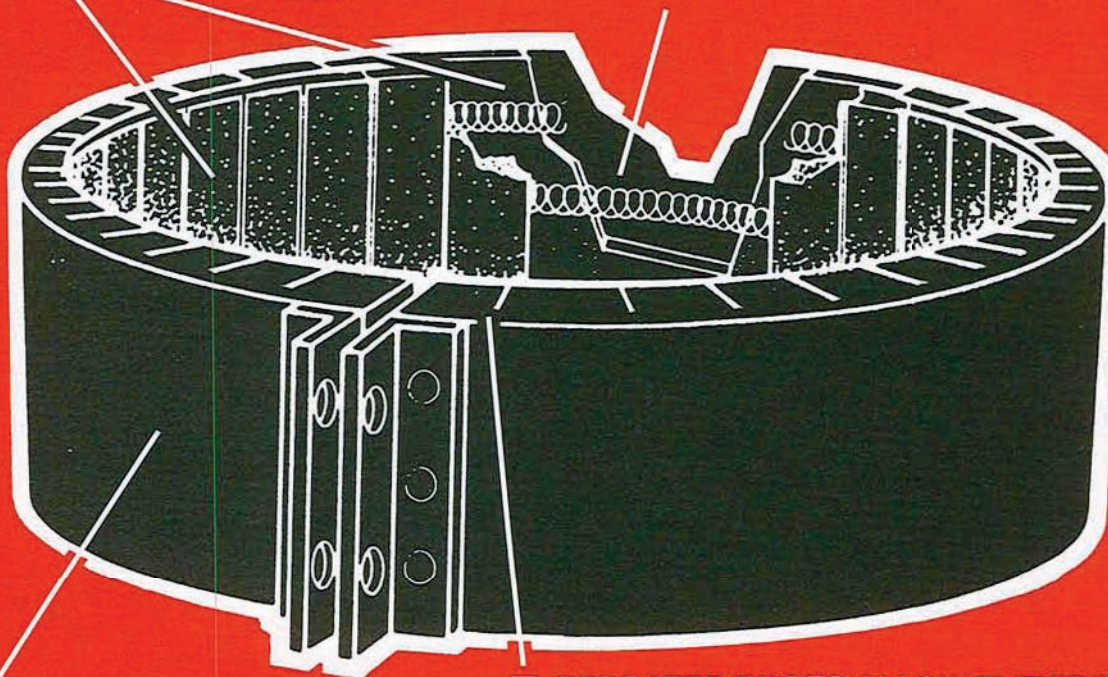


CERAMIC BAND HEATERS

- INTERCONNECTING HIGH TEMPERATURE CERAMIC TILES
- CERAMIC FIBER INSULATION TO MINIMIZE HEAT LOSS
- HELICALLY AND PRECISION WOUND NICKEL-CHROME RESISTANCE WIRE FOR EVEN HEATING AND FAST HEAT UP



- SERRATED EDGES ALLOW FLEXIBILITY
- CORROSION RESISTANT ALLOY SHROUD

FEATURES

- THERMAL INSULATION
- 1500°F. OPERATING TEMPERATURES
- FLEXIBLE
- CORROSION RESISTANT ALLOY SHROUD
- METRIC SIZES
- NICKEL-CHROME RESISTANCE WIRES
- ENERGY EFFICIENT, 25% SAVINGS
- RADIANT HEATING PRINCIPLE
- UNIFORM HEATING PATTERN
- AVAILABLE IN SPECIAL CONFIGURATIONS

APPLICATIONS

- EXTRUDER EQUIPMENT
- DIE HEADS
- INJECTION MOLDING EQUIPMENT
- CHEMICAL REACTORS

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CERAMIC BAND HEATERS

CONSTRUCTION

The use of ceramic inserts to support high temperature nickel chrome resistance wire allow the Delta ceramic heater band to operate at temperatures reaching 1500°F. Corrosion resistant metal is slit along the edges to allow easy fitting of the shroud to the object to be heated.

INSULATION

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

CLAMPING METHOD

Mounting flanges are standard on Delta 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, Delta will exit the heater with the use of 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.

RADIANT EFFECT

The radiant heating effect of ceramic heaters allows construction in widths greater than that in other types of heaters. Wider bands allow fewer heaters per zone, and more uniform heat patterns.

SENSOR HOLES

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

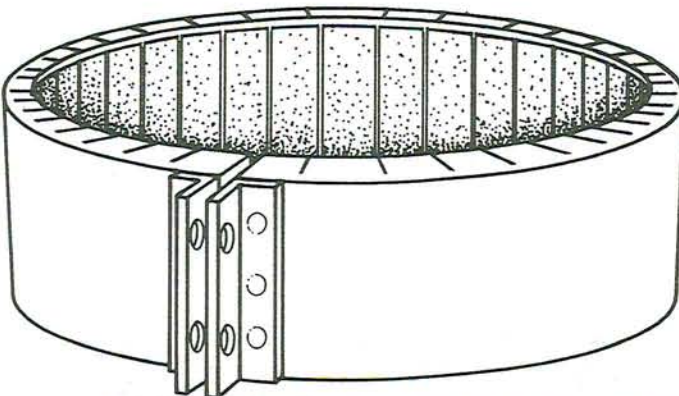
CERAMIC PLATE HEATER

Ceramic heaters can be supplied as a flat plate heater. The use of a heavy gauge metal in the shroud and a lip on four sides causes the heater to be more rigid. Mounting holes can be placed in the perimeter of the shroud.

