Radiant Heaters

PanelMax Panel Heaters

The PanelMax radiant panel heater product line from Heat and Sensor Technology solves virtually any application requiring radiant heat from contamination-resistant surfaces to fast responding high-temperature panels.

Heat and Sensor Technology's engineering staff has the training and expertise required to meet the most complicated application requirements. Technical support includes calculating watt density and temperature requirements and recommending system components such as sensors and controllers.

Performance Capabilities

Maximum face temperature up to 2000°F (1095°C)

Maximum watt densities up to 30 W/in^2 (4.7 W/cm^2)

Features and Benefits

Variety of styles

Match the ideal temperature and watt density requirements of the application

Heat and Sensor Technology engineering and application support

Assures projects run smoothly

Custom designs

Adapts to specific needs

Heat and Sensor Technology sensors and controllers are compatible with PanelMax heaters

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

Typical Applications

Thermoforming

Food warming

Paint and epoxy curing

Heat treating

High-temperature furnaces

Tempering and annealing processes

Caution: *Fire Hazard*

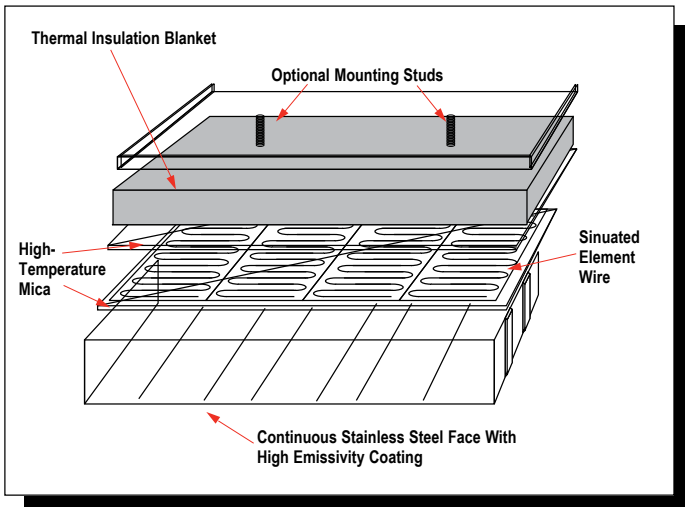
Radiant heaters must not be operated in the presence of flammable vapors, gases or combustible materials without proper ventilation and safety precautions. Radiant heaters must be properly wired and controlled to comply with all applicable electrical codes.

PanelMax Panel Heaters

PanelMax 1010

Designed to resist contamination, the PanelMax 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 the metal surface can be easily wiped or brushed clean whenever needed.

Rugged, all-metal construction creates a shock-proof, shatter-proof heater, which is durable and long lasting.



Performance Capabilities

- Face temperature: 1000°F (540°C) maximum
- Watt densities: 10 W/in^2 (1.5 W/cm^2) maximum
- 50 amperes maximum
- Maximum voltage up to 480V

Features and Benefits

Uniform full-surface heat source
Provides more even heat

Convenient ready-to-use package
Makes installation easier

One-inch thick backside insulation
Reduces losses

Totally sealed version available
Suitable for hose down applications

Repeatable temperature sensing options
Increases accuracy

UL® component recognized versions are available

Typical Applications

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

PanelMax Panel Heaters

PanelMax 1010

Applications and Technical Data

Sizes and Ratings

Thickness: $1\frac{3}{4}$ in. (45 mm)

Voltage: Customer specified up to 480V.

Note: Small heaters may not be able to be built at high voltages. Contact your Heat and Sensor Technology representative for specific application requirements.

Watt density: Up to 10 W/in^2 (1.5 W/cm^2), 50A max.

