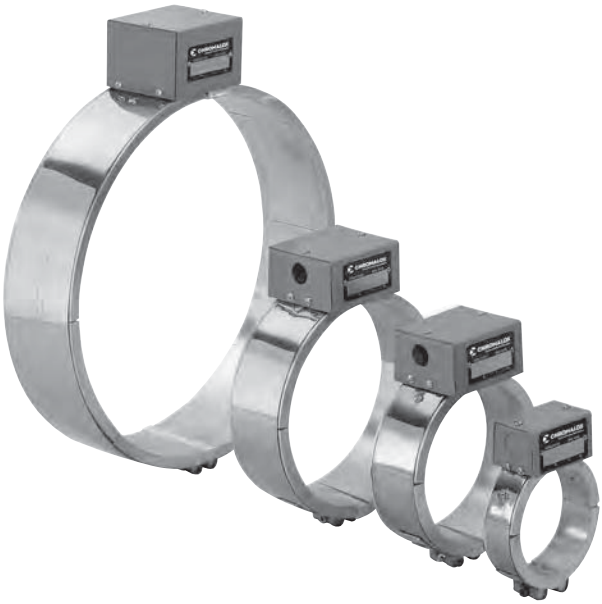
# AFH
## Aluma-Flex® Band Heaters

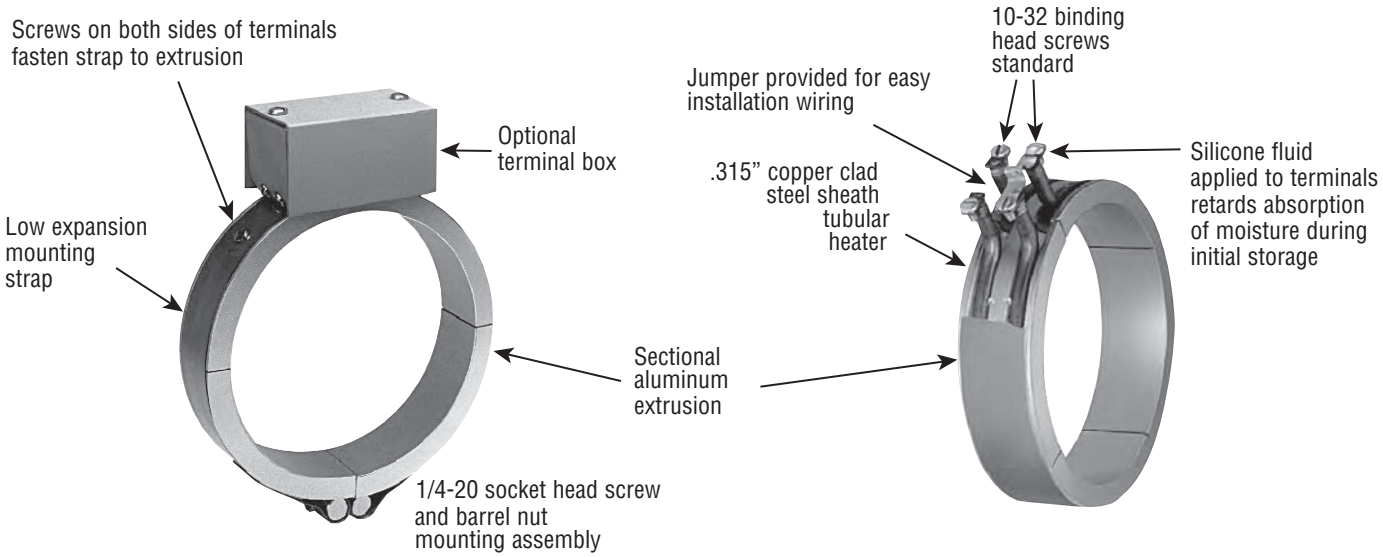


NEW!

