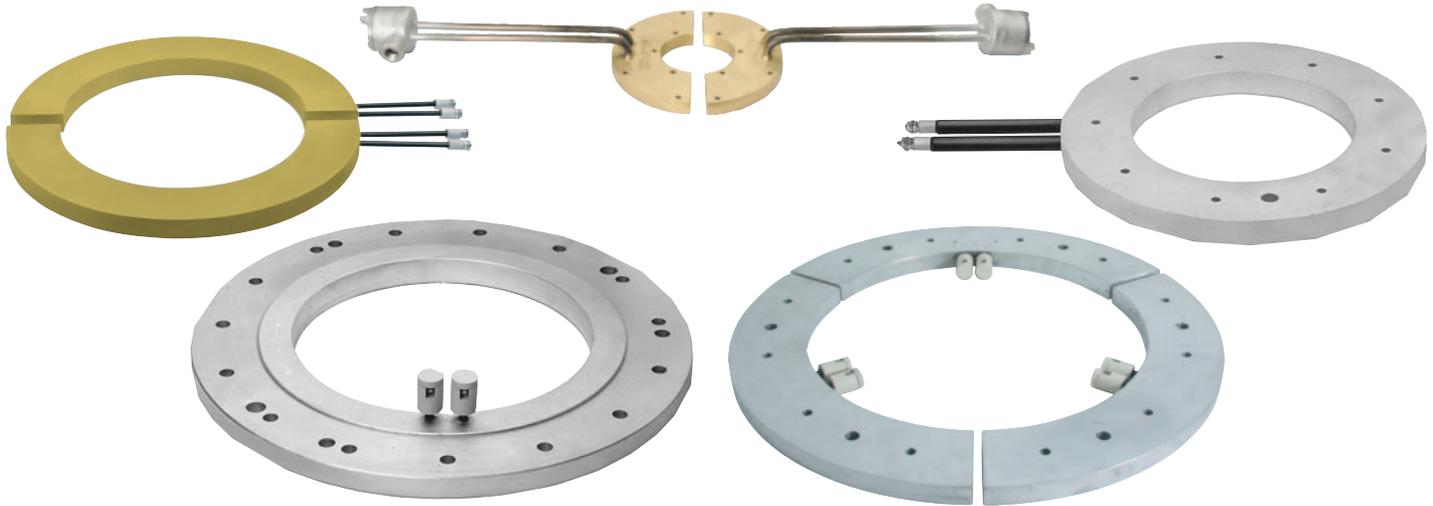


# Cast-In Heaters



## Ring-Shaped

### Cast-In Aluminum or Bronze Ring Heaters for Plastics Processing Equipment



#### Designed to Heat Limited Access Locations

Tempco Cast-In Ring Heaters provide an excellent means of applying extremely uniform heat to limited access application areas. Cast-In Ring Heaters are frequently used in Blown Film Die, Extrusion Die, Screen Changer and Extruder Barrel Adapter applications where long life and minimal maintenance concerns are prevalent.

The design scope of this product line makes it possible to cast large or small diameter disc shaped rings with nominal thicknesses of 5/8" to 1". These units are an excellent choice for heating the top or bottom of a cylindrical die.

As a standard, Cast-In Ring Heaters are generally manufactured in aluminum because of its superior thermal conductivity. For higher temperature or high watt density requirements, bronze or brass alloys can be used. A variety of standard terminations shown on pages 3-54 and 3-55 are available. The units can be fully machined to include through holes for mounting, thermocouple holes and surface machining.

#### Standard Cast-In Ring Heaters

##### Design Features and Options:

- \* Computer designed, precisely formed tubular heating element optimizing the heat transfer pattern
- \* Variety of termination options including terminal enclosure housings
- \* Variety of shapes and sizes
- \* Through holes, tapped holes or cutouts to facilitate mounting or obstructions
- \* Precision machining of one or all surfaces of casting – specify your individual requirements.