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

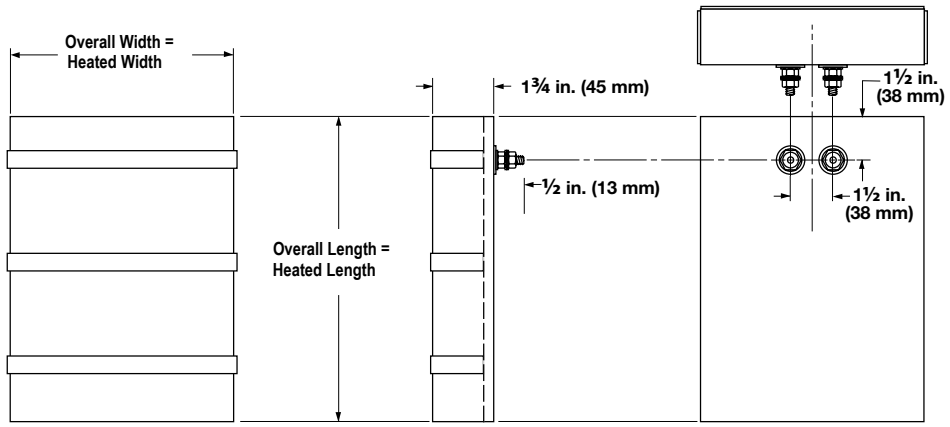
Typical peak energy wavelength: 3.5-4 microns

Note: New designs require a minimum charge per design.

Specifications

Heater Dimensions	Min.		Max.		Increments	
Width: in. (mm)	4	(102)	20	(508)	2	(50.8)
Length: in. (mm)	10	(254)	68	(1727)	0.06	(1.6)
Area: in^2 (cm^2)			864	(5574)	Any	

Note: Less than maximum length x width may exceed the maximum area.



Options

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

PanelMax Panel Heaters

PanelMax 1120

The PanelMax 1120 radiant heater panel is lightweight, yet sturdy and durable. The emitter sheath is stainless steel with a black coating providing a highly efficient radiating surface. The heater's low mass allows rapid start-up and fast response to controllers.

The patented PanelMax heater features 1 in. (25 mm) wide emitter strips which are individually replaceable for lower maintenance costs. Weighing only 5.5 lbs/ft^2 (26.8 kg/m^2), the heater is easy to mount.

Performance Capabilities

- Face temperature: 1100°F (595°C) maximum
- Watt density: 20 W/in^2 (3 W/cm^2) maximum
- Maximum voltage up to 480V
- UL® component recognized versions are available

Features and Benefits

Replaceable emitters
Reduces cost

High temperature mica
Insulates nickel chromium resistance wire, permitting longer heater life

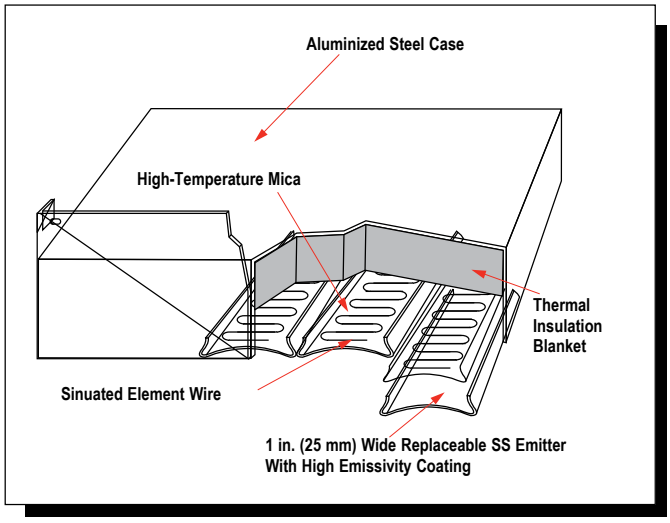
High emissivity coating on emitter strips
Improves radiant heating efficiency

$^7/_8$ in. (22.2 mm) thick thermal insulation
Backs the emitter strips to reduce backside losses

Uniform full surface heat source
Provides better, more even heat

Special requirements are easily met
Ensures availability of custom sizes and ratings

Next day shipment on RAPID SHIP heaters
Provides quick delivery to meet customer's needs



Typical Applications

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

PanelMax Panel Heaters

PanelMax 1120
Applications and Technical Data

Sizes and Ratings

Face Temperature: 1100°F (595°C) max.

Wattage: Watt densities up to 20 W/in^2 (3 W/cm^2)

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

Note: Small heaters may not be able to be built at high voltages. Contact your Heat and Sensor Tech representative to discuss specific application requirements.

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

Tolerance: ±1/16 in. (1.6 mm)

Typical Peak Energy Wavelength: 3-3.5 microns

Note: New designs require a minimum charge per design.