CONSTRUCTION VARIATIONS

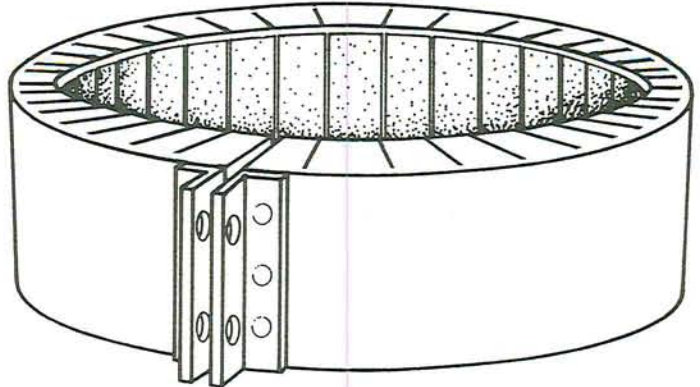
STANDARD

Standard construction consists of flange lockup, 1/4" thick ceramic insulation, 10-24 screw terminals, located 180° from gap, on center line of width, completely flexible. MAX. I.D. 21", MIN. WIDTH 1-1/2".



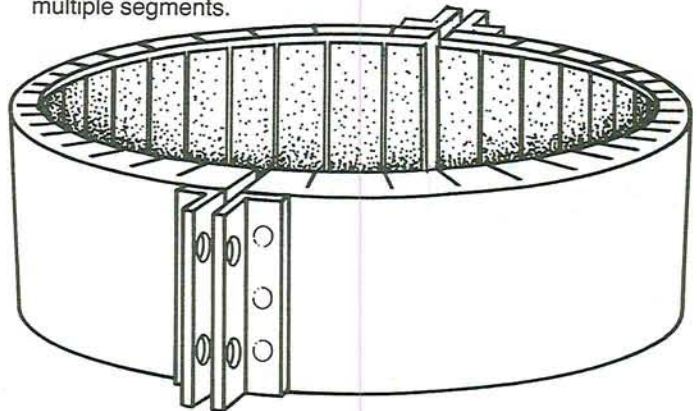
SPECIAL INSULATION

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 innerliner is inserted the heater will be 7/8" thick.



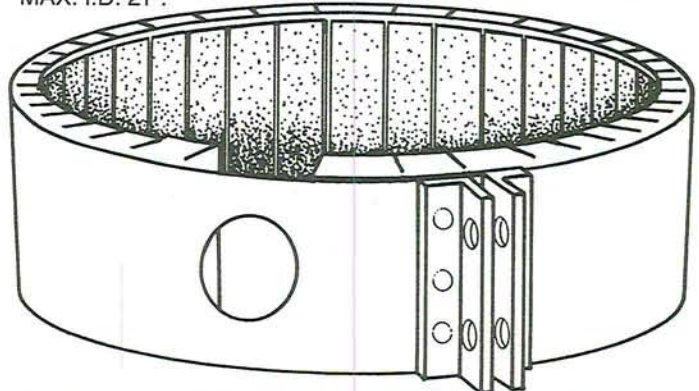
2-PIECE CONSTRUCTION

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 the voltage and each half is rated half of the total wattage. MIN. I.D. 4", WIDTH 1-1/2", MAX. I.D. 44". Larger diameters made in multiple segments.



SHROUD OVERLAP

Shroud overlap covering gap, designed to accommodate a thermocouple hole. This is the preferred method of adding a thermocouple hole. Heaters can be supplied with any termination or clamping variation. MIN. I.D. 5", WIDTH 1-1/2", MAX. I.D. 21".



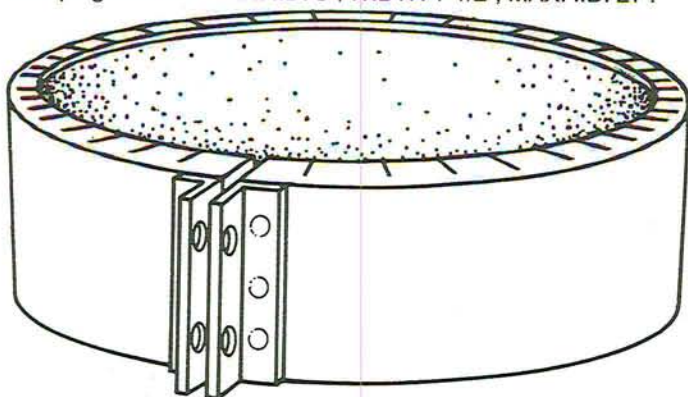
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CERAMIC BAND HEATERS