#### CUSTOM Manufactured

For sizes and ratings not listed, **TEMPCO** will design and manufacture a Cast-In Ring Heater to meet your requirements. **Specify the following:**

- Inside Diameter
- Outside Diameter
- Thickness
- Wattage and Voltage
- Number of Segments
- Termination Type (see pages 3-54 and 3-55)
- Alloy (Aluminum or Bronze)
- Special Features
- Machining Specifications
- Detailed Drawing

#### Stock and Standard (Non-Stock) Cast-In Ring Heaters

Stock Items Are Shown In **RED**

I.D. in	O.D. in	Thickness in	Watts	Volts	Special Features	Part Number
5.500	14.000	1.000	2250	230	(8) 1/2" dia. holes	CBH02625
6.750	11.750	1.000	1250	480	(4) 1/16" dia. holes E/H	CBH05499
7.000	11.500	0.875	3200	240	(9) 3/2" dia. holes	CBH01084
7.000	11.500	0.875	3200	460	(9) 3/16" dia. holes, (1) 1/2" dia. hole	CBH05415
8.500	13.000	1.000	3000	230	(8) 3/2" dia. holes	CBH01101
10.000	14.500	0.875	4000	230	(8) 3/2" dia. hole, (8) 1/2" c'bore	CBH01196
10.000	14.500	0.875	1000	230	(2) 90° Segments	<b>CBH01085</b>
12.000	16.250	0.875	2125	230	Bronze	<b>CBH01261</b>
12.000	16.250	0.875	2125	230	Bronze	CBH04776
13.000	20.000	1.120	2025	460	(4) 1/16" dia. holes E/H, (2) 1/2"-13 taps	CBH04836
16.250	20.500	1.000	1500	480	(6) 1/16" dia. holes	CBH04943
17.000	20.000	1.500	1250	230	(4) 90° Segments	CBH04990
19.750	34.000	1.130	4000	460	(12) 1/16" dia. holes, (2) 1/2"-13 taps	CBH04837
23.000	29.000	1.000	2000	480	(8) 1/32" dia. holes, (1) 5/8" dia. hole	CBH04220
32.500	40.000	1.125	9000	460	(24) 3/8" dia. holes	CBH02235
43.250	56.250	1.125	4333	290	(16) 1/16" dia. holes	CBH02811

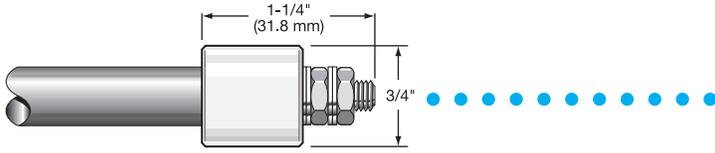


**Note:** Part numbers are for aluminum heaters unless otherwise specified.

**WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

### Standard Tubular Heater Terminations for Cast-In Heaters

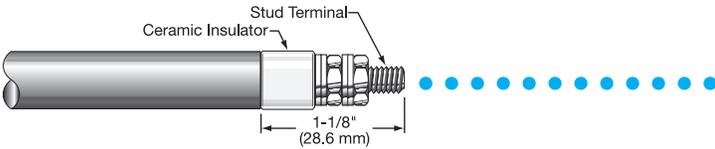
Select the termination style that meets your requirements for space, accessibility and reliability.



#### Type S Standard Unless Otherwise Specified

Heavy Duty Ceramic Insulators.

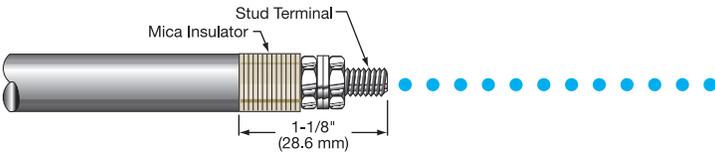
- .315" diameter heater has 8-32 screw terminals.
- .430" diameter heater has 10-32 screw terminals.



