Sealed IR Quartz Lamps

**LAMP GLASS TYPES**

- **Clear:** Standard
- **Ruby:** Reduces Glare
- **Translucent:** Reduces Glare
- **Frosted:** Reduces Glare
- **Gold Reflector:** Redirects heat toward target for increased efficiency.
- **White Reflector:** Redirects heat toward target for increased efficiency similar to gold, but will not degrade over time at high temperatures.

**Filament Temperature Ratings**

<table>
<thead>
<tr>
<th>Filament Type</th>
<th>Near Infrared (NIR)</th>
<th>Short Wave (SW)</th>
<th>Fast Response Medium Wave (FRMW) High Temperature</th>
<th>Fast Response Medium Wave (FRMW) Low Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Response</td>
<td>1 second</td>
<td>1 second</td>
<td>1-2 seconds</td>
<td>1-2 seconds</td>
</tr>
<tr>
<td>Filament Temperature</td>
<td>2900K/4800°F</td>
<td>2500K/4000°F</td>
<td>1900K/2900°F</td>
<td>1500K/2200°F</td>
</tr>
<tr>
<td>Approximate Peak Wavelength</td>
<td>1.0μm</td>
<td>1.2μm</td>
<td>1.6μm</td>
<td>2.0μm</td>
</tr>
<tr>
<td>Maximum watts/inch per Filament</td>
<td>200</td>
<td>200</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Average Lifetime (Hours)</td>
<td>2000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
</tr>
</tbody>
</table>

**SPECIFICATIONS**

- **Max. Temperature:** 350°C — End Seal
  - 900°C — Quartz Tube and optional White Ceramic Reflective Layer
  - 800°C — Optional Gold Reflective Layer
- **Max. Voltage:** 600 Volts depending on design

**Design Features**

- *Fast Filament Response*
- *High Power Densities possible — up to 200 watts per inch per filament*
- *Different filament temperatures available to suit different materials*

- *Optional white or gold reflective layer on lamps redirects heat towards target material*
- *Single or twin-tube construction*
- *Contour bending available*

*Sealed IR Quartz Lamps*
Lamp Terminations

Select the termination style that meets your requirements.

**Type R7s**  Recessed Single Contact

- Minimum Unheated Length: 1.12"
- Standard

**Type R7W**  R7S + Lead Wire

- 1.12"

**Type F**  Flat Ceramic + Lead Wire (No Cement)

- .59" .35" Thick
- .81" .125"

**Type FX**  Flat Ceramic + Lead Wire (Fixed with Cement)

- .23" Thick

**TYPE U**  Metal Clip + Lead Wire

- .61" .1.12"

**Type X**  Metal Tabs with Mounting Holes & Slots

- .50" .39" .78" .98" 4.00" .23" Thick

**Type W**  Lead Wire Only (Bare Wire Shown)

- 1.00"
- .394" Thick

**Type RC**  Round Ceramic

- 1.12"
## Radiant Process Heaters

### Sealed IR Quartz Lamps

Filament color temperature is 2500K and lead wire terminations have 145 mm (5-11/16") of uninsulated wire unless otherwise noted.

