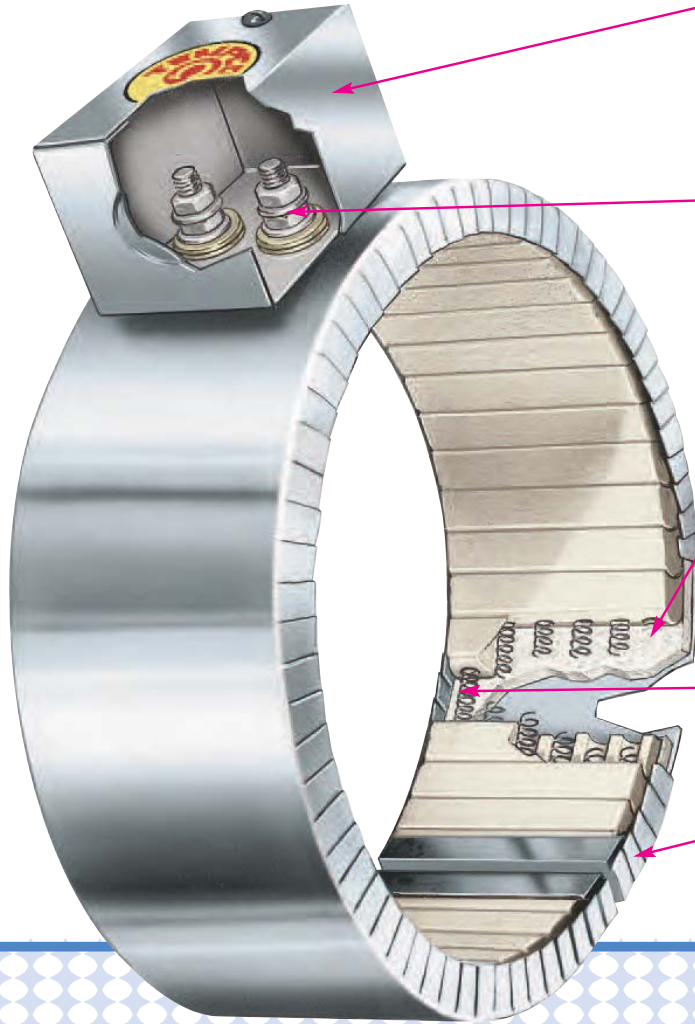


Band Heaters



Ceramic Insulated Band Heaters



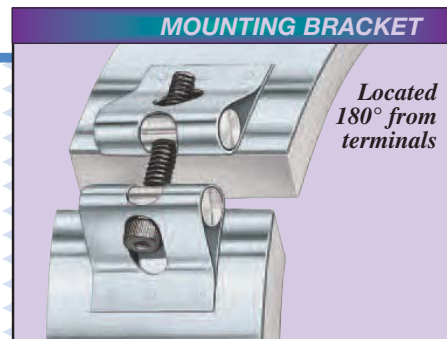
A General purpose terminal box offers excellent protection to exposed terminals. To simplify electrical wiring, the box has a 1/2" trade size knockout (actual dia. 7/8") that will accept standard conduit or flexible armor cable connectors.

B Stainless steel screw terminals connected to stranded nickel wire designed to provide maximum amperage carrying capacity.

C Built-In ceramic fiber insulation 1/4" thick standard on all Ceramic Bands will reduce power consumption by 25 to 30 percent. Further reduction can be obtained with optional 1/2" thick insulation. Specially designed mounting brackets with 1/4"-20 socket cap screws are used to securely draw the heating element assembly against the cylinder evenly and tightly across its entire width. Brackets are located 180° from the screw terminals.

D Helically wound nickel-chrome resistance wire strung through specially designed ceramic insulating bricks.

E Stainless steel housing with serrated edges provides maximum flexibility for ease of installation.



REDUCE HEAT LOSS

CONSERVE ENERGY

MAXIMIZE OPERATOR COMFORT

REDUCE OVERALL OPERATION COST



Band Heaters

Ceramic Band

Ceramic Band Heaters Are Designed To Conserve Energy and Improve Operation Efficiency

Design Features

- * Built-In Thermal Insulation
- * Conserves Electrical Energy
- * Minimum Heat Loss
- * Fully Flexible For Easy Installation
- * Good Temperature Uniformity
- * Longer Heater Life
- * Various Constructions & Terminations
- * Heats Through Conduction and Radiation
- * Designed to Your Specifications

Tempco Ceramic Insulated Band Heaters

are specifically designed and engineered to meet the ever increasing demand for energy conservation and to improve operation efficiency. The Ceramic Band Heaters are capable of generating the higher temperatures essential to process today's high temperature resins. Electrical energy savings are achieved by using a 1/4" thick ceramic fiber insulating blanket, reducing power consumption by 25 to 30 percent.

Because of the low thermal conductivity of the ceramic fiber insulation, the external surface temperature of the Ceramic Band Heater is approximately 400°F while running the inside surface temperature at 1200°F.

