



## **User and Installation Manual**

### **SI Series Aluminum Far-Infrared Heaters**

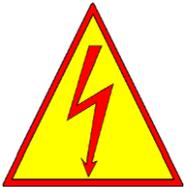
#### **Standard Sizes ( In Matte White )**

**Model SI-120-2424 & Model SI-240-2424 (24" x 24")\* 400 Watts (1360BTU/hr)**

**Model SI-120-4824 & Model SI-204- 4824 (48"x24")\* 750 Watts (2560BTU/hr)**

**Model SI-120-4141 & Model SI-240-4141 (41"x41")\* 1100 Watts ( 3750BTU/hr )**

- Approximate sizes in inches



**CAUTION!**  
**RISK OF ELECTRIC SHOCK - DO NOT OPEN -**  
**NO USER SERVICEABLE PARTS INSIDE**



**“WARNING” - IN ORDER TO AVOID  
OVERHEATING, DO NOT COVER THE HEATER**



**“WARNING” - TO REDUCE  
THE RISK OF FIRE:**

- Do not place any objects such as furniture, papers, clothes, and curtains closer than 3 feet (0.9m) to the front of the heater when unit is plugged in.
- Do not place the heater near a bed. Objects such as pillows or blankets can fall off the bed and might be ignited by the heater.
- Always unplug heater or switch off the power outlet switch (if fitted) when not in use.  Always plug heaters directly into a power outlet/receptacle.
- Do not operate any heater with a damaged supply cord or plug or any sign of damage to the heater body.
  
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- Do not run cord under carpeting, rugs or similar coverings.
- Keep the supply cord as straight as possible - do not curl it up.
- Do not route cord under furniture or appliances.
- Arrange supply cord away from traffic area and where it will not be tripped over.
- Check your heater cord and power plug connections.
- Faulty outlet connections or loose plugs can cause the outlet or plug to overheat. Be sure plug fits tight in the outlet
- Heaters draw more current than small appliances. Overheating of the power outlet may occur even if it has not occurred with the use of other small appliances.
- During use check frequently to determine if your plug outlet or faceplate is HOT!
- If so, immediately switch off the heater and have a qualified electrician check and/or replace the faulty outlet(s).

## **Spectrum Infrared's advantages over traditional heating systems**

- More comfortable than convection for most people.
- Moderately priced.
- Can be installed by a licensed electrician; where allowed, by the home owner.
- Fewer health problems (no unnecessary air movement).
- Much less movement of dust than convection.
- Helps reduce the growth of mold (when surface temperatures are higher than the air temperature no mold can grow).
- Therapeutic, healthy warmth.
  
- Far infrared stimulates the blood flow, which in turns allows the human body to absorb oxygen. It aids in both the prevention and healing of common illnesses.
- No “hot head/cold feet syndrome” - even comfortable warmth.
- Promotes learning and improves workers’ output. When students or workers are exposed to excessive hot air (in a convection system that is not capable of heating the floor to a comfortable level), they get drowsy and cannot focus. With SI there is even warmth, which translates into better productivity and less fatigue.
- Room temperature is back to normal almost immediately after an exterior door is opened/closed (Retains heat; slow to cool off).

- Thermostat can be placed at any convenient level from near the floor to near the ceiling (universal warmth throughout the room).
- Up to 50% proven energy savings over convection systems (universities' studies).
- The solution for room additions (no ducting or structural modifications and no strain on existing systems).
- Easy to expand (start in one or more rooms; then expand as required).
- Easy to create multiple comfort zones within the same space.
- In spaces with very high ceilings there is no need to heat the space near the roof or ceiling. SI's panels may be suspended by chains at their optimum performance height reducing the amount of energy required, even more.
- Low cost way to "repair" failed in-floor heating systems.

#### Disadvantages:

- Although people feel the warmth right away, in order to experience the full benefits of far infrared it takes time. It may take a number of hours to saturate a room. It takes even more hours, or in some cases days, to obtain the optimum results. If there is excessive moisture in a concrete floor, this moisture must evaporate before the full benefits can be experienced.

- In most cases, far infrared cannot be used to quickly warm a space. It is a slow and consistent warmth.