Specifications

Heater Dimensions	Min.	Max.	Increments
Width: in. (mm)	1 (25)	24 (610)	1 (25.0)
Length: in. (mm)	6 (152)	72 (1829)	0.06 (1.5)
Area: in^2 (cm^2)	6 (39)	864 (5574)	Any

Note: Less than maximum length x width may exceed the maximum area.

Options

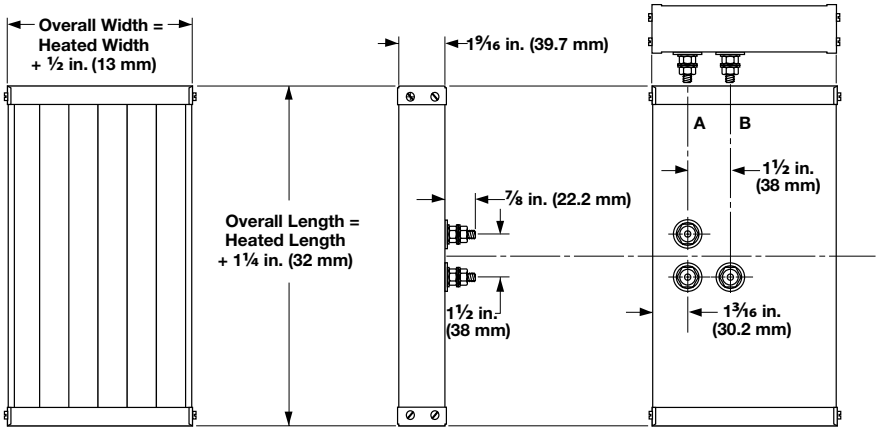
Terminal box

Thermowell

Thermocouple welded to hot face

Thermocouple pocket

Mounting studs



Panel Overall Size in. (mm) Width	Length	Panel Heated Size in. (mm) Width	Length	Volts	Watts	Watt Density W/in^2 (W/cm^2)	Approx. Net Wt. lbs (kg)	Delivery	Part Number
6 1/2 (165)	25 1/4 (641)	6 (152)	24 (610)	240	2880	20 (3.1)	6 (2.7)	RS	**P0624AX050**
12 1/2 (318)	13 1/4 (337)	12 (305)	12 (305)	240	2880	20 (3.1)	6 (2.7)	RS	**P1212AX030**
12 1/2 (318)	25 1/4 (641)	12 (305)	24 (610)	240	5760	20 (3.1)	12 (5.4)	RS	**P1224AX062**
12 1/2 (318)	49 1/4 (1251)	12 (305)	48 (1219)	480 3-phase	11,520	20 (3.1)	24 (10.8)	RS	**P1248AX073**

RAPID SHIP

RS - Next day shipment

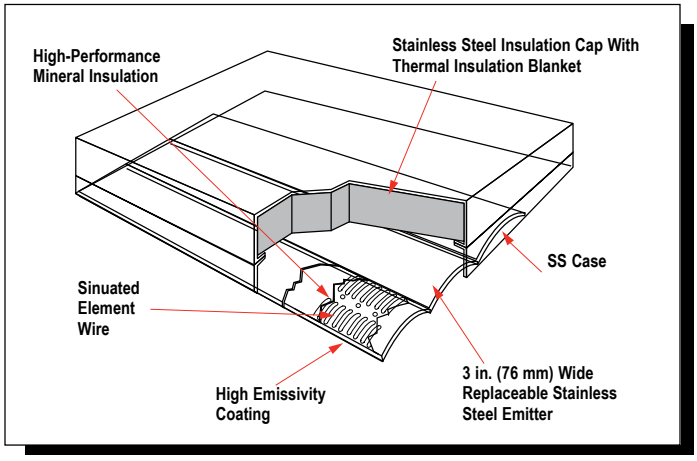
Notes: Panels are equipped with a terminal box, a thermocouple well with bayonet adapter and mounting studs.
Radiant panels must be properly applied for safe operation.
Please contact your Heat and Sensor Technology representative with the application before ordering.

