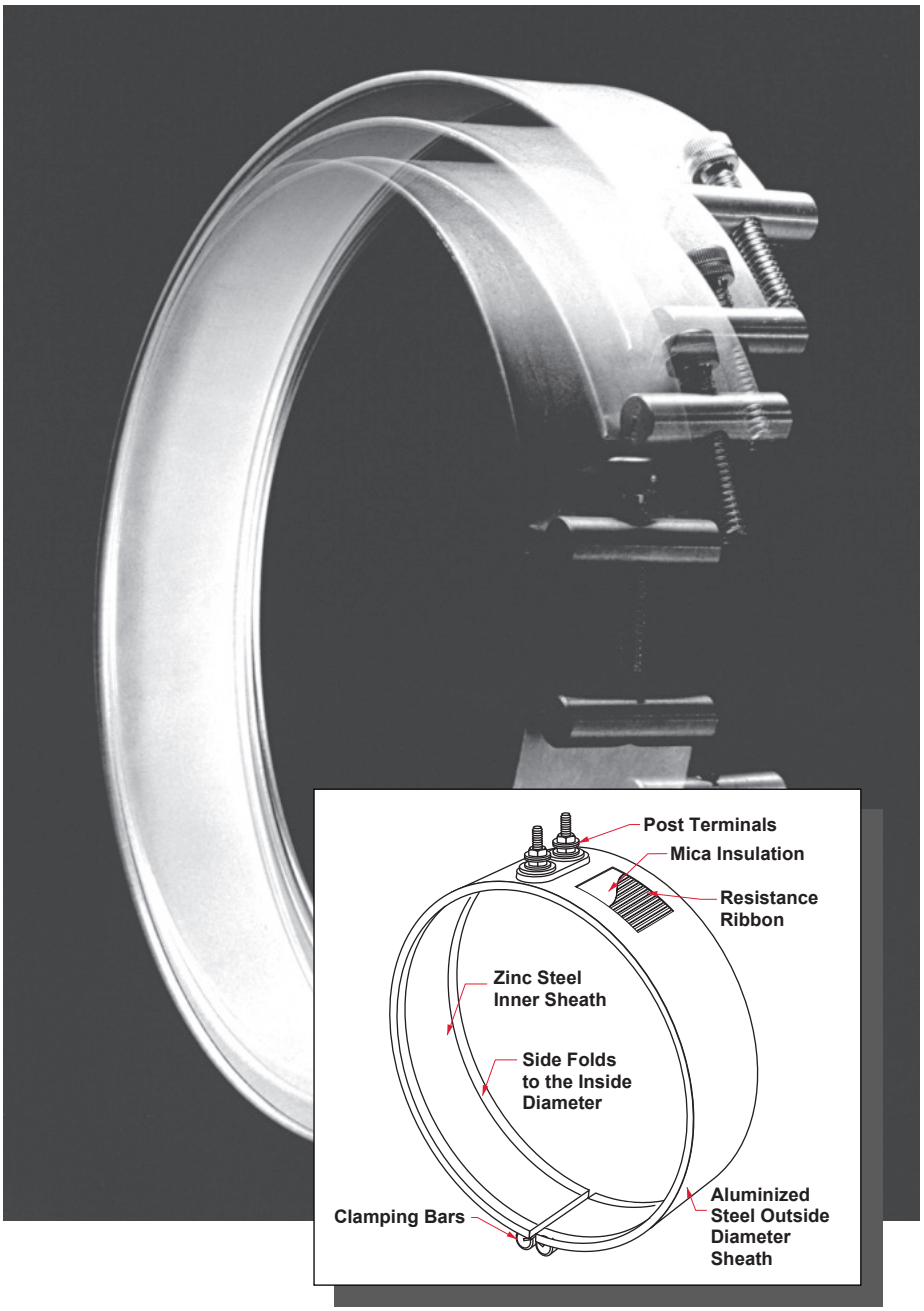
Heat & Sensor Technology

Band Heaters

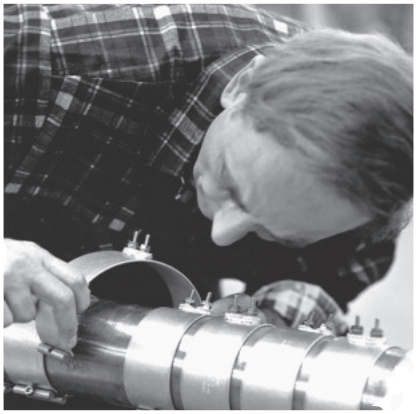
THINBAND® Mica Barrel and Nozzle



THINBAND heaters deliver fast and install easily, keeping costs down and machines running.