CONSTRUCTION VARIATIONS

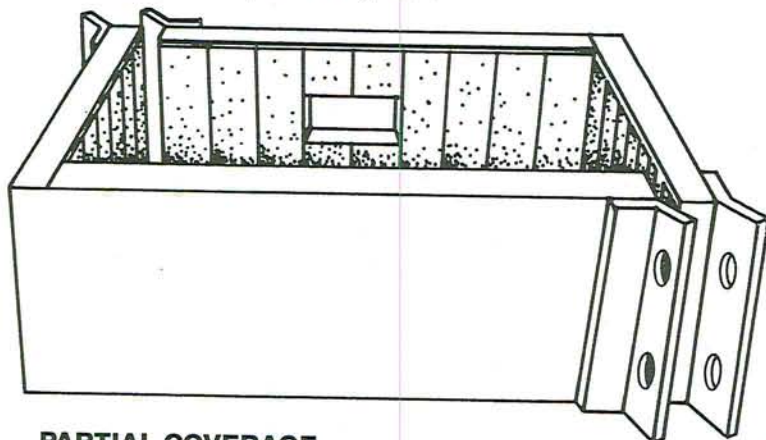
LINER

Stainless steel liners when used, delay contamination of the ceramic tiles. Heaters can be supplied with any termination, clamping variation. MIN. I.D. 3", WIDTH 1-1/2", MAX. I.D. 21".



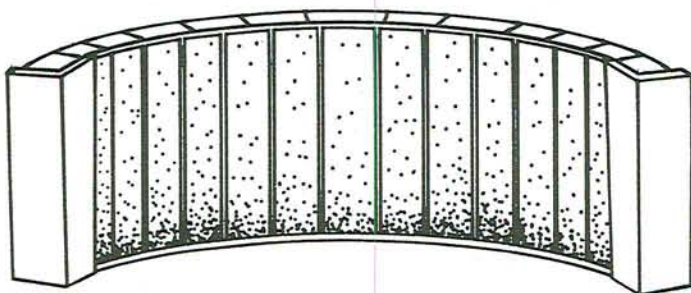
RECTANGULAR

Special designs allow full heat coverage on square or rectangular items, thermocouple holes, liners and 1/2" insulation available. MIN. linear dimension 3" per side, MIN. WIDTH 1-1/2", MAX. length 21".



PARTIAL COVERAGE

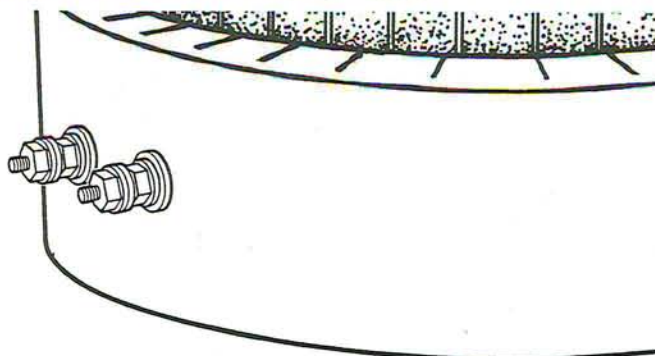
Allows for the heating of the accessible portion of machine when full coverage is not possible. Heaters supplied with standard clamping and termination. Extra insulation and liners are available. MIN. length 6", MAX. length 21".



TERMINATION VARIATIONS

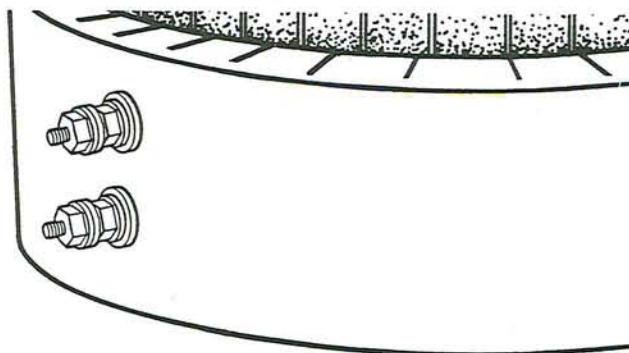
T-2 TANDEM

Tandem at 180° from gap, center line with length of heater with 10-24 or 1/4-20 post terminals. Standard on widths under 3". MIN. I.D. 3"



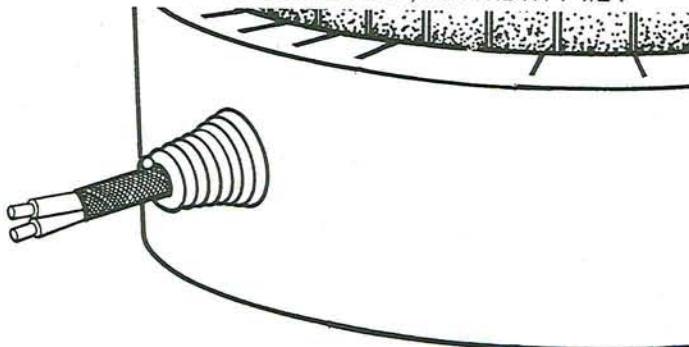
T-3 PARALLEL

Placed parallel with width of heater with 10-24 or 1/4-20 post terminals located 180° from gap. Standard on all heaters greater than 3" width. MIN. I.D. 3", MIN WIDTH 3".