### “WARNING” TO REDUCE THE RISK OF INJURY:

#### When using electrical appliances, the following precautions should always be followed to reduce the risk of fire, electric shock and injury to persons:

1. Read all instructions before using this heater.
2. **THIS HEATER IS HOT WHEN IN USE!**  
(the front surface approaches the temperature of freshly brewed coffee).
3. To avoid burns, do not let bare skin touch hot surfaces.
4. Do not move this heater when it is hot. Keep combustible materials, such as furniture, pillows, bedding, papers, clothes and curtains at least 3 feet (0.9m) from the front of the heater and keep them away from the sides and rear.
5. Extreme caution is necessary when any heater is used by or near children or disabled persons and when the heater is left operating and unattended.
6. This heater must be used with an earth fault detection circuit (RCD) when used in bathrooms, laundry areas and similar indoor locations. Never locate heater where it may fall into a bathtub or other water container.

7. This heater is not designed for outdoor use.
8. Connect to properly earthed/ grounded power outlets only.
9. Heater become hot during use and might generate sparks when switching on/off. Do not use it in areas where petrol, paint, or flammable liquids are used or stored.
10. Use this heater only as described in this manual. Any other use not recommended by the manufacturer may cause fire, electric shock, or injury to persons.
11. Do not install a higher capacity circuit breaker without consulting a qualified electrician.
12. **“KEEP THESE INSTRUCTIONS”**

- Please consult your electrician or a ILO representative if you have any safety concerns or questions.
- Single heating panel installations may use a plug-in utility power (120VAC) thermostat, which can be purchased from your local hardware/DIY store, or SI representative.
- Please consult a qualified electrician for larger systems to ensure that circuit breakers and RCDs meet the design criteria of your system.

### Electrical Specifications:

(use the following table to determine the maximum current for each size heater):

Model <sup>1</sup>	Ref. <sup>2</sup>	Power <sup>3</sup>	Voltage <sup>4</sup>	Max Current <sup>4</sup>	
SI-120-2424	(SI2424)	400W	120VAC	4.4A	A
SI-120-4824	(SI4824)	750W	120VAC	8.1A	B
SI-120-4141	(SI4141)	1100W	120VAC	11.1A	C

Operating frequency for approvals is 50/60 HZ (usable frequency range DC-400Hz)

The part number reflects the panels' nominal sizes. Please note that the suspended system ceiling compatible units are 0.25" (6mm) smaller to facilitate the ceilings' "T" rails.

#### Notes:

- <sup>1</sup> **Model** information is provided for quick reference only, refer to your actual heater's data label for Voltage, Wattage and current requirements.
- <sup>2</sup> **Ref**, denotes the approved model reference. It may differ from the trade size reference. For warranty service, please use the actual part number.

<sup>3</sup> **Power** indicates the typical power at the operating temperature.

<sup>4</sup> **Voltage** denotes the nominal approved operating voltage range.

**Current** denotes the maximum current consumed when first powered up. This will vary slightly depending on the line voltage. It self regulates to where the surface approaches temperatures of a hot cup of coffee  $\approx 200^{\circ}\text{F}$  .

<sup>4</sup> **Mounting** “A”, “B” and “C” refer to the mounting hole spacing for the brackets.

#### Color matching:

Although SI only uses a specific (agency approved) coating and identical color number, there may be some slight variations between lots. This is due to industry accepted mixing tolerances. To facilitate exact color matching for panels installed in the same room, SI provides a color lot number as part of its product identification. Simply select panels with the same color lot code to ensure that the installation is aesthetically pleasing.

#### Thermostat placement:

Please disregard the mounting height restriction which is normally included with a room thermostat. In a room which is warmed by SI's far infrared, the thermostat may be located at any level between 6" (15cm) above the floor, to 6" (15cm) below the ceiling because the typical floor to ceiling temperature difference is 35 to 37°F (2 to 3°C).

Room thermostats are designed to measure a representative air temperature, which is present at an average person's eye level. The thermostat in a convection system has no idea what the temperatures are near the floor (these may be around freezing), nor does it know the temperatures near the ceiling (these may be much higher).

With SI's far infrared, the differences between floor and ceiling are so small that the thermostat may be used at almost any convenient location. This freedom to choose makes a SI system an ideal candidate for using a plug-in utility power thermostat. Wherever the power outlet is located, the thermostat may be used.