Performance Capabilities

- Sheath temperatures to 900°F (480°C)
- Watt densities to 55 W/in^2 (8.5 W/cm^2)



Features and Benefits

New flexible, one-piece design makes installation faster on plastic processing equipment because it can be opened to the full diameter of the barrel without internal damage to the heater. The THINBAND heater can be installed on a barrel without removing other band heaters already in place.

- **Quick Clamp** opens to fit over barrels and snaps in place with one easy flip of its latching lever. No need to remove other heaters.
- **Permanently attached clamping bars.**
- **Contamination resistance.** No folds on outside of heater.

Applications

- Extruders
- Blown film dies
- Injection molding machines
- Other cylinder heating applications

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Applications and Technical Data

Operating Factors

Use as low a watt density rating as your application permits. A close match of the heat supplied to the actual requirements will reduce temperature overshoot, reduce cycling and increase the life of any band heater you use.

Calculate the **safe maximum wattage** for your heater using:

Heated Area x Maximum Watt Density

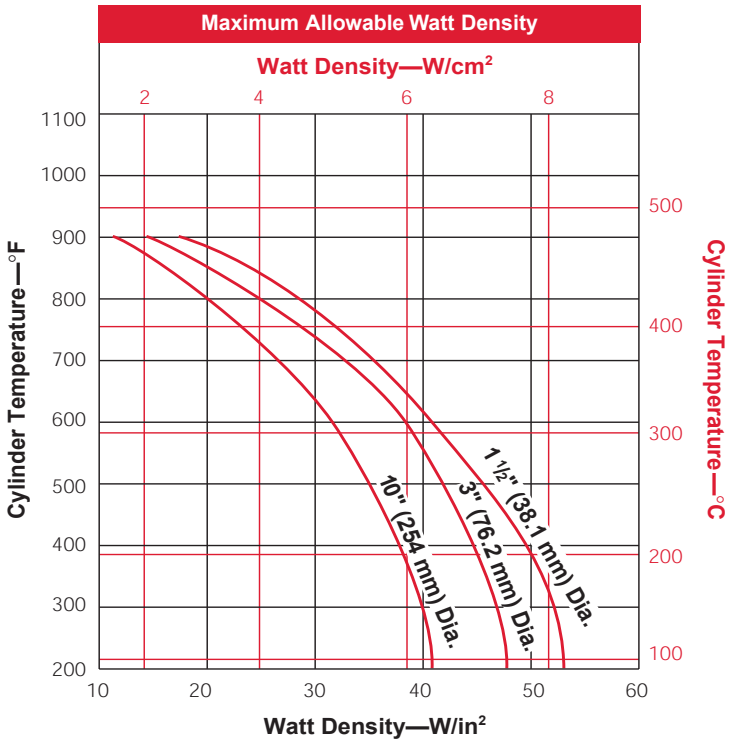
Calculate the **heated area** of your band heater by subtracting the no-heat area from the total area in contact with the cylinder (3.14 x I.D. x width). Subtract the no-heat area at the terminals (from table) and any additional no-heat area caused by holes, slots or oversize gaps.

Determine the maximum watt density of your heater from the graph on this page. The curves are based on narrow heaters mounted on a smooth, steel cylinder. Apply the necessary correction factors:

- For heaters 2¼ inches (57 mm) to five inches wide (127 mm), multiply watt density by 0.8.
- For high expansion cylinders (aluminum or brass), reduce the watt density by 3 W/in^2 (0.46 W/cm^2).
- For heaters 2¼ inches to five inches (57 mm to 127 mm) wide installed on a high expansion cylinder, reduce watt density by a total of 3 W/in^2 (0.46 W/cm^2) only.
- For regular cylinder surfaces other than smooth, machined finish, reduce watt density by 3 W/in^2 (0.46 W/cm^2).

