

Radiant Process Heaters



Infrared Medium Wave Panel Heaters

4 **EMITTER FACE CONSTRUCTION STYLES**
*Will Accommodate a Diverse Selection
of Process Heating Applications
Requiring the Advantages of
Medium Wave Infrared Heating*



Energy Efficient
80% of the Radiant
Energy is Transmitted to the Process

Rugged Construction
Excellent Durability
Life Expectancy of up to 25,000 Hours



Direct Retrofits for Existing Applications and Custom Design/Engineering for New Applications

Rugged Construction for Trouble Free Service

Panel Infrared Heaters are available in a complete range of standard emitter face construction styles, sizes, electrical ratings and watt densities (watts/in²) with optional thermowell only or including a type J or K thermocouple.

Ordering information and product selection can be found on pages 7-89 through 7-95.

Experience the Tempco Advantage

Panel Infrared Heaters shown on this page are a small representation of the many Custom Engineered and Manufactured designs we have produced.

If you have a special application and need free technical assistance, consult our team of professionals with your requirements.

We Welcome Your Inquiries



Radiant Process Heaters

Infrared Panel Heaters

Infrared Medium Wave Panel Heater Construction Styles

Style RPB
Black Quartz
Composite Face



High Emissivity Coating
(See page 7-90)

Style RPG
Black Glass Face



Cleanable Glass Surface
(See page 7-91)

Style RPW
High Temperature
Ceramic Glass Face



Highest Watt Density
(See page 7-92)

Style RPM
Metal Face



Cleanable Metal Surface
(See page 7-93)

Construction Characteristics

The placement of the resistance coils is carefully designed to provide uniform heat distribution.

The refractory material is backed by layers of insulation to minimize back heat loss. The standard housing is made of heavy gauge aluminized steel. Optional housing materials include 304 Stainless Steel.

The backside of the housing has a terminal box for electrical wiring with ceramic terminal bushings and stainless steel screw terminals.

Options available include: Standard quartz tube thermowell and clamp on the short side, standard Type K or J 1/8" diameter thermocouple probes and various back mounted thermowell/thermocouple combinations described on page 7-95.



DANGER: Fire Hazard

Infrared Panel Heaters are not to be used in applications where flammable vapors, gases or combustible materials are present as defined in the National Electrical Code. Do not mount the heater closer than 6 inches to any structural or surrounding material that does not have a minimum temperature rating of continuous operation at 395°F (200°C). Proper ventilation is required to expel vapors or fumes away from the process and personnel.

Design Features

- * Available in convenient standard building block sizes
- * Standard mounting screw studs (1/4-20 x 1" L) on the back side
- * Available in four emitter face styles
- * Can be ordered with standard side mounted thermowell, clamp bracket and/or Type J or K thermocouple
- * 3 different back mounted thermowell/thermocouples are available
- * Does not require external reflectors, which require maintenance
- * Voltages available include 120, 240, 480 VAC, 1 or 3 phase, dual voltage and custom
- * Maximum watt densities from 25 to 40 watts /in²
- * Multiple zones and distributed wattage in the same panel heater
- * Uniform infrared heating coverage
- * Stainless Steel power screw terminals



Note:

Not hermetically sealed.

Radiant Process Heaters



Style RPB Panel Heater

Style RPB Black Quartz Composite Face Infrared Panel Heaters



Design Features

- * Panel heater can be mounted in any direction
- * High temperature black quartz composite face
- * High temperature black coating
- * Precision wound resistance wire
- * Heavy gauge aluminized steel enclosure box standard
Optional: 304 Stainless Steel
- * Optional: quartz thermowell tube
Standard: side mount with clamp
Optional-3 back mounted styles
- * Refractory blanket insulation
- * Stainless Steel power screw terminals
- * Mounting screw studs
Standard: 1/4-20 x 1"L
- * Electrical junction box, standard

Construction Characteristics

Tempco Style RPB panel infrared heaters have a woven silica quartz composite surface that is transparent to radiant energy and is coated with a high temperature black coating for high emissivity.