- **Rugged, Long Lasting Design**
- **Excellent Heat Transfer from Element to Sheath and Sheath to Heated Part**
- **Virtually Contamination Proof**
- **Uniform Sheath Temperatures up to 650˚F (345˚C)**
- **Easy Installation**

### *Description*

The element utilized in the Aluma-Flex Band Heater is the highly efficient, rugged, long lasting tubular heater pressed in a grooved aluminum extrusion. The combination of the tubular heater in exact contact with the excellent thermal conducting aluminum extrusion create a quick responding band heater with uniform sheath temperatures for precise process heating. With the termination a significant distance from the part being heated and no other place for contaminants to enter, the Aluma-Flex is virtually indestructible. A low expansion alloy strap with mounting hardware allows the assembly to be tightly drawn to the part to be heated. With sheath temperatures to 650°F attainable, the Aluma-Flex Band Heater is ideal for use on barrels of plastic extruders, injection molding machines, dies and die heads of extruders and blow molding equipment, or, within temperature limitations, any cylindrical surface.



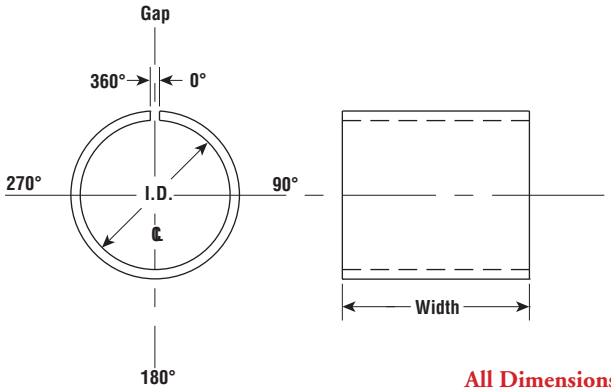
# CB
## Ceramic Band Heater

- **3-12" Barrel Dia.**
- **1-1/2 - 6" Widths**
- **500 - 5,000 Watts**
- **120 to 600 Volts**
- **18 - 40 W/In²**
- **Ceramic Fiber Insulated**
- **Up to 1600°F Band Operating Temp.**
- **Corrosion - Resistant Alloy Shell**

### *Applications*

- Blow Molding
- Die Heads
- Extruders
- Heating Pipes
- Injection Molding

### *Dimensions*




All Dimensions in Inches

### *Features*

**Type CB** ceramic band heaters are best suited for applications up to 1600°F Band operating temperatures and provide even heating on injection and extrusion molding barrels. The ceramic segments and high temperature resistance wires are capable of highly efficient heat transfer. Ceramic fiber insulation, 1/4" thickness, provides an additional 25% energy savings over non-insulated types. Ceramic bands also contribute a radiant heating effect to the object being heated. They can be constructed in greater widths, allowing fewer heaters per zone, wider heating patterns, and simplified wiring.

**Energy Efficient**, 25% Savings

**Radiant** Heating Principle

**Uniform** Heating Pattern

Available in **Special** Configurations

**Thermal Insulation**

**1600°F Band Operating Temperatures**

**Flexible**

**Corrosion-Resistant** Alloy Shell

**High Temperature** Resistance Wires

### *Construction*

The use of ceramic inserts to support high temperature resistance wire allows the Chromalox Type CB ceramic heater band to operate at high temperatures reaching 1500°F. Corrosion resistant metal is slit along the edges to allow easy fitting of the shroud to the object being heated.

**Insulation —** 1/4" of ceramic fiber is placed between the inserts and the shroud to provide a 25% energy savings over non-insulated heater bands. Additional insulation and metal liners can be supplied as an option.

**Clamping Method —** Mounting flanges are standard on Chromalox ceramic bands. Other clamping methods are available.

**Terminations —** Due to the high temperature capabilities of ceramic insulated heat bands, the use of lead wires is not recommended. When leads must be supplied, Chromalox will exit the heater with ceramic wire insulating beads, and make a junction with the nickel alloy lead wire at a point outside the shroud. Terminals are generally best located 180° from the gap. Alternate locations are possible, consult factory.

**Sensor Holes —** Sensor holes should be positioned in the gap, and a shroud be supplied as a shell overlap construction. For holes through the elements, consult factory.