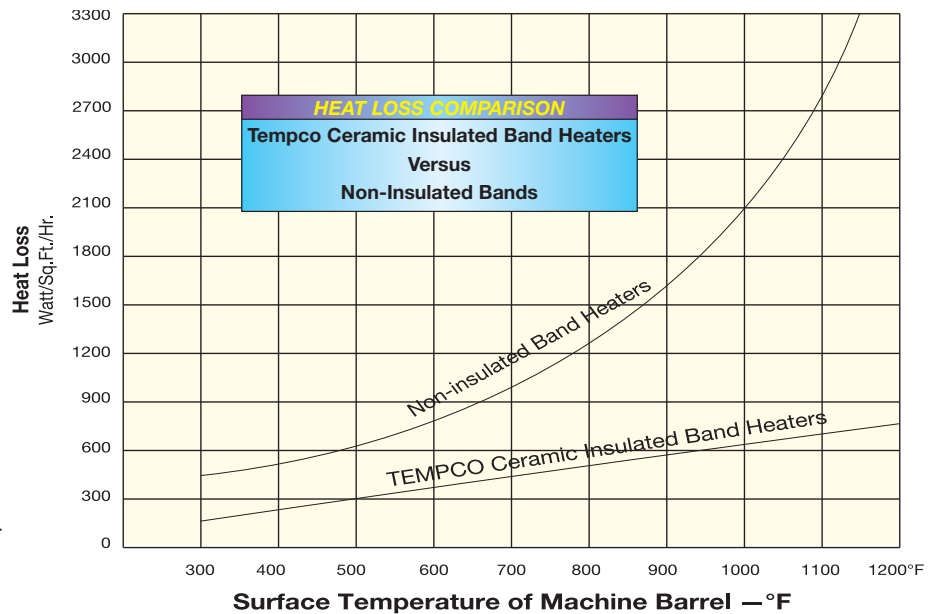
Ceramic Band Heaters transmit heat through both conduction and radiation. The element winding is designed to run at maximum temperature and heat the ceramic blocks to the point at which they radiate energy into the barrel as well as conduct energy by being in contact with the barrel. Therefore, the fit is not as critical as in other types of bands.

Tempco Ceramic Band Heaters have become extremely popular among Original Equipment Manufacturers as the standard heaters for the barrels of Plastic Injection Molding Machines, Extruders, and Blow Molding Equipment.

Variations and Advantages

Ceramic Band Heaters are manufactured in a full range of standard construction variations, physical dimensions, electrical ratings, and a complete arrangement of screw terminals and lead terminations.

However, these standard Ceramic Band Heater variations and terminations do not represent the extent of our capabilities. Tempco's engineering staff, with many years of experience in heat processing and temperature control applications, can assist you in designing the right Ceramic Band Heater for your specific application.



Construction Characteristics

Standard

The basic Tempco Ceramic Band Heater design consists of a helically wound resistance coil made from nickel-chrome wire, evenly stretched and precisely strung through specially designed ceramic insulating bricks, forming a flexible heating mat. The ceramic heating mat along with 1/4" thick ceramic fiber insulation is installed in a stainless steel housing made with serrated edges, providing maximum flexibility for ease of installation. This allows the use of wider band heaters, eliminating the need for numerous narrow width and two-piece band heaters.

Double Insulated

For situations requiring additional insulation for lower external temperatures and increased electrical energy savings, Tempco offers Double Insulated Ceramic Bands with a full 1/2" thick ceramic fiber insulation. This will decrease power consumption by 35 to 37 percent when compared to uninsulated band heaters.

Rib Cage (Type R) Ceramic Band Heater

When Ceramic Band Heaters are used on extruder barrels that require both heating and cooling, Tempco manufactures the **Rib Cage (Type R)** Air-Cooled Ceramic Band Heater in two watt density styles. See page 1-75 for details.

Band Heaters



Ceramic Band Specifications

Ceramic Band Standard Specifications and Tolerances

PERFORMANCE RATINGS

Maximum Temperature: 1400°F (760°C)
Nominal Watt Density: 20-45 W/in² (3-7 W/cm²)
Maximum Watt Density: 45 W/in²

ELECTRICAL RATINGS

Maximum Voltage: 480 VAC per termination
Dual Voltage: Available depending on heater configuration
Maximum Amperage per circuit:
 lead wire termination: 10 amp
 screw terminations: 25 amp
Resistance Tolerance: +10%, -5%
Wattage Tolerance: +5%, -10%



Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.

PHYSICAL SIZE CONSTRUCTION LIMITATIONS

Sheath Material: Stainless Steel
Insulation Material: Ceramic Fiber Blanket
 Standard Thickness: 1/4"
 Double Thickness: 1/2"
Overall Thickness: Standard Insulation: 5/8"
 Double Insulation: 3/4"
Minimum Width: 1"
Standard Width Increments: 1/2"
 Consult Tempco for non-standard widths.
Maximum Width: Dependent upon the ratio of diameter to width
Width Tolerance: 1" to 3-1/2": ±1/16"
 4" to 6-1/2": ±1/8"
 Over 6-1/2": ±1/4"
Minimum Diameter: 2"
Maximum Diameter—One-Piece: 21"
 Two-Piece: 44"
Nominal Gap: 3/8" — If a larger gap is required for probes or thermocouples, specify when ordering.

If tighter tolerances are required consult Tempco.

