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# 3

section

## Cast-In Heaters



# *Delivering Cutting Edge Solutions with Highly Customized/Engineered Cast-In Thermal Components*

## **Developing Solutions Through Product Innovation**

Tempco is a name synonymous with state-of-the-art technology and a strong commitment to providing practical, cost effective, quality thermal component solutions. We are a widely recognized industry-leading authority in the field of design, engineering and manufacturing. We offer a diverse line with endless design possibilities of cast-in heaters and cast-in thermo cooling components for applications requiring heating and cooling, or just cooling by using air, aqueous or oil solutions.

Tempco's expertise and flexible manufacturing capabilities allow cast-in thermal components to be designed in virtually any imaginable size and shape, including complex and challenging geometries. Casting alloys used are pure or secondary aluminum, brass, bronze and iron.

## **Supporting A Diversified Segment of Industries**

Tempco applies imaginative and creative thinking to use our acquired knowledge and expertise—we have a proven track record that extends over three decades. This is the key to successfully assisting our customers in solving or improving complex and challenging applications with cast-in thermal component technology, whether for heating or cooling functions. We consistently deliver on our commitment to exceed our customers' expectations in a diverse segment of industries from Original Equipment Manufacturers (OEMs), to Research and Development, Life Science and Maintenance (MRO) Applications.

*Realizing our customers' conceived vision of their needs, Tempco provides value-added engineering solutions tailored to meet the specific requirements of their cast-in thermal component applications.*

# Supporting Diversified & Demanding Industrial, Life Science, Commercial & Scientific Applications

## Vertically Integrated Manufacturing Capabilities

Tempco is a company uniquely qualified and committed to taking full ownership and responsibility of your Cast-In thermal component challenges. Consult Tempco at the early stages of your application requirements. We can provide you with the ultimate solution for cost savings, reliability and the highest quality and service money can buy.

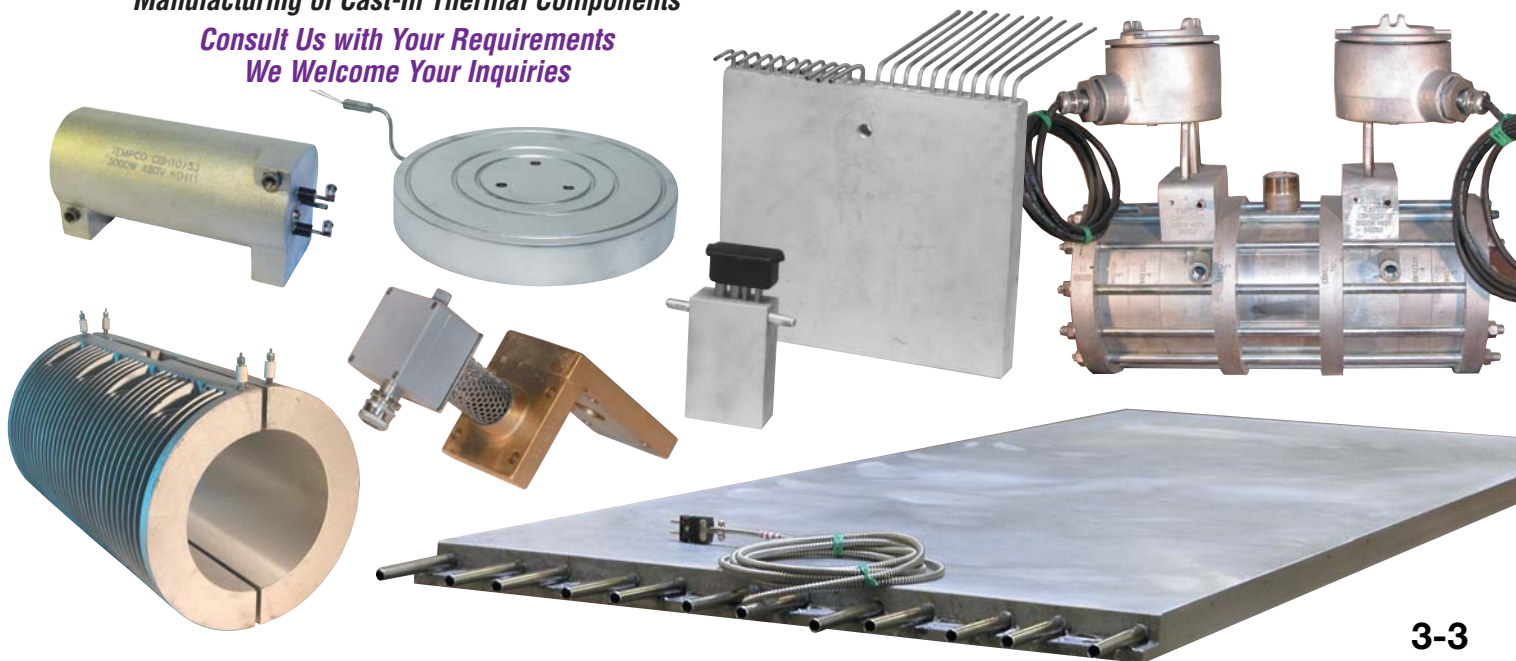
Cast-In thermal components, from simple to complex three-dimensional geometric shapes, are highly engineered components whether used for heating and/or cooling (air or liquid). Their design, engineering and manufacturing processes are unique and tailored to a specific end-use application.

**Tempco's in-house vertically integrated manufacturing capabilities to produce Cast-In Thermal Components include:**

- Custom designing and engineering utilizing 3-D and CAD/CAM solid modeling technology
- Tubular and Cable Heating Element manufacturing
- Full service foundry facility processing Aluminum, Brass, Bronze and Iron Alloys
- Foundry tooling fabrication — Steel Permanent Molds, Wood or Plastic Patterns
- Machining — Full service State-of-the-Art CNC machine shop capabilities including Coordinate Measuring Machine
- Lab services — computerized infrared heating profiles, lifecycle testing, X-ray examination, 3-D solidification modeling

**Experience our Passion for Excellence in the Design & Manufacturing of Cast-In Thermal Components**

**Consult Us with Your Requirements  
We Welcome Your Inquiries**



# One Source Providing Extensive Engineering/Manufacturing Capabilities



## Casting Process: Low Pressure

Used for large volume quantities. Specifically suited for intricate and challenging geometric shapes and highly engineered applications such as pedestal cast-in heaters for semiconductor processing and producing near-net-shape quality castings with consistent dimensional accuracy and superior surface finish.

**Alloy:** Aluminum (only)

**Tooling:** Requires a Steel or Cast Iron Permanent Mold

**Machining:** Minimum to no machining

**Weight Capacity:** Up to 150 pounds depending on shape



## Casting Process: Tilt-Pour Gravity Feed

Used extensively for medium to high volume quantities. Will accommodate simple to some irregular shape castings producing good dimensional accuracy and surface finish.

**Alloy:** Aluminum

**Tooling:** Requires a Steel or Cast Iron Permanent Mold

**Machining:** Moderate to Extensive

**Weight Capacity:** Up to 150 pounds depending on shape

## Casting Process: No-Bake Sand Molds

Used for lower volume quantities, prototypes, very large irregular shapes and thermal platens.

**Alloys:** Aluminum, Brass, Bronze and Iron

**Tooling:** Requires a Wood or Plastic Pattern

**Machining:** Extensive

**Weight Capacity:** Up to 600 pounds



## Pattern Shop

Tempco offers a full-service in-house Pattern Shop. Our pattern makers build and maintain wood or plastic patterns required to produce castings with no-bake sand molds.



## Melting Capabilities

Electric Reverb and Induction furnaces are used to minimize gas inclusion into the molten metal, thereby producing a denser, higher quality casting.

## Casting Size & Weight Limitations

	Cylindrical	Platen
Minimum Inside Diameter:	1" (25.4 mm)	—
Maximum Inside Diameter:	48" (1219 mm)	—
Minimum Width:	2-1/2" (63.5 mm)	1-1/2" (38.1 mm)
Maximum Width:	36" (914 mm)	60" (1524 mm)
Minimum Length:	2" (50.8 mm)	4" (102 mm)
Maximum Length:	36" (914 mm)	72" (1829 mm)
Finish:	125 RMS Standard or to customer spec.	
Gap (two-piece cylindrical cast-in band heaters):	1/4" (6.4 mm) top and bottom or to customer specification	
Maximum Weight:	Aluminum—600 pounds Bronze & Brass—300 pounds Iron—200 pounds	

## Casting Alloys

Casting Alloy	Maximum Surface Temperature
Aluminum 319 (Standard)	700°F (371°C)
Aluminum 356 (Optional)	750°F (399°C)
Pure Aluminum (Optional)	700°F (371°C)
Brass	1200°F (649°C)
Bronze	1350°F (732°C)
Iron	1200°F (649°C)



**Note:** Cast-In thermal components can be made in any practical size, weight and geometric shape.

*Consult Tempco with your specific requirements.*

# Experience Our Value-Added Services that are Second to None

## Minimum Casting Thickness vs. Heating Element and/or Cooling Tube Diameters

Casting Thickness	Available Element Diameter	Maximum Available Cooling Tube Diameter	Maximum Element and Cooling Tube Combination
	Heat Only	Cool Only	Heat and Cool
5/8" (15.9 mm)	.260	1/4	—
3/4" (19.1 mm)	.260, .315, .430	3/8	—
1" (25.4 mm)	.260, .315, .430	5/8	.260 and 3/8
1-3/8" (34.9 mm)	.315, .430	1/2	.315 and 1/2
1-1/2" (38.1 mm)	.315, .430	1/2	.430 and 1/2
1-5/8" (41.3 mm)	.315, .430	1/2	.430 and 1/2
1-3/4" (44.5 mm)	.315, .430	1/2	.430 and 1/2
<b>Finned Casting</b>			
3/4" (19.1 mm)	.260, .315	3/8	—
1" (25.4 mm)	.260, .315, .430	1/2	.260 and 3/8
1-3/4" (44.5 mm)	.315, .430	1/2	.430 and 1/2

## Heating Element Electrical Specifications

Tubular Heater Diameter	.260"	.315"	.375"	.430"	.475"
Maximum Volts	240	277	480	550	550
Maximum Amps Per Element	15	30	40	40	40
Maximum Watt Density:	Aluminum Alloy—35 W/in <sup>2</sup> on the element Bronze or Brass—45 W/in <sup>2</sup> on the element				
Resistance Tolerance:	+10%, -5%				
Wattage Tolerance:	+5%, -10%				
Three Phase available depending on casting size. Ground Studs can be added to most cast-ins.					



**Note:** Depending on application requirements, Tempco-Pak mineral insulated cable heaters can be used in place of tubular heating elements to provide higher watt densities or fit physical constraints not possible with conventional heating elements. See catalog Section 5 for more details.

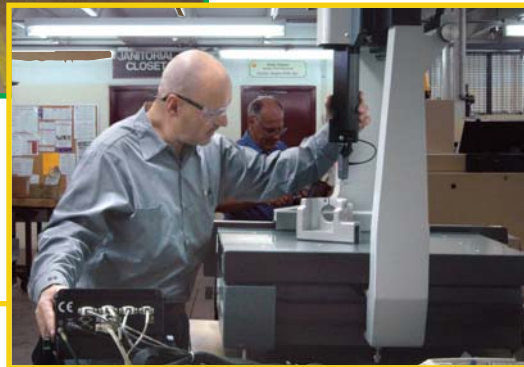
## Cooling Tube Materials for Castings with Liquid Cooling

Tube Material	Tube OD and Wall Thickness
Stainless Steel (Standard)	1/4" O.D. × .020 wall
Stainless Steel (Standard)	3/8" O.D. × .035 wall
Stainless Steel (Standard)	1/2" O.D. × .049 wall
Stainless Steel (Optional)	5/8" O.D. × .049 wall
Incoloy® 840 (Optional)	1/2" O.D. × .049 wall
Tubing with heavier wall thickness is available upon request.	



### Machine Shop

Tool and Die Machinists build and maintain steel permanent mold tooling for low pressure and tilt-pour gravity feed casting processes.



### CNC Machining

Typically there are certain dimensional and/or finish tolerances or geometry that cannot be produced as cast and must be machined. To accomplish this function, our team of engineers and machinists make use of SolidWorks and MasterCAM software, the industry leaders in 3D solid modeling and CNC machining programming. In addition, Tempco offers a full service state-of-the-art machine shop featuring various types of CNC machine tools to perform all of the precision machining required—from simple to complex contour geometries, including turning and/or boring, with repeatable accuracy from one machine casting to the next.

### CMM Inspection Capabilities

**CMM** (Coordinate Measuring Machine) provides precise measurement of complex parts in process or at final inspection.

## Optional Special Services for Cast-In Thermal Components

### Casting Surface Treatments

Special surface finishes are required in some applications:

- Electroless Nickel Plating
- Anodizing
- Teflon®
- Hard-Coat Anodizing
- Magnaplate

### Lab Services

- Computerized Infrared Heating Profiles
- Life Cycle Testing
- X-Rays to confirm heating element location and casting density
- Heating and Cooling Ramp Rates Testing

Agency  Approvals

Cast-In Heaters are UL recognized under UL File Number E90771. If you require UL Agency Approval, please specify when ordering.

## Research and Development

We are R & D committed, maintaining our industry leadership status with ongoing refinements in our Design/Engineering and Manufacturing processes, achieving higher levels of productivity and quality in our diverse product line offering.

Consult Us  
with Your  
Requirements

No one can do it  
better than Tempco —  
**LET US PROVE IT!**

# Cast-In Heaters – Complex Geometrics for Diversified Industries

## Delivering Cutting-Edge Engineered Cast-In Thermal Component Solutions

Today's fast-paced and high-tech industries demand products that are high quality, unique, reliable, and diverse. Tempco is passionate about meeting those expectations and putting our customers' needs first by providing quality service and products with superior capabilities. Tempco specializes in engineering and manufacturing customized cast-in thermal component solutions to service and support virtually all major industries. The following pages illustrate a sampling of cast-in thermal components we have produced for original equipment manufacturers (OEMs) and maintenance (MRO) applications that enjoy the advantages and benefits our products offer.

**High Performance Cast-In Thermal Components are not  
Just a Challenge – They Are Our Bread & Butter.  
Please Consult Us with Your Requirements.  
We Welcome Your Inquiries.**



Cast Iron Manifold Heater for Aluminum  
Low Pressure Casting Machine



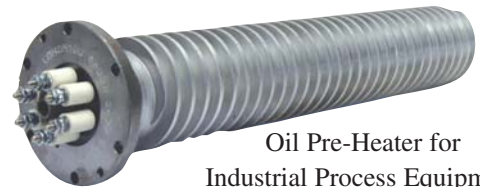
Integral Machine  
Component  
Cast-In Heater



Rectangular Manifold  
Cast-In Heater



Aluminum Cast-In Heater Used in  
the Carpet Mill Industry



Oil Pre-Heater for  
Industrial Process Equipment



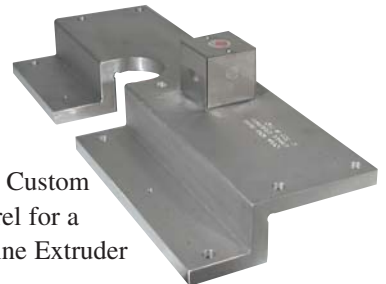
Barrel Adapter for Polymer  
Extruder Equipment



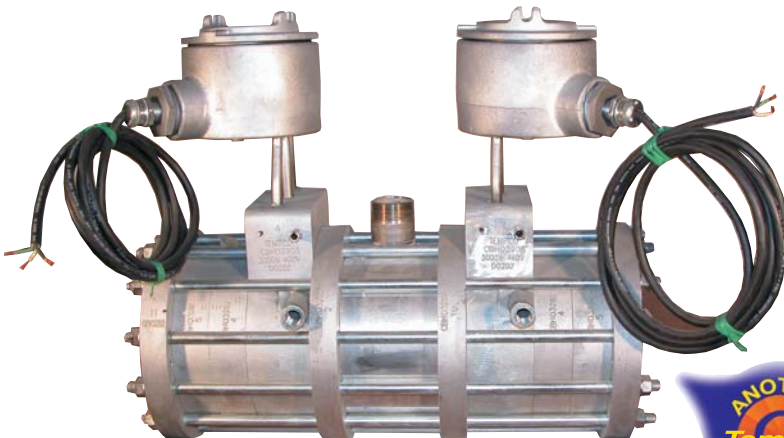
Autoclave Pure Aluminum Cast-In  
Heater Electroless Nickel-Plated for  
Sterilizing Dental Instruments



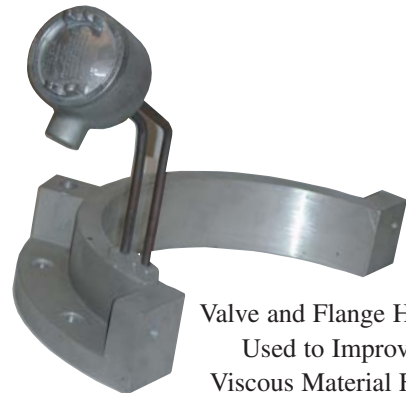
Heating Elements &  
Aluminum Casted Over  
Steel Transfer Feed Pipe



Heater used on a Custom  
Rectangular Barrel for a  
Monofilament Line Extruder



System for Pre-Heating and Mixing  
Chemicals for Sand Cores



Valve and Flange Heater  
Used to Improve  
Viscous Material Flow

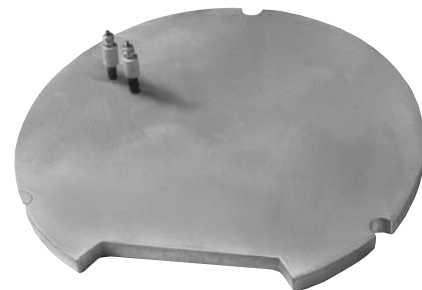


# Cast-In Heaters – Complex Geometrics for Diversified Industries



Integral Machine Component  
Cast-In Heater

Cast-In Heater Used to Decrease  
Viscosity in Glue Processing



Waste Treatment Sanitation  
Equipment Heater



Manifold  
Valve Assembly



Bronze Cast-In Heater for  
Packaging Sealing Machine



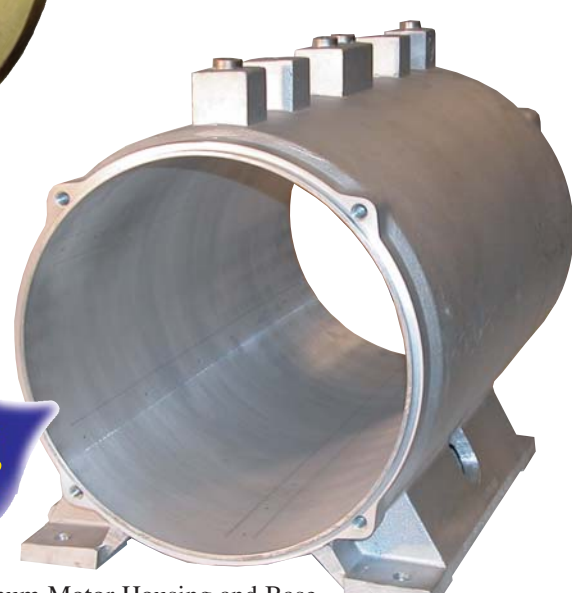
Used as a Resistor for  
Thermal Dynamic Braking of  
Large Electric Motors



Cast-In Platen used for  
Heating a Custom  
Rectangular Extruder Barrel



Bronze Cast-In Heater for  
Pre-Heating Salt Baths



Cast Aluminum Motor Housing and Base  
with Integral Liquid Cool Capabilities used for Medium  
to Large Horsepower Electric Motors  
*Can be made for any size motor.*

**CONTINUED**

Developed and Patented by Tempco  
U.S. Patents: # 6222289 & #5939808



In-Line System for  
Pre-Heating Water to  
Induce Humidity in  
Baking Ovens



Bronze Cast-In Heater for  
a Laminating Press

# Cast-In Heaters – Complex Geometrics for Diversified Industries



Used in the Packaging Industry for Adhering Tax Stamps to Cigarette Packs



Bronze Cast-In Heater Used in the Packaging Industry for Container Sealing



Brass Casting Used in Industrial Processing Machinery



Bronze Electroless Nickel-Plated Cast-In Heater Used in Equipment that Tests Nuclear Hazardous Waste



Used in a Thermoforming Mold

Used as Part of a Feed Nozzle in a Candy Processing Machine



Used for Freeze Protection in an Outdoor Valve Assembly



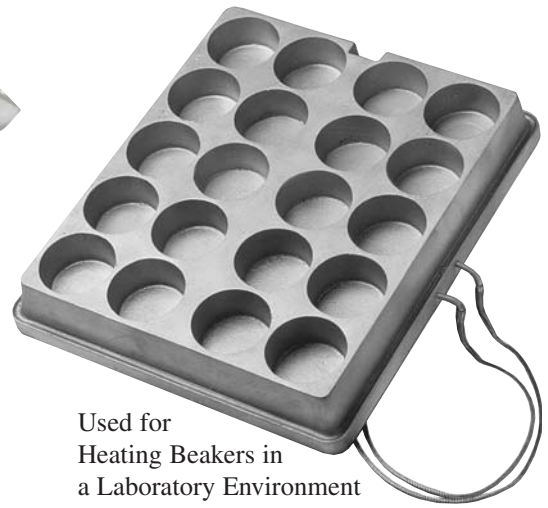
Used for Heating a Rectangular Barrel for Sheath Extrusion



Plastic Processing Extrusion Die Heater



Bronze Cast-In Heater Used in Heating Outdoor Hoppers to Maintain Product Flow



Used for Heating Beakers in a Laboratory Environment

## Additional Applications Where Tempco Cast-In Heaters Are Used

- Chemical Processing
- Extrusion Die Heaters
- Food Service Equipment
- Glue Pots
- Heat Sealing
- Heat Sealing Equipment
- Heat Treating Equipment
- Hot Melt Dispensing Equipment
- Hot Stamping Machinery
- Laboratory Equipment
- Laminating Equipment
- Life Science Equipment
- Packaging Machinery
- Plastics Machinery
- Research and Development
- Silk-Screening Equipment
- Solvent Reclaim Equipment
- Steam Cleaning Equipment
- Textile Manufacturing
- Vacuum Forming



**Note:** The cast-in thermal components shown on pages 3-6 through 3-14 are merely a sampling of our capabilities.

Let the endless possibilities spark your imagination!

Put our knowledge and experience to work for you.

Challenge us!  
You will be glad you did.

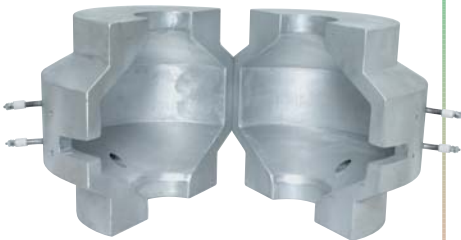
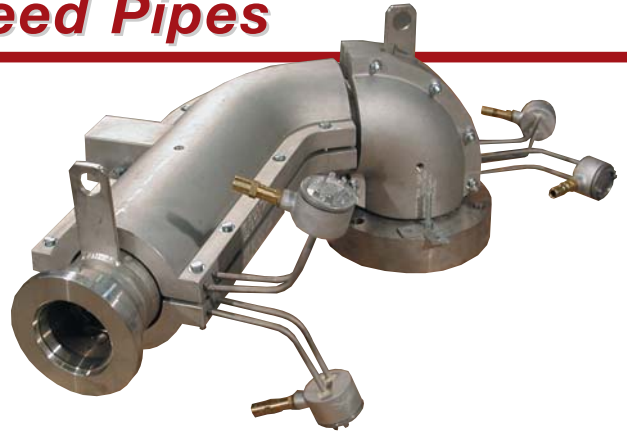
**We Welcome your Inquiries**

# Cast-In Heaters for Transfer/Feed Pipes

## Tempco offers the perfect solution for difficult to heat Transfer/Feed Pipes

Transfer pipes used in large-scale extrusion lines are difficult to heat because of their irregular geometry. They are not machined cylinders so proper contact and heat transfer are difficult to achieve.

Consequently, a special Cast-In Heater must be engineered for each pipe to accommodate its individual characteristics. Typically, this entails the customer sending the pipe to Tempco and our Engineering staff designing a Cast-In Heater System that will optimally fit the pipe and improve the quality of the process by eliminating hot spotting and/or uneven heated surfaces. In some cases, we actually cast the heater directly onto the pipe.



*Let Tempco's Creative Team of  
Professionals Tackle Your Next Cast-In  
Thermal Component Project.*

*We Have the Technology,  
Infrastructure & Commitment to  
Exceed Our Customers' Expectations.*



## Special Cast-In Process for Unusual and Complex Applications



In the event that a cast-in heater cannot be made the conventional way for assembly into a machine part, Tempco has the expertise to directly attach a tubular heating element or a tube for cooling purposes to a customer supplied part.

By making a wood pattern with the required shape we can create a sand mold to encapsulate the entire assembly and pour the molten aluminum or bronze over the part.

The sample depicted in this picture represents the typical process. In this case, a tubular heating element is attached to a steel roller and is then placed in a sand mold prior to casting. After casting, the roller OD is machined per customer specifications — in addition, the aluminum roller will be vulcanized with rubber. The finished heated roller will be used in a laminating web press.

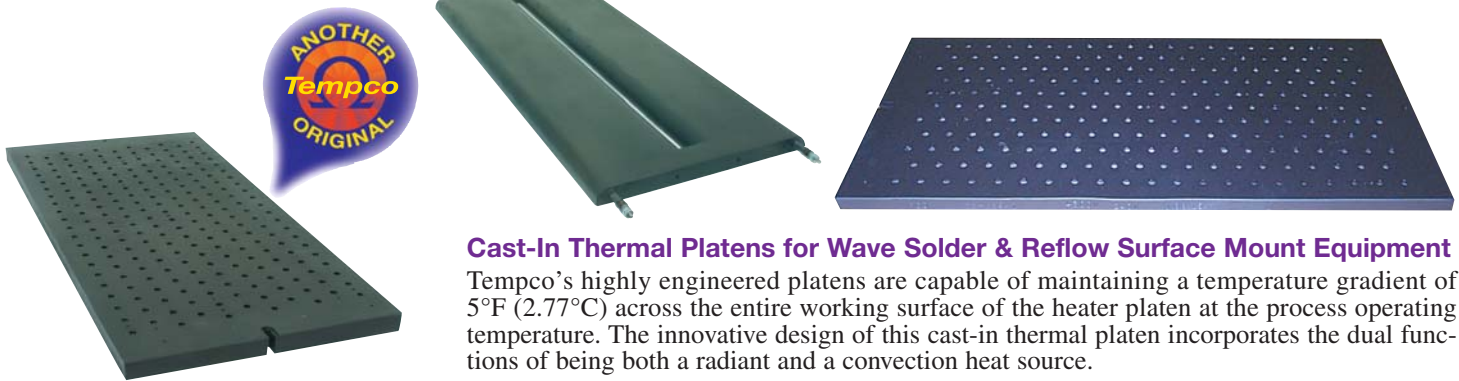


# Cast-In Heaters for Semiconductor Manufacturing

## Cast-In Heaters for the Semiconductor Processing Industry

Tempco has been at the forefront of the industry, addressing the challenges of stringent operating parameters and high quality requirements faced by original equipment manufacturers specializing in the semiconductor, wave solder and reflow surface mount processes.

By employing state-of-the-art technologies and by utilizing our acquired knowledge as a company, we have met the challenges by offering and delivering excellence in the design, engineering and manufacturing of a complete selection of innovative, reliable and high quality cast-in aluminum thermal component products.



### Cast-In Thermal Platens for Wave Solder & Reflow Surface Mount Equipment

Tempco's highly engineered platens are capable of maintaining a temperature gradient of 5°F (2.77°C) across the entire working surface of the heater platen at the process operating temperature. The innovative design of this cast-in thermal platen incorporates the dual functions of being both a radiant and a convection heat source.

### Cast-In Heaters for Wafer Processing

Tempco offers a complete selection of highly customized semiconductor process heaters which include *Pedestal Heaters, Pedestal Heaters with Integrated Cooling Capabilities, Bake Platen Heaters, High-Temperature Platen Heaters with Interference Press Fit Tubular or Cable Heating Elements*. For this type of platen heater construction the available base alloys are *Stainless Steel, Nickel, Inconel®, Copper, Bronze, Brass, and Aluminum*.

Our metallurgical knowledge and foundry expertise are the catalyst for producing cast-in heaters with the precise heat profiles and temperature gradient required for the process. Tempco's state-of-the-art CNC machining capabilities will ensure that the working surface requirements of the part are precisely machined to customer requirements including extremely flat surfaces of 0.0005 in (0.0127 mm) for optimizing the performance of the application.

In order to satisfy the stringent requirements of the industry, these products are manufactured under rigid quality control standards. Specific attention is directed to the heating element design and the casting processes.



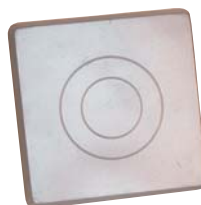
### Design Features & Options

- \* **Aluminum Alloy**

319	<i>Maximum Operating Temperature</i>
356	700° F (371°C)
Pure (99.7%)	750° F (399°C)
	700° F (371°C)

\*Pure Aluminum is also used to reduce the risk of contamination during the process.

- \* **Interference Press Fit Construction** – maximum operating temperature depends on base alloy used
- \* **Surface Finish** – Hard-Coat Anodized
- \* **Built-in Temperature Sensors**
- \* **Selection of heating element and cooling tube terminations**



**Note:** Cast-In heaters for semiconductor processing are made to customer specifications. For technical assistance, engineering data and available options

please refer to pages 3-4 and 3-5. When ordering, please provide detailed design drawings including dimensions, critical tolerances, watts, volts, and any other features or special requirements.

# Cast-In Heaters for the Food Service Industry

## Offering a Multitude of Eye-Opening Options

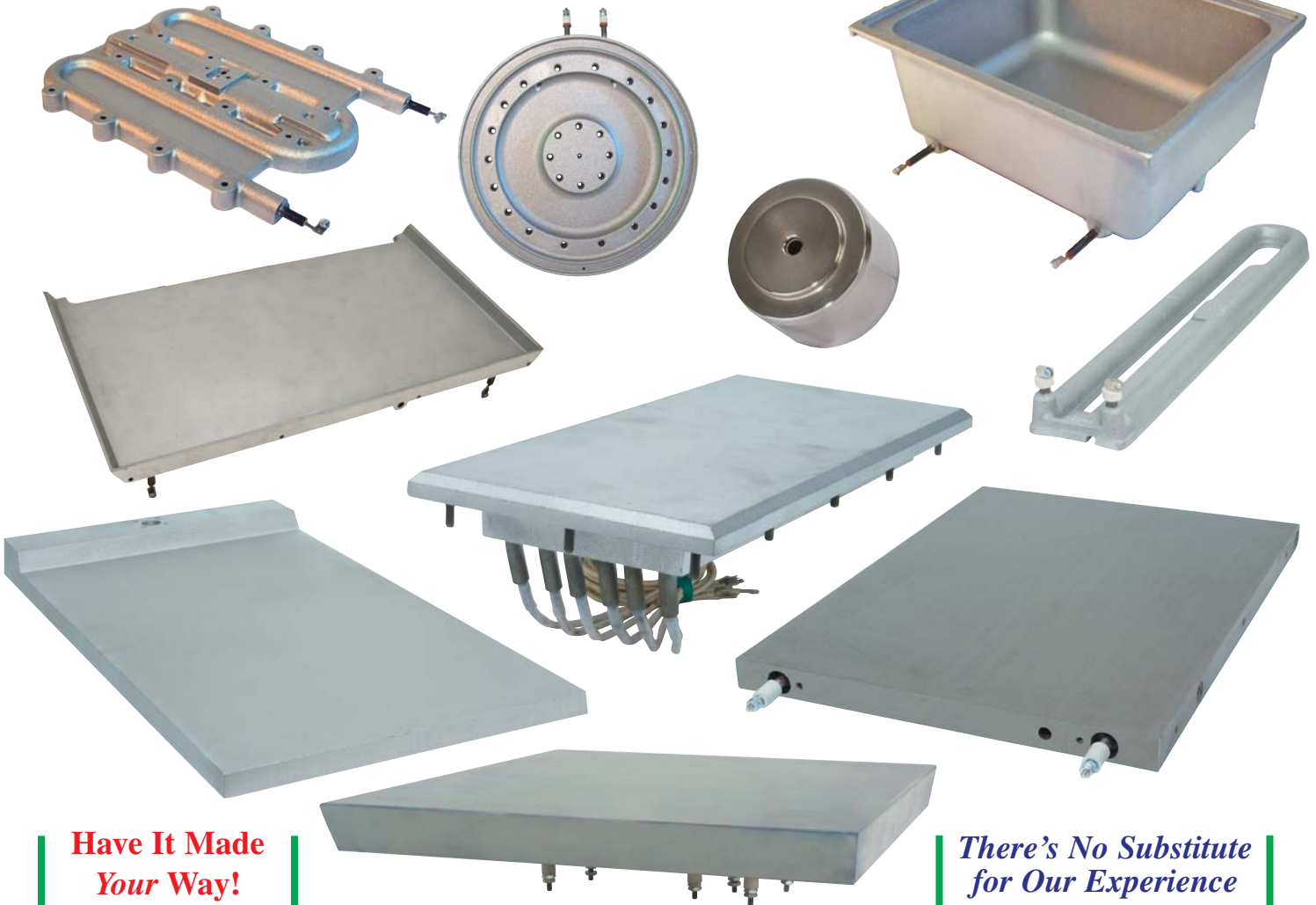
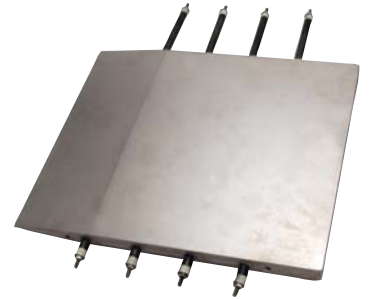
Tempco's cast-in heater products are an excellent choice to satisfy the food service industry's demanding requirements. Tempco demonstrates its value-added supplier capabilities with Food Service OEMs through our remarkable versatility and engineering expertise. Tempco offers the equipment manufacturers the option of manufacturing an existing design at a superior value, or evaluating the current heating design requirements and proposing a Cast-In Heater that offers great functionality, reliability and value.

## Exceptional Performance and Reliability for Use on Food Service Equipment

Equipment manufacturers must assure their customers in the food service equipment market that their product will be reliable and trouble-free. Tempco Cast-In Heaters are a sure step toward achieving this mandate. Cast-In Heaters assure long life and exceptional performance because of their unique design characteristics. They feature a tubular heating element cast into a highly thermal conductive aluminum alloy, yielding exceptional uniform heat profiles unattainable with strip heaters or tubular heating elements that are sometimes clamped to a working surface.

## Special Features to Improve Functionality

Tempco excels by incorporating unique modifications to our Cast-In heaters designed to benefit the functionality of our customers' processes. Threaded studs are cast into the aluminum body to readily accommodate mounting in the equipment. Heaters featuring cast flanges with machined grooves and "O" Rings can be made to isolate the terminal area in a wash-down environment. Special moisture resistant terminations can be provided when splash water or contaminants are present. In applications where food may come into contact with the casting, working surfaces can be Teflon® coated or Electroless-Nickel plated.



**Have It Made  
Your Way!**

*There's No Substitute  
for Our Experience*

# Cast-In Heaters - Large Thermo-Platens

## Engineered Solutions With Advanced Technology in Cast-In Thermo-Platens

Tempco specializes in innovative engineering and manufacturing of thermal components. Coupled with our diverse foundry and machine shop capabilities, this expertise provides the know-how behind our product line offering of large electrically heated platens that are manufactured by using our cast-in heater technology.

This casting process incorporates the heat source (tubular heating element) as an integral component of the platen. This process provides a more cost-effective and reliable approach than drilling holes for cartridge heaters or clamping inefficient and cumbersome-to-use strip heaters to the back surface of a platen.

Tempco's thermo-platens are made from aluminum, bronze and brass alloys. These materials provide excellent thermal conductivity for rapid heat transfer with uniform temperature gradients. To further enhance heat profiles, the formation and the location of the tubular heaters within the casting are precisely engineered using the latest computer design techniques.

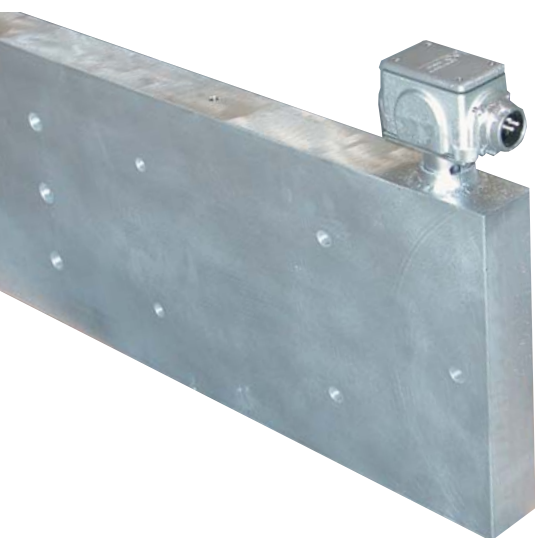
When the process requires heating and cooling cycles, thermo-platens can be manufactured with the addition of stainless steel tubing to provide liquid cooling capabilities.