## How does Far Infrared Technology save energy?

The sun, which is the world's oldest source of infrared heating, contains a wide radiant spectrum. It ranges from the soothing, therapeutic and healthy far infrared warmth, to dangerous and damaging near infrared and ultraviolet wavelengths. The sun's rays travel a great distance through space without requiring a medium to transfer its energy.

SI's far infrared radiant heating technology operates in the healthy and therapeutic “long wavelength” part of the sun's spectrum (7,000 to 10,000 nm, or 7-10 $\mu$ ).

Far infrared is “invisible light” which can be found outside of the visible light's spectrum.

Invisible light at 7,000-10,000nm wavelengths travels mostly around the air molecules in a room. As with a standard flashlight, the far infrared light simply passes through the air. Hence the air is not heated.

When the far infrared light collides with surfaces (including people and objects in the room) a portion of the invisible light's energy is absorbed (causing the surface to heat up slowly) and some is reflected. The reflected light will eventually collide with another surface/object and heat this up as well, until all of the

bouncing heat energy has been absorbed. This process will continue until the thermostat reaches its pre-programmed setting and switches the heater off.

As with a wall that has been exposed to the sun, the surfaces within the room will start radiating heat energy. After the sun has set, the wall referenced above will still be radiating the energy that was absorbed and stored. This is the best example how far infrared works.

Because far infrared does not heat the air, there are very significant energy savings over traditional systems.

## Sizing and Controlling SI's Far Infrared Heaters and Radiant Artworks:

Radiant heaters and artworks are “sized” based on a number of different criteria.

If used as primary heat source, the size and number of panels can be calculated using a sizing calculator.

Even if the artworks are not used as the primary heat source, the best method to determine the size (or quantity) of the artworks is to use the calculator.

Once selected, the panel or panels can be controlled in a number of ways which are easily managed by the panel's owner. This ranges from simply plugging or unplugging the units, switching a switchable power outlet “ON” or “OFF”, or to user purchased, plug-in utility power thermostats. For more sophisticated systems, control can even be facilitated from anywhere in the world, using a wireless networked system.

Selecting a plug-in utility power thermostat is very simple. Most people buy one thermostat per panel. Almost all utility power thermostats can support any one of SI's panels. If unsure, please check the thermostat's “AMP rating. It should exceed the panel's current, or AMP rating. If in doubt contact your local electrician or your local SI representative.

Integrated control systems generally require an electrician to help design and install.

**Typical coverage based on SI's calculator during an average Toronto winter** (reference only): There are many factors that play a role in the success or failure of an infrared system. SI offers access to a simple transmission calculator, which to date has worked well for over 98% of the SI systems sold.

Below are some typical examples of installations, showing situations with various heat/loss situations:

□ A ceiling mounted SI2424 (24" X 24") panel of **1360BTU** (400W) typically heats a **70ft<sup>2</sup>** (6,5m<sup>2</sup>) room with a 8'6" (2.6m) ceiling, a 7' x 3' (2.13 x 0.91m) interior door and a 2' x 3' ((0.61 x 0.91m) double glazed exterior window.

When the same unit is **wall mounted** it typically only heats an area of **50ft<sup>2</sup>** (4.6m<sup>2</sup>).

- A ceiling mounted SI4824 (48" X 24") panel of **2560BTU** (750W) typically heats a **150ft<sup>2</sup>** (13.9m<sup>2</sup>) room with a 8'6" (2.6m) ceiling, a 7' x 3' (2.13 x 0.91m) interior door and a 3' x 4' (0.91 x 1.22m) double-glazed exterior window.

When the same unit is **wall mounted** it typically heats an area of **110ft<sup>2</sup>** (10.22m<sup>2</sup>).

- **OR**..... the very same unit can heat a **216ft<sup>2</sup>** (20m<sup>2</sup>) well insulated windowless basement with a 8'6" (2.6m) ceiling.

## Operating Voltages and Connectors

SI's standard for the North American 120v market is the Type B (NEMA 5 - 15 P) plug. It features Line, Neutral and Ground pins. Outlets must have a proper ground .



**Type B Plug (NEMA 5 - 15P) - 15A max**

Notes:

- 1) Heaters installed in wet/damp spaces must be protected by a GFCI.