Construction Clamp	Min. ID		Min. Width		Max. ID	
	in	mm	in	mm	in	mm
One-Piece	2	50.8	1	25.4	21	533.4
Two-Piece	4	101.6	1	25.4	44	1117.6
Standard Insulation	2	50.8	1	25.4		N/A
Double Insulation	2	50.8	1½	38.1		N/A
Rib Cage (RCC)	3	76.2	4½	114.3		N/A
Built-In Bracket	2	50.8	1	25.4		N/A
Built-In Bracket Spring Loaded	2	50.8	1	25.4		N/A
Latch and Trunnion	4	101.6	1	25.4		N/A
Bent-Up Flange	2	50.8	1	25.4		N/A
Shell Overlap	3	76.2	1½	38.1	20	508.0



Note: Refer to individual construction and termination descriptions on pages 1-66 through 1-74 for further information. Actual heater minimums and maximums will depend upon the combination of construction/clamp, termination styles and electrical ratings.

Band Heaters



Ceramic Band Construction

How To Specify A Ceramic Band Heater

Ceramic band heaters offer several variations in construction, clamping and electrical terminations. For ease of ordering, make a selection from options listed in each of the boxes below.

Construction Styles

(See below)
One-piece
Two-piece
Multiple Sections
(Specify number of sections required.)

Clamping

(See page 1-67)
Type B – Built-in bracket (Standard)
Type S – Built-in bracket with spring loaded screw
Type L – Latch and trunnion
Type F – Bent-up flange (Ears)

Termination

Select termination type from pages 1-68 through 1-74

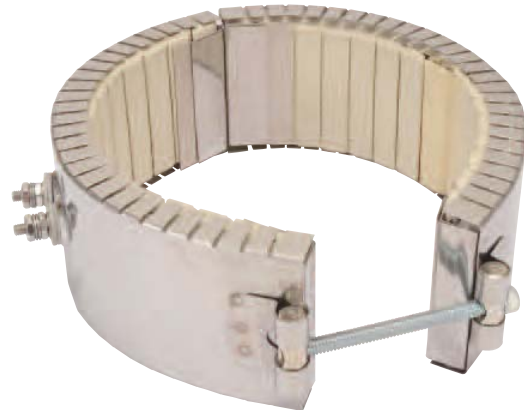
Insulation

(See below)
Standard 1/4" insulation (**S**)
Double 1/2" insulation (**D**)

Shell Overlap

(See page 1-67)
Provides T/C hole. (Specify if required.)

Ceramic Band Construction Styles



One-Piece Band

The One-Piece Ceramic Band Heater is the basic design most often specified by OEMs and processors. It is available with all types of insulation, construction styles, clamping or termination variations.

Min. ID: 2" (50.8 mm)
Min. Width: 1" (25.4 mm)
Max. ID: 21" (533.4 mm)

Two-Piece Band

The Two-Piece Ceramic Band Heater is commonly used on sizes larger than 21" diameter or when it would be inconvenient to use a one-piece heater. It is available with all types of insulation, construction styles, clamping or termination variations.

Min. ID: 4" (101.6 mm)
Min. Width: 1" (25.4 mm)
Max. ID: 44" (1118 mm)

Larger sizes are manufactured in multiple sections. Watts and volts are specified per each section when ordering.

Ceramic Band Insulation Options

Standard Insulation (S): 1/4"

Built-In ceramic fiber insulation 1/4" thick standard on all Ceramic Bands will reduce power consumption by 25 to 30 percent, and lower external temperatures.



Standard Insulation Cross Section

Optional Double Insulation (D): 1/2"

For situations requiring additional insulation for lower external temperatures and increased electrical energy savings, Tempco offers Double Insulated Ceramic Bands with a full 1/2" thick ceramic fiber insulation. This will decrease power consumption by 35 to 37 percent when compared to uninsulated band heaters.



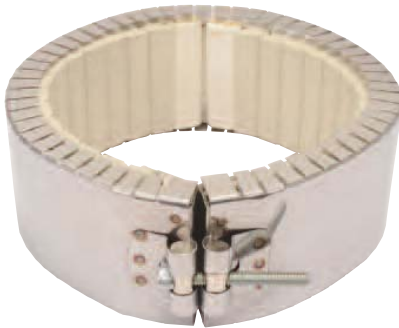
Double Insulation Cross Section



Band Heaters

Ceramic Band

Ceramic Band Clamping Variations



Type B – Built-In Bracket (Standard)

The Built-In Bracket is the basic design most often specified by OEMs and processors. The standard screw used is 1/4-20. It is available with all types of insulation, construction styles, and termination variations.

Type S – Built-In Bracket with Spring-Loaded Screw

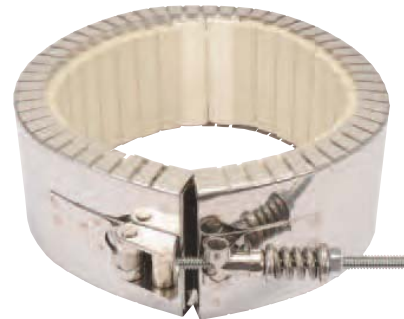
The Built-In Bracket can also be supplied with a spring-loaded screw. The spring-loaded clamp aids in absorbing thermal expansion.

Limitations – One-Piece Bands

Min. ID: 2" (50.8 mm)
Min. Width: 1" (25.4 mm)

Limitations – Two-Piece Bands

Min. ID: 4" (101.6 mm)
Min. Width: 1" (25.4 mm)



Type L – Latch and Trunnion

The spring-loaded Latch and Trunnion clamping system is ideal for bands over 12" in diameter to absorb thermal expansion and facilitate installation on large bands.