C - STAINLESS STEEL METAL BRAID

Protection of fiberglass leads, used to provide abrasion resistance, electrical grounding and where clearance is limited. Leads exit one point of heater surface through a strain relief. 10" braid over 12" leads. MIN. I.D. 3", MIN WIDTH 1-1/2".

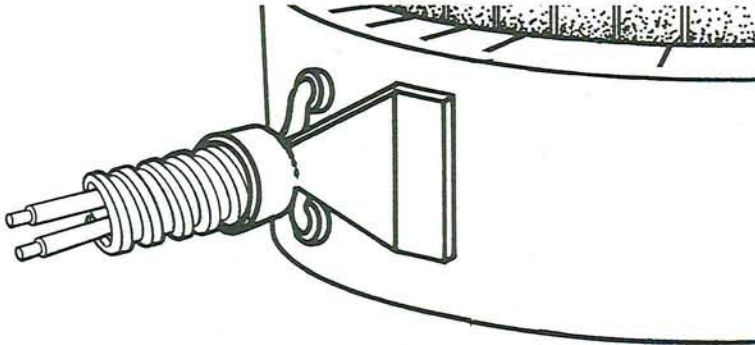


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CERAMIC BAND HEATERS

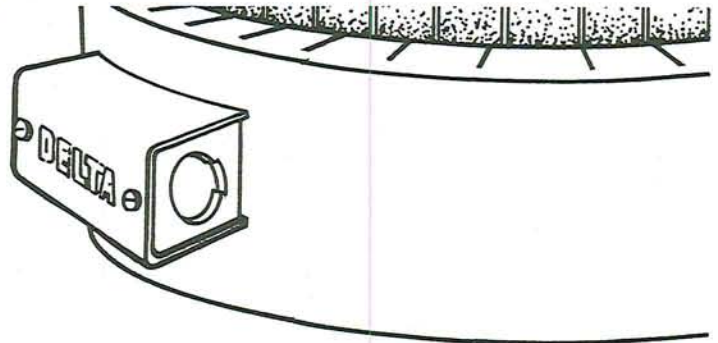
M – METAL HOSE

Stainless steel or galvanized. Flexible metal hose to protect leads from abrasion. Available on any construction or clamping variation. 10" metal hose over 12" fiberglass leads, standard. MIN. I.D. 3", MIN. WIDTH 1-1/2".



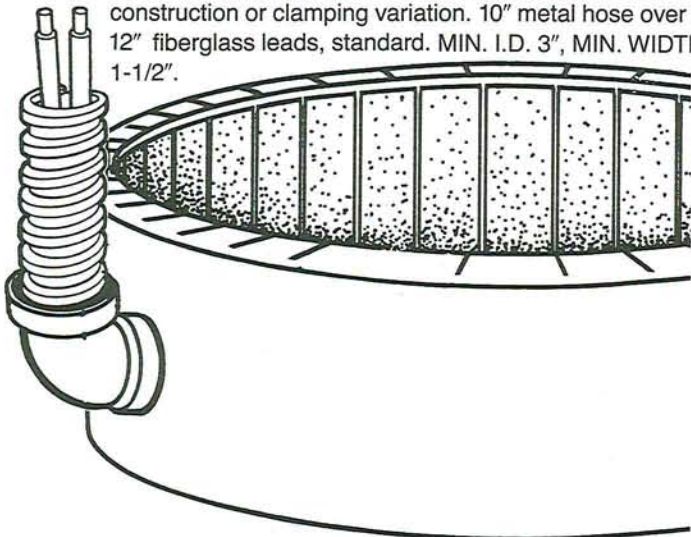
TB – TERMINAL BOX PROTECTION

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



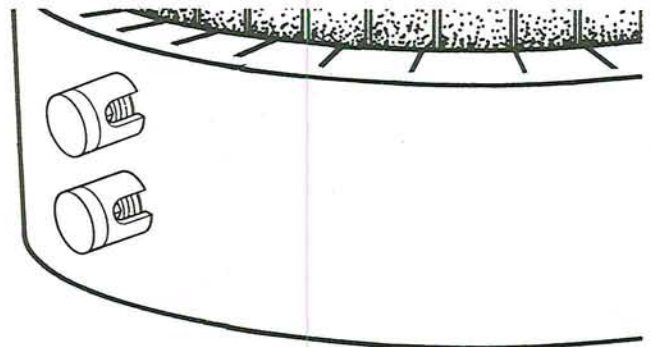
MR – RIGHT ANGLE CONNECTION

Stainless steel or galvanized flexible metal hose attached by copper elbow to protect leads from abrasion. Available on any construction or clamping variation. 10" metal hose over 12" fiberglass leads, standard. MIN. I.D. 3", MIN. WIDTH 1-1/2".