The resistance wire is helically wound from a high temperature iron/chromium/aluminum alloy. A uniform pattern across the face is milled out in the high temperature ceramic fiberboard, and the resistance coil is cemented in place. Refractory blanket insulation backs up the fiberboard face assembly.

Tempco Style RPB Radiant Heaters can transmit up to 79.5% of the input energy and can be positioned as close as 2 to 4" from the material being heated.

Typical Applications

- ➔ Thermoforming
- ➔ Paint Drying
- ➔ Ink Drying
- ➔ Curing of Plastic Coatings
- ➔ Silk Screen Painting
- ➔ Food Warming
- ➔ Laminating

SPECIFICATIONS

Maximum Size: In addition to the standard sizes listed below; custom sizes up to 30"W x 84"L can be manufactured.

Thickness: Standard — 3", Optional — 1.5" to 5"

Maximum Watt Density: 25 Watts/in²

Maximum Voltage: Voltage can be single, dual or 3-phase up to 600 VAC (depending on heater size and wattage)

Maximum Face Temperature: 900°C (1652°F)

Wavelength Range: Between 2.5 and 6.0 microns (μm)

Distributed Wattage and Zoning: Yes, dependent on size

Infrared / Convection Radiant Panels

RPB Radiant Panels can also be supplied for combination radiant/convection applications. Holes are drilled in a uniform pattern in the face of the panel to allow air flow from the rear plenum. A 3" hole is typically provided in the rear panel for mounting a blower or ductwork. Submit your requirements to Tempco.

Standard (Non-Stock) Sizes and Ratings of Style RPB Black Face Infrared Heaters

To complete the part numbers below, include the designated number that applies to the following options:

0 = Plain, no thermowell or T/C **1** = Thermowell only **2** = Thermowell and type K T/C **3** = Thermowell and type J T/C
Available Thermowell/Thermocouple types and descriptions can be found on page 7-95.

For the part numbers below, if a thermowell is specified, the standard Side Mount Thermowell with Clamp is supplied.

Width		Length		15W/in ²				25W/in ²			
in	mm	in	mm	Watts	Volts	Ph.	Part Number	Watts	Volts	Ph.	Part Number
6	152	12	305	1080	120	1	RPB0101__	1800	240/480	1	RPB0201__
6	152	18	457	1620	240	1	RPB0102__	2700	240/480	1	RPB0202__
6	152	24	610	2160	240/480	1	RPB0103__	3600	240/480	1	RPB0203__
6	152	30	762	2700	240/480	1	RPB0104__	4500	240/480	1	RPB0204__
12	305	12	305	2160	240/480	1	RPB0107__	3600	240/480	1	RPB0207__
12	305	18	457	3240	240/480	1	RPB0108__	5400	240/480	1	RPB0208__
12	305	24	610	4320	240/480	1	RPB0109__	7200	240	3	RPB0209__
12	305	30	762	5400	240/480	1	RPB0110__	9000	240	3	RPB0210__
12	305	36	914	6480	240	3	RPB0111__	10800	480	3	RPB0211__
12	305	48	1219	8640	240	3	RPB0112__	14400	480	3	RPB0212__
18	457	18	457	4860	240/480	1	RPB0117__	8100	240	3	RPB0217__
24	610	24	610	8640	240	3	RPB0118__	14400	480	3	RPB0218__



Radiant Process Heaters

Style RPG Panel Heater

Style RPG High Temperature Glass Face Infrared Panel Heaters



Design Features

- * Panel heater can be mounted in any direction
- * High temperature transparent red/black glass emitter face
- * Precision wound resistance wire
- * Milled ceramic fiberboard to hold resistance wire, cemented in place
- * Heavy gauge aluminized steel enclosure box standard
Optional: 304 Stainless Steel
- * Optional: quartz thermowell tube
Standard: side mount with clamp
Optional-3 back mounted styles
- * Refractory blanket insulation
- * Stainless Steel power screw terminals
- * Mounting screw studs
Standard: 1/4-20 x 1" L
- * Electrical junction box, standard

Construction Characteristics

The Tempco Style RPG Radiant Panel Heater has a red/black high temperature ceramic glass for the exterior radiant surface. The RPG Radiant Panel Heater is the ideal heater when a cleanable surface is required, such as for the bottom heaters of a thermoforming oven.