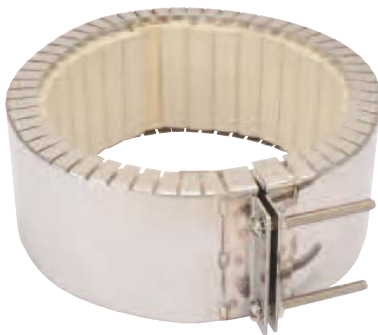
The Latch and Trunnion clamping system is available with all types of insulation, construction styles, and termination variations.

Limitations – One-Piece Bands

Min. ID: 4" (101.6 mm)
Min. Width: 1" (25.4 mm)

Limitations – Two-Piece Bands

Min. ID: 4" (101.6 mm)
Min. Width: 2" (50.8 mm)



Type F – Bent-Up Flange (Ears)

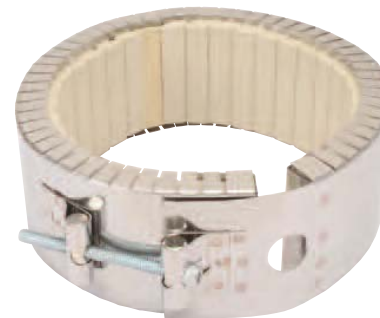
The Bent-Up Flange (Ears) design is available with all types of insulation, construction styles, and termination variations.

Limitations – One-Piece Bands

Min. ID: 2" (50.8 mm)
Min. Width: 1" (25.4 mm)

Limitations – Two-Piece Bands

Min. ID: 4" (101.6 mm)
Min. Width: 2.5" (63.5 mm)



Shell Overlap

The Shell Overlap design is the preferred method of providing a thermocouple mounting hole in a ceramic band heater. It is available with all types of insulation, construction styles, clamping and termination variations.

Limitations – One-Piece Bands

Min. ID: 3" (76.2 mm)
Min. Width: 1-1/2" (38.1 mm)
Standard Hole: 3/4" (19.1 mm)

Limitations – Two-Piece Bands

Min. ID: 4" (101.6 mm)
Min. Width: 2" (50.8 mm)
Standard Hole: 3/4" (19.1 mm)

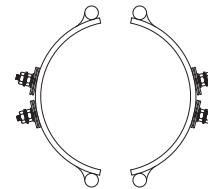
Band Heaters



Terminations

Ceramic Band Type T2 – Screw Terminals

Type T2 Screw Terminals are available with all types of insulation, construction styles, and clamping variations. They are considered to be standard on most band heaters under 2" in width unless otherwise specified. 10-32 post terminals are standard.



One-Piece Band

Standard Termination Location:
opposite the gap; center of width

- * **Minimum Inside Diameter:** 2" (50.8 mm)
- * **Minimum Width:** 1" (25.4 mm)
- * **Maximum Volts/Amps:** 480VAC/25A

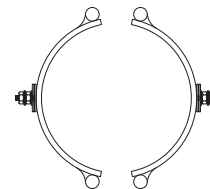
Two-Piece Band

Standard Termination Location:
center of each half; center of width

- * **Minimum Inside Diameter:** 4" (101.6 mm)
- * **Minimum Width:** 1" (25.4 mm)
- * **Maximum Volts/Amps:** 480VAC/25A each half

Ceramic Band Type T3 – Screw Terminals

Type T3 Screw Terminals are available with all types of insulation, construction styles, and clamping variations. They are considered to be standard on most band heaters unless otherwise specified. For use with leads, crimp terminals, or bus bars.



One-Piece Band

Standard Termination Location:
opposite the gap; across center of width

- * **Minimum Inside Diameter:** 2" (50.8 mm)
- * **Minimum Width:** 2" (50.8 mm)
- * **Maximum Volts/Amps:** 480VAC/25A

Two-Piece Band

Standard Termination Location:
center of each half; across center of width

- * **Minimum Inside Diameter:** 4" (101.6 mm)
- * **Minimum Width:** 2" (50.8 mm)
- * **Maximum Volts/Amps:** 480VAC/25A each half



Band Heaters

Ceramic Band

Optional Igloo™ Ceramic Covers for Heaters with Screw Terminals

Igloo™ Ceramic Terminal Covers consist of two individual ceramic parts. They are available with all types of insulation, construction styles, and clamping variations. Unlike conventional ceramic caps, Igloo fully insulates any standard #10 terminal lugs used for electrical hook-ups.

Limitations

Min. ID: 2" (50.8 mm); **Min. Width:** 1" (25.4 mm)

Four types of Igloo™ bases are available:

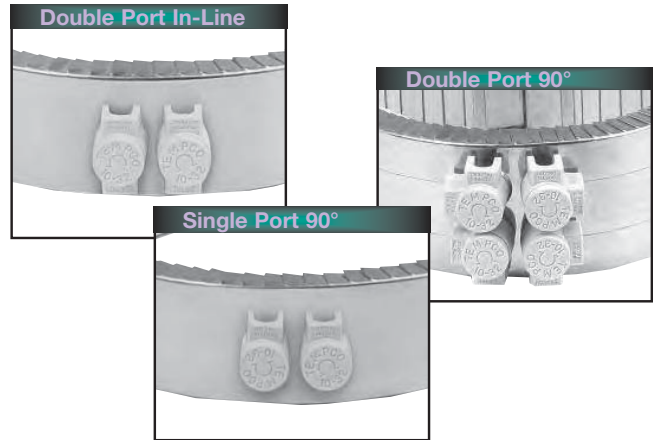
Type C6 – Double Port In-Line P/N CER-101-104

