

## Radiant Heaters

### The RAYMAX® Family

Watlow's diverse RAYMAX® heater line allows you to solve virtually any application that requires radiant heat. Our capabilities cover a wide range of needs, from contamination-resistant surfaces, to fast responding high temperature panels, to replaceable tubular elements.

Applying radiant heaters can be complicated. Watlow's engineering staff has the level of training and expertise required to help meet your application requirements, providing a high degree of technical support such as conducting testing for your application at our facility, calculating your watt density and temperature requirements, and recommending system components such as sensors and controllers. With our experience in a wide range of industries, chances are Watlow has already helped someone handle a radiant heating application like yours.

#### Features and Benefits

##### Variety of styles

- Matches the ideal temperature and watt density requirements of your application

##### Watlow engineering and application support

- Helps projects run smoothly

##### Custom designs

- Can be quickly adapted for particular needs such as special wattage zoning

##### Watlow sensors and controllers are completely compatible with RAYMAX heaters

- Offers a single source thermal system that is reliable and designed just for your application



#### Applications

- Thermoforming
- Food warming
- Paint and epoxy curing
- Heat treating
- High temperature furnaces
- Tempering and annealing processes



#### Caution: Fire Hazard

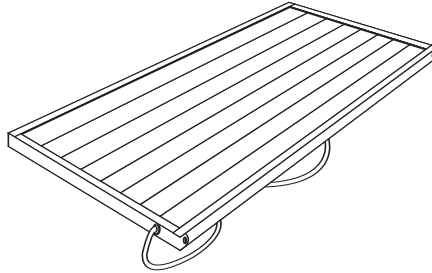
Radiant heaters must not be operated in the presence of flammable vapors, gases or combustible materials without proper ventilation and safety precautions. Radiant heaters must be properly wired and controlled to comply with all applicable electrical codes.

# Radiant Heaters

## The RAYMAX Family

### Panel Variations

#### Low Profile

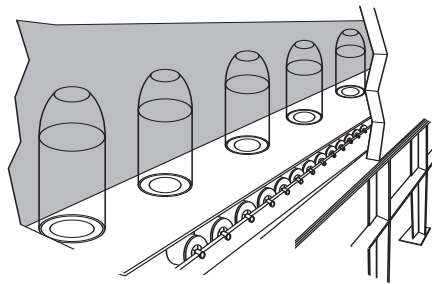


This design may be required where mounting space is limited, for example, when converting existing equipment or designs to radiant panels.

Available options may vary from the standard units when you specify a low profile design. Consult Watlow for further information.

**Available with RAYMAX 1010, 1120, 1220 and 2030.**

#### Zoning



Watt densities can be varied across the entire width of RAYMAX heaters. If desired, each zone can have an individually controlled power supply.

Zoning can be very valuable when part of the product requires more heat, or when you must compensate for heat losses at the edges. By separately turning off part of the heated width, you can adjust for various widths of material.

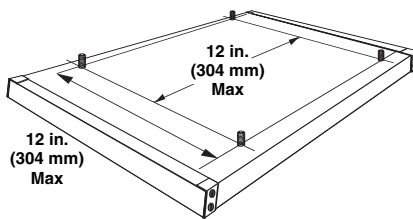
**Available with RAYMAX 1010, 1120, 1220, 1330, and 2030.**

## Radiant Heaters

### The RAYMAX Family Mounting Accessories

**Application note:** Allow for some thermal expansion of the heater case during operation. An expansion of up to one percent can occur when the case reaches its normal maximum limit of 1100°F (595°C). If your equipment has mounting screws to connect to the slots in the mounting legs, allow for a small amount of extra length. If you are using mounting bolts to interface with the mounting studs on the back of the RAYMAX case, make sure your holes are oversized. Also, use washers and avoid overtightening.

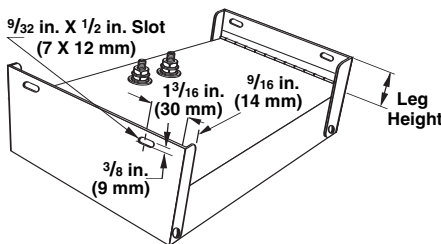
#### Mounting Studs



Standard ¼-20 X 1 ½ inch (M6-1 X 40) steel studs are welded to the case. For best support, studs should be approximately located on 12 inch centers. Consult Watlow for exact locations on specific heaters.