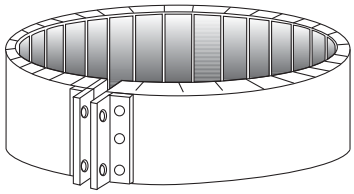
# CB
# Ceramic Band Heater

## *Variations*

### One-Piece

Standard completely flexible construction consists of flange lockup, 1/4" thick ceramic insulation, 1/4-20 screw terminals, located 180° from gap, on width center line.

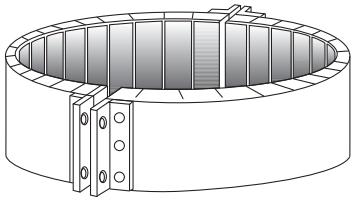
Max. I.D. 21"
Min. Width 1-1/2"



### Two-Piece

Easy to apply when an obstruction prohibits the application of 1-piece heater. Heaters can be supplied with any termination or clamping variation. 2-piece heaters are rated at half of the voltage and each half is rated half of the total wattage. Larger diameters made in multiple segments.

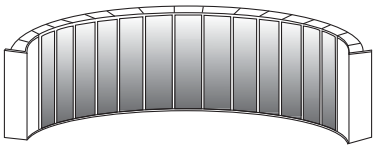
Min. I.D. 4"
Width 1-1/2"
Max. I.D. 44"



### Partial Coverage

Allows for the heating of the accessible portion of machine when full coverage is not possible. Heaters supplied with standard clamping and termination.

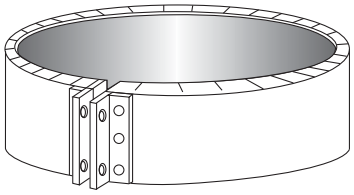
Min. length 6"
Max. length 21".



### Liner

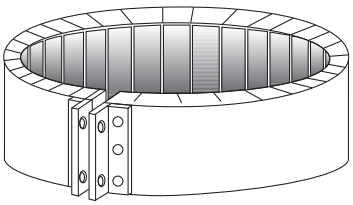
Stainless steel liners inhibit contamination of the ceramic tiles.

Min. I.D. 3"
Width 1-1/2"
Max. I.D. 21"



### Special Insulation

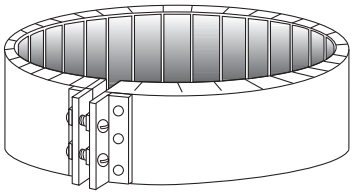
1/2" ceramic fiber insulation can be inserted. The thickness of the heater will expand to 3/4". When 3/4" ceramic fiber and an inner liner is inserted the heater will be 7/8" thick.



## *Clamping*

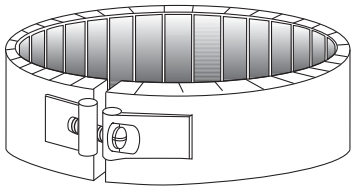
### Bent-Up Flange - F

Flange clamping is standard construction on ceramic heaters



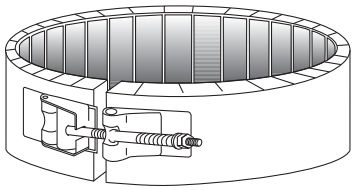
### Built-In Bracket - BB

Mounting bracket with barrel nut lockup, and 1/4-20 screws. Supplied in any construction or termination variation.



### Latch and Trunion - LT

Quick Release Spring loaded latch & trunion. Recommended I.D. 12" or greater.



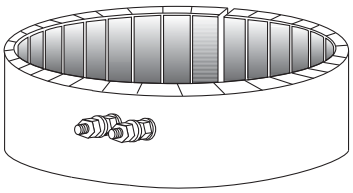
# CB
# Ceramic Band Heater *(cont'd.)*

## *Terminations*

### Tandem T-2

Tandem terminals located 180° from gap, on center line with length of heater. Available with 1/4-20 post terminals. Standard on widths under 3".

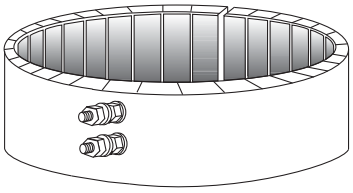
Min. I.D. 3"



### Parallel T-3

Parallel terminals located 180° from gap with width of heater. Available with 1/4-20 post terminals. Standard on all heaters greater than 3" width.