The working surfaces and/or contours of the thermo-platen can be machined to your specifications up to and including blanchard ground for extremely flat surface requirements.

Our capabilities for manufacturing large thermo-platens offer you the freedom to think big in your design requirements.

We offer complete engineering services and support, working with you every step of the way, from prototype to production, to ensure customer satisfaction.

*There is no substitute for our acquired knowledge.*



# Cast-In Heaters – Large Thermo-Platens

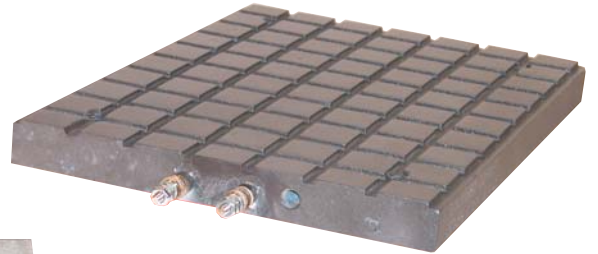
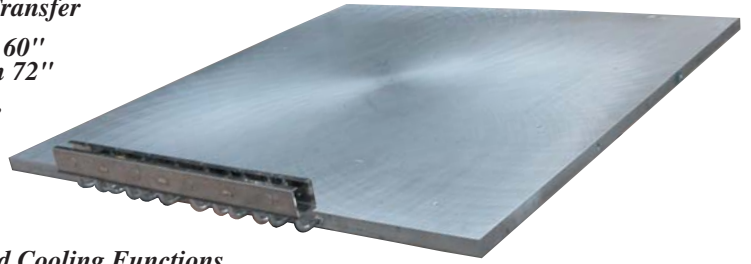
## Design Features & Options

- \* **Castings:**
  - Aluminum up to 600 lbs.
  - Bronze & Brass up to 300 lbs. (Recommended for high operating pressures and temperatures)
- \* **Exceptionally Long Operating Life**
- \* **Single or Three-Phase Circuit**
- \* **Surface Finishes: Electroless Nickel-Plated, Teflon®, Hard-Coat Anodizing, Magnaplate**
- \* **Thermowells for Temperature Sensors**
- \* **Excellent Heat Transfer**
- \* **Maximum width 60" Maximum length 72"**
- \* **Uniform Surface Temperatures**
- \* **Machined to Customer Specifications**
- \* **Heating & Liquid Cooling Functions**
- \* **Various Heater & Cooling Tube Terminations**



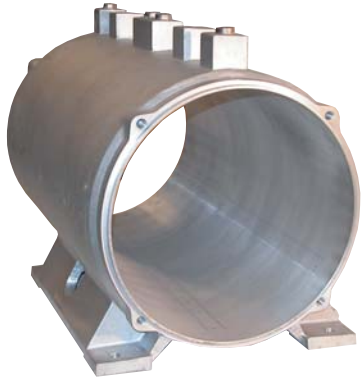
**Note: Cast-In Thermo-Platens are made to customer specifications.** For technical assistance, engineering data and available options please refer to pages 3-4 & 3-5.

When ordering please provide detailed design drawings, including dimensions, critical tolerances, electrical ratings, watts, volts, single or three-phase, and any other feature or special requirements.



*When Your Needs Call for **LARGER** Than **BIG** Cast-In Thermal Platens & You Need Them **NOW** – Look No Further Than Tempco!  
**We Can Do It – We Have the Technology!***

# Cast-In Thermal Components – Liquid Cool



Cast Aluminum Motor Housing & Base with Integral Liquid Cool Capabilities  
U.S. Patents: # 6222289 & #5939808

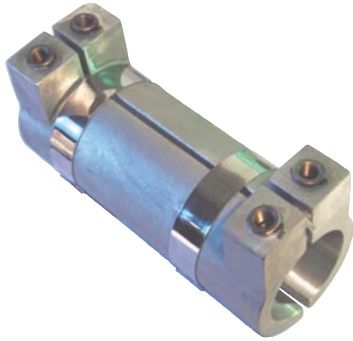
## Engineered Solutions With State-Of-The-Art Technology in Liquid Cool Aluminum Cast-In Thermal Components

You can count on Tempco to continue its leadership tradition for providing cutting edge solutions as we address the needs and challenges of specialized segments of industries that depend on cooling for the operating efficiency and performance of their equipment.

As a result of market demand for such products, Tempco introduces our capabilities of producing a complete selection of made-to-order liquid cool aluminum cast-in thermal components available in both complex geometrics or simple platens.

The thermodynamic relationship between the liquid heat transfer media circulating through the precisely formed and configured stainless steel cooling tube and the aluminum alloy casting maximizes heat removal efficiency. Tempco's liquid cool cast-in thermal component technology is a novel approach to clean, efficient and reliable process cooling of difficult and complex applications.

Consult Tempco with your challenging applications. Our capabilities for manufacturing these complex liquid cool thermal components offer you the advantage to think outside the box. Let the endless possibilities spark your imagination, allowing you the freedom to customize your design.



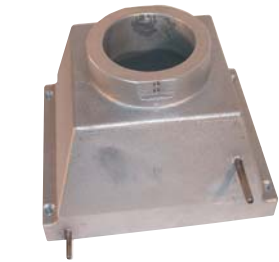
**Let Tempco's Creative Team of Professionals Tackle Your Next Cast-In Liquid Cool Thermal Component Project. We Have the Technology, Infrastructure & Commitment to Exceed Our Customers' Expectations.**

## Thermo-Platens for Liquid Cooling of High Density Electronic Systems & Other Applications Requiring Flat Surface Cooling

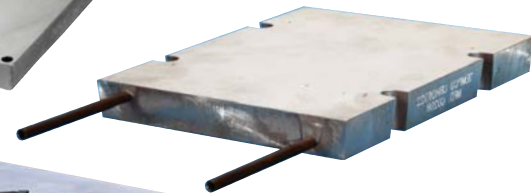
In a world of compact designs with increased power densities, more heat is being generated than can be properly dissipated by conventional air blowers. For applications that have high-watt densities such as lasers, high-powered electronics, telecommunications, and semiconductor processing, liquid-cooled cold plates are the ideal high-performance heat transfer solution.

Mounting the components on an aluminum platen with internal liquid cooling tubes replaces forced air cooling to achieve and maintain lower electronic cabinet temperatures, thus increasing the operating service life of the individual components and the system.

When drilling and/or tapping is required for the cold plate application, Tempco will perform the machining to ensure that the product's integrity is not compromised.

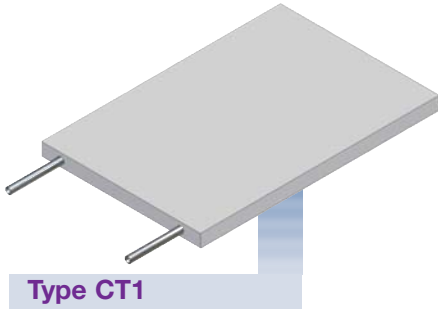


**Now You Can Give Your Electronics a Chill!**





### Typical Cooling Tube Exit Locations For Cast-In Thermo-Platens



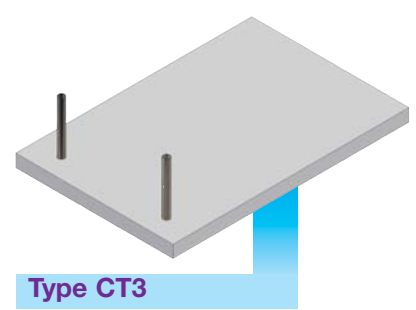
**Type CT1**

Cooling tubes exiting through the thickness toward the ends of the width or length.



**Type CT2**

Cooling tubes exiting through the thickness opposite of each other toward the ends of the width or length.



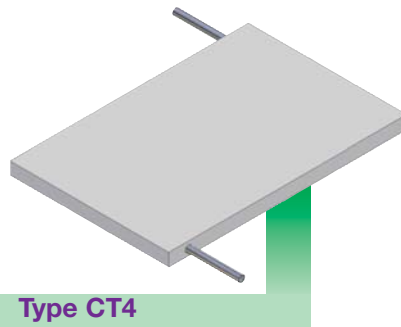
**Type CT3**

Cooling tubes exiting at the ends of the width or length through the top surface.

#### Complex Geometrics

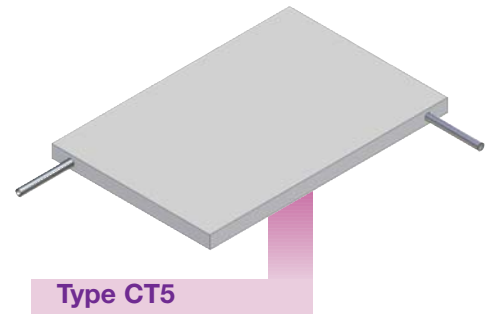


**Note:** Cooling Tube Exit Locations for Complex Geometric Liquid Cool Thermal Components can be at any practical location for the shape and size of the individual thermal component.



**Type CT4**

Cooling tubes exiting through the thickness at opposite ends of each other toward the ends of the width or length.



**Type CT5**

Cooling tubes exiting through the thickness at opposite ends of each other with one in the width and one in the length.

For Cooling Tube Termination Optional Fittings and Accessories See pages 3-54 and 3-55

## Ordering Information

To process your order or quotation, please specify the following information.



**Note: Cast-In Thermal Components – Liquid Cool are made to customer specifications.** For technical assistance, engineering data and available options please refer to pages 3-4 & 3-5. For cooling

tube terminations and optional fittings refer to pages 3-54 and 3-55. When ordering please provide detailed design drawings, including dimensions, critical tolerances and any other feature or special requirements.

#### Variable Dimensions

Length \_\_\_\_\_ Width \_\_\_\_\_ Thickness \_\_\_\_\_

Special Features \_\_\_\_\_

#### Material Specifications

Aluminum  Bronze  Brass

#### Cooling Tube Sizes

1/4" O.D. SS  3/8" O.D. SS  1/2" O.D. SS  
 Optional Incoloy® (1/2" & 3/8" only)  Dual Cooling Tubes

#### Cooling Tube Exit Location

CT1  CT2  CT3  CT4  CT5

#### Surface Finish

Machined or As-Cast. *Indicate surfaces to be machined.*

#### Special Cast-In Features

Holes, Cutouts, Slots, Bevels, Mounting Studs, Stand-Offs and Taper Angles.  
*For special features a detailed drawing is required.*

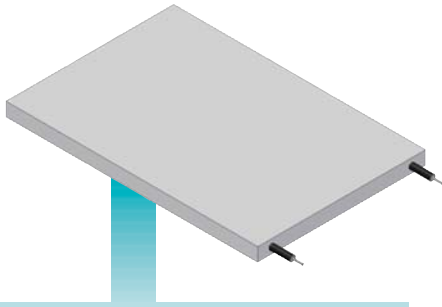


**Note: For Machining,** please provide a detailed drawing of your electronic component placement (layout). Tempco will machine and pre-drill all mounting holes to ensure that the cooling tube is not compromised. For field drilling Tempco will

provide a detailed drawing of the cooling tube path and the maximum depth at which holes can be drilled. Specify the location and size of the thermal plate mounting holes, and exiting location and length of the cooling tubes. For cooling tube fittings and accessories refer to pages 3-54 and 3-55.

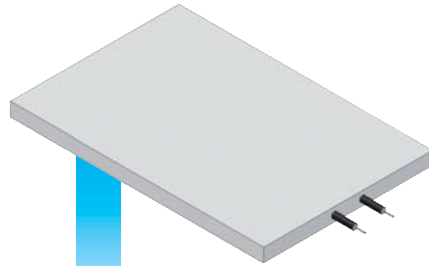


### Typical Tubular Heating Element Exit Locations For Thermo-Platens



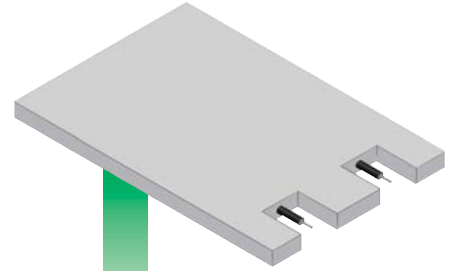
#### Type TE1

Elements exiting through the thickness toward the ends of the width or length.



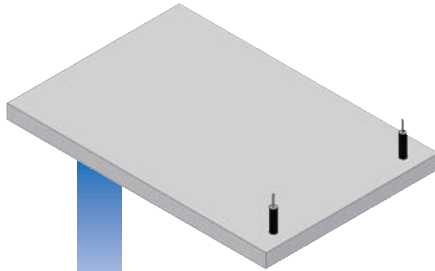
#### Type TE2

Elements exiting through the thickness toward the center of the width or length.



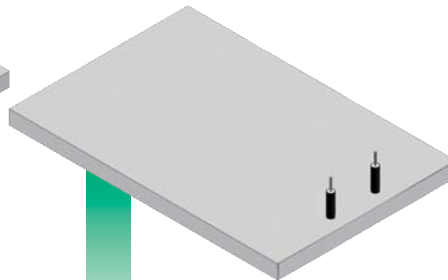
#### Type TE3

Elements exiting through the thickness and recessed to protect the screw terminals from mechanical damage. Can be located toward the end or center.



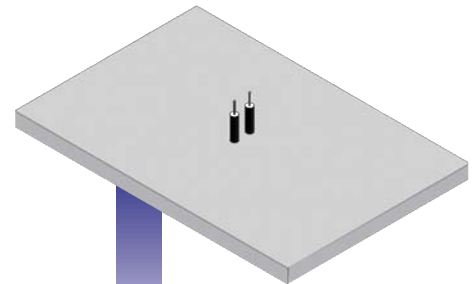
#### Type TE4

Elements exiting toward the ends of the width or length through the top surface.



#### Type TE5

Elements exiting at the end and toward the center of the width or length through the top surface.

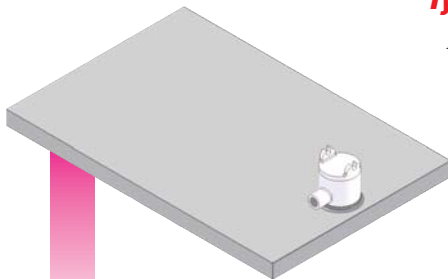


#### Type TE6

Elements exiting toward the center of the length and width and through the top surface.

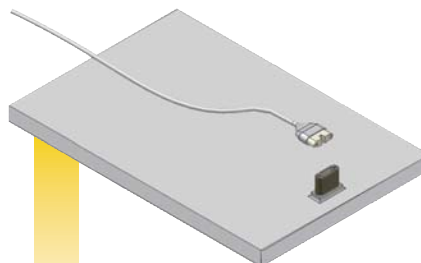
### Typical Terminal Box Options and Locations

For Standard Tubular Heating Element Terminations  
See pages 3-17, 3-56 and 3-57.



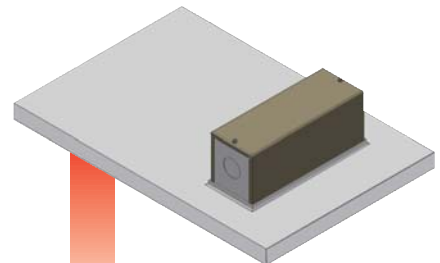
#### Type EP

Explosion and/or moisture resistant box.



#### Type P1

Quick-disconnect cup assembly mounted directly to casting provides a fast and safe means to apply power to the Cast-In heating element. Available for .260", .315" and .430" diameter elements. Rated 250V max., 15 Amp max.



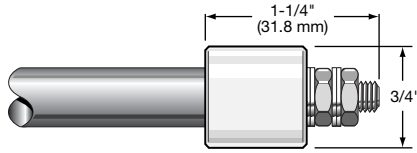
#### Type C2

Sheet metal terminal box with 5/8" knockouts.

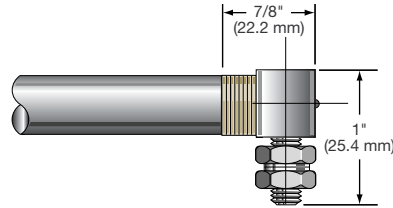


### Standard Tubular Heater Terminations for Thermo-Platens

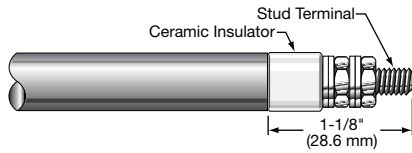
**Type S**  
Standard Unless  
Otherwise Specified



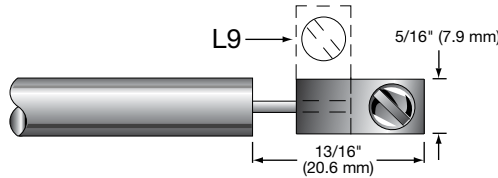
**Type R**  
90° Blockhead  
Screw Terminal



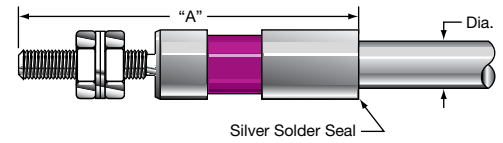
**Type T7**  
Straight Stud Terminal



**Type L & L9**  
Lug Terminal with  
10-32 Binding  
Head Screw



**Type H** Hermetic Seal Screw Terminal



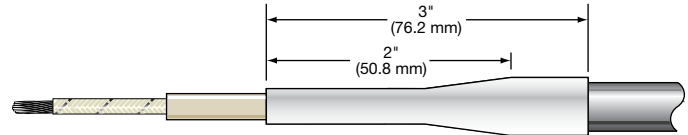
**Type R1** Flexible Stainless Steel Armor Cable



**Type F** Flexible Lead



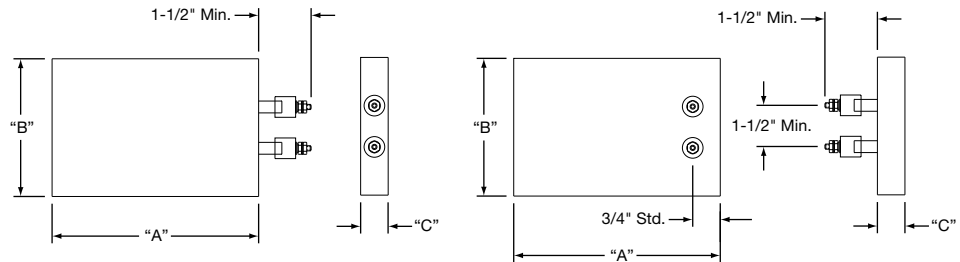
**Type TS** Flexible Lead with Shrink-Down Teflon®



For Additional Terminations See pages 3-56 and 3-57

### Ordering Information

To process your order or quotation, please specify the following information.



**Variable Dimensions**

“A” \_\_\_\_\_ “B” \_\_\_\_\_ Thickness “C” \_\_\_\_\_ Special Features \_\_\_\_\_

**Material Specifications**

Aluminum  Bronze  Brass

**Electrical Specifications**

Watts each element \_\_\_\_\_ Volts each element \_\_\_\_\_ Phase \_\_\_\_\_

**Cooling Tube Sizes**

1/4" O.D. SS  3/8" O.D. SS  1/2" O.D. SS  
 Optional Incoloy® (1/2" & 3/8" only)  Dual Cooling Tube

**Termination Style**

“S” Post Terminals  “T7” Post Terminals  “C4” Ceramic cover  
 “R” 90° Blockhead  “F” Plain Leads  “H” Hermetic Seal  
 “E” Right-Angle Lugs  “R1” Armor Cable Leads  “SF” Tabs  “SF9” Tabs  
 “TS” Leads and Shrink Sleeve  “P1” Quick-Disconnect  
 “R2” Blockhead and Through Hole  “L” Terminal Lug  “L9” Terminal Lug

**Terminal Protection Box**

“C2” Standard  “MR1” Rigid Moisture Resistant  “EP” Explosion Resistant  
 “MP” Moisture Resistant  “MPR” Moisture Resistant  
 “P2” High Temperature Quick-Disconnect  Cast Box

**Surface Finish**

Machined or As-Cast. *Indicate surfaces to be machined.*

**Special Cast-In Features**

Holes, Cutouts, Slots, Bevels, Mounting Studs, Stand-Offs and Taper Angles.  
*For special features a detailed drawing is required.*

# TEMPCO Offers the Largest Selection of Quality Cast-In Heaters for Plastics Processing

Over 11,000 Existing Designs on File and Growing



**Single Source Advantage –**

**From Beginning to End**

Tempco has set industry standards as the leading manufacturer of Aluminum, Brass and Bronze Cast-In Heaters in a variety of standard designs and styles for the plastics processing industry.

However, we realize not every Cast-In Heater application can be solved by one of our standard products. Our solutions help our customers and create new opportunities for Tempco. It is our engineering talents and vast application knowledge that provide a winning combination for solving specific application problems with custom designed and manufactured Cast-In Heaters.

The design, engineering and manufacturing of Tempco Cast-In Heaters is done under one roof—administered by a team of experienced professionals with a vast knowledge in product design and proven foundry expertise, producing the best quality Cast-In Heaters money can buy.

**Computer Designed Tubular Heaters** manufactured under our rigid quality control standards are the heat source for the Cast-In Heater. They can be formed into endless configurations to accommodate any practical Cast-In Heater shape.

**Wood Pattern Shop** A full-service in-house wood pattern shop builds, modifies and maintains patterns.

**Foundry Capabilities** Tempco's modern foundry produces Low Pressure Permanent Mold, Tilt Pour Permanent Mold, and No-Bake Mold Sand Castings. Our team of professionals with years of practical experience provides the knowledge essential for producing quality cast-in heaters for the plastics processing industry.

Tempco's Exclusive **Cool TO-THE Touch™**  
Heating & Air Cooling Shroud Systems for  
Extrusion Processing Can be found  
on pages 3-20 through 3-28

Cast-In  
Heaters are  
produced  
in-house by a  
team of experts  
for unparalleled quality!

**SATISFACTION  
GUARANTEED!**

Consult us with your requirements.  
No one can do it better than  
Tempco — Let us prove it!

## Plastics Extrusion Processing

Our Cast-In Band Heaters have proven to be the most effective method for heating and cooling the barrels of extruders used in the plastics processing industry.

Tempco offers Cast-In Band Heaters with liquid or air cooling. Liquid cooling incorporates tubing cast in as part of the heater assembly, allowing water or heat transfer solutions to remove excess heat. Air cooling uses fins cast to the Outer Diameter surface of the band heater;

blowers and specially designed shrouds aid in heat removal.

Aluminum is the predominant alloy used for the Cast-In Heater. Copper-based alloys (Bronze and Brass) are used when the required operating temperatures exceed the maximum for Aluminum. Bronze or Brass are recommended for heated platens in molding presses as they can withstand a greater force of pressure per square inch than Aluminum.

### Typical Plastics Processing Applications For Tempco's Cast-In Heaters

- \* Extruders
- \* Blow Molding
- \* Injection Molding
- \* Extrusion Die Heads
- \* Silk-Screening
- \* Laminating Equipment
- \* Heat Sealers
- \* Vacuum Forming
- \* Compression Molding
- \* Polymer Compounding

**When your needs call for Cast-In Heaters for Plastics Processing & you need them NOW!**

**Look no further than Tempco – we have an extensive inventory.**

**Custom manufactured and delivered in 3 weeks or less!**

# Experience Our Value-Added Services that are Second to None

## Minimum Casting Thickness vs. Heating Element and/or Cooling Tube Diameters

Casting Thickness	Available Element Diameter	Maximum Available Cooling Tube Diameter	Maximum Element and Cooling Tube Combination
	Heat Only	Cool Only	Heat and Cool
5/8" (15.9 mm)	.260	1/4	—
3/4" (19.1 mm)	.260, .315, .430	3/8	—
1" (25.4 mm)	.260, .315, .430	5/8	.260 and 3/8
1-3/8" (34.9 mm)	.315, .430	1/2	.315 and 1/2
1-1/2" (38.1 mm)	.315, .430	1/2	.430 and 1/2
1-5/8" (41.3 mm)	.315, .430	1/2	.430 and 1/2
1-3/4" (44.5 mm)	.315, .430	1/2	.430 and 1/2
<b>Finned Casting</b>			
3/4" (19.1 mm)	.260, .315	3/8	—
1" (25.4 mm)	.260, .315, .430	1/2	.260 and 3/8
1-3/4" (44.5 mm)	.315, .430	1/2	.430 and 1/2

## Casting Size & Weight Limitations

	Cylindrical	Platen
<b>Minimum Inside Diameter:</b>	1" (25.4 mm)	—
<b>Maximum Inside Diameter:</b>	48" (1219 mm)	—
<b>Minimum Width:</b>	2-1/2" (63.5 mm)	1-1/2" (38.1 mm)
<b>Maximum Width:</b>	36" (914 mm)	60" (1524 mm)
<b>Minimum Length:</b>	2" (50.8 mm)	4" (102 mm)
<b>Maximum Length:</b>	36" (914 mm)	72" (1829mm)
<b>Finish:</b>	125 RMS Standard	
<b>Gap</b> (two-piece cylindrical cast-in band heaters):	1/4" (6.4 mm) top and bottom or to customer specification	
<b>Maximum Weight:</b>	Aluminum — 600 pounds Bronze & Brass — 300 pounds Iron — 200 pounds	



### Machine Shop

Tool and Die Machinists build and maintain steel permanent mold tooling for low pressure and tilt-pour gravity feed casting processes.



## Agency Approvals

**Cast-In Heaters** are UL recognized under UL File Number E90771. If you require UL Agency Approval, please specify when ordering.

### CNC Machining

Typically there are certain dimensional and/or finish tolerances or geometry that cannot be produced as cast and must be machined. To accomplish this function our team of engineers and machinists make use of Mastercam and Autodesk Inventor, industry-leading 3D CNC machining programming softwares. In addition Tempco offers a full service state-of-the-art machine shop featuring various types of CNC machine tools to perform all of the precision machining required from simple to complex contour geometrics, including turning and/or boring, with repeatable accuracy from one machine casting to the next.

### CMM Inspection Capabilities

**CMM** (Coordinate Measuring Machine) provides precise measurement of complex parts in process or at final inspection.

## Heating Element Electrical Specifications

Tubular Heater Diameter	.260"	.315"	.375"	.430"	.475"
<b>Maximum Volts</b>	240	277	480	550	550
<b>Maximum Amps Per Element</b>	15	30	40	40	40
<b>Maximum Watt Density:</b>	Aluminum Alloy—35 W/in <sup>2</sup> on the element Bronze or Brass—45 W/in <sup>2</sup> on the element				
<b>Resistance Tolerance:</b>	+10%, -5%				
<b>Wattage Tolerance:</b>	+5%, -10%				
Three Phase available depending on casting size. Ground Studs can be added to most cast-ins.					



**Note:** Depending on application requirements, Tempco-Pak mineral insulated cable heaters can be used in place of tubular heating elements to provide higher watt densities or fit physical constraints not possible with conventional heating elements. See catalog Section 5 for more details.

## Cooling Tube Materials for Castings with Liquid Cooling

Tube Material	Tube OD and Wall Thickness
Stainless Steel (Standard)	1/4" O.D. × .020 wall
Stainless Steel (Standard)	3/8" O.D. × .035 wall
Stainless Steel (Standard)	1/2" O.D. × .049 wall
Stainless Steel (Optional)	5/8" O.D. × .049 wall
Incoloy® 840 (Optional)	1/2" O.D. × .049 wall
Tubing with heavier wall thickness is available upon request.	

## Casting Alloys

Casting Alloy	Maximum Surface Temperature
Aluminum 319 (Standard)	700°F (371°C)
Aluminum 356 (Optional)	750°F (399°C)
Pure Aluminum (Optional)	700°F (371°C)
Brass	1200°F (649°C)
Bronze	1350°F (732°C)
Iron	1200°F (649°C)



### Are You Operating Your Extruders with Liquid Cooling?

If You Answer Yes –

Then You Are SO Ready for a

**TEMPCO**

**EXTREME**

**MAKEOVER**

With Our Exclusive  
**Cool To-THE Touch™**

**Shroud Systems**



*A 4-Zone Cool TO-THE Touch Shroud System for a 2-1/2" Extruder*

[Click this Link to 4-page "Going from Clunker to Cool"](#)

- 1.) Monetary Benefits of going green with Cool TO-THE-Touch
- 2.) Special 5 year warranty on Aluminum Cast-In Band Heaters supplied with Cool TO-THE-Touch systems
- 3.) Details components of Cool TO-THE-Touch systems
- 4.) Introduces cash back Clunker to Cool Program



### **The Challenge**

We understand that choosing to make a change can be challenging and full of "What-If's?" Not to worry – Tempco warranties the performance of our systems. Our expert team will be with you every step of the conversion to help you select the ideal system for your extrusion lines.

**Cool TO-THE Touch** is a fully integrated system that offers powerful functionality, user-friendly installation and operation, customizable features and other benefits you simply will not find in any existing extruder heating and cooling system.

These highly engineered products are designed for durability and trouble-free operating performance.

It can very well be the most important step you take when you purchase a new extruder or rebuild existing equipment.

*Experience the benefits and advantages offered by upgrading to Cool TO-THE Touch Shroud Systems.*

*Take your extrusion operation to the next level of technology with Tempco at your side.*

**There is nothing to lose, except. . .**

*The entire closed loop recirculating system which includes: chiller, heat exchanger, heat transfer fluid, and all associated piping and electrical components.*



**Let's Not Forget About This!!**

**Think about all the great changes ahead for your business – when you no longer have to babysit your unreliable, maintenance nightmare on your extruder heating and cooling system.**



### ***It's a Reality – Extreme Makeover for Extruders Is Finally Here! Take Advantage of It If You Are . . .***

#### ***Purchasing a New Extruder***

*Specify to your machine builder to install one of Tempco's exclusive high-efficiency Cool TO-THE Touch heating and air cooling systems.*

**SMALL  
INVESTMENT  
  
BIG  
RETURN**

#### ***Retrofitting***

*Outdated air cooled systems without replacing your existing heaters with Tempco's efficient clamshell air cooled shroud design.*

**Add Value  
to Your  
Extrusion  
Process**

#### ***Rebuilding***

*An outdated, high maintenance, low efficiency liquid cooled system with one of Tempco's turnkey ready-to-go Cool TO-THE Touch heating and air cooling systems.*

**Improve Your Bottom Line**

### ***Designed for Durability and Trouble-Free Operating Performance***

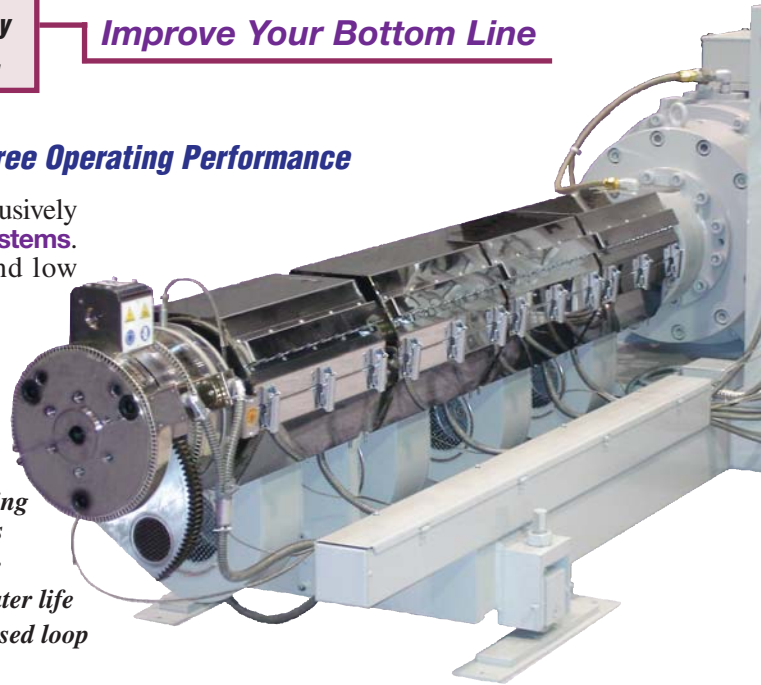
Tempco's **Finned Cast-In Heaters** with bolt clamping are exclusively designed to work with **Tempco's Cool TO-THE Touch Shroud Systems**. They are manufactured with special high-efficiency fins and low overall mass cross-section for maximizing thermodynamics.



**Unmatched Quality Shroud System & Finned Cast-In Heater**

#### **Design Features**

- \* *Reduced operating costs*
- \* *Quick, easy installation*
- \* *Greater Reliability*
- \* *Thermally efficient heating & cooling characteristics*
- \* *Reduces costly downtime*
- \* *Exceptional Cast-In Heater life*
- \* *Eliminates expensive closed loop liquid cooling systems*
- \* *Rugged, Durable & Appealing Design*



### ***Liquid Cooling Cast-In Band Heaters vs. Cool TO-THE Touch Air Cooling Shroud Systems***

#### **Liquid Cooling**

Up to now Liquid Cooling Cast-In Band Heaters have been the predominant method of controlling the melt temperature of extrusion barrels. Although effective in removing heat from the extrusion process, there are a number of drawbacks that are primarily maintenance related.

Extruders using liquid cooled Cast-In Heaters can be subject to unpredictable and untimely failures of the cooling tube assemblies, resulting in extremely costly downtime to the processor. Inherent maintenance problems include stress corrosion cracks, linear thermal expansion of the heater body, and clogging of the tubes due to accumulation of mineral deposits. Additionally, Liquid Cooled Cast-In Heaters require an expensive cooling tower or heat exchange system, extensive plumbing systems and labor for installation.

#### **A Change Is In The Air**

Tempco-designed air cooled systems have evolved considerably and become more thermally efficient as a result of geometric changes and implementation of sophisticated shrouding and air flow techniques. Optimized direction and ducting of airflow, coupled with selection of the proper blower CFM, are important to ensuring that the air cooling technique removes the proper amount of heat from the extrusion barrel. Air Cooled Cast-In Heaters are virtually maintenance free and therefore, when properly installed and applied, have the capability to far outlast and perform their liquid cooled counterparts.

***Consult Tempco With Your Requirements. We Welcome Your Inquiries.***



# 4 Turnkey State-Of-The-Art Systems to Improve Operating Efficiencies in Plastic Extrusion Equipment

Designed for Durability, Ease of Installation and Trouble-Free Service . . .

These highly engineered heating and cooling systems are an innovative concept in product design, offering a very efficient means to heat and cool the barrels of plastic extruders. They provide cooling efficiencies equal to or better than conventional liquid cooled cast-in aluminum band heaters.

These shroud designs are made with stainless steel sheet metal, cast aluminum, or an aluminum sheet metal/cast aluminum hybrid construction.

These systems are self-contained and can be supplied as turnkey ready-to-go, requiring minimum labor and installation cost, and drastically reducing downtime and maintenance upkeep compared to conventional liquid cooling and heating cast-in band heaters.

Experience all the advantages offered by Tempco's exclusive **Cool TO-THE Touch High-Efficiency shroud and aluminum finned cast-in band heater designed system.**





The engineering of these two components is perfectly matched to work in tandem, offering thermally efficient heating and air cooling characteristics and eliminating the shortcomings of liquid cool cast-in aluminum band heaters

*Improve Efficiencies in Extrusion Processing.*

**Need Assistance Selecting a System? We Welcome Your Inquiries.**

If you have a special application requiring a custom manufactured system or need assistance selecting one of our standard systems for a new or existing installation, consult Tempco with your requirements. We offer complete engineering services and support, working with you every step of the way, to ensure customer satisfaction.

### Selection Guide – Plastic Extruder Heating and Cooling Shroud Design Systems

Shroud Style Construction	Recommended Heater Types	Barrel Diameter Range		Zone Length Range	
		Min.	Max.	Min.	Max.
 <p><b>1</b> <b>Cool TO-THE Touch™, Page 3-23</b> Inner Stainless Steel Solid Layer; Outer Stainless Steel Perforated Layer</p>	Tempco Finned Cast Aluminum Heaters, Vented Ceramic Band or Maxiband Heaters	3" 76 mm	16" 406 mm	5" 127mm	30-1/2" 775 mm
 <p><b>2</b> <b>Multi-Versal, Page 3-29</b> Single Stainless Steel Solid Layer</p>	Tempco Finned Cast Aluminum Heaters, Vented Ceramic Band or Maxiband Heaters	3" 76 mm	16" 406 mm	3-3/4" 95 mm	30-1/2" 775 mm
 <p><b>3</b> <b>Polar Cast, Page 3-36</b> Inner Stainless Steel Solid Layer; Outer Cast Aluminum Vented Layer</p>	Tempco Finned Cast Aluminum Heaters	4" 102 mm	16" 406 mm	8" 203 mm	30-1/2" 775 mm
 <p><b>4</b> <b>Arctic Cast®, Page 3-39</b> Single Cast Aluminum Solid Layer</p>	Tempco Finned Cast Aluminum Heaters	4" 102 mm	16" 406 mm	6-1/2" 165 mm	30-1/2" 775 mm



### Cool TO-THE Touch Extruder Heat/Cool System

Tempco's Cool TO-THE Touch extruder heat/cool systems are custom engineered to provide optimal heating and cooling while providing personnel safety with a Cool Touch perforated outer layer. These systems are designed with finned cast-in heaters that optimize overall system efficiency.