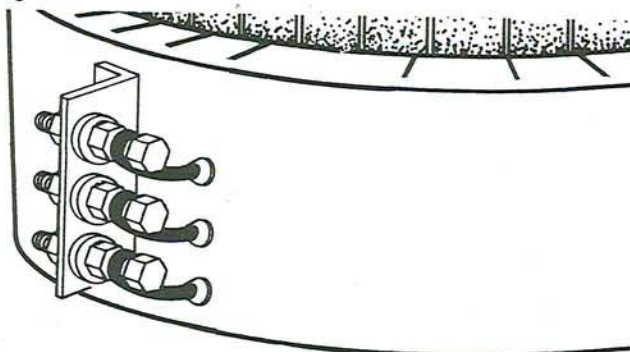
CC – CERAMIC CAPS

Protect against electric shock, used with insulated wire. Can be rotated at any angle – Screw size 10-24 – standard



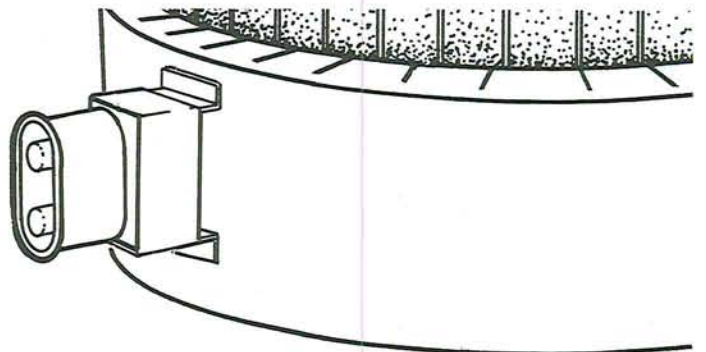
SO – STANDOFF TERMINALS

Provides relief from direct heat. Available on any construction or clamping variation. Single or 3-phase power, single or dual voltage. MIN. I.D. 3", MIN. WIDTH 3".



EP – EURO PLUG

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.



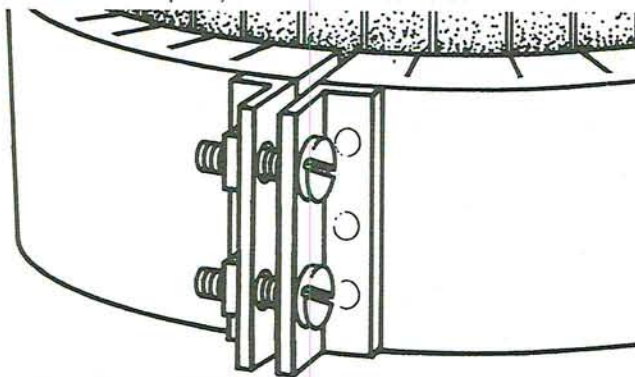
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CERAMIC BAND HEATERS

CLAMPING VARIATIONS

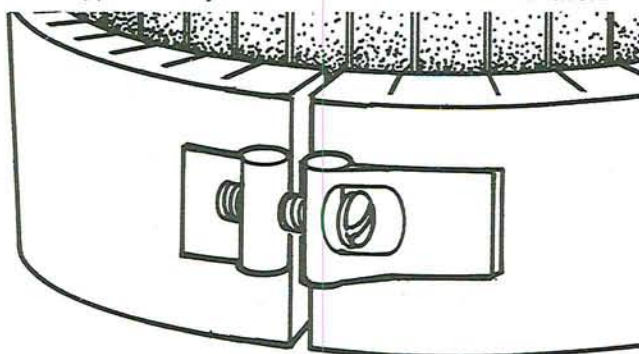
F – BENT UP FLANGE

Flange clamping is standard on all heaters as in standard construction description, unless otherwise noted.