**Available with RAYMAX 1010, 1120, 1220, 1330, and 2030.**

#### Mounting Legs



Mounting legs are extensions of the steel end caps with mounting slots for bolting directly to field support members. There is no extra charge for legs; they can be supplied in half inch increment from 0.5 inch (12.5 mm) to three inches (76 mm). No slots are provided in legs less than one inch (25 mm) long.

For panels over 24 inches (610 mm) long, mounting studs are recommended for the best panel support.

**Available with RAYMAX 1120, 1220, and 2030.**

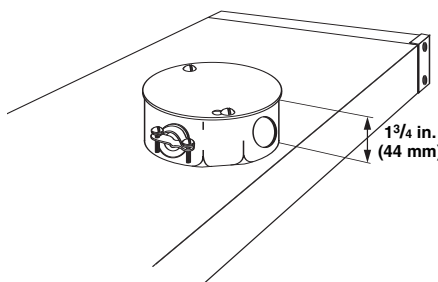
### Terminal Accessories

#### Special Terminal Locations

If the standard terminal locations shown will not meet your needs special locations can be designed.

**Available with RAYMAX 1010, 1120, 1220, 1330, and 2030.**

#### Terminal Box

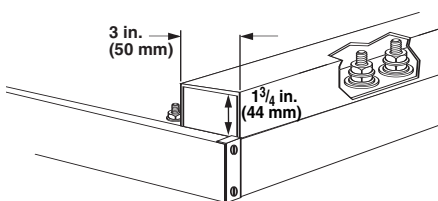


To protect electrical connections, a standard NEMA octagon terminal box is available. The standard size is 3 5/16 X 3 5/16 X 1 ½ inches (90.5 X 90.5 X 38.1 mm) with knockouts for ½ inch (12.5 mm) conduit. Other NEMA sizes are also available.

Care should be taken to use lead wire capable of withstanding the ambient temperatures.

**Available with RAYMAX 1010, 1120, 1220, 1330, and 2030.**

#### Wiring Raceway



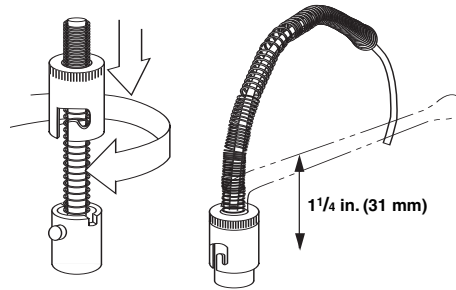
Custom designed to your specific requirements, a steel raceway provides electrical and physical protection for all terminal connections. This can be particularly useful for multi-zone panels.

**Available with RAYMAX 1010, 1120, 1220, 1330, and 2030.**

## Radiant Heaters

### The RAYMAX Family Temperature Control

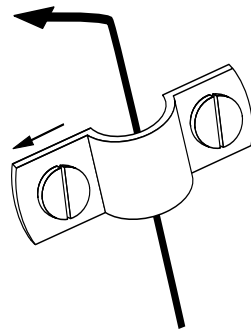
#### Thermowells



A thermowell allows you to use a thermocouple with a bayonet fitting to monitor heater temperature. The thermowell is located on the back of the panel to allow easy access for thermocouple replacement. Spring tension holds the tip of the thermocouple in contact for close control of the heater temperature. Thermocouple not included.

**Available with RAYMAX 1010, 1120, and 1330.**

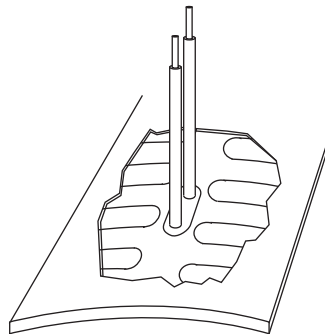
#### Thermocouple Clamps



A thermocouple mounting clamp can be provided on the end of the heater case. The clamp is suitable for use with  $\frac{1}{8}$  inch (3.175 mm) and  $\frac{1}{4}$  inch (6.35 mm) O.D. sheath thermocouples, which should be bent 90° so that the sensing tip is just above and lightly touching the hot face at an element location.