#### Type T7

Ceramic insulator is the same diameter as the heating element.

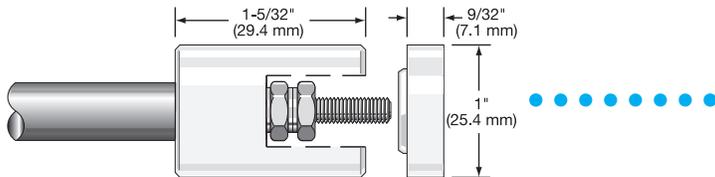
- .260" diameter heater has 6-32 screw terminals.
- .315" diameter heater has 8-32 screw terminals.
- .430" diameter heater has 10-32 screw terminals.



#### Type T

Mica insulator is the same diameter as the heating element.

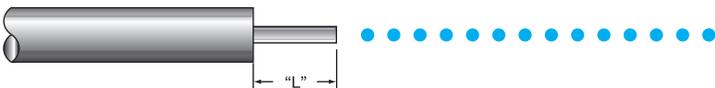
- .260" diameter heater has 6-32 screw terminals.
- .315" diameter heater has 8-32 screw terminals.
- .430" diameter heater has 10-32 screw terminals.



#### Type C4

Heavy duty ceramic insulator with terminal cover.

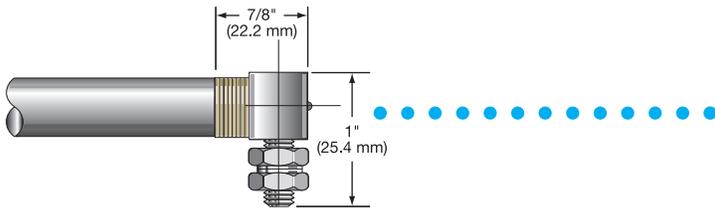
- .315" diameter heater has 10-32 screw terminals.
- .430" diameter heater has 10-32 screw terminals.



#### TYPE P—Plain Pin

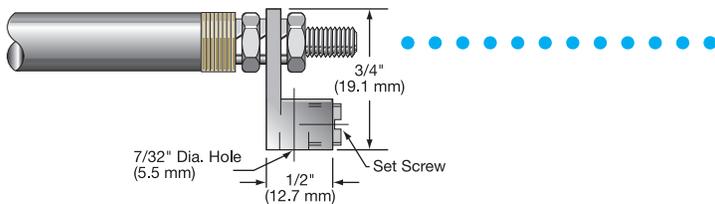
Plain terminal pin. Specify Length "L." Standard 1/2" (12.7 mm) pin length.

Element Diameter		Nominal Pin Diameter	
in	mm	in	mm
.260	6.6	.091	2.3
.315	8.0	.100	2.5
.430	10.9	.120	3.0



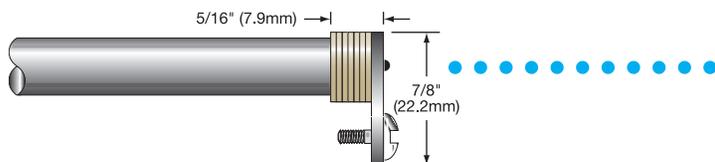
#### Type R

Mica washers with 90° blockhead screw terminal with 10-32 screw threads. Available for .315" and .430" diameter heaters.



#### Type R2

Mica washers with blockhead and through hole for lead wire connection. Eliminates the use of ring terminals. Available for .315" and .430" diameter heaters. Accepts 6-14 gauge wire.



#### Type E

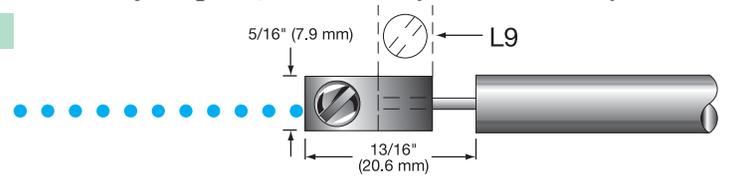
Right-angle lug welded to pin with mica washer insulators and 10-32 binding head screw. Available for .260", .315" and .430" diameter heaters.