<table>
<thead>
<tr>
<th>Wattage</th>
<th>Voltage</th>
<th>Overall Length (in)</th>
<th>Heated Length (in)</th>
<th>Base Type</th>
<th>Burning</th>
<th>Glass Type</th>
<th>Special Notes</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>120</td>
<td>8.46 215.0</td>
<td>4.17 106.0</td>
<td>U</td>
<td>V</td>
<td>Clear</td>
<td></td>
<td>LMP00001</td>
</tr>
<tr>
<td>300</td>
<td>120</td>
<td>8.43 214.0</td>
<td>4.17 106.0</td>
<td>U</td>
<td>H</td>
<td>Translucent</td>
<td></td>
<td>LMP00002</td>
</tr>
<tr>
<td>375</td>
<td>120</td>
<td>8.69 220.6</td>
<td>5.06 128.6</td>
<td>R7s</td>
<td>V</td>
<td>Clear</td>
<td></td>
<td>LMP00003</td>
</tr>
<tr>
<td>500</td>
<td>120</td>
<td>8.50 216.0</td>
<td>5.06 128.6</td>
<td>R7s</td>
<td>H</td>
<td>Frosted</td>
<td></td>
<td>LMP00004</td>
</tr>
<tr>
<td>500</td>
<td>120</td>
<td>8.66 220.0</td>
<td>5.00 127.0</td>
<td>R7s</td>
<td>V</td>
<td>Translucent</td>
<td></td>
<td>LMP00005</td>
</tr>
<tr>
<td>500</td>
<td>120</td>
<td>8.69 220.6</td>
<td>4.84 123.0</td>
<td>R7s</td>
<td>V</td>
<td>Clear</td>
<td></td>
<td>LMP00006</td>
</tr>
<tr>
<td>500</td>
<td>120</td>
<td>8.81 223.8</td>
<td>4.84 123.0</td>
<td>U</td>
<td>H</td>
<td>Clear</td>
<td></td>
<td>LMP00007</td>
</tr>
<tr>
<td>500</td>
<td>240</td>
<td>8.69 220.6</td>
<td>5.06 128.6</td>
<td>R7W</td>
<td>H</td>
<td>Clear</td>
<td></td>
<td>LMP00008</td>
</tr>
<tr>
<td>500</td>
<td>240</td>
<td>8.96 227.5</td>
<td>6.50 165.0</td>
<td>Fx</td>
<td>H</td>
<td>Clear</td>
<td>Teflon® Insulated Lead Wire (with #10 Spade Terminal)</td>
<td>LMP00009</td>
</tr>
<tr>
<td>1000</td>
<td>208</td>
<td>13.63 346.2</td>
<td>10.06 255.5</td>
<td>R7s</td>
<td>H</td>
<td>Clear</td>
<td></td>
<td>LMP00010</td>
</tr>
<tr>
<td>1000</td>
<td>240</td>
<td>11.93 303.0</td>
<td>10.00 254.0</td>
<td>U</td>
<td>H</td>
<td>Clear</td>
<td></td>
<td>LMP00011</td>
</tr>
<tr>
<td>1000</td>
<td>240</td>
<td>12.63 346.2</td>
<td>10.06 255.5</td>
<td>R7s</td>
<td>H</td>
<td>Clear</td>
<td></td>
<td>LMP00012</td>
</tr>
<tr>
<td>1000</td>
<td>240</td>
<td>13.81 350.8</td>
<td>10.00 254.0</td>
<td>U</td>
<td>V</td>
<td>Translucent</td>
<td>Teflon® Insulated Lead Wire (with #10 Spade Terminal)</td>
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<td>10.71 272.0</td>
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<td>H</td>
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<td>Clear</td>
<td>LMP00014</td>
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<tr>
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<td>240</td>
<td>13.98 355.0</td>
<td>10.71 272.0</td>
<td>Fx</td>
<td>H</td>
<td>Translucent</td>
<td>Clear</td>
<td>LMP00015</td>
</tr>
<tr>
<td>1000</td>
<td>240</td>
<td>19.09 485.0</td>
<td>10.71 272.0</td>
<td>X</td>
<td>H</td>
<td>White Reflector</td>
<td>Clear</td>
<td>LMP00016</td>
</tr>
</tbody>
</table>

### Terminations Key
- F = Flat ceramic (no cement)
- FX = Flat ceramic (fixed with cement)
- X = Metal tab & holes & slot
- U = Metal sleeve + wire
- R7s = Recessed single contact
- RC = Round ceramic + lead wire
- W = Lead wire only - no base
- H = Horizontal use only
- V = Horizontal or vertical use

### View Product Inventory @ www.tempco.com
Radiant Process Heaters

Sealed IR Quartz Lamps

Worksheet for Sealed IR Quartz Lamps

1.) Heater Specifications:

- Filament Temperature:
  - Standard FRMW = 1500K
  - High Temperature FRMW = 1900K
  - Standard Halogen = 2500K
  - NIR Halogen = 2900K
  - Other _______

- Tube Cross Section:
  - Single Round Tube
  - Twin Bore Tube

- Tube Shape
  - Straight
  - Special Bend Configuration

- Tube Color:
  - Clear (Standard)
  - Ruby
  - Translucent
  - Frosted Ruby
  - Frosted (Sandblasted) Clear

- Maximum Overall Length (Inches) ______

- Heated Length (Inches) ______

- Built-In Reflector:
  - No Reflector
  - White Reflector
  - Gold Reflector

2.) Electrical requirements:

- Voltage:
  - 120
  - 240
  - 277
  - 480
  - Other ______

- Wattage

3.) Termination Types:

- Single Tube Bases
  - R7s
  - R7W
  - RC
  - X
  - F
  - FX
  - U
  - Other ______

- Twin Tube Bases
  - Ceramic with straight exit leads (Standard)
  - Other ______

- Lead Wire Type
  - Bare Wire (Standard)
  - Teflon®@200°C
  - Fiberglass@250°C
  - Mica@450°C

- Lead Length 5.7" (Standard)______ (Note: Type R7s and X do not have leads)

- Terminal Options
  - None (Standard)
  - #10 Ring Terminal
  - #10 Spade Terminal
  - Other ______

4.) Panel wiring & control options:

- Tempco to supply array panel
- Factory wired per customer specs & wiring diagram
- Tempco Engineering to design internal wiring & determine line input requirements
- Tempco to supply turnkey power control panel(s)

5.) Any special features required?

6.) Application Data:

Type of application and physical properties of processed materials

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**WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov.
QRH Quartz Lamp Radiant Heaters

QRH Single Quartz Lamp Radiant Heater Assemblies

Designed for use in applications that require instant on/off response with rapid heat-up and cooldown rates. These heater assemblies are designed to operate in the short wavelength range of 2.5-1.2 microns (1600 to 4000°F peak emitter temperatures). These Universal 2000 Modular Housing assemblies utilize T3 (10mm) LMP sealed lamps.

These rugged short wavelength units contain double ended lamps having quick connect RSC/R7s bases for easy lamp access without disassembly of housing or removing heater from installation. The Quartz IR heat lamps are mounted at the focal point of a polished aluminum reflector within the housing. These units are available in a variety of sizes and power combinations.

Design Features

✴ Direct Retrofit into existing NEMA 1 applications
✴ Rugged Universal 2000 anodized aluminum housing
✴ Wattage range of 375W to 3800W in standard designs
✴ 110-600V voltages available depending on heated length
✴ Power density range of 65-220 w/in available; contact Tempco
✴ RSC/R7s quick connect lamp terminations (8 amps maximum per lamp)
✴ Maximum lamp length 41 inches, minimum 8 inches
✴ Fast response, immediate on/off, 20-40 sec for full heat-up
✴ Full cooldown in less than 3-6 minutes
✴ Single end wiring option available
✴ Utilizes standard TRH removable guard designs
✴ Custom dual lamp units up to 48" OAL housing length are available

Installation Notes:

These units are for horizontal installation only.

Lamp sockets are prewired in terminal enclosures with 16ga 600V rated conductors. Wires or connectors used for line connections inside junction boxes should be rated 200°C or higher, and sized per NEC/NFPA for unit voltage and amperage ratings.

Wiring used inside the internal wireways as crossover wiring must be rated 450°C or higher. Termination temperature at the exposed lamp cold ends must not exceed 650°F (343°C). Lamps should be shielded from direct visual observation due to their intense brightness when operating.

Initial inrush current will be 10 to 15 times the steady state current. Choose appropriate fuses for this heater assembly. Lamps should be operated within +/- 10% of rated voltage with minimal cycling to ensure long life. Operating outside this voltage range may cause internal degasification and discoloration of the lamp sheath, promoting premature element failure. When using copper wiring for field wiring, use only nickel plated or nickel clad conductors. Unplated or silver plated copper must not be used.

Standard Design (Non–Stock) QRH1 Series Single T3 Lamp Double End RSC Termination