Behind the glass, a 1" thick ceramic fiberboard is milled out to support the helically wound iron/chromium/aluminum alloy based resistance element. The resistance coils are placed into the precision machined grooves in the fiberboard and cemented into place. Ceramic cloth is placed between the glass and the resistance coil.

Tempco Style RPG Radiant Heaters can transmit up to 78.5% of the input energy and can be positioned as close as 2 to 4" from the material being heated.

Typical Applications

- ↔ Moisture Removal
- ↔ Paint Drying
- ↔ Glass Processing
- ↔ Curing of plastic coatings, paint, ink, etc.
- ↔ Thermoforming
- ↔ Heat Setting
- ↔ Film Shrinking
- ↔ Blister Packaging
- ↔ Food Processing
- ↔ Textile Drying

SPECIFICATIONS

Maximum Size: In addition to the standard sizes listed below; custom sizes up to 34"W x 36"L can be manufactured.

Thickness: Standard — 3", Optional — 1.5" to 5"

Maximum Watt Density: 20 Watts/in²

Maximum Voltage: Voltage can be single, dual or 3-phase up to 600 VAC (depending on heater size and wattage)

Maximum Face Temperature: 750°C (1382°F)

Wavelength Range: Between 2.5 and 6.0 microns (μm)

Distributed Wattage and Zoning: Yes, dependent on size

Standard (Non-Stock) Sizes and Ratings of Style RPG High Temperature Glass Infrared Heaters

To complete the part numbers below, include the designated number that applies to the following options:

0 = Plain, no thermowell or T/C **1** = Thermowell only **2** = Thermowell and type K T/C **3** = Thermowell and type J T/C
Available Thermowell/Thermocouple types and descriptions can be found on page 7-95.

For the part numbers below, if a thermowell is specified, the standard Side Mount Thermowell with Clamp is supplied.

Width		Length		10W/in ²			15W/in ²				
in	mm	in	mm	Watts	Volts	Ph.	Part Number	Watts	Volts	Ph.	Part Number
6	152	12	305	720	120	1	RPG0101__	1080	120/240	1	RPG0201__
6	152	18	457	1080	120/240	1	RPG0102__	1620	240	1	RPG0202__
6	152	24	610	1440	120/240	1	RPG0103__	2160	240/480	1	RPG0203__
12	305	12	305	1440	120/240	1	RPG0104__	2160	240/480	1	RPG0204__
12	305	18	457	2160	240/480	1	RPG0105__	3240	240/480	1	RPG0205__
12	305	24	610	2880	240/480	1	RPG0106__	4320	240/480	1	RPG0206__
16	406	24	610	3840	240/480	1	RPG0107__	5760	240/480	1	RPG0207__
24	610	24	610	5760	240	1	RPG0108__	8640	480	1	RPG0208__

Radiant Process Heaters



Style RPW Panel Heater

Style RPW Very High Temperature Ceramic Glass Face Infrared Panel Heaters



Design Features

- * Panel heater can be mounted in any direction
- * High temperature white translucent glass emitter surface
- * Precision wound resistance wire
- * Milled ceramic fiberboard to hold resistance wire, cemented in place
- * Heavy gauge aluminized steel enclosure box standard
Optional: 304 Stainless Steel
- * Optional: quartz thermowell tube
Standard: side mount with clamp
Optional-3 back mounted styles
- * Refractory blanket insulation
- * Stainless Steel power screw terminals
- * Mounting screw studs
Standard: 1/4-20 x 1"L
- * Electrical junction box, standard

Construction Characteristics

Tempco Style RPW Radiant Panel Heaters use a very high temperature ceramic glass for the emitter surface. The RPW Radiant Panel Heater is the perfect heater when a cleanable surface is required at a higher watt density

Behind the very high temperature glass, a 1" thick ceramic fiber refractory board is milled out in a uniform pattern to accept the helically wound iron/chromium/aluminum alloy resistance element. The resistance coils are set into the precision machined grooved board and cemented into place. A ceramic cloth is placed between the very high temperature glass and the resistance coils.