The reflective inner layer of the shroud decreases the heat-up cycle, reducing energy consumption. The "maxi-flow" unrestricted blower port directs inlet air to the hottest part of the casting and distributes it evenly over the entire cross section of the zone.

## 1 – Cool TO-THE Touch Construction

### Cool TO-THE Touch

**Dual Layer Shroud with Inner Stainless Steel solid layer (thermally isolated from heater) and Outer Stainless Steel Perforated Layer for Maximum Venting and Heat Dissipation that is Cool Touch**

#### Usage Requirements

*The Cool TO-THE Touch Construction Style achieves best results when built for Tempco's High-Efficiency Finned Cast-In Heaters.*

Cool TO-THE Touch shown with optional dual blowers mounted vertically with knock-outs for heater termination(s) and top vertical air outlet



### Ordering Information

See Page 3-35 for complete Ordering Information.

### Cool to-the Touch Construction Details

#### Dual Layer Shroud

- \* Inner Stainless Steel solid layer – radiation shield that directs the cooling air flow over the heater
- \* Outer Stainless Steel perforated layer – isolates hot surfaces from contact (cool touch)

#### Shroud Assembly Features

- \* Hinge with Clamps (Clamshell) – designed for ease of installation
- \* Two Individual Halves with Clamps (Two-Piece) – used where installation space is tight or mounting is difficult
- \* Clamping – Standard Barrel Clamps or Optional Adjustable Clamps
- \* Internal Support Straps or Support U-Bolt on blower mount half of shroud permits shroud to be opened for servicing without removing unit from barrel
- \* Anti-Rotate Tabs – used only with Finned Cast-In Heaters to prevent shroud from radial and axial movement around the barrel
  - Tabs are cast as part of the heater and may require a Terminal Box
- \* Blower Options – See page 3-43 through 3-45 for Complete Details
  - Single or Dual Tempco Recommended Blowers available from 148 CFM up to 1210 CFM at 115V or 230V
  - Customer Specified blower
  - Blower not required for Heat-Only Shrouds
- \* Blower Location
  - Horizontal or Vertical Orientation
  - Extension Housings Available
- \* Standard separate top Air Outlet
- \* Optional Air Outlet Features Include:
  - Air Outlet Shield deflects air flow out of shroud and shields shroud from external solid contamination
  - Air Outlet combined with Terminal Box
  - Alternate Radial Air Outlet locations available
- \* Shroud Air-Inlet Baffle Optional

#### Heater Type and Components

- \* Recommended Heater Types – Finned Cast-In Heaters with standard 1/4" gap between heater halves, Ceramic Band and Maxiband Heaters
- \* Power Input Terminal Box with 7/8" dia. K.O. for 1/2" conduit:
  - Standard 10-32 stud termination with ceramic or mica insulator
  - With Louvered Cover – used when terminal box is separate from air-outlet
  - Stainless Steel Screen – used when terminal box is combined with air outlet
- \* Power Input through Blower Mount – input wiring through knock-outs in blower mount eliminates terminal box and facilitates ease of heater service
- \* Optional internal Bus Bars for ceramic band heaters or Bus Wiring for other style heaters

#### Sensing and Controlling

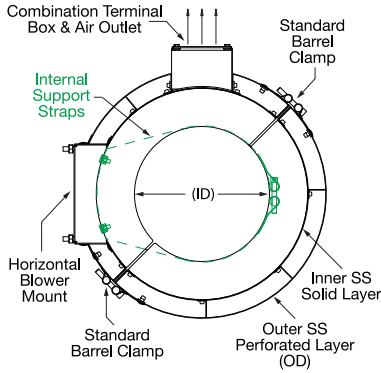
- \* Existing Zone Control Probe – Shroud System can be designed per customer specifications
- \* Tempco supplied Zone Control Probe
- \* Tempco customized Power Control Panel designed to complete Your Thermal Loop System



### Existing Cool TO-THE Touch Extruder Heat/Cool Systems

#### Horizontal Blower Motor Mount Design Specifications

The following partial listings are part numbers and specifications for shroud designs that Tempco has engineered and manufactured. Each item listed below can be modified to fit customer requirements. Zone Control Probes are placed per customer specifications. See page 3-23 for complete details.

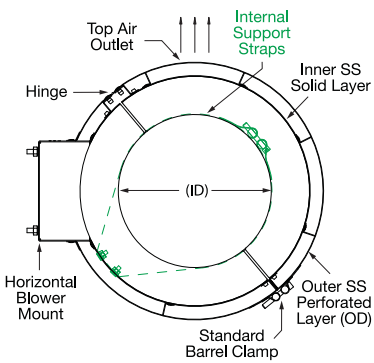


Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00228	7.50	13.81	19.50	760	11.00	CBH12232	11250	240-1 $\phi$

#### Table CT-H1 Shroud Features

- \* Combination Terminal & Air Outlet Box
- \* Barrel Clamps (no Hinge)
- \* Internal Support Straps

**Heater Part Number Prefix Key**  
CBH = Cast-In Heater



Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00086	6.75	12.56	18.50	550	7.75	BCH04442	4000	230-1 $\phi$
ASJ00087	6.75	12.56	27.00	2 @ 350	7.75	BCH04442	6000	230-1 $\phi$
ASJ00106	8.50	14.25	14.50	350	9.50	BCH04749	8400	230-1 $\phi$
ASJ00105	8.50	14.25	8.00	265	9.50	BCH04749	4200	230-1 $\phi$
ASJ00104	8.50	14.25	21.00	550	9.50	BCH04749	12600	230-1 $\phi$

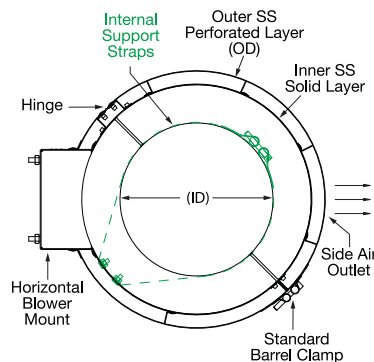
#### Table CT-H2A & CT-H2B Shroud Features

- \* No Terminal Box
- \* Separate Air Outlet
- \* Barrel Clamps with Hinge
- \* Internal Support Straps

**Heater Part Number Prefix Key**  
BCH = Ceramic Band  
MBH = Micaband



**Note:** Air Outlet and Shroud Opening Locations differ between tables CT\_H2A and CT\_H2B. See drawings for details.



Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00072	8.87	14.38	25.56	2 @ 382	9.88	MBH11120	10000	480-1 $\phi$
ASJ00069	10.63	16.13	24.38	2 @ 382	11.63	BCH03796	12000	480-1 $\phi$
ASJ00070	13.0	18.25	30.69	2 @ 488	14.00	BCH03841	16800	480-1 $\phi$

## Ordering Information

If you cannot find an existing shroud design that meets your requirements precisely, please use the ordering form on page 3-35 to process your quote request.

Tempco's engineering professionals will custom design a shroud system to meet your extruder process challenges.

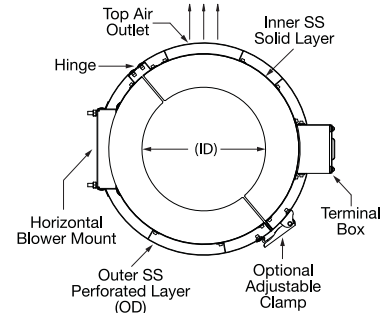


### Existing Cool TO-THE Touch Extruder Heat/Cool Systems

#### Horizontal Blower Motor Mount Design Specifications (continued)

The following partial listings are part numbers and specifications for shroud designs that Tempco has engineered and manufactured. Each item listed below can be modified to fit customer requirements. Zone Control Probes are placed per customer specifications. See page 3-23 for complete details.

Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00158	6.89	12.75	8.27	283	10.13	CBH11196	3900	230-1 $\phi$
ASJ00175	7.48	13.31	9.88	283	11.00	CBH11516	3400	230-1 $\phi$
ASJ00156	7.87	14.06	8.03	283	11.13	CBH11195 MXH02493	6000	230-1 $\phi$
ASJ00157	7.87	14.06	8.27	283	11.13	CBH11195 MXH02495	6000	230-1 $\phi$
ASJ00173	8.07	14.87	6.00	283	12.56	CBH11514	4200	230-1 $\phi$
ASJ00174	8.07	14.87	11.31	283	12.56	CBH11515 MXH02570	7160	230-1 $\phi$
ASJ00230	8.58	14.75	14.25	760	12.44	CBH12304	8800	230-1 $\phi$
ASJ00231	8.58	16.56	12.38	550	13.22	CBH12303 MXH02758	10000	230-1 $\phi$
ASJ00152	9.45	15.31	7.95	283	12.69	CBH11194	6600	230-1 $\phi$
ASJ00232	10.55	18.06	13.13	550	14.41	CBH12002 MXH02757	12360	230-1 $\phi$
ASJ00172	11.42	17.25	13.13	283	14.94	CBH11513	15000	230-3 $\phi$
ASJ00229	12.60	18.06	12.50	550	15.63	CBH12301	7500	230-1 $\phi$



#### Table CT-H3 Shroud Features

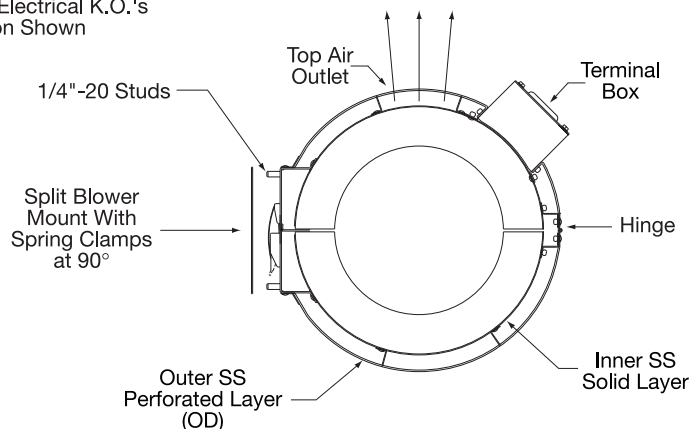
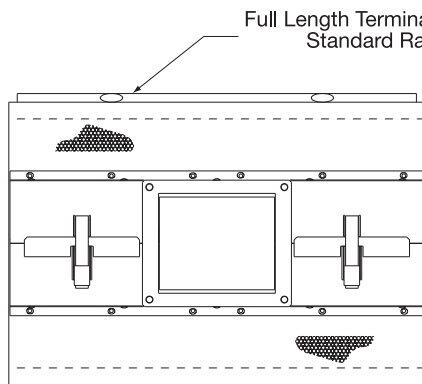
- \* Terminal Box
- \* Adjustable Clamps with Hinge
- \* Separate Air Outlet
- \* No Internal Support

#### Heater Part Number Prefix Key

CBH = Cast-In Heater      MXH = Maxiband

### Cool TO-THE Touch Split Motor Mount Extruder Heat/Cool Systems

The Cool TO-THE Touch Split Motor Mount Design has been replaced by the Solid Motor Mount Design. The solid motor mount design has many installation and maintenance advantages over the split design. Split motor mount designs are still available as replacement systems. However, Tempco recommends upgrading to a solid motor mount design.



Consult Tempco for complete details.

Existing split motor mount shroud part numbers and specifications can be found at [www.tempco.com/splitshrouds](http://www.tempco.com/splitshrouds).

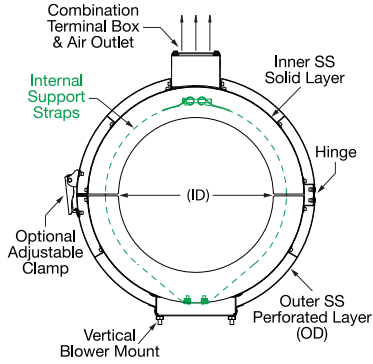
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### Existing Cool TO-THE Touch Extruder Heat/Cool Systems

#### Vertical Blower Motor Mount Design Specifications

The following partial listings are part numbers and specifications for shroud designs that Tempco has engineered and manufactured. Each item listed below can be modified to fit customer requirements. Zone Control Probes are placed per customer specifications. See page 3-23 for complete details.



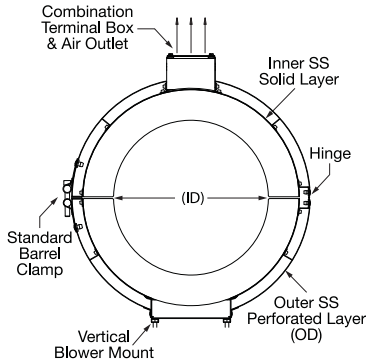
Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00200	10.75	16.56	23.00	(2) 550	14.25	CBH11759	20000	240-3 $\phi$
ASJ00199	10.75	16.56	27.00	(2) 550	14.25	CBH11758	20000	240-3 $\phi$
ASJ00201	10.75	16.56	28.00	(2) 550	14.25	CBH11791	20000	240-3 $\phi$
*ASJ00165	11.42	17.25	13.50	687	15.00	CBH11412	15000	480-1 $\phi$

\*No Internal Support for this design.

#### Table CT-V1 Shroud Features

- \* Combination Terminal Box & Air Outlet
- \* Adjustable Clamps with Hinge
- \* Internal Support Straps

Heater Part Number Prefix Key  
CBH = Cast-In Heater

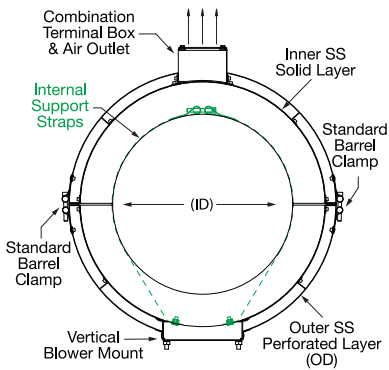


Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00151	5.50	11.00	13.00	265	8.75	CBH07945	5600	600-1 $\phi$
ASJ00238	6.00	11.81	10.50	—	9.50	CBH12250	4000	220-1 $\phi$
ASJ00139	10.00	16.25	25.00	(2) 550	14.00	CBH08665	24000	287-3 $\phi$

#### Table CT-V2 Shroud Features

- \* Combination Terminal Box & Air Outlet
- \* Barrel Clamps with Hinge
- \* No Internal Support

Heater Part Number Prefix Key  
CBH = Cast-In Heater



Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00241	8.51	14.81	19.75	(2) 550	12.50	CBH08176	11800	240-3 $\phi$

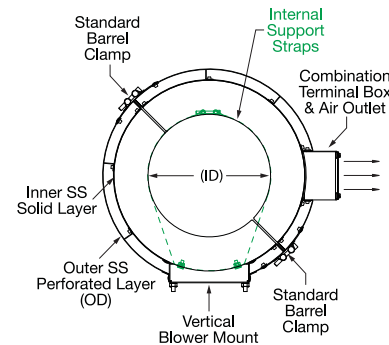
#### Table CT-V3A & V3B Shroud Features

- \* Combination Terminal Box & Air Outlet
- \* Barrel Clamps (no Hinge)
- \* Internal Support Straps



**Note:** Air Outlet and Shroud Opening Locations differ between tables CT\_V3A and CT\_V3B. See drawings for details.

Heater Part Number Prefix Key  
CBH = Cast-In Band



Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00237	12.50	18.56	15.00	550	16.25	CBH12328	15000	240-3 $\phi$



### Existing Cool TO-THE Touch Extruder Heat/Cool Systems

#### Vertical Blower Motor Mount Design Specifications (continued)

The following partial listings are part numbers and specifications for shroud designs that Tempco has engineered and manufactured. Each item listed below can be modified to fit customer requirements. Zone Control Probes are placed per customer specifications. See page 3-23 for complete details.

Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00189	4.50	10.00	7.06	350	7.75	(3)BCH05644	1800	190/380 $\phi$
ASJ00182	4.50	10.00	13.25	350	7.75	CBH05676	3000	230-1 $\phi$
*ASJ00197	7.00	14.25	21.50	550	10.50	CBH11746	4700	480-3 $\phi$
*ASJ00188	10.00	17.50	27.00	760	13.50	CBH11665	9600	480-3 $\phi$

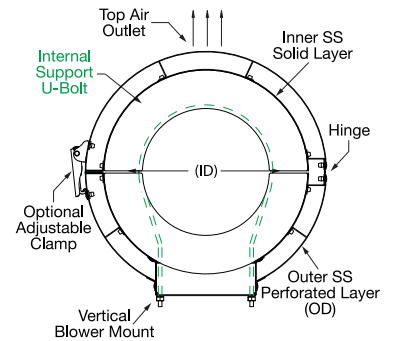
\*No Internal Support for this design.

#### Table CT-V4 Shroud Features

- \* No Terminal Box
- \* Separate Air Outlet
- \* Adjustable Clamps with Hinge
- \* Internal Support U-Bolt

#### Heater Part Number Prefix Key

- BCH = Ceramic Band
- CBH = Cast-In Heater



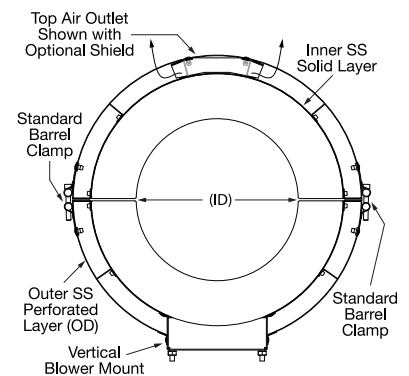
Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00221	5.00	12.00	16.63	265	8.50	CBH12046	3000	480-1 $\phi$
ASJ00220	7.00	14.00	21.50	550	10.50	CBH12045	4700	480-3 $\phi$
ASJ00219	8.00	15.00	24.13	760	11.50	CBH12044	7100	480-3 $\phi$
ASJ00244	9.00	16.06	27.50	760	12.50	CBH12403	8300	480-3 $\phi$

#### Table CT-V5 Shroud Features

- \* No Terminal Box
- \* Separate Air Outlet
- \* Barrel Clamps (no Hinge)
- \* No Internal Support

#### Heater Part Number Prefix Key

- CBH = Cast-In Heater



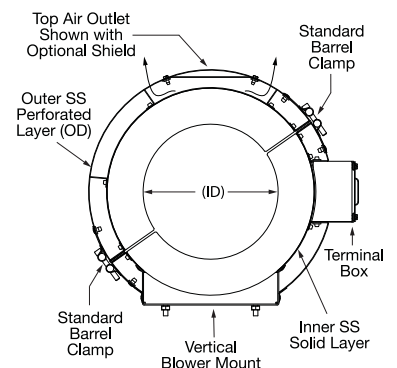
Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00223	6.50	12.81	11.00	265	9.75	CBH12061	4600	240-1 $\phi$
ASJ00222	6.50	12.81	18.00	550	9.75	CBH12060	7600	240-1 $\phi$
ASJ00213	7.50	13.56	17.50	1210	10.75	CBH12000	7500	240-1 $\phi$
ASJ00218	8.50	14.31	21.00	—	11.75	(2)BCH05888	10000	240-1 $\phi$

#### Table CT-V6 Shroud Features

- \* Terminal Box
- \* Separate Air Outlet
- \* Barrel Clamps (no Hinge)
- \* No Internal Support

#### Heater Part Number Prefix Key

- BCH = Ceramic Band
- CBH = Cast-In Heater



## Ordering Information

If you cannot find an existing shroud design that meets your requirements precisely, please use the ordering form on page 3-35 to process your quote request.

Tempco's engineering professionals will custom design a shroud system to meet your extruder process challenges.

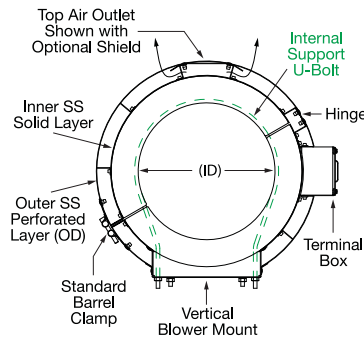
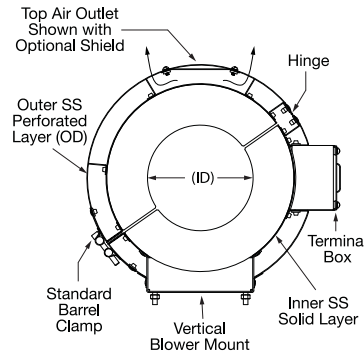
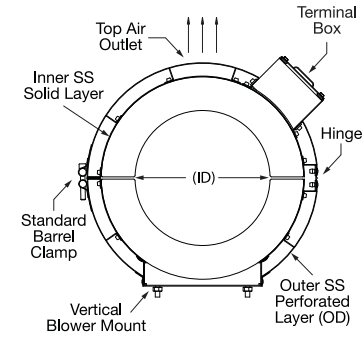
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### Existing Cool TO-THE Touch Extruder Heat/Cool Systems

#### Vertical Blower Motor Mount Design Specifications (continued)

The following partial listings are part numbers and specifications for shroud designs that Tempco has engineered and manufactured. Each item listed below can be modified to fit customer requirements. Zone Control Probes are placed per customer specifications. See page 3-23 for complete details.



Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00168	7.50	12.75	21.50	760	10.50	CBH10818	4500	240-3 $\phi$
ASJ00185	9.00	15.31	19.25	550	13.00	CBH08278	5000	230-1 $\phi$

#### Table CT-V7A & V7B Shroud Features

- \* Terminal Box
- \* Separate Air Outlet
- \* Barrel Clamps with Hinge
- \* No Internal Support



**Note:** Air Outlet and Shroud Opening Locations differ between tables CT\_V7A and CT\_V7B. See drawings for details.

#### Heater Part Number Prefix Key

CBH = Cast-In Band

Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00240	5.50	11.81	22.00	—	9.00	CBH12342	3500	200-3 $\phi$

Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00098	5.51	11.00	17.00	350	8.50	CBH10338	5700	208-1 $\phi$
ASJ00100	7.09	12.50	22.00	550	10.08	CBH10340	12000	208-1 $\phi$
ASJ00110	7.09	12.50	22.00	606	10.08	CBH10607	12000	110-1 $\phi$
ASJ00193	7.56	12.50	22.00	687	10.08	CBH11727	12000	240-1 $\phi$
ASJ00103	8.27	13.81	24.81	(2) 350	11.50	CBH10452	13000	208-1 $\phi$
*ASJ00206	9.50	15.31	16.00	550	12.50	CBH11909	9550	240-3 $\phi$
*ASJ00205	9.50	15.31	24.50	(2) 550	12.50	CBH11891	14600	240-3 $\phi$

\*Internal Support U-Bolt used in place of Internal Support Straps.

#### Table CT-V8 Shroud Features

- \* Terminal Box
- \* Separate Air Outlet
- \* Barrel Clamps with Hinge
- \* Internal Support Straps

#### Heater Part Number Prefix Key

CBH = Cast-In Band

## Ordering Information

If you cannot find an existing shroud design that meets your requirements precisely, please use the ordering form on page 3-35 to process your quote request.

Tempco's engineering professionals will custom design a shroud system to meet your extruder process challenges.



### Multi-Versal Extruder Heat/Cool System

Tempco's Multi-Versal extruder heat/cool systems are designed for efficient heating and cooling. The shroud systems can be used with a many styles of band heaters. Due to the single layer design, the Multi-Versal shroud system has a low profile OD.

The reflective interior of the shroud decreases the heat-up cycle, reducing energy consumption. The unrestricted blower port directs inlet air to the hottest part of the heater and distributes it evenly over the entire cross section of the zone.

## 2 – Multi-Versal Construction

### Multi-Versal Extruder

#### Solid, Stainless Steel Single Layer Shroud

#### Usage Requirements

*A highly adaptable single layer shroud, suited for retrofit and/or new applications regardless of the type of barrel band heater being used.*

### Ordering Information

See Page 3-35 for complete Ordering Information.

### Multi-Versal Construction Details

#### Single Layer Shroud

- \* Solid Stainless Steel Layer – radiation shield that directs the cooling air flow over the heater

#### Shroud Assembly Features

- \* Hinge with Clamps (Clamshell) – designed for ease of installation
- \* Two Individual Halves with Clamps (Two-Piece) – used where installation space is tight or mounting is difficult
- \* Clamping: Standard Barrel Clamps or Optional Adjustable Clamps
- \* Internal Support Straps or Support U-Bolt on blower mount half of shroud permits shroud to be opened for servicing without removing unit from barrel
- \* Anti-Rotate Tabs – used only with Finned Cast-In Heaters to prevent shroud from radial and axial movement around the barrel
  - ➔ Tabs are cast as part of the heater and may require a Terminal Box
- \* Blower Options – See page 3-43 through 3-45 for Complete Details
  - ➔ Single or Dual Tempco Recommended Blowers available from 148 CFM up to 1210 CFM at 115V or 230V
  - ➔ Customer Specified blower
  - ➔ Blower not required for Heat-Only Shrouds
- \* Blower Location
  - ➔ Horizontal or Vertical Orientation
  - ➔ Extension Housings Available
- \* Standard separate top Screened Air Outlet
- \* Optional Screened Air Outlet Features Include:
  - ➔ Air Outlet combined with Terminal Box
  - ➔ Alternate Radial Air Outlet locations available
- \* Shroud Air-Inlet Baffle Optional



Multi-Versal shown with horizontally mounted blower and vertical combination terminal box and air outlet

#### Heater Type and Components

- \* Recommended Heater Types – Finned Cast-In Heaters with standard 1/4" gap between heater halves, Ceramic Band and Maxiband Heaters
- \* Power Input Terminal Box with 7/8" dia. K.O. for 1/2" conduit:
  - ➔ Standard 10-32 stud termination with ceramic or mica insulator
  - ➔ With Louvered Cover – used when terminal box is separate from air-outlet
  - ➔ Stainless Steel Screen – used when terminal box is combined with air outlet
- \* Power Input through Blower Mount – input wiring through knock-outs in blower mount eliminates terminal box and facilitates ease of heater service
- \* Optional internal Bus Bars for ceramic band heaters or Bus Wiring for other style heaters

#### Sensing and Controlling

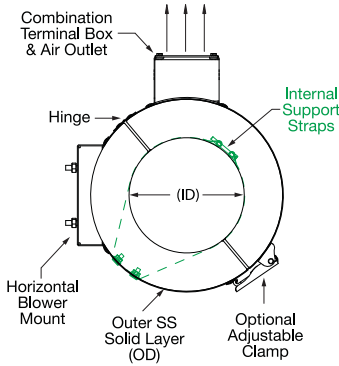
- \* Existing Zone Control Probe – Shroud System can be designed per customer specifications
- \* Tempco supplied Zone Control Probe
- \* Tempco customized Power Control Panel designed to complete Your Thermal Loop System



### Multi-Versal Extruder Heat/Cool System

#### Horizontal Blower Motor Mount Design Specifications

The following partial listings are part numbers and specifications for shroud designs that Tempco has engineered and manufactured. Each item listed below can be modified to fit customer requirements. Zone Control Probes are placed per customer specifications. See page 3-29 for complete details.

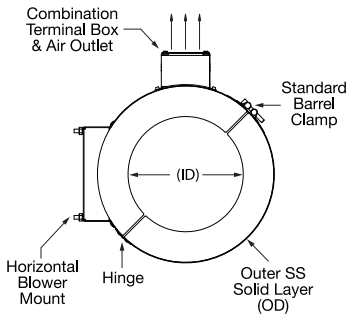


Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00171	6.00	10.00	9.50	148	7.00	BCH04428	3500	460-1 $\phi$

#### Table MV\_H1 Shroud Features

- \* Combination Terminal Box and Air Outlet
- \* Adjustable Clamps with Hinge
- \* Internal Support Straps

**Heater Part Number Prefix Key**  
BCH = Ceramic Band

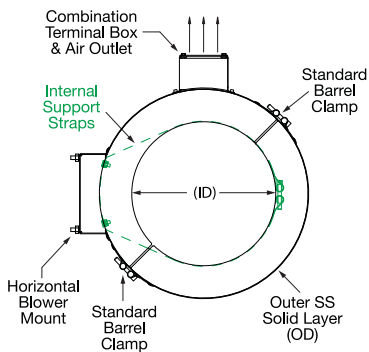


Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00117	8.00	12.25	24.38	(2) 550	11.50	CBH10732	9000	480-3 $\phi$

#### Table MV\_H2 Shroud Features

- \* Combination Terminal Box and Air Outlet
- \* Barrel Clamps with Hinge
- \* No Internal Support

**Heater Part Number Prefix Key**  
CBH = Cast-In Heater



Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00242	10.00	14.56	25.00	(2) 550	13.75	(2)CBH12393	25600	230-3 $\phi$

#### Table MV\_H3 Shroud Features

- \* Combination Terminal Box and Air Outlet
- \* Barrel Clamps (no Hinge)
- \* Internal Support Straps

**Heater Part Number Prefix Key**  
CBH = Cast-In Heater

## Ordering Information

If you cannot find an existing shroud design that meets your requirements precisely, please use the ordering form on page 3-35 to process your quote request.

Tempco's engineering professionals will custom design a shroud system to meet your extruder process challenges.



### Existing Multi-Versal Extruder Heat/Cool Systems

#### Horizontal Blower Motor Mount Design Specifications

The following partial listings are part numbers and specifications for shroud designs that Tempco has engineered and manufactured. Each item listed below can be modified to fit customer requirements. Zone Control Probes are placed per customer specifications. See page 3-29 for complete details.

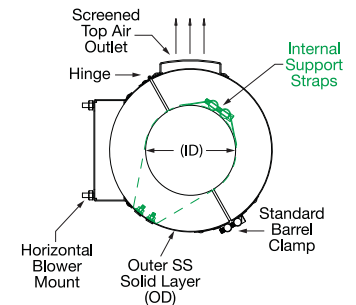
Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00080	5.00	9.00	14.00	550	6.00	BCH04356	4320	415-1 $\phi$

#### Table MV\_H4 Shroud Features

- \* No Terminal Box
- \* Screened Air Outlet
- \* Barrel Clamps with Hinge
- \* Internal Support Straps

#### Heater Part Number Prefix Key

BCH = Ceramic Band



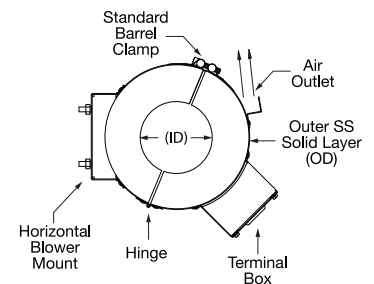
Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00053	3.75	7.50	3.75	56	4.75	BCH02971	800	460-1 $\phi$
ASJ00054	3.75	7.50	3.75	56	4.75	BCH02975	800	460-1 $\phi$

#### Table MV\_H5 Shroud Features

- \* Terminal Box
- \* Separate Air Outlet
- \* Barrel Clamps with Hinge
- \* No Internal Support

#### Heater Part Number Prefix Key

BCH = Ceramic Band



#### Vertical Blower Motor Mount Design Specifications

The following partial listings are part numbers and specifications for shroud designs that Tempco has engineered and manufactured. Each item listed below can be modified to fit customer requirements. Zone Control Probes are placed per customer specifications. See page 3-29 for complete details.

Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00088	5.25	9.50	13.50	To Suit	8.50	CBH10173	7500	230-3 $\phi$
*ASJ00149	10.63	14.56	14.75	550	13.81	CBH11140	6000	480-1 $\phi$
*ASJ00163	9.75	14.50	22.00	550	13.75	CBH11410	22000	230-3 $\phi$
*ASJ00164	9.75	14.00	11.00	265	13.25	CBH11409	11000	230-1 $\phi$

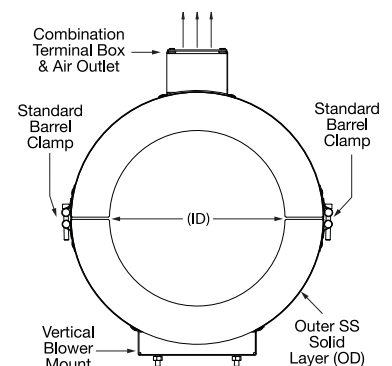
\*No Internal Support for this design.

#### Table MV\_V1 Shroud Features

- \* Combination Terminal Box & Air Outlet
- \* Barrel Clamps (no Hinge)
- \* Internal Support Straps

#### Heater Part Number Prefix Key

CBH = Cast-In Band



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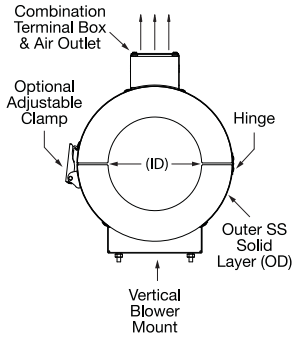


## Multi-Versal Shroud System

### Existing Multi-Versal Extruder Heat/Cool Systems

#### Horizontal Blower Motor Mount Design Specifications (continued)

The following partial listings are part numbers and specifications for shroud designs that Tempco has engineered and manufactured. Each item listed below can be modified to fit customer requirements. Zone Control Probes are placed per customer specifications. See page 3-29 for complete details.



Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00177	6.25	10.25	18.50	350	9.50	CBH11500	8800	460-1 $\phi$
ASJ00181	6.25	10.50	13.00	350	9.75	CBH11544	8000	600-1 $\phi$
ASJ00167	6.50	10.75	15.50	350	10.00	CBH11428	8000	575-1 $\phi$

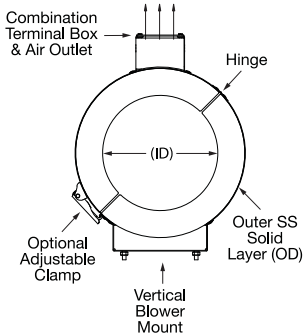
#### Table MV\_V2A & MV\_V2B Shroud Features

- \* Combination Terminal Box & Air Outlet
- \* Adjustable Clamps with Hinge
- \* No Internal Support

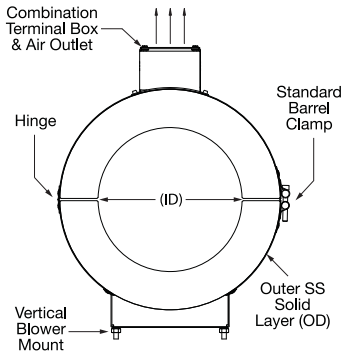


**Note:** Air Outlet and Shroud Opening Locations differ between tables CT\_H2A and CT\_H2B. See drawings for details.

**Heater Part Number Prefix Key**  
BCH = Ceramic Band



Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00203	8.00	11.75	17.75	550	11.00	CBH11821	7000	240-1 $\phi$
ASJ00202	8.75	13.00	22.00	(2) 350	12.25	CBH11822	15000	240-3 $\phi$



Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00041	5.50	9.50	13.00	265	8.75	CBH07945	5600	600-1 $\phi$
ASJ00042	6.63	10.63	18.50	550	9.88	CBH07946	8800	600-1 $\phi$
ASJ00073	9.50	13.25	27.75	(2) 350	12.50	CBH09759	24000	230-3 $\phi$
ASJ00078	9.75	13.75	11.50	382	12.63	CBH09965	9000	230-1 $\phi$
ASJ00095	5.00	9.38	11.00	265	8.38	CBH10294	4000	240-1 $\phi$
ASJ00112	9.75	13.50	23.50	(2) 350	12.75	CBH10719	16000	240-1 $\phi$
ASJ00113	9.75	13.50	19.00	(2) 350	12.75	CBH10720	12600	240-1 $\phi$
ASJ00114	5.00	9.25	16.63	550	8.50	CBH10731	3000	480-1 $\phi$
ASJ00115	8.00	12.25	24.38	(2) 550	11.50	CBH10732	9000	480-3 $\phi$
ASJ00116	9.00	13.25	27.75	(2) 550	12.50	CBH10733	11500	480-3 $\phi$
ASJ00133	6.29	11.25	10.88	—	10.38	CBH10846	5000	347-1 $\phi$
ASJ00138	5.50	9.50	15.00	350	8.75	CBH10930	6000	460-1 $\phi$
ASJ00146	6.70	11.00	7.88	265	10.25	CBH11060	4500	240-1 $\phi$
ASJ00239	9.50	13.25	27.75	(2) 550	12.50	CBH09759	24000	230-3 $\phi$
ASJ00147	5.50	10.50	12.00	350	9.50	CBH11063	5050	240-1 $\phi$

#### Table MV\_V3 Shroud Features

- \* Combination Terminal Box & Air Outlet
- \* Barrel Clamps with Hinge
- \* No Internal Support

**Heater Part Number Prefix Key**  
CBH = Cast-In Band



### Existing Multi-Versal Extruder Heat/Cool Systems

#### Vertical Blower Motor Mount Design Specifications (continued)

The following partial listings are part numbers and specifications for shroud designs that Tempco has engineered and manufactured. Each item listed below can be modified to fit customer requirements. Zone Control Probes are placed per customer specifications. See page 3-29 for complete details.

