

# HIGH TEMPERATURE AIR DUCT HEATERS

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## ADH and ADHT Series

- ✓ Series ADH Outlet Air Temperatures to 426°C (800°F)
- ✓ Series ADHT Outlet Air Temperatures to 648°C (1200°F)
- ✓ 5 to 270 kW
- ✓ 480V, 3 Phase
- ✓ 0.475" Dia. Tubular Elements



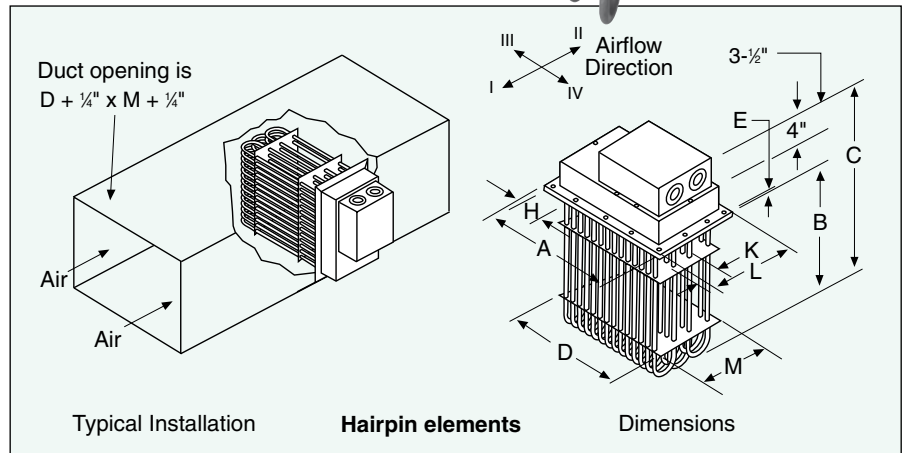
ADH-005/480V/3P shown smaller than actual size.

### APPLICATIONS

Heating air for various drying/curing operations up to 648°C (1200°F) air temperature, heat treating, re-heating or dehumidification, and other similar air heating applications.

### FEATURES

**Rugged construction.** Sturdy 0.475" diameter tubular elements mounted to a heavy ¼ or ⅝" thick steel flange. Terminal housing made of 18 gage aluminized steel. Element support plates of 16 gage aluminized steel are held in place by stainless steel support rods. High temperature units have the



additional feature of stainless steel material for the 3" insulation housing and element support plate—all of which provides superior rigidity, strength and reliability.

**Long life metal sheath tubular elements—Corrosion/oxidation resistant sheath.** High grade Incoloy sheath material for excellent corrosion/oxidation resistance at high operating temperatures.

### To Order

#### ADH-Low-Medium Temperature (30 W/in<sup>2</sup>)

kW	Dimensions - Inches									No. Elem.	No. Circ.	Model No.	Wt. lbs
	A	B	C	D	E	H	K	L	M				
5	5 <sup>5</sup> / <sub>8</sub>	20 <sup>1</sup> / <sub>8</sub>	28 <sup>1</sup> / <sub>8</sub>	4	¼	2½	3½	11 <sup>1</sup> / <sub>8</sub>	9½	3	1	ADH-005/480V/3P	8
10	7 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>3</sup> / <sub>8</sub>	6	¼	3½	3½	11 <sup>1</sup> / <sub>8</sub>	9½	6	1	ADH-010/480V/3P	15
15	9 <sup>5</sup> / <sub>8</sub>	20 <sup>5</sup> / <sub>8</sub>	28 <sup>5</sup> / <sub>8</sub>	8	¼	3	3½	11 <sup>1</sup> / <sub>8</sub>	9½	9	1	ADH-015/480V/3P	25
20	11 <sup>5</sup> / <sub>8</sub>	20 <sup>7</sup> / <sub>8</sub>	28 <sup>7</sup> / <sub>8</sub>	10	¼	2¾	3½	11 <sup>1</sup> / <sub>8</sub>	9½	12	1	ADH-020/480V/3P	35
25	13 <sup>5</sup> / <sub>8</sub>	20 <sup>9</sup> / <sub>8</sub>	28 <sup>9</sup> / <sub>8</sub>	12	¼	3¼	3½	11 <sup>1</sup> / <sub>8</sub>	9½	15	1	ADH-025/480V/3P	40
30	15 <sup>5</sup> / <sub>8</sub>	20 <sup>11</sup> / <sub>8</sub>	28 <sup>11</sup> / <sub>8</sub>	14	⅜	3¾	3½	11 <sup>1</sup> / <sub>8</sub>	9½	18	1	ADH-030/480V/3P	55
35	17 <sup>5</sup> / <sub>8</sub>	20 <sup>13</sup> / <sub>8</sub>	28 <sup>13</sup> / <sub>8</sub>	16	⅝	4¼	3½	11 <sup>1</sup> / <sub>8</sub>	9½	21	1	ADH-035/480V/3P	65
40	19 <sup>5</sup> / <sub>8</sub>	20 <sup>15</sup> / <sub>8</sub>	28 <sup>15</sup> / <sub>8</sub>	18	⅝	4¾	3½	11 <sup>1</sup> / <sub>8</sub>	9½	24	2	ADH-040/480V/3P	70
45	21 <sup>5</sup> / <sub>8</sub>	20 <sup>17</sup> / <sub>8</sub>	28 <sup>17</sup> / <sub>8</sub>	20	⅝	5¼	3½	11 <sup>1</sup> / <sub>8</sub>	9½	27	2	ADH-045/480V/3P	80
50	23 <sup>5</sup> / <sub>8</sub>	20 <sup>19</sup> / <sub>8</sub>	28 <sup>19</sup> / <sub>8</sub>	20	⅝	5¾	3½	11 <sup>1</sup> / <sub>8</sub>	9½	30	2	ADH-050/480V/3P	90
60	27 <sup>5</sup> / <sub>8</sub>	20 <sup>21</sup> / <sub>8</sub>	28 <sup>21</sup> / <sub>8</sub>	26	⅝	4½	3½	11 <sup>1</sup> / <sub>8</sub>	9½	36	2	ADH-060/480V/3P	105
100	43 <sup>5</sup> / <sub>8</sub>	20 <sup>27</sup> / <sub>8</sub>	28 <sup>27</sup> / <sub>8</sub>	42	⅝	5⅝	3½	11 <sup>1</sup> / <sub>8</sub>	9½	60	5	ADH-100/480V/3P	175
162	39 <sup>5</sup> / <sub>8</sub>	35	42 <sup>7</sup> / <sub>8</sub>	38	⅝	4 <sup>7</sup> / <sub>8</sub>	3½	11 <sup>1</sup> / <sub>8</sub>	9½	54	6	ADH-162/480V/3P	185
216	27 <sup>5</sup> / <sub>8</sub>	35	42 <sup>7</sup> / <sub>8</sub>	26	⅝	4½	3 <sup>7</sup> / <sub>8</sub>	20	18 <sup>3</sup> / <sub>8</sub>	72	6	ADH-216F/480V/3P	240
270	33 <sup>5</sup> / <sub>8</sub>	35	42 <sup>7</sup> / <sub>8</sub>	32	⅝	5½	3 <sup>7</sup> / <sub>8</sub>	20	18 <sup>3</sup> / <sub>8</sub>	90	8	ADH-270F/480V/3P	300

Ordering Example: ADH-035/480V/3P, 21-element, 3-phase, 480V high temperature air duct heater. Refer to J-3 for application data.

**Low watt density resistor wire.** Watt density on the heating coil is designed for low watt density operation by increasing the coil diameter, gage and length of resistance wire to give maximum surface area and low operating coil surface temperature—providing longer coil life.

**Easy element replacement.** Individual elements are mechanically fastened to the flange permitting convenient, easy replacement.

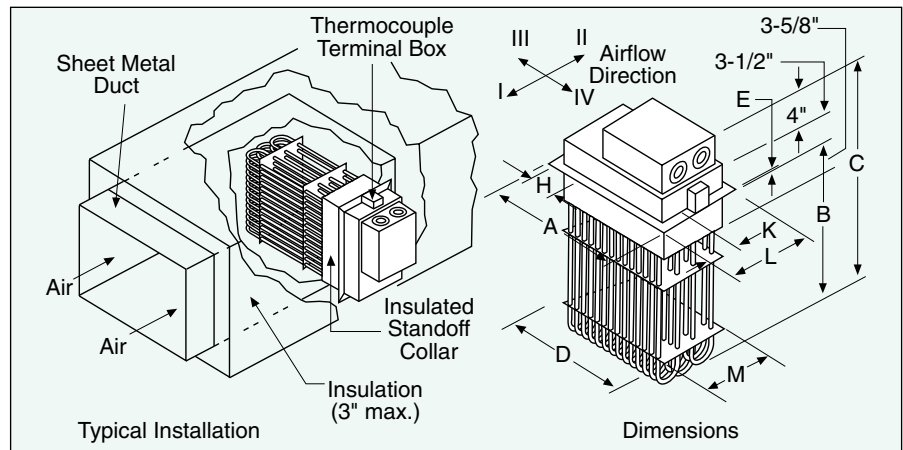
**Low wiring compartment temperatures.** Made possible by the addition of a one-inch thick blanket of insulation in the terminal box—allows use of low temperature field wiring instead of expensive high temperature busbars and wire. High temperature units include additional three inches of insulation to help reduce duct heat losses.

**Easy access to simplified field wiring terminals.** Terminal housing is completely removable for maximum access to field wiring terminals. Individual terminal blocks with threaded stud type terminals are provided for each circuit to permit quick positive attachment of circuit wiring conductors.

**Dirt/dust resistant terminal housing.** Terminal housing made of solid heavy gauge aluminized steel rather than perforated metal to resist dirt and dust accumulation on the electrical connections and thus provide longer service life.



ADHT-005/480V/3P shown smaller than actual size.



**Flange mounting gasket.** Packed separately with each duct heater to minimize leakage between the flange and air duct.

minimize leakage between the flange and air duct.

To Order													
ADHT-High Temperature (20 W/in <sup>2</sup> )													
kW	Dimensions - Inches									No. Elem.	No. Circ.	Model No.	Wt. lbs
	A	B	C	D	E	H	K	L	M				
5	5 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>5</sup> / <sub>8</sub>	4	1/4	2 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	3	1	ADHT-005/480V/3P	10
10	7 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>5</sup> / <sub>8</sub>	6	1/4	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	6	1	ADHT-010/480V/3P	20
15	9 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>5</sup> / <sub>8</sub>	8	1/4	3	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	9	1	ADHT-015/480V/3P	30
20	11 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>5</sup> / <sub>8</sub>	10	1/4	2 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	12	1	ADHT-020/480V/3P	40
25	13 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>5</sup> / <sub>8</sub>	12	1/4	3 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	15	1	ADHT-025/480V/3P	50
30	15 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>3</sup> / <sub>4</sub>	14	3/8	3 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	18	1	ADHT-030/480V/3P	65
35	17 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>3</sup> / <sub>4</sub>	16	3/8	4 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	21	1	ADHT-035/480V/3P	80
40	19 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>3</sup> / <sub>4</sub>	18	3/8	4 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	24	2	ADHT-040/480V/3P	90
45	21 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>3</sup> / <sub>4</sub>	20	3/8	5 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	27	2	ADHT-045/480V/3P	100
50	23 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>3</sup> / <sub>4</sub>	22	3/8	5 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	30	2	ADHT-050/480V/3P	110
60	27 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>3</sup> / <sub>4</sub>	26	3/8	4 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	36	2	ADHT-060/480V/3P	130
80	35 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>3</sup> / <sub>4</sub>	34	3/8	4 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	48	4	ADHT-080/480V/3P	175
90	39 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>3</sup> / <sub>4</sub>	38	3/8	4 <sup>7</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	54	5	ADHT-090/480V/3P	200
100	43 <sup>5</sup> / <sub>8</sub>	20 <sup>3</sup> / <sub>8</sub>	28 <sup>3</sup> / <sub>4</sub>	42	3/8	5 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	60	5	ADHT-100/480V/3P	220
120	27 <sup>5</sup> / <sub>8</sub>	35	42 <sup>7</sup> / <sub>8</sub>	26	3/8	4 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	36	4	ADHT-120/480V/3P	205
160	35 <sup>5</sup> / <sub>8</sub>	35	42 <sup>7</sup> / <sub>8</sub>	34	3/8	4 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	48	8	ADHT-160/480V/3P	270
180	39 <sup>5</sup> / <sub>8</sub>	35	42 <sup>7</sup> / <sub>8</sub>	38	3/8	4 <sup>7</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	54	6	ADHT-180/480V/3P	305
240	27 <sup>5</sup> / <sub>8</sub>	35	42 <sup>7</sup> / <sub>8</sub>	26	3/8	4 <sup>1</sup> / <sub>2</sub>	3 <sup>7</sup> / <sub>8</sub>	20	18 <sup>5</sup> / <sub>8</sub>	72	8	ADHT-240F/480V/3P	400

**Ordering Example:** ADHT-020/480V/3P is a 12-element, 3-phase, 480V high temperature air duct heater.

Refer to J-3 for application data.

All ADHT models come with K type overtemp thermocouple.

# HIGH TEMPERATURE AIR DUCT HEATERS

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## APPLICATION GUIDE

**Selecting heater size.** Refer to Technical Section for examples on determining kW requirements. For quick estimating purposes, the following formula may be used for standard conditions (includes 1.2 safety factor):

$$kW = \text{CFM} \times \text{temp. diff}/2500$$

**Maximum work temperature.** Types ADH and ADHT process air heaters can generally be used at the following maximum temperature shown, provided the minimum air velocity is maintained uniformly through the heater:

Air Velocity (ft/sec)	Max. Outlet Air Temp. °F	
	ADH	ADHT
4	800	1050
9	800	1100
16	800	1150
25	800	1200
36	800	1200

**Application assistance.** OMEGALUX sales/application engineers are available to assist you in the design or selection of equipment.

## INSTALLATION MOUNTING TIPS

**Low temperature duct heaters** can be fastened directly to the sheet metal duct work with bolts or sheet metal screws.

**High temperature duct heaters** are generally mounted to a field fabricated stand off collar from the ductwork to position the heater such that the 3" insulation housing is in the same plane as the duct insulation.

**All heaters** can be mounted in any position; top, side or bottom (preferred) entry. Minimum duct size is A or L dimension plus 3/8" and B dimension plus 1/2".

**Provide adequate heater support.** Consideration should be given to installing hangers or some other means of heater support whenever there is any question about the ability of the ductwork to support the heater weight.

**Overtemperature protection.** All heaters should include an overtemperature (overheat) control whose temperature sensing element is located on the air discharge side of the heater as close to the heater as is practical. High temperature ADHT units include an overtemperature (Type K) thermocouple as standard.

**Additional protection** can be achieved by installing an air flow or pressure differential switch to protect the heater against low air flow conditions.

**Operation controls.** Selection of these controls, thermostat, SCR units, contactors etc., depends on the degree of accuracy required, reliability, electrical rating of heater and economic considerations.

**Field power & control circuit wiring.** Must be capable of carrying the electrical load and be protected by overcurrent protective devices, such as fusing, circuit breakers or ground fault detection in accordance with the requirements of the NEC and local codes as applicable.

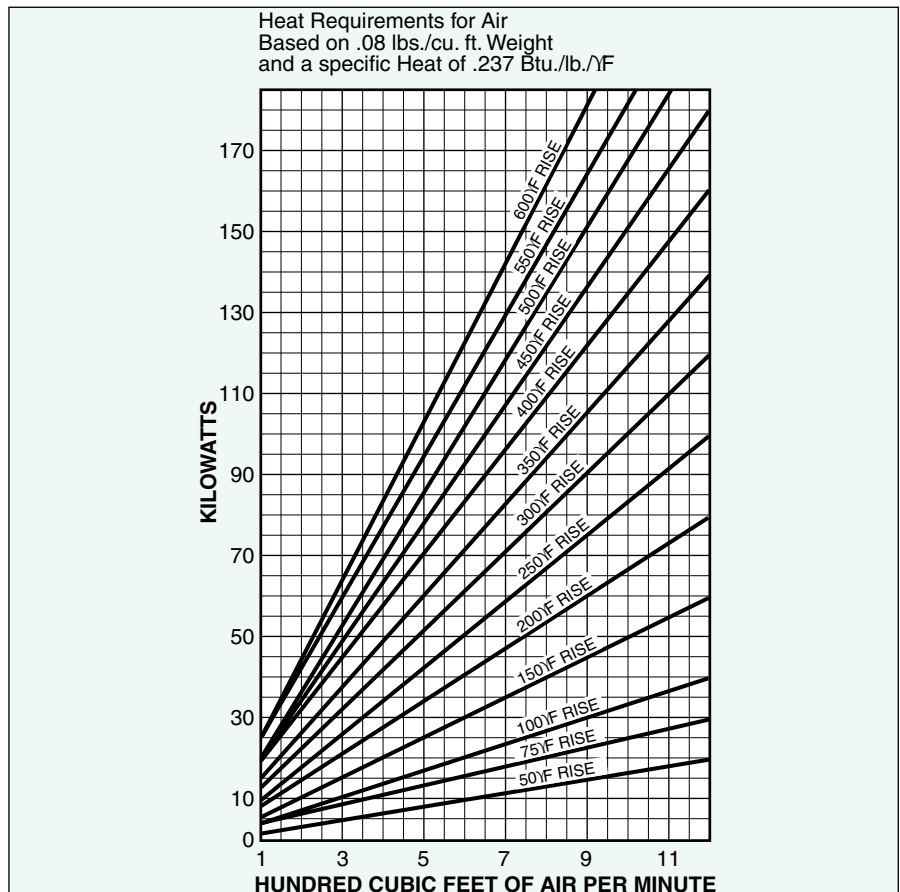
**Tandem mounting.** Multiple heaters may be mounted in tandem with each other provided the maximum recommended outlet air temperature is not exceeded.

## OPTIONS AVAILABLE

**Gas tight design.** Achieved by the use of threaded compression fittings with fiber washers to attach heating elements to flange—prevents leakage of ducted air into terminal housing.

**Overtemperature protection.** Thermocouple welded to the element sheath surface and wired to a terminal block can be provided for accurate overheat protection. Standard on high temperature units.

**Moisture or explosion-resistant terminal housings** are available for those applications requiring special terminal protection.



# MAXIMUM FLOW AIR HEATERS

## For Low Pressure, High Flow Air Heating

### AHF Series



- ✓ 4" OD Mounting Flange
- ✓ Air Flows Up To 200 CFM\*
- ✓ Exit Air Temperatures up to 315°C (600°F)
- ✓ Post Terminals Junction Box

### APPLICATIONS

The AHF series maximum flow air heaters are used with blowers or recirculating air in baking, drying, and preheating applications.

This air heater is designed with a 60 mm (2 3/8") OD aluminum tube and a cross frame heating element for minimum resistance to air flow. The nickel-chrome heating element is insulated by ceramic beads on a stainless steel support frame which is firmly secured to the inside of the tube. Post terminals enclosed in a junction box simplify the wiring. A 102 mm (4") round flange with pre-drilled holes at the inlet side are used for mounting the heater. It has a practical operating range of up to 200 CFM with temperatures up to 315°C (600°F).

Calculate the flow rate, temperature rise, or power requirement as follows:

$$\text{Watts} = \text{SCFM} \times \Delta T / 3$$

$$\text{SCFM} = \text{Standard Cubic Feet Per Minute}$$

$$\Delta T = \text{Temperature Rise in Degrees F from the Inlet to the Outlet}$$

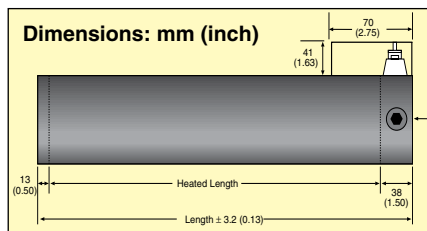
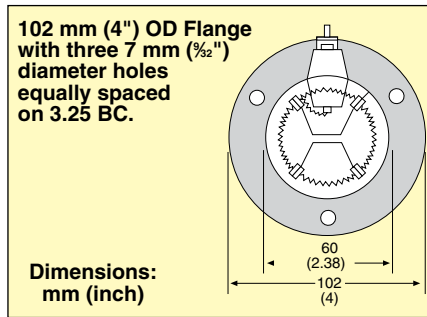
Minimum flow rates are given in the table to right.

### SPECIFICATIONS

- Maximum Amperage:** 15
- Cross Sectional Flow Area:** 3.5 square inches
- Threaded Terminals:** 6-32



Nickel-Chrome Heating Element Insulated with Ceramic Beads



AHF-10120 shown smaller than actual size.



CFM	Max Watts/Linear Inch of Heated Length
1	150
2	150
4	150
6	150
8	150
10	150
20	175
30	275
40	350
50	450
60	525

To Order							
Model Number	Volts	Watts	Heated Length mm (inch)	Watts/Inch**	Maximum CFM	Length mm (inch)	Weight kg (lb)
<b>120 Vac Models</b>							
AHF-06120	120	600	102 (4)	150	200	152 (6)	0.23 (0.5)
AHF-10120	120	1000	203 (8)	125	200	254 (10)	0.57 (1.25)
<b>120/240 Vac Models*</b>							
AHF-12240	120	375	254 (10)	38	200	305 (12)	0.68 (1.5)
	240	1500	254 (10)	150	200		
AHF-14240	120	500	305 (12)	42	200	356 (14)	0.79 (1.75)
	240	2000	305 (12)	166	200		

\* These air heaters can be operated on either 120 or 240 Volts. Specifications are given for operation on both 120 and 240 Volts.

\*\* Indicates watts per inch of heated length. Use the table above to determine minimum required flow rates. The watts per inch of heated length can be changed by reducing the operating voltage or by ordering a custom made heater. Stainless steel construction also available. Consult Engineering.

Ordering Example: AHF-12240, air heater, 240 Vac, 1500 W.