Type C7 – Double Port 90° P/N CER-101-106

Type C8 – Single Port P/N CER-101-107

Igloo™ caps are available in the following screw terminal size:

10-32 – P/N CER-102-101

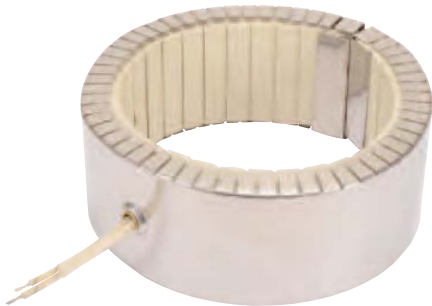


Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.

Ceramic Band Type L1 – Straight Lead Wires

Type L1 Straight Lead Wires are available with all types of insulation, construction styles, and clamping variations. They are used primarily on small diameter bands where clearance is limited. If applicable, screw terminals should always be specified due to the high heat generated by ceramic bands. The standard flexible leads are 10" long.

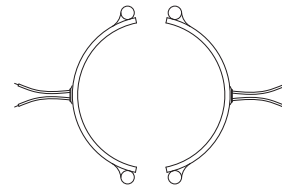
If longer leads are required, specify when ordering.



One-Piece Band

Standard Termination Location:
opposite the gap; center of width

- * **Minimum Inside Diameter:** 2" (50.8 mm)
- * **Minimum Width:** 1" (25.4 mm)
- * **Maximum Volts/Amps:** 480VAC/10A



Two-Piece Band

Standard Termination Location:
center of each half; center of width

- * **Minimum Inside Diameter:** 4" (101.6 mm)
- * **Minimum Width:** 1" (25.4 mm)
- * **Maximum Volts/Amps:** 480VAC/10A each half

Band Heaters



Terminations

Ceramic Band Type W1 – Abrasion Resistant Straight Wire Braid Leads

Straight Wire Braid Leads are available with all types of insulation, construction styles, and clamping variations. Wire braid leads offer sharp bending not possible with armor cable. If applicable, screw terminals should always be specified due to the high heat generated by ceramic bands. The standard leads are 10" of wire braid over 12" of flexible leads.

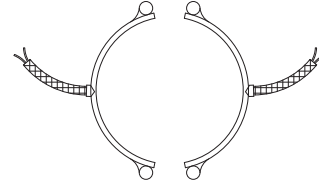
If longer leads are required, specify when ordering.



One-Piece Band

Standard Termination Location:
opposite the gap; center of width

- * Minimum Inside Diameter: 2" (50.8 mm)
- * Minimum Width: 1" (25.4 mm)
- * Maximum Volts/Amps: 480VAC/10A



Two-Piece Band

Standard Termination Location:
center of each half; center of width

- * Minimum Inside Diameter: 4" (101.6 mm)
- * Minimum Width: 1" (25.4 mm)
- * Maximum Volts/Amps: 480VAC/10A each half

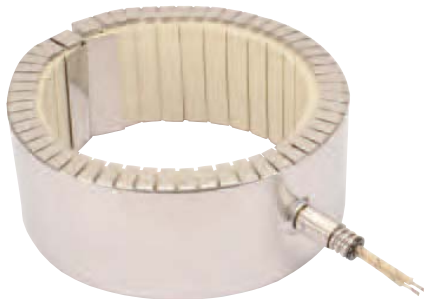
Ceramic Band Type R1 – Abrasion Resistant Straight Armor Cable

Straight Armor Cable is available with all types of insulation, construction styles, and clamping variations. Armor cable provides far superior protection to lead wires where abrasion is a constant problem. If applicable, screw terminals should always be specified due to the high heat generated by ceramic bands. The standard leads are 10" of armor cable over 12" of flexible leads.

If longer leads or electrical connectors are required, specify when ordering.

Type R1A – Galvanized Steel Armor Cable

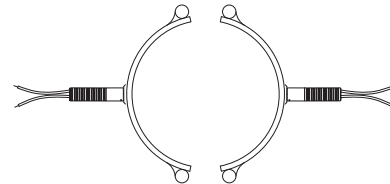
Type R1B – Stainless Steel Armor Cable



One-Piece Band

Standard Termination Location:
opposite the gap; center of width

- * Minimum Inside Diameter: 2" (50.8 mm)
- * Minimum Width: 1" (25.4 mm)
- * Maximum Volts/Amps: 480VAC/10A



Two-Piece Band

Standard Termination Location:
center of each half; center of width

- * Minimum Inside Diameter: 4" (101.6 mm)
- * Minimum Width: 1" (25.4 mm)
- * Maximum Volts/Amps: 480VAC/10A each half



Band Heaters

Ceramic Band

Ceramic Band Type R2 – Abrasion Resistant Right-Angle Armor Cable

Right-Angle Armor Cable is available with all types of insulation, construction styles, and clamping variations. It is used where space is limited and abrasion is a constant problem. If applicable, screw terminals should always be specified due to the high heat generated by ceramic bands. The standard leads are 10" of armor cable over 12" of flexible leads.

If longer leads or electrical connectors are required, specify when ordering.