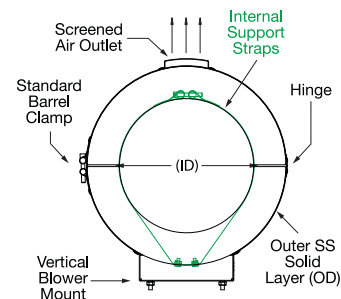
Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00076	9.75	15.00	19.50	1210	13.75	CBH08025	12000	230-1 $\phi$
ASJ00081	9.50	15.00	21.50	1210	13.75	CBH10096	12000	230-1 $\phi$
ASJ00150	9.50	15.75	14.75	1210	15.00	-----	-----	-----
ASJ00179	9.32	13.81	23.00	760	10.50	(2)BCH05552	15000	240-1 $\phi$
ASJ00148	7.50	12.00	21.00	550	8.50	(2)BCH05289	8340	240-1 $\phi$
ASJ00180	9.32	13.81	12.00	350	10.50	BCH05552	7500	240-1 $\phi$

#### Table MV\_V4 Shroud Features

- \* No Terminal Box
- \* Screened Air Outlet
- \* Barrel Clamps with Hinge
- \* Internal Support Straps

#### Heater Part Number Prefix Key

- BCH = Ceramic Band
- CBH = Cast-In Band



Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00198	8.66	12.57	11.00	283	11.66	CBH11762	6800	240-1 $\phi$
*ASJ00131	9.75	13.75	11.50	350	12.63	CBH09965	9000	230-1 $\phi$

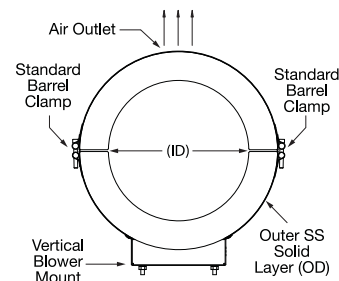
\*No Internal Support for this design.

#### Table MV\_V5 Shroud Features

- \* No Terminal Box
- \* Separate Air Outlet
- \* Barrel Clamp (no Hinge)
- \* Internal Support U-Bolt

#### Heater Part Number Prefix Key

- CBH = Cast-In Band



## Ordering Information

If you cannot find an existing shroud design that meets your requirements precisely, please use the ordering form on page 3-35 to process your quote request.

Tempco's engineering professionals will custom design a shroud system to meet your extruder process challenges.

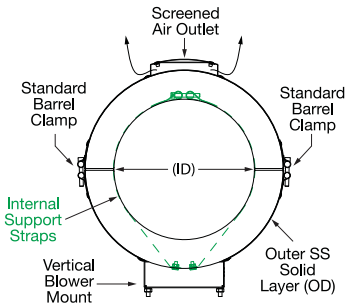
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### Existing Multi-Versal Extruder Heat/Cool Systems

#### Vertical Blower Motor Mount Design Specifications (continued)

The following partial listings are part numbers and specifications for shroud designs that Tempco has engineered and manufactured. Each item listed below can be modified to fit customer requirements. Zone Control Probes are placed per customer specifications. See page 3-29 for complete details.



Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
*ASJ00210	4.00	8.31	10.25	265	7.50	CBH11936	3300	230-1 $\phi$
*ASJ00204	5.00	8.31	13.50	265	5.25	—	—	—
ASJ00141	7.63	12.13	14.38	760	11.13	CBH11026	7000	230-1 $\phi$
*ASJ00207	8.00	11.82	17.50	—	9.00	(3)BCH05789	15000	480-1 $\phi$
*ASJ00208	8.00	11.82	22.50	—	9.00	(2)BCH05789 (2)BCH05790	14000	480-1 $\phi$
ASJ00227	9.75	13.75	18.50	760	10.75	(3)BCH05949	13500	480-1 $\phi$

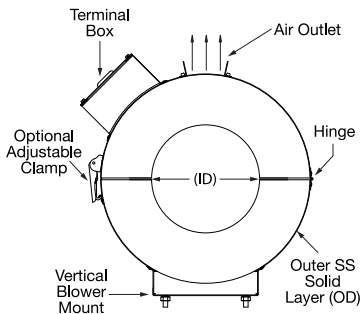
\*Internal Support U-Bolt used in place of Internal Support Straps.

#### Table MV\_V6 Shroud Features

- \* No Terminal Box
- \* Barrel Clamps (no Hinge)
- \* Screened Air Outlet
- \* Internal Support Straps

#### Heater Part Number Prefix Key

- BCH = Ceramic Band
- CBH = Cast-In Band
- MBH = Micaband



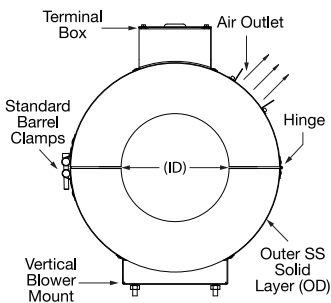
Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00038	3.75	7.50	7.75	265	4.75	—	—	—
ASJ00039	5.50	9.25	15.13	265	6.50	—	—	—
ASJ00040	4.50	8.25	11.25	265	5.50	—	—	—
ASJ00083	7.50	14.50	20.00	To Suit	13.75	CBH10129	12000	240-1 $\phi$

#### Table MV\_V7 Shroud Features

- \* Terminal Box
- \* Separate Air Outlet
- \* Adjustable Clamps with Hinge
- \* No Internal Support

#### Heater Part Number Prefix Key

- CBH = Cast-In Heater



Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Maximum Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASJ00045	4.50	8.25	10.00	265	5.50	BCH02473	3250	240V-1 $\phi$
ASJ00046	3.75	7.50	6.50	265	4.75	BCH02475	2000	240V-1 $\phi$
ASJ00047	3.75	7.50	7.75	265	4.75	BCH02479	3000	240V-1 $\phi$
ASJ00050	6.75	10.50	14.75	265	7.75	—	—	—
ASJ00055	7.50	11.50	20.50	465	8.50	—	—	—

#### Table MV\_V8 Shroud Features

- \* Terminal Box
- \* Separate Air Outlet
- \* Barrel Clamps with Hinge
- \* No Internal Support

#### Heater Part Number Prefix Key

- BCH = Ceramic Band

### Ordering Information

See Page 3-35 for complete Ordering Information.



### Made-To-Order Quote Request Form — Copy and Fax Us Your Requirements

#### Customer Information

Name: \_\_\_\_\_ Company: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_  
 Extruder Barrel Manufacturer: \_\_\_\_\_ Model Number: \_\_\_\_\_  
 Resin Type: \_\_\_\_\_ Process Temperature: \_\_\_\_\_

**When submitting this form, please be sure to include an extruder barrel sketch or drawing that includes the following:**

- \* Extruder Barrel Support(s)      \* Number of Heating Zones      \* Vent Location(s)      \* Zone Probe Location(s)
- \* Input Feed Location      \* Pressure Tap Location(s)      \* Zone Length(s)      \* Additional Restriction(s)

**Note:** To assist Tempco in designing a shroud system, please provide digital images (in .jpg format) of the extruder barrel.

**Shroud Specifications (For replacement of existing Tempco Shroud(s), please contact your Tempco Factory or Sales Representative.)**

**Shroud Style:**  Cool TO-THE Touch™     Multi-Versal    Quantity Required: \_\_\_\_\_

#### Shroud Dimensions

Shroud Width / Zone Length: \_\_\_\_\_ Extruder Barrel OD / Shroud ID: \_\_\_\_\_  
 Maximum Shroud OD: \_\_\_\_\_ (Determined by Engineering unless specified by customer.)  
 Existing Heater OD (including terminations): \_\_\_\_\_ (Determined by Engineering when new Tempco Heater is purchased.)

**Internal Shroud Support Required:**     Yes     No

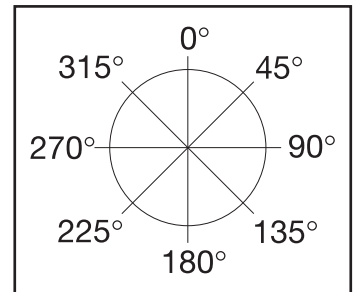
#### Shroud Components and Component Locations

**Component Options** (see page 3-23 for shroud component details)

1. Blower Mount:
  - Horizontal                       Vertical
2. Air Outlet:
  - Separate from Terminal Box       Combined w/ Terminal Box
3. Terminal Box:
  - None                       Louvered (Separated from Air Outlet)
  - Screened (Combined with Air Outlet)
4. Clamping Method at Shroud Opening:
  - Barrel Clamps with Hinge       Barrel Clamps (no Hinge)      Hinge \_\_\_\_\_
  - Adjustable Clamps with Hinge       Adjustable Clamps (no Hinge)
5. Zone T/C Probe(s) - Customer Specified:      **5** Probe(s) \_\_\_\_\_  
 Quantity: \_\_\_\_\_      Clearance Hole Diameter(s): \_\_\_\_\_

#### Component Radial Locations

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 Clamp(s) \_\_\_\_\_  
Hinge \_\_\_\_\_
- 5 Probe(s) \_\_\_\_\_



**Blower Specifications** (see page 3-43 for standard Tempco blowers & configuration details)

**Configuration:**     Single     Dual     Customer Supplied (\*see below)  
 Stock Tempco Blower (Engineering will determine specifications if none specified)  
 P/N: \_\_\_\_\_ or CFM: \_\_\_\_\_ Volts: \_\_\_\_\_ Operating Frequency: \_\_\_\_\_ Hz  
 Optional Blower Extension:     Horizontal     Vertical     Custom (Consult Tempco.)  
 \*Customer Supplied Blower (**Please attach mounting information when submitting this form.**)  
 Manufacturer: \_\_\_\_\_ P/N: \_\_\_\_\_ CFM: \_\_\_\_\_ Volts: \_\_\_\_\_ Operating Frequency: \_\_\_\_\_ Hz

#### Heater Specifications

**Existing Tempco Heater:** P/N: \_\_\_\_\_     Replace Existing Heater     Cover Existing Heater

**If purchasing new Tempco Heater(s), please provide the following information if known:**

Type and Quantity Required:  
 \_\_\_\_\_ Cast-In(s)    \_\_\_\_\_ Other: \_\_\_\_\_  
 Inner Diameter: \_\_\_\_\_ Width(s): \_\_\_\_\_ Wattage per Shroud: \_\_\_\_\_ Voltage: \_\_\_\_\_



## Polar Cast Shroud System

### Polar Cast Extruder Heat/Cool System

We took our original single layer Arctic Cast concept and modified it, creating the more efficient dual layer Polar Cast shroud system. The Polar Cast features the same 1/4" thick outer aluminum shroud as the Arctic Cast, but the similarities end there. The Polar Cast features finned cast-in heaters that allow for quick thermal response during heat-up and cool-down cycles. The Cool

Touch outer layer is vented to improve cooling and provide personnel safety. A reflective inner layer has been added to this shroud design to decrease the heat-up cycle and reduce energy consumption. The unrestricted blower port directs inlet air to the hottest part of the heater and distributes it evenly over the entire cross section of the zone.

## 3 – Polar Cast Construction



Polar Cast shown with Tempco's Exclusive High-Efficiency Finned Aluminum Cast-In Band Heater

### Ordering Information

See Page 3-38 for complete Ordering Information.

### Heater Type and Components

- \* Recommended Heater Types – Tempco Finned Cast-In Heaters with standard 1/4" gap between heater halves
- \* Heater Strap Clamping is available
- \* Power Input through Cast Terminal Box with 7/8" dia. K.O. for 1/2" conduit:
  - ➔ Standard 10-32 stud termination with ceramic or mica insulator
  - ➔ Bus Wiring between halves is optional

### Sensing and Controlling

- \* Existing Zone Control Probe – Shroud System can be designed per customer specifications
- \* Tempco supplied Zone Control Probe
- \* Tempco customized Power Control Panel designed to complete Your Thermal Loop System

### Polar Cast Extruder

Dual Layer Shroud with an Inner Solid Stainless Steel Layer and an Outer Vented Cast Aluminum Layer that are thermally isolated from the heater and extruder barrel by Stainless Steel End Plates

### Usage Requirements

*This rugged shroud design is recommended for installations where the shroud system could be exposed to physical damage, such as instances where the extruder barrel is low to the ground. It is suited to work with Tempco's High-Efficiency Cast-In Heaters and cannot be used on any existing finned cast-in heaters.*

## Polar Cast Construction Details

### Dual Layer Shroud

- \* Inner Solid Aluminum Sheet Metal layer – radiation shield that directs the cooling air flow over the heater
- \* Outer 1/4" thick Vented Cast Aluminum layer – isolates hot surfaces from contact (cool touch) and provides structural integrity for the shroud

### Shroud Assembly Features

- \* Two Individual Halves bolted together (Two-Piece) with integrally cast terminal box
- \* Stainless Steel End Plates – support outer layer and thermally isolate the shroud from the heater and extruder barrel
- \* Anti-Rotate Tabs – prevent shroud from radial and axial movement around the barrel
  - ➔ Tabs are cast as part of the heater
- \* Blower Options – See Pages 3-43 through 3-45 for complete details
  - ➔ Single or Dual Tempco Recommended Blowers available from 148 CFM up to 1210 CFM at 115V or 230V
  - ➔ Customer Specified blower
- \* Blower Location
  - ➔ Vertical Orientation– at the bottom of the shroud
  - ➔ Custom location achieved only by rotating entire shroud system
- \* Top Combination Air Outlet/Terminal Box with Stainless Steel Perforated Cover
  - ➔ Custom location achieved only by rotating entire shroud system
- \* Shroud Air-Inlet Baffle Optional



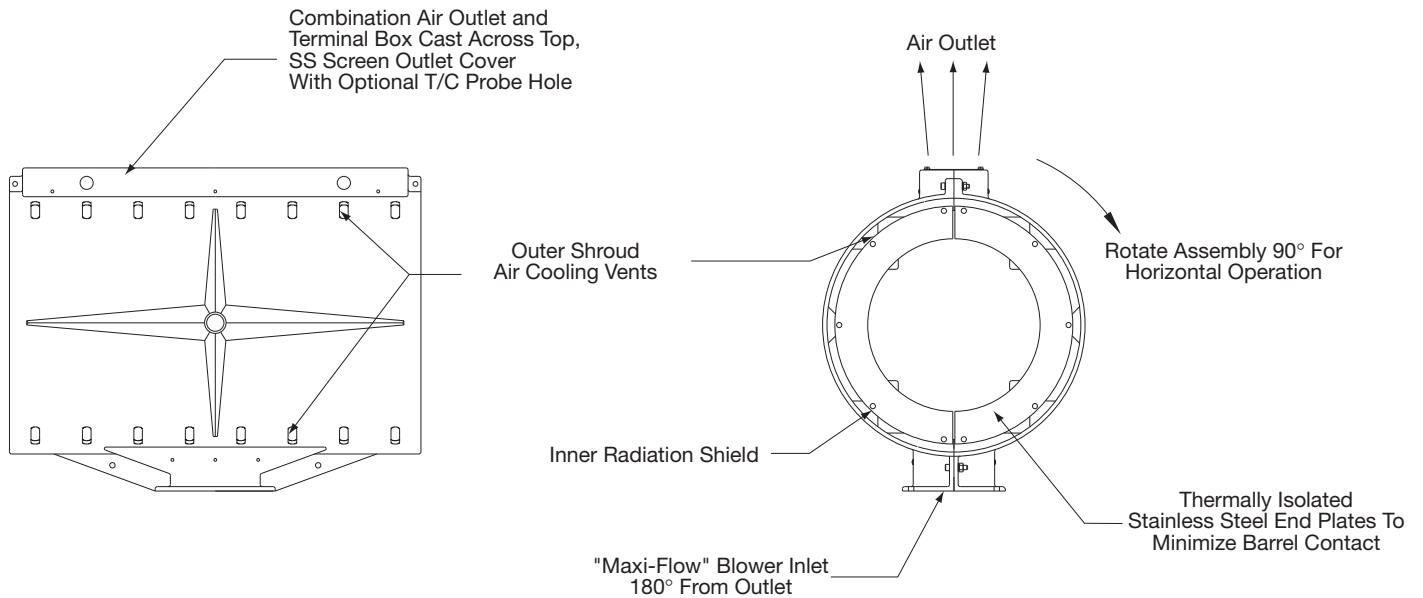
### Polar Cast Extruder Heat/Cool System

Dual Layer Cast Aluminum Vented Outer Shell Shroud System with Stainless Steel Outer Layer Supports and Reflective Aluminum Internal Liner.

This shroud design is not suited for any other finned cast-in heater.

### Polar Cool Touch Cast Aluminum Shroud System Specifications for Finned Cast Aluminum Heaters

Shroud Part Number	Barrel OD (Shroud ID) in	Shroud OD in	Shroud Width in	Blower CFM	Heater OD in	Heater Part Number	Wattage per Shroud	Heater Voltage
ASF01179	7.38	13.38	22.00	550	10.38	CBH10017	8320	230 3 $\phi$
ASF01124	7.50	13.44	23.00	550	10.50	CBH08128	8000	230 3 $\phi$
ASF01169	8.25	14.25	23.00	550	11.25	CBH09707	18000	230 3 $\phi$
ASF01105	9.31	15.31	24.00	550	12.31	CBH07492	15000	230 3 $\phi$
ASF01104	9.31	15.31	29.00	550	12.31	CBH07491	15000	230 3 $\phi$
ASF01150	13.00	19.00	29.00	550	16.00	CBH08813	30000	230 3 $\phi$



## Complete Your Thermal Loop System

### Instrumentation:

Video Graphic Data Loggers and Paper Chart Recorders



### Pressure Transducers and Rupture Disks



Complete details can be found in Section 12 of this catalog.

### TEC Temperature Controllers



Complete details can be found in Section 13 of this catalog.

### Thermocouples



Complete details can be found in Section 14 of this catalog.



## Polar Cast Shroud System

### Made-To-Order Quote Request Form — Copy and Fax Us Your Requirements

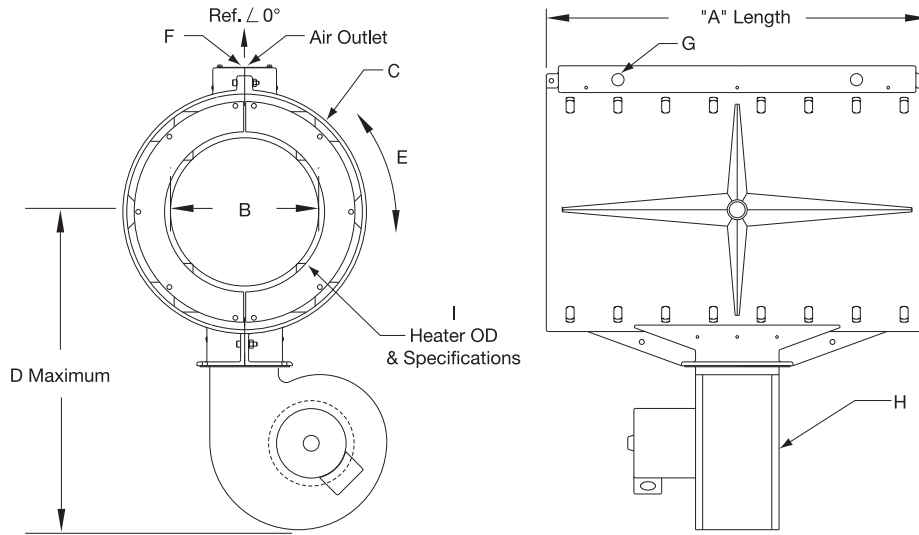
#### Customer Information

Name: \_\_\_\_\_ Company: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_  
 Extruder Barrel Manufacturer: \_\_\_\_\_ Model Number: \_\_\_\_\_  
 Resin Type: \_\_\_\_\_ Process Temperature: \_\_\_\_\_

**When submitting this form, please be sure to include an extruder barrel sketch or drawing that includes the following:**

- \* Extruder Barrel Support(s)      \* Number of Heating Zones      \* Vent Location(s)      \* Zone Probe Location(s)
- \* Input Feed Location      \* Pressure Tap Location(s)      \* Zone Length(s)      \* Additional Restriction(s)

**Note:** To assist Tempco in designing a shroud system, please provide digital images (in .jpg format) of the extruder barrel.



#### Shroud Specifications (For replacement of existing Tempco Shroud(s), please contact your Tempco Factory or Sales Representative.)

- A.** Shroud Width / Zone Length: \_\_\_\_\_      **B.** Extruder Barrel OD / Shroud ID: \_\_\_\_\_  
**C.** Maximum Shroud OD: \_\_\_\_\_ (Determined by Engineering unless specified by customer.)

#### Shroud Component Specifications

- D.** Maximum Blower Clearance: \_\_\_\_\_  
**E.** Rotational Orientation of Air Outlet and Blower \_\_\_\_\_  
 Indicate Angle from Vertical 0° Reference if other than 90° or 180° \_\_\_\_\_  
**F.** Zone T/C Probe(s):    Quantity: \_\_\_\_\_    Clearance Hole Diameter: \_\_\_\_\_  
 Location:  Centered at Top (standard)     Custom: \_\_\_\_\_ (Indicate Clockwise from Drawing Reference Angle)  
**G.** Wiring Entrances:  7/8" (1/2 Trade Size Conduit - Standard)     1-3/32" (3/4 Trade Size Conduit - Optional)  
 Customer Specified: \_\_\_\_\_

#### Blower Specifications

- H. Configuration:**     Single       Dual       Customer Supplied (\*see below)  
 Stock Tempco Blower (Engineering will determine specifications if none specified)  
 P/N: \_\_\_\_\_ or CFM: \_\_\_\_\_ Volts: \_\_\_\_\_ Operating Frequency: \_\_\_\_\_ Hz  
 Optional Inlet Guard (Available for most stock blowers.)  
 Optional Blower Extension:  Horizontal     Vertical     Custom (Consult Tempco.)  
 Mounting Dimensions: Length \_\_\_\_\_ Width \_\_\_\_\_  
 \*Customer Supplied Blower (Please attach mounting information when submitting this form.)  
 Manufacturer: \_\_\_\_\_ P/N: \_\_\_\_\_ CFM: \_\_\_\_\_ Volts: \_\_\_\_\_ Operating Frequency: \_\_\_\_\_ Hz

#### Heater Specifications

- I.** Inner Diameter: \_\_\_\_\_    Wattage per Half: \_\_\_\_\_    Voltage per Half: \_\_\_\_\_



### Arctic Cast® Extruder Heat/Cool System

Our pioneer product in cast shroud designs, Tempco's Arctic Cast shroud systems provide vast improvements over standard water cooled castings for durability and performance. The Arctic Cast shroud features a vented 1/4" thick cast aluminum layer. The cast-in heaters are designed with a large fin surface area to maximize cooling efficiency. The blower port directs inlet air to

the hottest part of the heater, distributing it evenly over the entire cross section of the zone. The cooling efficiency of Tempco's Arctic Cast shroud system meets or exceeds that of water-cooled systems when used with our field proven high capacity blowers.

## 4 – Arctic Cast Construction

### Arctic Cast Extruder

**Single Layer Shroud – Vented Cast Aluminum layer bolted directly onto Tempco's Specially Designed Finned Cast-In Aluminum Band Heater**

### Usage Requirements

*This rugged shroud design is recommended for installations where the shroud system could be exposed to physical damage, such as instances where the extruder barrel is low to the ground. It is suited to work with Tempco's Specially Designed Finned Cast-In Aluminum Heater and cannot be used on any existing finned cast-in heaters.*

### Ordering Information

See Page 3-42 for complete Ordering Information.

### Arctic Cast Construction Details

#### Single Layer Shroud

- \* Vented 1/4" thick Cast Aluminum layer – directs the cooling air flow over the heater

#### Shroud Assembly Features

- \* Two Individual Halves bolted together (Two-Piece) and clamped directly to finned cast heater
- \* Blower Options – See Pages 3-43 through 3-45 for complete details
  - ➔ Single or Dual Tempco Recommended Blowers available from 148 CFM up to 1210 CFM at 115V or 230V
  - ➔ Customer Specified blower
- \* Blower Location
  - ➔ Vertical Orientation – at the bottom of the shroud
  - ➔ Custom location achieved only by rotating entire shroud system
- \* Standard top Air Outlet
  - ➔ Custom location achieved only by rotating entire shroud system
- \* Shroud Air-Inlet Baffle with built-in air deflector that breaks up incoming airflow, distributing it across the cast-in heater(s)



Arctic Cast shown with Dual Blower Mount Option

#### Heater Type and Components

- \* Recommended Heater Types – Tempco Finned Cast-In Heaters with standard 1/4" gap between heater halves and bolt and nut clamping
- \* Heater Strap Clamping is available
- \* Power Input with Standard 10-32 stud termination with ceramic or mica insulator
  - ➔ Bus Wiring between halves is optional

#### Sensing and Controlling

- \* Existing Zone Control Probe – Shroud System can be designed per customer specifications
- \* Tempco supplied Zone Control Probe
- \* Tempco customized Power Control Panel designed to complete Your Thermal Loop System



### Selecting Standard (Non-Stock) Arctic-Cast® System Assembly

Extruder Size	Heater I.D. in	Assy. No. Shroud & Heater	Watts Each Half	Volts Each Half	Replacement Components		Dimensions			Shroud Style
					Heater	Shroud	"A" in	"B" in	"L" in	
2" to 2½"	4.500	FCS01001	1620	230	CBH02937	ASF01006	9.000	8.500	10.750	A
	4.500	FCS01002	1500	230	CBH05676	ASF01052	7.750	5.375	12.250	C
	5.000	FCS01003	2000	230	CBH05677	ASF01053	9.000	6.313	12.438	C
	5.500	FCS01004	2750	230	CBH03270	ASF01001	10.000	9.125	11.000	A
	4.725	FCS01005	1400	240	CBH03960	ASF01015	8.188	6.299	7.402	A
	4.940	FCS01006	2250	230	CBH05539	ASF01046	8.940	10.625	12.000	A
	5.500	FCS01007	2100	230	CBH02803	ASF01002	10.000	9.125	11.000	A
	5.500	FCS01008	1700	230	CBH02909	ASF01007	10.000	9.125	8.500	A
	5.500	FCS01009	4150	230	CBH03664	ASF01009	10.000	10.125	13.250	A
	5.500	FCS01010	1725	230	CBH04193	ASF01020	9.000	7.063	9.000	A
	5.750	FCS01011	2700	230	CBH05404	ASF01037	10.250	11.250	13.000	A
3½"	6.250	FCS01012	1400	260	CBH05153	ASF01029	10.250	7.688	8.250	A
	6.250	FCS01013	5000	480	CBH05648	ASF01051	10.500	10.125	15.000	A
	6.500	FCS01014	3600	230	CBH02802	ASF01003	11.000	9.750	17.500	A
	6.500	FCS01015	3000	240	CBH03699	ASF01010	10.500	9.375	12.000	A
	6.500	FCS01016	3000	240	CBH03700	ASF01011	10.500	10.125	15.000	A
	6.500	FCS01017	3600	230	CBH02802	ASF01014	11.000	9.750	17.500	A
	6.500	FCS01018	3750	230	CBH04953	ASF01026	10.500	10.500	13.000	A
	6.500	FCS01019	3600	230	CBH02802	ASF01050	11.000	9.750	17.500	A
	6.625	FCS01020	4625	480	CBH03606	ASF01008	11.000	9.750	17.500	A
	6.750	FCS01021	4800	230	CBH05405	ASF01038	11.250	11.250	16.000	A
	4"	7.500	FCS01022	6000	240	CBH04815	ASF01025	11.500	10.000	21.000
7.500		FCS01023	4500	240	CBH05092	ASF01028	11.500	10.000	18.000	A
7.500		FCS01024	3500	230	CBH05395	ASF01035	12.000	11.250	17.000	A
7.500		FCS01025	6000	230	CBH05396	ASF01036	12.000	11.250	22.000	A
7.500		FCS01026	4170	230	CBH05397	ASF01036	12.000	11.250	22.000	A
7.500		FCS01027	4170	230	CBH05573	ASF01047	12.000	12.250	22.000	A
7.500		FCS01028	6000	230	CBH05575	ASF01047	12.000	12.250	22.000	A
7.500		FCS01029	3500	230	CBH05574	ASF01048	12.000	12.250	18.000	A
7.625		FCS01030	5500	230	CBH04732	ASF01024	11.500	8.375	14.438	A
8.000		FCS01031	3250	230	CBH03738	ASF01013	12.000	8.438	14.000	A
8.250		FCS01032	3850	230	CBH03994	ASF01019	12.250	9.000	13.000	A
8.250		FCS01033	7000	190	CBH04426	ASF01021	12.250	11.430	16.000	A
8.500		FCS01034	5750	240	CBH05234	ASF01030	12.500	10.500	20.000	B
8.250		FCS01035	7000	480	CBH04629	ASF01012	13.000	10.500	19.000	A
8.500		FCS01036	7200	240	CBH03711	ASF01012	13.000	10.500	19.000	A
8.660	FCS01037	3000	230	CBH03508	ASF01004	13.125	10.875	8.000	A	
8.660	FCS01038	3000	230	CBH03508	ASF01005	13.125	10.875	16.000	A	
6"	9.313	FCS01039	7500	230	CBH05326	ASF01033	13.813	14.500	23.500	A
	9.313	FCS01040	9900	230	CBH05327	ASF01033	13.813	14.500	23.500	A
	9.313	FCS01041	7500	230	CBH05328	ASF01034	13.813	14.500	28.500	A
	9.313	FCS01042	7500	230	CBH05445	ASF01039	13.813	14.500	23.500	A
	9.313	FCS01043	9900	230	CBH05446	ASF01039	13.813	14.500	23.500	A
	9.313	FCS01044	7500	230	CBH05447	ASF01040	13.813	14.500	28.500	A
	9.313	FCS01045	9900	460	CBH05513	ASF01042	13.813	14.500	28.500	A
	9.313	FCS01046	7500	460	CBH05515	ASF01043	13.813	14.500	23.500	A
	9.750	FCS01047	9000	110	CBH04428	ASF01022	13.750	12.125	22.000	A
	9.750	FCS01048	9000	190	CBH04427	ASF01022	13.750	12.125	22.000	A
	9.750	FCS01049	5700	480	CBH05530	ASF01044	13.750	11.125	15.500	A
	9.750	FCS01050	5700	480	CBH05531	ASF01045	13.750	11.125	21.500	A
	9.750	FCS01051	5250	240	CBH05619	ASF01049	13.750	12.125	22.000	A
	9.750	FCS01052	7500	480	CBH05684	ASF01054	13.750	11.125	19.000	A
	9.750	FCS01053	7500	480	CBH05685	ASF01055	13.750	11.125	19.000	A
10.000	FCS01054	7850	240	CBH04996	ASF01027	14.000	11.250	24.500	B	
10.630	FCS01055	3450	240	CBH05238	ASF01031	16.875	14.065	29.000	B	
8"	11.000	FCS01056	11000	110	CBH04429	ASF01023	15.000	12.750	22.000	A
	13.000	FCS01057	6750	480	CBH05289	ASF01032	17.000	12.000	14.000	A

The typical Arctic Cast System consists of:

- A Cast-In Aluminum Finned Band Heater
- A Cast Aluminum Shroud
- An appropriately rated Forced Air Blower



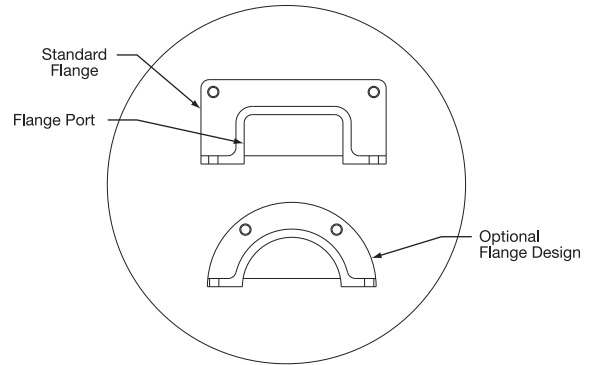
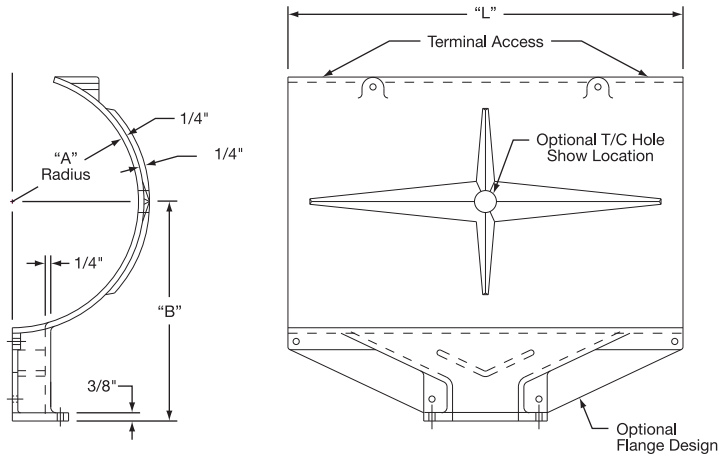
**Note:** For additional information on sizing and selecting Cast-In Band Heaters for your application, see page 3-39. To order an Arctic-Cast system not shown in our Standard Sizes and Ratings, consult Tempco or send us your specifications and/or drawing.

Page 3-37 illustrates the system complete as well as the components that make up each assembly. Envelope dimensions for the shrouds shown on page 3-39 are also provided. Pages 3-40 and 3-41 display different forced air blower styles and specifications.