**Available with RAYMAX 1220, 1525 ( $\frac{1}{8}$  only) , 1626 ( $\frac{1}{8}$  only) and 2030.**

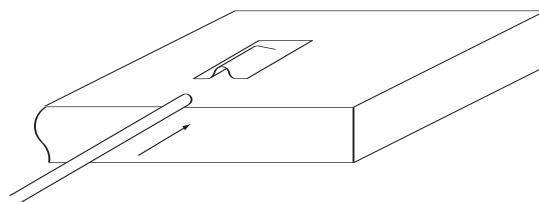
#### Welded Thermocouple



A thermocouple junction is welded to the emitting surface to provide optimum temperature sensing accuracy and responsiveness. This option permits the actual radiating face temperature to be precisely monitored and controlled. The standard length of the thermocouple wire is 12 inches (304.8 mm).

**Available with RAYMAX 1010, 1120, and 1330.**

#### Thermocouple Pocket



A thermocouple pocket is welded to the emitting surface. The pocket accepts a 0.063 inch (1.6 mm) diameter thermocouple (not included). This option provides accurate temperature sensing and easy thermocouple replacement.

**Available with RAYMAX 1010, 1120, and 1330.**

**Quick Ship**

• Next day shipment on all stock units.

## Radiant Heaters

### RAYMAX® 1120

The RAYMAX® 1120 is a lightweight, yet sturdy and durable radiant heater panel. The emitter sheath is stainless steel with a black coating that makes it a highly efficient radiating surface. In addition, the heater's low mass allows rapid start-up and fast response to controls.

The patented RAYMAX heater features one inch (25 mm) wide emitter strips that are individually replaceable for lower maintenance costs. Weighing only 5.5 lbs/ft<sup>2</sup> (26.8 kg/m<sup>2</sup>), the heater is easy to mount.