Type R2A – Galvanized Steel Armor Cable

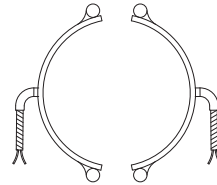
Type R2B – Stainless Steel Armor Cable



One-Piece Band

Standard Termination Location:
opposite the gap; center of width

- * **Minimum Inside Diameter:** 2" (50.8 mm)
- * **Minimum Width:** 1" (25.4 mm)
- * **Maximum Volts/Amps:** 480VAC/10A



Two-Piece Band

Standard Termination Location:
center of each half; center of width

- * **Minimum Inside Diameter:** 4" (101.6 mm)
- * **Minimum Width:** 1" (25.4 mm)
- * **Maximum Volts/Amps:** 480VAC/10A each half

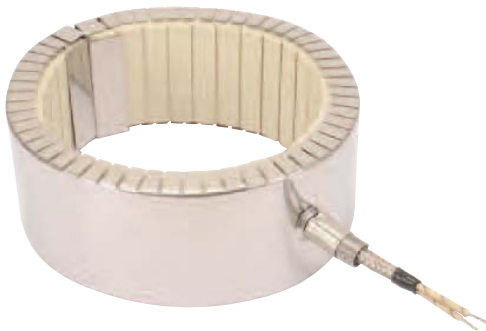
Ceramic Band Type S1 – Lead Wire Spring Strain Relief

A strain relief spring is attached to the heater at the termination exit to reduce strain on leads subjected to excessive flexing. The spring is 2-5/8" long. The flexible standard leads are 10" long with 2-1/2" of fiberglass sleeving.

If longer leads are required, specify when ordering.

Type S1A – Plain Leads and Strain Relief Spring

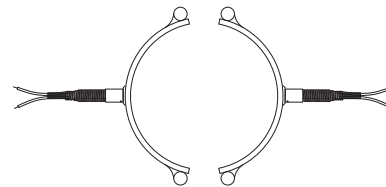
Type S1B – Stainless Steel Wire Braided Leads and Strain Relief Spring



One-Piece Band

Standard Termination Location:
opposite the gap; center of width

- * **Minimum Inside Diameter:** 2" (50.8 mm)
- * **Minimum Width:** 1" (25.4 mm)
- * **Maximum Volts/Amps:** 480VAC/10A



Two-Piece Band

Standard Termination Location:
center of each half; center of width

- * **Minimum Inside Diameter:** 4" (101.6 mm)
- * **Minimum Width:** 1" (25.4 mm)
- * **Maximum Volts/Amps:** 480VAC/10A each half

Band Heaters



Terminations

General Purpose Terminal Boxes: Type C2 & Type C5

Terminal Boxes are available with all types of insulation, construction styles, or clamping variations. It is a simple and economical way to protect employees from electric shock or prevent electric shorts that can result from exposed wiring on band heater electrical installations.

The Heavy Duty Terminal Boxes have a 1/2" trade size knockout (actual diameter 7/8") that will accept standard armor cable connectors. The boxes can be field assembled on band heaters that have a center distance between screws of 7/8". To simplify installation the boxes can be pre-wired with galvanized armor, stainless steel armor, or wire braid.

Ceramic Band Type C2 – Standard Terminal Box



One-Piece Band

Standard Termination Location:
opposite the gap; center of width

- * **Minimum Inside Diameter:** 2" (50.8 mm)
- * **Minimum Width:** 1-1/2" (38.1 mm)
- * **Maximum Volts/Amps:** 480VAC/25A

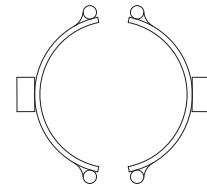
Type C2 □ Standard Box

- C2A**—Box only
- C2B**—with galvanized armor
- C2C**—with stainless steel armor
- C2D**—with wire braid

Box Size: 1-1/2"H × 1-1/2"W × 2-1/2"L
for bands 1-1/2" to 2" wide

Box Size: 1-1/2"H × 2-1/8"W × 2-1/8"L
for bands greater than 2" wide

NOTE: Heater dimensions will determine terminal configuration.



Two-Piece Band

Standard Termination Location:
center of each half; center of width

- * **Minimum Inside Diameter:** 4" (101.6 mm)
- * **Minimum Width:** 1-1/2" (38.1 mm)
- * **Maximum Volts/Amps:** 480VAC/25A each half

Ceramic Band Type C5 – Low-Profile Terminal Box



One-Piece Band

Standard Termination Location:
opposite the gap; center of width

- * **Minimum Inside Diameter:** 2" (50.8 mm)
- * **Minimum Width:** 1-1/2" (38.1 mm)
- * **Maximum Volts/Amps:** 480VAC/25A

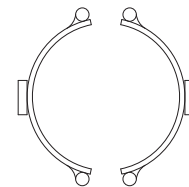
Type C5 □ Low Profile Box

- C5A**—Box only
- C5B**—with galvanized armor
- C5C**—with stainless steel armor
- C5D**—with wire braid
- C5J**—Box with lead wire

Box Size: 1"H × 1-1/4"W × 3"L
for bands 1-1/2" to 2" wide

Box Size : 1"H × 2-1/4"W × 2"L
for bands greater than 2" wide

NOTE: Heater dimensions will determine terminal configuration.