## Ceiling Mounting:

SIs SI Series Far-infrared heating panels may be installed on a ceiling using the (supplied) mounting system. Alternatively, these may be suspended from joist or rafters by steel cables or chains in a manner compliant with local building codes.

In buildings with a suspended ceiling grid, the panels (SI2424 and SI4824) may be placed in the ceiling's grid. During operation, it is possible that the heating panels curve up slightly. To ensure the most aesthetically pleasing installation, standard accessory hold-down clips may be placed in the corners to keep the panels level when these expand.

Local building codes may require additional steel cables or chains to secure the panels to the rafters or joists above. Wires, cables and/or chains may be secured through the appropriate size holes at the ends of the panel's mounting brackets

To reduce heat losses in installations with a large open space above the ceiling panels, fiberglass (or similar) insulation capable of withstanding temperatures of at least 200°F (or about 90°C ) may be used to cover the back of the unit.

Please contact your SI representative or your local electrician for details regarding available thermostats and/or control systems.

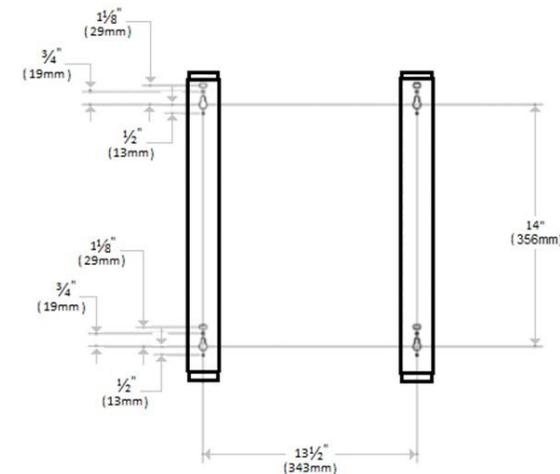
**CAUTION!** To minimize the risk of fire and to prevent the undesired loss of performance (caused by voltage-drop) do not use extension cords!

## Mounting Diagrams

### SI Series aluminum far infrared heaters.

Owing to the low operating temperatures (the temperature of hot coffee), there are no minimum mounting height requirements. The units may be placed at any practical height and may be mounted horizontally, vertically or at any desired angle to blend in with the room's décor. With ceiling mounting there is virtually no convection.

### Mounting dimensions "A" SI-2424



- For ease of installation, SI's mounting brackets are fitted with a safety latch mechanism that replaces the need to use safety screws or security wire in wall and "on-ceiling" installations. Owing to the design of the safety latch mechanism the heaters can be removed from the mounting brackets without the need of tools.
- The brackets may be mounted on the wall or ceiling.
- The primary fastener (hole) pattern is 13½" X 14" (343 by 346mm). Please observe the 13½" dimension as it is critical for proper bracket insertion.
- The power supply cable may exit over the edges, or through the mounting bracket/panel opening.

## SI Series Aluminum Panel Mounting System

Please review the following procedure to properly install a SI far infrared heating panel. Be sure to properly space the brackets, observing the notes on "critical dimensions" in the "Mounting Dimensions" section of this manual (the previous three pages).

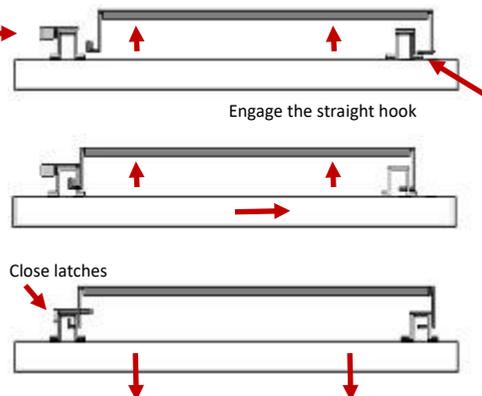
To install the SI120-2424, SI120-4824 and SI120-4141 models Including the 240v versions), (mounting sizes

A-B- C), mark the mounting locations using the dimensional information from the previous section and install the mounting brackets (be sure the brackets face the same direction). Where possible (in joist ceilings and/or stud walls), at least one of the brackets'

mounting holes should be over a stud or joists. The other(s) should be installed using appropriate anchors. (Mounting hardware is not included as installations vary by building and region.)