# LOW FLOW AIR PROCESS AND LIQUID CIRCULATION HEATERS

## For In-Line Air, Gas and Liquid Heating

### AHPF Series



- ✓ 316 Stainless Steel Construction
- ✓ Air/Gas Flow up to 15 CFM
- ✓ Air/Gas Outlet Temperatures up to 430°C (800°F)
- ✓ Pressures up to 100 psi\*
- ✓ 50 Watts/Square Inch\*\*

The AHPF Series heaters are used to heat low flows of air, gas, water, or aqueous solutions. Applications include those where clean air is necessary, as in laboratories and environmental testing areas. The stream of air is heated by passing over an enclosed heated surface rather than directly over resistance elements. This method assures that no foreign matter will enter the stream of flow. The AHPF Series is also used as a miniature circulation heater for small volume of liquids as in photographic developer solution, chemicals, dyes, and inks. For heating liquids, contact engineering. The Thermocouple "T" fitting AHPF-NPT12 can be used with the subminiature thermocouple probes and with the SSLK series stainless steel compression fittings (see omega.com) and with stainless steel compression fittings (Model SSLK-18-14) to monitor or control temperature at the outlet of the AHPF series heaters.

### SPECIFICATIONS

#### Cross Sectional Area:

0.152 square inches

**Pressure Rating:** Up to 100 psig

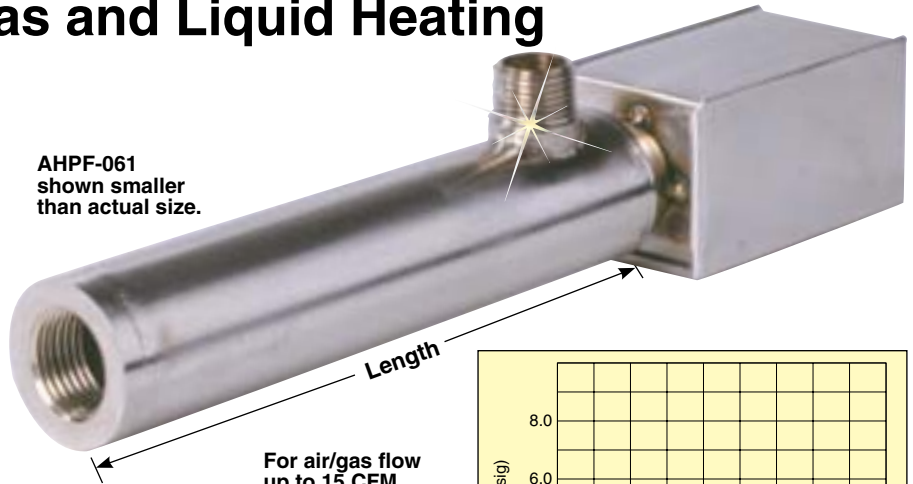
**Wattage Tolerance:** +5, -10% or better at the voltage specified

**Outside Diameter:** 32 mm (1 1/4")

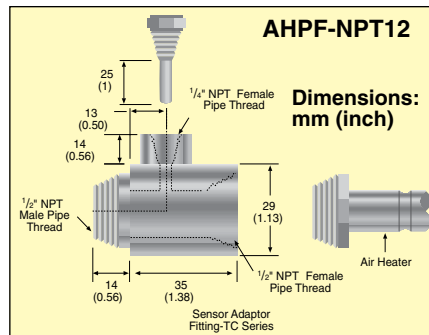
**Inlet:** Male 3/8" NPT

**Outlet:** 1/2" NPT

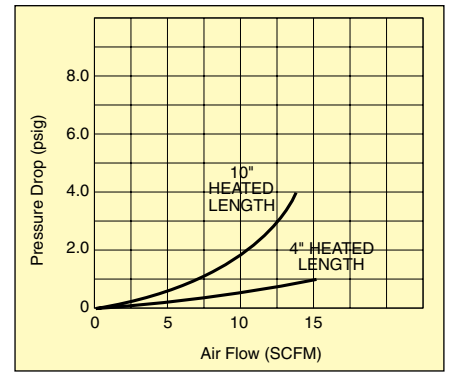
AHPF-061 shown smaller than actual size.



For air/gas flow up to 15 CFM.



Model Number
AHPF-NPT12



CFM	Maximum Watts/Linear Inch of Heated Length
1	75
2	100
4	150
6	200
8	200
10	250
15	275

### To Order Visit [omega.com/ahpf\\_heater](http://omega.com/ahpf_heater) for Pricing and Details

Model Number	Volts	Watts	Heated Length mm (inch)	Watts/Inch*	Max CFM	Length mm (inch)	Weight kg (lb)
<b>120 Vac Models</b>							
AHPF-061	120	400	102 (4)	91	15	152 (6)	0.45 (1.0)
AHPF-081	120	600	152 (6)	94	15	203 (8)	0.54 (1.18)
AHPF-101	120	1000	203 (8)	120	15	254 (10)	0.62 (1.37)
AHPF-121	120	1200	254 (10)	115	15	305 (12)	0.70 (1.55)
<b>120/240 Volt Models**</b>							
AHPF-062	120 240	100 400	102 (4) 102 (4)	23 91	15 15	152 (6)	0.45 (1.0)
AHPF-082	120 240	150 600	152 (6) 152 (6)	23 94	15 15	203 (8)	0.54 (1.18)
AHPF-102	120 240	250 1000	203 (8) 203 (8)	30 120	15 15	254 (10)	0.62 (1.37)
AHPF-122	120 240	300 1200	254 (10) 254 (10)	29 115	15 15	305 (12)	0.70 (1.55)

\* Indicates watts per inch of heated length. Use the table above to determine minimum required flow rates. \*\* These air heaters can be operated on either 120 or 240V. Specifications are shown for either 120 or 240V operation.

Ordering Example: AHPF-101, 120V, 1000 W low flow air process and liquid circulation heater.

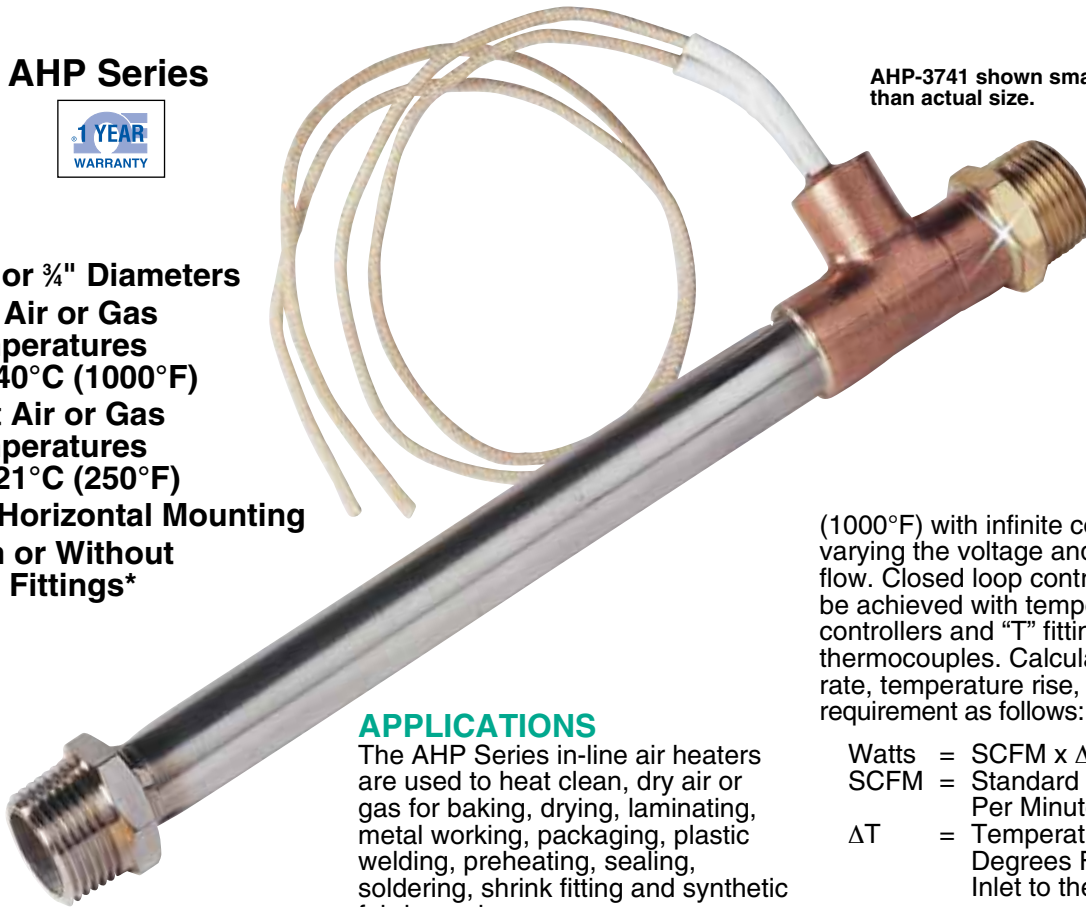
# "T" TYPE AIR PROCESS HEATERS

## For In-Line Air and Gas Heating

### AHP Series



- ✓ ⅜, ½ or ¾" Diameters
- ✓ Exit Air or Gas Temperatures to 540°C (1000°F)
- ✓ Inlet Air or Gas Temperatures to 121°C (250°F)
- ✓ For Horizontal Mounting
- ✓ With or Without NPT Fittings\*



AHP-3741 shown smaller than actual size.

### APPLICATIONS

The AHP Series in-line air heaters are used to heat clean, dry air or gas for baking, drying, laminating, metal working, packaging, plastic welding, preheating, sealing, soldering, shrink fitting and synthetic fabric sewing.

AHP series air process heaters provide hot air and gas up to 540°C

(1000°F) with infinite control by varying the voltage and/or the air flow. Closed loop control can also be achieved with temperature controllers and "T" fittings to mount thermocouples. Calculate the flow rate, temperature rise, or power requirement as follows:

$$\begin{aligned} \text{Watts} &= \text{SCFM} \times \Delta T / 3 \\ \text{SCFM} &= \text{Standard Cubic Feet Per Minute} \\ \Delta T &= \text{Temperature Rise in Degrees F from the Inlet to the Outlet} \end{aligned}$$

Maximum flow rates are given in the table below. For minimum flow rates, see table on page 120.

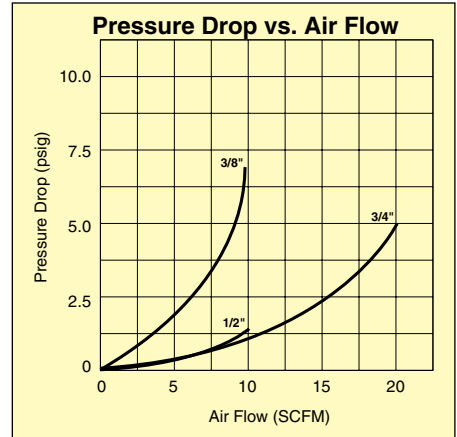
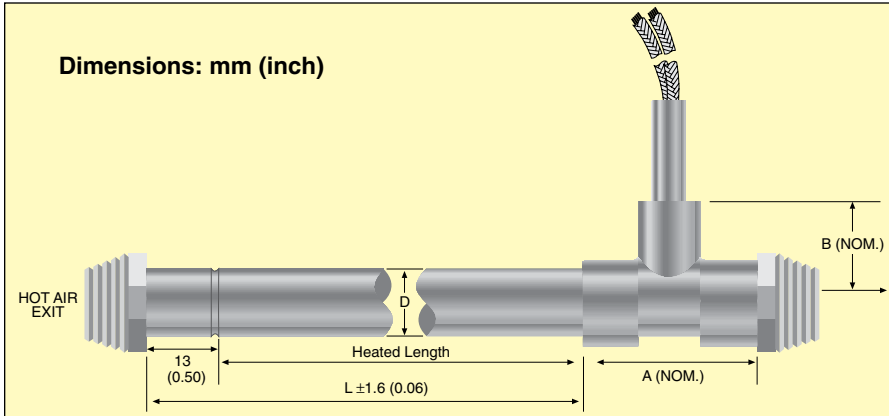
To Order								
Model Number	Volts	Watts	Heated Length mm (inch)	Watts/Inch†	Maximum CFM	Diameter mm (inch)	NPT Fitting	Weight g (lb)
<b>120 Vac Models</b>								
AHP-3741	120	200	889 (3½)	57	8	10 (⅜)	¼"	82 (0.18)
AHP-5051	120	400	114 (4½)	88	10	13 (½)	⅜"	113 (0.25)
AHP-7561	120	750	140 (5½)	136	20	19 (¾)	¾"	308 (0.68)
<b>120/240 Vac Models**</b>								
AHP-3742	120	50	889 (3½)	14	8	10 (⅜)	¼"	82 (0.18)
	240	200	889 (3½)	57	8			
AHP-5052	120	100	114.3 (4½)	22	10	13 (½)	⅜"	113 (0.25)
	240	400	114.3 (4½)	80	10			
AHP-7562	120	190	139.7 (5½)	34	20	19 (¾)	¾"	308 (0.68)
	240	750	139.7 (5½)	136	20			

\* Note: To order heaters without NPT fittings add suffix "-NF" to model number, price for heaters without fittings is an additional cost for AHP-374 Series, for AHP-505 Series, and for AHP-756 Series.

\*\* These air heaters can be operated on either 120 or 240V. Specifications are shown for operation on both 120 and 240V.

† Indicates watts per inch of heated length. Use the table above to determine minimum required flow rates. The watts per inch of heated length can be changed by reducing the operating voltage or by ordering a custom made heater.

Ordering Example: AHP-3741/120, 200 W, 120 Vac "T" Type in-line air/gas heater.



**Dimensions: mm (inch)**

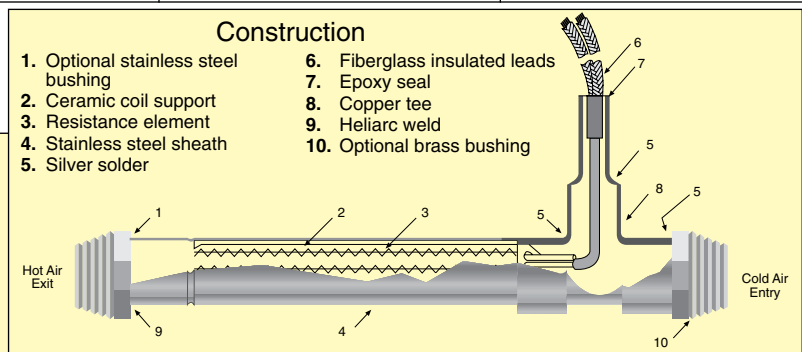
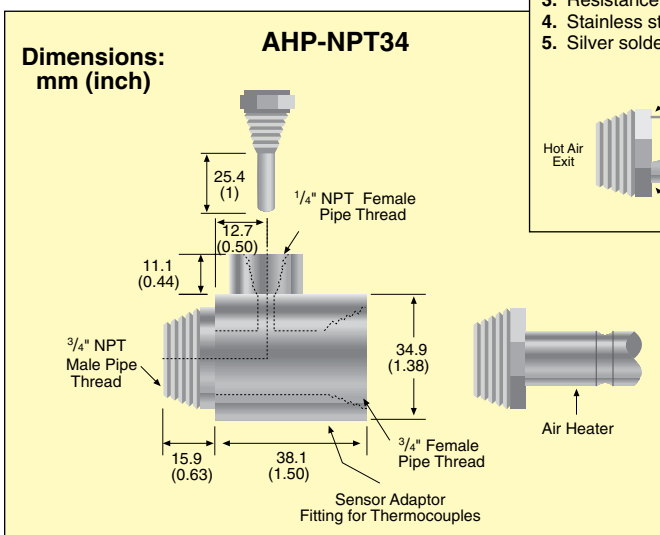
Series	Diameter	Heated Length	L	A	B
AHP-374	9.5 (3/8)	89 (3 1/2)	101.6 (4)	33.3 (1 1/8)	7.9 (5/16)
AHP-505	12.7 (1/2)	114 (4 1/2)	127.0 (5)	34.9 (1 3/8)	19 (3/4)
AHP-756	19.1 (3/4)	140 (5 1/2)	152.4 (6)	61.9 (2 3/8)	41.3 (1 5/8)

**SPECIFICATIONS**

**Pressure Rating:** 80 psig  
**Wattage Tolerance:** +5, -10% or better at the voltage specified  
**Leads:** 0.3 m L (1') fiberglass insulated leads

**Maximum Watts Per Linear Inch of Heated Length**

Minimum CFM Required	3/8" Diameter	1/2" Diameter	3/4" Diameter
1	60	80	120
2	60	80	120
4	100	100	120
6	150	150	150
8	200	200	200
10	-	250	250
15	-	-	375
20	-	-	500



**Thermocouple T-Fitting**

The AHP-NPT34 fitting can be used with subminiature thermocouple probes (see omega.com) and with stainless steel compression fittings (model SSLK-18-14) to monitor temperature at the outlet of the AHP-756 Series heaters.

**Ordering Example:** AHP-NPT34, thermocouple t-fitting.

<b>Model Number</b>
<b>AHP-NPT34</b>

# RUGGED CLEAN WATER IMMERSION HEATER—2 NPT BRASS FITTING

## ARMT-2 Series



- ✓ Ideal For Clean Liquids within pH 6 to pH 8 Range
- ✓ Quality Construction with Copper Sheath
- ✓ Models Available with 120V, 208V, 240V, or 480V, 1 Phase Power
- ✓ Integral Thermostat

The OMEGALUX® ARMT-2 Series clean water immersion heater feature 2 NPT brass fitting screw plug for direct heating of the process fluid in your tank or vessel. Tested design characteristics assure years of dependable performance.

**Note:** The integral thermostat functions as a temperature control only. This is not a fail safe device. An approved pressure or temperature control should be used with these heaters to assure safe operation. See the Temperature Section for our full selection of control devices.

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

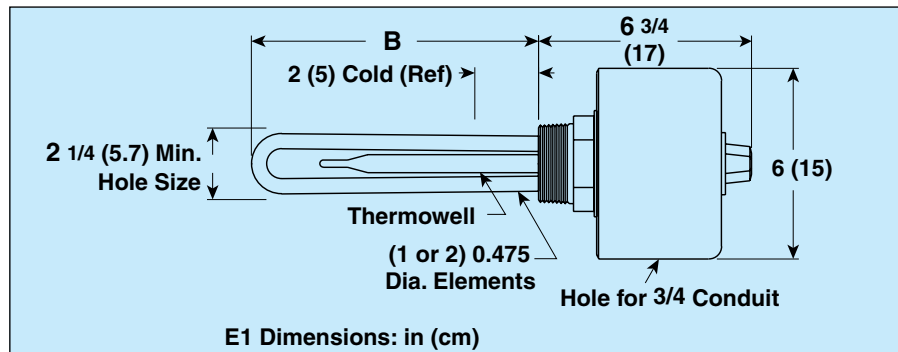


ARMT-2155/240 shown smaller than actual size.

## SPECIFICATIONS

**Wattage:** 1.5 to 15 kW  
**Power:** 120, 208, 240, 490 Vac, 1 phase power  
**Sheath:** 0.475" (1 cm) diameter copper  
**Screw Plug:** 2 NPT brass  
**Thermostat:** Bulb and capillary type, 2 temperature ranges, 60 to 250°F, 0 to 100°F

**Watt Density:** 46 to 53 W/in<sup>2</sup>  
**Enclosure:** General Purpose NEMA-1 rated; or optional type E2 moisture tight/explosion resistant enclosure  
 Meets Class I: Groups C & D, Div. 1 & 2  
 Class II: Groups E, F, & G, Div. 1 & 2  
 Class III: Div. 1 & 2



## To Order

kW	No. Phase	Dim. B W/in <sup>2</sup>	Elem.	in (cm)	T-2 Temp Range (60 to 250°F)	Wt. lb (kg)	T-1 Temp Range (0 to 100°F)	Wt. lb (kg)
					Model No.		Model No.	
1.5	1	48	1	12 (30)	ARMT-2155/*	5 (2)	ARMT-2155T1/*	5 (2)
2	1	51	2	8 (20)	ARMT-2205-3/**	5 (2)	ARMT-2205-3T1/**	5 (2)
2.5	1	48	2	9½ (20)	ARMT-2255/***	6 (3)	ARMT-2255T1/***	6 (3)
3	1	48	2	12 (30)	ARMT-2305/**	6 (3)	ARMT-2305T1/**	6 (3)
4	1	48	2	18 (46)	ARMT-2405/***	7 (3)	ARMT-2405T1/***	7 (3)
5	1	53	2	19¾ (39)	ARMT-2505/***	8 (4)	ARMT-2505T1/***	8 (4)
6	1	47	2	25½ (64)	ARMT-2605/***	8 (4)	ARMT-2605T1/***	8 (4)
7	1	49	2	28 (71)	ARMT-2705/***	9 (4)	ARMT-2705T1/***	9 (4)
10	1	46	2	40½ (103)	ARMT-2105/***	9 (4)	ARMT-2105T1/***	9 (4)
12	1	46	2	48 (122)	ARMT-2125/240	10 (5)	ARMT-2125T1/240	10 (5)
12	1	46	2	48 (122)	ARMT-2125/480	10 (5)	ARMT-2125T1/240	10 (5)
15	1	50	2	54 (137)	ARMT-21505/240	11 (5)	ARMT-21505T1/240	11 (5)

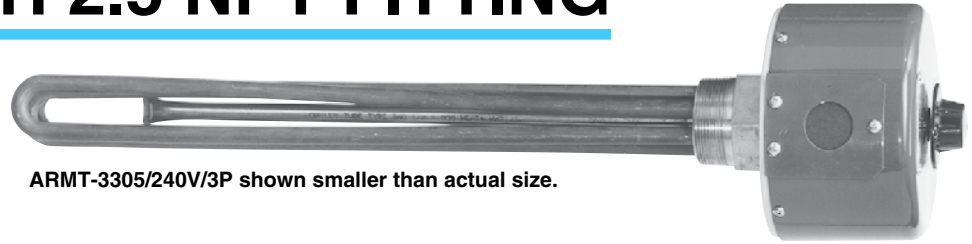
\* Designate voltage: 120, 208, or 240 Vac. /\*\* Designate voltage: 120, 208, 240, or 480 Vac. /\*\*\* Designate voltage: 208, 240, or 480 Vac. To order the unit with the optional E2 enclosure, insert "E2" into the model number as shown, ARMT-2255E2T1/240 for an additional cost. E2 enclosure not intended for use in hazardous areas.