No-Heat Area for THINBAND (All Terminations)

Heater Type	Heater Size		No-Heat Area at Terminals in (mm)
	Diameter in (mm)	Width in (mm)	
One Piece	Less than 2½ (63.5)	Up to 7 (177.8)	1 (25.4) x width
Two Piece	5 (127) or more	More than 3 (76.2)	2 (50.8) x width



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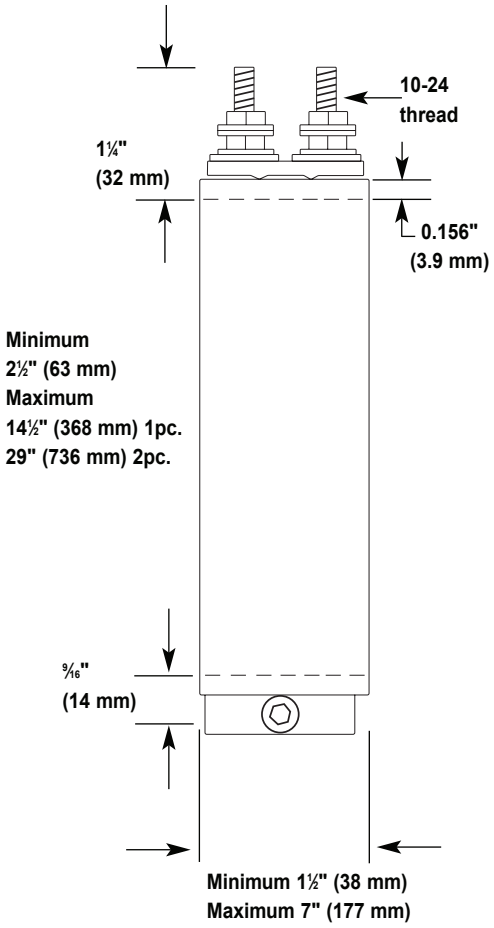
Physical Limitations of Lead Variations

Check the table to be certain the variations and lead arrangements you order are available on the heater size you require.

THINBAND Barrel



Physical Limitations of Lead Variations

Heater Type	Diameter				Width			
	Min.		Max.		Min.		Max.	
	in	(mm)	in	(mm)	in	(mm)	in	(mm)
1 pc. const.	1	(25.4)	14½	(368.3)	1½	(38.1)	7	(177.8)
2 pc. const.	5	(127)	29	(736.6)	1½	(38.1)	7	(177.8)
Nozzle								
Type A	1	(25.4)	4	(101.6)	1	(25.4)	6	(152.4)
Type L	1	(25.4)	4	(101.6)	1	(25.4)	6	(152.4)
Barrel								
Type T	2½	(63.5)			1½	(38.1)	7	(177.8)
Type H	2½	(63.5)			1½	(38.1)	7	(177.8)
Type F, FR	2½	(63.5)			1½	(38.1)	7	(177.8)
Type E	2½	(63.5)			1½	(38.1)	7	(177.8)
Type C, BR	2½	(63.5)			1½	(38.1)	7	(177.8)
Type K, KR	2½	(63.5)			1½	(38.1)	7	(177.8)
Terminal Box	3½	(88.9)			1½	(38.1)	7	(177.8)
European Plug								
1 pc. vertical	2½	(63.5)	14½	(368.3)	1½	(38.1)	7	(177.8)
1 pc. horizontal	2½	(63.5)	14½	(368.3)	1½	(38.1)	7	(177.8)
Welded Barrel Nuts								
1 pc.	2½	(63.5)	14½	(368.3)	1½	(38.1)	7	(177.8)

Note: Some combinations of maximums and minimums cannot occur on the same heater. Check the table to be certain the variations and lead arrangements you order are available on the heater size you require.

Standard gap is ⅜ inch (9.53 mm) between clamp bars.

Band Heaters

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Barrel Heater Quick Clamp Option

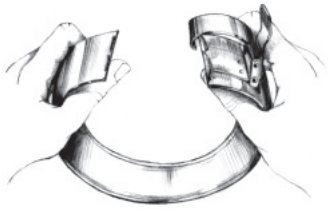
With Quick Clamp, the THINBAND heater can be secured tightly in place in a matter of seconds. The spring-loaded clamp secures the heater tightly around the barrel with an easy flip of the lever.