PanelMax Panel Heaters

PanelMax 1330

The PanelMax 1330 is the only radiant heater featuring specially insulated heater emitter strips for higher performance. Watlow's unique compacted mineral insulation electrically insulates the element wire, creating superior heat transfer and higher operating capabilities.

The PanelMax 1330 lasts longer due to its rugged stainless steel construction. It features a high emissivity black coating and a uniform, full-surface heat source for better efficiency.



Performance Capabilities

- Maximum face temperature: 1300°F (700°C)
- Maximum watt density: 30 W/in^2 (4.7 W/cm^2)
- Typical peak energy wavelength: 3-3.6 microns
- Maximum voltage up to 480V

Features and Benefits

Field replaceable emitter strips
Eliminates the cost to buy a whole new radiant heater

Rugged metal construction
Protects the heater from contaminants

No reflectors
Eliminates cleaning and replacement

No fragile glass or ceramic elements
Prevents possible safety hazards

Backside insulation
Results in better heating efficiency

Responsive face temperature sensing options
Increases accuracy

Typical Applications

- Thermoforming plastics and composites
- Circuit board soldering
- Heat shrinking of plastic

PanelMax Panel Heaters

PanelMax 1330
Applications and Technical Data

Sizes and Ratings

Thickness: 2.46 in. (62.5 mm)

Voltage: Customer specified up to 480V. Balanced 3-phase is available on units with three or six emitters.

Note: Small heaters may not be able to be built at high voltages. Contact your Heat and Sensor Tech representative to discuss specific application requirements.

Maximum Watt Density: 30 W/in^2 (4.7 W/cm^2)

Maximum Face Temperature: 1300°F (700°C)

Typical Peak Energy Wavelength: 3 microns

Standard Tolerances: ±$^1/_{16}$ in. (1.6 mm)

Specifications

	Min.	Max.	Increments
Length: in. (mm)	12 (305)	30.5 (775)	0.06 (1.5)

Number of Emitters	Heated Width in. (mm)		Overall Width in. (mm)	
1	2.95	(75)	3.36	(85)
2	6.14	(156)	6.54	(166)
3	9.33	(237)	9.73	(247)
4	12.51	(318)	12.92	(328)
5	15.70	(399)	16.11	(409)
6	18.89	(480)	19.29	(490)

Options

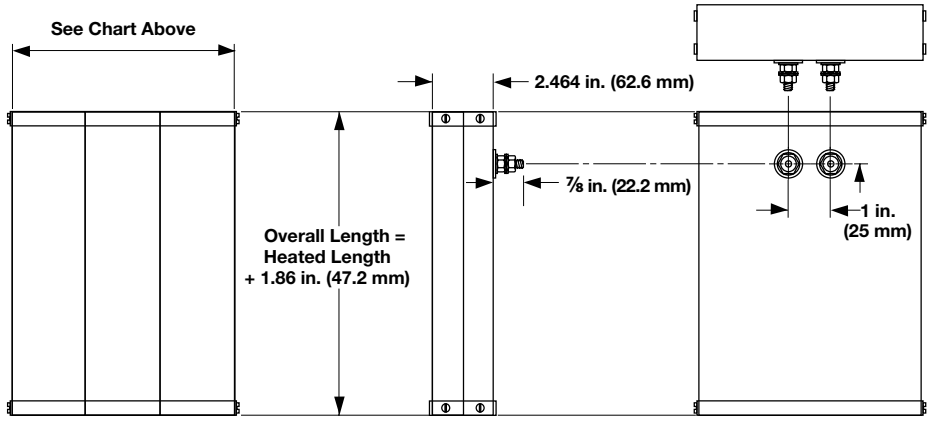
Terminal box

Thermowell

Thermocouple welded to hot face

Thermocouple pocket

Mounting studs



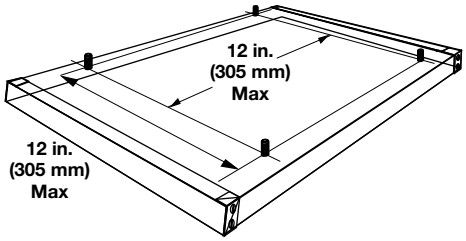
PanelMax Panel Heaters

Mounting Accessories

Mounting Studs

Standard 1/4-20 x 1 1/2 in. (38 mm) or (M6-1 x 40) steel studs are welded to the case. For best support, studs should be approximately located on 12 in. (305 mm) centers. Contact your Heat and Sensor Technology representative for exact locations on specific heaters.