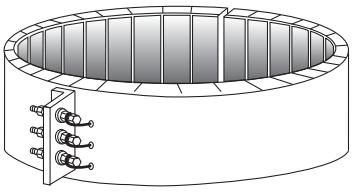
Min. I.D. 3"
Min. Width 3"



### Standoff Terminals - SO

Provides relief from direct heat. Available on any constrution or clamping variation. Single or 3-phase power, single or dual voltage.

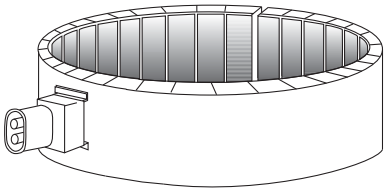
Min. I.D. 3"
Min. Width 3"



### Euro Plug - EP

Quick disconnect cup assembly is a safe way to provide power to heater.

Min. Width 1-1/2"
Max. Amps 15 at 240V, Max. Volts 240

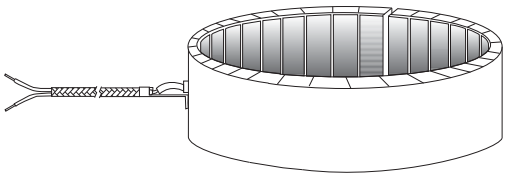


## *Lead Types*

### Stainless Steel Metal Braid - C

Provides abrasion resistant protection of fiberglass leads. Leads exit one point of heater surface through a strain relief. 10" braid over 12" leads, standard.

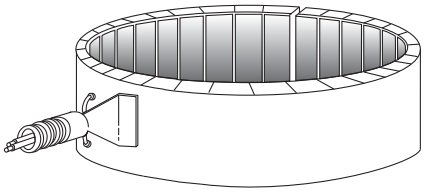
Min. I.D. 3"
Min. Width 1-1/2"



### Metal Flexible Conduit - M

Stainless steel or galvanized. Flexible metal conduit to protect leads from abrasion. Available on any construction or clamping variation. 10" metal conduit over 12" fiberglass leads, standard.

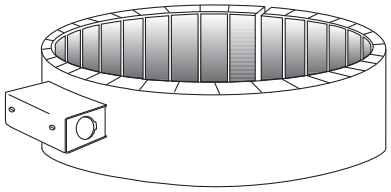
Min. I.D. 3"
Min. Width 1-1/2"



## *Options*

### Terminal Box Protection - TB

Designed in standard height of 1-3/4" high, with 5/8" conduit knockout for standard metal conduit connections. Protects terminals from damage, spill leakage, grounding or short circuiting. Available for single or 3-phase construction. For conduit connections, consult factory.



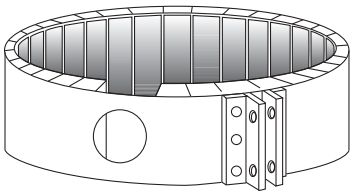
# CB
## Ceramic Band Heater *(cont'd.)*

### *Options (cont'd.)*

**Shroud Overlap**

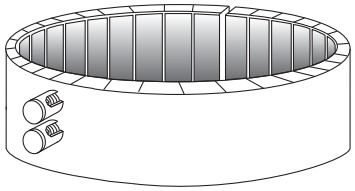
Shroud overlap designed to accommodate a thermocouple hole in gap. This is the preferred way of adding a themocouple hole. Heaters can be supplied with any termination or clamping variation.

Min. I.D. 5"
Width 1-1/2"
Max. I.D. 21"



**Ceramic Caps - CC**

Protects against electric shock, when used with insulated wire. Can be rotated at any angle - Screw size 1/4-20 standard.



### *How to Order Ceramic Bands*

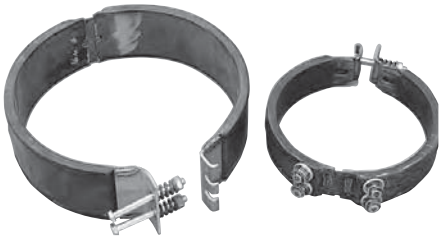
1. Order by Catalog Code and PCN
2. Specify quantity
3. Specify Inside diameter (ID)
4. Specify Width (1/2" increments)
5. Wattage - 2-piece bands each half is rated one-half the wattage.
6. Voltage on 2-piece bands, we recommend each piece is rated at half the operating voltage.
7. Terminal type - post terminals are standard, specify terminal location.
8. Standard 1/4" insulated or optional 1/2" insulation.
9. Indicate size and location of thermocouple holes, cutouts, partial coverage, gaps or other special features - Fax Drawing.