Two-Piece Band

Standard Termination Location:
center of each half; center of width

- * **Minimum Inside Diameter:** 4" (101.6 mm)
- * **Minimum Width:** 1-1/2" (38.1 mm)
- * **Maximum Volts/Amps:** 480VAC/25A each half



Note: If a Low Profile Box with cable or leads is required, it is strongly recommended to order it pre-wired by the factory.

Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.



Band Heaters

Ceramic Band

Quick Disconnect Plugs: Type P1, Type P2, Type P3 & Type P4

Quick Disconnect Plugs are available on any construction or clamping variation. These quick disconnect plug assemblies are highly recommended and should be used whenever possible. The combination of plug and cup assembly along with armor cable covered leads eliminates all live exposed terminals or wiring that can be a potential hazard to employees or machinery.

Type P1 and P3 assemblies are available with a straight or right-angle plug. Type P2 and P4 plug assemblies have a lower profile and are available with a straight plug only.

To simplify installation, band heaters with these assemblies can be supplied pre-wired using high temperature lead wire protected with armor cable. *If longer leads are required, specify when ordering.*

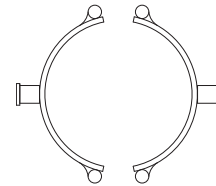
Ceramic Band Type P1 – High Temperature Quick Disconnect Plugs



Type P1Q shown

Type P1□—Standard Cup Assembly

- P1K**—Cup Assembly only
- P1L**—w/straight plug only
- P1M**—w/90° plug only
- P1N**—w/straight plug & galvanized armor cable
- P1O**—w/straight plug & stainless steel armor cable
- P1P**—w/straight plug & wire braid
- P1Q**—w/90° plug & galvanized armor cable
- P1R**—w/90° plug & stainless steel armor cable
- P1S**—w/90° plug & wire braid



One-Piece Band

Standard Termination Location:
opposite the gap; center of width

- * **Minimum Inside Diameter:** 2" (50.8 mm)
- * **Minimum Width:** 2" (50.8 mm)
depending on termination orientation

Plug Electrical Ratings

- * **2-Pole 3-Wire Grounding**
- * **Maximum Volts:** 250 VAC
- * **Maximum Amps:** 16A
- * **Maximum Temperature:**
572°F (300°C)

Two-Piece Band

Standard Termination Location:
center of each half; center of width

- * **Minimum Inside Diameter:** 4" (101.6 mm)
- * **Minimum Width:** 2" (50.8 mm)
depending on termination orientation

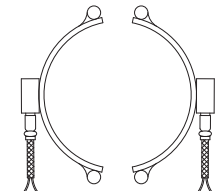
Ceramic Band Type P2 – High Temperature Quick Disconnect Plugs



Type P2H shown

Type P2□—Low Profile Assembly

- P2F**—Low profile assembly only
- P2G**—w/straight plug only
- P2H**—w/straight plug and galvanized armor cable
- P2J**—w/straight plug and stainless steel armor cable
- P2K**—w/straight plug and wire braid



One-Piece Band

Standard Termination Location:
opposite the gap; center of width

- * **Minimum Inside Diameter:** 2" (50.8 mm)
- * **Minimum Width:** 2" (50.8 mm)

Plug Electrical Ratings

- * **2-Pole 3-Wire Grounding**
- * **Maximum Volts:** 250 VAC
- * **Maximum Amps:** 16A
- * **Maximum Temperature:**
572°F (300°C)

Two-Piece Band

Standard Termination Location:
center of each half; center of width

- * **Minimum Inside Diameter:** 4" (101.6 mm)
- * **Minimum Width:** 2" (50.8 mm)

CONTINUED →

Band Heaters



Terminations

Ceramic Band Type P3 – DIN 49458 A/B Quick Disconnect Plugs

Continued from previous page...



One-Piece Band

Standard Termination Location:
opposite the gap; center of width

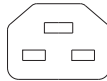
- * Minimum Inside Diameter: 3" (76.2 mm)
- * Minimum Width: 2" (50.8 mm)

Type P3□—Vertical Box Assembly

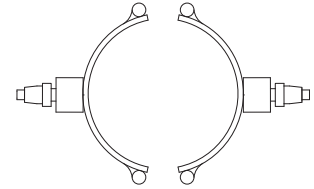
- P3A**—Box assembly only
- P3B**—Box assembly w/straight plug
- P3C**—Box assembly w/right-angle plug

Plug Electrical Ratings

- * 2-Pole 3-Wire Grounding
- * Maximum Volts: 250 VAC
- * Maximum Amps: 16A
- * Maximum Temperature: 392°F (200°C)



Standard Pin Orientation



Two-Piece Band

Standard Termination Location:
center of each half; center of width

- * Minimum Inside Diameter: 4" (101.6 mm)
- * Minimum Width: 2" (50.8 mm)

Ceramic Band Type P4 – DIN 49458 A/B Quick Disconnect Plugs



One-Piece Band

Standard Termination Location:
opposite the gap; center of width

- * Minimum Inside Diameter: 2-1/2" (63.5 mm)
- * Minimum Width: 2-1/2" (63.5 mm)

Type P4□—Horizontal Box Assembly

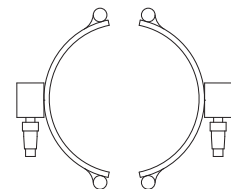
- P4A**—Box assembly only
- P4B**—Box assembly w/straight plug