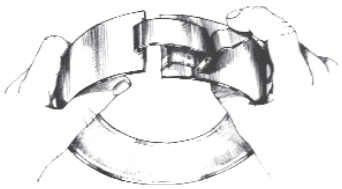
Features and Benefits

- THINBAND with Quick Clamp fits over barrels and snaps in place with easy flip of its latching lever.
- Hot change-outs are completed in seconds.
- Spring tensioned clamp keeps the THINBAND heater tight against barrel—won't loosen over time.
- Ideal for vertical applications.
- Available on selected stock and made-to-order THINBAND barrel heaters—minimum four inch (100 mm) diameter, 1½ inch (38 mm) width.
- Standard gap is ½ inch.

Quick Clamp eliminates tools, loose parts and hassle

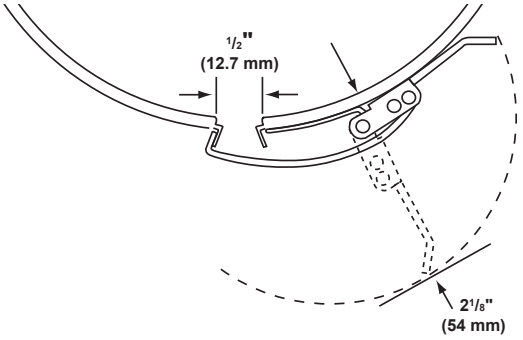
- THINBAND opens up to fit over barrel. There is no need to remove other heaters.
- One easy flip of the latching lever and Quick Clamp shuts, completing installation.





Clearance Dimensions

Width Range in (mm)	Number of Quick Clamps	Distance Between Clamps in (mm)
1½ (38.1) to 2 11/16 (69.3)	1	N/A
2¾ (69.9) to 3 11/16 (94.8)	2	½ (12.7)
3¾ (69.9) to 4 11/16 (120.1)	2	1 (25.4)
4¾ (120.6) to 5 11/16 (145.5)	3	½ (12.7)
5¾ (146.1) to 7 (145.5)	3	1 (25.4)



Recommended Clamping Options

THINBAND Barrel Products

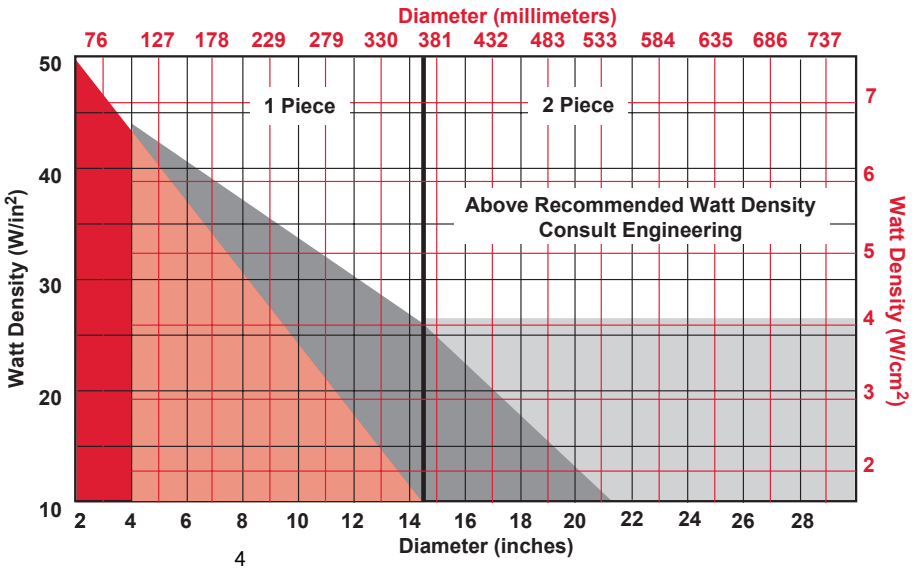
Clamp Bars

Clamp Bars
Or Quick Clamp above 4" (101.6 mm) diameter

Quick Clamp
For 2 piece: Clamp bar at other gap

Coil Spring
For 2 piece only: Clamp bar at other gap

Notes: Widths four inches (101.6 mm) and over add two inches (50.8 mm) to diameter then reference chart clamp selection.