Tempco Style RPW Radiant Heaters can transmit up to 78.5% of the power input as infrared energy.

Typical Applications

- Moisture Removal
- Paint Drying
- Glass Processing
- Curing of plastic coatings, paint, ink, etc.
- Thermoforming
- Heat Setting
- Film Shrinking
- Blister Packaging
- Food Processing
- Toasting
- Textile Drying

SPECIFICATIONS

Maximum Size: In addition to the standard sizes listed below; custom sizes up to 24"W x 24"L can be manufactured.

Thickness: Standard — 3", Optional — 1.5" to 5"

Maximum Watt Density: 40 Watts/in²

Maximum Voltage: Voltage can be single, dual or 3-phase up to 600 VAC (depending on heater size and wattage)

Maximum Face Temperature: 800°C (1472°F)

Wavelength Range: Between 2.5 and 6.0 microns (μm)

Distributed Wattage and Zoning: Yes, dependent on size

Standard (Non-Stock) Sizes and Ratings of Style RPW Very High Temperature Glass Infrared Heaters

To complete the part numbers below, include the designated number that applies to the following options:

0 = Plain, no thermowell or T/C **1** = Thermowell only **2** = Thermowell and type K T/C **3** = Thermowell and type J T/C
Available Thermowell/Thermocouple types and descriptions can be found on page 7-95.

For the part numbers below, if a thermowell is specified, the standard Side Mount Thermowell with Clamp is supplied.

Width		Length		40W/in ²			Part Number
in	mm	in	mm	Watts	Volts	Ph.	
4	102	10	254	1600	240	1	RPW0101__
6	152	10	254	2400	240/480	1	RPW0102__
6	152	12	305	2880	240/480	1	RPW0103__
8	203	10	254	3200	240/480	1	RPW0104__
10	254	10	254	4000	240/480	1	RPW0105__
12	305	10	254	4800	240/480	1	RPW0106__
12	305	12	305	5760	240/480	1	RPW0107__



Radiant Process Heaters

Style RPM Panel Heater

Style RPM Metal Face Infrared Panel Heaters



Design Features

- * Panel heater can be mounted in any direction
- * Metal emitter face
Stainless steel with black finish
- * Precision wound resistance wire
- * Milled ceramic fiberboard to hold resistance wire, cemented in place
- * Heavy gauge aluminized steel enclosure box standard
Optional: 304 Stainless Steel
- * Optional: quartz thermowell tube
Standard: side mount with clamp
Optional-3 back mounted styles
- * Refractory blanket insulation
- * Stainless Steel power screw terminals
- * Mounting screw studs
Standard: 1/4-20 x 1"L
- * Electrical junction box, standard

Construction Characteristics

Tempco Style RPM Radiant Panel Heaters have a stainless steel metal with a black finish for the emitter surface. The RPM Radiant Panel Heater is a good heater when a cleanable surface and a robust design is required.

The ceramic fiber refractory board is milled out in a uniform pattern to accept the helically wound iron/chromium/aluminum alloy resistance element. The resistance coils are set into the precision machined grooved board and cemented into place. A ceramic cloth is placed between the metal face and the resistance coils.

Tempco Style RPM Radiant Heaters can transmit up to 65.0% of the power input as infrared energy. They can be positioned as close as 2 to 4" from the material being heated.

Typical Applications

- Thermoforming
- Paint Drying
- Ink Drying
- Curing of Plastic Coatings
- Silk Screen Painting
- Food Warming
- Heat Setting
- Film Shrinking
- Blister Packaging

SPECIFICATIONS

Maximum Size: In addition to the standard sizes listed below, custom sizes up to 24"W x 48"L can be manufactured.