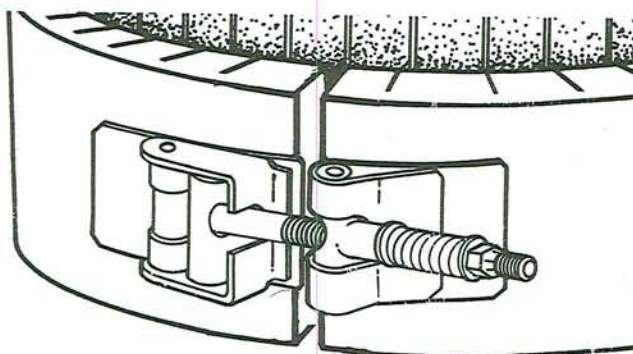
BB – BUILT IN BRACKET

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



LT – LATCH & TRUNION

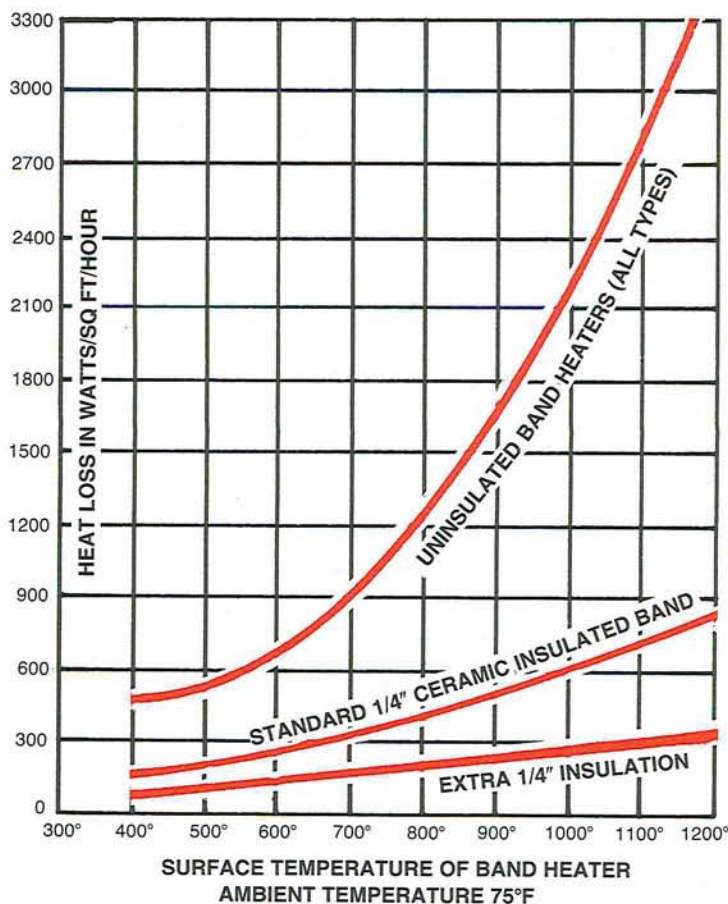
Spring loaded latch & trunion is quick release. Recommended I.D. 12" or greater.



HOW TO ORDER CERAMIC BANDS

1. Order by part number, if known
2. State quantity
3. Inside diameter
4. 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" insulation or optional 1/2" insulation.
9. Indicate size and location of thermocouple holes, cutouts, partial coverage, gaps or other special features – **FAX DRAWING.**
10. Consult factory for metric sizes.

HEAT LOSS COMPARISON INSULATED VERSUS NON INSULATED HEATER BANDS



CERAMIC SPECIFICATIONS

SHEATH MATERIAL:

Corrosion resistant alloy shroud

MAXIMUM TEMPERATURE:

1500°F

INSULATION MATERIAL:

Thickness of heater with 1/4" insulation = 5/8"

Thickness of heater with 1/2" insulation = 3/4"

MINIMUM I.D.:

3"

MINIMUM WIDTH:

1-1/2" wide

Width in 1/2" increments

Width tolerance: $\pm 1/8"$

STANDARD GAP WHEN TIGHTENED:

3/8" $\pm 1/8"$

RESISTANCE TOLERANCE:

NEMA standard + 10% - 5%

WATTAGE TOLERANCE:

NEMA standard + 5% - 10%

WATT DENSITY:

Depends on power, operating temperature and heater size.

45 watts per sq. in.

MAXIMUM VOLTS:

480 volts

MAXIMUM AMPS:

25 amps

CERAMIC BAND HEATERS

INSTALLATION INSTRUCTIONS AND GENERAL INFORMATION

Mount bands on a clean, smooth cylinder and secure with lockup screws.

Tighten the lockup screws to take out any loose fit on the cylinder.

Excessive torque should not be applied to terminal post. Breakage of internal connections could be experienced. Connections to post terminals must be made using high temperature hardware and lead wire.

Adjustments should be made when heater and cylinder have cooled. Should areas of excessive heat be visible, heater has not been properly applied.

The heater ID should be the same as the OD of the cylinder.

Heaters should be kept free of plastic, oils and other hydrocarbons. These materials will carbonize with temperature and cause electrical failures.

Temperature controls, thermocouples and accessories should be properly maintained to achieve optimum results.

Always protect leads and terminals from abuse and abrasion by using boxes, ceramic covers or flexible metal hose over lead wires.

Innerliners should be used wherever contaminants are present, or frequent removal is the practice. While protecting the heater, innerliners reduce the efficiency of heat transfer.

Ceramic heaters operate on a radiant concept.