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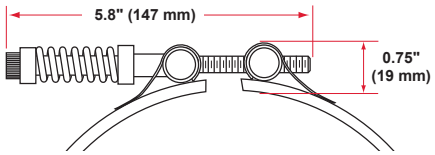
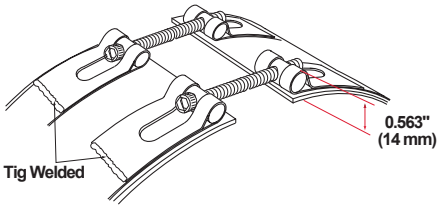
Barrel Heater Clamping Variations



Tig Welded Barrel Nuts With Spring Loaded Clamping

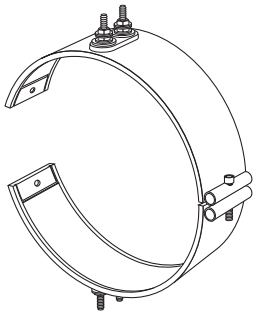
Tig welded barrel nuts with spring loaded clamping are used during start-up to maintain a tight heater fit on large barrels. Stainless steel top metal is required.



Tig Welded Barrel Nuts

An ideal way to provide access for instrumentation is to specify an oversized gap between the heater ends. If the THINBAND clamp bar screw interferes with the positioning of the instrumentation device, tig welded barrel nuts are recommended. Stainless steel top metal is required. Maximum gap is one inch (25 mm) Specify **tig welded barrel nuts** and **gap dimension** when ordering.

Non-Stock Option

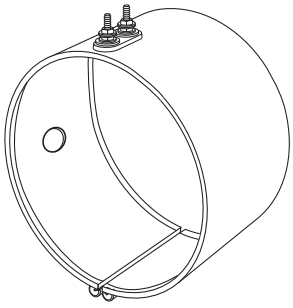


Clamping Pads

Clamping pads are used when an obstruction would prevent a standard full circumferential heater from fitting completely around a machine barrel. The clamping pads have a hole to allow easy fastening to the machine barrel. **Dimensional drawing required** when ordering.

Variations

Non-Stock Option



Holes

An economical way to provide access for instrumentation is to specify an oversized gap between the heater ends. A hole in the sheath should be specified only when all the cylinder surface adjacent to the hole must be heated. **When required, one hole may be provided in nearly any location as long as there is at least one inch (25 mm) between the hole and one side of the heater. Standard hole sizes up to two inches (51 mm) diameter**. Consult factory for limitations. For proper hole location, a **dimensional drawing is required.**

Band Heaters

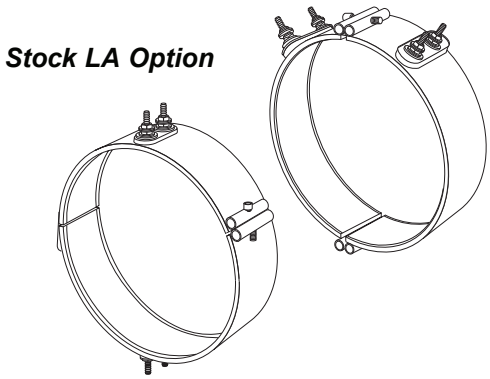
THINBAND Mica Barrel and Nozzle

Barrel Heater Variations

Continued

Non-Stock Option

Stock LA Option



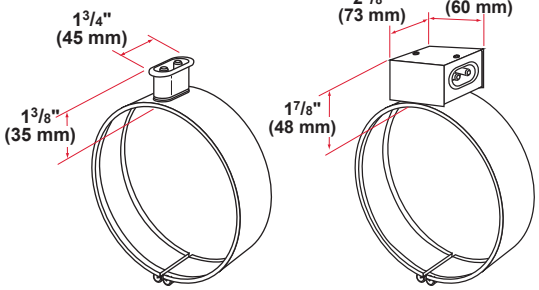
Two-Piece Band Heaters

Two-piece construction is available on heaters five inches (127 mm) or greater in diameter. Heaters 1½ inches (38 mm) wide and greater with post terminals have the two terminals side-by-side.