**Ordering Examples:** ARMT-2255/480, 2.5 kW heater, powered by 480 Vac.  
 ARMT-21505T1/240, 15 kW heater, powered by 240 Vac.



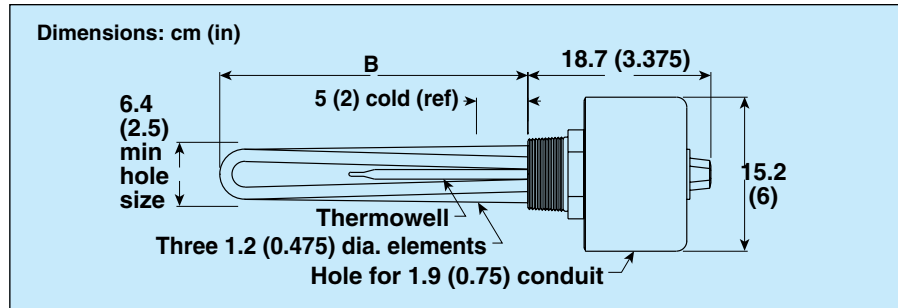
# HEATER WITH 2.5 NPT FITTING

## ARMT-3 Series



ARMT-3305/240V/3P shown smaller than actual size.

- ✓ Integral Thermostat
- ✓ General Purpose Enclosure NEMA 1 Rated
- ✓ 1 cm (0.475") Diameter Copper Sheath
- ✓ 3 to 18 kW
- ✓ Dependable 3 Element Heater Design
- ✓ 120, 208, 240 and 480 Vac Power; 1 and 3 Phase Models



**Note:** This integral thermostat functions as a temperature control only. This is not a fail safe device. An approved pressure and/or temperature control should be used with these heaters to assure safe operation.

Visit us online for our selection of control devices. Also Available with Type E2 moisture tight/explosion proof enclosure. Not intended for use in hazardous locations.

## To Order

kW	Volts	W/in <sup>2</sup>	No. Htg. Elem.	T-2 Temp Range (60 to 250°F)			T-1 Temp Range (0 to 100°F)		
				Dim. B cm (in)	Model No.	Wt. kg (lb)	Model No.	Wt. kg (lb)	
<b>ARMT-3 Series with General Purpose Enclosure</b>									
3	240	51	3	19 (7 <sup>5</sup> / <sub>8</sub> )	ARMT-3305/240V/*	3 (6)	ARMT-3305T1/240V/*	3 (6)	
3.75	240	52	3	21 (8 <sup>1</sup> / <sub>8</sub> )	ARMT-3375/240V/*	3 (6)	ARMT-3375T1/240V/*	3 (6)	
4.5	120	48	3	29 (11 <sup>3</sup> / <sub>8</sub> )	ARMT-3455/120V	3 (6)	ARMT-3455T1/120V	3 (6)	
4.5	208	48	3	29 (11 <sup>3</sup> / <sub>8</sub> )	ARMT-3455/208V/*	3 (7)	ARMT-3455T1/208V/*	3 (7)	
4.5	240	48	3	29 (11 <sup>3</sup> / <sub>8</sub> )	ARMT-3455/240V/*	3 (7)	ARMT-3455T1/240V/*	3 (7)	
4.5	480	48	3	29 (11 <sup>3</sup> / <sub>8</sub> )	ARMT-3455/480V/*	3 (7)	ARMT-3455T1/480V/*	3 (7)	
6	120	48	3	44 (17 <sup>1</sup> / <sub>2</sub> )	ARMT-3605/120V	4 (8)	ARMT-3605T1/120V	4 (8)	
6	208	48	3	44 (17 <sup>1</sup> / <sub>2</sub> )	ARMT-3605/208V/*	4 (8)	ARMT-3605T1/208V/*	4 (8)	
6	240	48	3	44 (17 <sup>1</sup> / <sub>2</sub> )	ARMT-3605/240V/*	4 (8)	ARMT-3605T1/240V/*	4 (8)	
6	480	48	3	44 (17 <sup>1</sup> / <sub>2</sub> )	ARMT-3605/480V/*	4 (8)	ARMT-3605T1/480V/*	4 (8)	
7.5	208	53	3	49 (19 <sup>1</sup> / <sub>8</sub> )	ARMT-3755/208V/*	4 (8)	ARMT-3755T1/208V/*	4 (8)	
7.5	240	53	3	49 (19 <sup>1</sup> / <sub>8</sub> )	ARMT-3755/240V/*	4 (8)	ARMT-3755T1/240V/*	4 (8)	
7.5	480	53	3	49 (19 <sup>1</sup> / <sub>8</sub> )	ARMT-3755/480V/*	4 (8)	ARMT-3755T1/480V/*	4 (8)	
9	208	47	3	62 (24 <sup>1</sup> / <sub>2</sub> )	ARMT-3905/208V/*	4 (9)	ARMT-3905T1/208V/*	4 (9)	
9	240	47	3	62 (24 <sup>1</sup> / <sub>2</sub> )	ARMT-3905/240V/*	4 (9)	ARMT-3905T1/240V/*	4 (9)	
9	480	47	3	62 (24 <sup>1</sup> / <sub>2</sub> )	ARMT-3905/480V/*	4 (9)	ARMT-3905T1/480V/*	4 (9)	
12	240	46	3	82 (32 <sup>5</sup> / <sub>8</sub> )	<sup>1</sup> ARMT-31205/240V/*	6 (13)	<sup>1</sup> ARMT-31205T1/240V/*	6 (13)	
12	480	46	3	82 (32 <sup>5</sup> / <sub>8</sub> )	ARMT-31205/480V/*	6 (13)	ARMT-31205T1/480V/*	6 (13)	
15	208	46	3	101 (39 <sup>3</sup> / <sub>8</sub> )	<sup>1</sup> ARMT-31505/208V/*	6 (14)	<sup>1</sup> ARMT-31505T1/208V/*	6 (14)	
15	240	46	3	101 (39 <sup>3</sup> / <sub>8</sub> )	<sup>1</sup> ARMT-31505/240V/*	6 (14)	<sup>1</sup> ARMT-31505T1/240V/*	6 (14)	
15	480	46	3	101 (39 <sup>3</sup> / <sub>8</sub> )	ARMT-31505/480V/*	6 (14)	ARMT-31505T1/480V/*	6 (14)	

/\* Insert the suffix "3P" to the model number for 3 phase power. Other voltages available contact OMEGALUX.<sup>®</sup>  
See next page for caution and warning note.

<sup>1</sup> Not UL Listed or CSA Certified for 1 Phase (exceeds 48 amps)

**Ordering Examples:** ARMT-3305/240V/3P, 3 kW heater powered by 3 phase 240 Vac.

ARMT-3755/240V, 7.5 kW heater.

# IMMERSION HEATERS, INCOLOY SHEATH—2 NPT FITTING

ARMTI-2 Series Starts at

**\$1100**



- ✓ Ideal Immersion for Severe, Hard Water pH 5 to 9
- ✓ Integral Thermostat
- ✓ 2 NPT Stainless Steel Fitting with 2 Heating Elements
- ✓ Available with NEMA-1 Rated General Purpose Enclosure, or Explosion Resistant Enclosure
- ✓ 240 or 480V, 1 Phase Power
- ✓ 46 to 51 W/in<sup>2</sup> Watt Density

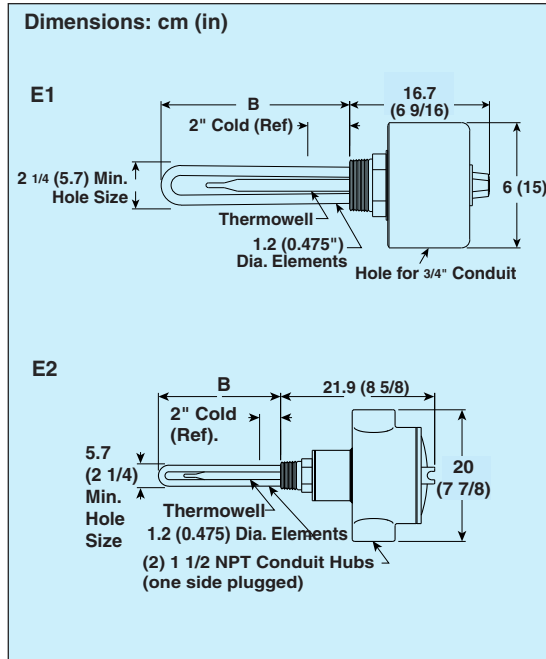
## SPECIFICATIONS

**Wattage:** 2 to 15 kW  
**Power:** 240, or 480V; 1 phase  
**Sheath:** 1.2 cm (0.475") diameter incoloy  
**Screw Plug:** 2 NPT stainless steel  
**Thermostat:** Bulb and capillary  
**Enclosure:** General purpose, NEMA-1 rated, or type E2 moisture resistant/explosion resistant enclosure

*Note: The integral thermostat functions as a temperature control only. This is not a fail safe device. An approved pressure or temperature control should be used with these heaters to assure safe operation. See Section P for our selection of control devices.*

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.



ARMTI-2255/240, \$1100, shown smaller than actual size.

ARMTI-2305E2/240, \$1400, shown smaller than actual size.

**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Phase	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B cm (in)	Temp Range (60 to 250°F)		Wt. lb(kg)	T-1 Temp Range (0 to 100°F)		Wt. lb(kg)
					Model No.	Price		Model No.	Price	
<b>ARMTI-2 Series with E1 General Purpose Terminal Enclosure<sup>1</sup></b>										
2	1	51	2	22 (8)	ARMTI-2205-3/*	\$1100	6(3)	ARMTI-2205-3T1/*	\$1100	6(3)
2.5	1	51	2	23 (9)	ARMTI-2255/*	1100	7(3)	ARMTI-2255/*	1100	7(3)
3	1	48	2	30 (12)	ARMTI-2305/*	1150	7(3)	ARMTI-2305/*	1150	7(3)
4	1	47	2	44 (17½)	ARMTI-2405/*	1200	7(3)	ARMTI-2405/*	1200	7(3)
5	1	46	2	50 (19¾)	ARMTI-2505/*	1300	8(4)	ARMTI-2505/*	1300	8(4)
6	1	46	2	64 (25¼)	ARMTI-2605/*	1350	8(4)	ARMTI-2605/*	1350	8(4)
7	1	49	2	71 (28¾)	ARMTI-2705/*	1350	9(4)	ARMTI-2705/*	1350	9(4)
10	1	46	2	71 (40¾)	ARMTI-21005/*	1550	10(5)	ARMTI-21005/*	1550	10(5)
12	1	46	2	71 (47¾)	†ARMTI-21205/*	1650	11(5)	†ARMTI-21205/*	1650	11(5)
15	1	50	2	137 (54)	†ARMTI-21505/*	1800	12(5)	†ARMTI-21505/*	1800	12(5)
<b>ARMTI-2 Series with E2 Moisture Resistant/Explosion Resistant Enclosure<sup>2</sup></b>										
2	1	51	2	22 (8)	ARMTI-2205-3E2/*	\$1350	12(5)	ARMTI-2205-3E2T1/*	\$1350	12(5)
2.5	1	51	2	23 (9)	ARMTI-2255E2/*	1350	13(6)	ARMTI-2255E2T1/*	1350	13(6)
3	1	48	2	30 (12)	ARMTI-2305E2/*	1400	13(6)	ARMTI-2305E2T1/*	1400	13(6)
4	1	47	2	44 (17½)	ARMTI-2405E2/*	1450	13(6)	ARMTI-2405E2T1/*	1450	13(6)
5	1	46	2	50 (19¾)	ARMTI-2505E2/*	1650	14(6)	ARMTI-2505E2T1/*	1650	14(6)
6	1	46	2	64 (25¼)	ARMTI-2605E2/*	1600	14(6)	ARMTI-2605E2T1/*	1600	14(6)
7	1	49	2	71 (28¾)	ARMTI-2705E2/*	1600	15(7)	ARMTI-2705E2T1/*	1600	15(7)
10	1	46	2	71 (40¾)	ARMTI-21005E2/*	1800	16(7)	ARMTI-21005E2T1/*	1800	16(7)
12	1	46	2	71 (47¾)	†ARMTI-21205E2/*	1900	17(7)	†ARMTI-21205E2T1/*	1900	15(7)
15	1	50	2	137 (54)	†ARMTI-21505E2/*	1900	18(8)	†ARMTI-21505E2T1/*	1900	18(8)

\* Insert "240" for 240 Vac, or "480" for 480 Vac

<sup>1</sup> Heaters with general purpose enclosures are UL Listed and CSA certified except models with † (exceeds 48 amps).

<sup>2</sup> Heaters with moisture resistant/explosion resistant enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas. Except models with † (exceeds 48 amps).

**Ordering Examples:** ARMTI-2255/240, 2.5 kW heater with thermostat range of 60 to 250°F powered by 240 Vac, \$1100.

ARMTI-2305E2/240 explosion resistant immersion heater \$1400



**UNITED STATES**

[www.omega.com](http://www.omega.com)  
1-800-TC-OMEGA  
Stamford, CT.

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[www.omega.ca](http://www.omega.ca)  
Laval(Quebec)  
1-800-TC-OMEGA

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0800-8266342

**UNITED KINGDOM**

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088-466-342

**CZECH REPUBLIC**

[www.omegaeng.cz](http://www.omegaeng.cz)  
Karviná, Czech Republic  
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**BENELUX**

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## More than 100,000 Products Available!

### • Temperature

Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

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Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

### • Data Acquisition

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# SOLUTION WATER IMMERSION HEATERS—2.5 NPT FITTING

ARMTI-3305/240, \$1300, shown smaller than actual size.

ARMTI-3 Series Starts at  
**\$1300**



- ✓ Thermostat for Reliable Operation
- ✓ Incoloy® Sheath for Compatibility with Most Industrial Fluids
- ✓ 240 and 480V Models with 3 Phase Power
- ✓ 3 to 18 kW
- ✓ 46 to 51 W/in<sup>2</sup>

## SPECIFICATIONS

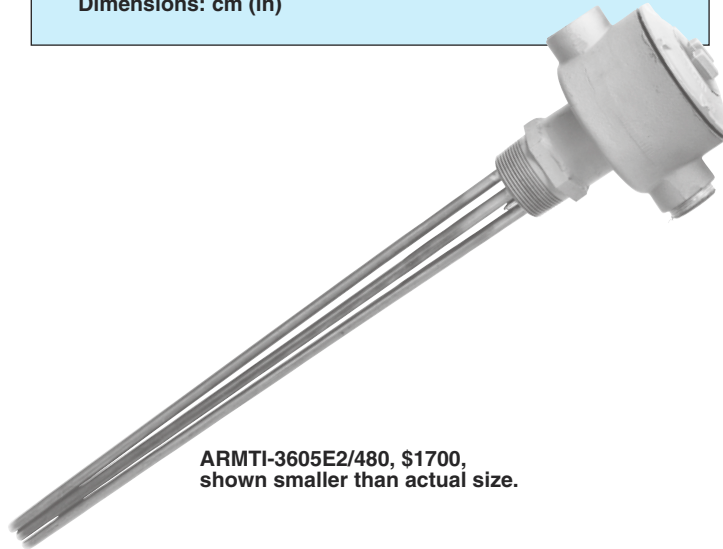
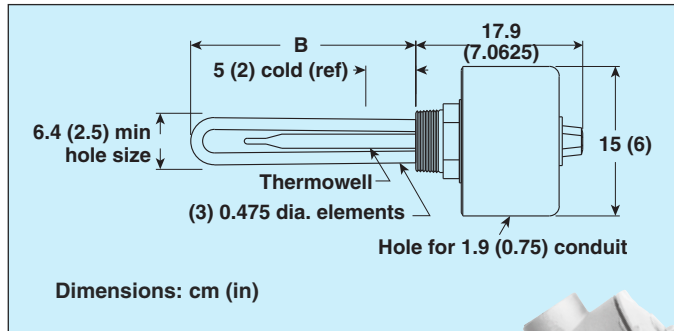
**Wattage:** 3 to 18 kW  
**Power:** 240 or 480 V—3 phase  
**Sheath:** 3 cm (0.475") diameter Incoloy  
**Screw Plug:** 2½ NPT stainless steel  
**Thermostat:** Bulb and capillary  
**Enclosure:** General Purpose, NEMA 1 rated, or type E2 moisture resistant/explosion resistant<sup>2</sup> enclosure

**Note:** The integral thermostat functions as a temperature control only. This is not a fail safe device. An approved pressure or temperature control should be used with these heaters to assure safe operation. See Section P for our selection of control devices.

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

<sup>1</sup> Heaters with General Purpose Enclosures are UL Listed and CSA Certified.  
<sup>2</sup> Heaters with Moisture Resistant/Explosion Resistant Enclosures are CSA NRTL/C Certified and not intended for use in hazardous areas.



ARMTI-3605E2/480, \$1700, shown smaller than actual size.

### **MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)										
kW	Phase	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B cm (in)	Temp Range (60 to 250°F)		Wt. kg (lb)	T-1 Temp Range (0 to 100°F)		Wt. kg (lb)
					Model No.	Price		Model No.	Price	
<b>ARMTI-3 Series with General Purpose Terminal Enclosure<sup>1</sup></b>										
3	3	51	3	17 (7)	ARMTI-3305/*	\$1300	4 (8)	ARMTI-3305T1/*	\$1300	4 (8)
4.5	3	48	3	30 (11)	ARMTI-3455/*	1372	4 (8)	ARMTI-3455T1/*	1372	4 (8)
6	3	48	3	44 (17%)	ARMTI-3605/*	1700	4 (9)	ARMTI-3605T1/*	1700	4 (9)
7.5	3	53	3	48 (19)	ARMTI-3755/*	1525	5 (10)	ARMTI-3755T1/*	1525	5 (10)
9	3	47	3	62 (24%)	ARMTI-3905/*	1600	5 (10)	ARMTI-3905T1/*	1600	5 (10)
12	3	46	3	64 (32¼)	ARMTI-3120/*	1750	5 (11)	ARMTI-3120T1/*	1750	5 (11)
15	3	46	3	101 (39%)	ARMTI-3150/*	1900	5 (12)	ARMTI-3150T1/240	1900	5 (12)
18	3	51	3	120 (47%)	ARMTI-3180/*	2050	6 (13)	ARMTI-3180T1/240	2050	6 (13)
<b>ARMTI-3 Series with Type E2 Moisture Resistant/Explosion Resistant Enclosure<sup>2</sup></b>										
3	3	51	3	17 (7)	ARMTI-3305E2/*	\$1550	6 (13)	ARMTI-3305E2T1/*	\$1550	6 (13)
4.5	3	48	3	30 (11)	ARMTI-3455E2/*	1600	6 (13)	ARMTI-3455E2T1/*	1600	6 (13)
6	3	48	3	44 (17%)	ARMTI-3605E2/*	1700	6 (14)	ARMTI-3605E2T1/*	1700	6 (14)
7.5	3	53	3	48 (19)	ARMTI-3755E2/*	1750	7 (15)	ARMTI-3755E2T1/*	1750	7 (15)
9	3	47	3	62 (24%)	ARMTI-3905E2/*	1850	7 (15)	ARMTI-3905E2T1/*	1850	7 (15)
12	3	46	3	82 (32¼)	ARMTI-3120E2/*	2000	7 (16)	ARMTI-3120E2T1/*	2000	7 (16)
15	3	46	3	101 (39%)	ARMTI-3150E2/*	2150	8 (17)	ARMTI-3150E2T1/*	2150	8 (17)
18	3	51	3	120 (47%)	ARMTI-3180E2/*	2300	8 (18)	ARMTI-3180E2T1/*	2300	8 (18)

/\* Insert "240" for 240 Vac or "480" for 480 Vac. \* Not intended for use in hazardous areas.

**Ordering Examples:** ARMTI-3305/240, 3 kW, 3-phase heater with thermostat range of 60 to 250°F, powered by 240 Vac, \$1300.

ARMTI-3120/120V, 12 kW, 3-phase heater with thermostat range of 60 to 250°F, \$1750.



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Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# LIGHT WEIGHT OIL IMMERSION HEATER

## With Integral Thermostat—2 NPT Steel Fitting

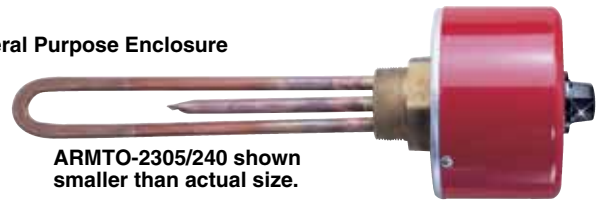
ARMT0-2 Series



- ✓ Built-In Thermostat—Three Temperature Ranges Available
- ✓ 1.5 to 6 kW
- ✓ 120, 208, 240 or 480V, 1 Phase
- ✓ Rugged, 2 Element Design
- ✓ Premium Grade Steel Sheath
- ✓ Lower Watt Densities for Heating Lightweight Oils

**Note:** The integral thermostat functions as a temperature control only. This is not a fail safe device. An approved pressure and/or temperature limit control should be used with these heaters to assure safe operation. Visit OMEGA section for our selection of control devices.

E1-General Purpose Enclosure

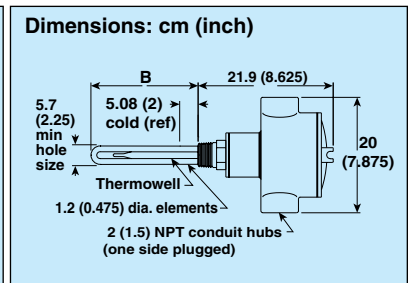
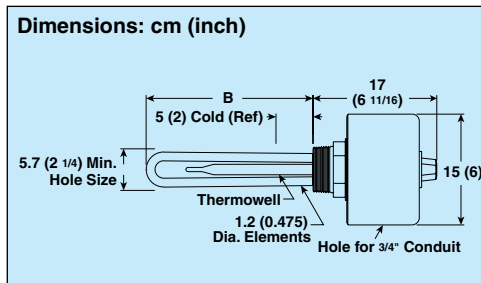


ARMT0-2305/240 shown smaller than actual size.