CERAMIC BAND HEATER STOCK LIST

INSIDE DIA. INCH	WIDTH INCH	TOTAL WATTS	VOLTS 240 (2)	480 (4)	WATT DENSITY	PART NUMBER	STANDARD TERMINALS
5 3/4	1 1/2	650	*	*	27	CBE75A50	POST T2
	2	850	*	*	25	CBE75B00	POST T2
	3	1250	*	*	25	CBE75C00	POST T3
	4	1750	*	*	27	CBE75D00	POST T3
6	1 1/2	1100	*	*	40	CBF00A50	POST T2
	2 1/2	1500	*	*	35	CBF00B50	POST T2
	4	1450	*	*	21	CBF00D00	POST T3
	5	1800	*	*	20	CBF00E00	POST T3
	5 1/2	2000	*	*	22	CBF00E50	POST T3
	6	3000	*	*	28	CBF00F00	POST T3
6 1/2	1 1/2	1000	*	*	33	CBF50A50	POST T2
	2	1000	*	*	26	CBF50B00	POST T2
	3	2000	*	*	35	CBF50C00	POST T3
	5	2500	*	*	26	CBF50E00	POST T3
	6 1/2	3000	*	*	24	CBF50F00	POST T3
6 3/4	1 1/2	1000	*	*	31	CBF75A50	POST T2
	2	1500	*	*	36	CBF75B00	POST T2
	4	2000	*	*	25	CBF75D00	POST T3
	5	3000	*	*	30	CBF75E00	POST T3
	6	3000	*	*	25	CBF75F00	POST T3
7	1 1/2	1400	*	*	43	CBG00A50	POST T2
	2	1700	*	*	38	CBG00B00	POST T2
	3	2500	*	*	38	CBG00C00	POST T3
	4	2600	*	*	32	CBG00D00	POST T3
	5	3000	*	*	30	CBG00E00	POST T3
	6	5000	*	*	40	CBG00F00	POST T3
7 1/2	1 1/2	1200	*	*	35	CBG50A50	POST T2
	2	1500	*	*	35	CBG50B00	POST T2
	3	2000	*	*	30	CBG50C00	POST T3
	4 1/2	3000	*	*	30	CBG50D50	POST T3
	5	3500	*	*	32	CBG50E00	POST T3
	5 1/2	4000	*	*	33	CBG50E50	POST T3
	8	4500	*	*	25	CBG50H00	POST T3
8	1 1/2	1250	*	*	33	CBH00A50	POST T2
	2	1500	*	*	21	CBH00B00	POST T2
	3	2000	*	*	28	CBH00C00	POST T3
	4	3000	*	*	30	CBH00D00	POST T3
	6	4000	*	*	28	CBH00F00	POST T3
8 1/2	1 1/2	1500	*	*	39	CBH50A50	POST T2
	3	3200	*	*	42	CBH50C00	POST T3
9	1 1/2	1300	*	*	31	CBJ00A50	POST T2
	2	1750	*	*	32	CBJ00B00	POST T2
	3	2800	*	*	34	CBJ00C00	POST T3
	5 1/2	3000	*	*	20	CBJ00E50	POST T3
9 1/2	3	2200	*	*	25	CBJ50C00	POST T3
	6	5500	*	*	32	CBJ50F00	POST T3
10	1 1/2	1250	*	*	27	CBK00A50	POST T2
	3	2400	*	*	26	CBK00C00	POST T3
	5	3000	*	*	20	CBK00E00	POST T3
	5 1/2	4000	*	*	25	CBK00E50	POST T3
10 1/2	3	2500	*	*	25	CBK50C00	POST T3
	4 1/2	4000	*	*	34	CBK50E00	POST T3
11	3	2500	*	*	25	CBL00C00	POST T3
	5	4000	*	*	25	CBL00E00	POST T3
	6	4500	*	*	23	CBL00F00	POST T3
12	2	2000	*	*	28	CBM00B00	POST T2
	3	3000	*	*	28	CBM00C00	POST T3
	6	5000	*	*	23	CBM00F00	POST T3

The above list is of common sizes and ratings available. Not all items are stocked.