### *Specifications*

| | |
|---|---|
| Sheath Material | Corrosion resistant alloy shroud |
| Maximum Temperature | 1600°F |
| Insulation Material | Thickness of heater with 1/4" insulation = 5/8<br>Thickness of heater with 1/2" insulation = 3/4" |
| Minimum I.D. | 3" |
| Minimum Width/Tolerance | 1-1/2" wide<br>Width in 1/2" increments<br>Width tolerance: ± 1/8" |
| Standard Gap When Tightened | 3/8" ± 1/8" |
| Resistance Tolerance | NEMA standard + 10% -5% |
| Wattage Tolerance | NEMA standard +5% -10% |
| Watt Density | Depends on power, operating temperature and heater size. See ordering information. |
| Maximum Volts | 600 volts |
| Maximum Amps | 25 amps |

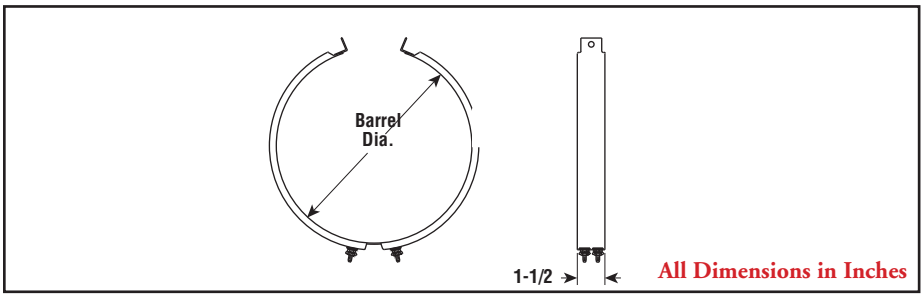
# DB

## 1-1/2" One-Piece Band Heater



- **5 - 12-1/2" Barrel Dia.**
- **750 - 2,100 Watts**
- **240 - 480 Volt**
- **24 - 40 W/In²**
- **Chrome Steel Sheath**
- **Up to 1200°F Max. Sheath Temp.**
- **Up to 800°F Max. Barrel Temp.**

### *Dimensions*




### *Applications*

- Heating Barrels of Plastic Injection Molding Machines and Extruders
- Die and Die Holder Heating of Plastic Extruders and Blow Molding Machines
- Autoclaves
- Burnout Ovens
- Heated Kettles
- Fluidized Beds
- Heat Treating Pipes
- Any application requiring heat applied to a cylindrical surface

**Ten Times the Life —** Long life heavy duty band heater uses a 3/8 inch thick strip heater with chrome steel sheath, offers ten times the life of a mica band heater.

**Heavy Duty —** Uses type PT Chromalox strip heater.

**Flexible One-Piece Construction for Easy Installation and Removal —** The unheated section between heated halves functions as a hinge and permits repeated opening and closing for moving heaters from one application to another. The heavy duty spring loaded clamping bolt pulls the heater tight to the work and maintains tightness by compensating for expansion.

**Spring Loaded —** For tight fit with Inconel® spring and nickel-plated clamping bolts and nuts. Maintains tightness.

**Uniform High Temperature Capability —** Highly compacted refractory insulation assures efficient heat transfer, therefore lower resistance wire temperatures.

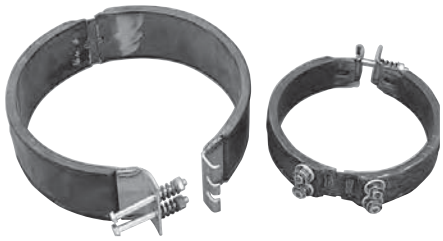
**Convenient Wiring Options —** Each heated half is rated at 240V and one-half the overall wattage. Halves can be wired parallel for 240V operation or series for 480V operation.