Note: When ordering two-piece band heaters, specify the **volts** and **watts per half.** On two-piece units with leads, you must also specify the **power supply voltage.** Example: a two-piece band that is 240V~(ac) per half may be wired in series to a 480V~(ac) power supply. In this case the band heater lead wire insulation must be rated for 480V~(ac). Available from stock by combining two one-piece heaters to create a large diameter. Terminations will be 90 degrees from each gap. **Quick Clamp** must be supplied at one gap when ordering.

Stock Option

Stock Option

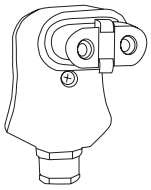


Vertical **Horizontal**

High Temperature "Quick Disconnect" European Style Plugs

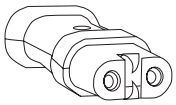
They provide the simplest and safest way to apply power to band heaters. The combination of high temperature male and female quick disconnect plug assemblies eliminates all live exposed terminals and electrical wiring that can be a potential hazard to employees or machine. Maximum 15 amps at 240V~(ac), maximum volts 240. When ordering, specify **vertical** or **horizontal European** plug.

Stock Option



Right Angle
Code # N6027AF049

Stock Option



Straight
Code # N6027ZZ028

High Temperature "Quick Disconnect" European Style Female Adaptors

Available as an accessory item that must be used in conjunction with high temperature "quick disconnect" European style plugs. Specify code number **N6027AF049** or **N6027ZZ028** and quantity.

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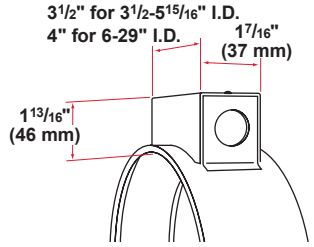
Barrel Heater Variations

Continued

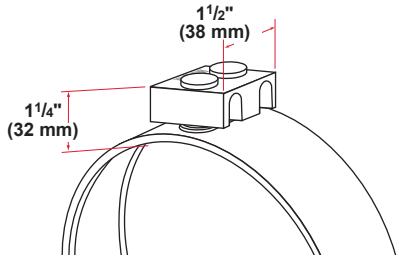
Stock Option



Metallic Terminal Box

Available on heaters of 3½ inches (88 mm) diameter or larger. Terminal boxes are attached to the heater to cover the terminals for an added safety feature. Conduit may be attached to the box through ⅞ inch (22 mm) diameter holes in the ends of the box. Terminal box is available on one or two piece stock THINBAND heaters. When ordering, specify **terminal box.**

Stock Option



Code # Z-4919

Ceramic Terminal Covers

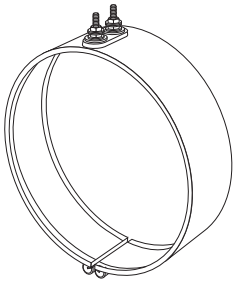
A convenient and economic way to insulate post terminals. Sized for standard length posts. 10-24 screw thread size. These are supplied as an accessory item and shipped separately. Specify code number **Z-4919** and quantity.

Metric Clamp Bars and Screws

Metric hardware is available on made-to-order THINBAND heaters with post terminals and clamp bars. The post terminal thread size is M5X.8. The screw for the clamp bar will be M6X1.0 socket head cap screw. When ordering, specify **metric hardware** required.

Terminations

Stock LA Option



Type T

Post terminals provide a quick connection with ring or fork connectors, or buss strips. Threaded 10-24 studs or optional metric (M5X.8) are provided with double nuts and washers. Post terminals have a threaded length of 9/16 inch (14 mm) and require 1¼ inches (32 mm) clearance from the cylinder. Maximum amperage for post terminals is 35 amps and they can withstand up to 45 in-lbs (61.0 Newton-Meter) of torque. The increased torque is possible due to the unique add-on lead cap design, which makes the cap a separate entity from the heater. This means all of the torque carrying capability is maintained within the cap design, allowing the terminal hardware to be torqued to a specific setting and tested prior to connection to the heater.

The welded electrical connection to the heater is superior to crimped or staked connections which can loosen and oxidize during operation.

To order, specify **Type T.**

THINBAND Mica Barrel and Nozzle

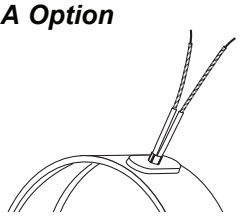
Barrel Heater Terminations

Continued

Heaters rated at less than 250 volts use UL® approved lead insulation for operations to 482˚F (250˚C) as standard. Lead insulation UL® rated for operation to 850˚F (450˚C) may be required in high temperature applications where the leads are shrouded or enclosed with the heater. All heaters rated at more than 250V~(ac) use this wire.