#### Performance Capabilities

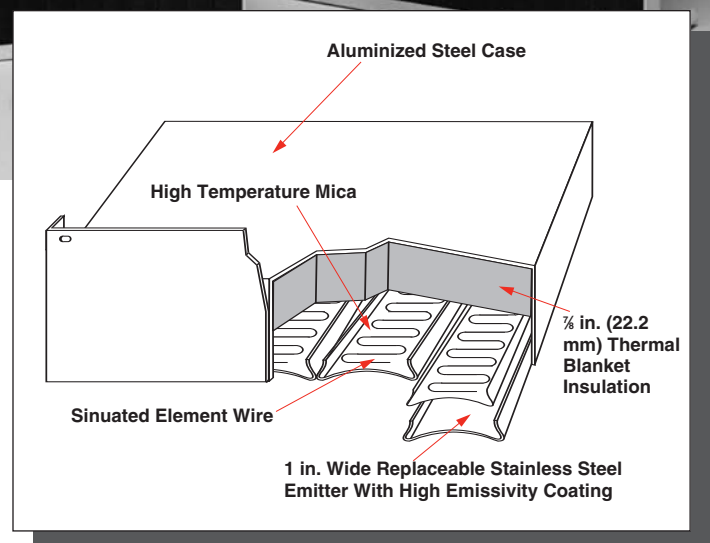
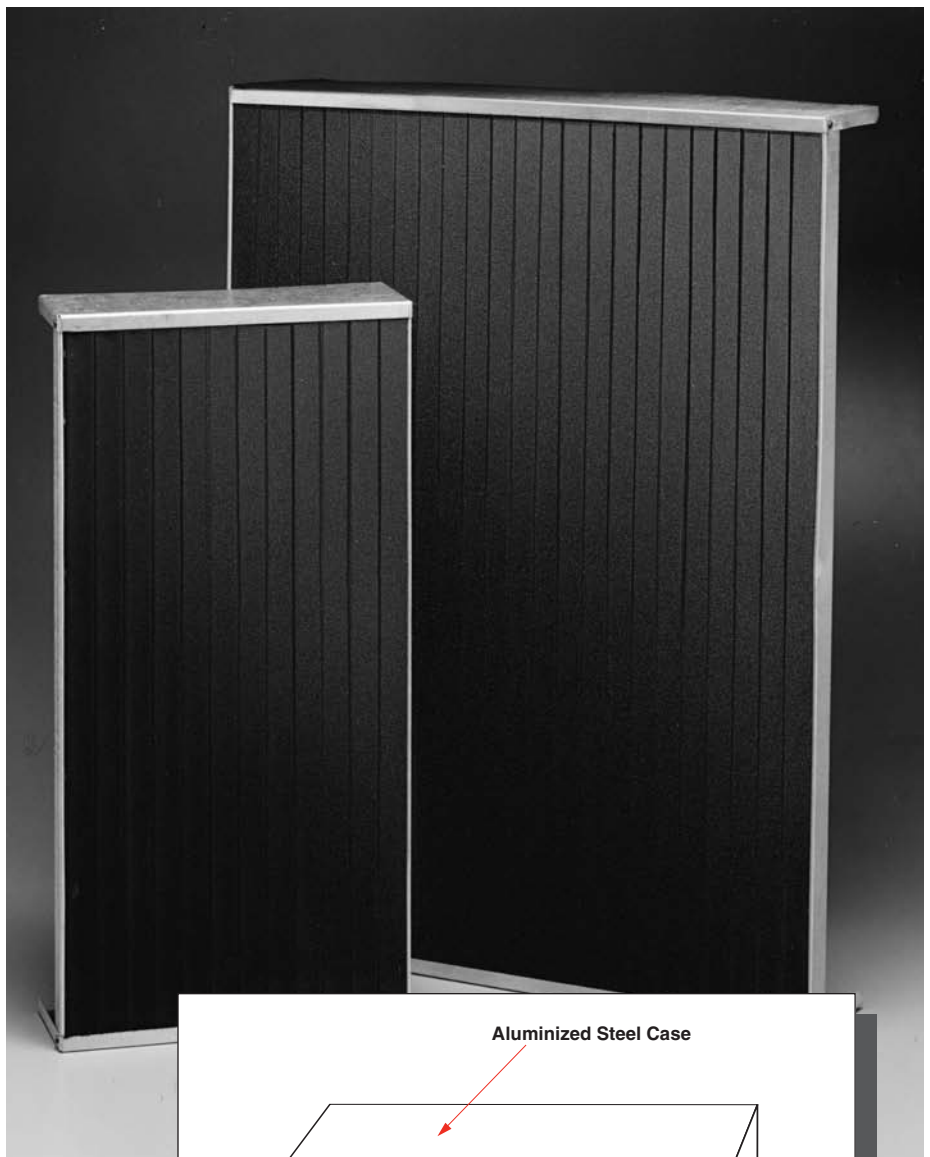
- Face temperature: 1100°F (595°C) max.
- Watt density: 20 W/in<sup>2</sup> (3 W/cm<sup>2</sup>) max.

#### Features and Benefits

- **Replaceable emitters** reduce your costs.
- **High temperature mica** electrically insulates nickel chromium resistance wire, permitting longer heater life.
- **High emissivity coating** on emitter strips improves radiant heating efficiency.
- **Thermal insulation**, 3/8 inch thick, backs the emitter strips to reduce backside losses.
- **Uniform full surface heat source** provides better, more even heat.
- **Special requirements** are easily met with custom sizes and ratings.
- **Next day shipment** is available on stock sizes.

#### Applications

- Thermoforming
- Textile drying
- Paint curing
- Powder coating fusing
- Shrink wrapping
- Circuit board soldering