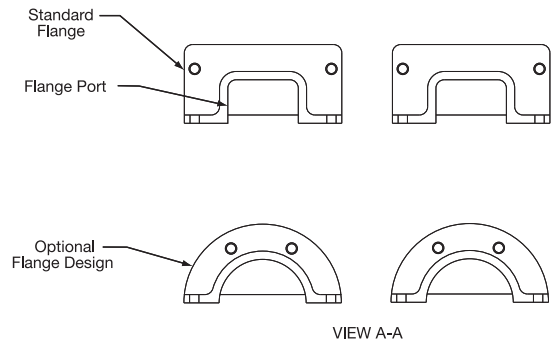
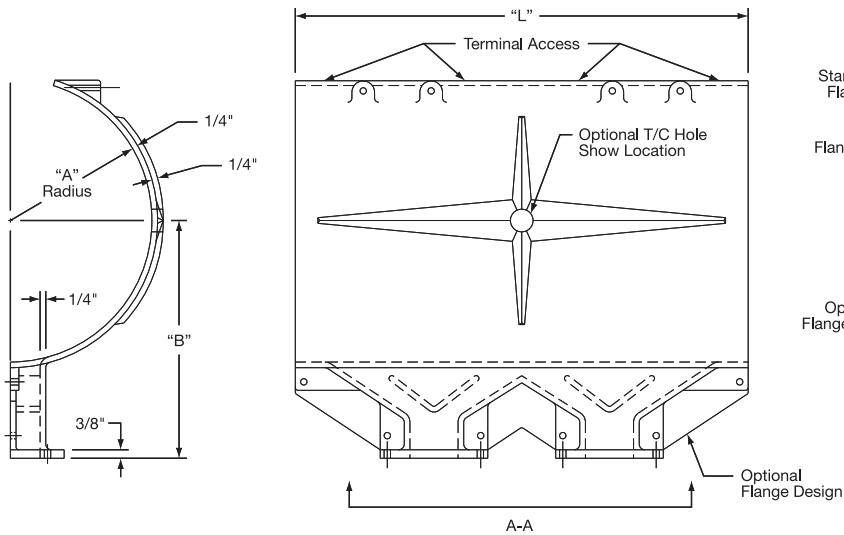
### Selection of Arctic Cast® Shroud Design Styles

#### Shroud Style A



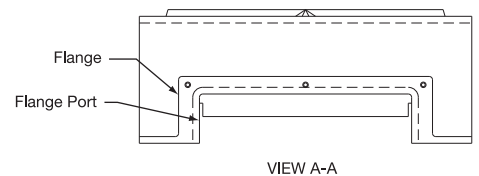
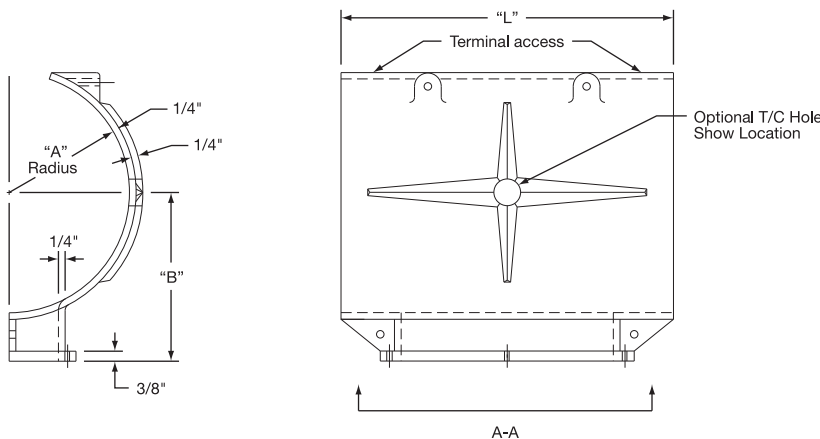
*Please provide mounting hole specifications if using other than Tempco standard.*

#### Shroud Style B



*Please provide mounting hole specifications if using other than Tempco standard.*

#### Shroud Style C



*Please provide mounting hole specifications if using other than Tempco standard.*



## Arctic Cast® Shroud System

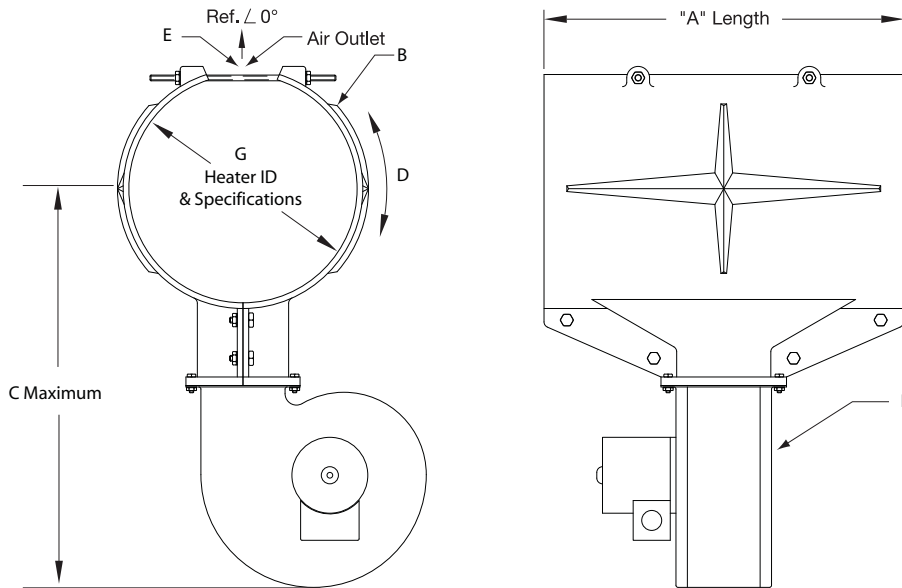
### Made-To-Order Quote Request Form — Copy and Fax Us Your Requirements

#### Customer Information

Name: \_\_\_\_\_ Company: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_  
 Extruder Barrel Manufacturer: \_\_\_\_\_ Model Number: \_\_\_\_\_  
 Resin Type: \_\_\_\_\_ Process Temperature: \_\_\_\_\_

**When submitting this form, please be sure to include an extruder barrel sketch or drawing that includes the following:**

- \* Extruder Barrel Support(s)      \* Number of Heating Zones      \* Vent Location(s)      \* Zone Probe Location(s)
  - \* Input Feed Location      \* Pressure Tap Location(s)      \* Zone Length(s)      \* Additional Restriction(s)
- Note:** To assist Tempco in designing a shroud system, please provide digital images (in .jpg format) of the extruder barrel.



#### Shroud Specifications (For replacement of existing Tempco Shroud(s), please contact your Tempco Factory or Sales Representative.)

- A. Shroud Width / Zone Length: \_\_\_\_\_  
 B. Maximum Shroud OD: \_\_\_\_\_ (Determined by Engineering unless specified by customer.)

#### Shroud Component Specifications

- C. Maximum Blower Clearance: \_\_\_\_\_  
 D. Rotational Orientation of Air Outlet and Blower \_\_\_\_\_  
 Indicate Angle from Vertical 0° Reference if other than 90° or 180° \_\_\_\_\_  
 E. Zone T/C Probe(s): Quantity: \_\_\_\_\_ Clearance Hole Diameter: \_\_\_\_\_  
 Location:  Centered at Top (standard)     Custom: \_\_\_\_\_ (Indicate Clockwise from Drawing Reference Angle)

#### Blower Specifications

- F. Configuration:     Single       Dual       Customer Supplied (\*see below)  
 Stock Tempco Blower (Engineering will determine specifications if none specified)  
 P/N: \_\_\_\_\_ or CFM: \_\_\_\_\_ Volts: \_\_\_\_\_ Operating Frequency: \_\_\_\_\_ Hz  
 Optional Inlet Guard (Available for most stock blowers.)  
 Optional Blower Extension:  Horizontal     Vertical     Custom (Consult Tempco.)  
 Mounting Dimensions: Length \_\_\_\_\_ Width \_\_\_\_\_  
 \*Customer Supplied Blower (Please attach mounting information when submitting this form.)  
 Manufacturer: \_\_\_\_\_ P/N: \_\_\_\_\_ CFM: \_\_\_\_\_ Volts: \_\_\_\_\_ Operating Frequency: \_\_\_\_\_ Hz

#### Heater Specifications

- G. Extruder Barrel OD/Heater ID: \_\_\_\_\_ Wattage per Half: \_\_\_\_\_ Voltage per Half: \_\_\_\_\_



### Forced-Air Blowers for Air-Cooled Heating Systems

A variety of sizes and styles of forced-air centrifugal blowers are used on Tempco's air-cooled extrusion systems. Tempco Forced-Air Blowers are available in a large range of CFM ratings to fit any new or existing application. All blowers include air inlet guards for your safety.



#### Standard Single Phase Centrifugal Blowers

Tempco standard blowers feature corrosion protected sheet metal housings and impeller wheels. The quiet operation and quick response coupled with high volume unrestricted output results in a field-proven efficient cooling means for extrusion processes. Standard blowers are readily available for single phase 115V or 230V and represent the shortest delivery times.

#### Single Port Blowers

Part Number	"D"	"F"	"G"	"H"	"N"	"P"	"R"	"S"	Outlet "L" x "W"	CFM	Volts	Full Load Amps	Replacement Guard PN
MTR-102-101	3.50	4.60	3.96	2.88	6.91	6.26	5.32	5.70	2.18 x 3.25	146	115	0.75	GRD-101-102
MTR-102-102	5.00	5.51	4.86	4.37	8.21	7.56	8.88	9.90	3.62 x 4.13	273	115	0.77	GRD-101-103
MTR-102-103	5.00	5.51	4.86	4.37	8.21	7.56	8.88	9.90	3.62 x 4.13	273	230	0.43	GRD-101-103
MTR-102-104	5.63	5.08	4.50	5.00	8.09	7.48	10.44	11.16	4.25 x 3.81	358	230	0.54	GRD-101-104
MTR-102-105	5.63	5.08	4.50	5.00	8.09	7.48	10.40	11.20	4.25 x 3.81	485	115	1.35	GRD-101-104
MTR-102-106	5.63	6.63	6.00	5.00	9.59	8.92	10.42	11.16	4.25 x 5.25	550	115	2.05	GRD-101-104
MTR-102-107	5.63	6.63	6.00	5.00	9.59	8.92	10.40	11.20	4.25 x 5.25	550	230	0.98	GRD-101-104
MTR-102-108	6.37	8.75	8.00	5.00	11.56	11.56	13.13	14.88	5.56 x 7.19	1202	115/230	7.30/3.70	GRD-101-108

**Note:** See Blower Drawing 1 on page 3-45

#### Single Port Large Volume Blowers

Part Number	"D"	"F"	"G"	"H"	"N"	"R"	"S"	Outlet "L" x "W"	CFM	Volts	Full Load Amps	Replacement Guard PN
MTR-102-109	5.00	9.69	4.41	4.38	9.25	8.81	9.88	3.69 x 8.06	458	115	1.28	GRD-101-103
MTR-102-110	5.00	9.69	4.41	4.38	9.45	8.81	9.88	3.69 x 8.06	458	230	0.65	GRD-101-103
MTR-102-111	5.63	9.31	4.38	5.00	10.75	10.31	11.13	4.19 x 8.69	797/549	115	3.20/2.20	GRD-101-104

**Note:** See Blower Drawing 2 on page 3-45

#### Double Port Blowers

Part Number	"D"	"F"	"G"	"H"	"M"	"N"	"P"	"R"	"S"	Outlet "L" x "W"	CFM	Volts	Full Load Amps	Replacement Guard PN
MTR-102-112	4.75	4.75	4.13	1.47	7.50	12.20	10.90	8.06	7.89	2.94 x 3.31	312	115	0.77	GRD-101-103

**Note:** See Blower Drawing 3 on page 3-45



#### Low-Profile Single Phase Centrifugal Blowers

Tempco low-profile 115/230V single phase blowers offer a narrower footprint than the standard blowers. The motor is integrated with the impeller so that the motor housing protrudes only slightly from the blower housing. Low-profile blowers are made of die-cast aluminum and galvanized sheet steel and are perfect for applications where space is a concern.

#### Single Port Blowers

Part Number	"D"	"F"	"G"	"H"	"N"	"P"	"R"	"S"	Outlet "L" x "W"	CFM	Volts	Full Load Amps	Replacement Guard PN	Replacement Capacitor PN
MTR-103-101	2.68	3.00	2.60	2.28	3.44	3.15	4.65	4.50	2.19 x 1.66	56	115	0.24	GRD-101-101	TEC-114-101
MTR-103-102	2.68	3.00	2.60	2.28	3.44	3.15	4.65	4.50	2.19 x 1.66	56	230	0.13	GRD-101-101	TEC-114-102
MTR-103-103	4.72	5.12	4.53	4.13	5.12	3.94	8.90	9.72	3.62 x 3.70	283	230	0.89	GRD-101-103	TEC-114-101
MTR-103-104	7.40	6.96	5.00	6.00	5.27	4.96	11.28	14.04	4.79 x 5.27	500	230	0.78	GRD-101-106	TEC-114-101

**Note:** See Blower Drawing 1 on page 3-45



## Forced-Air Blowers

### Forced-Air Blowers for Air-Cooled Heating Systems



#### Universal Three Phase Centrifugal Blowers

Tempco high-end blowers use heavy duty construction for a long service life. They are available with universal three phase motors for 50/60 HZ operation on voltages from 202 up to 530V. They meet Cenelec standards and are IP41 or IP54 rated with class B or F insulation systems. These low noise, continuous duty rated blowers operate efficiently under higher static pressure loads than our standard blowers. Optional attachments are available for transferring high temperature air up to 200-300° C and inlet filters for dusty environments.

#### Single Port Blowers — 3 Phase 60 Hz (202-306V 3 Ph. Delta, 350-530V 3 Ph. Y)

Part Number	"D"	"F"	"G"	"H"	"N"	"P"	"R"	"S"	Outlet "L" x "W"	CFM	Volts	Full Load Amps
MTR-104-101	3.85	4.41	3.74	3.15	9.17	8.62	7.75	3.00	2.56 x 3.11	253-300	240/480	0.51/0.29
MTR-104-102	5.11	5.51	4.72	4.33	11.85	11.06	8.81	8.97	3.54 x 3.66	459-556	240/480	1.15/0.65
MTR-104-103	5.51	5.91	5.19	4.72	13.62	13.00	9.49	10.43	3.90 x 4.29	732-853	240/480	2.30/1.35
MTR-104-104	6.14	6.61	5.94	4.96	15.02	14.25	10.51	11.73	4.41 x 4.88	1130-1200	240/480	4.00/2.30

**Note:** See Blower Drawing 1 on page 3-45

#### Double Port Blowers — 3 Phase 60 Hz (202-306V 3 Ph. Delta, 350-530V 3 Ph. Y)

Part Number	"D"	"F"	"G"	"H"	"M"	"N"	"P"	"R"	"S"	Outlet "L" x "W"	CFM	Volts	Full Load Amps
MTR-104-105	5.19	5.51	4.72	4.33	9.74	15.25	13.68	8.82	8.98	3.54 x 3.66	550-665	240/480	1.10/0.65

**Note:** See Blower Drawing 3 on page 3-45

### Extensions for Forced-Air Blowers

Blower extensions are available for applications where space restrictions do not allow the blower to be mounted directly to the shroud assembly.



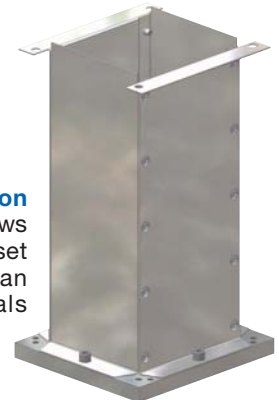
**Horizontal Blower Extension** allows blower to be mounted perpendicular to the shroud. A baffle inside the blower extension smoothly guides air flow into the shroud.



**Vertical Blower Extension** allows blower to be vertically offset at a distance below the shroud as specified by the customer. Especially useful in retrofit applications.



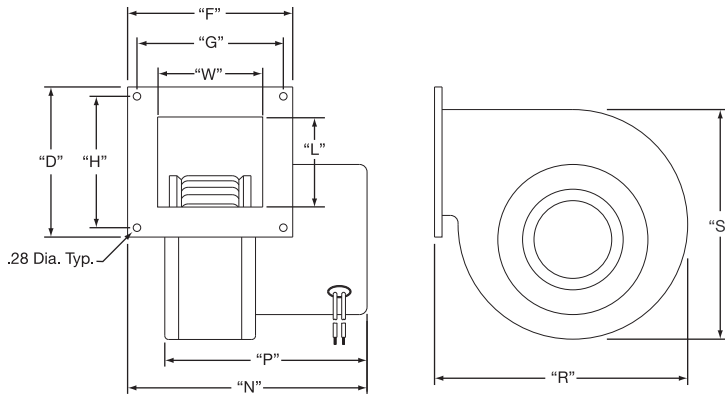
**Vertical Blower Extension with 90° adapter plate** allows blower to be vertically offset from the shroud. Blower can be rotated at 90° intervals relative to the extension.





### Inlet Guards for Single Inlet Centrifugal Blowers

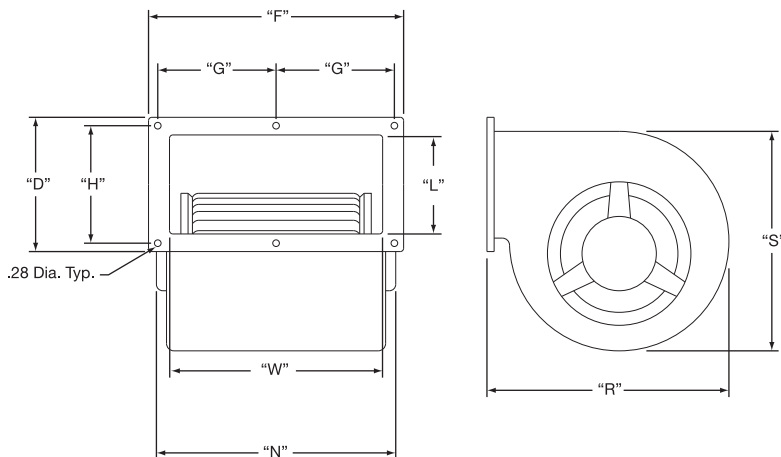
#### Single Port Blower: Drawing 1



**Special cast housing narrow blowers** for small extruders or short barrel zone widths are available from 23 up to 350 CFM.

**Single port blowers** can be obtained up to 1210 CFM for use in large extruder installations. Consult Tempco with your requirements.

#### Single Port Large Volume Blower: Drawing 2

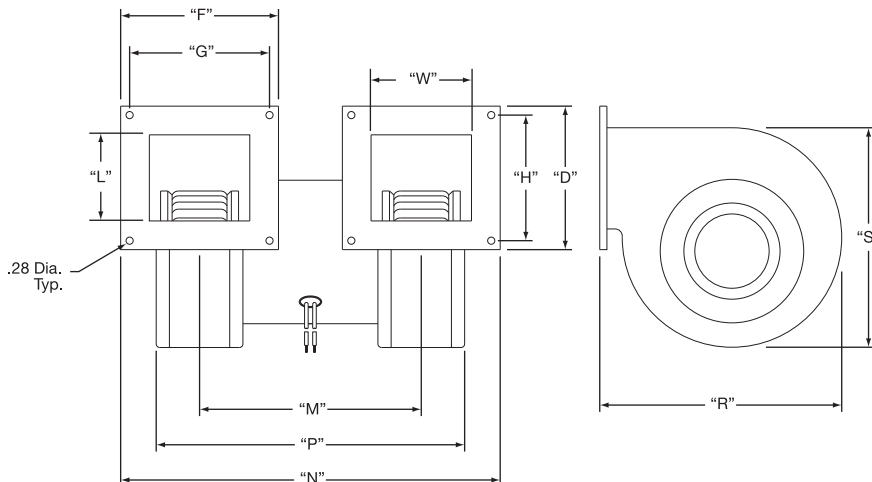


**Note:** Blower's wheel and motor assembly is mounted within the sheet metal housing, allowing air in from both ends.

Additional sizes of two-speed blowers rated 435/296 are also available. A full range of special dual inlet sizes from 120 CFM up to 1200 CFM can be supplied for extruder zone widths of 6" and longer. Consult Tempco with your requirements.

**All CFM Values are with free inlet and discharge and 0" Static Pressure. All Dimensions are in inches.**

#### Double Port Blower: Drawing 3



**Note:** A smaller 157 CFM version is also available. Special cast housing blowers rated 500 to 600 CFM for use on larger extruders can be obtained. Consult Tempco with your requirements.



## Finned Air-Cooled

### Standard Cast-In Finned Heater Designs for Air-Cooled Extruder Systems

Aluminum Finned Cast-In Band Heaters are used as an alternative to Liquid Cooled Cast-In Band Heaters for heating and cooling the barrels of plastic extruders.

As a standard, Finned Cast-In Band Heaters are manufactured in aluminum alloys because this material provides very good thermal conductive properties. For applications requiring higher operating temperatures and/or higher watt densities, bronze or brass alloys can be used.

Precision machining of the inside diameter yields superior heat transfer between the heater and the machine barrel, thereby

ensuring uniform heating and cooling of the extrusion process. The heaters are secured to the barrel either by Stainless Steel Clamp Bands or by means of Bolt Clamping the heater halves together.

Finned Cast-In Band Heaters can be designed to meet the mechanical and physical constraints of existing extruder shroud systems. They are manufactured for Original Equipment Manufacturers (OEM) and maintenance (MRO) applications to customer specifications.

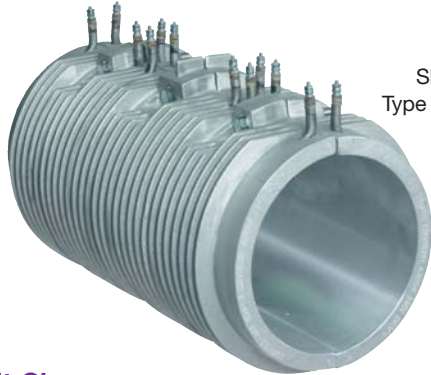


#### Type FF – Finned Aluminum Cast-In

This aluminum cast-in band heater style is normally made to be used in conjunction with Arctic Cast Shroud Systems. It can also be used as a stand-alone replacement for other heating and air cooling extrusion systems.

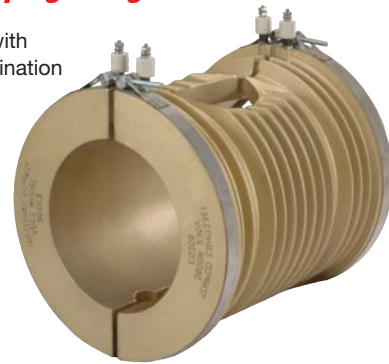
The clamping mechanism consists of separate stainless steel straps and is normally supplied with Type “E” screw terminals. For other termination styles see pages 3-56 and 3-57.

### Cast-In Aluminum Band Heater Bolt and Strap Clamping Designs



Shown with  
Type T Termination

Shown with  
Type S Termination



#### Type P – Bolt Clamp

This finned aluminum cast-in band heater features standard bolt clamping design. The fins cover approximately 95% of the heater width. This style can be used on Tempco’s exclusive shroud systems and/or as a stand-alone replacement for other heating and air cooling extrusion systems.

It is supplied with Type “S” terminals if not otherwise specified. For other termination styles see pages 3-56 and 3-57.

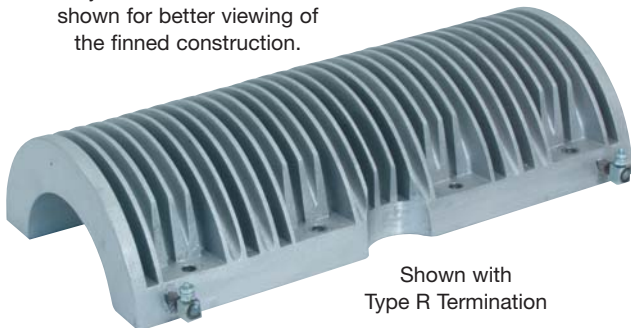
#### Type F – Strap Clamp

This finned aluminum cast-in band heater features standard strap clamping design. The fins cover approximately 90% of the heater width. This style is utilized as a replacement heater for existing extrusion systems requiring heating and forced air cooling by finned aluminum cast-in heaters.

It is supplied with Type “S” terminals if not otherwise specified. For other termination styles see pages 3-56 and 3-57.

### Low-Profile Finned Aluminum Cast-In Band Heater – New Unique Design for Smaller Extruders

Only half the band heater is shown for better viewing of the finned construction.



Shown with  
Type R Termination

#### Type LP Low-Profile for 1" to 1-1/2" Extruders

This low-profile aluminum cast-in band heater has a compact design that is intended to be used on small tabletop extruders – 1" to 1-1/2" in screw size. Clamping is achieved by a unique, low profile bolting method that allows the maximum use of surface area for fins. If not otherwise specified, supplied with Type “S” screw terminals. For other termination styles see pages 3-56 and 3-57.



### Stock and Standard (Non-Stock) Finned Aluminum Cast-In Band Heaters for Extrusion Processing

Standard Sizes and Ratings Listed by Extruder Size

These Sizes and Ratings are among the most commonly used. They will provide the shortest delivery times.

Many of these Cast-In Heaters are available Off-the-Shelf for Immediate Delivery.

Extruder Size	I.D. in	O.D. in	Width in	Watts Each Half	Volts	Phase	Cooling Tube O.D.	Features	Part Number
1" to 1-1/2"	2.875	5.000	4.125	750	240	1	N/A	Bolt clamp	CBH04188
	2.875	5.000	4.125	500	240	1	N/A	Bolt clamp, 1/2" dia. hole at top of gap	CBH03853
	2.875	5.000	7.500	1100	240	1	N/A	Bolt clamp, 3/4" dia. hole at top of gap	CBH03796
	3.625	6.750	5.500	375	110	1	N/A	Type F leads, 1" dia. T/C hole top/bot. at gap	CBH02483
2" to 2-1/2"	4.000	8.000	10.750	2000	230	1	N/A	(1) 3/4" dia. hole in center at gap, 2 1/2" dia. x 3 hole	CBH03254
	4.000	8.000	10.750	3000	230	1	N/A	Bronze	*CBH04719
	4.000	9.000	5.375	1000	240	1	3/8"	(1) 3/4" dia. hole in center at gap	CBH03256
	4.250	7.500	13.000	2910	230	3	N/A	(1) 1" dia. hole	CBH08563
	4.375	8.250	12.250	2000	230	1	N/A	(2) 1/8" NPT TC holes	*CBH01139
	4.375	8.375	4.500	710	230	1	N/A	(2) 1/8" NPT holes	CBH01671
	4.375	9.875	12.250	2000	230	1	1/2"	2" Lg. slot at gap top/bot.	CBH02189
	4.500	8.000	11.000	2000	240	1	N/A	(1) 1 1/4" dia. hole E/H	CBH01558
	4.500	8.500	12.000	2750	240	1	N/A	Bolt clamp	CBH06640
	4.500	9.000	11.500	2000	230	1	N/A	3/4" x 3" slot	CBH05533
	4.750	7.688	7.313	1250	460	1	N/A	(2) 1 1/16" dia. holes on 1 half only	CBH01625
	5.000	8.000	16.250	3500	190	1	N/A	Bolt clamp, (1) 3/4" dia. hole at top and bottom gap	CBH03671
	5.000	8.000	16.250	3500	240	1	N/A	Bolt clamp	CBH04477
	5.000	10.000	11.187	2500	230	1	N/A	Bolt clamp	CBH01787
	5.000	10.000	11.187	2500	230	1	N/A	Bolt clamp	CBH03215
	5.000	10.250	14.000	3300	230	1	N/A	Bolt clamp	CBH03564
5.500	8.750	3.500	900	240	1	N/A		CBH04418	
5.500	9.000	9.000	1725	230	1	N/A		CBH04193	
5.500	9.500	5.250	1250	230	1	N/A	3/8" Radius cutout at each end, both halves	CBH01772	
5.500	9.500	12.500	2800	240	1	N/A	Bolt clamp	CBH04982	
5.500	10.000	11.000	2100	230	1	N/A		*CBH02803	
5.500	10.000	14.000	3250	240	1	N/A	5/8" dia. Hole E/H	CBH04964	
3-1/2"	6.000	10.500	11.500	2700	230	1	N/A	Slot at gap	CBH02588
	6.000	10.500	14.500	3500	230	1	N/A	Slot at gap	CBH02432
	6.250	9.250	18.000	5000	240	1	N/A	Bolt clamp, 5 3/4" dia. vent at gap	CBH04383
	6.250	10.250	6.250	1400	240	1	N/A	Bolt clamp	*CBH04382
	6.250	10.250	6.250	1700	240	1	N/A	Bolt clamp	CBH06373
	6.250	10.250	10.438	2500	230	1	N/A	2" Lg. slot at top gap, (2) 1/8" NPT holes at top gap	*CBH01708
	6.250	10.250	13.688	3000	230	1	N/A	2" Lg. slot at top gap, (2) 1/8" NPT holes E/H	*CBH01406
	6.253	10.250	14.000	4400	240	1	N/A	Bolt clamp	CBH06089
	6.300	9.550	15.750	5000	240	1	N/A	M12-6 tap on 1 half only, 3/8" dia. hole top gap	CBH03793
	6.500	9.625	5.500	1500	240	1	N/A		CBH03016
	6.500	10.500	7.500	2000	230	1	N/A	3/8" Radius cutout each end E/H	CBH03321
	6.500	10.500	13.000	3750	230	1	N/A	Bolt clamp	CBH04953
	6.500	11.000	17.500	3600	230	1	N/A	1" dia. T/C hole top/bot. at gap	CBH07372
	6.500	11.000	17.500	3600	230	1	N/A		*CBH02802
6.750	11.250	16.000	4800	230	1	N/A		CBH05405	

An asterisk (\*) next to the Part Number guarantees in-stock availability for same-day shipping when



**Note:** Part numbers are for aluminum heaters unless otherwise specified. For Sizes and Ratings not listed, Tempco will manufacture a Cast-In Heater to your specifications. See page 3-49 for how to order.

#### Key for Abbreviations found under the Features Column

- E/H = Each Half
- EP = Explosion Resistant Terminal Housing
- MR = Moisture Resistant Terminal Housing
- MPR = Moisture Proof Die Cast Aluminum Box
- C/T = Cooling Tubes
- CW = Single Set of Cooling Tubes
- CWW = Dual Set of Cooling Tubes
- RC = Non-Exposed Cooling Tubes/Recessed NPT Fittings

**CONTINUED**

Call Toll Free: (800) 323-6859 • Fax: (630) 350-0232 • E-Mail: sales@tempco.com

# Cast-In Heaters



## Finned Air-Cooled

### Stock and Standard (Non-Stock) Finned Aluminum Cast-In Band Heaters for Extrusion Processing

Continued from previous page...

Extruder Size	I.D. in	O.D. in	Width in	Watts	Volts Each Half	Phase	Cooling Tube O.D.	Features	Part Number
4-1/2"	7.000	10.250	18.000	6000	230	3	N/A	(1) 1" dia. hole	CBH08425
	7.000	11.000	13.500	2400	230	1	N/A	6" Lg. slot at gap	CBH05871
	7.500	10.375	18.000	4500	240	3	N/A	Bolt clamp	*CBH07211
	7.500	11.500	10.875	3500	240	1	N/A		CBH04269
	7.500	11.500	21.000	7500	230	1	N/A	Used with shroud ASF1025	CBH05122
	7.500	12.000	10.250	2085	230	1	N/A	1" dia. hole top/bot. gap	*CBH01314
	7.500	12.000	17.000	3500	230	1	N/A		CBH05395
	7.500	12.000	18.000	4500	240	3	N/A	3/4" dia. hole at gap	CBH06595
	7.500	12.000	18.000	3500	230	1	N/A		CBH05574
	7.500	12.000	22.000	6000	230	1	N/A		CBH05396
	7.500	12.500	20.875	7500	230	3	1/2	Bolt clamp, CWW C/T, 5/4" dia. vent	*CBH01958
	7.500	12.750	20.875	7500	230	3	N/A	Bolt clamp	CBH01665
	7.500	12.875	12.500	2500	230	1	3/8	Bolt clamp	CBH05559
	7.500	13.000	17.375	4000	230	1	1/2	Bolt clamp	CBH03383
	7.625	11.500	18.000	3500	230	1	N/A	1 1/8" Lg. slot at top gap, (2) 1/8" NPT holes E/H	CBH02252
	7.625	11.625	14.438	3500	230	1	N/A	2" Lg. slot at top gap, (2) 1/8" NPT holes E/H	CBH01401
	8.000	12.000	8.000	2500	240	1	N/A	Bolt clamp	CBH06574
	8.000	12.000	8.000	2850	240	1	N/A	Bolt clamp	CBH06642
	8.000	12.000	10.000	3550	240	1	N/A	Bolt clamp	CBH06643
	8.250	12.250	13.000	5500	240	1	N/A	1" dia. Hole E/H	CBH04892
	8.250	12.250	16.000	7000	230	3	N/A	Bolt clamp, 1" dia. hole E/H	CBH05247
	8.268	11.504	21.457	7500	240	3	N/A	M12 Hole E/H, 3/8" dia. hole top gap	*CBH04167
	8.500	11.500	20.500	6300	240	3	N/A	Bolt clamp	CBH08281
	8.500	12.000	8.500	2750	230	1	N/A		CBH05417
	8.500	12.500	6.000	1250	240	1	N/A		CBH04854
	8.500	12.500	18.000	5500	240	1	N/A		CBH05287
	8.500	13.000	19.000	6000	480	1	N/A		CBH05227
	8.502	13.500	12.750	4500	480	3	N/A	Bolt clamp, (2) 1 1/4" dia. holes E/H	CBH07212
6"	9.313	12.313	23.000	7500	230	3	N/A	Bolt clamp, 1 1/4" dia. hole at gap	CBH07492
	9.313	12.313	28.000	7500	230	3	N/A	Bolt clamp, 1 1/4" dia. hole at gap	CBH07491
	9.313	13.813	23.500	9900	230	1	N/A		CBH05327
	9.313	13.813	23.500	7500	460	3	N/A		CBH05515
	9.313	13.813	28.500	7500	460	3	N/A	1" dia. hole top gap	CBH05514
	9.313	13.813	28.500	9900	460	3	N/A	1" dia. hole top gap	CBH05513
	9.500	15.000	13.750	4000	230	1	1/2	Bolt clamp	CBH02797
	9.500	15.000	13.750	7250	230	1	1/2	Bolt clamp	CBH02185
	9.500	15.000	27.750	12000	230	3	N/A	Bolt clamp, 1/8" NPT hole E/H	CBH01666
	9.750	14.000	19.438	6000	230	1	N/A	2" Lg. slot top gap	*CBH01262
	9.750	14.000	23.875	6000	230	1	N/A	2" Lg. slot top/bot. gap	CBH02945
	9.858	14.000	7.125	4000	230	1	N/A	Bolt clamp	CBH03984
	9.875	13.875	8.500	3500	240	1	N/A	Bolt clamp	CBH06644
	9.875	13.875	8.500	3750	240	1	N/A	Bolt clamp	CBH06645
	10.000	13.250	12.000	6480	230	3	N/A		CBH08424
	10.039	13.289	12.992	6000	230	3	N/A		CBH04738
8"	12.010	17.760	7.870	4000	230	1	N/A	Bolt clamp, 1" dia. hole at gap	CBH07905
	12.127	15.750	22.000	7050	210	1	N/A	2 Elements E/H @ 105V each	CBH03006
	12.250	18.500	11.562	5500	230	1	N/A	Bolt clamp, 3/8" dia. hole E/H	CBH05455

An asterisk (\*) next to the Part Number guarantees in-stock availability for same-day shipping when

**ORDERED BY 2<sup>PM</sup> CST**

#### Key for Abbreviations found under the Features Column

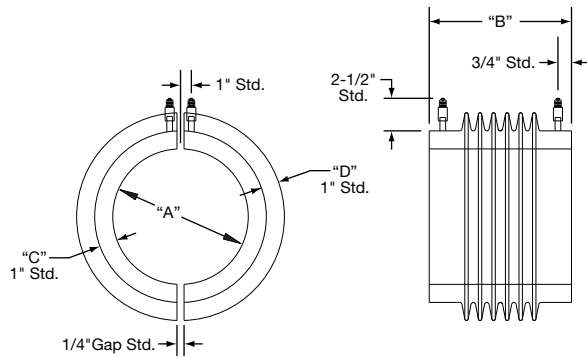
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|--|--|
| E/H = Each Half                            | C/T = Cooling Tubes                                  |
| EP = Explosion Resistant Terminal Housing  | CW = Single Set of Cooling Tubes                     |
| MR = Moisture Resistant Terminal Housing   | CWW = Dual Set of Cooling Tubes                      |
| MPR = Moisture Proof Die Cast Aluminum Box | RC = Non-Exposed Cooling Tubes/Recessed NPT Fittings |



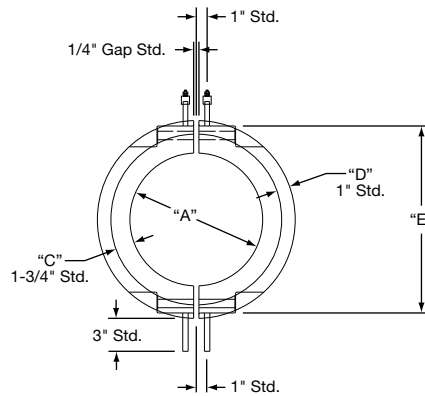
**Note:** Part numbers are for aluminum heaters unless otherwise specified. For Sizes and Ratings not listed, Tempco will manufacture a Cast-In Heater to your specifications. See page 3-49 for how to order.



### Cast-In Finned Band Heaters Ordering Information



**Finned Cast-In Band Heater Strap Clamping**



**Finned Cast-In Band Heater Bolt Clamping**

*Specify size and location of bolt holes.*

## Ordering Information

To process your order or quotation, please specify the following information.