Type K

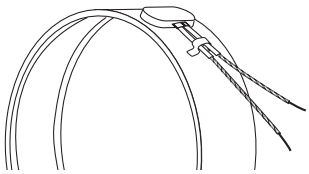
Stock LA Option



Flexible lead wires exit vertically from the heater. These leads can be bent adjacent to the heater for a quick and easy connection. To order, specify **Type K** and length.

Type KR

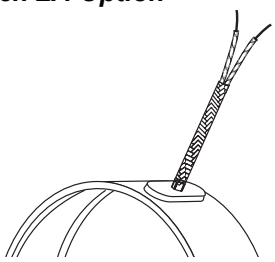
Stock LA Option



Same specifications as Type K except lead wires exit at right angle. To order, specify **Type KR** and length.

Type C

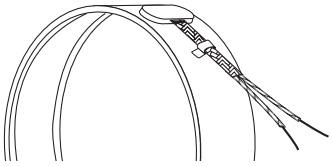
Stock LA Option



Two fiberglass lead wires exit a single tightly woven metal braid for good abrasion protection, lead flexibility and wiring convenience. Leads are two inches (51 mm) longer than the braid. To order, specify **Type C** and length.

Type BR

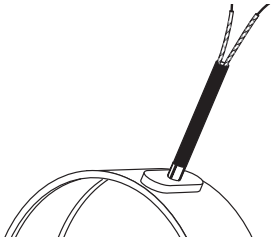
Stock LA Option



Same specifications as Type C except lead wires exit at right angle. To order, specify **Type BR** and length.

Type F

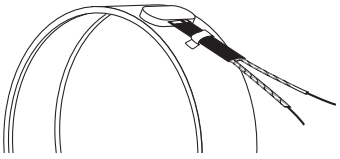
Stock LA Option



Loose fiberglass sleeving encloses two fiberglass leads for additional insulation protection where high temperature or minor abrasion is present. Leads are two inches (51 mm) longer than the sleeving. To order, specify **Type F** and length.

Type FR

Stock LA Option



Same specifications as Type F except lead wires exit at right angle. To order, specify **Type FR** and length.

Band Heaters

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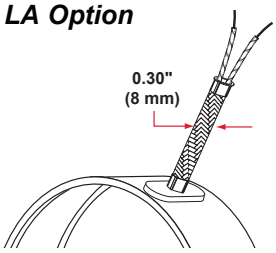
Barrel Heater Terminations

Continued

Type E

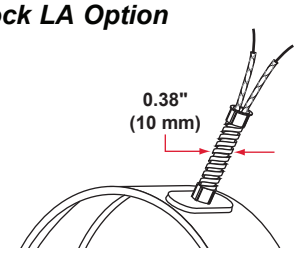
Stock LA Option



Loose metal braid encloses two fiberglass leads for good abrasion protection, lead flexibility and wiring convenience. Leads are two inches (51 mm) longer than the braid. To order, specify **Type E** and length.

Type H

Stock LA Option



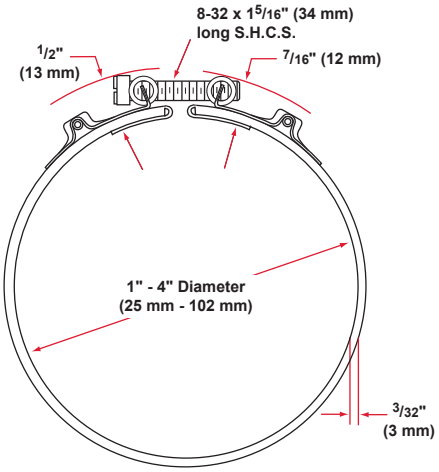
A stainless steel, flexible conduit encloses the leads for superior mechanical protection where lead abrasion is a particular problem. Leads are two inches (51 mm) longer than the conduit. To order, specify **Type H** and length.