# Radiant Heaters

## RAYMAX 1120

### Applications and Technical Data

**Face Temperature:** 595°C (1100°F) maximum

**Wattage:** Watt densities up to 20 W/in<sup>2</sup> (3 W/cm<sup>2</sup>)

**Voltage:** Customer specified up to 480 volts. Balanced 3-phase available on unit widths divisible by three.

**Note:** Small heaters may not be able to be built at high voltages. Consult Watlow for specific application.

**Terminals:** Non-standard locations are available. Please specify.

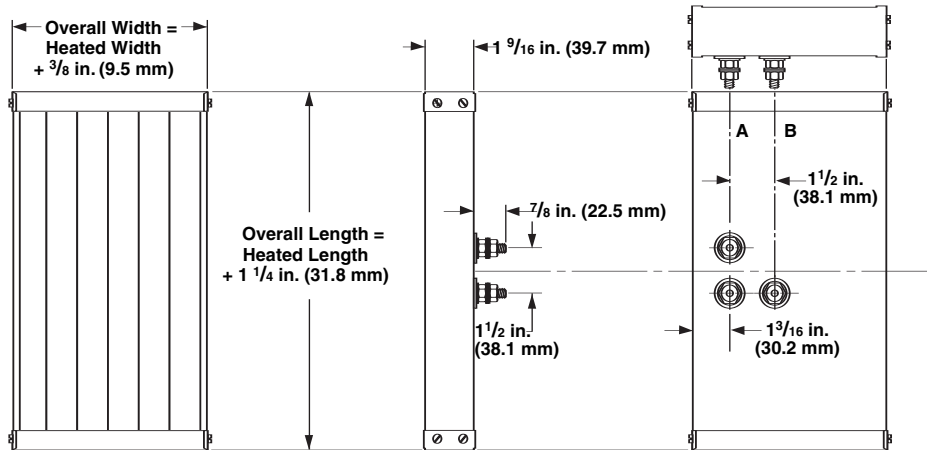
**Standard Tolerance:** ±1/16 inch (1.6 mm)

**Typical Peak Energy Wavelength:** 3-3.5 microns

### Specifications

Heater Dimensions	Min.	Max.	Increments
Width: inches (mm)	1 (25.4)	39 (990.6)	1 (25.4)
Length: inches (mm)	6 (152.4)	94 (2,387.6)	06 (1.6)
Area: in <sup>2</sup> (cm <sup>2</sup> )	6 (38.7)	864 (5574.2)	any

**Note:** Less than maximum length X width may exceed maximum area.



F.O.B.: St. Louis, Missouri

Panel Overall Size in. (mm)		Panel Heated Size in. (mm)		Volts	Watts	Watt Density W/in <sup>2</sup> (W/cm <sup>2</sup> )	Approx. Net Wt. lbs (kg)	Availability	Code No.
Width	Length	Width	Length						
6 3/4 (161.93)	25 1/4 (641.35)	6 (152.4)	24 (609.6)	240	2880	20 (3.1)	6 (2.7)	Stock	P0624AX050
12 3/4 (314.33)	13 1/4 (336.55)	12 (304.8)	12 (304.8)	240	2880	20 (3.1)	6 (2.7)	Stock	P1212AX030
12 3/4 (314.33)	25 1/4 (641.35)	12 (304.8)	24 (609.6)	240	5760	20 (3.1)	12 (5.4)	Stock	P1224AX062
12 3/4 (314.33)	49 1/4 (1250.95)	12 (304.8)	48 (1219.2)	480 3-phase	11520	20 (3.1)	24 (10.8)	Stock	P1248AX073

**Note:**

- Panels are equipped with terminal box, thermocouple well with bayonet adapter and mounting studs.
- Watlow stock radiant panels must be properly applied for safe operation.
- Please consult Watlow with your application before ordering.

### How to Order

To order your stock RAYMAX heater, specify:

- RAYMAX 1120
- Quantity
- Watlow code number

If our stock units do not meet your application needs, Watlow can manufacture RAYMAX heaters to your special requirements. For **made-to-order** heaters, specify the following:

- Heated width and length. Three-phase panels must have width divisible by three.
- Total wattage of each panel.
- Exact voltage and phase. A five percent variation in voltage at the oven will cause a 10 percent variation in power.
- Zoning. Indicate dimensions and wattage of each zone.
- Mounting legs or mounting studs, if desired. For studs, give number and location or indicate standard location.
- Terminal location if non-standard.
- Terminal box or wire raceway, if required.

Supplying a drawing with an order or request for quotation can be very helpful in clarifying design information.

### Availability

**Stock:** Next day shipment

**Made-to-Order:** Consult Watlow