### *Specifications and Ordering Information*

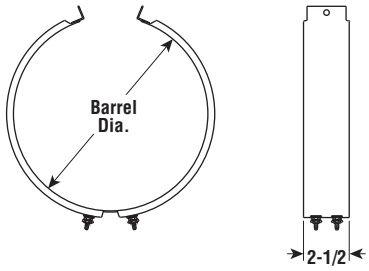
# DBW

## 2-1/2" One-Piece Band Heater

- **6-1/2 - 11-1/2" Barrel Dia.**
- **1,525 - 3,250 Watts**
- **240 - 480 Volt**
- **30 - 36 W/In²**
- **Chrome Steel Sheath**
- **Up to 1200°F Max. Sheath Temp.**
- **Up to 800°F Max. Barrel Temp.**



### *Dimensions*




All Dimensions in Inches

### *Applications*

- Heating Barrels of Plastic Injection Molding Machines and Extruders
- Die and Die Holder Heating of Plastic Extruders and Blow Molding Machines
- Autoclaves
- Burnout Ovens
- Heated Kettles
- Fluidized Beds
- Heat Treating Pipes
- Any application requiring heat applied to a cylindrical surface

**Ten Times the Life —** Long life heavy duty band heater uses a 3/8 inch thick strip heater with chrome steel sheath, offers ten times the life of a mica band heater.

**Heavy Duty —** Uses type PT Chromalox strip heater.

**Flexible One-Piece Construction for Easy Installation and Removal —** The unheated section between heated halves functions as a hinge and permits repeated opening and closing for moving heaters from one application to another. The heavy duty spring loaded clamping bolt pulls the heater tight to the work and maintains tightness by compensating for expansion.

**Spring Loaded —** For tight fit with Inconel® spring and nickel-plated clamping bolts and nuts. Maintains tightness.

**Uniform High Temperature Capability —** Highly compacted refractory insulation assures efficient heat transfer, therefore lower resistance wire temperatures.

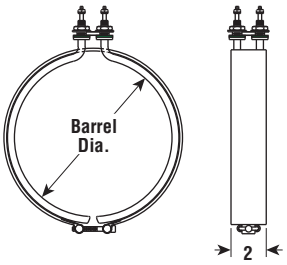
**Convenient Wiring Options —** Each heated half is rated at 240V and one-half the overall wattage. Halves can be wired parallel for 240V operation or series for 480V operation.

# HBT

## 2" Two-Piece Band Heater

- **3 - 12" Barrel Dia.**
- **650 - 2,000 Watts**
- **120 and 240 Volt**
- **24 - 44 W/In²**
- **3 - 12" Barrel Dia.**
- **INCOLOY® Sheath**
- **Up to 1200°F Max. Sheath Temp.**
- **Up to 900°F Max. Barrel Temp.**

### *Dimensions*




All Dimensions in Inches

### *Applications*

- Barrel and Nozzles of Plastics Injection Molders
- Extrusion Barrels
- Autoclaves
- Heat Treating of Large Diameter Pipes

### *Features*

**Type HBT** has two matching alloy-sheath tubular elements and stainless steel matching clamping band, same as type HB. Elements are flattened for maximum heat transfer.

**High Temperature, Tight Fitting.**

**Uniform Heating** accurately controllable.

**Reduced Downtime** elements are refractory insulated for long life and heavy usage.

**Complete, Firm Coverage** at all times is assured by slip proof, stainless steel clamping bands equipped with heavy threaded socket bolt. This allows the pair of elements to be drawn tight to heated surface. The hotter it gets, the tighter it fits. Because clamps cannot loosen or slip off heater, heat transfer is continuously efficient, adding to heater life.

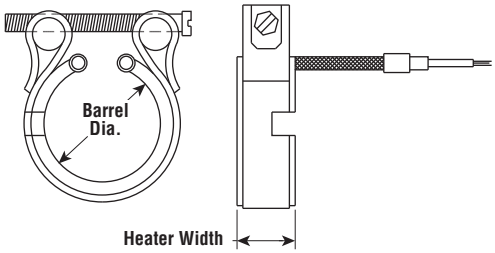
**Stock Heater** can be easilly modified to drill for thermocouple.