E2-Moisture Resistant/Explosion Resistant Enclosure



ARMT0-2305E2/240 shown smaller than actual size.



To Order							
kW	Htg. W/in <sup>2</sup>	Dim. B Elem.	No. cm (in)	Temp Range 200 to 550°F†	Temp Range 60 to 250°F	Temp Range 0 to 100°F	Wt. lb (kg)
				Model No.	Model No.	Model No.	
<b>General Purpose Enclosure</b>							
1.5	24	2	30 (11 <sup>3</sup> / <sub>4</sub> )	ARMT0-2155/*	ARMT0-2155T2/*	ARMT0-2155T1/*	6 (3)
2	24	2	45 (17 <sup>3</sup> / <sub>4</sub> )	ARMT0-2205/*	ARMT0-2205T2/*	ARMT0-2205T1/*	7 (3)
2.5	26	2	50 (19 <sup>5</sup> / <sub>8</sub> )	ARMT0-2255/*	ARMT0-2255T2/*	ARMT0-2255T1/*	8 (4)
3	23	2	63 (24 <sup>7</sup> / <sub>8</sub> )	ARMT0-2305/*	ARMT0-2305T2/*	ARMT0-2305T1/*	8 (1)
4	23	2	83 (32 <sup>3</sup> / <sub>4</sub> )	ARMT0-2405/*	ARMT0-2405T2/*	ARMT0-2405T1/*	9 (4)
5	23	2	102 (40 <sup>1</sup> / <sub>4</sub> )	ARMT0-2505/*	ARMT0-2505T2/*	ARMT0-2505T1/*	9 (4)
6	23	2	121 (47 <sup>3</sup> / <sub>4</sub> )	ARMT0-2605/**	ARMT0-2605T2/**	ARMT0-2605T1/**	10 (5)
<b>Moisture Resistant/Explosion Resistant Enclosure</b>							
1.5	24	2	30 (11 <sup>3</sup> / <sub>4</sub> )	ARMT0-2155E2/*	ARMT0-2155E2T2/*	ARMT0-2155E2T1/*	12 (5)
2	24	2	45 (17 <sup>3</sup> / <sub>4</sub> )	ARMT0-2205E2/*	ARMT0-2205E2T2/*	ARMT0-2205E2T1/*	12 (5)
2.5	26	2	50 (19 <sup>5</sup> / <sub>8</sub> )	ARMT0-2255E2/*	ARMT0-2255E2T2/*	ARMT0-2255E2T1/*	13 (6)
3	23	2	63 (24 <sup>7</sup> / <sub>8</sub> )	ARMT0-2305E2/*	ARMT0-2305E2T2/*	ARMT0-2305E2T1/*	13 (6)
4	23	2	83 (32 <sup>3</sup> / <sub>4</sub> )	ARMT0-2405E2/*	ARMT0-2405E2T2/*	ARMT0-2405E2T1/*	14 (6)
5	23	2	102 (40 <sup>1</sup> / <sub>4</sub> )	ARMT0-2505E2/*	ARMT0-2505E2T2/*	ARMT0-2505E2T1/*	14 (6)
6	23	2	121 (47 <sup>3</sup> / <sub>4</sub> )	ARMT0-2605E2/**	ARMT0-2605E2T2/**	ARMT0-2605E2T1/**	15 (7)

/\* Designate voltage, i.e., insert "120" for 120 Vac, "208" for 208 Vac, "240" for 240 Vac, or "480" for 480 Vac.

\*\* Designate voltage, i.e., insert "208" for 208 Vac, "240" for 240 Vac, or "480" for 480 Vac.

† Heaters with temperature ranges 200 to 550°F are not UL listed.

**Caution:** Explosion resistant type E2 construction refers to heater design features which provide explosion resisting containment of electrical wiring according to National Electric Code. Abnormal application or use of heaters which results in excessive temperatures can create hazardous conditions which can lead to fire.

Consult OMEGA for data on allowable watt densities for more viscous materials.

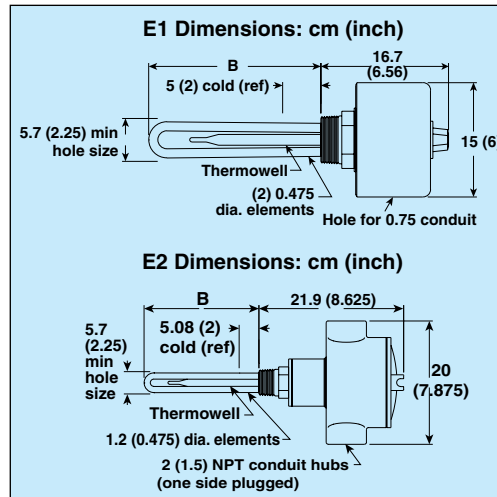
**Ordering Examples:** ARMT0-2155/208, 1.5 kW heater with thermostat range of 200 to 550°F, powered by 208 Vac.

## With Integral Thermostat—2 NPT Fitting



### ARMTO-2 Series

- ✓ Steel Sheath and Low Watt Density for Heating Medium Weight Oils
- ✓ Integral Thermostat Three Temperature Ranges Available
- ✓ 2 to 6 kW
- ✓ 208, 240 or 480V; 1 Phase
- ✓ 2 Element Construction with 2 NPT Steel Fitting



ARMTO-2020/240 shown smaller than actual size.

ARMTO-2020E2T1/240 shown smaller than actual size.

### APPLICATIONS

**Heating medium viscosity oil—** Suitable for heating medium bodied oils such as industrial gear oils or numbers 4 and 5 residual fuel oils. Heating provides low ambient temperature protection, ensuring that oil remains fluid to lubricate effectively and reduce load on gear motor drives.

### SPECIFICATIONS

**Wattage:** 2 to 6 kW  
**Power:** 240, or 480V; 1 phase  
**Watt Density:** 15 W/in<sup>2</sup>  
**Sheath:** 0.475" diameter steel  
**Screw Plug:** 2 NPT steel  
**Enclosure:** General purpose<sup>1</sup>, NEMA-1 rated, or E2 moisture resistant/explosion resistant enclosure<sup>2</sup>; see caution below

*Note: This integral thermostat functions as a temperature control only. This is not a fail safe device. An approved pressure and/or temperature limit control should be used with these heaters to assure safe operation. Visit OMEGA for our selection of controllers.*

### To Order

kW	W/in <sup>2</sup>	Elem.	No. Dim. B cm (in)	T3 Temp Range (200 to 550°F) Model No.	T2 Temp Range (60 to 250°F) Model No.	T1 Temp Range (0 to 100°F) Model No.	Htg. Wt. lb (kg)
<b>ARMTO-2 Series with General Purpose Enclosure<sup>1</sup></b>							
2	15	2	16 (24 <sup>7</sup> / <sub>8</sub> )	ARMTO-2020/*	ARMTO-2020T2/*	ARMTO-2020T1/*	4 (8)
2.66	15	2	16 (32 <sup>3</sup> / <sub>4</sub> )	ARMTO-2026/*	ARMTO-2026T2/*	ARMTO-2026T1/*	4 (9)
3.33	15	2	20 (40 <sup>1</sup> / <sub>4</sub> )	ARMTO-2033/*	ARMTO-2033T2/*	ARMTO-2033T1/*	4 (9)
4	15	2	23 (47 <sup>3</sup> / <sub>4</sub> )	ARMTO-2040/**	ARMTO-2040T2/**	ARMTO-2040T1/**	5 (10)
5	15	2	31 (57 <sup>1</sup> / <sub>2</sub> )	ARMTO-2050/*	ARMTO-2050T2/*	ARMTO-2050T1/*	5 (11)
6	15	2	41 (67 <sup>3</sup> / <sub>4</sub> )	ARMTO-2060/*	ARMTO-2060T2/*	ARMTO-2060T1/*	5 (12)
<b>ARMTO-2 Series with Moisture Tight/Explosion Resistant Enclosure<sup>2†</sup></b>							
0.2	15	2	16 (24 <sup>7</sup> / <sub>8</sub> )	ARMTO-2020E2/*	ARMTO-2020E2T2/*	ARMTO-2020E2T1/*	6 (13)
2.66	15	2	16 (32 <sup>3</sup> / <sub>4</sub> )	ARMTO-2026E2/*	ARMTO-2026E2T2/*	ARMTO-2026E2T1/*	6 (14)
3.33	15	2	20 (40 <sup>1</sup> / <sub>4</sub> )	ARMTO-2033E2/*	ARMTO-2033E2T2/*	ARMTO-2033E2T1/*	6 (14)
4	15	2	23 (47 <sup>3</sup> / <sub>4</sub> )	ARMTO-2040E2/**	ARMTO-2040E2T2/**	ARMTO-2040E2T1/**	7 (15)
5	15	2	31 (57 <sup>1</sup> / <sub>2</sub> )	ARMTO-2050E2/*	ARMTO-2050E2T2/*	ARMTO-2050E2T1/*	7 (16)
6	15	2	31 (67 <sup>3</sup> / <sub>4</sub> )	ARMTO-2060E2/*	ARMTO-2060E2T2/*	ARMTO-2060E2T1/*	8 (17)

/\* Designate voltage, i.e., insert "240" for 240 Vac, or "480" for 480 Vac.

\*\* Designate voltage, ie., insert "208" for 208 Vac, "240" for 240 Vac, or "480" for 480 Vac.

<sup>1</sup> Heaters with general purpose enclosures are UL Listed with T1 or T2 temps and CSA certified with T1, T2 or T3 temps.

<sup>2</sup> Heaters with moisture resistant/explosion resistant enclosures are CSA NRTL/C certified with T1, T2 or T3 temps.

**Ordering Examples:** ARMTO-2020/240, 2 kW heater with thermostat range of 200 to 550°F, powered by 240 Vac.

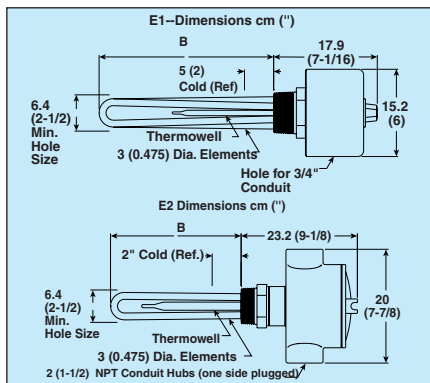
ARMTO-2020E2/120V, 0.2 kW heater with thermostat range of 200 to 550°F, powered by 120 Vac.

† **Caution:** Explosion resistant type E2 construction refers to heater design features which provide explosion resisting containment of electrical wiring according to National Electric Code. Abnormal application or use of heaters which in excessive temperatures can create hazardous conditions which can lead to fire consult OMEGA for data on allowable watt densities for more viscous materials.

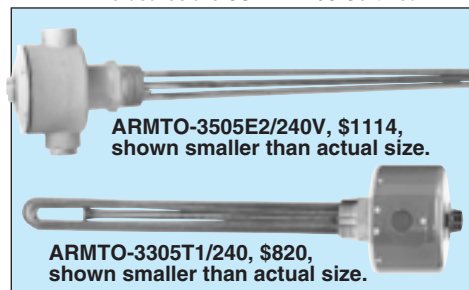
# With Integral Thermostat—2½" NPT Screw Plug ARMTO-3 Series



- Built in Thermostat—  
Three Temperature Ranges Available
- Steel Sheath and Lower Watt Density for Heating  
Lightweight Oils
- 208, 240 or 480 V  
1 & 3 Phase



<sup>1</sup>Heaters with T1 or T2 Temps are UL Listed.  
<sup>2</sup>Heaters with T1, T2 or T3 Temps are CSA Certified.  
<sup>3</sup>Heaters with Moisture Res./Explosion Res. Enclosures are CSA NRTL/C Certified.



## To Order (Specify Model Number)

kW	Volts	W/in <sup>2</sup>	No. Htg. Elem.	Dim B cm (")	T-3 Temp. Range (200-550°F)		T-2 Temp. Range (60-250°F)		T-1 Temp. Range (0-180°F)		Wt kg (lb)
					Model No.	Price	Model No.	Price	Model No.	Price	
<b>ARMTO-3 Series with General Purpose Enclosure<sup>1</sup></b>											
3	208	24	3	44 (17 3/8)	ARMTO-3305/208/*	\$820	ARMTO-3305T2/208/*	\$820	ARMTO-3305T1/208/*	\$820	4 (9)
3	240	24	3	44 (17 3/8)	ARMTO-3305/240/*	820	ARMTO-3305T2/240/*	820	ARMTO-3305T1/240/*	820	4 (9)
3	480	24	3	44 (17 3/8)	ARMTO-3305/480/*	820	ARMTO-3305T2/480/*	820	ARMTO-3305T1/480/*	820	4 (9)
3.75	208	26	3	49 (19 1/8)	ARMTO-3375/208/*	859	ARMTO-3375T2/208/*	859	ARMTO-3375T1/208/*	859	5 (10)
3.75	240	26	3	49 (19 1/8)	ARMTO-3375/240/*	859	ARMTO-3375T2/240/*	859	ARMTO-3375T1/240/*	859	5 (10)
3.75	480	26	3	49 (19 1/8)	ARMTO-3375/480/*	859	ARMTO-3375T2/480/*	859	ARMTO-3375T1/480/*	859	5 (10)
4.5	208	24	3	62 (24 1/2)	ARMTO-3455/208/*	900	ARMTO-3455T2/208/*	900	ARMTO-3455T1/208/*	900	5 (11)
4.5	240	24	3	62 (24 1/2)	ARMTO-3455/240/*	900	ARMTO-3455T2/240/*	900	ARMTO-3455T1/240/*	900	5 (11)
4.5	480	24	3	62 (24 1/2)	ARMTO-3455/480/*	900	ARMTO-3455T2/480/*	900	ARMTO-3455T1/480/*	900	5 (11)
6	208	23	3	82 (32 3/8)	ARMTO-3605/208/*	1014	ARMTO-3605T2/208/*	1014	ARMTO-3605T1/208/*	1014	5 (12)
6	240	23	3	82 (32 3/8)	ARMTO-3605/240/*	1014	ARMTO-3605T2/240/*	1014	ARMTO-3605T1/240/*	1014	5 (12)
6	480	23	3	82 (32 3/8)	ARMTO-3605/480/*	1014	ARMTO-3605T2/480/*	1014	ARMTO-3605T1/480/*	1014	5 (12)
7.5	208	23	3	101 (39 3/8)	ARMTO-3755/208/*	1132	ARMTO-3755T2/208/*	1132	ARMTO-3755T1/208/*	1132	6 (13)
7.5	240	23	3	101 (39 3/8)	ARMTO-3755/240/*	1132	ARMTO-3755T2/240/*	1132	ARMTO-3755T1/240/*	1132	6 (13)
7.5	480	23	3	101 (39 3/8)	ARMTO-3755/480/*	1132	ARMTO-3755T2/480/*	1132	ARMTO-3755T1/480/*	1132	6 (13)
9	208	23	3	120 (47 3/8)	ARMTO-3905/208/*	1224	ARMTO-3905T2/208/*	1224	ARMTO-3905T1/208/*	1224	6 (14)
9	240	23	3	120 (47 3/8)	ARMTO-3905/240/*	1224	ARMTO-3905T2/240/*	1224	ARMTO-3905T1/240/*	1224	6 (14)
9	480	23	3	120 (47 3/8)	ARMTO-3905/480/*	1224	ARMTO-3905T2/480/*	1224	ARMTO-3905T1/480/*	1224	6 (14)
<b>ARMTO-3 Series with E2 Moisture Resistant/Explosion Resistant Enclosure<sup>1,2</sup></b>											
3	208	24	3	44 (17 3/8)	ARMTO-3305E2/208/*	\$1114	ARMTO-3305E2T2/208/*	\$1114	ARMTO-3305E2T1/208/*	\$1114	6 (14)
3	240	24	3	44 (17 3/8)	ARMTO-3305E2/240/*	\$1114	ARMTO-3305E2T2/240/*	\$1114	ARMTO-3305E2T1/240/*	\$1114	6 (14)
3	480	24	3	44 (17 3/8)	ARMTO-3305E2/480/*	\$1114	ARMTO-3305E2T2/480/*	\$1114	ARMTO-3305E2T1/480/*	\$1114	6 (14)
3.75	208	26	3	49 (19 1/8)	ARMTO-3375E2/208/*	\$1152	ARMTO-3375E2T2/208/*	\$1152	ARMTO-3375E2T1/208/*	\$1152	7 (15)
3.75	240	26	3	49 (19 1/8)	ARMTO-3375E2/240/*	\$1152	ARMTO-3375E2T2/240/*	\$1152	ARMTO-3375E2T1/240/*	\$1152	7 (15)
3.75	480	26	3	49 (19 1/8)	ARMTO-3375E2/480/*	\$1152	ARMTO-3375E2T2/480/*	\$1152	ARMTO-3375E2T1/480/*	\$1152	7 (15)
4.5	208	24	3	62 (24 1/2)	ARMTO-3455E2/208/*	\$1200	ARMTO-3455E2T2/208/*	\$1200	ARMTO-3455E2T1/208/*	\$1200	7 (16)
4.5	240	24	3	62 (24 1/2)	ARMTO-3455E2/240/*	\$1200	ARMTO-3455E2T2/240/*	\$1200	ARMTO-3455E2T1/240/*	\$1200	7 (16)
4.5	480	24	3	62 (24 1/2)	ARMTO-3455E2/480/*	\$1200	ARMTO-3455E2T2/480/*	\$1200	ARMTO-3455E2T1/480/*	\$1200	7 (16)
6	208	23	3	82 (32 3/8)	ARMTO-3605E2/208/*	\$1315	ARMTO-3605E2T2/208/*	\$1315	ARMTO-3605E2T1/208/*	\$1315	8 (17)
6	240	23	3	82 (32 3/8)	ARMTO-3605E2/240/*	\$1315	ARMTO-3605E2T2/240/*	\$1315	ARMTO-3605E2T1/240/*	\$1315	8 (17)
6	480	23	3	82 (32 3/8)	ARMTO-3605E2/480/*	\$1315	ARMTO-3605E2T2/480/*	\$1315	ARMTO-3605E2T1/480/*	\$1315	8 (17)
7.5	208	23	3	101 (39 3/8)	ARMTO-3755E2/208/*	\$1428	ARMTO-3755E2T2/208/*	\$1428	ARMTO-3755E2T1/208/*	\$1428	9 (18)
7.5	240	23	3	101 (39 3/8)	ARMTO-3755E2/240/*	\$1428	ARMTO-3755E2T2/240/*	\$1428	ARMTO-3755E2T1/240/*	\$1428	9 (18)
7.5	480	23	3	101 (39 3/8)	ARMTO-3755E2/480/*	\$1428	ARMTO-3755E2T2/480/*	\$1428	ARMTO-3755E2T1/480/*	\$1428	9 (18)
9	208	23	3	120 (47 3/8)	ARMTO-3905E2/208/*	\$1523	ARMTO-3905E2T2/208/*	\$1523	ARMTO-3905E2T1/208/*	\$1523	9 (19)
9	240	23	3	120 (47 3/8)	ARMTO-3905E2/240/*	\$1523	ARMTO-3905E2T2/240/*	\$1523	ARMTO-3905E2T1/240/*	\$1523	9 (19)
9	480	23	3	120 (47 3/8)	ARMTO-3905E2/480/*	\$1523	ARMTO-3905E2T2/480/*	\$1523	ARMTO-3905E2T1/480/*	\$1523	9 (19)

\* Add the suffix "3P" to the model number for 3 phase power. Consult Section Z for data on allowable watt densities for viscous materials.  
†CAUTION: Explosion resistant type E2 construction refers to heater design features which provide explosion resisting containment of electrical wiring according to National Electric Code. Abnormal application or use of heaters which result in excessive temperatures can create hazardous conditions which can lead to fire. Not intended for use in hazardous areas.  
<sup>1</sup>Heaters with General Purpose Enclosures are UL Listed with T1 or T2 Temps and CSA Certified with T1, T2 or T3 Temps.  
<sup>2</sup>Heaters with Moisture Resistant/Explosion Resistant Enclosures are CSA NRTL/C Certified with T1, T2 or T3 Temps.







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### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

### • pH and Conductivity

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

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Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

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### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# With Integral Thermostat—2½ NPT Steel Fitting

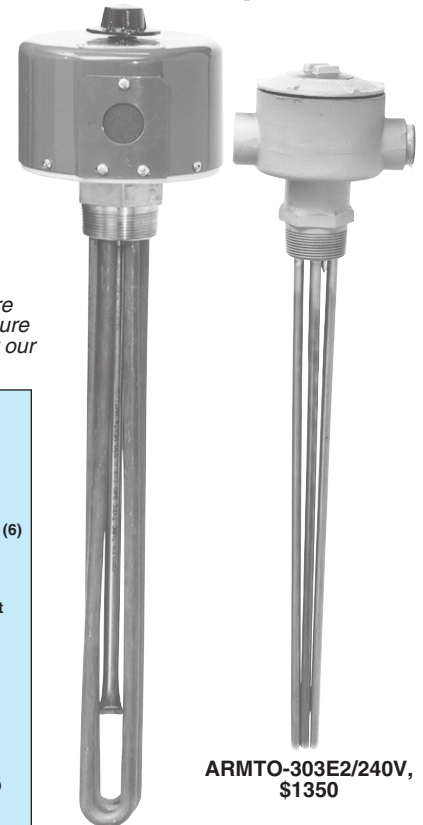
- ✓ 3 to 9kW
- ✓ Rugged 3 Element Steel Construction
- ✓ Low Watt Density, 15 W/in<sup>2</sup>
- ✓ Built-in Thermostat, Three Temperature Ranges Available
- ✓ 240 and 480V, 3 Phase

ARMTO-3 Series  
Starts at

**\$1100**



*Note: The integral thermostat functions as a temperature control only. This is not a fail safe device. An approved pressure and/or temperature control should be used with these heaters to assure safe operation. See the Temperature Section for our selection of control devices.*



ARMTO-303/240, \$1100

ARMTO-303E2/240V, \$1350

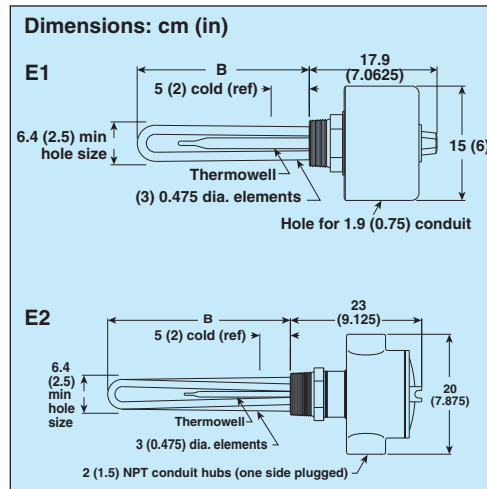
Both models shown smaller than actual size.