**Variable Dimensions**      Inside Dia. "A" \_\_\_\_\_ Length "B" \_\_\_\_\_ Thickness "C" \_\_\_\_\_ Fin Height "D" \_\_\_\_\_ "E" \_\_\_\_\_

**Material Specifications**       Aluminum     Bronze     Brass

**Electrical Specifications**      Watts each half \_\_\_\_\_ Volts each half \_\_\_\_\_ Phase \_\_\_\_\_

**Clamping Style**       Straps     Bolt Clamp

**Terminal Style**

"S" Post Terminals     "T7" Post Terminals     "C4" Ceramic Cover

"R" 90° Blockhead     "F" Plain Leads     "H" Hermetic Seal     "T" Mica Washers

"SF" Quick-Disconnect     "R1" Armor Cable Leads     "TS" Leads and Shrink Sleeve

"SF9" Quick-Disconnect     "E" Right-Angle Lugs     "R2" Blockhead and Through Hole

"L" Terminal Lug     "L9" Terminal Lug

**Terminal Protection Box**

"C7" 1 Box for both halves     "EP" Explosion Resistant     "MPR" Moisture Resistant Box

"P2" High Temperature Quick Disconnect     "CB1" 1 Box per half

"C2" 1 Box for both halves

**Surface Finish**      Machined or As-Cast. *Indicate surfaces to be machined.*

**Special Cast-In Features**      Holes, Cutouts, Slots, Bevels, Mounting Studs, Stand-Offs and Taper Angles.  
*For special features a detailed drawing is required.*

### Optional Cooling Tubes

**Cooling Tube Sizes**

1/4" O.D. SS     3/8" O.D. SS     1/2" O.D. SS

Optional Incoloy® (1/2" & 3/8" only)     Dual Cooling Tubes

**Cooling Tube Fittings**

Non-exposed 3/8" NPTF     "HS" Hi-Seal Fitting     "RA" 90° Copper Elbow

Non-exposed 1/2" NPTF     "BF" High Pressure     "RT" 90° Threaded Elbow

"FF" Flared Seal     "R3" Straight Threaded

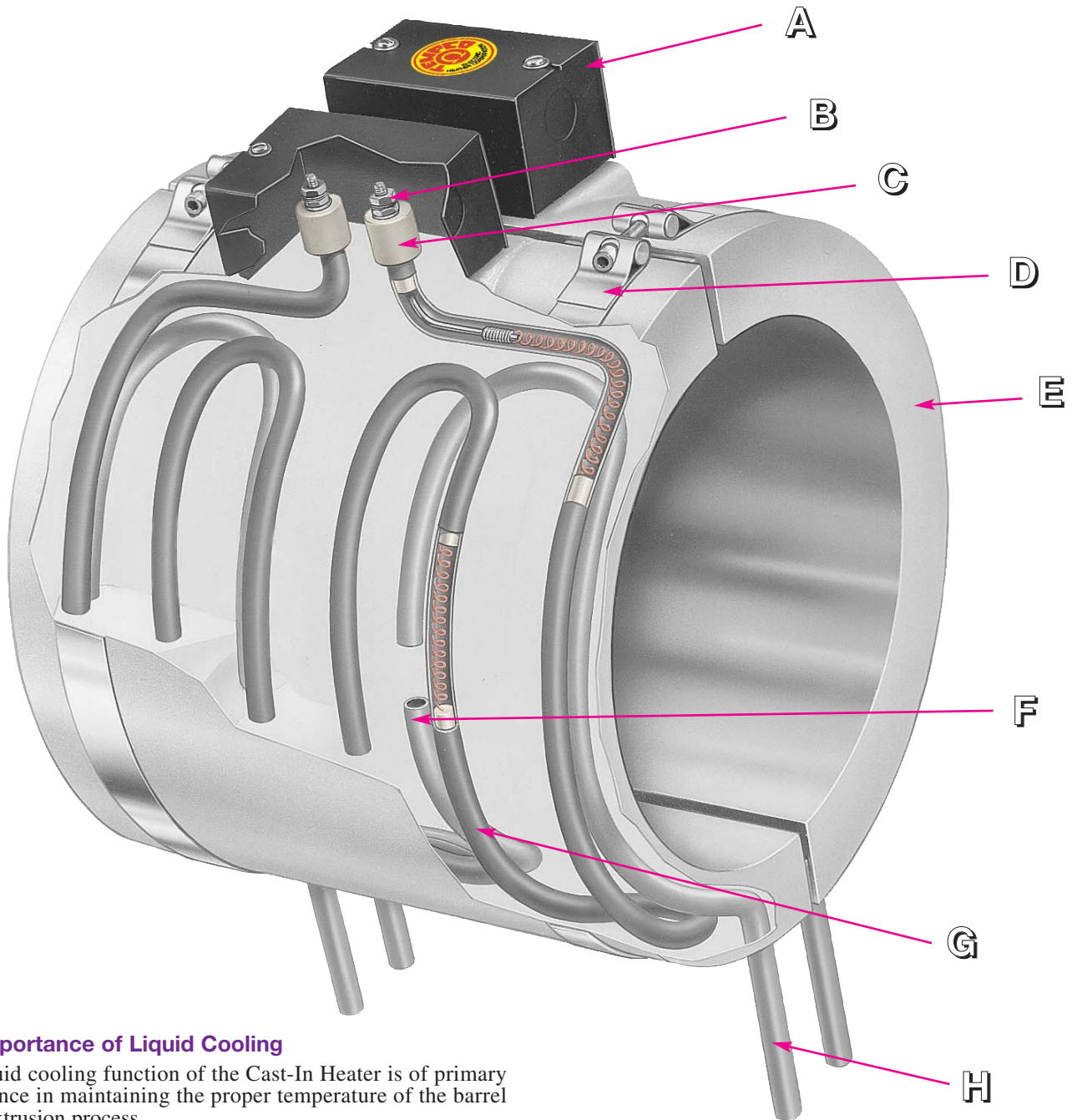


Liquid-Cooled

## Reasons Why OEMs Using

## Liquid Cool Cast-In Aluminum Band Heaters

### Specify Tempco's Quality Products



#### The Importance of Liquid Cooling

The liquid cooling function of the Cast-In Heater is of primary importance in maintaining the proper temperature of the barrel in the extrusion process.

Tempco offers many different liquid cooling variations, styles and terminations. The following pages will assist you in selecting the liquid cooling system best suited to your application. See page 3-65 for complete details on how to order.



### ***THE PERFORMANCE FACTS***

- A** General purpose stainless steel terminal boxes provide a simple and economical way to eliminate exposure to live electrical terminals. To simplify electrical wiring, the box has two knockouts for standard 3/8" BX cable connectors. Boxes can be supplied factory prewired with high temperature lead wire protected with armor cable or wire braid. Other boxes are available to accommodate your requirements. See pages 3-58 and 3-59.
- B** Threaded post terminals with 10-32 threads are securely fastened to the tubular heating element cold pin, assuring positive electrical contact for maximum amperage carrying capacity. Other terminations are available to accommodate your requirements. See pages 3-56 and 3-57.
- C** The standard Type "S" terminal has specially designed ceramic insulators that provide support to the screw terminals. The tubular heater is recessed into the insulator to help prevent the screw terminals from bending or breaking from mechanical abuse. Other specially designed ceramic insulators are available for the screw terminals and the connecting wire. See page 3-56.
- D** Specially designed, low expansion 430 stainless steel clamping straps with 1/4"-20 socket head cap screws and barrel nuts, in either 3/4" or 1-1/4" widths, are supplied as our standard method for securing the casting to the barrel. The number and width of the straps is determined by the length and weight of the heater. For optional bolt and nut clamping design see page 3-52.

**E** Having an in-house foundry gives us the flexibility required to apply sound foundry techniques to control the quality of each casting. Specially designed steel and cast iron molds are used in our Permanent Mold Casting Process, producing a dense casting, free of internal voids and drastically reducing porosity, resulting in smoother as-cast surfaces. When processing small quantities, No-Bake Sand Molds are used. This sand casting process produces a better quality casting than other sand processes. The inside diameter of all Cast-In Band Heaters is machine finished to customer specifications.



**F** The most important part in the design of a heat and liquid cooled Cast-In Heater is the cooling tube itself, since cooling tube failures usually occur before heating element failures. Tempco has devoted many years of testing and research to selecting an alloy tube that is resistant to corrosion, and that will also withstand the continuous stress that is placed on the cooling tube. Our testing has shown that Incoloy® tubing performs best with exposed cooling tube extensions under these harsh conditions, versus stainless steel tubing. Incoloy® is also less susceptible to carbide precipitation, a product of the thermal shock of repetitive heat/cool cycling, that produces internal stress corrosion cracking, a common failure for cooling tubes. We have also learned that using tubing with a .049-inch-thick wall is essential to preventing cracked cooling tubes due to linear thermal expansion as they exit the Cast-In Heater.



- G** To maintain lower watt densities important for good heater life, the largest possible diameter steel sheath tubular heater is used. Tempco most commonly uses a .430 diameter element with 1/8" diameter cold pins. This pin size allows installation of larger and stronger screw terminal connections, providing additional strength to prevent broken terminals due to mechanical abuse.
- H** Cooling tube extensions can be cut to your specified length, with various types of tube fittings factory installed. The casting can also be supplied with non-exposed cooling tube fittings, which reduce cooling tube failure due to stress corrosion cracking. For a complete selection of cooling tube terminations see pages 3-54.



### Liquid-Cooled Cast-In Band Heaters for Extrusion Processing

#### Single Set of Cooling Tubes—The Industry Standard

The single set cooling tube design features 1/4", 3/8" or 1/2" diameter tubing precisely formed into a serpentine or any other suitable shape and cast into the body of the Cast-In Heater. This is the most widely used method for providing a means of cooling in liquid-cooled Cast-In Heaters.

From this basic design, the user can choose to factory equip the cooling tube extensions with any of the cooling tube termination options shown on page 3-54, and electrical termination options shown on pages 3-56 and 3-57. The two most common clamping variations are shown below.



#### Type CW—Single Cooling Tube with Strap Clamping

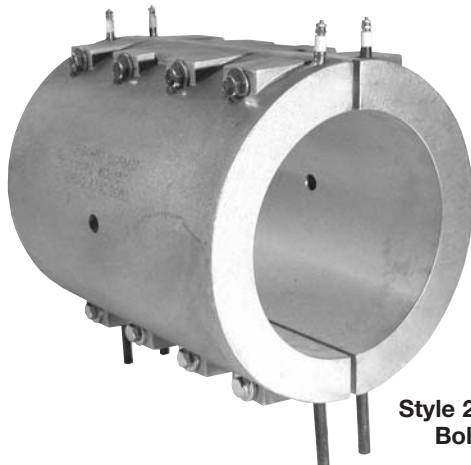
Type CW Cast-In Band Heaters consist of liquid cooled and/or heating functions, and are secured to the extruder barrel with 3/4" or 1-1/4" wide low expansion stainless steel clamping straps with 1/4"-20 socket head cap screws and barrel nuts.

If not otherwise specified, supplied with Type S electrical screw termination, 3" long cooling tube extensions and straps for clamping. For a wide selection of electrical and cooling tube termination options, see pages 3-54 through 3-57. See page 3-65 for complete details on how to order.

#### Type CWB—Single Cooling Tube with Bolt Clamping

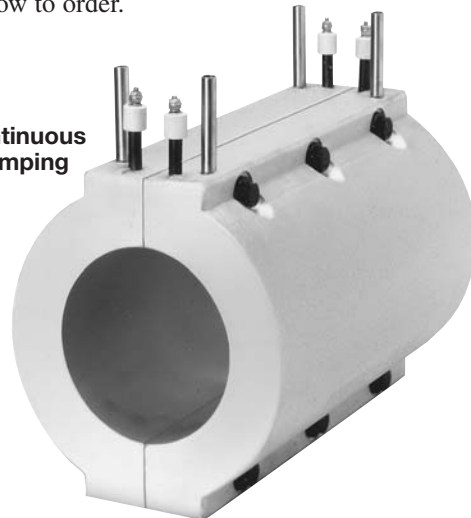
Type CWB Cast-In Band Heaters consist of liquid cooled and/or heating functions, and are secured to the barrel by bolts clamping the two halves together around the barrel. A variety of bolt clamping designs and hardware is available. Consult Tempco with your specific requirements.

If not otherwise specified, cast-in band heaters are supplied with Type S electrical screw termination and 3" long cooling tube extensions. For a wide selection of electrical and cooling tube termination options, see pages 3-54 through 3-57. See page 3-65 for complete details on how to order.



Style 2 – Segmented Bolt Clamping

Style 1 – Full Continuous Length Bolt Clamping





### Liquid-Cooled Cast-In Band Heaters for Extrusion Processing

#### Type CWW — Dual Set of Cooling Tubes within the Same Cast-In Heater

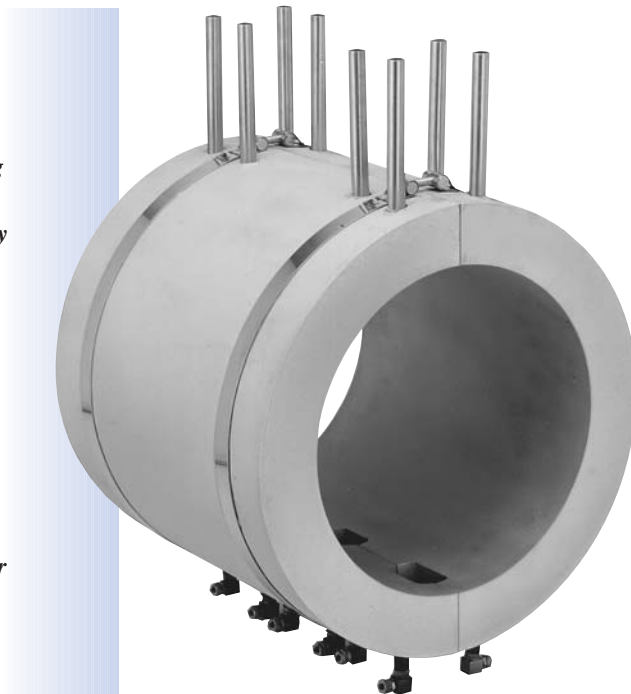
The Dual cooling tube design incorporates two sets of 3/8" or 1/2" diameter tubing formed into a serpentine or any other suitable shape within the same Cast-In Heater. Dual cooling tubes will actually double the operating life of a Cast-In Heater with liquid-cool function, since cooling tube failures usually occur before heating element failures.

There are two main causes for failure on liquid-cooled Cast-In Heaters: Stress corrosion cracking at the exiting point of the tube extensions and clogged lines due to scale build-up that reduces flow, decreasing cooling capacity and finally completely blocking the tube. Once the first set of cooling tubes has failed, reconnect to the spare set and you are back in operation, thus eliminating costly downtime and additional labor for heater replacement. Dual cooling tubes are also used when additional cooling capacity is required.

Cooling tube extensions can be factory equipped with your choice of fittings. Clamping styles are low thermal expansion alloy straps or bolt clamping. If not otherwise specified, supplied with Type S electrical screw termination, 3" long cooling tube extensions and straps for clamping. For a wide selection of electrical and cooling tube termination options, see pages 3-54 through 3-57. See page 3-65 for complete details on how to order.

#### Design Features

- \* Double operating life
- \* Greater reliability
- \* Reduces costly downtime
- \* Double cooling capacity
- \* Reduces heater replacement inventory
- \* Various heater terminations
- \* Made to customer specifications



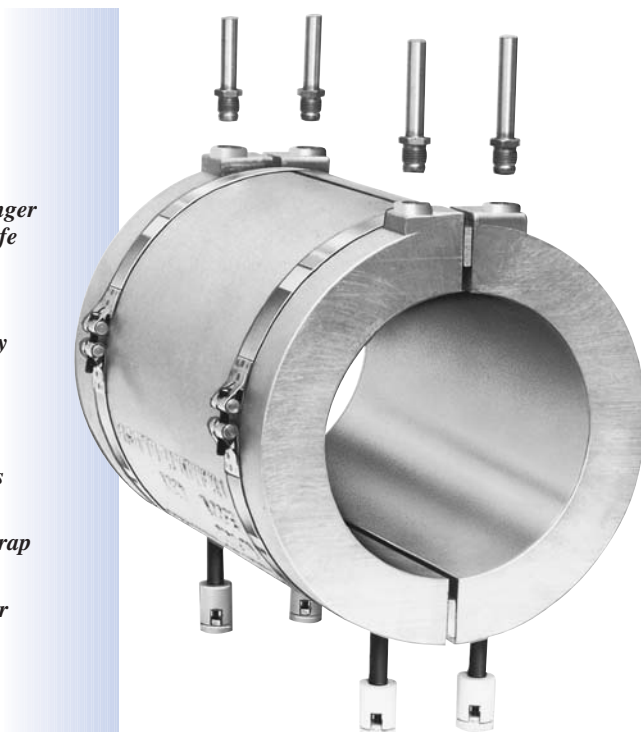
#### Type RC — Non-Exposed Cooling Tubes Recessed NPT Fittings

The recessed cooling tube design incorporates 3/8" or 1/2" diameter tubing formed into a serpentine or any other suitable shape with specially designed stainless steel NPT fittings that are welded to the tube ends and cast below the surface of the Cast-In Heater, thus eliminating the troublesome, commonly used tube extensions as they exit the casting for connection to the coolant lines.

Non-exposed fittings will drastically increase the operating life of a Cast-In Heater with liquid cool function as this feature eliminates broken and/or damaged cooling tube extensions, which are a major factor in premature heater failure. Type RC fittings are available in two female NPT thread sizes, 3/8"-18 and 1/2"-14. Standard clamping styles for Cast-In Band Heater sets are low thermal expansion alloy straps or bolt clamping. Specify fitting thread size and clamping style when ordering. If not otherwise specified, supplied with Type S electrical screw termination and straps for clamping. For fittings with special thread size, consult Tempco with your requirements. See page 3-65 for complete details on how to order.

#### Design Features

- \* Quick and easy installation
- \* Exceptionally longer Cast-In Heater life
- \* Reduces costly downtime
- \* Greater reliability
- \* Rugged durable construction
- \* Available on all cooling tube sizes
- \* Available in Bolt Clamping and Strap Clamping
- \* Made to customer specifications





### Cooling Tube Termination Options for Liquid-Cooled Cast-In Band Heaters



#### Type BF Brazed Seal Fittings

Brazed seals are excellent for high pressures and temperatures. Recommended to be factory installed to assure good braze seals. Available for 3/8" and 1/2" diameter tubing.

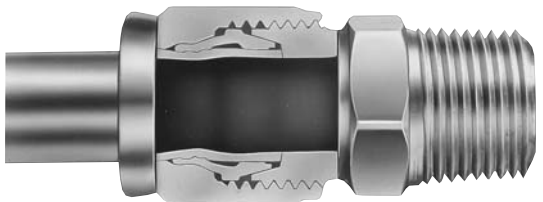
Diameter Tubing	Thread	Nut Part No.	Sleeve Part No.
3/8"	5/8"-18	FTG-119-101	FTG-119-102
1/2"	3/4"-16	FTG-119-103	FTG-119-104



#### Type FF Flared Seal Fittings

Brass flared seal fittings are well adapted for low to medium pressure and resistant to mechanical pullout. Available for 3/8" and 1/2" diameter tubing with SAE 45° flare.

Diameter Tubing	Thread	Part Number
3/8"	5/8"-18	FTG-124-101
1/2"	3/4"-16	FTG-124-104



#### Type HS Hi-Seal Fittings

Hi-seal fittings are highly dependable under the most adverse conditions. For reliable and trouble-free service with ease of installation, we strongly recommend hi-seal fittings. Available for 3/8" and 1/2" diameter tubing. Male thread is 1/2" NPT for 1/2" tube and 3/8" tube. Fitting is brass.

Diameter Tubing	Part Number
3/8"	FTG-118-124
1/2"	FTG-118-116



#### Type RA 90° Copper Elbow

90° copper elbow is brazed to the Cast-In Heater cooling tube extension with additional tube extension for connecting cooling lines with compression and/or flared fittings. Available for 3/8" and 1/2" diameter tubing. If required, specify.

Diameter Tubing	Part Number
3/8"	FTG-127-102
1/2"	FTG-127-103



#### Type RT Cast Brass 90° Threaded Elbow

90° threaded elbow is brazed to the cooling tube extension, providing an easy and quick method for connecting cooling lines. Recommended to be factory installed to assure good braze seals. Available for 3/8" and 1/2" NPT internal threads. If required, specify.

Diameter Tubing	NPT	Part Number
1/2"	3/8"	FTG-125-101
1/2"	1/2"	FTG-125-102



#### Type R3 Straight Threaded Copper Fitting

Straight threaded fitting is brazed to the cooling tube extensions, providing an easy and quick method for connecting cooling lines. Recommended to be factory installed to assure good braze seals. Available for 3/8" and 1/2" diameter tubing with internal threads. If required, specify.

Diameter Tubing	NPT	Part Number
3/8"	3/8"	FTG-131-103
1/2"	3/8"	FTG-131-102
1/2"	1/2"	FTG-131-101



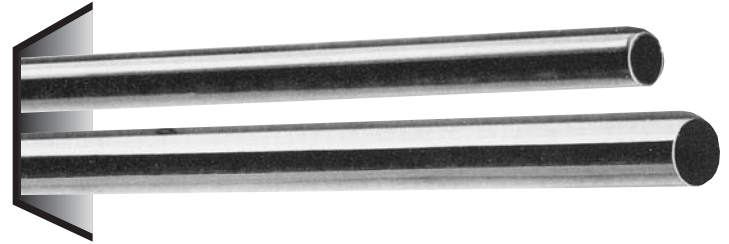
### Installation Accessories for Liquid-Cooling Cast-In Band Heaters

#### Stock Tubing for Cooling Lines

Tempco offers standard tubing for cooling lines to accommodate the connection of Tempco Cast-In heater/cooler bands and the plumbing system of your extruder. Typical 3/8" and 1/2" diameters in Incoloy® and stainless steel materials are available off the shelf for immediate delivery.

Diameter	Wall Thickness	Material	Part Number
3/8"	.035"	Stainless Steel	TUB-101-108
1/2"	.049"	Incoloy®	TUB-128-101
1/2"	.049"	Stainless Steel	TUB-101-110

Available in 6'8" lengths for U.P.S. shipments.  
Up to 20 ft. for truck shipments.



*Available from Stock*

#### Flexible Teflon® Wire Braided Hose



Flexible Teflon® Wire Braided Hose provides an excellent means of connecting Cast-In Heaters to the extruder plumbing system. This style of hose meets the demands of medium to tight bending radius requirements. The stainless steel braid protects the Teflon® hose from any harsh mechanical conditions that may be present.

A variety of brass male and female threaded fittings can be incorporated onto the hose, making it a practical choice for use in conjunction with Tempco's Style RC Non-Exposed Fittings and other available fittings.

Rigid brass adapter fittings as listed below are used to mate the base hose assembly to your existing installation. This allows for the installation of the rigid NPT coupling into the plumbing system and then attaching the swivel fitting on the hose, making assembly relatively easy. Remember to use Teflon® tape or equivalent.

**Standard Hose:** Size 8 (1/2") .405" I.D., .549" O.D.

**Operating Pressure:** 2000 PSI

**Burst Pressure:** 8000 PSI

#### Ordering Information

The standard hose assemblies are supplied with 1/2" female 37° SAE flare swivel style crimped-on fittings. The hose assemblies can be ordered in 6" increments starting at 18" minimum. Fitting material is Brass.

**Part Number\***

WHT05

\*Complete the Part Number with length of hose in 6" increments starting at 18" (018).

**Standard lead time is 2 weeks or less.**

#### Adapter Fittings for Flexible Teflon® Wire Braid Hose

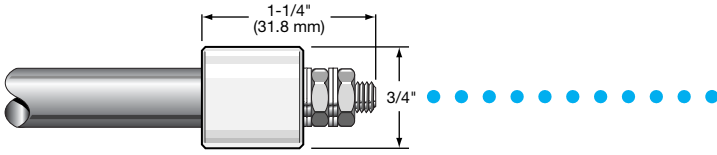
Rigid brass adapter fittings are used to mate the base hose assembly to your existing installation.

T1	T2	Part Number
1/2" male 37° SAE flare	1/2"-14 NPT male	FTG-161-103
1/2" male 37° SAE flare	1/2"-14 NPT female	FTG-161-102
1/2" male 37° SAE flare	3/8"-18 NPT male	FTG-161-104
1/2" male 37° SAE flare	3/8"-18 NPT female	FTG-161-105



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

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

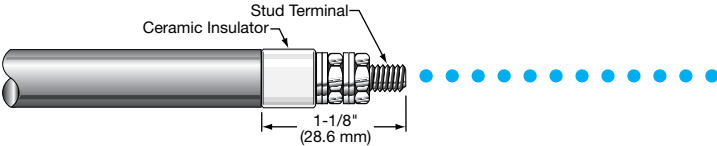


#### Type S Standard Unless Otherwise Specified

Heavy Duty Ceramic Insulators.

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

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



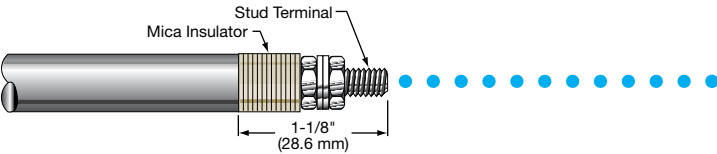
#### Type T7

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.



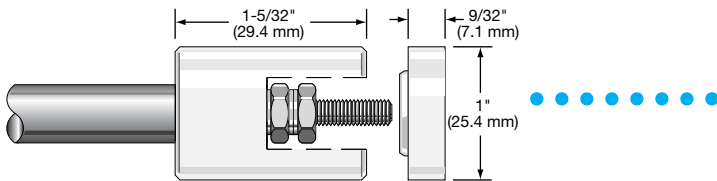
#### Type T

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.

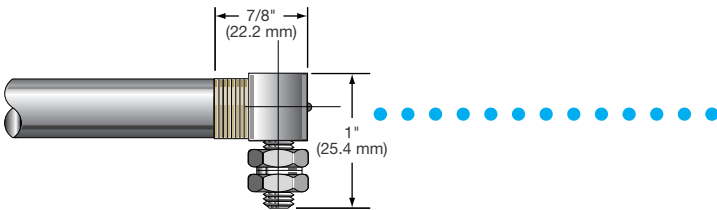
.430" diameter heater has 10-32 screw terminals.



#### TYPE P—Plain Pin

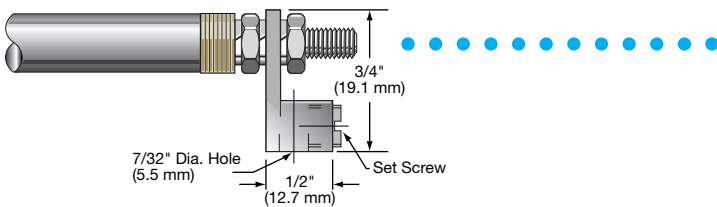
Plain terminal pin. Specify Length "L." Standard 1/2" (12.7 mm) pin length.

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



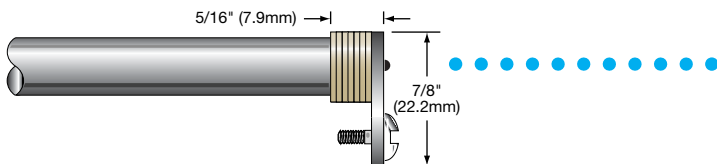
#### Type R

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.

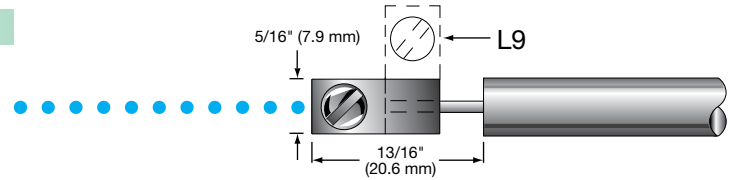


### Standard Tubular Heater Terminations for Cast-In Heaters

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

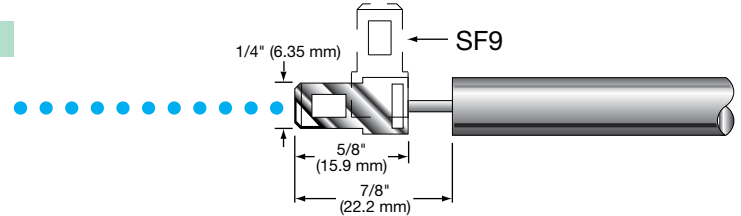
#### Type L & L9

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 Stainless Steel 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.



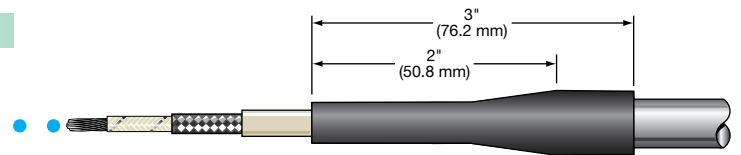
#### Type R1A

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.



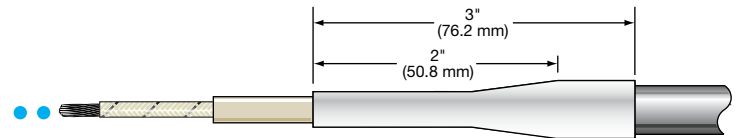
#### Type MR

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

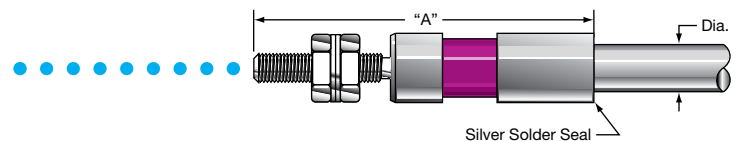
Contamination seal shrink-down Teflon® sleeving over the heater and lead wire splice. Provides a good moisture resistant seal. Maximum operating temperature 500°F (260°C). Available for .260", .315" and .430" diameter heaters. Specify lead length.



#### Type H

Ceramic to metal hermetic seal screw terminal. Maximum operating temperature is 1000°F (538°C).

Diameter	.260"	.315"	.430"
"A" Dim.	1-11/16"	1-11/16"	2-1/8"
Thread	8-32	10-32	1/4-28"





### General Purpose Terminal Protection Boxes For Cast-In Heaters

#### Standard Box Type C2



Terminal Boxes provide a simple and economical means to eliminate exposed heater terminals and live electrical wiring, protecting employees from potential electrical shock. They also eliminate electrical shorts that can result from exposed wiring on Cast-In Heater installations.

Type C2 is an individual terminal box for protecting the terminals on each Cast-In Band Heater half. It is also used on many other Cast-In Heater designs with one set of heater terminals. The C2 box design requires a flat pad on half-round castings or a flat surface on other casting designs for mounting. It is made from heavy gauge, rust resistant sheet metal. The cover is removable for easy access to terminals. The box has two 5/8" diameter knockouts opposite each other for standard 3/8" BX connectors.

To simplify installation, Cast-In Heaters fitted with boxes can be factory pre-wired with high temperature lead wire, protected with armor cable. If either one of these options is required, *specify terminal box type, lead wire and cable length*. Satisfies NEMA 1 requirements.

Standard C2 box size: L = 4", W = 2-1/2" H = 2"

#### Terminal Protection for Both Heater Halves Type C7

Type C7 terminal boxes are made from rust-resistant sheet metal. The C7 base is fixed to the clamping straps. The box has two 5/8" diameter knockouts opposite each other for standard 3/8" BX connectors. The cover is removable, providing easy access to the screw terminals for electrical wiring.

To simplify installation, Cast-In Heaters fitted with boxes can be factory pre-wired with high temperature lead wire, protected with armor cable. If either one of these options is required, *specify terminal box type, lead wire and cable length*. Satisfies NEMA 1 requirements.

C7 Terminal Box Size varies with dimensions of casting.



#### Quick-Disconnect High Temperature Cup and Box Assembly Type P2



Quick-Disconnect Cup assemblies provide the simplest and safest means for applying power to any type of Cast-In Heater installation. The box extends over the screw terminals on both Cast-In Band Heater halves. The combination of prewired cup and box assembly, along with factory prewired high temperature lead wire protected with armor cable, eliminates live exposed heater terminals and electrical wiring, protecting employees from electrical shock and the possibility of electrical shorts due to exposed wiring.

If prewired plugs are required, *specify length of lead wire and cable*.

Rated 250V maximum, 15 Amp maximum

Terminal Box Size varies with dimensions of casting.



### Terminal Protection Boxes for Cast-In Heaters



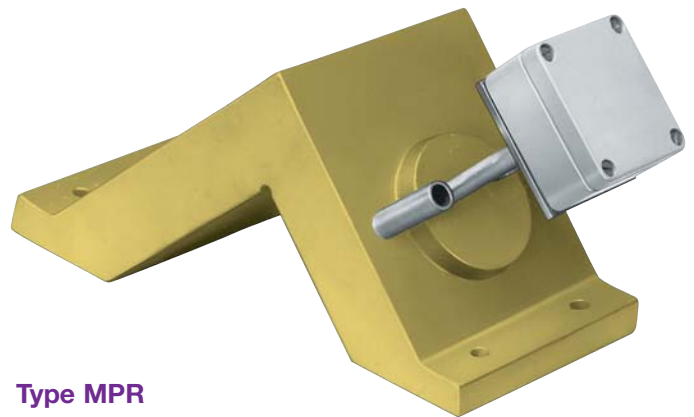
#### Type EP Explosion and Moisture Resistant Box

Cast Iron explosion and moisture resistant boxes should be used in areas where the surrounding air may become contaminated with combustible gases or a high humidity level may exist. Installation requires one box per Cast-In Heater half and they are brazed to the tubular heater. The standard box has one 1/2" NPT hub.

**Optional:** Two hubs per box available. Cast-In Heater fitted with boxes can be factory prewired with high temperature lead wire, protected with special armor cable. If either of these options is required, please specify the following:

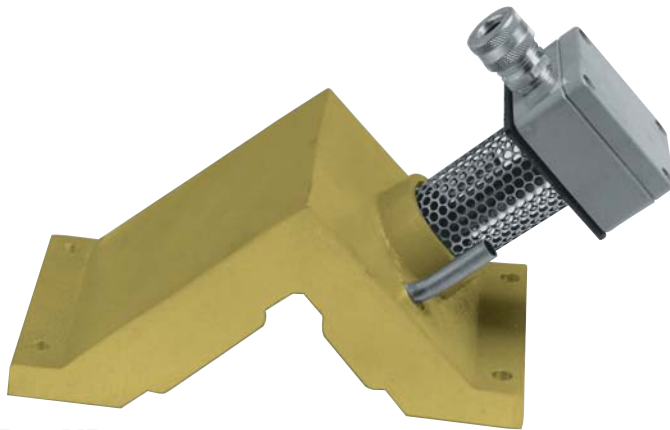
- Number of hubs
- Cable type
- Lead wire
- Cable length

Rated to 450°F (232°C).



#### Type MPR

This design has a moisture resistant die cast aluminum box with a non-removable polyurethane gasket in the lid. Lid is secured with captive stainless steel screws. Body and lid are painted in basic industrial gray; interior contains copper ground screw. Box is mounted to a plate that is brazed to the element. Available in a wide variety of sizes. Rated to 250°F (121°C).



#### Type MR1

This design incorporates the MPR housing style along with a perforated tube shielding unheated extensions of the tubular heating elements. This feature provides mechanical strength to the element extension and prevents overheating of the terminals, reducing possible premature failure from corrosion and oxidation. Rated to 250°F (121°C).

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



#### Type CB1

A Cast Aluminum Box is used to protect and secure lead wire terminations on narrower designs.



## Liquid-Cooled

### Cast-In Band Heater Selection for Plastics Extrusion & Downstream Equipment

#### Instructions for Selecting Standard Cast-In Band Heaters – Listed by Extruder Size

The Cast-In Band Heater listings on the following pages constitute a small segment of the thousands of Cast-In Band Heaters we have produced for plastics processing equipment. In order to assist you in selecting the exact heater replacement for your machine, adhere to the following instructions:

1. Measure the O.D. of your barrel, which in turn will be the I.D. of the heater.
2. Measure the width of your heater.
3. Check the wattage and voltage rating per half or per segment. This information is normally stamped on the heater.
4. Establish heater cooling function, if any. If water cooled, measure length and diameter of cooling tube extensions. Cooling tube extensions are 3" long, and 1/2" x .049 O.D. wall thickness unless otherwise specified. If air cooled, Cast-In Band will have cast fins.
5. Check for special features such as: thermocouple clearance holes, drill and tapped holes, vent cutouts and terminal boxes.
6. There are two methods for securing a Cast-In Band Heater to a barrel—separate clamping straps or nut and bolt clamping.
7. Once you have established this information, proceed to match your heater description with one of our standard Cast-In Band Heaters. They are listed by extruder size. Starting with the I.D., read across the chart until you have a perfect match. Wattage can vary up to 15% either way with little or no effect to your process.

#### Specifications for Standard Cast-In Band Heaters

1. Made as sets (two pieces)
2. Aluminum, Bronze or Brass alloy
3. Screw Terminals, Type S or R
4. Cooling tube extensions are 1/2" diameter and 3" long standard
5. Complete with one set of clamping straps

For additional assistance on Design Specifications see page 3-19.

## READ ME...

- **Standard Sizes and Ratings** Listed by Extruder Size
- These Sizes and Ratings are among the most commonly used. They will provide the shortest delivery times.
- Many of these Cast-In Heaters are available Off-the-Shelf for Immediate Delivery.