Thickness: Standard — 3", Optional — 1.5" to 5"

Maximum Watt Density: 15 Watts/in²

Maximum Voltage: Voltage can be single, dual or 3-phase up to 600 VAC (depending on heater size and wattage)

Maximum Face Temperature: 700°C (1292°F)

Wavelength Range: Between 3.0 and 6.0 microns (μm)

Distributed Wattage and Zoning: Yes, dependent on size

Standard (Non-Stock) Sizes and Ratings of Style RPM Metal Face (SS) Infrared Heaters

To complete the part numbers below, include the designated number that applies to the following options:

0 = Plain, no thermowell or T/C **1** = Thermowell only **2** = Thermowell and type K T/C **3** = Thermowell and type J T/C
Available Thermowell/Thermocouple types and descriptions can be found on page 7-95.

For the part numbers below, if a thermowell is specified, the standard Side Mount Thermowell with Clamp is supplied.

Width		Length		10W/in ²				15W/in ²			
in	mm	in	mm	Watts	Volts	Ph.	Part Number	Watts	Volts	Ph.	Part Number
6	152	12	305	720	120	1	RPM0101__	1080	120/240	1	RPM0201__
6	152	18	457	1080	120/240	1	RPM0102__	1620	240	1	RPM0202__
6	152	24	610	1440	120/240	1	RPM0103__	2160	240/480	1	RPM0203__
12	305	12	305	1440	120/240	1	RPM0104__	2160	240/480	1	RPM0204__
12	305	18	457	2160	240/480	1	RPM0105__	3240	240/480	1	RPM0205__
12	305	24	610	2880	240/480	1	RPM0106__	4320	240/480	1	RPM0206__
16	406	24	610	3840	240/480	1	RPM0107__	5760	240/480	1	RPM0207__
24	610	24	610	5760	240	1	RPM0108__	8640	480	1	RPM0208__