## SPECIFICATIONS

**Wattage:** 3 to 9 kW  
**Power:** 240, and 480V, 3 phase  
**Watt Density:** 15 W/in<sup>2</sup>  
**Sheath:** 0.475" diameter steel  
**Screw Plug:** 2½ NPT Steel  
**Thermostat:** Bulb and capillary type, three temperature ranges available (see To Order table below)  
**Enclosure:** E1 General Purpose, NEMA-1 rated, or E2 moisture resistant/explosion resistant enclosure<sup>2</sup>

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.



**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	W/in <sup>2</sup>	No Htg Elem.	Dim. B cm (in)	T3 Temp. Range (200 to 550°F)		T2 Temp. Range (60 to 250°F)		T1 Temp. Range (0 to 100°F)		Wt. kg (lb)
				Model No.	Price	Model No.	Price	Model No.	Price	
<b>ARMTO-3 with E1 General Purpose Enclosure<sup>1</sup></b>										
3	15	3	62 (24½)	ARMTO-303/*	\$1100	ARMTO-303T2/*	\$1100	ARMTO-303T1/*	\$1100	5 (11)
4	15	3	82 (32¾)	ARMTO-304/*	1150	ARMTO-304T2/*	1150	ARMTO-304T1/*	1150	5 (12)
5	15	3	101 (39¾)	ARMTO-305/240	1250	ARMTO-305T2/240	1250	ARMTO-305T1/240	1250	6 (13)
6	15	3	121 (47¾)	ARMTO-306/*	1350	ARMTO-306T2/*	1350	ARMTO-306T1/*	1350	6 (14)
7.5	15	3	145 (57)	ARMTO-307/240	1470	ARMTO-307T2/240	1470	ARMTO-307T1/240	1470	6 (15)
9	15	3	171 (67¾)	ARMTO-309/240	1600	ARMTO-309T2/240	1100	ARMTO-309T1/240	1600	7 (16)
<b>ARMTO-3 Series with Moisture Resistant/Explosion Resistant Enclosure<sup>2†</sup></b>										
3	15	3	62 (24½)	ARMTO-303E2/*	\$1350	ARMTO-303E2T2/*	\$1350	ARMTO-303E2T1/*	\$1350	7 (16)
4	15	3	82 (32¾)	ARMTO-304E2/*	1400	ARMTO-304E2T2/*	1400	ARMTO-304E2T1/*	1400	8 (17)
5	15	3	101 (39¾)	ARMTO-305E2/240	1500	ARMTO-305E2T2/240	1500	ARMTO-305E2T1/240	1500	8 (18)
6	15	3	121 (47¾)	ARMTO-306E2/*	1600	ARMTO-306E2T2/*	1600	ARMTO-306E2T1/*	1600	9 (19)
7.5	15	3	145 (57)	ARMTO-307E2/240	1700	ARMTO-307E2T2/240	1700	ARMTO-307E2T1/240	1700	9 (20)
9	15	3	171 (67¾)	ARMTO-309E2/240	1850	ARMTO-309E2T2/240	1850	ARMTO-309E2T1/240	1850	10 (21)

\* Insert "208" for 208 Vac, "240" for 240 Vac, or "480" for 480 Vac. Model numbers containing 240 V are only available in that voltage.

<sup>1</sup> Heaters with General Purpose Enclosures are UL Listed with T1 or T2 Temps and CSA Certified with T1, T2 or T3 Temps.

<sup>2</sup> Heaters with Moisture Resistant/Explosion Resistant Enclosures are CSA NRTL/C Certified with T1, T2 or T3 Temps.

† **Caution:** Explosion resistant type E2 construction refers to heater design features which provide explosion resisting containment of electrical wiring according to National Electric Code. Abnormal application or use of heaters which in excessive temperatures can create hazardous conditions which can lead to fire Consult Section Z for data on allowable watt densities for more viscous materials.

**Ordering Examples:** ARMTO-303/240, 3 kW heater with a thermostat range of 200 to 550°F powered by 240 Vac, \$1100.  
 ARMTO-309T2/240, 9 kW thermostat range, 60 to 250°F powered by 240 Vac, \$1850



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Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

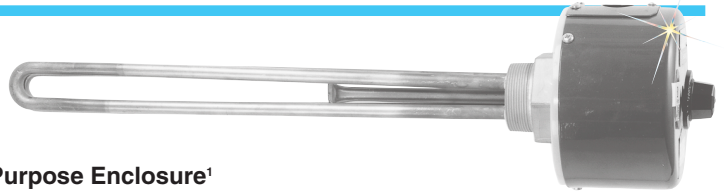
# RUGGED PROCESS WATER

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## IMMERSION HEATER WITH 2 NPT FITTING

ARMTS-2 Series  
Starts at

**\$1050**



✓ All Passivated Stainless Steel Construction: Ideal for Mild Acid or Alkaline Solutions

✓ Integral Thermostat

✓ 208, 240, or 480 Vac, 1 phase

✓ 43 to 51 W/in<sup>2</sup>

**Note:** This integral thermostat functions as a temperature control only. This is not a fail safe device. An approved pressure and/or temperature control should be used with these heaters to assure safe operation. See Section P for our selection of control devices

### SPECIFICATIONS

**Wattage:** 2 to 15 kW

**Power:** 208, 240 or 480 Vac, 1 phase

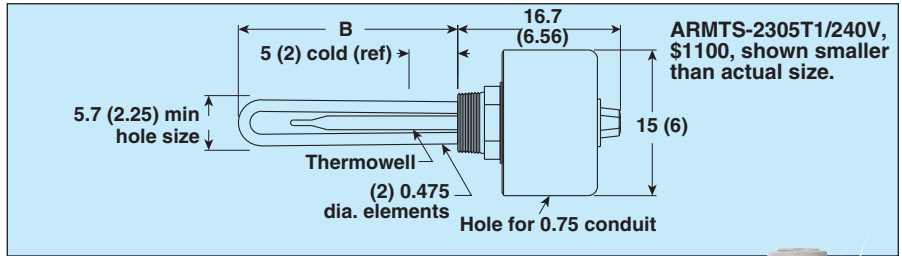
**Sheath:** 0.475" (1cm) diameter passivated stainless steel

**Screw Plug:** 2 NPT stainless steel

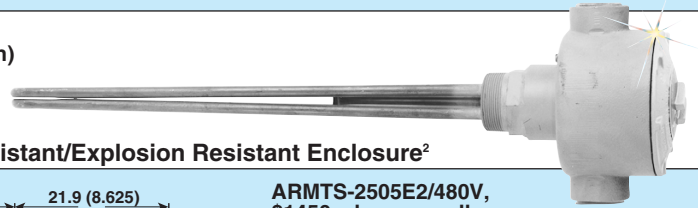
**Thermostat:** Bulb and capillary

**Enclosure:** General Purpose, NEMA-1 rated<sup>1</sup>, or E2 moisture resistant/explosion resistant enclosure<sup>2</sup>

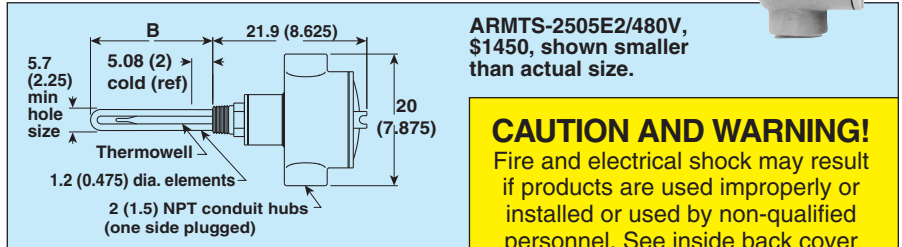
### E1-General Purpose Enclosure<sup>1</sup>



Dimensions: cm (in)



### E2-Moisture Resistant/Explosion Resistant Enclosure<sup>2</sup>



### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

kW	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B in (cm)	T-2 Temp. Range (60-250°F)			T-1 Temp. Range (0°-100°F)		
				Model No.	Price	Wt. lb (kg)	Model No.	Price	Wt. lb (kg)
<b>ARMTS-2 Series with E1 General Purpose Enclosure<sup>1</sup></b>									
2	51	2	7½ (19)	ARMTS-2205-3/**	\$1050	6 (3)	ARMTS-2205-3T1/**	\$1050	6 (3)
2	47	2	9 (23)	ARMTS-2255/*	1050	7 (3)	ARMTS-2255T1/*	1050	7 (3)
3	43	2	11½ (29)	ARMTS-2305/**	1100	7 (3)	ARMTS-2305T1/**	1100	7 (3)
4	44	2	17½ (44)	ARMTS-2405/**	1150	7 (3)	ARMTS-2405T1/**	1150	7 (3)
5	45	2	19 (48)	ARMTS-2505/*	1200	8 (4)	ARMTS-2505T1/*	1200	8 (4)
6	46	2	24½ (62)	ARMTS-2605/*	1250	8 (4)	ARMTS-2605T1/*	1250	8 (4)
7	46	2	27½ (70)	ARMTS-2705/*	1300	9 (4)	ARMTS-2705T1/*	1300	9 (4)
10	46	2	40 (102)	ARMTS-21005/*	1500	10 (5)	ARMTS-21005T1/*	1500	10 (5)
12	46	2	48 (122)	ARMTS-21205/*	1600	11 (4)	ARMTS-21205T1/*	1600	11 (4)
<b>ARMTS-2 with Type E2 Moisture Resistant/Explosion Resistant Enclosure<sup>2</sup></b>									
2	51	2	7½ (19)	ARMTS-2205-3E2/**	\$1280	12 (5)	ARMTS-2205-3E2T1/*	\$1280	12 (5)
2.5	47	2	9 (23)	ARMTS-2255E2/*	1300	13 (6)	ARMTS-2255E2T1/*	1300	13 (6)
3	43	2	11½ (29)	ARMTS-2305E2/**	1350	13 (6)	ARMTS-2305E2T1/**	1350	13 (6)
4	44	2	17½ (44)	ARMTS-2405E2/**	1400	13 (6)	ARMTS-2405E2T1/**	1400	13 (6)
5	46	2	19 (48)	ARMTS-2505E2/*	1450	14 (6)	ARMTS-2505E2T1/*	1450	14 (6)
6	46	2	24½ (62)	ARMTS-2605E2/*	1500	14 (6)	ARMTS-2605E2T1/*	1500	14 (6)
7	46	2	27½ (70)	ARMTS-2705E2/*	1550	15 (7)	ARMTS-2705E2T1/*	1550	15 (7)
10	46	2	40 (102)	ARMTS-21005E2/*	1750	16 (7)	ARMTS-21005E2T1/*	1750	16 (7)
12	46	2	48 (122)	ARMTS-21205E2/*	1850	17 (7)	ARMTS-21205E2/*	1850	17 (7)

/\*Designate voltage, i.e., insert "240" for 240 Vac or "480" for 480 Vac.

\*\*Designate voltage, i.e., insert "208" for 208 Vac, "240" for 240 Vac or "480" for 480 Vac.

<sup>1</sup> Heaters with General Purpose Enclosures are UL Listed and CSA Certified.

<sup>2</sup> Heaters with Moisture Resistant/Explosion Resistant Enclosures are CSA NRTL/C Certified.

**Ordering Example:** ARMTS-2505E2/240V, 5000 W heater with moisture resistant/explosion enclosure, 240 Vac, \$1450.

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### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# IMMERSION HEATER WITH INTEGRAL THERMOSTAT – 2.5 NPT FITTING

ARMTS-3 Series Starts at

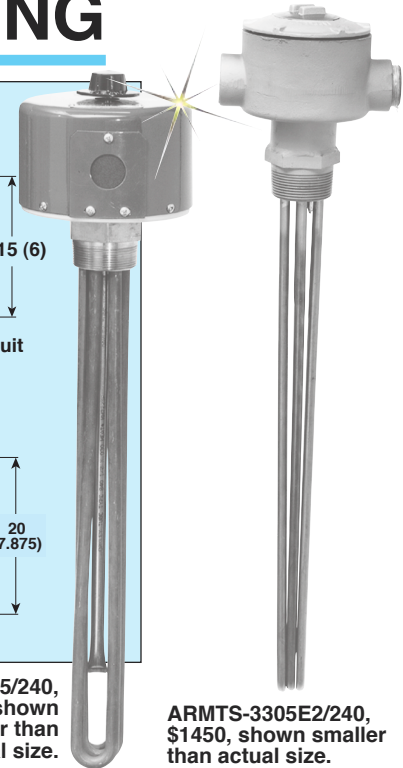
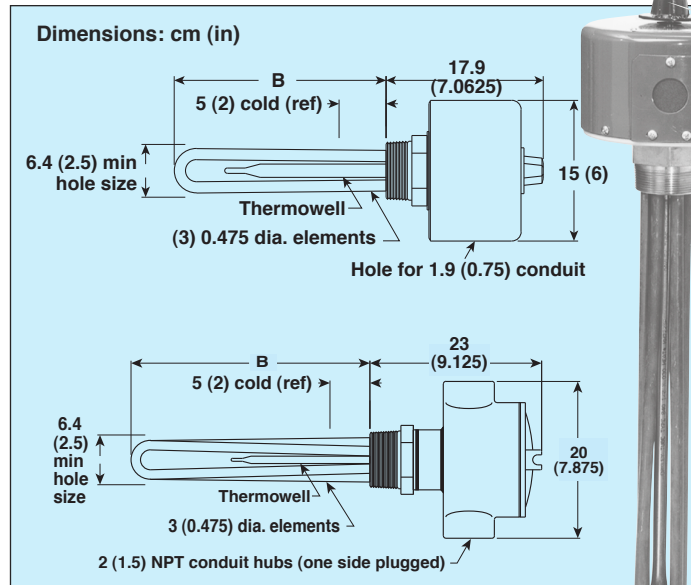
**\$1200**



- ✓ Passivated Stainless Steel Wetted
- ✓ 3 Element Heater Design
- ✓ 208, 240, or 480 Vac; 3 Phase Power
- ✓ 3 to 18 kW
- ✓ For Process Water Applications

## SPECIFICATIONS

**Wattage:** 3 to 18 kW  
**Power:** 208, 240 or 480V; 3 phase power  
**Sheath:** Passivated stainless steel  
**Screw Plug:** 2½ NPT passivated stainless steel  
**Thermostat:** Bulb and capillary  
**Enclosure:** General purpose, NEMA-1 rated, or type E2 moisture resistant/explosion resistant enclosure



**CAUTION AND WARNING!**

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel.

ARMTS-3305/240, \$1200, shown smaller than actual size.

ARMTS-3305E2/240, \$1450, shown smaller than actual size.

**Note:** The integral thermostat functions as a temperature control only. This is not a fail safe device. An approved pressure or temperature control should be used with these heaters to assure safe operation. See Section P for our selection of control devices.

**■ MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Phase	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B cm (in)	T-2 Temp Range (60 to 250°F)			T-1 Temp Range (0 to 100°F)		
					Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)
<b>ARMTS-3 with General Purpose Terminal Enclosure</b>										
3	3	51	3	18 (7)	ARMTS-3305*/3P	\$1200	4 (8)	ARMTS-3305T1*/3P	\$1200	4 (8)
4.5	3	48	3	28 (11)	ARMTS-3455*/3P	1300	4 (8)	ARMTS-3455T1*/3P	1300	4 (8)
6	3	48	3	43 (17)	ARMTS-3605*/3P	1350	4 (9)	ARMTS-3605T1*/3P	1350	4 (9)
7.5	3	53	3	47 (8.5)	ARMTS-3755*/3P	1400	5 (10)	ARMTS-3755T1*/3P	1400	5 (10)
9	3	47	3	61 (24)	ARMTS-3905*/3P	1500	5 (10)	ARMTS-3905T1*/3P	1500	5 (10)
12	3	46	3	81 (32)	ARMTS-3120*/3P	1650	4 (11)	ARMTS-3120T1*/3P	1650	4 (11)
15	3	46	3	100 (39.5)	ARMTS-3150*/3P	1800	5 (12)	ARMTS-3150T1*/3P	1800	5 (12)
18	3	51	3	119 (47)	<sup>1</sup> ARMTS-3180*/3P	1900	6 (13)	<sup>1</sup> ARMTS-3180T1*/3P	1900	6 (13)
<b>ARMTS-3 with Moisture Resistant/Explosion Resistant Enclosure (Type E2)</b>										
3	3	51	3	18 (7)	ARMTS-3305E2*/3P	\$1450	6 (13)	ARMTS-3305E2T1*/3P	\$1450	6 (13)
4.5	3	48	3	28 (11)	ARMTS-3455E2*/3P	1550	6 (13)	ARMTS-3455E2T1*/3P	1550	6 (13)
6	3	48	3	43 (17)	ARMTS-3605E2*/3P	1600	5 (12)	ARMTS-3605E2T1*/3P	1600	6 (14)
7.5	3	53	3	47 (8.5)	ARMTS-3755E2*/3P	1650	6 (14)	ARMTS-3755E2T1*/3P	1650	7 (15)
9	3	47	3	61 (24)	ARMTS-3905E2*/3P	1750	7 (15)	ARMTS-3905E2T1*/3P	1750	7 (15)
12	3	46	3	81 (32)	ARMTS-3120E2*/3P	1900	7 (15)	ARMTS-3120E2T1*/3P	1900	7 (16)
15	3	46	3	100 (39.5)	ARMTS-3150E2*/3P	2050	8 (17)	ARMTS-3120E2T1*/3P	1900	8 (17)
18	3	51	3	119 (47)	<sup>2</sup> ARMTS-3180E2*/3P	2150	8 (18)	<sup>2</sup> ARMTS-3180E2T1*/3P	2150	8 (18)

<sup>1</sup> Not UL Listed or CSA Certified (exceeds 48 amps) <sup>2</sup> Not CSA NRTL/C Certified (exceeds 48 amps)

\* Designate voltage, i.e., "240" for 240V or "480" for 480V.

Ordering Example: ARMTS-3305T1/240/3P 3 kW heater with a thermostat range of 0 to 100°F powered by 240 Vac \$1200





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Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

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# LIGHT WEIGHT OIL IMMERSION HEATER

## With Thermostat—1 NPT Steel Fitting

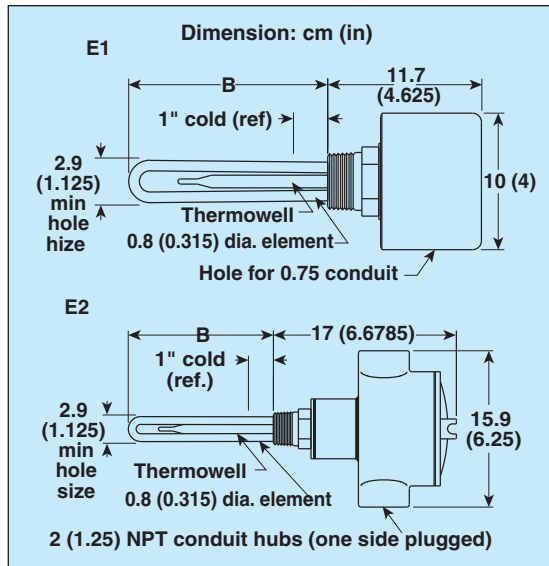
ARTMO Series  
Starts at  
**\$255**



- ✓ Built in Thermostat—Three Temperature Ranges Available
- ✓ 0.25 to 0.50 kW
- ✓ 120 and 240V, 1 Phase
- ✓ 0.315" Diameter Heavy Duty Steel Sheath
- ✓ Lower Watt Density for Heating Light Weight Oils
- ✓ Single Heating Element Design

**Heating low viscosity oil —**  
For better flow, improved characteristics, and maintenance of bulk oil at predetermined temperature levels. Also suitable for hydrocarbon based coolants and heat transfer oils where adequate flow conditions are maintained.

**Features rugged construction —**  
Sturdy heating steel screw plugs provide superior rigidity and strength. Heavy duty jumper straps and terminal posts assure permanent tightness of connection's carrying capacity.



**High conductivity elements —**  
Filled with highest purity blends of magnesium oxide refractory (MgO) compacted to a rock hard density to insure maximum thermal conductivity, maximum electrical resistance, and assure long element life.

**Heavy coil construction —**  
Watt density on the heating coil is designed for low watt density operation by increasing the coil diameter and length to give maximum coil surface area and limit coil surface temperature, providing longer coil life.

**Note:** The integral thermostat functions as a temperature control only. This is not a fail safe device. An approved pressure and/or temperature control should be used with these heaters to assure safe operation. See the Temperature Section for our selection of control devices.