### Standard Tubular Heater Terminations for Cast-In Heaters

Select the termination style that meets your requirements for space, accessibility and reliability.

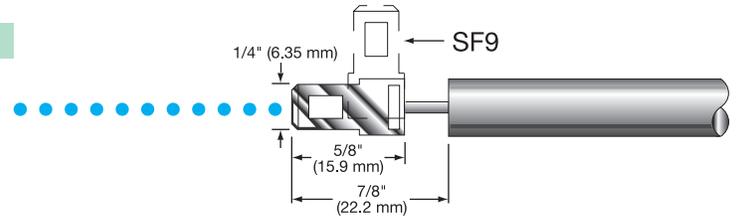
#### Type L & L9

Terminal lug spot welded to pin with 10-32 binding head screw. Available for .260", .315" and .430" diameter heaters. Type L represents straight; Type L9 represents 90° to pin. Specify lug orientation.



#### Type SF & SF9

Quick-disconnect spade tabs spot welded to pin. Available for .260", .315" and .430" diameter heaters. Type SF represents straight. Type SF9 represents 90° to pin. Specify tab orientation.



#### Type F

Flexible lead: insulated stranded wire crimped to cold pin. Crimp connection is insulated with fiberglass sleeving. Available for .260", .315" and .430" diameter heaters. Wire insulation rated to 250°C, 450°C optional. Specify lead length.



#### Type R1

Flexible Armor Cable provides excellent protection to lead wires against abrasion and contaminants. Available for .260", .315" and .430" diameter heaters. Specify cable length and lead length. Style may vary from depiction depending on heater diameter and cable diameter used.



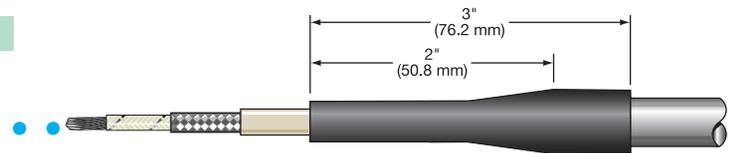
#### Type R1A

Stainless Steel Wire Overbraid provides flexibility and excellent protection to lead wires against abrasion. Available for .260", .315" and .430" diameter heaters. Specify stainless steel wire overbraid length and lead length. Style may vary from depiction depending on heater diameter and braid diameter used.



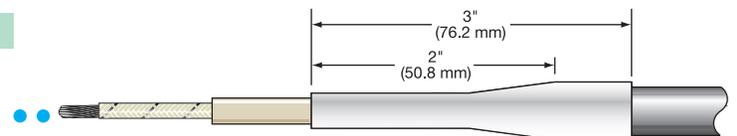
#### Type MR

Moisture resistant shrink strain relief and lead wire with or without stainless steel overbraid. Available for .260", .315" and .430" diameter heaters. Specify lead wire and overbraid length. Maximum operating temperature is 350°F (177°C).



#### Type TS

Contamination seal shrink-down Teflon® sleeving over the heater and lead wire splice. Provides a good moisture resistant seal. Maximum operating temperature 500°F (260°C). Available for .260", .315" and .430" diameter heaters. Specify lead length.



#### Type P1

Quick -disconnect plug, either mounted directly on casting or on elements ends offset a specified distance from casting. Rating: 16A-250VAC.



## Installation Recommendations

### Installation Recommendations for Cast-In Thermal Components

Tempco Cast-In Heaters will provide long life and dependable, trouble-free service if properly installed, operated, and maintained as per the following recommendations:

#### Installation

1. Allow sufficient space for thermal expansion. The amount of space required depends upon the Cast-In Heater size, operating temperature and alloy.
2. Surface being heated must be free of any foreign materials and have a smooth finish.
3. Make sure that the casting is properly seated. The clamping devices used should be tightened down to the correct recommended torque. After initial heat-up, retighten fasteners to the correct recommended torque.