<table>
<thead>
<tr>
<th>Wattage</th>
<th>Volts</th>
<th>Housing Overall Length in mm</th>
<th>Lamp Heated Length in mm</th>
<th>Lamp watts/inch</th>
<th>Part Number without Guard</th>
<th>Part Number with Guard</th>
<th>Replacement Lamp Part Number</th>
<th>Replacement Protective Wire Guard</th>
<th>Replacement Reflectors Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>375</td>
<td>115/120</td>
<td>16</td>
<td>5.06</td>
<td>128.5</td>
<td>QRH10001</td>
<td>QRH100010</td>
<td>LMP00003</td>
<td>GRD-104-125</td>
<td>SMPR-1111</td>
</tr>
<tr>
<td>500</td>
<td>115/120</td>
<td>16</td>
<td>5.06</td>
<td>128.5</td>
<td>QRH10002</td>
<td>QRH100011</td>
<td>LMP00006</td>
<td>GRD-104-125</td>
<td>SMPR-1111</td>
</tr>
<tr>
<td>1000</td>
<td>208</td>
<td>21</td>
<td>9.81</td>
<td>249.2</td>
<td>QRH10003</td>
<td>QRH100012</td>
<td>LMP00017</td>
<td>GRD-104-126</td>
<td>SMPR-1113</td>
</tr>
<tr>
<td>1000</td>
<td>220/240</td>
<td>21</td>
<td>9.81</td>
<td>249.2</td>
<td>QRH10004</td>
<td>QRH100013</td>
<td>LMP00017</td>
<td>GRD-104-126</td>
<td>SMPR-1113</td>
</tr>
<tr>
<td>1000</td>
<td>277</td>
<td>27</td>
<td>16.00</td>
<td>406.4</td>
<td>QRH10005</td>
<td>QRH100015</td>
<td>LMP00025</td>
<td>GRD-104-127</td>
<td>SMPR-1113</td>
</tr>
<tr>
<td>1600</td>
<td>220/240</td>
<td>27</td>
<td>16.00</td>
<td>406.4</td>
<td>QRH10006</td>
<td>QRH100016</td>
<td>LMP00028</td>
<td>GRD-104-127</td>
<td>SMPR-1113</td>
</tr>
<tr>
<td>2500</td>
<td>460/480</td>
<td>36</td>
<td>25.06</td>
<td>636.5</td>
<td>QRH10008</td>
<td>QRH100017</td>
<td>LMP00028</td>
<td>GRD-104-107</td>
<td>SMPR-1113</td>
</tr>
<tr>
<td>3800</td>
<td>550/575</td>
<td>48</td>
<td>37.00</td>
<td>939.8</td>
<td>QRH10009</td>
<td>QRH100018</td>
<td>LMP00053</td>
<td>GRD-104-108</td>
<td>SMPR-1123</td>
</tr>
</tbody>
</table>

Danger: Hazard of Fire  Do not mount heater closer than 6" to any combustible or structural material that does not have at least a 200°C continuous temperature rating.

These heaters are not for use in atmospheres where flammable or combustible vapors, dust, gases, or liquids are present as defined in the National Electrical Code. Where solvents, water vapor or other VOCs are being evaporated from the process, it is necessary to provide substantial quantities of ventilating air to remove all resulting vapors.

View Product Inventory @ www.tempco.com
Radiant Process Heaters

QRH Quartz Lamp Radiant Heaters

Standard Double-End Wiring

Attach properly rated line input wires to both element ends using the nickel-plated steel ring crimp connectors provided. Solid or stranded conductors can be used.

NOTE:
Allow for element movement when wiring inside this end.

To external wiring connections in remote junction box in area not exceeding 300°F (for copper wire)

Single phase line voltage input with ground

Optional Single End-Wiring

CAUTION: Do not cut or connect to this wire inside QRH housing.
For connection to field wiring within external junction box only.

Single return wire rated for 842°F (450°C), 600V is supplied in internal wireway for line input at ground lug end.

External wiring connection in remote junction box in area not exceeding 300°F (for copper wire)

Wireway conductor extends 12" from unit

Single phase line voltage input with ground

Lamp Accessories

Mounting Clamp
11 mm × 23 mm
Part Number: CRK00087

Clearance for .375" (9.5 mm) Diameter Hole

.91" (23.1 mm)

.72" (18.2 mm)

1.20" (30.5 mm)

16QA 200°C, 600V
18" Long Lead Wire

MAX COMPRESSION OF CERAMIC INSERT = .014"

Mounting Clamp
10 mm
Part Number: CRK00059

Clearance for .375" (9.5 mm) Diameter Hole

.39" Dia. (9.9 mm)

.120" (30.5 mm)

.100" (25.4 mm)

.980

.656 Dia.

.814 Dia.

1.250

1.562

.395

.500

.856 Dia.

.814 Dia.

Aluminum Housing & Mounting Flange

146 Dia. Mounting Holes

16QA 200°C, 600V
18" Long Lead Wire

Wiring Options

Series QRH Heaters can be prewired with plain leads, stainless steel armor cable, galvanized armor cable, stainless steel wire braid or SJO cable. For additional information See Wiring Options on page 7-17.

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