**CAUTION AND WARNING!**  
Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

**AVAILABLE FOR FAST DELIVERY!**

To Order (Specify Model Number)										
kW	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B in (cm)	Temp. Range (60 to 187°F) Model No.	Price	Temp. Range (60 to 240°F) Model No.	Price	Temp. Range (0 to 127°F) Model No.	Price	Wt lb (kg)
<b>E1 General Purpose Enclosure<sup>1</sup></b>										
0.250	20	1	6½ (17)	ARTMO-250/120	\$255	ARTMO-250TH/120	\$255	ARTMO-250TL/120	\$255	2 (1)
0.375	20	1	9½ (24)	ARTMO-375/*	260	ARTMO-375TH/*	260	ARTMO-375TL/*	260	3 (1)
0.500	20	1	12½ (32)	ARTMO-500/*	265	ARTMO-500TH/*	265	ARTMO-500TL/*	265	3 (1)
<b>E2 Moisture Resistant/Explosion Resistant Enclosure<sup>2</sup></b>										
0.250	20	1	6½ (17)	ARTMO-250E2/120	\$475	ARTMO-250E2TH/120	\$475	ARTMO-250E2TL/120	\$475	5 (2)
0.375	20	1	9½ (24)	ARTMO-375E2/*	485	ARTMO-375E2TH/*	485	ARTMO-375E2TL/*	485	6 (3)
0.500	20	1	12½ (32)	ARTMO-500E2/*	490	ARTMO-500E2TH/*	490	ARTMO-500E2TL/*	490	6 (3)

\* To designate voltage insert "120" for 120 Vac or "240" for 240 Vac. Model numbers containing "/120" are only available in that voltage. Consult Section Z for data on allowable watt densities for more viscous materials.

<sup>1</sup> Heaters with general purpose enclosures are UL Listed and CSA certified.

<sup>2</sup> Heaters with moisture resistant/explosion resistant enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.

**Ordering Example:** ARTMO-375/120. 0.375 kW heater with a thermostat range of 60 to 187°F, powered by 120 Vac. \$260.





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# IMMERSION HEATER WITH STAINLESS STEEL WETTED CONSTRUCTION, 1 NPT

ARTMS Series Starts at

**\$500**



NRTL/C

✓ **Passivated Stainless Steel Sheath for Weak Corrosive Solutions**

✓ **0.75 to 3 kW**

✓ **120, and 240 Vac, 1 phase**

✓ **Integral Thermostat**

The OMEGALUX® ARTMS Series Immersion Heaters feature all passivated stainless steel wetted construction, ideal for process solutions with a 5 to 9 pH range.

*Note: This integral thermostat functions as a temperature control only. This is not a fail safe device. An approved pressure and/or temperature control should be used with*

## SPECIFICATIONS

Wattage: 0.75 to 3 kW

Power: 120, 240 Vac, 1 phase

Sheath: 0.315" diameter passivated stainless steel

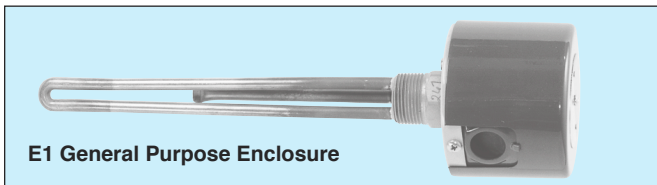
Screw Plug: 1 NPT stainless steel

Thermostat: Bulb and capillary tube

Enclosure: E1 general purpose, NEMA-1 rated, or E2 moisture resistant/explosion resistant enclosure<sup>2</sup>

## CAUTION AND WARNING!

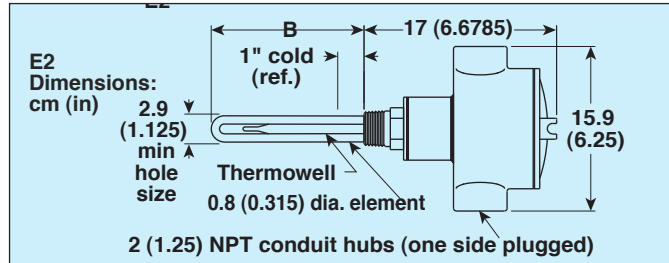
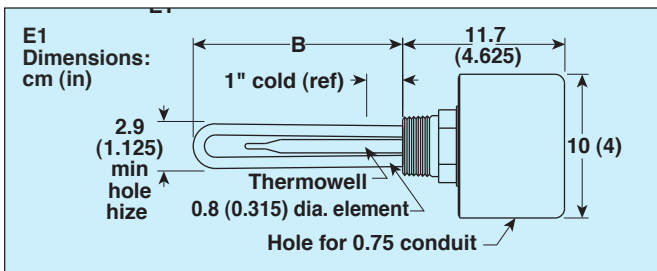
See ARTM-3 for warnings.



E1 General Purpose Enclosure



E2 Moisture Resistant/Explosion Resistant Terminal Enclosure



**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B in (cm)	Temp Range (60 to 187°F)		Temp Range (60 to 240°F)		Temp Range (0 to 127°F)		Wt. lb (kg)
				Model No.	Price	Model No.	Price	Model No.	Price	
<b>ARTMS Series with E1 General Purpose Enclosure<sup>1</sup></b>										
0.75	64	1	6 <sup>5</sup> / <sub>16</sub> (16)	ARTMS-750/*	\$500	ARTMS-750TH/*	\$500	ARTMS-750TL/*	\$500	2 (1)
1.0	85	1	6 <sup>5</sup> / <sub>16</sub> (16)	ARTMS-1000/*	525	ARTMS-1000TH/*	525	ARTMS-1000TL/*	525	2 (1)
1.25	83	1	8 <sup>1</sup> / <sub>16</sub> (20)	ARTMS-1250/*	525	ARTMS-1250TH/*	525	ARTMS-1250TL/*	525	3 (1)
1.5	86	1	9 <sup>1</sup> / <sub>4</sub> (23)	ARTMS-1500/*	525	ARTMS-1500TH/*	525	ARTMS-1500TL/*	525	3 (1)
2.0	83	1	12 <sup>1</sup> / <sub>4</sub> (31)	ARTMS-2000/*	550	ARTMS-2000TH/*	550	ARTMS-2000TL/*	550	3 (1)
2.5	79	1	16 <sup>1</sup> / <sub>4</sub> (41)	ARTMS-2500/*	575	ARTMS-2500TH/*	575	ARTMS-2500TL/*	575	3 (1)
3.0	78	1	19 <sup>1</sup> / <sub>8</sub> (50)	ARTMS-3000/240V	600	ARTMS-3000TH/240V	600	ARTMS-3000TL/240V	600	3 (1)
<b>ARTMS Series with E2 Moisture Resistant/Explosion Resistant Enclosure<sup>2</sup></b>										
0.75	64	1	6 <sup>5</sup> / <sub>16</sub> (16)	ARTMS-750E2/*	\$725	ARTMS-750E2TH/*	\$725	ARTMS-750E2TL/*	\$725	5 (2)
1.0	85	1	6 <sup>5</sup> / <sub>16</sub> (16)	ARTMS-1000E2/*	750	ARTMS-1000E2TH/*	750	ARTMS-1000E2TL/*	750	5 (2)
1.25	83	1	8 <sup>1</sup> / <sub>16</sub> (20)	ARTMS-1250E2/*	750	ARTMS-1250E2TH/*	750	ARTMS-1250E2TL/*	750	5 (2)
1.5	86	1	9 <sup>1</sup> / <sub>4</sub> (23)	ARTMS-1500E2/*	750	ARTMS-1500E2TH/*	750	ARTMS-1500E2TL/*	750	6 (3)
2.0	83	1	12 <sup>1</sup> / <sub>4</sub> (31)	ARTMS-2000E2/*	775	ARTMS-2000E2TH/*	775	ARTMS-2000E2TL/*	775	6 (3)
2.5	79	1	16 <sup>1</sup> / <sub>4</sub> (41)	ARTMS-2500E2/*	800	ARTMS-2500E2TH/*	800	ARTMS-2500E2TL/*	800	6 (3)
3.0	78	1	19 <sup>1</sup> / <sub>8</sub> (50)	ARTMS-3000E2/240V	825	ARTMS-3000E2TH/240V	825	ARTMS-3000E2TL/240V	825	6 (3)

<sup>1</sup> Heaters with general purpose enclosures are UL Listed and CSA certified.

<sup>2</sup> Heaters with moisture resistant/explosion resistant enclosures are CSA NRTL/C certified.

\* Designate voltage, "/120" for 120 Vac or "/240" for 240 Vac. Those numbers already containing "/240" are available only in that voltage.

Ordering Example: ARTMS-750/120, 750 W heater, 60 to 187°F thermostat range, 120 Vac, \$500.

F



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# CLEAN WATER IMMERSION HEATER WITH INTEGRAL THERMOSTAT

## 1 NPT Fitting

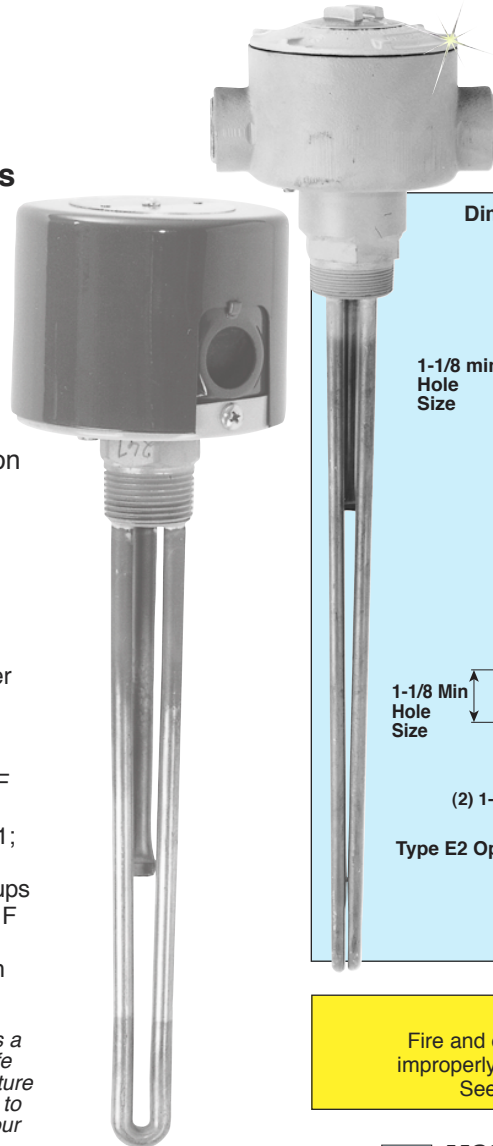
- 1" Brass Screw Plug
- Copper Sheath for Clean Water Applications
- Integral Bulb and Capillary Thermostat—3 Temperature Ranges Available
- UL Listed with General Purpose NEMA-1 Rated Enclosure

ARTM Series screw plug immersion heaters are designed for direct contact heating in clean water applications.

### SPECIFICATIONS

**Wattage:** 0.75 to 3 kW  
**Power:** 120 or 240 Vac, 1 phase  
**Sheath:** 0.800 cm (0.315") dia. copper  
**Screw Plug:** 1 NPT brass  
**Thermostat:** bulb and capillary type, 3 temperature ranges available; 60 to 187°F, 60 to 240°F, or 0 to 127°F  
**Watt Density:** 64-78 W/in<sup>2</sup>  
**Enclosure:** General purpose NEMA-1; optional moisture tight/explosion resistant enclosure meets Class I, groups C & D, Div. 1 & 2, Class II, Groups E, F & G, Div. 1&2, Class III, Div. 1 & 2  
**Third Party Approvals:** UL listed with general purpose enclosures

*Note: The integral thermostat functions as a temperature control only. this not a fail safe device. An approved pressure or temperature control should be used with these heaters to assure safe operation. See section P for our full selection of control devices.*

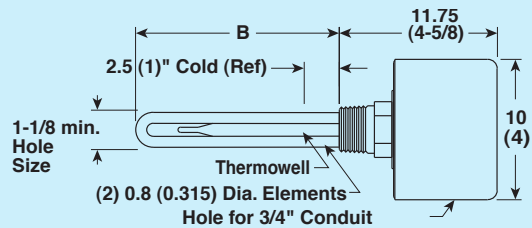


ARTM Series Starts at

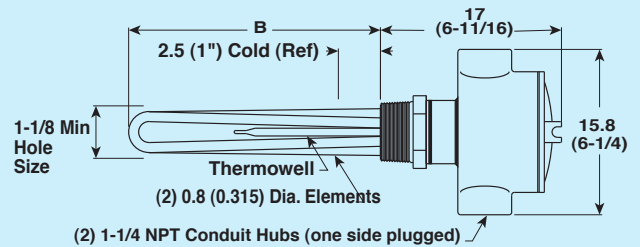
**\$205**



Dimensions: cm (in)



General Purpose Terminal Enclosure--E1



Type E2 Optional Moisture Tight/Explosion Resistant Enclosure

(Explosion resistant enclosure - not intended for use in hazardous areas)

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

kW	Phase	W/in <sup>2</sup>	No. Htg. Elem.	Dim.B cm (")	Temp. Range (60 to 187°F)		Temp. Range (60 to 240°F)		Temp. Range (0 to 127°F)		Wt. kg (lb)
					Model No.	Price	Model No.	Price	Model No.	Price	
0.75	1	64	1	16 (5/8)	†ARTM-750/*	\$205	†ARTM-750TH/*	\$205	†ARTM-750TL/*	\$205	1 (2.25)
1.0	1	85	1	16 (5/8)	†ARTM-1000/*	215	†ARTM-1000TH	215	†ARTM-1000TL/*	215	1 (2.25)
1.25	1	83	1	21 (8 1/8)	†ARTM-1250/*	225	†ARTM-1250TH/*	225	†ARTM-1250TL/*	225	1 (2.50)
1.5	1	86	1	24 (9 1/4)	†ARTM-1500/*	235	†ARTM-1500TH/*	235	†ARTM-1500TL/*	235	1 (2.50)
2.0	1	83	1	31 (12 1/4)	ARTM-2000/*	250	ARTM-2000TH/*	250	ARTM-2000TL/*	250	1 (2.75)
2.5	1	79	1	41 (16 1/4)	ARTM-2500/*	270	ARTM-2500TH/*	270	ARTM-2500TL/*	270	1 (3.00)
3.0	1	78	1	50 (19 7/8)	ARTM-3000/240	285	ARTM-3000TH/240	285	ARTM-3000TL/240	285	1 (3.25)

† U.L. Listed

\* Designate voltage, insert "120" for 120 Vac or "240" for 240 Vac. Those model numbers already containing /240 are only available in that voltage. To order with the optional E2 enclosure, insert "E2" into the model number as shown, ARTM-750E2/240, add \$430 to base price.

Ordering Example: ARTM-1250E2TH240 is a 1.25kW heater with thermostat range 60 to 240°F powered by 240 Vac with moisture tight explosion resistant enclosure. \$225 + 460 = \$685 (Not intended for use in hazardous areas) Note: add 1 kg (3 lb) to weight listed if ordered



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# RING HEATERS

“A” Series



- ✓ U.L. Component Recognized
- ✓ CSA Certified
- ✓ For Flat Surfaces
- ✓ Rugged, Heavy-Duty

## APPLICATIONS

- ✓ Tank Bottoms
- ✓ Glue and Lead Melting Pots
- ✓ Dies
- ✓ Platens
- ✓ Valve Flanges
- ✓ Incubators
- ✓ Hot Plates
- ✓ Vulcanizers

## FEATURES

Single-heat rings have two terminals for single wattage, ON-OFF switch or thermostat.

Three-heat rings have three terminals which split the total rated wattage into two equal circuits. By using a three-heat switch  $\frac{1}{4}$ ,  $\frac{1}{2}$  or full wattage may be obtained. Use the two equal circuits in parallel to obtain full wattage. Center terminal is common.

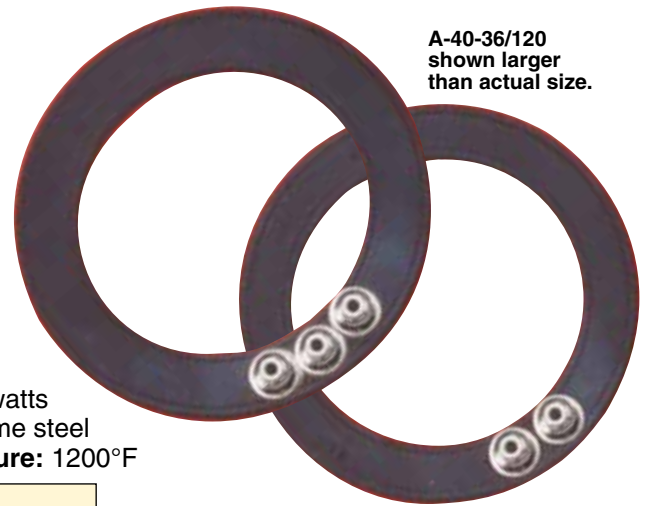
**Refractory-insulated construction** exclusively. By far the most rugged and best for long, dependable service.

**Easy installation.** The circular shape and the use of OMEGALUX® utility clamps simplifies the use of ring heaters. **Nesting rings to pack heat in a small area** can be done by installing rings within each other. For examples: A-651, A-802 and A-903 provide 4050 watts within a  $10\frac{3}{32}$ " (28 cm) circle.

### Utility clamps.

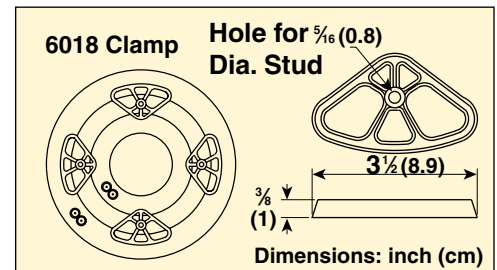
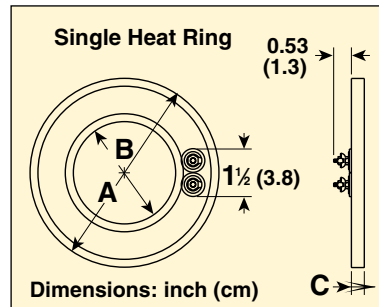
Usually used in sets of 4 to clamp ring elements on flat surfaces.  $\frac{5}{16}$ " (8 cm) flat-head machine screws are normally used, with head brazed or welded to work surface.

To order utility clamps, ask for model number **6018 Clamp**.



## SPECIFICATIONS

**Power:** 120 or 240V  
**Wattage:** 125 to 1800 watts  
**Sheath Material:** Chrome steel  
**Max Sheath Temperature:** 1200°F



To Order							
Watts	W/In <sup>2</sup>	Dimensions: inch (cm)			Single-Heat Element Chrome Steel Sheath	Three-Heat Element Chrome Steel Sheath	Wt. lb (kg)
		A	B	C	Model No.	Model No.	
300	12	3 $\frac{31}{32}$ (10)	1 $\frac{11}{16}$ (4)	$\frac{5}{16}$ (8)	A-203/*	A-20-33/*	0.7 (0.3)
400	15	3 $\frac{31}{32}$ (10)	1 $\frac{11}{16}$ (4)	$\frac{5}{16}$ (8)	A-204/*	A-20-34/*	0.7 (0.3)
500	19	3 $\frac{31}{32}$ (10)	1 $\frac{11}{16}$ (4)	$\frac{5}{16}$ (8)	A-205/*	A-20-35/*	0.7 (0.3)
450	14	4 $\frac{7}{8}$ (12)	2 $\frac{1}{4}$ (6)	$\frac{5}{16}$ (8)	A-304/*	A-30-34/*	0.8 (0.4)
500	15	4 $\frac{7}{8}$ (12)	2 $\frac{1}{4}$ (6)	$\frac{5}{16}$ (8)	A-305/*	A-30-35/*	0.8 (0.4)
550	17	4 $\frac{7}{8}$ (12)	2 $\frac{1}{4}$ (6)	$\frac{5}{16}$ (8)	A-306/*	A-30-36/*	0.8 (0.4)
500	12	5 $\frac{7}{16}$ (14)	3 (8)	$\frac{5}{16}$ (8)	A-405/*	A-40-35/*	0.8 (0.4)
660	16	5 $\frac{7}{16}$ (14)	3 (8)	$\frac{5}{16}$ (8)	A-406/*	A-40-36/*	0.8 (0.4)
750	18	5 $\frac{7}{16}$ (14)	3 (8)	$\frac{5}{16}$ (8)	A-407/*	A-40-37/*	0.8 (0.4)
400	10	6 $\frac{1}{16}$ (15)	4 $\frac{3}{16}$ (11)	$\frac{5}{16}$ (8)	A-504/*	A-50-34/*	0.9 (0.4)
450	11	6 $\frac{1}{16}$ (15)	4 $\frac{3}{16}$ (11)	$\frac{5}{16}$ (8)	A-505/*	A-50-35/*	0.9 (0.4)
500	13	6 $\frac{1}{16}$ (15)	4 $\frac{3}{16}$ (11)	$\frac{5}{16}$ (8)	A-506/*	A-50-36/*	0.9 (0.4)
660	12	6 $\frac{1}{8}$ (16)	3 (9)	$\frac{5}{16}$ (8)	A-656/*	A-65-36/*	1.0 (0.5)
750	14	6 $\frac{1}{8}$ (16)	3 (9)	$\frac{5}{16}$ (8)	A-657/*	A-65-37/*	1.0 (0.5)
1000	19	6 $\frac{1}{8}$ (16)	3 (9)	$\frac{5}{16}$ (8)	A-651/*	A-65-31/*	1.0 (0.5)
500	11	6 $\frac{19}{32}$ (17)	4 $\frac{1}{2}$ (11)	$\frac{5}{16}$ (8)	A-605/*	A-60-35/*	1.0 (0.5)
660	14	6 $\frac{19}{32}$ (17)	4 $\frac{1}{2}$ (11)	$\frac{5}{16}$ (8)	A-606/*	A-60-36/*	1.0 (0.5)
750	16	6 $\frac{19}{32}$ (17)	4 $\frac{1}{2}$ (11)	$\frac{5}{16}$ (8)	A-607/*	A-60-37/*	1.0 (0.5)
550	9	7 $\frac{7}{16}$ (19)	5 $\frac{3}{16}$ (13)	$\frac{5}{16}$ (8)	A-705/*	A-70-35/*	1.1 (0.5)
660	11	7 $\frac{7}{16}$ (19)	5 $\frac{3}{16}$ (13)	$\frac{5}{16}$ (8)	A-706/*	A-70-36/*	1.1 (0.5)
750	13	7 $\frac{7}{16}$ (19)	5 $\frac{3}{16}$ (13)	$\frac{5}{16}$ (8)	A-707/*	A-70-37/*	1.1 (0.5)
880	14	8 $\frac{3}{8}$ (21)	6 $\frac{3}{16}$ (16)	$\frac{5}{16}$ (8)	A-808/*	A-80-38/*	1.3 (0.6)
1050	16	8 $\frac{3}{8}$ (21)	6 $\frac{3}{16}$ (16)	$\frac{5}{16}$ (8)	A-801/*	A-80-31/*	1.3 (0.6)
1250	19	8 $\frac{3}{8}$ (21)	6 $\frac{3}{16}$ (16)	$\frac{5}{16}$ (8)	A-802/*	A-80-32/*	1.3 (0.6)
1000	10	10 $\frac{31}{32}$ (28)	8 $\frac{1}{2}$ (22)	$\frac{5}{16}$ (8)	A-901/*	A-90-31/*	1.8 (0.6)
1500	16	10 $\frac{31}{32}$ (28)	8 $\frac{1}{2}$ (22)	$\frac{5}{16}$ (8)	A-902/*	A-90-32/*	1.8 (0.6)
1800	19	10 $\frac{31}{32}$ (28)	8 $\frac{1}{2}$ (22)	$\frac{5}{16}$ (8)	A-903/*	A-90-33/*	1.8 (0.6)

\* Designate voltage. Insert "120" for 120 Vac or "240" for 240 Vac. Lower wattages down to 125 watts and smaller outside diameters are also available. Contact OMEGALUX.

