

## 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

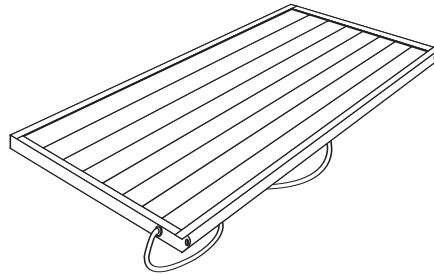
Radiant heaters must not be operated in the presence of flammable vapors, gases or combustible materials without proper ventilation and safety precautions. Radiant heaters must be properly wired and controlled to comply with all applicable electrical codes.

# Radiant Heaters

## The RAYMAX Family

### Panel Variations

#### Low Profile

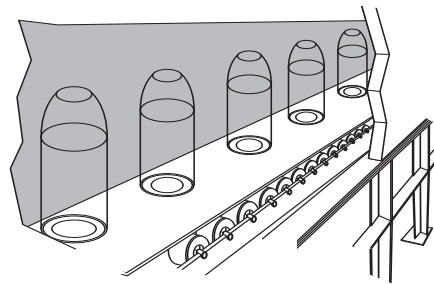


This design may be required where mounting space is limited, for example, when converting existing equipment or designs to radiant panels.

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.

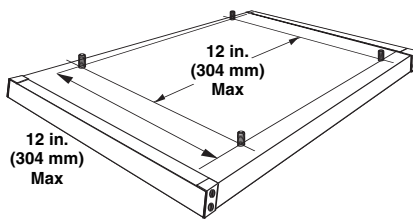
**Available with RAYMAX 1010, 1120, 1220, 1330, and 2030.**

## 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.

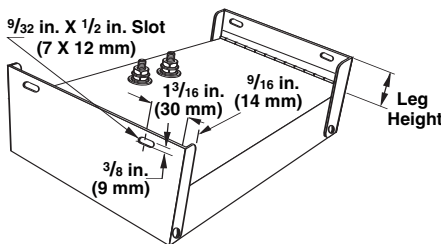
#### Mounting Studs



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.**

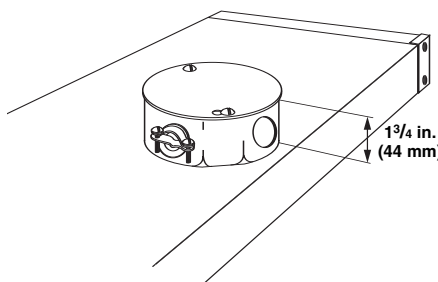
### Terminal Accessories

#### 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

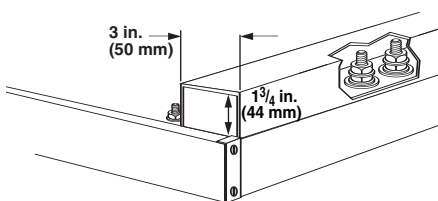


To protect electrical connections, a standard NEMA octagon terminal box is available. The standard size is 3 5/16 X 3 5/16 X 1 ½ inches (90.5 X 90.5 X 38.1 mm) with knockouts for ½ inch (12.5 mm) conduit. Other NEMA sizes are also available.

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



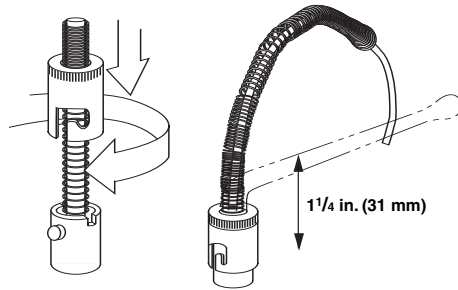
Custom designed to your specific requirements, a steel raceway provides electrical and physical protection for all terminal connections. This can be particularly useful for multi-zone panels.

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

## Radiant Heaters

### The RAYMAX Family Temperature Control

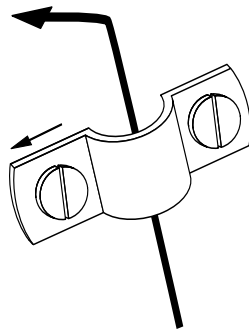
#### Thermowells



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.**

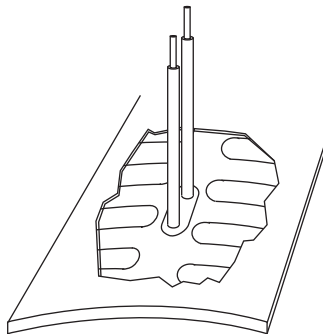
#### Thermocouple Clamps



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.**

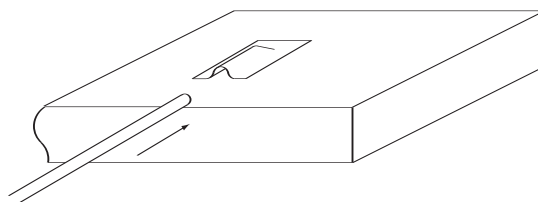
#### Welded Thermocouple



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.**

## Radiant Heaters

### RAYMAX® 1010

Designed to resist contamination, the RAYMAX® 1010 is ideal for use in screen printing, food warming and other low heat applications. The heater's "sealed face" keeps contaminants away from the heating element, and this metal surface can be easily wiped or brushed clean whenever needed.