Available with PanelMax 1010, 1120, and 1330

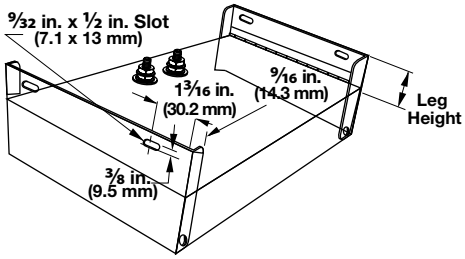


Mounting Legs

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 increments from 0.5 in. (13 mm) to 3 in. (76 mm). Slots are not provided in legs less than 1 in. (25 mm) long.

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

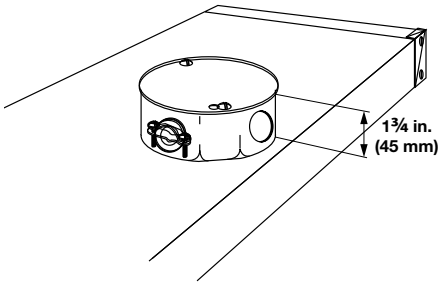
Available with PanelMax 1120
(Available as an extended capability for PanelMax 1010 and 1330.)



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 the equipment has mounting screws to connect to the slots in the mounting legs, allow for a small amount of extra length. If mounting holes are used to interface with the mounting studs on the back of the PanelMax case, make sure that the holes are oversized. Use washers and avoid overtightening the screws.

Terminal Accessories

Terminal Box

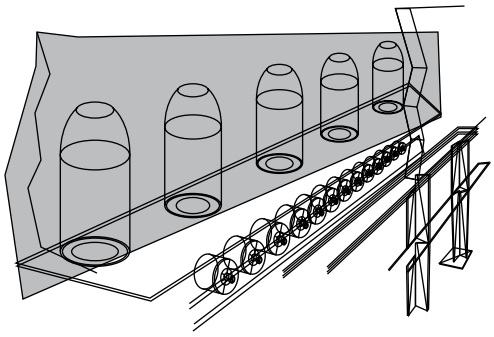


To protect electrical connections, a standard NEMA octagon terminal box is available. The standard size is 3 9/16 x 3 9/16 x 1 1/2 in. (90.5 x 90.5 x 38 mm) with knockouts for 1/2 in. (13 mm) conduit. Other NEMA sizes are available as an extended capability.

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

Available with PanelMax 1010, 1120 and 1330.

Zoning



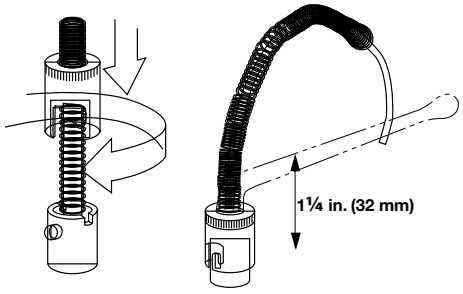
Watt densities can be varied across the entire width of PanelMax heaters. If desired, each zone can have an individually controlled power supply.

Zoning can be very valuable when part of the product requires more heat, or when it must compensate for heat losses at the edges. Separately turning off part of the heated width enables the heater to adjust for various widths of material.

Available with PanelMax 1010, 1120 and 1330.

PanelMax Panel Heaters

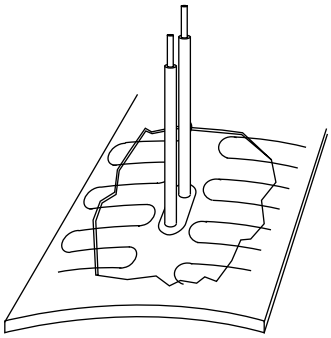
Temperature Control Thermowells



A thermowell allows a thermocouple to be used 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. A spring tension holds the tip of the thermocouple in contact for close control of the heater temperature. A thermocouple is not included.

Available with PanelMax 1010, 1120 and 1330.