Ordering Examples: A-60-36/120, 3-element ring heater, 120 Vac, 660 W.  
 A-504/120, single-heat element heater.

# LOW TEMPERATURE

Rometec srl - [www.rometec.it](http://www.rometec.it) - [info@rometec.it](mailto:info@rometec.it) - Rometec srl - [www.rometec.it](http://www.rometec.it) - [info@rometec.it](mailto:info@rometec.it)

# AIR DUCT HEATERS

## CAB and CABB Styles

- Side Terminals (Type CAB)
- Bottom Terminals (Type CABB)
- 6 to 100 kW
- 120, 208, 240 and 480V
- 1 or 3 Phase
- Rust-Resisting Iron or Chrome Steel Sheath Elements
- 440°F Max Outlet Air Temp

### Applications

- Sole Heat Source
- Booster Heater in Process and Comfort Heating Ducts
- Convert existing Forced Air Dryers and Ovens
- With Blower and Duct, Can be used to Fabricate simple Forced Air Drying Unit

### Features

**Simple Duct Transition Sections** may be used to adapt standard heater sizes to various duct sizes to increase air velocities for better heat transfer, lower sheath temperature and longer element life.

**Field Wiring Terminals**—Heavy duty 3/8" diameter bolts of either brass (iron sheath units) or Stainless Steel (chrome steel sheath units) with necessary hardware are provided for field wiring connections. Terminals are located on the side for CAB units and on the bottom for CABB units, and should be on the outside of ducting.

**Fins** of aluminized steel are provided to improve heat transfer to the air.

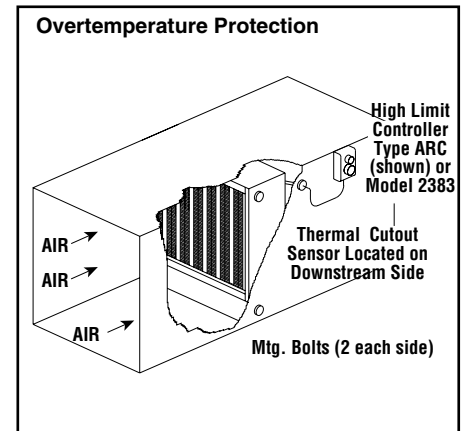
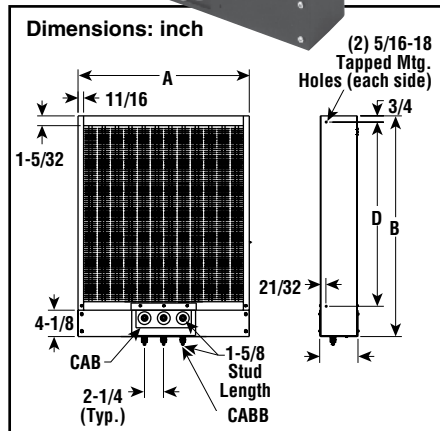
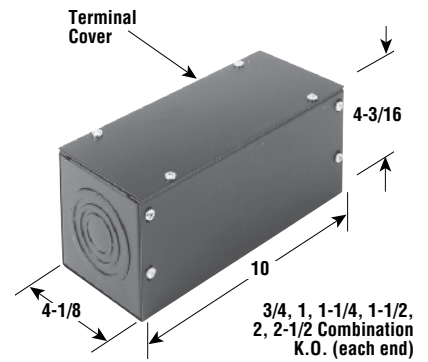
**Elements** are individually replaceable.

**Terminal Cover Option** is available to prevent accidental contact with live electrical terminals (PCN 269720), one (1) required per circuit

**MONEL Sheath and MONEL Fins** are available for humid conditions. Model TDH heaters, using Fintube elements are also available.

### Construction

**Rugged Finstrip Elements** are mounted



**Finstrip Elements, Exclusive Construction**—High-quality, coiled resistor wire is uniformly spaced over the width and length of the Finstrip element, then embedded in high-grade refractory material which insulates the wire and transfers heat rapidly. Refractory is then compressed to rock hardness and maximum density under tremendous hydraulic pressure to improve heat transfer from coil to sheath. Elements are oven baked at high temperatures to semi-vitrify and mature the refractory. Sheath material is either rust-resisting iron or chrome steel.

**Sturdy Steel Frame**—14 gauge cold rolled steel painted with high heat resisting black enamel paint.

**Internal Electrical Connections** are made using a combination of buss bars and jumper straps consisting of either Manganese-Nickel or MONEL.

### Mounting

Always install heaters in duct work with terminal box on bottom of heater. Type CAB units should have field wiring terminals facing upstream to provide maximum cooling affect. Secure to duct work using mounting holes on both vertical sides of heater.

### Application and Selection Guidelines

**Selection Heater Size** — Refer to Technical section for examples on determining kW requirements. For quick estimating purposes, the following

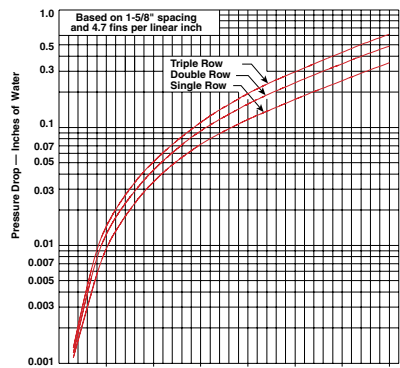
formula may be used for air at standard conditions:

$$kW = \frac{SCFM \times \text{Temp. Rise } (^\circ F)}{3000}$$

**Maximum Work Temperatures**—Type CAB and CABB heaters can generally be used at the following maximum temperatures, provided the minimum air velocity is maintained uniformly through the heater.

Air Velocity (ft/sec)	Max Outlet Air Temp	
	Iron Sheath	Chrome Steel Sheath
4	—	200
9	90	330
16	220	440

**Note**—Maximum temperatures are based on 26 W/in<sup>2</sup>. If elements have a lower watt density, work temperatures may be increased; if watt density is higher, work temperatures should be lower.



# LOW TEMPERATURE AIR DUCT HEATERS



## CAB and CABB Styles

To Order											
kW	Volts	Phase	Amps/ Circ.	No. Circ.	No. Elem.	inches			Rust-Resisting Iron Sheath Temperatures to 750°F	Chrome Steel Sheath Temperatures to 950°F	Wt. (lb)
						A	B	D	Model No.	Model No.	
<b>CAB—Side Terminals (26 W/in<sup>2</sup>)</b>											
6	120	1	50	1	6	10%	15%	11½	CAB-62/120	CAB-611/120	25
6	208	1	28.9	1	6	10%	15%	11½	CAB-62/208	CAB-611/208	25
6	240	1	25	1	6	10%	15%	11½	CAB-62/240	CAB-611/240	25
6	480	1	12.5	1	6	10%	15%	11½	CAB-62/480	CAB-611/480	25
6	208	3	16.7	1	6	10%	15%	11½	CAB-62/208/3P	CAB-611/208/3P	25
6	240	3	14.5	1	6	10%	15%	11½	CAB-62/240/3P	CAB-611/240/3P	25
6	480	3	7.2	1	6	10%	15%	11½	CAB-62/480/3P	CAB-611/480/3P	25
12	208	1	57.7	1	9	15%	18½	14¼	CAB-122/208	CAB-1211/208	35
12	240	1	50	1	9	15%	18½	14¼	CAB-122/240	CAB-1211/240	35
12	480	1	25	1	9	15%	18½	14¼	CAB-122/480	CAB-1211/480	35
12	208	3	33.4	1	9	15%	18½	14¼	CAB-122/208/3P	CAB-1211/208/3P	35
12	240	3	28.9	1	9	15%	18½	14¼	CAB-122/240/3P	CAB-1211/240/3P	35
12	480	3	14.5	1	9	15%	18½	14¼	CAB-122/480/3P	CAB-1211/480/3P	35
15	208	1	72.1	1	9	15%	21%	17¼	CAB-152/208	CAB-1511/208	40
15	240	1	62.5	1	9	15%	21%	17¼	CAB-152/240	CAB-1511/240	40
15	480	1	31.3	1	9	15%	21%	17¼	CAB-152/480	CAB-1511/480	40
15	208	3	41.7	1	9	15%	21%	17¼	CAB-152/208/3P	CAB-1511/208/3P	40
15	240	3	36.1	1	9	15%	21%	17¼	CAB-152/240/3P	CAB-1511/240/3P	40
15	480	3	18.1	1	9	15%	21%	17¼	CAB-152/480/3P	CAB-1511/480/3P	40
20	208	3	55.6	1	12	20%	21%	17¼	CAB-202/208	CAB-2011/208	55
20	240	3	48.2	1	12	20%	21%	17¼	CAB-202/240	CAB-2011/240	55
20	480	3	24.1	1	12	20%	21%	17¼	CAB-202/480	CAB-2011/480	55
25	208	3	69.5	1	12	20%	26%	21¼	CAB-252/208	CAB-2511/208	65
25	240	3	60.2	1	12	20%	26%	21¼	CAB-252/240	CAB-2511/240	65
25	480	3	30.1	1	12	20%	26%	21¼	CAB-252/480	CAB-2511/480	65
30	480	3	18.1	2	18	29%	21%	17¼	—	CAB-3011/480	75
40	208	3	55.6	2	18	29½	27%	23	CAB-402/208	CAB-4011/208	90
40	240	3	48.2	2	18	29½	27%	23	CAB-402/240	CAB-4011/240	90
40	480	3	24.1	2	18	29½	27%	23	CAB-402/480	CAB-4011/480	90
50	208	3	69.5	2	18	29½	33%	28%	CAB-502/208	CAB-5011/208	110
50	240	3	60.2	2	18	29½	33%	28%	CAB-502/240	CAB-5011/240	110
50	480	3	30.1	2	18	29½	33%	28%	CAB-502/480	CAB-5011/480	110
75	208	3	69.5	3	27	44⅞	42%	37%	CAB-752/208	CAB-7511/208	200
75	240	3	60.2	3	27	44⅞	42%	37%	CAB-752/240	CAB-7511/240	200
75	480	3	30.1	3	27	44⅞	42%	37%	CAB-752/480	CAB-7511/480	200
100	208	3	92.6	3	27	44⅞	47½	43%	CAB-1002/208	CAB-10021/208	220
100	240	3	80.3	3	27	44⅞	47½	43%	CAB-1002/240	CAB-10021/240	220
100	480	3	40.1	3	27	44⅞	47½	43%	CAB-1002/480	CAB-10021/480	220
<b>CABB—Bottom Terminals (26 W/in<sup>2</sup>)</b>											
6	240	3	14.5	1	6	10%	15%	11½	—	CABB-611/240	25
6	480	3	7.2	1	6	10%	15%	11½	—	CABB-611/480	25
12	208	3	33.4	1	9	15%	18½	14¼	—	CABB-1211/208	35
12	240	3	28.9	1	9	15%	18½	14¼	—	CABB-1211/240	35
12	480	3	14.5	1	9	15%	18½	14¼	—	CABB-1211/480	35
20	480	3	24.1	1	12	20%	21%	17¼	—	CABB-2011/480	55
25	480	3	30.1	1	12	29½	26%	21¼	CABB-252/480	CABB-2511/480	65
40	480	3	24.1	2	18	29½	27%	23	CABB-402/480	CABB-4011/480	90
50	480	3	30.1	2	18	29½	33%	28%	CABB-502/480	CABB-5011/480	110
75	480	3	30.1	3	27	44⅞	42%	37%	CABB-752/480	CABB-7511/480	200
100	480	3	40.1	3	27	44⅞	47½	43%	—	CABB-10021/480	220

Ordering Examples: CAB-611/120, chrome steel sheath heater, 6 kW, 120V.

CAB-252/480, rust-resisting iron sheath heater, 25 kW, 480V.

### Free Area for Air Flow

Model No.	Square Feet	Model No.	Square Feet	Note — The volume of air being circulated along with the free area for air flow (in table above) will enable you to calculate the air velocity over the heater.
CAB-62 & 611	0.500	CAB-402 & 4011	3.29	
CAB-122 & 1211	0.927	CAB-502 & 5011	4.13	
CAB-152 & 1511	1.19	CAB-752 & 7511	8.25	
CAB-202 & 2011	1.63	CAB-1002 & 10021	9.38	
CAB-252 & 2511	2.07			





## CHF Series

**Self-contained heating units designed for optimum operating efficiency and performance—**

### **Providing trouble-free service and application flexibility!**

All of the heat generated by the elements is immediately transferred to the medium being processed with minimal losses.

### **Standard and optional features include...**

General purpose (NEMA 1) terminal housing is standard. Moisture proof (NEMA 4) and/or explosion resistant (NEMA 7) housings are optional. A set of installation and maintenance instructions along with a wiring diagram can be found inside the terminal housing of each unit.

Heating source—32 and 64 mm (1¼" and 2½") screw plug heaters are used on smaller units. 76 to 356 mm (3 to 14") size heaters use flanged immersion heaters. The flanges are made from forged steel rated for 150 lbs with raised face. Supplied with threaded eyebolts for ease of handling and installation. Optional stainless steel flanges or 300 lb ratings available.

Inlet-outlet connections are NPT pipe threads for 76 to 203 mm (3 to 8") circulation heaters (flanges are optional). Standard inlet-outlet connections on 254 mm (10") and larger units are 150 lb rated flanges.

Optional feature double-pole non-indicating bulb and capillary type thermostat can be located in the terminal box (standard) or attached to the insulation jacket as pictured. Solid state temperature controllers and indicating thermostats are available. Over-temperature protection can be provided by attaching a thermocouple to one of the elements.

Threaded mounting lugs to support the unit are welded to the steel vessel. Custom supports can be designed to fit your structure.

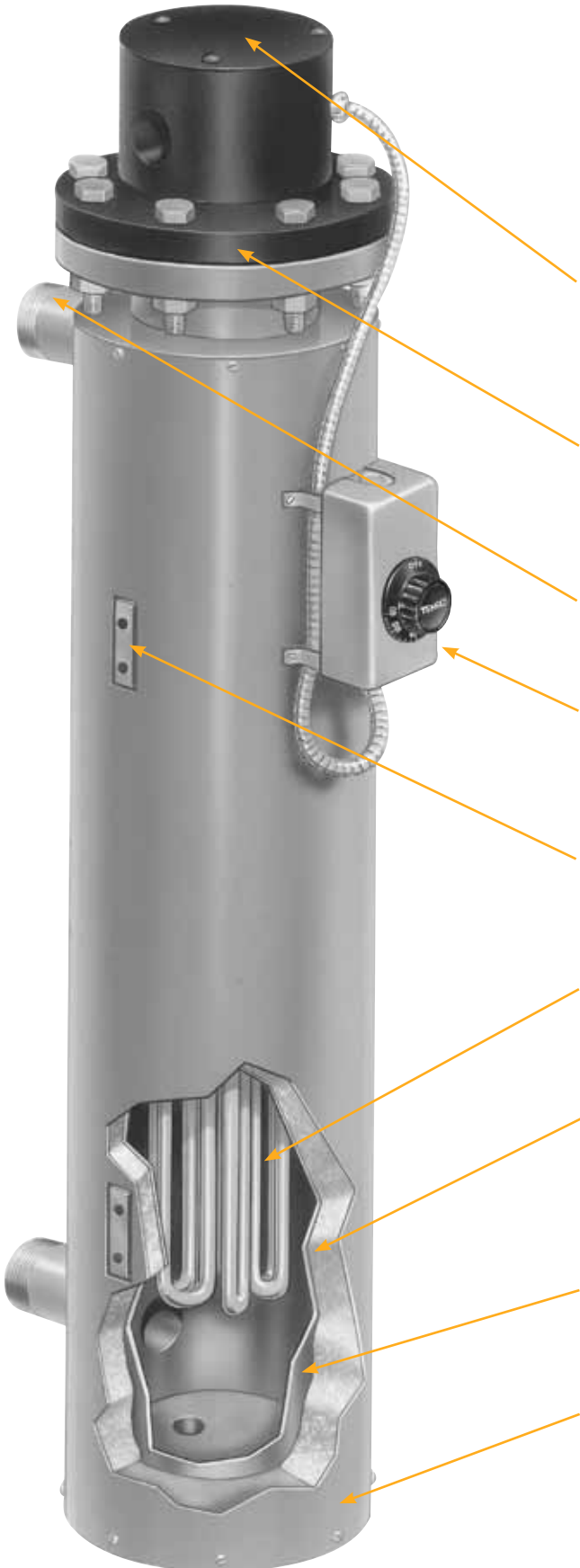
Wide selection of heating element sheath materials for maximum corrosion resistance to the medium being processed. On smaller circulation units with screw plug heaters, the element diameter is 8 or 12 mm (0.315 or 0.475"). On larger units with flanged heaters, the element diameter is 12 mm (0.475").

The vessel is surrounded with 25 mm (1") thick insulation rated to 399°C (750°F) to minimize heat loss. Additional insulation or a high temperature ceramic fiber insulation is optional. Vessels can also be supplied uninsulated.

Vessel material is SA53B or SA106B steel. Good for up to 399°C (750°F) operating temperature. For drainage and cleaning purposes, a drain plug is located in the base of the tank. Optional: stainless steel vessel.

Outer stainless steel sheet metal jacket protects the insulation from the environment and keeps it dry. Optional: Stainless steel outer jacket with a weather-tight seal.

**Note: Branch Circuit Wiring—Flange heater elements are wired into branch circuits having a maximum current of 48 Amps. The number of circuits is listed next to the heater's voltage and phase in the To Order tables. For different circuit wiring configurations, consult Omega.**



## Checklist for Selecting the Proper Circulation Heater

### ✓ Determine a Safe and Efficient Element Watt Density

**Element Watt Density** is the wattage dissipated per square inch of the element sheath surface and is calculated with the following formula:

$$\text{Watt Density} = \frac{\text{element wattage}}{\pi \times \text{element diameter} \times \text{element heated length}}$$

**For a particular application, element watt density will govern element sheath temperature. Factors to consider when choosing a suitable watt density are:**

1. Many materials are heat sensitive and can decompose or be damaged if the element is running too hot.
2. Air and other gases that are poor conductors of heat require watt densities matched to the velocity of the gas flow to prevent element overheating.
3. Mineral deposits when heating hard water and cleaning solutions can build up on the element sheath, acting as a heat insulator and raising the internal element temperature. If these deposits cannot be periodically removed, use a lower watt density element to increase heater life expectancy.

### ✓ Select the Element Sheath Material

#### Sheath Material Selection

**CORROSION.** In addition to selecting a sheath material that is compatible with the heated medium, other factors that affect corrosion need to be considered:

1. The temperature of the corrodent—As temperature increases the degree of corrosion increases. Also remember that usually the element temperature is higher than the material it is heating.
2. The degree of aeration to which a corrodent is exposed—Stagnant conditions can deprive the stainless steels of oxygen, which is required to maintain their corrosion resistant surface.
3. Velocity of the corrodent—Increased velocity can increase the corrosion rate.

#### Standard Element Sheath Materials

**Incoloy® 800** — A Nickel (30 to 35%), Chromium (19 to 23%), Iron alloy. The high nickel content of this alloy contributes to its resistance to scaling and corrosion. Used in air heating (also see Incoloy® 840) and immersion heating of potable water and other liquids that are not corrosive to an Incoloy® 800 sheath.

**Low Carbon Steel** — Applications include fluid heat transfer media, tar, high to low viscosity petroleum oils, asphalt, wax, molten salt, and other solutions not corrosive to a steel sheath.

**316 Stainless Steel** — A Chromium (16 to 18%), Nickel (11 to 14%), Iron Alloy with Molybdenum (2 to 3%) added to improve corrosion resistance in certain environments, especially those that would tend to cause pitting due to the presence of chlorides. Applications include deionized water.

**Copper** — Mainly used in clean water heating for washrooms, showers, rinse tanks and freeze protection of storage tanks.

#### Optional Element Sheath Materials

**304 Stainless Steel** — A Chromium (18 to 20%), Nickel (8 to 11%), Iron Alloy used in the food industry, sterilizing solutions, air heating and many organic and inorganic chemicals.

**321 Stainless Steel** — A Chromium (17 to 20%), Nickel (9 to 13%), Iron Alloy modified with the addition of titanium to prevent carbide precipitation and the resulting intergranular corrosion that can take place in certain mediums when operating in the 427 to 649°C (800 to 1200°F) temperature range.