# MB-1

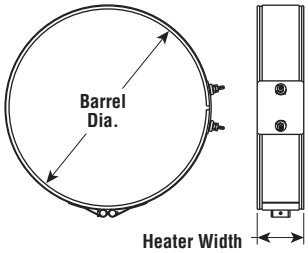
## One-Piece Mica Insulated Band Heater

- **1 - 6-1/8" Nozzle Dia.**
- **100 - 300 Watts**
- **120 and 240 Volt**
- **Up to 800°F Max. Sheath Temp.**
- **Up to 600°F Max. Barrel Temp.**
- **Type A Leads**
- **Heavy Duty Anti-torque Post Terminal (type P)**

### *Dimensions – Type A*




### *Dimensions – Type P*




All Dimensions in Inches

### *Applications*

- Barrels and Dies of Plastic Molding Machines
- Extruders
- Autoclaves

### *Features*

**Efficient Heat Transfer** is provided by high quality nickel chromium resistor wire wound on a select mica strip and enclosed in a die-formed aluminum coated steel sheath.

**Long-Term Durability** is assured by non-hygroscopic mica insulation.

**Uniform Fit** to ±1/16".

**Type A Extra Flexible Stranded Nickel Leadwire** protected by means of a close-knit stainless steel braided sleeve. Standard length is 24" with 18" of braid.

**Heavy Duty Stainless Steel Anti-torque Post Terminals —** Standard is #10-24 threads, except for 1" wide units which have #6-32 threads.

**Reliable Performance and Quick Temperature Response.**

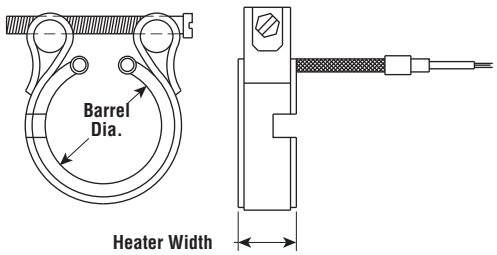
**One-Piece Construction** provides maximum nozzle coverage in tight spaces.

# MB-1

## One-Piece Mica Insulated Band Heater *(cont'd.)*

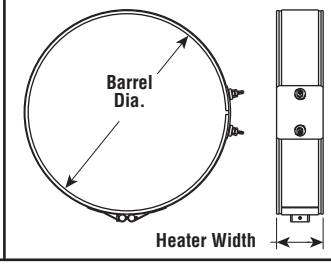
- 1 - 6-1/8" Nozzle Dia.
- 275 - 1000 Watts
- 120 and 240 Volt
- Up to 800°F Max. Sheath Temp.
- Up to 650°F Max. Barrel Temp.
- Type A Leads
- Heavy Duty Anti-torque Post Terminal (Type P)

*Dimensions – Type A*




All Dimensions in Inches

*Dimensions – Type P*



# MB-2

## Two-Piece Mica Insulated Band Heater

- **3-1/2 - 10-1/2" Barrel Dia.**
- **500 - 2,000 Watts**
- **240 - 480 Volt**
- **21 - 40 W/In²**
- **Up to 800°F Max. Sheath Temp.**
- **Up to 650°F Max. Barrel Temp.**
- **Heavy Duty Anti-torque Post Terminals (type P)**

### *Applications*

- Barrels and Dies of Plastic Molding Machines
- Extruders
- Autoclaves
- Standard Sections Up to 10-1/2" O.D. Consult Factory for Larger O.D's.

### *Features*

**Efficient Heat Transfer** is provided by high quality nickel chromium resistor wire wound on a selected mica strip and enclosed in a die-formed aluminum coated steel sheath.