Ground Wire or Terminal Stud

18 gauge uninsulated ground wire is available on all lead types except post terminals and Type C leads. A 10-24 ground terminal stud has a threaded length of 1 1/16 inch (17 mm). Studs are welded to the sheath and are provided with a green nut and washer. To order, specify **uninsulated ground wire** or **terminal stud.**

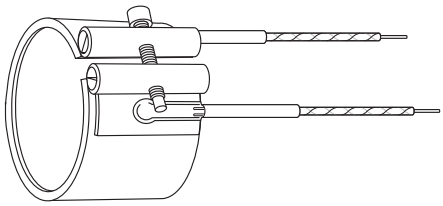
THINBAND Nozzle Heater Terminations

- **One to four inch diameter**
- **One to six inches wide**



Type L

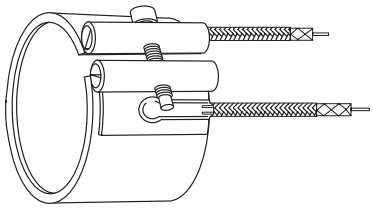
Stock Option



Flexible lead wires with fiberglass sleeves exit the nozzle heater on both sides of the gap. The heater sheath encloses the ends for protection against contamination. To order, specify **Type L.**

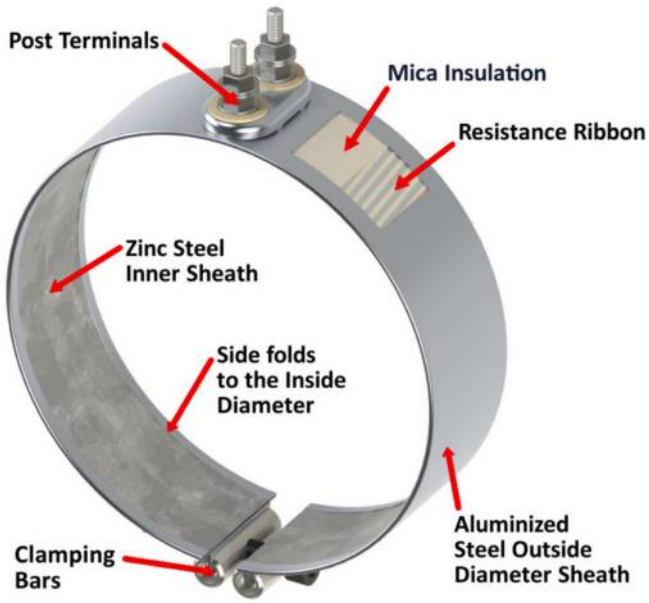
Type A

Stock Option

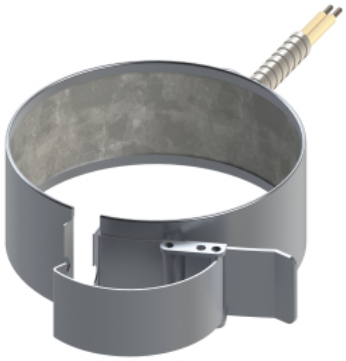


Especially designed for nozzle heaters. A galvanized metal braid over the fiberglass insulated leads provides strength and protection. The heater ends are enclosed to protect against melted plastic and contaminants. This arrangement permits one inch (25 mm) and wider nozzle heaters to be placed flush against a flange. Available on nozzle sizes only. To order, specify **Type A.**

Band Heaters



Heat & Sensor Technology



Installation Procedures

1. Install heaters over a clean surface.
2. After installing the unit, begin to tighten the clamp screw. The clamping screw is ¼ inch-20 x 1¼ inch, allen head cap screw. Begin tightening the clamp bars. If the clamp bars appear not to have seated, tap the clamp bars with a small hammer to insure the bars are well seated in the angle formed by the 60 degree bent tab and the heater.
3. If the bar has multiple screws, alternately tighten the screws as you would the lug nuts on a car wheel to insure even loading.
4. Torque all screws to approximately 8 ft-lbs.
5. Take a soft rubber mallet and tap gently around the circumference of the heater while tightening the screws. This will ensure the heater fit to the barrel is maximized without any air gaps.
6. When installing terminal lugs, torque the top nuts to 30 in-lbs. The bottom nut should not be touched as it is factory torqued to 45 in-lbs. at assembly.
7. Retighten the heater after the heater has operated for a short time. Always make adjustments when the heater and cylinder are cold.