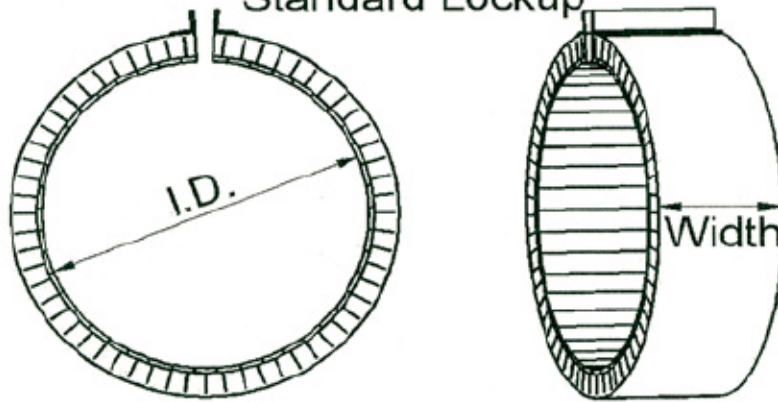
CERAMIC BAND HEATER STOCK LIST

INSIDE DIA. INCH	WIDTH INCH	TOTAL WATTS	VOLTS 240 (2)	480 (4)	WATT DENSITY	PART NUMBER	STANDARD TERMINALS
3	1 1/2	500	*	*	40	CBC00A50	POST T2
	2 1/2	1000	*	*	44	CBC00B50	POST T2
	4	1500	*	*	40	CBC00D00	POST T3
	6	1350	*	*	28	CBC00F00	POST T3
3 1/2	1 1/2	600	*	*	38	CBC50A50	POST T2
	2	650	*	*	30	CBC50B00	POST T2
	3	800	*	*	37	CBC50C00	POST T3
	4	1200	*	*	30	CBC50D00	POST T3
	4 1/2	1000	*	*	23	CBC50D50	POST T3
	6	2500	*	*	42	CBC50F00	POST T3
4	2	800	*	*	22	CBD00B00	POST T2
	3	1200	*	*	35	CBD00C00	POST T3
	4	1200	*	*	26	CBD00D00	POST T3
	6	2500	*	*	38	CBD00F00	POST T3
4 1/2	1 1/2	700	*	*	35	CBD50A50	POST T2
	2	1100	*	*	40	CBD50B00	POST T2
	3	1150	*	*	38	CBD50C00	POST T3
	4	1300	*	*	25	CBD50D50	POST T3
	6	2000	*	*	26	CBD50F00	POST T3
5	1 1/2	800	*	*	35	CBE00A50	POST T2
	2	1300	*	*	44	CBE00B00	POST T2
	3	1600	*	*	35	CBE00C00	POST T3
	4	2200	*	*	38	CBE00D00	POST T3
	6	2750	*	*	32	CBE00F00	POST T3
5 1/2	1 1/2	900	*	*	38	CBE50A50	POST T2
	2	1000	*	*	30	CB350B00	POST T2
	2 1/2	1500	*	*	38	CBE50B50	POST T2
	3	1200	*	*	25	CB350C00	POST T3
	4	1550	*	*	25	CB350D00	POST T3

The above list is of common sizes and ratings available. Not all items are stocked.

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Flange Type Standard Lockup



Post Termination Standard
180° From Gap

Note: Drawing is for illustration purposes only

DELTA MANUFACTURING COMPANY CERAMIC BAND SPECIFICATION DATA SHEET

<p>Customer _____</p> <p>Address _____</p> <p>Heater Dimensions: I.D. _____ (in) Width _____ (in) I.D. _____ (mm) Width _____ (mm)</p> <p>Maximum Operating Temperature _____ F°</p> <p>Rating: Voltage _____ Phase _____ Watts _____</p> <p>Construction: <input type="checkbox"/> 1-piece <input type="checkbox"/> 2-piece <input type="checkbox"/> Partial <input type="checkbox"/> Special Insulation <input type="checkbox"/> Liner</p> <p>Clamping: <input type="checkbox"/> Flange(F) Standard <input type="checkbox"/> Built-In (BB) <input type="checkbox"/> Latch & Trunion (LT)</p> <p>Terminations: (POST TERMINALS RECOMMENDED) 15 Amps Max <input type="checkbox"/> Post T2 Tandem <input type="checkbox"/> Post T3 Parallel</p> <p>Terminations: (LEADS <u>NOT</u> RECOMMENDED) Maximum 10 amps <input type="checkbox"/> Fiberglass Leadwire length _____ <input type="checkbox"/> Overbraid/Conduit length _____</p> <p>Single Exit: <input type="checkbox"/> Metal Braid (C) <input type="checkbox"/> Conduit (M) <input type="checkbox"/> Galv <input type="checkbox"/> SS <input type="checkbox"/> Right Angle Elbow (MR) <input type="checkbox"/> Galv <input type="checkbox"/> SS <input type="checkbox"/> Standoff Construction (SO)</p>	<p>Contact _____ Phone # _____</p> <p>Fax # _____ E-mail address _____</p> <p>Other: <input type="checkbox"/> Terminal Box (TB) - Standard 2-Terminal <input type="checkbox"/> Terminal Box (TB3) - 3 Terminals <input type="checkbox"/> Ceramic Caps (CC) <input type="checkbox"/> Euro Plug w/ Box (EPB) <input type="checkbox"/> Horizontal <input type="checkbox"/> Vertical All (EP) maximum 15 Amps</p> <p>Options: Note: Holes/cutouts Not Recommended Probe Provision Should Be at Gap <input type="checkbox"/> Special Gap Width 1-pc Construction _____ in. <input type="checkbox"/> Special Gap Width 2-pc Each End _____ in. <input type="checkbox"/> Customers Part Number <input type="checkbox"/> Other Specify _____</p> <p>Fax drawings to: 918-224-6866 E-Mail to: info@deltamfg.com Send sample: 8717 W. 84th St. Tulsa, Ok 74131</p>
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