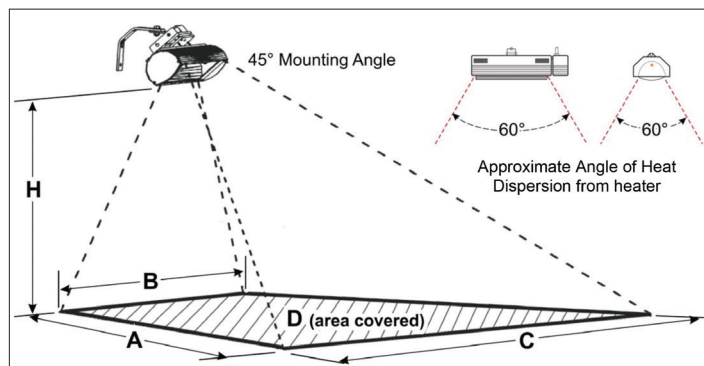


TECHNICAL SERVICE BULLETIN

How to size SunWarmth™ CIR heaters to heat a space

The size and quantity of heaters (the amount of heat input) required for comfort in an area is affected by several factors.

- › The chilling effect of air movement in an area (outside or inside) requires additional heat input, so provide wind breaks wherever possible.
- › Any area heated outdoors is “spot heat.”
- › “Spot heating” comfort is most effective if people are heated from at least two sides.
- › When “spot heating” only part of a cold indoor area, factor the activity level of the people: seated at rest, hard physical labor, etc.
- › Space heaters uniformly around the perimeter (and if required, in the center or throughout the area) to provide sufficient heat density to accomplish the desired temperature rise.
- › Heating the space in an entire structure requires an accurate heat loss calculation and is beyond the scope of this TSB. Contact Stiebel Eltron for assistance.



Mounting and Coverage Information

Model	Wattage	H Mounting height	Dimensions of area heated				E Average heat density
			A Length heated	B Width heated close to heater	C Width heated far from heater	D Size of heated area	
CIR 150-1 I, CIR 150-1 O	1500 W	Minimum: 7' (2.1 m)	8' 10" (2.7 m)	8' 6" (2.6 m)	16' 1" (4.9 m)	108 ft ² (10.1 m ²)	13.9 W/ft ² (148.5 W/m ²)
		Maximum: 8' (2.4 m)	9' 10" (3.0 m)	9' 2" (2.8 m)	18' 1" (5.5 m)	133 ft ² (12.4 m ²)	11.3 W/ft ² (121.0 W/m ²)
CIR 200-2 O	2000 W	Minimum: 8' (2.4 m)	9' 10" (3.0 m)	9' 2" (2.8 m)	18' 1" (5.5 m)	133 ft ² (12.4 m ²)	15.0 W/ft ² (161.3 W/m ²)
		Maximum: 9' (2.7 m)	11' 2" (3.4 m)	9' 10" (3.0 m)	20' (6.1 m)	165 ft ² (15.3 m ²)	12.1 W/ft ² (130.7 W/m ²)
CIR 400-2 O	4000 W	Minimum: 10' (3.0 m)	11' 10" (3.6 m)	11' 2" (3.4 m)	23' (7.0 m)	205 ft ² (19.0 m ²)	19.5 W/ft ² (210.5 W/m ²)
		Maximum: 11' 6" (3.5 m)	13' 5" (4.1 m)	14' 1" (4.3 m)	27' 7" (8.4 m)	275 ft ² (25.4 m ²)	14.5 W/ft ² (157.5 W/m ²)

To calculate the number of heaters required for an area, determine the size of the area and the amount of heat input required to achieve a comfortable temperature in the space. Here is a checklist for the calculations.

- › In what seasons is comfort required and what is the outside design temperature?
- › What temperature rise is desired for comfort? (10°, 15°, 20°, 25°?)
- › Calculate the required input to get the desired average temperature rise using Table 1 to determine Heat Density Per Degree.
- › Use this formula to calculate the amount of heater wattage required for the space:
Input = Site Length × Site Width × Temperature Rise × Heat Density per Degree
- › **Example:**
 - Outdoor patio: 30 feet long by 10 feet wide
 - Desired temperature rise: 20°F (area average)
 - 30 × 10 × 20 × 2 = 12,000 Watts total input required
- › Use the total wattage required to determine the number of heaters needed, making sure placement follows the guidelines for safety and comfort.

Table 1
Input Required per Area per Degree Comfort Temperature Rise

	Heat density per °F W/(ft ²)/°F	Heat density per °C W/(m ²)/°C
Outdoor heating (up to 10 mph wind)	2	40
Indoor spot heating (protected area, low air movement)	0.75	14