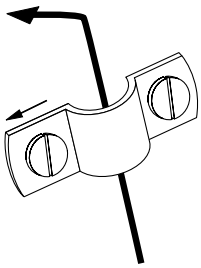
Welded Thermocouple



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 in. (305 mm).

Available with PanelMax 1330.

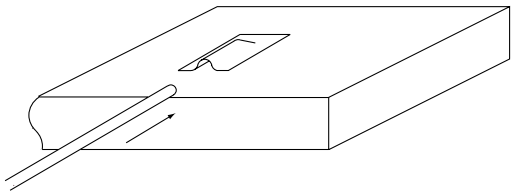
Thermocouple Clamps



A thermocouple mounting clamp can be provided on the end of the heater case. The clamp is suitable for 1/8 in. (3.2 mm) and 1/4 in. (6 mm) outside diameter sheath thermocouples bent to 90° so that the sensing tip is just above and lightly touching the hot face at an element location.

Not available for this product line.

Thermocouple Pocket



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

Available with PanelMax 1010, 1120 and 1330.

EXTENDED CAPABILITY

Extended Capability For PanelMax Panel Heaters

Specifications

PanelMax 1120

Heater Dimensions	Min.	Max.	Increments
Width: in. (mm)	24 (610)	36 (914)	1 (25.0)
Length: in. (mm)	6 (152)	94 (2388)	0.06 (1.5)
Area: in^2 (cm^2)	6 (38.7)	864 (5574.2)	Any

Note: Less than maximum length x width may exceed the maximum area.

PanelMax 1330

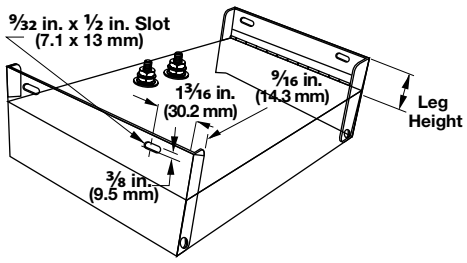
Number of Emitters	Heated Width in.	Heated Width (mm)	Overall Width in.	Overall Width (mm)
7	22.08	(560.8)	22.48	(570.9)
8	25.26	(641.6)	25.67	(652.0)

Mounting Legs

Mounting legs are extensions of the steel end caps with mounting slots for bolting directly to field support members. They can be supplied in half inch increments from 0.5 in. (13 mm) to 3 in. (76 mm). Slots are not provided in legs less than 1 in. (25 mm) long.

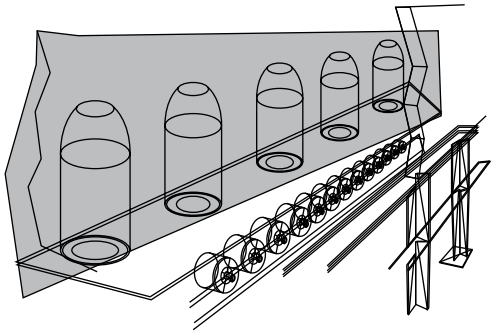
For panels over 24 in. (610 mm) long, mounting studs are recommended for the best panel support.

Available as an extended capability for PanelMax 1010 and 1330.



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 the equipment has mounting screws to connect to the slots in the mounting legs, allow for a small amount of extra length. If mounting holes are used to interface with the mounting studs on the back of the PanelMax case, make sure that the holes are oversized. Use washers and avoid overtightening the screws.

Zoning

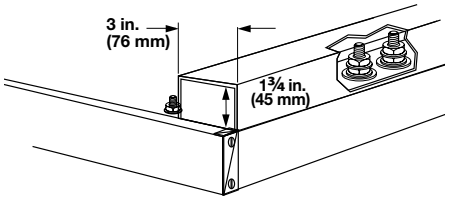


Watt densities can be varied across the entire width of PanelMax heaters. If desired, each zone can have an individually controlled power supply.

Zoning can be very valuable when part of the product requires more heat, or when it must compensate for heat losses at the edges. Separately turning off part of the heated width enables the heater to adjust for various widths of material.

Not available for this product line.

Wiring Raceway



A steel raceway provides electrical and physical protection for all terminal connections. This can be particularly useful for multi-zone panels.

Available as an extended capability for PanelMax 1010, 1120, and 1330 .