The rugged all-metal construction results in a shock-proof, shatter-proof heater that is durable and long lasting. No fragile glass, ceramic or fiber is used.

#### Performance Capabilities

- Face temperature: 540°C (1000°F) max.
- Watt densities: 10 W/in<sup>2</sup> (1.5 W/cm<sup>2</sup>) max.
- 50 amps maximum

#### Features and Benefits

##### Uniform full surface heat source

- Provides better, more even heat

##### No reflectors

- Nothing to clean or replace

##### Convenient ready-to-use package

- Makes installation easier

##### One-inch thick backside insulation

- Reduces losses

##### Totally sealed version available

- Suitable for hose down applications

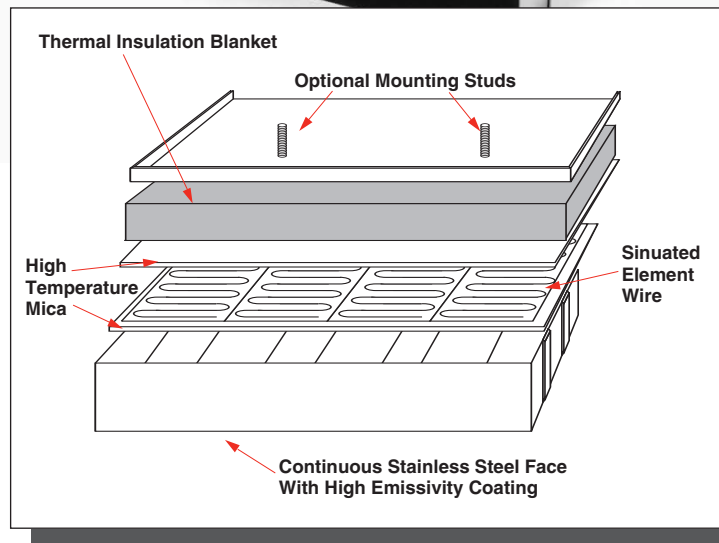
##### Accurate, repeatable temperature sensing options

##### UL® component recognized versions are available

#### Applications

- Drying screen-printed textiles
- Curing process coatings on circuit boards
- Food warming/cooking
- Epoxy curing
- Thermoforming

UL® is a registered trademark of Underwriter's Laboratories, Inc.



# Radiant Heaters

## RAYMAX 1010

### Applications and Technical Data

#### Sizes and Ratings

**Thickness:** 1.75 inch (44.4 mm)

**Voltage:** Customer specified up to 480 volts.

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

**Watt density:** Up to 10 W/in<sup>2</sup> (1.5 W/cm<sup>2</sup>), 50 amps max.

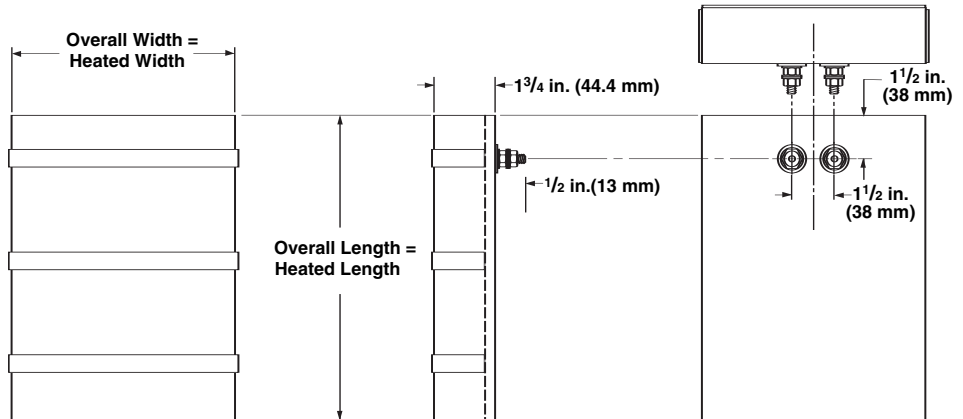
**Face temperature:** Up to 1000°F (540°C)

**Typical peak energy wavelength:** 3.5-4 microns

### Specifications

Heater Dimensions	Min.	Max.	Increments
Width: inches (mm)	4 (101.6)	20 (508)	2 (50.8)
Length: inches (mm)	10 (254)	68 (1727.2)	0.06 (1.6)
Area: in <sup>2</sup> (cm <sup>2</sup> )		864 (5574)	any

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



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

### Options

- Terminal box
- Thermowell (VAT style thermocouple required)
- Thermocouple pocket (thermocouple required)
- Thermocouple welded to hot face
- Mounting studs
- Totally sealed construction
- Food-safe surface treatment

#### How to Order

All units are **made-to-order**. Please specify the following information when placing an order:

- Width and length
- Total wattage
- Voltage and phase
- Mounting studs, if desired

- Terminal location, if non-standard
- Terminal box, if desired
- Internally welded thermocouple or thermowell, if desired

#### Availability

Please consult Watlow for lead time required.