#### Recommended Torque:

10 ft-lb for 1/4–5/16 bolts, 20 ft-lb for 7/16–5/8 bolts

5. Thermal insulation can be used to reduce heat losses.
6. Avoid mounting heaters in an atmosphere containing combustible gases and vapors unless specifically manufactured for use in such conditions.
7. Liquid Cooled Cast-In Heater fittings must be securely tightened to prevent leaks.
8. To prevent overheating and heater failure, adequate temperature controls should be installed. For assistance in selecting temperature controls and thermocouples, see Tempco's (in-stock) complete line of Plug-In type Proportional Temperature Controls for heating and cooling applications in Section 13. Also see the listing on standard and hot melt thermocouples in Section 14.

#### Wiring

1. For connections at the heater terminals, use high temperature nickel conductor or nickel clad copper lead wire or alloy bus bar. Keep all electrical connections properly protected to eliminate electric shock to machine operators.
2. Heaters of equal wattage and voltage can be connected in series for higher voltage.
3. Heater installations must be properly grounded to eliminate electric shock hazard, and wiring must comply with electrical codes.
4. Always have a qualified electrician perform all wiring and connection of heaters and control components. Terminals must be tightened to the correct torque (2.5 ft/lb for terminal connections).

**CAUTION:** Castings are not designed to be lifted or carried by the terminations or leads.

**Exposed electrical wiring on cast-in heater installations is a violation of Electrical Safety Codes including O.S.H.A.**



**Note:** See page 16-11 for Wiring Diagrams and page 15-2 for lead wire selection

#### Operation

1. It is recommended to slow start the process during first use.
2. Do not operate above rated voltage. Excess voltage will result in heater failure.
3. Do not operate Cast-In Heaters above recommended temperatures. Heater temperature must be monitored and controlled. Use of over-temperature T/C is strongly recommended for higher temperature applications. Excess temperatures will result in heater failure and/or melting.
4. Electrical terminals must be kept free of contaminants, as spillage of plastic, water, oils, and their vapors can cause electric shorts, resulting in heater failure.
5. Liquid Cooled Cast-In Heaters must not be cycled to operate simultaneously. Thermal stresses may result in shorter heater life.
6. The water used on Liquid Cooled Cast-In Heaters must be properly treated. Hard water contains corrosive media that will contaminate the tubing, producing stress corrosion cracks and resulting in shorter heater life. Presence of minerals in water can cause clogged tubes that can result in poor heat transfer and eventually heater failure.

#### Maintenance

1. Never perform any type of service on heaters prior to disconnecting all electrical power.
2. To ensure good surface contact, periodically check clamping. Retighten clamping to the correct torque when required.
3. Repeat cycling of temperature controls can indicate poor surface contact or a burned-out heater.
4. Heater terminals must be kept free of plastics, oil, water, and any other foreign matter. As these materials carbonize, they create electrical shorts.
5. Heater terminal electrical connections must be kept tight. Loose connections can overheat and eventual destroy the connection or the heater terminal.
6. Water lines must be periodically checked for leaks. Water on heater terminals can be detrimental to the entire heating system.
7. Thermocouples must be kept free of contaminants and be checked for good response to temperature changes. Our recommendation is to change them periodically, as a bad thermocouple can be the cause of destroying an entire heating zone.

..... **Complete Your Installation With** .....  
▼▼▼▼▼▼▼▼▼▼ **Accessories Available From Stock** ▼▼▼▼▼▼▼▼▼▼

Accessory	Catalog Section
* Stainless Steel Tubing and Fittings For Cooling Lines	3
* Pressure Transducers and Rupture Disks	12
* Temperature Controllers	13
* Temperature Sensors, Thermocouple Wire, Jacks & Plugs	14
* High Temperature Lead Wire & Fiberglass Tape, Ceramic Terminal Covers and Electric Plugs	15

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