### Installation:

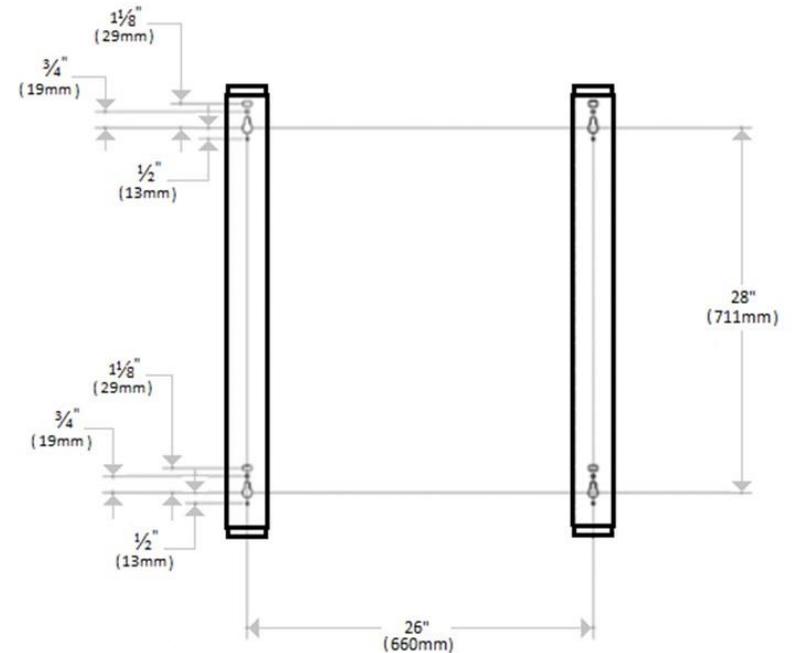
1. Locate an area near an active power outlet, or employ an electrician to provide a power outlet at or near the heating panel.
2. Install the two mounting brackets. Wherever possible utilize the holds which are closest to each end.
3. Using a flat blade screw driver open the safety latches
4. Ensure that the intended power outlet or circuit breaker is switched off.
5. While a helper holds the panel, route the power cord to the outlet. Do not activate the circuit breaker for this circuit until the installation is complete.
6. Plug the power plug into the outlet.
7. Place the panel near the mounting brackets and engage the right-hand (straight) hook.
8. Slide the panel onto the bracket by holding it gently against the wall or ceiling to engage the left-hand hook.



9. If wall mounted, pull the top of the panel away from the wall and engage the safety latches (use a screw driver or suitable tool if needed). If ceiling mounted, allow the panel to rest in on the brackets, slide it to the latch side and close the safety latches.
10. Plug in the panel or activate the circuit breaker and test the panel.

Note: Single person installation is possible by using temporary "s" hooks (obtained locally) in the "boxed hook" (left-hand side) of the mounting bracket and the holes in the reinforcement bars (replaces the helper in step 5). These hooks temporarily suspend one end of the panel while the electrical connections are made. To remove the hooks simply shake the panel (the hooks will drop). Then, install it as outlined above.

### Mounting dimensions "C" SI-120-4141



- SI's 4141 panels are fitted with a safety latch mechanism that replace the need to use safety screws or security-wire in wall and "on-ceiling" installations. Owing to the design of the safety latch mechanism the heaters can be removed from the mounting brackets without the need of tools.
- The brackets may be mounted on the wall or ceiling.

- For the 4141, the primary fastener (hole) pattern is 26" X 28" (660 by 711mm) . Please observe the 26" dimension as it is critical for proper bracket insertion.
- The power supply cable may exit over the edges, or through the mounting bracket/panel opening.

- For the SI-120-4824, the primary fastener (hole) pattern is 36" X 14" (915 by 346mm). Please observe the 36" dimension as it is critical for proper bracket insertion.
- The power supply cable may exit over the edges, or through the mounting bracket/ panel opening.



**Mounting dimensions "B" SI-120-4824**

- SI's 4824 panels are fitted with a safety latch mechanism that replace the need to use safety screws or security-wire in wall and "on-ceiling" installations. Owing to the design of the safety latch mechanism the heaters can be removed from the mounting brackets without the need of tools.
- The brackets may be mounted on the wall or ceiling.