An asterisk (\*) next to the Part Number guarantees *in-stock* availability for same-day shipping when **ORDERED BY 2<sup>PM</sup> CST**

### Stock and Standard (Non-Stock) Liquid-Cooled Cast-In Band Heaters for Plastics Extrusion

Extruder Size	I.D. in	O.D. in	Width in	Watts Each Half	Volts	Phase	Cooling Tube O.D.	Features	Part Number
1" to 1-3/4"	2.875	5.000	11.500	800	240	1	N/A		CBH02335
	3.000	6.500	7.750	1000	460	1	1/2	1" dia. Hole at gap	CBH01911
	3.250	4.500	3.300	400	240	1	N/A	Brass, R1 term., 24" leads w/cable, (1) 1 1/8" dia. hole	*CBH04708
2" to 2-1/2"	4.000	6.000	2.500	375	230	1	N/A		*CBH05632
	4.000	6.000	5.000	N/A	N/A	N/A	1/2	Cool only, w/1" dia. hole at gap	CBH04873
	4.000	7.500	10.750	2000	230	1	1/2	Heat & Cool	CBH04509
	4.331	5.831	6.890	600	230	1	N/A	4.091 x 3.150 Vent, C4: 10-32	CBH08244
	4.375	7.875	12.250	2000	230	1	1/2	(2) 1/8" NPT holes	CBH01595
	4.375	8.000	16.250	3000	230	1	1/2	(2) 1/8" NPT holes, vented	*CBH01707
	4.500	6.250	10.000	2600	208	1	N/A	Heat only, EP terminal box	CBH04112
	4.500	6.250	10.000	2600	380	1	N/A	Heat only, EP terminal box	CBH04113
	4.500	7.000	4.375	810	240	1	3/8	T/C hole at gap	CBH01320
	4.750	6.750	3.625	960	230	1	N/A	Heat only, (2) 3/4" dia. holes E/H	CBH03322
	5.000	8.000	6.750	1000	230	1	1/2	(1) 3/4" dia. Hole at gap on 1 end, BF C/T fittings	CBH01621
	5.000	8.500	8.500	2000	230	1	1/2	RC - C/T	CBH04141
	5.000	8.500	14.000	3300	230	1	1/2	Bolt clamp	CBH05478
	5.118	8.618	14.625	5000	240	1	1/2	RC - C/T	CBH04425
	5.249	8.749	13.500	3750	230	3	1/2	(1) 1" dia hole each half	CBH05105
	5.500	7.500	18.000	N/A	N/A	N/A	1/2	Cool only, RC - C/T	CBH01511
5.500	8.000	8.000	1500	240	1	1/2	(1) 3/4" dia. Hole, RC - C/T	CBH09146	
5.500	8.000	13.500	3750	240	1	1/2	(4) 3/4" dia. Holes	CBH09133	
5.500	8.750	5.500	1050	230	1	3/8		*CBH01023	
5.500	8.750	5.500	1400	230	1	1/2	C4 Terminal	CBH05266	



### Stock and Standard (Non-Stock) Liquid-Cooled Cast-In Band Heaters for Plastics Extrusion

Continued from previous page...

Extruder Size	I.D. in	O.D. in	Width in	Watts Each Half	Volts Each Half	Phase	Cooling Tube O.D.	Features	Part Number
3-1/2" to 4"	6.000	9.000	8.500	1500	230	1	1/2	BF C/T	*CBH04317
	6.000	9.250	9.750	N/A	N/A	N/A	1/2	Bolt clamp, feed throat cooler	CBH02587
	6.000	9.500	14.250	4150	230	1	1/2	(1) 1" dia. hole E/H, 2 elements E/H	CBH03483
	6.010	9.500	15.500	3500	460	1	1/2	1 1/2" dia. hole top/bot. gap, self drain C/T	CBH04999
	6.010	9.500	18.750	4420	460	1	1/2	1" dia. hole at gap	CBH01812
	6.250	8.250	12.813	3500	240	1	N/A	Heat only, (2) holes at gap	CBH05101
	6.250	9.250	9.000	1100	240	1	1/2	RC - C/T	CBH06093
	6.250	9.750	8.000	2000	230	1	1/2	2" slot at gaps	CBH01503
	6.250	9.750	10.438	2500	230	1	1/2	1/8" NPT holes E/H, (2) slots at gap	CBH01530
	6.250	9.750	13.625	3000	230	1	1/2	(3) 1/8" NPT holes E/H, 2 slots at gap	CBH01266
	6.250	9.750	13.625	3000	230	1	1/2		CBH01312
	6.250	10.000	12.375	4000	230	1	1/2	Bolt clamp, CWW - C/T	CBH03585
	6.250	10.000	15.875	5000	230	1	1/2	Bolt clamp, CWW - C/T	CBH01590
	6.250	10.000	15.875	5000	230	1	1/2	Bolt clamp	*CBH01726
	6.300	9.812	15.750	5000	240	1	1/2	CWW, RC - C/T	CBH04912
	6.500	8.500	12.000	N/A	N/A	N/A	1/2	Cool only	CBH04974
	6.500	9.000	4.000	900	230	1	1/2	Heat & Cool	CBH09049
	6.500	9.000	8.000	1700	230	1	1/2	(1) 3/8" dia. T/C hole one half only	CBH09050
	6.500	9.500	6.000	1250	230	1	1/2	3/4" dia. hole at gap, BF fittings	CBH02575
	6.500	9.750	7.750	1800	230	1	1/2		*CBH01066
	6.500	10.000	5.000	1100	230	1	1/2	3/4" dia. hole top/bot. at gap	CBH04863
	6.500	10.000	13.000	3750	230	1	1/2	2 element E/H, 1" dia. hole E/H	CBH02237
	6.500	10.000	13.000	3750	230	1	1/2	RC, self drain C/T	CBH04142
	6.625	8.625	4.000	1200	230	1	N/A	Heat only	CBH02097
	6.625	10.125	6.000	1550	230	1	1/2	Cast-in ground terminal	CBH02138
	6.635	9.875	17.500	4360	240	1	1/2	Bolt clamp, (1) notch at gap, (1) 1 1/2" dia. hole	CBH06070
	6.750	9.750	8.500	2250	230	1	1/2	(1) 3/4" dia. hole at gap, BF fittings	*CBH05661
	6.877	10.500	12.250	2640	210	1	1/2	2 elements E/H 105V each element, RC - C/T	CBH03003
	6.877	10.500	12.250	N/A	N/A	N/A	1/2	CW - RC - C/T	CBH05213
	6.999	10.499	18.000	6000	208	3	1/2	C7 Terminal box	CBH04473
6.999	10.499	18.000	6000	230	3	1/2	1" dia. hole E/H, self drain C/T	CBH05138	



**Note:** Part numbers are for aluminum heaters unless otherwise specified. For Sizes and Ratings not listed, Tempco will manufacture a Cast-In Heater to your specifications. See page 3-65 for how to order.



**Note: Made-to-Order Manufacturing:**

For sizes, ratings, terminations and/or features not listed, Tempco will manufacture a Cast-In Heater to your specifications. State quantity, watts, volts and full heater description with all the appropriate specifications and features required. See Ordering Information on page 3-65.

**Customer Assistance:**

If you have a special application requiring a custom manufactured Cast-In Band Heater or need assistance selecting one of our standard heaters for a new or existing installation, consult Tempco with your requirements. We offer complete engineering services and support, working with you every step of the way, to ensure customer satisfaction.

**Key for Abbreviations found under the Features Column**

- E/H = Each Half
- EP = Explosion Resistant Terminal Housing
- MR = Moisture Resistant Terminal Housing
- MPR = Moisture Proof Die Cast Aluminum Box
- C/T = Cooling Tubes
- CW = Single Set of Cooling Tubes
- CWW = Dual Set of Cooling Tubes
- RC = Non-Exposed Cooling Tubes/Recessed NPT Fittings



# Cast-In Heaters



## Liquid-Cooled

### Stock and Standard (Non-Stock) Liquid-Cooled Cast-In Band Heaters for Plastics Extrusion

Continued from previous page...

Extruder Size	I.D. in	O.D. in	Width in	Watts	Volts	Phase	Cooling Tube O.D.	Features	Part Number
4-1/2"	7.283	8.779	8.228	1300	230	1	N/A	C4: 10-32, 3.937 x 3.74 vent	CBH08232
	7.500	10.000	10.000	3225	240	1	1/2	(1) 3/4" hole	CBH09142
	7.500	10.000	17.500	3750	240	1	1/2	(3) 3/4" holes	CBH09052
	7.500	10.000	17.500	5625	240	1	1/2	(6) 3/4" & (3) 3/4" dia. holes at gap	CBH09141
	7.500	10.500	6.000	1500	230	1	1/2	BF - C/T	*CBH01033
	7.500	10.500	7.000	1700	230	1	1/2	1" dia. hole top/bot. at gap	*CBH04727
	7.500	10.500	10.250	2085	190	1	1/2	C2 Terminal box	CBH03057
	7.500	10.500	10.250	2085	230	1	1/2	C2 Terminal box	*CBH01079
	7.500	10.500	10.250	3000	190	1	1/2	C2 Terminal box	CBH04781
	7.500	10.500	10.250	3000	230	1	1/2	C2 Terminal box	CBH03133
	7.500	10.500	10.250	3000	230	1	1/2	C2 Terminal box	*CBH03778
	7.500	10.750	20.875	7500	230	1	1/2	Bolt clamp, CWW - C/T	CBH04072
	7.500	11.000	10.250	2085	230	1	1/2		CBH05192
	7.500	11.000	12.000	3550	240	1	1/2	1" dia. T/C hole at 45°	CBH03921
	7.500	11.000	16.500	5100	230	1	1/2	RC - C/T	CBH04660
	7.500	11.000	16.500	5100	230	1	1/2	Dual element E/H	CBH02351
	7.500	11.000	16.500	5100	230	1	1/2	Dual element E/H, 1" dia T/C hole E/H	CBH02878
	7.500	11.000	18.000	4000	240	1	1/2		CBH01146
	7.500	11.000	20.875	7500	230	3	1/2	Bolt clamp, (3) holes	CBH03164
	7.500	12.500	13.000	3500	230	1	1/2	Bolt clamp	CBH02296
	7.500	12.500	13.000	3500	230	1	1/2	Bolt clamp	CBH02294
	7.560	11.125	18.000	4950	230	1	1/2	Slot at gap	*CBH02240
	7.625	10.625	10.000	3000	240	1	1/2		CBH05319
	7.625	11.125	9.625	2500	230	1	1/2		CBH05089
	7.625	11.125	14.375	3500	230	1	1/2	(2) 1/8" NPT holes E/H, 2" long slot top & bottom	*CBH01026
	7.625	11.125	14.438	3500	240	1	1/2	2" Lg. slot top/bot. gap, (2) 1/8" NPT holes E/H	CBH01094
	7.625	11.125	18.000	3500	230	1	1/2	2" Lg. slot top/bot. gap, (2) 1/8" NPT holes E/H	CBH01140
	7.625	11.125	18.000	3500	230	1	1/2	(2) 1/8" NPT holes E/H	*CBH01143
	7.873	10.873	9.250	1500	240	1	1/2	CWW - C/T, 1/8" NPT hole E/H	CBH04976
	8.000	11.000	11.500	2000	240	1	1/2	RC - C/T	CBH06630
	8.000	11.000	12.750	2875	240	1	1/2	RC - C/T	CBH06647
	8.250	11.750	13.000	3850	230	1	1/2	2 elements E/H, (1) 1" dia T/C hole E/H	CBH02865
	8.250	11.750	13.000	5500	460	1	1/2	Self drain C/T, 2 elements E/H	CBH02460
	8.250	11.750	15.750	7000	460	1	1/2	2 elements E/H, (1) 1" dia T/C hole E/H	CBH02245
	8.268	11.768	21.457	7500	220	3	1/2	RC - C/T	CBH03794
	8.270	10.230	7.080	2050	240	1	N/A	Segment heater, EP terminal box E/H	CBH05528
8.500	12.000	6.500	2100	230	1	1/2	3/4" dia. hole top/bot. gap, BF fittings	*CBH01376	
8.500	12.000	8.000	2400	230	1	1/2		CBH01780	
8.500	12.000	8.750	3000	230	1	1/2		CBH01444	
8.500	12.000	19.000	6000	240	3	1/2	(2) 2" dia. holes E/H	CBH09042	
8.500	12.000	20.500	5900	480	3	1/2	1 1/8" dia. hole E/H	CBH05232	
8.510	11.750	18.250	5900	240	1	1/2	Bolt clamp, drill and tap (1) 1/8" NPT and (1) 3/8" NPT	CBH06068	
8.666	12.250	11.625	3400	240	1	1/2	Bolt clamp, RC - C/T, 128" leads & 71" wire braid	CBH07586	



**Note:** Part numbers are for aluminum heaters unless otherwise specified. For Sizes and Ratings not listed, Tempco will manufacture a Cast-In Heater to your specifications. See page 3-65 for how to order.

An asterisk (\*) next to the Part Number guarantees in-stock availability for same-day shipping when

**ORDERED BY 2<sup>PM</sup> CST**



### Stock and Standard (Non-Stock) Liquid-Cooled Cast-In Band Heaters for Plastics Extrusion

Continued from previous page...

Extruder Size	I.D. in	O.D. in	Width in	Watts	Volts	Phase	Cooling Tube O.D.	Features	Part Number
6"	9.127	12.750	16.500	4275	210	1	1/2	RC - C/T, 2 elements E/H,	CBH03152
	9.312	12.625	11.000	3750	230	1	1/2		*CBH05110
	9.313	12.625	11.000	3750	230	1	1/2	R: 10-32	CBH01273
	9.313	12.625	11.000	3750	230	1	1/2		CBH03051
	9.313	12.625	11.000	3750	230	1	1/2	C2 Terminal box	*CBH01108
	9.313	12.625	11.000	4950	230	1	1/2	C2 Terminal box	*CBH01133
	9.500	12.000	8.000	2625	230	1	1/2	RA 90° elbow C/T fittings	CBH01784
	9.500	12.000	16.000	5150	240	1	1/2	(1) 3/4" hole	CBH09126
	9.500	12.000	24.500	7850	240	1	1/2	(3) 3/4" holes	CBH09127
	9.500	12.625	11.000	3750	230	1	1/2	C2 Terminal box	CBH01169
	9.500	13.000	12.000	4500	460	3	1/2	S: 10-32, Bolt clamp	CBH08748
	9.500	13.000	27.750	12000	230	3	1/2	S: 10-32, Bolt clamp, ground lug	CBH03208
	9.500	13.000	27.750	12000	230	3	1/2	S: 10-32, Bolt clamp, dual cool	CBH03214
	9.500	13.000	27.750	12000	230	3	1/2	Bolt clamp, 1" dia. hole E/H, 1/8" NPT hole E/H	*CBH01528
	9.500	13.000	27.750	12000	230	3	1/2	Bolt clamp, CWW	CBH01816
	9.750	11.750	6.250	2400	230	1	N/A	Heat only	CBH04973
	9.750	12.750	8.500	3000	230	1	1/2	BF C/T fittings, 3/4" dia. hole top/bot. gap	*CBH01057
	9.750	12.750	9.750	3000	230	1	1/2	(2) 1/8" NPT holes E/H	CBH01718
	9.750	12.750	24.000	9185	240	1	1/2	2 elements E/H, 12" Lg. slot top/bot. gap	*CBH02183
	9.750	13.000	19.000	6750	480	3	1/2	Bolt clamp	CBH05550
	9.750	13.000	19.250	7500	480	3	1/2	S: 10-32, Bolt clamp	CBH05333
	9.750	13.250	9.000	3100	230	1	1/2		CBH01532
	9.750	13.250	11.000	3500	230	1	1/2	2 Elements E/H, self drain C/T	CBH02461
	9.750	13.250	11.000	4500	230	1	1/2	RC, self drain C/T	*CBH03873
	9.750	13.250	12.000	4500	230	1	1/2		CBH01453
	9.750	13.375	19.438	6000	230	1	1/2	R: 10-32, (2) 1/8" NPT holes E/H	*CBH01144
	9.750	13.375	19.438	6000	230	1	1/2	S: 10-32, (1) 1/8" NPT hole E/H	CBH01221
	9.750	13.375	23.875	6000	230	1	1/2	S: 10-32, (2) 1/8" NPT holes E/H	CBH01220
	9.750	13.375	23.875	6000	230	1	1/2	Self drain C/T, 2" Lg. slot top/bot. gap	*CBH01077
	9.760	13.000	12.250	5000	240	1	1/2	Bolt clamp, (5) holes drilled/core, (1) slot	CBH06069
	9.875	13.000	8.500	2000	240	1	1/2	RC - C/T	CBH06648
	9.875	13.000	12.250	4500	240	1	1/2	RC - C/T	CBH06094
10.000	13.500	12.000	6480	230	3	1/2	Self drain C/T	CBH05102	
10.000	13.500	12.000	6480	290	3	1/2	Self drain C/T	CBH05120	
10.000	13.500	16.250	5760	480	1	1/2	Self drain C/T	CBH04652	
10.030	13.530	24.900	6000	480	1	1/2	C4: 10-32, RC - C/T	CBH06260	
10.039	13.535	13.000	6000	220	3	1/2	C4: 10-32, RC - C/T	CBH04378	
10.500	14.000	21.000	10500	240	3	1/2	Bolt clamp, RC - C/T	CBH05647	
11.000	14.500	8.000	5000	480	3	1/2	CWW - C/T	CBH03575	
11.024	14.606	13.976	6050	230	1	1/2	Bolt clamp, RC - C/T, 96" leads & 39" wire braid	CBH08121	



**Note:** Part numbers are for aluminum heaters unless otherwise specified. For Sizes and Ratings not listed, Tempco will manufacture a Cast-In Heater to your specifications. See page 3-65 for how to order.



#### Notes: Made-to-Order Manufacturing

For sizes, ratings, terminations and/or features not listed, Tempco will manufacture a Cast-In Heater to your specifications. State quantity, watts, volts and full heater description with all the appropriate specifications and features required. See How to Order on page 3-65.

#### Customer Assistance

If you have a special application requiring a custom manufactured Cast-In Band Heater or need assistance selecting one of our standard heaters for a new or existing installation, consult Tempco with your requirements. We offer complete engineering services and support, working with you every step of the way to ensure customer satisfaction.

#### Key for Abbreviations found under the Features Column

E/H = Each Half	C/T = Cooling Tubes
EP = Explosion Resistant Terminal Housing	CW = Single Set of Cooling Tubes
MR = Moisture Resistant Terminal Housing	CWW = Dual Set of Cooling Tubes
MPR = Moisture Proof Die Cast Aluminum Box	RC = Non-Exposed Cooling Tubes/Recessed NPT Fittings

**CONTINUED**

# Cast-In Heaters



## Liquid-Cooled

### Stock and Standard (Non-Stock) Liquid-Cooled Cast-In Band Heaters for Plastics Extrusion

Continued from previous page...

Extruder Size	I.D. in	O.D. in	Width in	Watts Each Half	Volts Each Half	Phase	Cooling Tube O.D.	Features	Part Number
8"	11.500	14.750	11.625	4700	230	1	1/2	C2 box	*CBH01136
	12.000	15.500	8.000	2200	240	1	1/2	RC - C/T	CBH06111
	12.000	15.500	23.000	8500	480	3	1/2		CBH05060
	12.250	15.750	12.000	5650	230	1	1/2		CBH01156
	12.500	16.000	11.000	7500	460	1	1/2	1" dia. hole E/H	CBH02870
	12.500	16.000	14.000	7500	460	1	1/2	1" dia. hole E/H	CBH02868
	12.500	16.000	15.000	6000	240	1	1/2	Dual element E/H, 5/8" dia T/C hole E/H,	CBH02669
	12.500	16.000	15.000	8750	230	3	1/2	Self drain C/T	CBH05359
	12.500	16.000	28.000	10500	240	3	1/2	R2: 10-32, RT fittings	CBH09195
	12.598	16.181	16.653	8400	230	1	1/2	Bolt clamp, RC - C/T, Leads & Wire braid	CBH08122
	12.999	16.500	13.750	6750	230	1	1/2	CWW, RC - C/T	CBH05357
	13.000	16.000	14.500	7000	300	1	1/2	Bolt clamp, RC - C/T	CBH06140
	13.000	16.500	6.000	2900	230	1	1/2		CBH05505
	13.000	16.500	19.000	9300	230	3	1/2		CBH05460
	13.500	17.000	6.500	4250	230	1	1/2		CBH04328
	13.500	17.000	18.000	7000	460	3	1/2	CWW, RC - C/T	CBH02601
	13.500	17.000	26.500	10000	460	3	1/2	CWW, RC - C/T	CBH02602
	13.500	17.250	13.250	5000	460	1	1/2	Segment heater, HS C/T fittings	*CBH05090
	13.500	17.250	26.500	10000	460	1	1/2	Segment heater, HS C/T fittings, 120° coverage	CBH01685
	13.500	17.250	26.500	10000	575	1	1/2	Segment heater, HS C/T fittings, 120° coverage	*CBH04724
10"	15.000	18.500	8.000	5000	230	1	1/2	R: 10-32	CBH01535
	15.000	18.625	8.000	5000	230	1	3/8	CWW - C/T	CBH03338
	15.500	19.000	10.000	6750	240	1	1/2	Self drain C/T	CBH05655
	15.750	19.250	15.000	10000	277	1	3/8	CWW, C2 terminal box	CBH02242



**Note:** Part numbers are for aluminum heaters unless otherwise specified. For Sizes and Ratings not listed, Tempco will manufacture a Cast-In Heater to your specifications. See page 3-65 for how to order.

#### Key for Abbreviations found under the Features Column

- E/H = Each Half
- EP = Explosion Resistant Terminal Housing
- MR = Moisture Resistant Terminal Housing
- MPR = Moisture Proof Die Cast Aluminum Box
- C/T = Cooling Tubes
- CW = Single Set of Cooling Tubes
- CWW = Dual Set of Cooling Tubes
- RC = Non-Exposed Cooling Tubes/Recessed NPT Fittings

An asterisk (\*) next to the Part Number guarantees in-stock availability for same-day shipping when

**ORDERED BY 2 PM CST**

## Complete Your Thermal Loop System

### Instrumentation:

Video Graphic Data Loggers and Paper Chart Recorders



### Pressure Transducers and Rupture Disks



Complete details can be found in Section 12 of this catalog.

### TEC Temperature Controllers



Complete details can be found in Section 13 of this catalog.

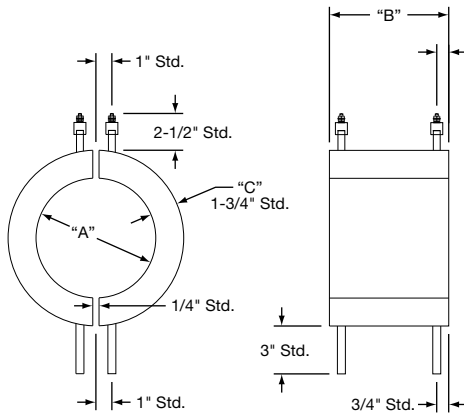
### Thermocouples



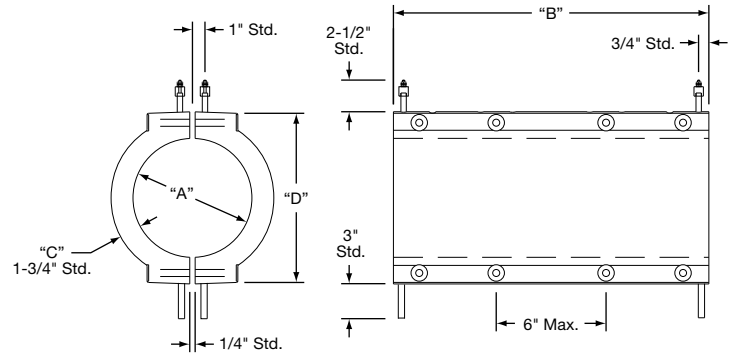
Complete details can be found in Section 14 of this catalog.



### Cast-In Band Heater Ordering Information



**Cast-In Band Heater Strap Clamping**



**Cast-In Band Heater Bolt Clamping**

## Ordering Information

To process your order or quotation, please specify the following information.

**Variable Dimensions**

Inside Diameter "A" \_\_\_\_\_ Length "B" \_\_\_\_\_ Thickness "C" \_\_\_\_\_ "D" \_\_\_\_\_

**Material Specifications**

Aluminum  Bronze  Brass

**Electrical Specifications**

Watts each half \_\_\_\_\_ Volts each half \_\_\_\_\_ Phase \_\_\_\_\_

**Clamping Style**

Straps  Bolt Clamp

**Cooling Tube Sizes**

1/4" O.D. SS  3/8" O.D. SS  1/2" O.D. SS  
 Optional Incoloy® (1/2" & 3/8" only)  Dual Cooling Tubes

**Cooling Tube Fittings**

Non-exposed 3/8" NPTF  "HS" Hi-Seal Fitting  "RA" 90° Copper Elbow  
 Non-exposed 1/2" NPTF  "BF" High Pressure  "RT" 90° Threaded Elbow  
 "FF" Flared Seal  "R3" Straight Threaded

**Terminal Style**

"S" Post Terminals  "L9" Terminal Lug  "C4" Ceramic Cover  "F" Plain Leads  
 "R" 90° Blockhead  "T7" Post Terminals  "H" Hermetic Seal  "MR"  
 "L" Terminal Lug  "E" Right-Angle Lugs  "T" Post Terminals  "P2"  
 "SF" Quick-Disconnect  "SF9" Quick-Disconnect  "TS" Leads and Shrink Sleeve  
 "R1" Armor Cable Leads  "R2" Blockhead and Through Hole

**Terminal Protection Box**

"C2" Standard  "C7" 1 Box for both halves  "EP" Explosion Resistant  
 "P2" High Temperature Quick-Disconnect  "MPR" Moisture Resistant Box  
 "MR1" Rigid Moisture Resistant Box  "CB1" Cast Aluminum Box

**Surface Finish**

Machined or As-Cast. *Indicate surfaces to be machined.*

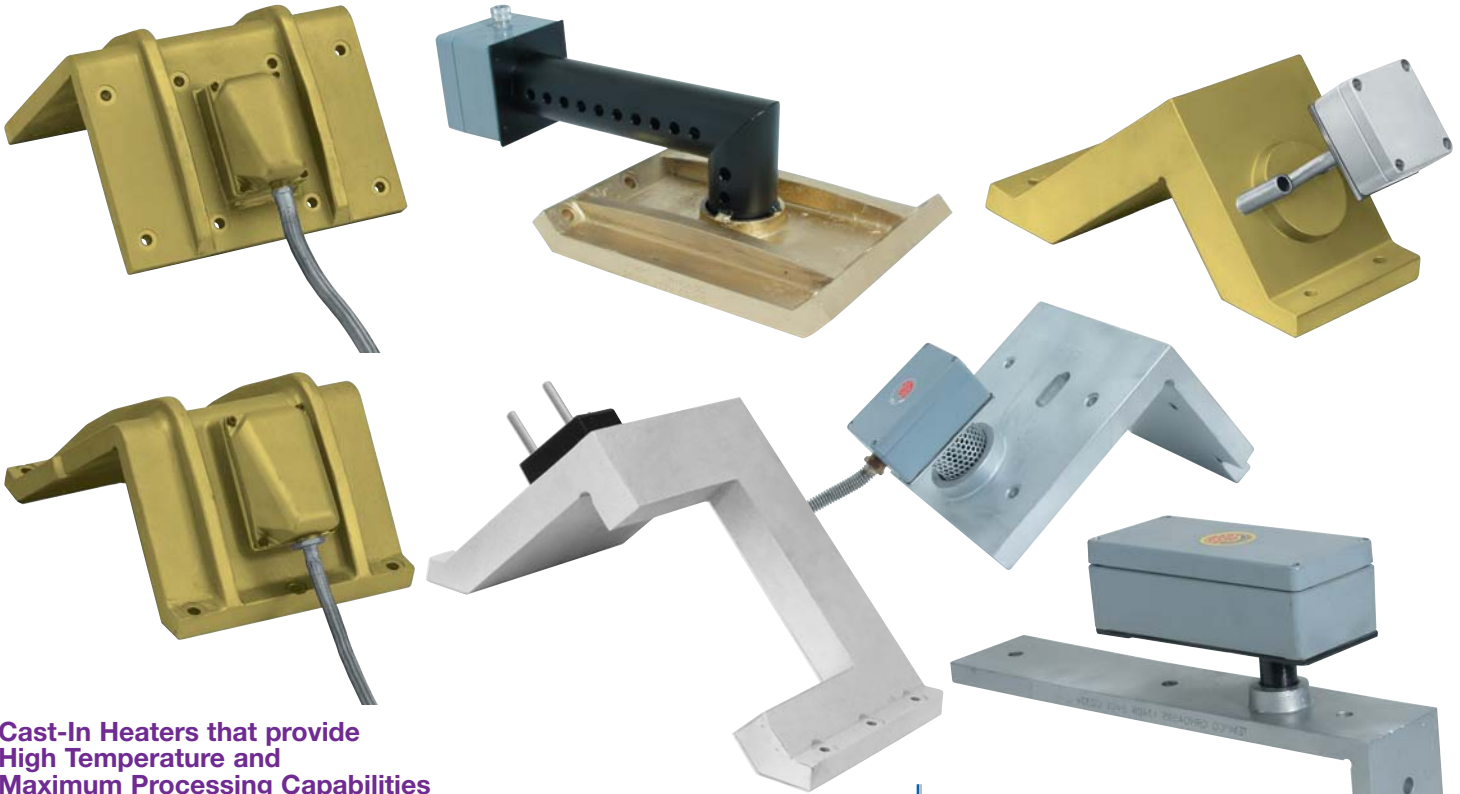
**Special Cast-In Features**

Holes, Cutouts, Slots, Bevels, Mounting Studs, Stand-Offs and Taper Angles  
*For special features a detailed drawing is required.*



## “L” Shaped

### “L” Shaped Bronze, Brass or Aluminum Cast-In Heaters for Square and Rectangular Extruder Barrels



#### Cast-In Heaters that provide High Temperature and Maximum Processing Capabilities

The “L” Shaped Cast-In Heaters are typically used on square and rectangular twin screw extruder barrels in compounding and plastic resin manufacturing applications. Due to high shear rates, which are common in this process, extreme operating temperatures and high watt densities are frequently encountered. For these reasons Tempco manufactures “L” shaped heaters in bronze or brass alloys, which are capable of withstanding high temperatures at higher watt densities.

In the case of applications requiring lower temperatures and lower watt densities, aluminum alloys can be used. Aluminum castings are desirable as they have greater thermal conductivity and weigh substantially less than their bronze or brass counterparts, allowing for greater ease of installation.

For mounting purposes, the heaters can be designed with 45° flanged ear extensions that are bolted and drawn together, or can be made with through holes machined into the casting body to bolt directly onto the barrel itself. Thermocouple and transducer holes or other special features can be accommodated as well.

To enhance the cooling capabilities, or to be used in place of integral feed screw cooling, “L” shaped heaters can be manufactured with cast-in cooling tubes to satisfy liquid cooling requirements. This feature allows processors the ease of changing a single unit at a time, thus representing a far less time-consuming and less expensive alternative should a cooling line become clogged or severely restricted.

#### Standard “L” Shaped Cast-In Heaters

##### Design Features

- \* Cast-In Bronze or Brass Alloys for high temperature, high shear applications
- \* Manufactured in sets consisting of two corresponding halves
- \* Flange bolt clamping arrangement or through holes in the heater body, allowing bolt mounting directly to the barrel
- \* High precision machining of the inner contact surface of the heater, yielding exceptional heat transfer to the process
- \* Moisture resistant terminal housing which is available in a variety of different styles and mounting arrangements
- \* Choice of terminal protection housings
- \* Elevated temperature terminations and enclosures. Prevents premature heater failure due to accelerated corrosion or oxidation of terminals caused by high heater surface temperature. See page 3-68 and 3-69 for details on how to order.

#### Enhanced Features

To aid processors in reducing maintenance downtime, Tempco has introduced several optional construction features to the basic “L” shaped design.

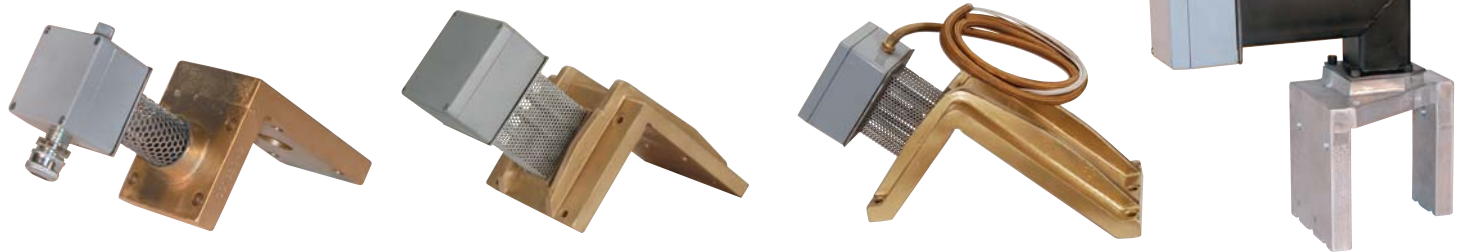
- \* Cast-In Aluminum Alloys for applications requiring lower temperatures and less watt density
- \* 3/8" or 1/2" O.D. cooling tubes for liquid cooling
- \* Non-Exposed cooling tubes (Type RC—See page 3-53). Eliminates cracked and broken cooling tubes.



**Note:** All of the options listed above are design enhancements that will provide value-added benefits to the basic “L” shape configuration, thereby extending the life and performance of your Cast-In Heaters.



### Standard (Non-Stock) "L" Shaped Cast-In Heaters



#### "L" Shaped Bronze, Brass or Aluminum Cast-In Heaters

are sold as sets or as individual units. They are normally supplied with a moisture resistant junction box. Also available with explosion resistant or cast-on junction box, fitted with convoluted wire braided hose and high temperature lead wire. If required, specify. For additional terminations, see pages 3-56 and 3-57.