Radiant Process Heaters

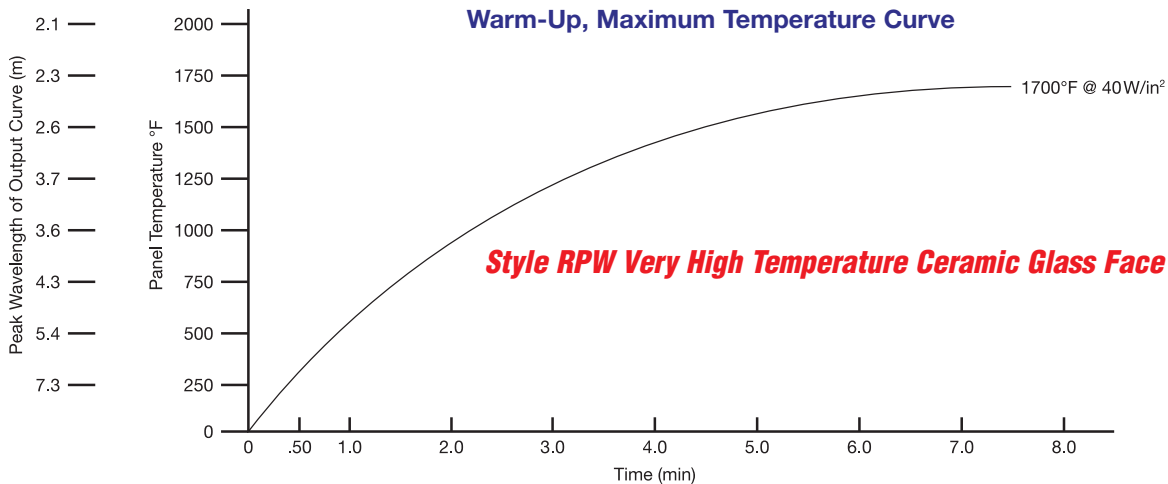
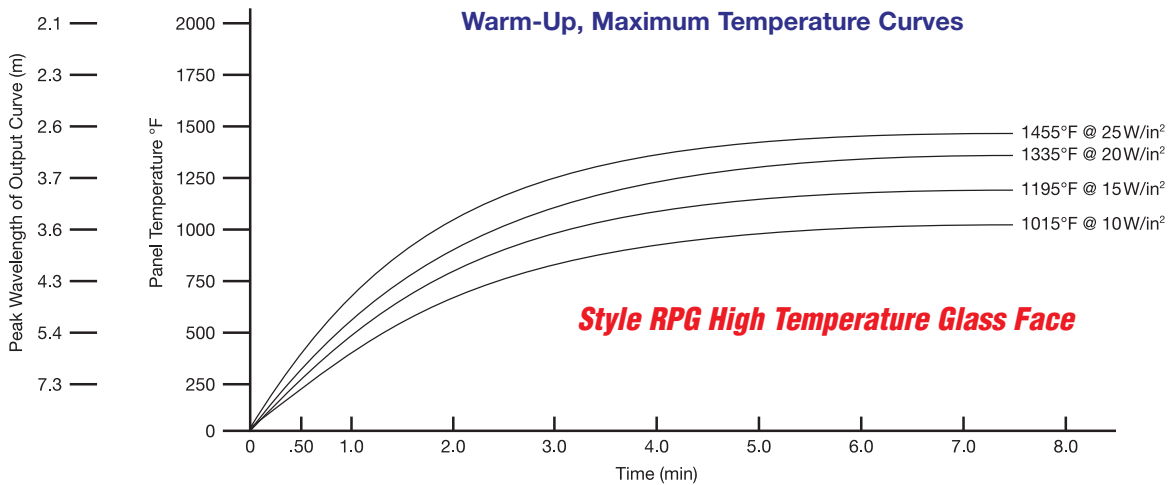
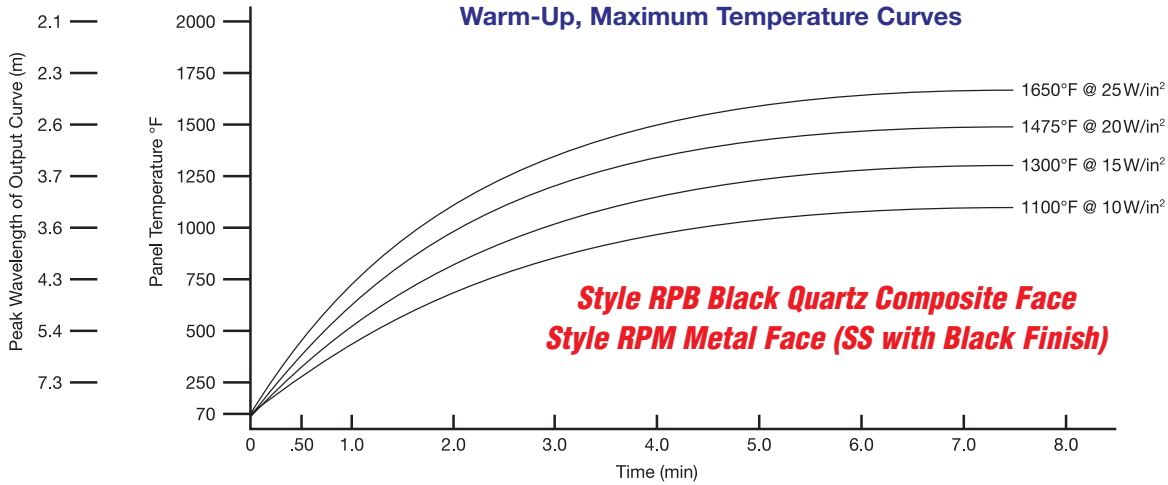


Panel Heater Technical Reference

Infrared Medium Wave Panel Heater Warm-Up Curves

Warm-up curves are measured from heaters running facedown in open air. The thermocouple is located in the standard location, in the thermowell located behind the coil. The curves will change with environment and thermocouple location.

The curves are also useful in determining what the potential maximum temperature and peak wavelength are for various watt density heaters.