**Long-Term Durability** is assured by non-hygroscopic mica insulation.

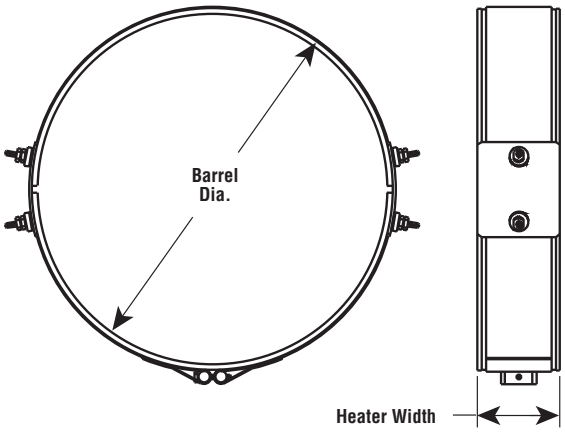
**Uniform Fit** to ± 1/16" because of low expansion stainless steel clamping band, which assures maximum heat distribution.

**Easy to Apply** due to two-piece construction. Each heater is rated 240V. Connect in series for 480V; parallel for 240V.

**Heavy Duty Nickel Plated Steel Post Terminals** complete with hardware, are designed to prevent excess torsion during tightening of connections. Standard #10-24 threads.

**Reliable Performance and Quick Temperature Response.**

### *Dimensions*




All Dimensions in Inches

# MTB
## Mighty-Tuff® Band Heaters

- **Stainless Steel Sheath resists oxidation**
- **Capable of up to 1200°F (760˚C) Sheath Temperatures**
- **Highest possible application temperatures**
- **Capable of long life at High Watt Densities**
- **Thin profile (3/16") for fast response**

NEW!

### *Description*

Rugged construction along with high temperature and high watt density capabilities allow the Mighty-Tuff Band Heater to surpass all other band heaters in providing the ever increasing temperatures required for processing today's high tech materials. The advanced design and thin profile allow the quick transfer of heat from the element to the sheath for efficient operation to 1200°F sheath temperature. Watt densities as high as 100 wp/in$^2$ on small diameters are possible. A stainless steel sheath encases a compressed mineral refractory material which surrounds a helical or sinuated resistance element. The Mighty-Tuff can stand up to shock, vibration and many contaminants long after standard band heaters have failed. In normal use, or in the most difficult application, the Mighty-Tuff will improve machine productivity by improving band heater performance.

### *Options*

- Full length fiberglass sleeving
- Ground Wire
- Ceramic Terminal Covers
- Standard NEMA Plugs
- Built-in Thermocouple

### *Terminations*

#### *Type F*

**High Temperature Leads**
12" long 850°F/450°C insulated lead wires are standard. Specify longer length. Also available with full length fiberglass sleeving.


#### *Type C*

**Armor Cable Leads**
Armor cable is the best protection for abrasion. 12" cable and 14" overall leads are standard.

# MTB
## Mighty-Tuff® Band Heaters *(cont'd.)*

**Metal Braided Leads**

Double conductor metal braid provides excellent abrasion protection and flexibility. Standard Length is 12" braid with 14"overall lead wires. Specify additional length if required. Type P and Type R are available without metal braid.

*Type A*


*Type R*


*Type P*


**Post Terminals**

*Type SH*

Terminals 180° from gap.


*Type SG*

Terminals at gap. Minimum width - 2"

*Type B*

Terminal Box. 2-1/16" H x 2-1/2" W x 2-1/8" D

# MTB
## Mighty-Tuff®
## Band Heaters *(cont'd.)*

**European Style High Temperature Plugs**

Maximum Voltage = 250V, Maximum Amperage = 25 Amps. Other plugs attached to leads are available.

***Type 110***

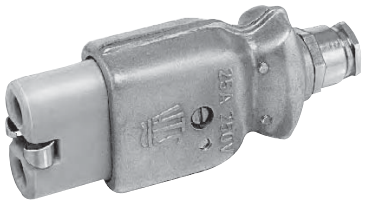
3-5/8" H x 1-5/16" L x 2-15/16" W

***Type 115***

1-3/8" H x 3-7/16" L x 1-7/8" W

***Fig GQ8***

Receptacle PC4396-3



**One Piece Expandable**

***Type E***

(Shown with Type SG terminals) Specify termination, terminal location and other options.

**Two Piece Contstruction**

***Type T***

(Shown with Type A leads and optional spring loaded screws) Specify termination, terminal location and other options.