Plug Electrical Ratings

- * 2-Pole 3-Wire Grounding
- * Maximum Volts: 250 VAC
- * Maximum Amps: 16A
- * Maximum Temperature: 392°F (200°C)



Standard Pin Orientation



Two-Piece Band

Standard Termination Location:
center of each half; center of width

- * Minimum Inside Diameter: 4" (101.6 mm)
- * Minimum Width: 2-1/2" (63.5 mm)



Band Heaters

Ceramic Band

Ceramic Band Heaters — Cool TO-THE Touch Shroud Systems

Type R Uninsulated Ceramic Band Heaters

This system was developed to provide another means of heating and cooling high temperature extrusion processes. Typically cast-in bronze or brass units are used in applications in which heater temperatures can be in excess of 700°F (371°C). Cast-in bronze or brass heaters are expensive and since they weigh approximately three times their aluminum counterparts they are difficult to install.

In response to this challenge, Tempco's engineers have developed a low mass, non-thermally insulated ceramic band heater to work in tandem with a highly efficient stainless steel sheet metal shroud for high temperature heating and cooling extrusion processes.

Forced air blowers are used for cooling. The ambient air-flow enters the shroud, circulates around the ceramic heater and barrel, removes the heat from the heater and the process and exits the shroud opposite the entrance port.

Construction Characteristics

Type R construction is an uninsulated ceramic band heater with a perforated Stainless Steel outer shell for more efficient cooling. It is typically used in multiple quantities with forced air cooling systems.

Consult Tempco with your requirements.

Type R Ceramic Insulated Band Heater



Cool TO-THE Touch™ Shroud System with Type RCC



Type RCC (Ribcage) Heating Mounting Configuration

Tempco's **Type RCC** (Rib Cage) Air Cooled System uses multiple Type R Ceramic Band Heaters under one air cooled shroud. Type R heaters are typically arranged with spaces between the heaters to enhance the cooling of the barrel when external heat is no longer required.

The Cool TO-THE Touch dual layer shroud uses an inner stainless steel solid layer thermally isolated from the heater, providing a path for the forced cooling air. An outer Stainless Steel perforated layer provides optimal venting and heat dissipation while providing personnel safety.

See catalog page 3-29 for shroud assembly details.

PERFORMANCE RATINGS FOR HEATER BAND

Maximum Watt Density: 50 W/in²

Maximum Temperature: 900°F (482°C)

MECHANICAL

Standard Width Increments: 1/2"

Maximum Width: depends on ratio of diameter to width

Minimum Width: 1-1/2" (38.1 mm)

Standard Gap: 1/2" ±1/8" (12.7 ±3.2 mm)

ELECTRICAL RATINGS

Resistance tolerance: +10%, -5%

Wattage tolerance: +5%, -10%

Maximum Voltage: 480 single or 3-phase (when applicable)

Maximum Amperage: 25 Amps per circuit

Band Heaters



Ceramic Band Features

Additional Features

Electrical VARIATIONS

Three-Phase — On very high wattage band heaters it would be advantageous to set up the wiring three-phase to reduce the current load across a single conductor. Three-phase wiring is available with all types of insulation, construction styles, and clamping variations.

Limitations

Minimum width: 3" (76.2 mm)

Dual Voltage — Band heaters can be designed using 3-wire series/parallel circuits for dual voltage applications. Whether the heater is run on the high or low voltage, the wattage will be the same. Dual Voltage wiring is available with all types of insulation, construction styles, or clamping variations.

Limitations

Minimum width: 2" (50.8 mm)

Single-Phase/Three-Phase — Ceramic Band Heaters can be designed with multiple circuits to operate single or three-phase.

Lead VARIATIONS

Electrical Plugs — Industry standard NEMA twist lock electrical connectors are available. The plugs can be attached to fiberglass leads, armor cable or wire braid. Electrical Plugs can be added to any termination variation. See Section 15 page 15-15.

Terminal Lugs — Various types of crimp terminals can be attached to the heater leads to make wiring into applications quick and easy. High temperature [1200°F (649°C)] ring terminals and nylon or PVC insulated terminals are available. Spade, ring, and right-angle or straight quick disconnect type terminals can be attached to the leads. See Section 15 page 15-18.

High Temperature Lead Wire — When required, high temperature lead wire can be used. The wire is insulated with mica tapes over the stranded nickel conductors and then treated fiberglass overbraid. See Section 15 page 15-2.

Maximum temperature: 450°C (842°F)

Ground Terminal or Lead — For those applications requiring a separate ground terminal or lead attached to the heater sheath. A Ground Terminal or Lead is available on any construction or termination variation.

Other VARIATIONS

Oversize Gap — The nominal gap is 3/8". If a larger gap is required for probes or thermocouples, specify when ordering.

Installation Accessories Available for Immediate Delivery

- * High Temperature Terminal Lugs
- * Igloo™ Ceramic Insulating Covers
- * UL Listed Plugs
- * High Temperature Lead Wire 842°F (450°C)
- * Armor Cable
- * Stainless Steel Braid
- * High Temperature Sleeving
- * High Temperature Mica Insulated Wiring Harnesses 842°F (450°C)
- * Thermocouples
- * Temperature Controllers
- * High Temperature Fiberglass Tape

All Items Available from Stock