Radiant Process Heaters

Panel Heater Options

Infrared Panel Heater Options

Construction Options

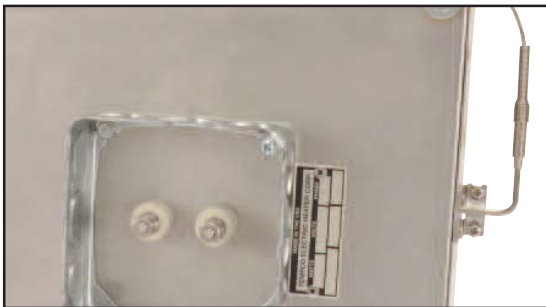
The standard enclosure case is aluminized steel. Aluminized steel is the optimum choice for most applications. It will reach 650°C/1200°F without discoloring or degrading.

304 Stainless Steel is available when cleanliness is of the utmost importance. (Note: 304 SS will discolor at a lower temperature than aluminized steel).

Rivets are normally used to hold the case together. In addition to the side slots, this allows for expansion/contracting of the case and minimizes potential warping. There are applications that require minimal potential particulate matter. For these applications the side slots are not put in and the metal seams can be welded closed.



Thermowell/Thermocouple Temperature Sensing Options



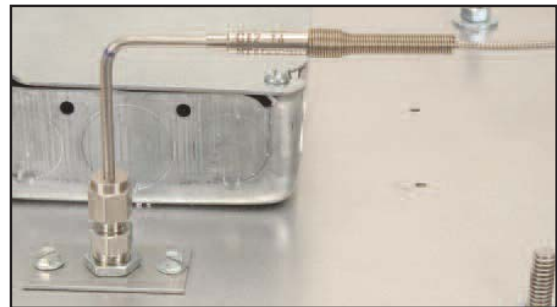
Standard Side Mount Thermowell with Clamp

The standard Side Mount Thermowell with Clamp is a 5" long, 4 mm ID quartz glass tube, installed in the short side of the panel, just behind the resistance coil. The screw pressure clamp and thermowell are designed to hold a 0.125" diameter probe.

Replacement TC Probes (with 48" leads, SS overbraid)

Type K — Part Number MTA00839

Type J — Part Number MTA00840



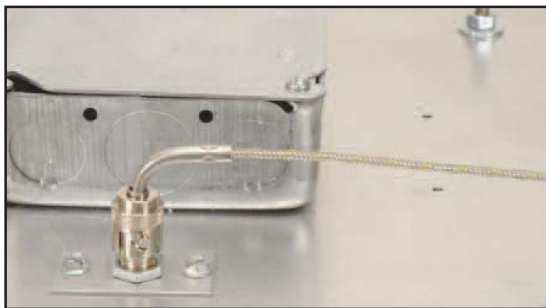
Back Mount Thermowell with Compression Fitting

The optional Back Mount Thermowell with Adjustable Compression Fitting is a short, 4 mm ID quartz glass tube, mounted perpendicular to the face with a ceramic disk at the bottom. The compression fitting and glass tube are sized for a 0.125" diameter probe.

Replacement TC Probes (with 48" leads, SS overbraid)

Type K — Part Number MTA00839

Type J — Part Number MTA00840



Back Mount Thermowell with Bayonet Fitting

The optional Back Mount Thermowell with Bayonet Fitting is a short, 8 mm ID quartz glass tube, mounted perpendicular to the face with a ceramic disk at the bottom. The bayonet fitting and glass tube are sized for a 0.187" diameter probe.

Replacement TC Probes (with 48" leads, SS overbraid)

Type K — Part Number TCP50270

Type J — Part Number TCP50269



Back Mount Thermowell – Parallel to Face

The optional Back Mount Thermowell (Parallel to Face) is a 5", 6 mm ID quartz glass tube with a soft 90° bend, mounted along the face, exiting in the rear. A maximum 0.063" diameter probe is required to make the bend. Screws and ceramic spacers are provided.

Replacement TC Probes (with connector set)

Type K — Part Number MTA01546

Type J — Part Number MTA01775