*The sizes and ratings listed are among the most commonly used. They will provide the shortest lead times.*

Long Leg (in)	Short Leg (in)	Width in	Thickness in	Watts	Volts	Special Features	Part Number
3.500	2.500	3.500	0.875	500	240	Cast terminal box, (3) .397" dia. holes, (1) 5/8" dia. cutout, Bronze	CBH05817
3.500	2.500	3.500	0.875	500	240	Cast terminal box, (3) .397" dia. holes, Bronze	CBH05818
3.500	2.500	7.000	0.875	1000	240	Cast terminal box, (6) .397" dia. holes, Bronze	CBH05819
2.500	1.550	1.750	0.500	300	120	(1) 1/2" long slot, R1, Hubbel® plug, Aluminum	CBH04036
2.500	1.550	1.750	0.500	300	120	(1) 1/8" NPT hole, (1) 1/2" long slot, Bronze	CBH04103
3.460	2.680	4.330	1.181	500	220	MPR terminal box, (1) 25 mm dia. hole, (4) 9 mm dia. holes, Aluminum	CBH04926
3.460	2.680	4.330	1.181	500	220	MPR terminal box, (1) 25 mm dia. hole, (4) 9 mm dia. holes, Aluminum	CBH04922
3.460	2.760	4.330	1.181	500	220	MPR terminal, (1) 25 mm dia. hole, (8) 9 mm dia. holes, Aluminum	CBH04929
3.937	3.465	4.331	1.181	500	230	MPR terminal, 3/8" NPT RA elbow C/T, Brass	CBH04045
4.173	3.071	4.310	1.000	900	240	Cast terminal box, (2) 1/2" dia. holes, (2) 1/2" dia. cutouts, Bronze	CBH01617
4.173	3.346	4.921	1.575	2000	230	MPR, (1) 25 mm dia. hole, Brass	CBH04295
4.724	3.248	4.921	1.575	1500	230	MPR terminal box, (1) 25 mm dia. hole, Brass	CBH04290
4.823	3.346	4.921	1.575	2000	230	MPR terminal box, (1) 25 mm dia. hole, Brass	CBH04294
6.000	4.449	6.417	1.000	2000	240	Cast terminal box, (4) 1/2" dia. holes, (2) 1" long cutouts, Bronze	CBH01618
6.140	4.311	7.480	0.750	2500	240	Cast terminal box, (5) 1/2" dia. holes, (2) 1/2" dia. cutouts, Bronze	CBH01971
6.180	4.215	6.690	1.000	3000	240	Cast terminal box, (5) 1/6" dia. holes, (2) 1" dia. cutouts, Bronze	CBH02140
6.188	4.313	1.000	1.000	1500	240	Cast terminal box, (1) 1" dia. hole, (4) 1/4" dia. holes, Bronze	CBH01619
7.756	11.693	14.961	1.970	4500	460	MPR terminal box, (6) .394" dia. holes, Aluminum	CBH05011
7.813	5.188	10.625	1.000	5250	480	Cast terminal box, (8) 1/16" dia. holes, Bronze	CBH03042
7.830	5.220	10.63	0.980	3500	480	Cast terminal box, (8) 1/16" dia. holes, Bronze	CBH02114
7.874	6.102	10.394	1.000	4200	480	Cast terminal box, (6) 1/16" dia. holes, Bronze	CBH01692
7.874	6.102	10.394	1.000	4200	480	Cast terminal box, (6) 1/16" dia. holes, Bronze	CBH01839
8.500	6.140	2.750	0.750	1200	240	Cast terminal cover, (1) 1" dia. hole, (2) 1/2" dia. holes, Bronze	CBH01725
8.500	6.140	7.480	0.750	5250	240	Cast terminal box, (6) 1/2" dia. holes, (2) 3/8" dia. holes, Bronze	CBH02124
8.890	5.945	6.420	1.000	3000	240	Cast terminal box, (6) 1/2" dia. holes, (1) 1" dia. hole, Bronze	CBH01550
9.055	4.684	2.362	0.591	750	240	13" Cable, 18" leads, (5) .413" dia. holes, Aluminum	CBH04591
9.134	6.000	7.480	1.000	3500	240	Cast terminal box, (4) 1/2" dia. holes, Bronze	CBH05352
9.173	6.181	10.630	1.772	5000	230	MPR terminal box, (8) .472" dia. holes, (1) 1" dia. hole, Brass	CBH03940
9.449	7.756	14.330	1.102	6800	277	Cast terminal box, 3 phase, (8) 1/16" dia. holes, Bronze	CBH01667
9.449	7.756	14.330	1.102	6800	575	Cast terminal box, 3 phase, (4) 1/2" dia. holes, (4) 1/16" dia. holes, Bronze	CBH01709
10.563	7.813	10.625	1.000	8800	480	Cast terminal box, 3 phase, (8) 1/16" dia. holes, Bronze	CBH03041
10.590	7.830	10.630	1.000	5500	480	Cast terminal box, 3 phase, (8) 1/16" dia. holes, Bronze	CBH02113
10.830	4.684	2.362	0.591	870	240	MPR terminal box, (5) .413" dia. holes, Aluminum	CBH04594
11.690	7.756	14.960	1.969	9000	460	MPR term. box, (8) .393" & (1) .984" dia holes, Al., Heat & Cool	CBH05012
11.690	7.756	14.960	1.968	N/A	N/A	(12) .393" dia. holes, (1) .984" dia. hole, Aluminum	CBH05013
11.690	7.760	14.960	1.969	9000	460	MPR terminal box, (10) .393" dia. holes, Aluminum	CBH05014
12.188	7.875	10.375	1.000	8100	480	Cast terminal box, (6) 1/16" dia. holes, Bronze	CBH04408
12.205	7.875	4.134	1.000	3000	240	Cast terminal box, (4) 1/16" dia. holes, (1) 1/8" dia. cutout, Bronze	CBH01756
12.205	7.875	10.394	1.000	6260	480	Cast terminal box, (6) 1/16" dia. holes, Bronze	CBH02144
15.712	13.000	9.250	1.250	5500	220	(6) 1/2" dia. holes, (1) 1/8" hole, Bronze	CBH05037
18.110	9.169	4.530	0.591	3030	240	(10) .493" dia. holes, 20" cable, 27" leads, Aluminum	CBH04593
18.110	9.169	4.530	0.591	3030	240	MPR terminal box, (10) .430" dia. holes, Aluminum	CBH04596

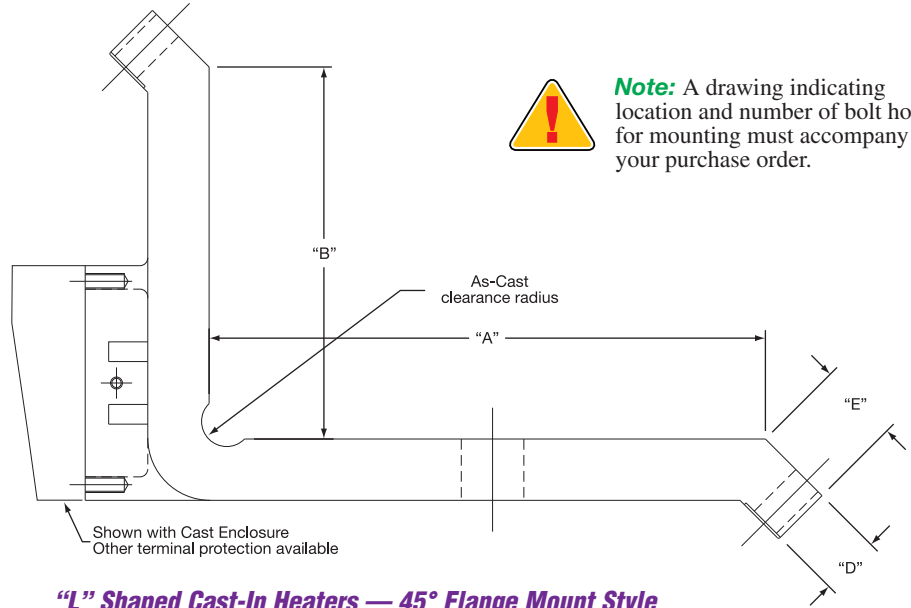
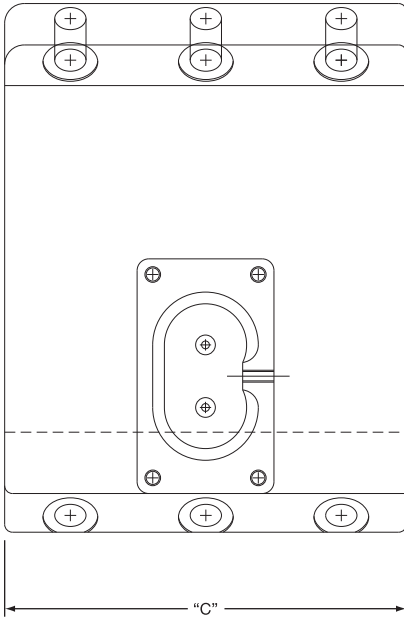
#### Key for Abbreviations found under the Features Column

E/H = Each Half	C/T = Cooling Tubes
EP = Explosion Resistant Terminal Housing	CW = Single Set of Cooling Tubes
MR = Moisture Resistant Terminal Housing	CWW = Dual Set of Cooling Tubes
MPR = Moisture Proof Die Cast Aluminum Box	RC = Non-Exposed Cooling Tubes/Recessed NPT Fittings



## Ordering Information

### "L" Shaped Cast-In Heater – 45° Flange Mount Style Ordering Information



**Note:** A drawing indicating location and number of bolt holes for mounting must accompany your purchase order.

### "L" Shaped Cast-In Heaters — 45° Flange Mount Style

#### Variable Dimensions

"A" \_\_\_\_\_ "B" \_\_\_\_\_ "C" \_\_\_\_\_  
 "D" \_\_\_\_\_ "E" \_\_\_\_\_

### Ordering Information

To process your order or quotation, please specify the following information.

#### Material Specifications

Aluminum  Bronze  Brass

#### Electrical Specifications

Watts each piece \_\_\_\_\_ Volts each piece \_\_\_\_\_ Phase \_\_\_\_\_

#### Clamping Style

Bolt Clamp  Other

#### Cooling Tube Sizes

1/4" O.D. SS  3/8" O.D. SS  1/2" O.D. SS  Optional Incoloy® (1/2" only)  
 Dual Cooling Tubes

#### Cooling Tube Fittings

Non-exposed 3/8" NPTF  "HS" Hi-Seal Fitting  "RA" 90° Copper Elbow  
 Non-exposed 1/2" NPTF  "BF" High Pressure  "RT" 90° Threaded Elbow  
 "FF" Flared Seal  "R3" Straight Threaded

#### Termination Style

"S" Post Terminals  "T7" Post Terminals  "T" Post Terminals  
 "R1" Armor Cable Leads  "E" Right Angle Lugs

#### Terminal Protection Box

"C2" Standard  Cast on box as shown  
 "EP" Explosion Resistant  "MR1" Rigid Moisture Resistant Box  
 "MPR" Moisture Resistant Box  "P2" High Temperature Quick Disconnect  
 "CB1" Cast Aluminum Box

#### Surface Finish

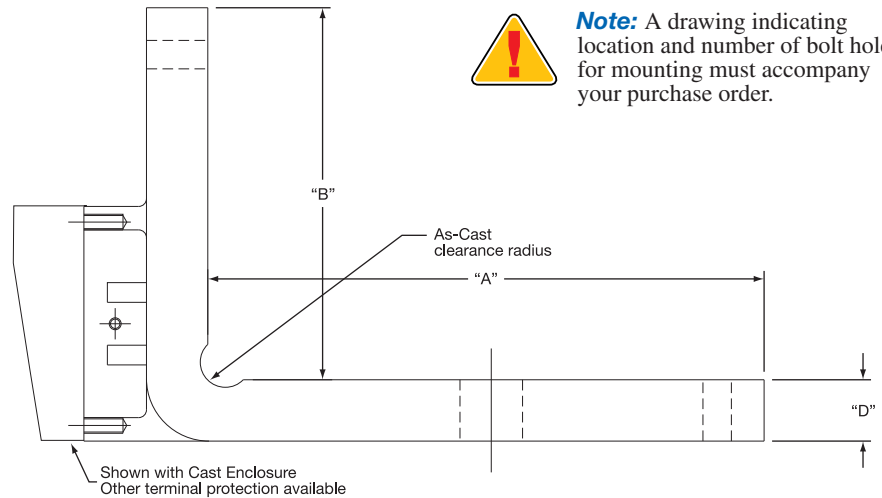
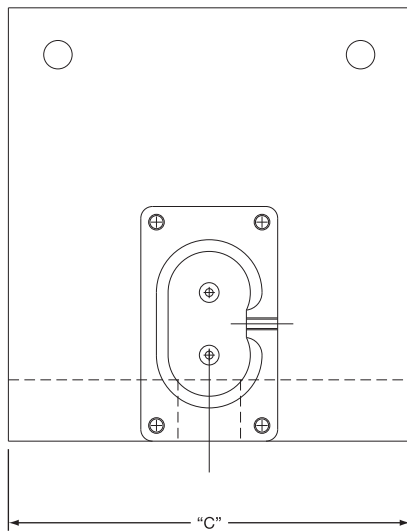
Machined or As-Cast. *Indicate surfaces to be machined.*

#### Special Cast-In Features

Holes, Cutouts, Slots, Bevels, Mounting Studs, Stand-Offs and Taper Angles.  
*For special features a detailed drawing is required.*



### "L" Shaped Cast-In Heaters Bolt Direct to Barrel Style Ordering Information



**Note:** A drawing indicating location and number of bolt holes for mounting must accompany your purchase order.

### "L" Shaped Cast-In Heaters Bolt Direct to Barrel Style

#### Variable Dimensions

"A" \_\_\_\_\_ "B" \_\_\_\_\_ "C" \_\_\_\_\_  
 "D" \_\_\_\_\_

### Ordering Information

To process your order or quotation, please specify the following information.

#### Material Specifications

Aluminum  Bronze  Brass

#### Electrical Specifications

Watts each piece \_\_\_\_\_ Volts each piece \_\_\_\_\_ Phase \_\_\_\_\_

#### Clamping Style

Bolt Clamp  Other

#### Cooling Tube Sizes

1/4" O.D. SS  3/8" O.D. SS  1/2" O.D. SS  
 Optional Incoloy® (1/2" only)  Dual Cooling Tubes

#### Cooling Tube Fittings

Non-exposed 3/8" NPTF  "HS" Hi-Seal Fitting  "RA" 90° Copper Elbow  
 Non-exposed 1/2" NPTF  "BF" High Pressure  "RT" 90° Threaded Elbow  
 "FF" Flared Seal  "R3" Straight Threaded

#### Termination Style

"S" Post Terminals  "T7" Post Terminals  "T" Mica Washers  
 "R1" Armor Cable Leads  "E" Right-Angle Lugs

#### Terminal Protection Box

"C2" Standard  Cast on box as shown  
 "EP" Explosion Resistant  "MR1" Rigid Moisture Resistant Box  
 "MPR" Moisture Resistant Box  "P2" High Temperature Quick Disconnect  
 "CB1" Cast Aluminum Box

#### Surface Finish

Machined or As Cast. *Indicate surfaces to be machined.*

#### Special Cast-In Features

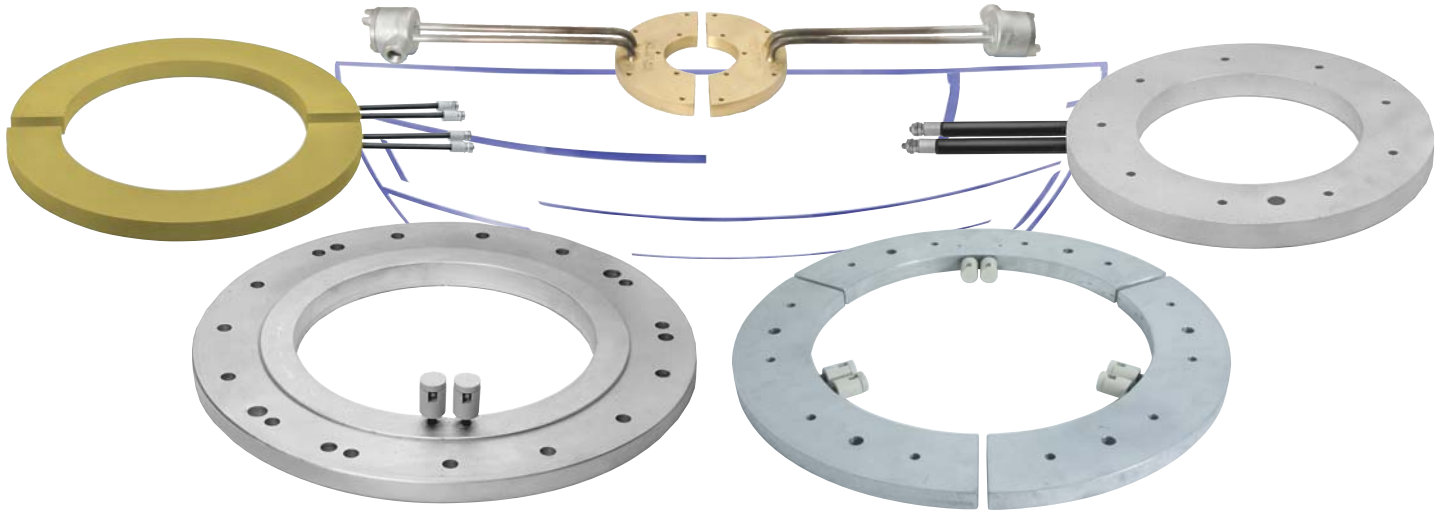
Holes, Cutouts, Slots, Bevels, Mounting Studs, Stand-Offs and Taper Angles.  
*For special features a detailed drawing is required.*

# 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 3-56 and 3-57 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
- \* Optional 1/4", 3/8" or 1/2" cooling tubes cast into the ring body for liquid cool function
- \* Variety of shapes and sizes
- \* Through holes, tap 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
- Termination Type (see pages 3-56 and 3-57)
- Alloy (Aluminum or Bronze)
- Special Features
- Machining Specifications
- Detailed Drawing

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

I.D. in	O.D. in	Thickness in	Watts	Volts	Special Features	Part Number
5.500	14.000	1.000	2250	230	(8) 3/32" 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) 3/32" 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) 3/32" dia. holes	CBH01101
10.000	14.500	0.875	4000	230	(8) 3/32" dia. hole, (8) 1 1/2" c'bore	*CBH01196
10.000	14.500	0.875	1000	230		*CBH01085
12.000	16.250	0.875	2125	230	Bronze	*CBH01261
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 1/32" dia. holes, (1) 3/8" 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

An asterisk (\*) next to the Part Number guarantees in-stock availability for same-day shipping when

**ORDERED BY 2 PM CST**



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



### Cast-In Cross Head Die Heaters for Plastics Extrusion Processing Equipment

#### Maximize Service Life on Difficult Extrusion Die Applications

Extrusion Cross Head and related extrusion dies present extremely challenging operating parameters to most conventional heating elements. This is primarily due to the presence of excessive contamination, high watt densities and high temperature as well as unusual physical and dimensional requirements.

Many processors continue to use ceramic and mica band heaters on this application, with frequently marginal results. In these instances, Cast-In Aluminum or Bronze heaters are recommended to substantially improve life and performance.

Cast-In Heaters are less susceptible to contamination problems, and can operate at higher temperatures with higher watt densities. In addition, the design is structurally better suited to accommodate holes and cutouts without compromising the heater's electrical and mechanical integrity.

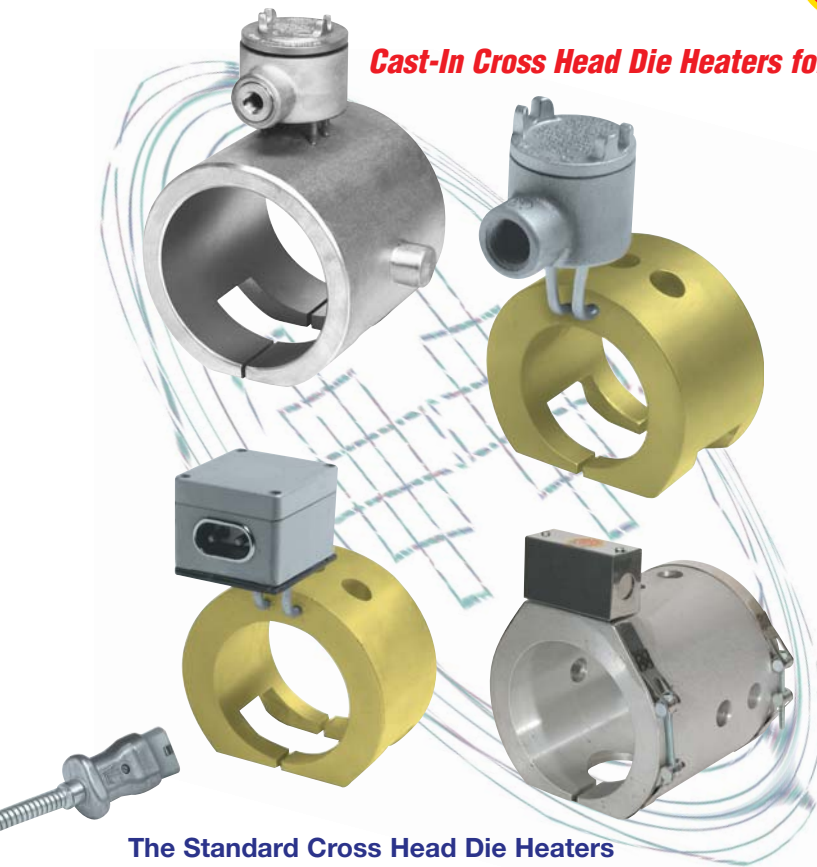
As a standard, Cross Head Die Heaters are typically designed in aluminum as a one-piece band with a single slot that can be slid over the die and clamped with stainless steel clamping straps. For higher temperature or high watt density requirements, bronze or brass alloys can be used.

#### CUSTOM Manufactured

For sizes and ratings not listed, TEMPCO will design and manufacture a Cross Head Die Heater to meet your requirements.

#### Specify the following:

- Inside Diameter
- Outside Diameter
- Thickness
- Wattage and Voltage
- Termination Type (see pages 3-56 and 3-57)
- Alloy (Aluminum or Bronze)
- Special Features
- Machining Specifications
- Detailed Drawing



#### The Standard Cross Head Die 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.
- \* Optional 1/4", 3/8" or 1/2" cooling tubes cast into the cross head die body for liquid cool function.
- \* Variety of shapes and sizes.
- \* Aluminum and bronze alloys.
- \* Through holes, tap holes or cutouts to facilitate mounting or obstructions.
- \* Precision machining of one or all surfaces of casting – specify your individual requirements.



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

An asterisk (\*) next to the Part Number guarantees **in-stock** availability for same-day shipping when



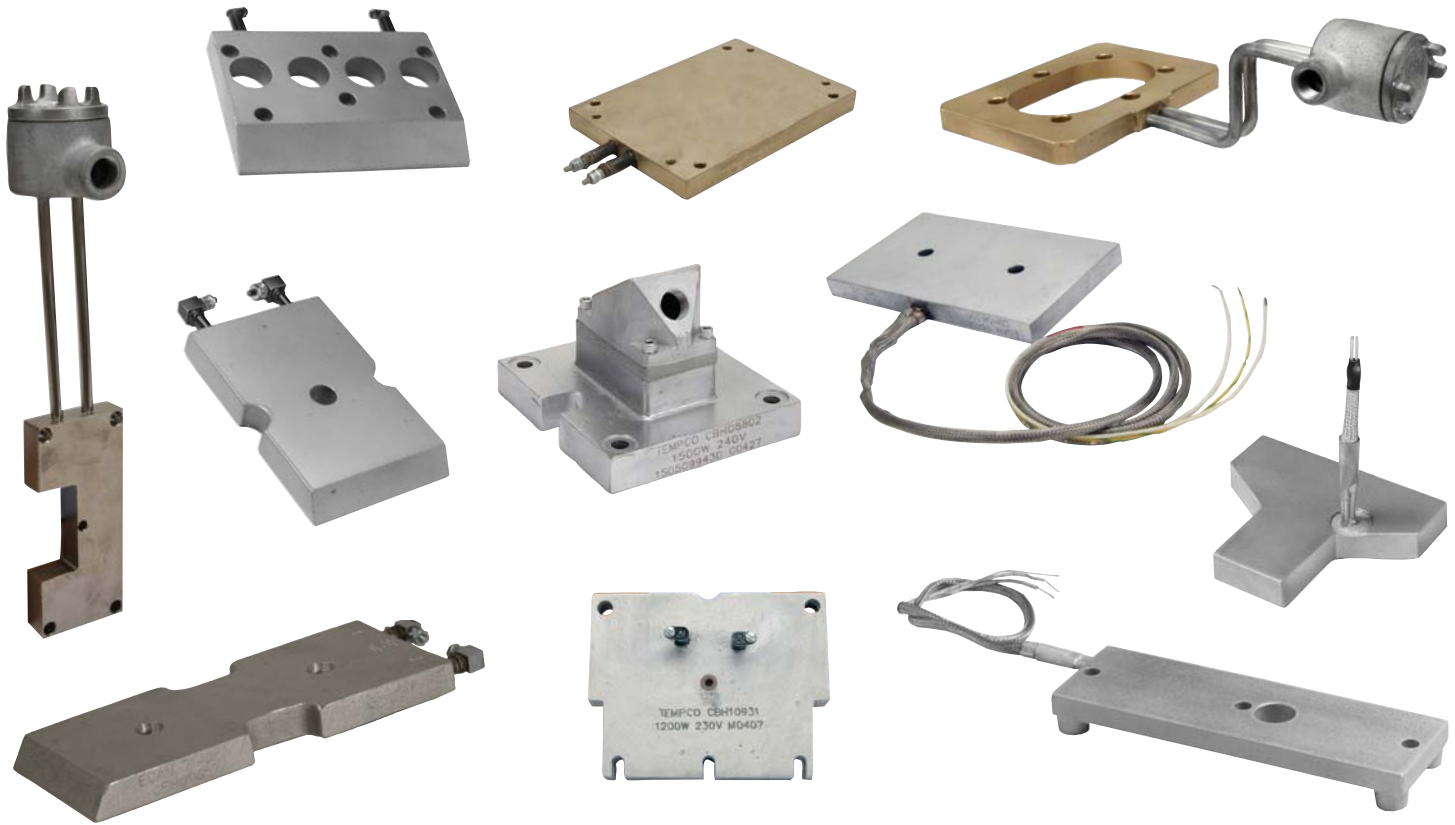
### Stock and Standard (Non-Stock) Cross Head Die Cast-In Heaters

I.D. in	O.D. in	Length in	Thickness in	Watts	Volts	Special Features	Part Number
2.500	4.000	2.625	0.750	750	240	Bronze, (3) 5/8" dia. holes, C7 terminal box	*CBH01913
3.000	4.500	4.000	0.750	1200	240	Bronze, (3) 3/4" dia. holes, 2" dia. cutout, R1 cable 70", 72" leads	*CBH02634
3.248	5.248	3.000	1.000	750	230	(3) 3/4" dia. holes, P2 plug, 92" cable, 102" leads	*CBH05491
3.248	5.25	3.000	1.000	750	230	(3) 3/4" dia. holes, EP box	CBH03741
3.248	5.25	3.000	1.000	750	230	(3) 3/4" dia. holes, EP box, 72" cable, 78" leads	CBH09274
3.250	5.250	3.000	1.000	1000	240	Bronze, (2) 5/8" and (1) 7/8" dia. hole, (1) 1 1/4" Lg. cutout EP box	CBH04153
3.250	5.25	5.625	1.000	1200	230	(2) 3/4" & (2) 7/8" dia holes, 1" slot, EP box, 72" cable, 84" leads	CBH09275
4.000	6.000	3.100	1.000	1200	240	EP Terminal box, (3) 3/4" dia. holes	CBH03979
5.000	6.500	2.250	0.750	700	240	Bronze, bolt clamp, (4) 3/4" dia. holes	CBH03753
5.000	6.500	5.875	0.750	2400	240	Bronze, (1) 2 1/2" dia. hole, (2) 7/8" dia. holes	*CBH01382
5.000	7.000	6.500	1.000	3000	460	Brass, CT, EP box, 2.125 x 1.688 cutout	CBH09123
5.687	7.750	8.500	1.031	3000	230	Bronze, CT, EP box, 2.375 x 1.562 cutout	CBH09150
5.998	8.000	4.313	1.000	2400	230	Brass, EP box, (1) 3/4" dia. hole, 2.125 x 1.688 cutout	CBH09180
6.000	8.000	4.313	1.000	2400	240	C2 box, (2) 3/4" dia holes	CBH06161
6.000	8.000	4.313	1.000	2400	460	EP Terminal box, (1) 2 5/8" Lg. cutout, (2) 3/4" dia. holes	CBH04030
7.500	9.500	8.875	1.000	4000	460	Brass, CT, EP box, 2.750 x 1.875 cutout	CBH09124

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### Cast-In Aluminum and Bronze Platen Die Heaters for Plastics Processing Equipment



**Tempco Cast-In Platen Heaters** are widely accepted as the industry standard for heating critical, temperature-sensitive plastics processing downstream equipment.

Typically, plastic die applications are highly temperature sensitive and require extreme heater uniformity and reliability.

Tempco Cast-In Aluminum Platen Heaters are a logical choice to satisfy these critical application parameters, as the aluminum alloy has excellent thermal conductivity and a highly reliable, computer designed heating element which provides good contamination resistance. Optional cooling tubes can be cast-in to more precisely regulate the temperature of your process. The result is a highly efficient, uniform heater which, if used properly, can be expected to provide years of trouble-free service.

Cast-In Platen Heaters are generally manufactured in aluminum but can also be made in bronze or brass alloys to meet higher temperature processing requirements. For high volume requirements, the permanent mold process can be used to achieve the most effective economies of scale as well as yielding the best cosmetic appeal. To service customers with lesser volume orders, Tempco's high quality no-bake sand mold process will be used, which assures excellent part quality and employs economical tooling.

#### Typical Applications for Tempco's Cast-In Platen Die Heaters:

- \* Sheet dies
- \* Plastic molds
- \* Plastic welding equipment
- \* Cast film dies
- \* Calendaring dies
- \* Screen changer equipment

#### Standard Cast-In Platen Heaters

##### Design Features and Options

- \* *Computer designed, precisely formed tubular heating element, optimizing the heat transfer pattern*
- \* *A variety of termination options including terminal enclosure housings*
- \* *Optional 1/4", 3/8", or 1/2" cooling tubes cast into the platen for liquid cool function*
- \* *A variety of shapes and sizes made to your specifications*
- \* *Through-holes, tapped holes or cutouts to facilitate mounting or obstructions*
- \* *Precision machining of one or all surfaces of casting—specify your individual requirements.*



**Note:** Cast-In Platen Heaters are made to customer specifications. Please review our "Standard Sizes and Ratings" data along with our "How To Order" information to determine the heater best suited to your needs. Tempco also offers numerous sizes and styles off the shelf for immediate delivery.

For further information on large platen heaters see pages 3-12 through 3-15.



### Stock and Standard (Non-Stock) Platen Die Heaters For Plastics Processing Equipment

The sizes and ratings listed are among the most commonly used. They will provide the shortest lead times.

Length in	Width in	Thickness in	Wattage	Volts	Notes	Part Number
3.000	4.000	0.750	400	230	(1) 3/8" dia. hole	CBH02755
3.500	4.500	0.750	600	230	(1) 3/8" dia. hole	*CBH03065
3.875	3.500	0.750	500	230	(1) 3/8" dia. hole	*CBH03468
3.875	3.500	0.750	500	230	(1) 3/8" dia. hole	CBH03147
4.000	4.000	0.750	600	240	60" Leads, 58" armor cable (1) 1/16" dia. hole	CBH05665
4.500	4.750	0.750	800	220	144" Leads, 120" braid, (1) 3/8" dia. hole	*CBH04845
5.000	5.000	0.750	900	220	(4) 5/16" dia. holes, (1) 1/8" NPT, C2 box	CBH01045
5.500	3.500	0.750	600	240	66" Leads, 64" braid, (1) 1/16" dia. hole	*CBH03869
5.500	4.500	0.750	900	230	48" Leads, 36" braid, (1) 1/16" dia. hole	CBH02698
5.875	3.875	0.750	750	230	(1) 3/8" dia. hole, 30° at front	*CBH02255
5.875	3.875	0.750	750	230	(1) 3/8" dia. hole, 30° at front, has ground screw	*CBH04170
6.000	3.500	0.750	800	230	(1) 3/8" dia. hole, (1) #10-32 tap	*CBH05693
6.000	4.500	0.750	800	460	(2) 3/8" dia. holes	CBH04104
6.250	5.469	1.938	1000	230	(2) 3/16-16 tap, (2) 3/16-18 tap	*CBH01090
7.000	4.000	0.625	800	240	P1 cup, (4) 3/16" dia. holes, (1) 1/2" dia. hole	CBH08409
7.500	3.000	1.000	1000	110	52" Leads & 48" Wire braid, (2) 1/16" dia. holes	CBH03453
7.500	5.500	1.000	1350	230	208" Leads, 180" braid, (1) 3/8" dia. hole	CBH04234
8.000	6.250	1.000	1200	230	(2) 1 1/2" dia. holes, (1) 1/8" NPT tap, (3) 1 1/2" slots	CBH01091
8.660	7.874	0.433	1250	220	24" Leads, 10" braid, (3) .213" dia. holes, (2) .234" dia. holes	*CBH04086
9.500	6.250	1.000	1700	230	(3) 1 1/2" dia. holes, (3) 1 1/2" slots, (1) 1/8" NPT tap	CBH01088
11.500	3.375	0.750	1900	240	C2 box, (8) bolt holes, (1) 3/8" dia. hole	CBH07511
11.875	23.875	0.750	4300	240	(226) 1/4" dia. holes	CBH05195
13.250	11.625	1.000	3450	230	(7) 1 1/2" dia. holes, (3) 1 1/2" slots, (1) 1/8" NPT tap	CBH01089
21.653	7.480	0.866	4500	280	P1 cup, (6) bolt holes	CBH05054
22.000	10.750	0.625	5000	240	(2) elements	CBH06970
22.750	18.000	0.750	10000	480	30" Leads, 3 phase, (403) 1/4" dia. holes	*CBH06162
22.750	18.000	0.750	10000	240	30" Leads, 3 phase, (403) 1/4" dia. holes	*CBH06225
22.750	22.000	0.750	12200	480	31" Leads, 3 phase, (344) 1/4" dia. holes	CBH07475
23.875	11.875	0.750	4300	240	S: 8-32, Dual element, (226) 1/4" dia. holes	CBH06947
23.875	11.875	0.750	8000	240	S: 8-32, Dual element, (226) 1/4" dia. holes	*CBH06948
26.000	22.750	0.750	13200	480	16" Leads, 3 phase, (305) 1/4" dia. holes	CBH07477
26.500	3.375	0.750	4000	240	(18) bolt holes, (1) 3/8" dia. hole, C2 box	CBH07594



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

An asterisk (\*) next to the Part Number guarantees in-stock availability for same-day shipping when

**ORDERED BY 2 PM CST**



#### Note: Customer Assistance

If you have a special application requiring a custom manufactured Cast-In Aluminum or Bronze Platen Die Heaters or need assistance selecting one of our standard die heaters, consult Tempco with your requirements. We offer complete engineering services and support, working with you every step of the way to ensure customer satisfaction.

### CUSTOM Manufactured

For sizes and ratings not listed, **TEMPCO** will design and manufacture a Platen Heater to meet your requirements.

#### Specify the following:

- Length
- Width
- Thickness
- Wattage and Voltage
- Termination type (see pages 3-56 and 3-57)
- Alloy (Aluminum or Bronze)
- Special Features
- Machining Specifications
- Detailed Drawing



## Special Shapes

### **Specialty Cast-In Aluminum and Bronze Heaters Used in Plastics Processing Equipment**

Plastics Processing Equipment utilizes numerous types of specially designed Cast-In Aluminum and/or Bronze Heaters. In addition to the typical and commonly used cylindrical cast-in heaters, complex geometric shapes are used extensively as well.

The following two pages provide you with a small overview of our manufacturing capabilities by illustrating some popular cast-in heater shapes and how they are used. Special designs can be made to your specifications. Consult Tempco with your requirements.



*Internal Ring Heater*



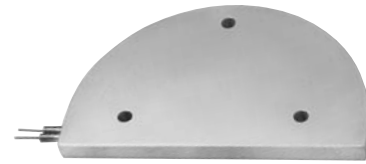
*Platen for Plastic Welding Equipment*



*Flat Platen Heater*



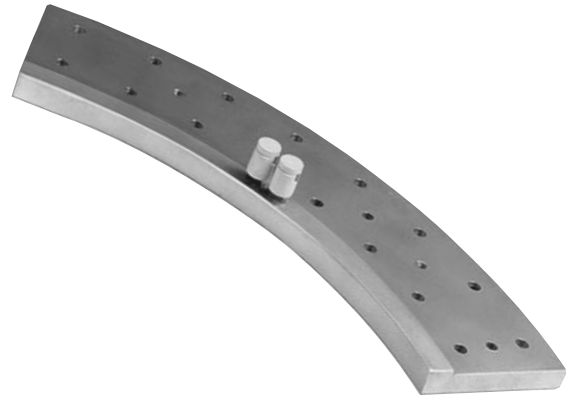
*"U" Shaped Heater*



*Semicircular Shaped Heater*



*Internal Ring Heater*



*Segmented Ring Heater*



*Laminating Radial Edge Heater*



*"L" Shape with Vent Clearance Hole*



### Specialty Cast-In Aluminum and Bronze Heaters Used in Plastics Processing Equipment



*Cast Nozzle Bronze Heater Bushings For Runnerless Molding*



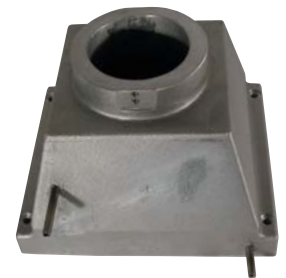
*Vented Barrel Heater*



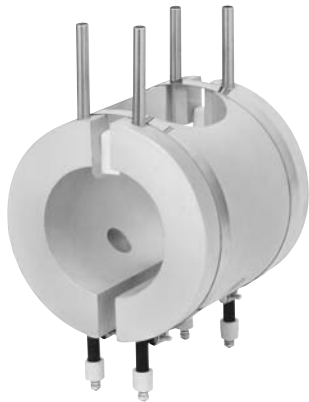
*Ring Heaters*



*"L" Shaped Heater*



*Hopper Feed Cooler*



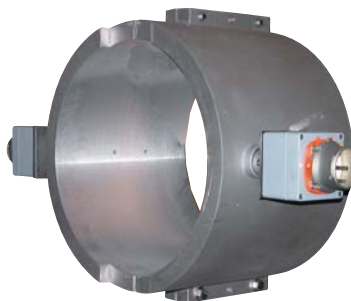
*Large Holes for Vented Barrels*



*Feed Throat Cooler*



*Feed Throat Cooler*



*Rugged Electrical Terminal Housing With Meltric® Receptacles*





## 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 and operating temperatures.
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 as much as possible.
4. After initial heat-up, retighten clamping devices to assure good surface contact.
5. Thermal insulation can be used to reduce heat losses, providing insulation does not come in contact with heaters.
6. Avoid mounting heaters in an atmosphere containing combustible gases and vapors.
7. On Cast-In Heaters equipped with water cool jackets, fittings must be securely tightened due to the high concentration of steam pressure buildup inside the cooling jacket. Flare type or braze seal fittings are recommended over compression type fittings.
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 series connected for next 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.

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

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

#### **Operation**

1. Do not operate above rated voltage. Excess voltage will result in heater failure.
2. Do not operate Cast-In Heaters above recommended temperatures. Excess temperatures will result in heater failure.
3. 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.
4. Cast-In Heaters with water cooling jackets must not be cycled to operate simultaneously. Thermal stresses may result in shorter heater life.
5. The water used on Cast-In Heaters with cooling jackets must be properly treated. Hard water contains corrosive media that will contaminate the tubing on the cooling jacket, producing stress corrosion cracks and resulting in shorter heater life.

#### **Maintenance**

1. Never perform any type of service on heaters prior to disconnecting all electrical power.
2. To assure good surface contact, periodically check clamping system.
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 eventually 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 |