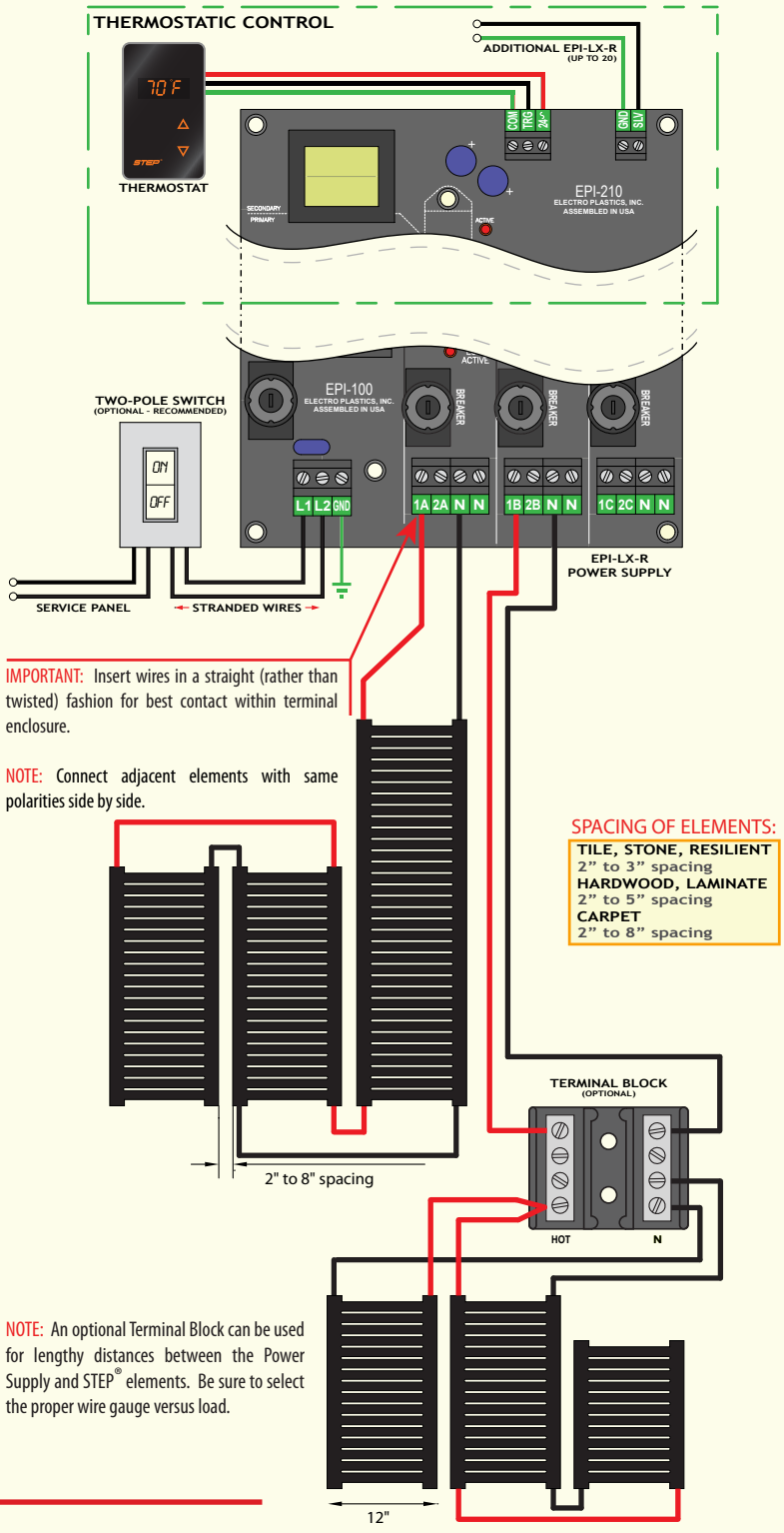


Hardwood / Laminate
Plywood Subfloor
STEP® Element
Extruded Polystyrene
Batt or Foam Insulation
Joist

## Thermal Insulation Guidelines

- With radiant heating, it is important to have insulation under the heating elements and on the slab perimeter.
- Know the added R-value of the floor covering. Use only approved underlayment and carpet pad.
- A higher R-value is required under the heating elements as opposed to over with a ratio of 4:1.
- Consult insulation manufacturer for deflection/load characteristics, and check that the product and installation procedure is approved for the application.

## Wiring Options




IMPORTANT: Insert wires in a straight (rather than twisted) fashion for best contact within terminal enclosure.

NOTE: Connect adjacent elements with same polarities side by side.

SPACING OF ELEMENTS:

| | |
|---|---|
| **TILE, STONE, RESILIENT** | 2" to 3" spacing |
| **HARDWOOD, LAMINATE** | 2" to 5" spacing |
| **CARPET** | 2" to 8" spacing |

NOTE: An optional Terminal Block can be used for lengthy distances between the Power Supply and STEP® elements. Be sure to select the proper wire gauge versus load.

## Notes:

Due to technical advancements, changes and improvements to the products described in this publication may occur without notice.

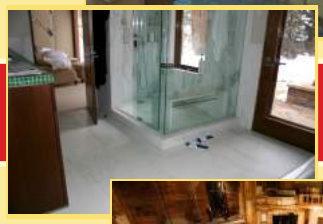
STEP Warmfloor® is a low voltage system that operates at **24 volts (AC or DC)**

STEP Warmfloor® heating elements are only **1.2 mm thick**

STEP Warmfloor® heating elements are made of **80% recycled material**

During the manufacturing process, there is **0% waste**

STEP Warmfloor® performs with **100% efficiency**



## 20 Year Warranty!

**Read and follow manufacture's installation instructions.**

STEP Warmfloor® is suitable for a variety of indoor and outdoor applications:

- Floor warming
- Primary heat
- Wall heater
- Motorhome
- Heated mirror
- Heated seat
- Heated bed
- Heated mat
- Heated container
- Roof deicing
- Snow melting

Authorized Distributor, Reseller & Installer

**Glenco, Inc.**

217 East Main St.

Middleburg, PA 17842

Ph: 570-837-0577

Fax: 570-837-0585

Email: info@glencoinc.com

PA Registration #PA019334

If it needs heating, STEP Warmfloor® has the solution. Contact us or one of our authorized distributors, so we can help you find the perfect solution for your application.

## Manufactured in the USA

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11147 Dorsett Road
Maryland Heights, MO 63043
USA

warmfloor.com

877-STEP-TEC