**Incoloy® 840** — A Nickel (18 to 20%), Chromium (18 to 22%), Iron alloy. Incoloy 840 has about 10% less nickel than Incoloy 800. Used in many air heating applications where it has exhibited superior oxidation resistance at less cost than Incoloy 800.

**Incoloy® 825** — A Nickel (38 to 46%), Chromium (19.5 to 23.5%), Molybdenum (2 to 3%) Iron alloy. Consult Omega for more information.

#### Surface Treatments for Stainless Steel and Incoloy® Elements and Other Wetted Parts to Improve Corrosion Resistance

Flanged immersion heater surfaces in contact with the material being heated can be passivated or electro-polished to improve their resistance to corrosion.

Passivation removes surface contamination, usually iron, so that the optimum corrosion resistance of the stainless steel is maintained. Surface contamination would come from the small amount of steel that may be worn off a tool during the manufacturing process. Passivating is accomplished by dipping the heater in a warm solution of nitric acid.

Electro-Polishing is an electrochemical process that removes surface imperfections and contaminants, enhancing the corrosion resisting ability of the stainless steels. The resultant surface is clean, smooth and bright. Many medical and food applications require this finish.



✓ **Standard Terminal Housings**

Omega circulation heaters are supplied with a General Purpose Housing (NEMA 1) as standard unless otherwise specified.

Additional housing types include:

- Moisture Resistant (NEMA 4)
- Explosion Resistant (NEMA 7)
- Moisture/Explosion Resistant (NEMA 4/7)



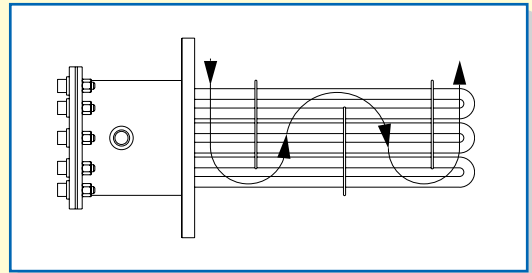
**Explosion resistant terminal housings are intended to provide containment of an explosion in the enclosure only. No portion of the heater assembly outside the enclosure is covered under this NEMA rating. Abnormal use of a heater which results in excessive temperature can create hazardous conditions such as a fire. Never perform any type of service nor remove the housing cover prior to disconnecting all electrical power to the heater.**

**Optional Terminal Housing Standoff Construction**



The electrical housing is separated from the flange by an air gap (six-inch standard) to lower the ambient temperature of the electrical wiring. This option is used on flanged immersion heaters where the flange temperature exceeds 250°C (482°F).

**Optional Circulation Heater Features**



**Flow Control Baffles**

Used on circulation tank heaters to aid heat transfer by forcing the liquid or gas back and forth across the elements. Baffles can be custom designed and positioned for your application.

**Temperature Control**

**Thermostats**

Thermostats are an optional feature on flanged immersion heaters. This type of control operates by expansion and contraction of a liquid in response to temperature change. Liquid contained within the sensing bulb and capillary flexes a diaphragm, causing the opening and closing of a snap action switch. For heating applications the contacts are normally closed and open on temperature rise.

**Installation Warnings and Recommendations**

1. Do not use the thermostat as a power switch. Use some other means of disconnecting power to the heater for servicing.
2. A Thermostat is not a fail-safe device. Use an approved high temperature limit control and/or pressure limit control for safe operation.
3. Avoid kinking or bending the capillary tube too sharply as this will alter the calibration and/or render the thermostat inoperable.
4. Excess capillary tube should be coiled neatly in junction box.
5. The capillary tube must never touch the thermostat contacts as this will create an electrical short capable of harming personnel and/or equipment.

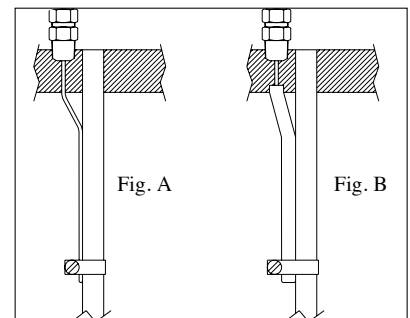
**Thermocouples**

Type J or Type K thermocouples can be supplied for process temperature or over-temperature control. Type J is reliable and accurate for temperatures up to 538°C (1000°F). Type K should be used for higher temperatures.

For measuring process temperatures the thermocouple can be mounted in a thermowell in the center of the element bundle. Note that a location somewhere away from the heater may give a more accurate measurement of process temperature.

For over-temperature protection the thermocouple is usually attached to one of the elements (Figure A) and any unusual rise in element temperature would shut the heater down. This thermocouple may also be mounted in a thermowell (Figure B), which is then attached to one of the heating elements if desired. This protects the thermocouple from the solution being heated and allows you to replace it without removing the heater, but does increase its response time.

Temperature and over-temperature controls for using the signal generated by thermocouples and how to select the best control for your application can be found at [omega.com/controllers](http://omega.com/controllers)



## Circulation Heater Installation Recommendations

Omega circulation heaters will have a long life and provide dependable, trouble-free service if properly installed, operated and maintained as per the following recommendations:

### Installation

1. Flange heaters are supplied with two drilled and tapped holes for threaded eye bolts, providing ease of handling during installation and flange removal during maintenance cleaning or heater replacement.
2. Replacement of heater is inevitable. Therefore, provide adequate space for installation, allowing ample room to remove the flange heater for cleaning or replacement.
3. In applications requiring the circulation heater to be fed by an inline pump, install the pump at the inlet end.
4. To maintain the lowest possible temperature at the terminal box, place the outlet at the end opposite to the terminal box. If your process temperature is circulating at 232°C (450°F) or above (at the nozzle closest to the flange), stand-off terminal box construction is recommended.
5. To prevent temperature and/or pressure buildup on closed loop circulation heater systems, adequate and strategically located thermocouples for temperature controllers and pressure relief valves should be installed. Never over-rate pressure relief valves beyond the pressure temperature rating of the flange being used.
6. During the process cycle, flow rate of the medium being heated should never be interrupted or reduced, thus creating an overheating condition. Excess temperature can result in damage to the medium being processed and premature heater failure.
7. Make sure that your circulation heater is equipped with the proper terminal housing for the environment in which the heater is being used. NEMA 1—general purpose, NEMA 4—moisture resistant, and NEMA 7—explosion resistant.

**Vertical Mounting—Liquids:**  
With terminal housing up and inlet pipe on the bottom, the heating elements will be immersed at all times to prevent premature failure.



**Horizontal Mounting—Liquids and Gases:**  
Always mount heater with inlet-outlet pipes facing up to ensure the heating elements will be immersed at all times to prevent premature failure. For liquid heating, outlet may be at either end. When heating gases the inlet should be closest to the terminal enclosure to minimize terminal box wiring temperatures.



**Vertical Mounting—Gases:** Mount with terminal enclosure and inlet pipe at bottom of tank to minimize terminal box wiring temperatures.

### Wiring

1. All heater installations must be properly earth grounded to eliminate electric shock hazard. Electrical wiring must be in accordance with Local and/or National Electrical Codes.
2. Circulation heaters are supplied standard with NEMA 1 terminal housings. All power to heaters must be disconnected before removing the terminal housing cover and performing any type of service.
3. Electrical connections on heater terminals must be kept tight. Loose connections will create arcing, over-heating, and eventually will destroy the heater terminal and cause premature heater failure.
4. If the amperage rating of your circulation heater exceeds the amperage capacity of the supplied thermostat, mercury relays or magnetic contactors should be used with the thermostat.
5. Over-temperature protection thermocouples require a separate conduit to the control panel for the thermocouple wire.
6. Omega offers a large selection of power control panels for circulation heaters. See [omega.com/controllers](http://omega.com/controllers)

### Maintenance

1. Never perform any type of service on the unit prior to disconnecting all electrical power and shutting off all intake lines.
2. Remove sludge deposits through the drain plug.
3. Check flange bolts for tightness.
4. Check terminal connections for tightness.
5. Check thermocouple or thermostat bulb for response to temperature changes. If defective, replace immediately.
6. Check for leaks.
7. Depending on operating conditions and medium being processed, the flange or screw plug heater should be periodically removed for physical inspection and cleaning of the element bundle.



## Circulation Tank Assembly Maximum Immersed Element Length

Standard circulation heaters shown in the tables have element immersion lengths determined by the element wattage and element watt density. The screw plug or flange heater containing the elements is matched to a standard circulation heater tank assembly to assure proper heat transfer and heated material flow. When designing a system

with a heater not shown on these pages the table below can be used to select a tank size based on the calculated immersion length. If a standard tank size is not suitable for your installation, Omega will design and manufacture a custom tank and heater assembly to satisfy the requirements of your application.

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
1½ NPT	1.1	18.0	457
	1.2	26.0	660
2½ NPT	2.1	25.5	648
	2.2	35.5	902
	2.3	48.0	1219
3" Flange	3.1	28.0	711
	3.2	38.0	965
	3.3	50.5	1283
4" Flange	4.1	26.5	673
	4.2	37.0	940
	4.3	58.0	1473
	4.4	79.0	2007
5" Flange	5.1	36.0	914
	5.2	43.0	1092
	5.3	54.5	1384
	5.4	68.0	1727
	5.5	85.0	2159
6" Flange	6.1	26.5	673
	6.2	37.0	940
	6.3	58.0	1473
	6.4	79.0	2007

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
8" Flange	8.1	32.5	826
	8.2	40.5	1029
	8.3	47.5	1207
	8.4	55.0	1397
	8.5	64.5	1638
	8.6	73.5	1867
	8.7	83.5	2121
10" Flange	10.1	60.0	1524
	10.2	67.0	1702
	10.3	73.0	1854
	10.4	82.0	2083
	10.5	90.0	2286
12" Flange	12.1	59.0	1499
	12.2	66.5	1689
	12.3	74.0	1880
	12.4	81.5	2070
	12.5	89.0	2261
14" Flange	14.1	58.0	1473
	14.2	65.5	1664
	14.3	73.0	1854
	14.4	80.5	2045
	14.5	88.0	2235

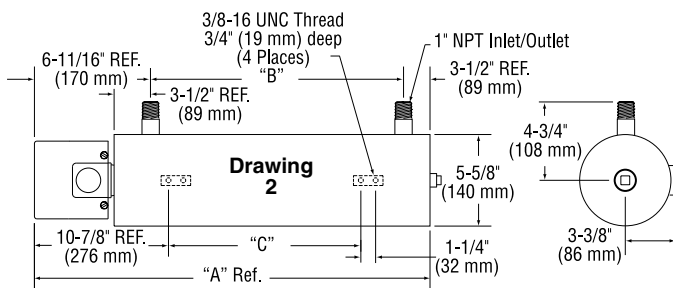
### 8 watts/in<sup>2</sup> (1.3 watts/cm<sup>2</sup>) — Typical Applications: Fuel Oils (Bunker C and Number 6)

- Steel Screw Plug and Steel 150 lb Flanged Heater Sizes
- Steel Sheath Heating Elements
- Steel Tank
- NEMA 1 Terminal Housing

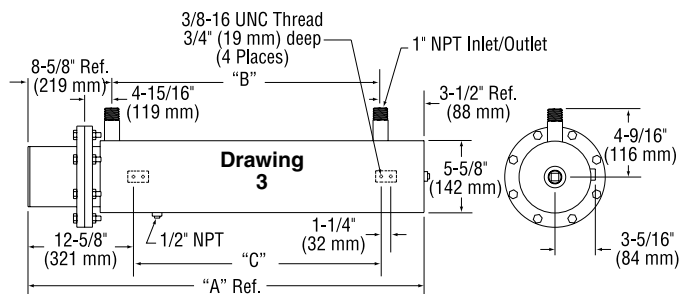
Note: 3-Phase only. Cannot be rewired for single phase.

Nominal Pipe Size	Dimensional Drawing Number	KW	Model Number					Approx Weight	
			120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)	lb	kg
2½ NPT 3 elements	2.2	2	—	—	CHF01100 (1)	—	CHF01101 (1)	37	17
	2.3	3	—	—	CHF01102 (1)	—	CHF01101 (1)	46	21
3"—150 lb 3 elements	3.2	2	—	—	CHF01104 (1)	—	CHF01105 (1)	62	28
	3.3	3	—	—	CHF01106 (1)	—	CHF01107 (1)	76	34

(C\*) = Number of Branch Circuits per heater



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
2.2	42 11/16	1084	32 1/2	826	26 1/2	673
2.3	55 5/16	1402	45	1143	39	991



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
3.2	44 5/8	1133	32 1/2	826	26 1/2	673
3.3	57 7/8	1451	45	1143	39	991

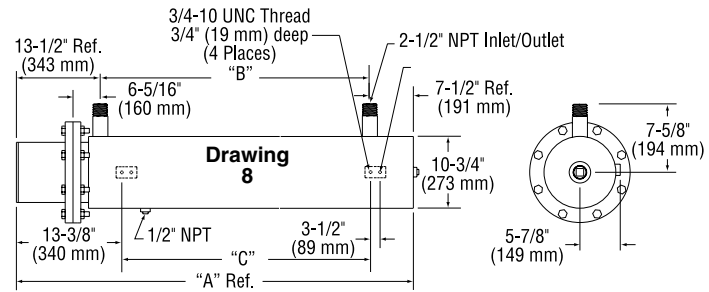
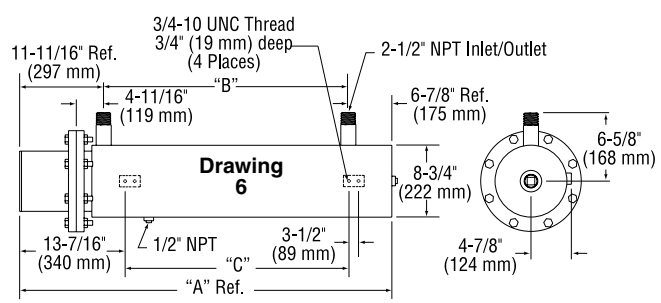
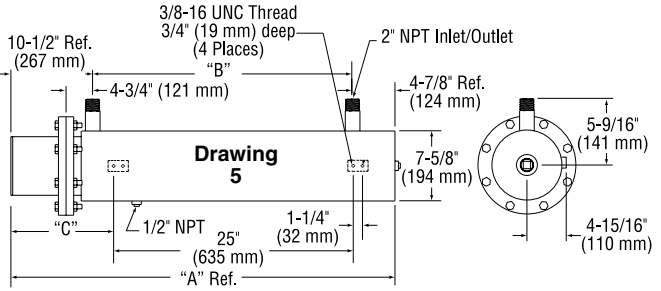
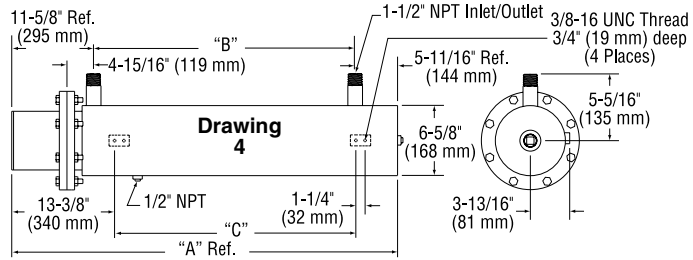
## Circulation Heaters

<b>To Order Visit <a href="http://omega.com/chf1">omega.com/chf1</a> for Pricing and Details</b>						
Nominal Pipe Size	Model No.		Dimensional Drawing No.	KW	Approximate Weight	
	240V-3Ph (C*)	480V-3Ph (C*)			lb	kg
4"—150 lb 6 elements	CHF01108 (1)	CHF01109 (1)	4.3	5	117	53
	CHF01110 (1)	CHF01111 (1)	4.3	6	120	54
	CHF01112 (1)	CHF01113 (1)	4.4	8	147	67
	CHF01114 (1)	CHF01115 (1)	4.4	10	151	68
5"—150 lb 6 elements	CHF01116 (1)	CHF01117 (1)	5.2	5	128	58
	CHF01118 (1)	CHF01119 (1)	5.3	6	146	66
	CHF01120 (1)	CHF01121 (1)	5.4	8	172	78
	CHF01122 (1)	CHF01123 (1)	5.5	10	192	87
5"—150 lb 9 elements	CHF01124 (1)	CHF01125 (1)	5.2	7.5	135	61
	CHF01126 (1)	CHF01127 (1)	5.3	9	154	70
	CHF01128 (1)	CHF01129 (1)	5.4	12	183	83
	CHF01130 (1)	CHF01131 (1)	5.5	15	205	93
6"—150 lb 12 elements	CHF01132 (1)	CHF01133 (1)	6.2	8	157	71
	CHF01134 (1)	CHF01135 (1)	6.3	10	197	80
	CHF01136 (1)	CHF01137 (1)	6.3	12	202	92
	CHF01138 (1)	CHF01139 (1)	6.4	16.5	249	113
	CHF01140 (1)	CHF01141 (1)	6.4	20	257	117
6"—150 lb 15 elements	CHF01142 (1)	CHF01143 (1)	6.2	10	163	74
	CHF01144 (1)	CHF01145 (1)	6.3	12.5	204	93
	CHF01146 (1)	CHF01147 (1)	6.3	15	211	96
	CHF01148 (5)	CHF01149 (1)	6.4	21	260	118
	CHF01150 (5)	CHF01151 (1)	6.4	25	273	124
8"—150 lb 18 elements	CHF01152 (1)	CHF01153 (1)	8.3	12.5	272	123
	CHF01154 (1)	CHF01155 (1)	8.4	16.5	300	136
	CHF01156 (1)	CHF01157 (1)	8.5	20	334	151
	CHF01158 (2)	CHF01159 (1)	8.6	24	367	166
	CHF01160 (2)	CHF01161 (1)	8.7	27	402	182
8"—150 lb 24 elements	CHF01162 (1)	CHF01163 (1)	8.3	17	287	130
	CHF01164 (2)	CHF01165 (1)	8.4	22	318	144
	CHF01166 (2)	CHF01167 (1)	8.5	27	356	161
	CHF01168 (2)	CHF01169 (1)	8.6	32	386	175
	CHF01170 (2)	CHF01171 (1)	8.7	36	428	194
10"—150 lb 27 elements	CHF01172 (3)	CHF01173 (1)	10.3	30	537	244
	CHF01174 (3)	CHF01175 (1)	10.4	35	580	263
	CHF01176 (3)	CHF01177 (1)	10.5	40	623	283
12"—150 lb 36 elements	CHF01178 (3)	CHF01179 (2)	12.4	47	751	341
	CHF01180 (3)	CHF01181 (2)	12.5	54	793	360
14"—150 lb 45 elements	CHF01182 (3)	CHF01183 (3)	14.4	60	885	401
	CHF01184 (5)	CHF01185 (3)	14.5	67	941	427

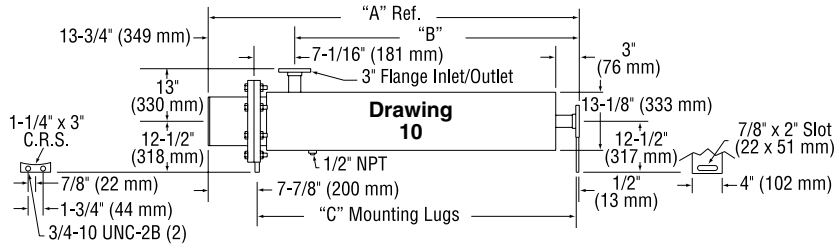
**Ordering Examples:** CHF01106, 3 KW, 240 Vac, 3 phase circulation heater. CHF01141, 20 KW, 480 Vac, 3 phase circulation heater.

**(C\*) = Number of Branch Circuits per heater**

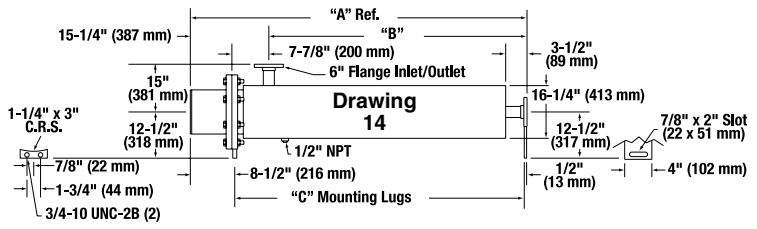
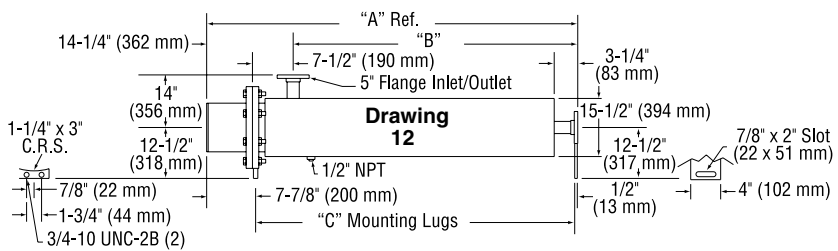
**Note:** Nominal pipe size 203 mm (8") and larger are 7 watts/in<sup>2</sup> (1.1 watts/cm<sup>2</sup>)



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
4.3	69 <sup>5</sup> / <sub>16</sub>	1761	52	1321	48 <sup>1</sup> / <sub>2</sub>	1232
4.4	90 <sup>5</sup> / <sub>16</sub>	2294	73	1854	69 <sup>1</sup> / <sub>2</sub>	1765
5.2	52 <sup>5</sup> / <sub>16</sub>	1330	37	940	15 <sup>1</sup> / <sub>4</sub>	387
5.3	63 <sup>7</sup> / <sub>16</sub>	1622	48 <sup>1</sup> / <sub>2</sub>	1232	21	533
5.4	77 <sup>1</sup> / <sub>4</sub>	1962	61 <sup>7</sup> / <sub>16</sub>	1572	27 <sup>1</sup> / <sub>2</sub>	698
5.5	90 <sup>1</sup> / <sub>4</sub>	2292	74 <sup>5</sup> / <sub>16</sub>	1902	34 <sup>1</sup> / <sub>4</sub>	870
6.2	49 <sup>5</sup> / <sub>16</sub>	1259	31	787	27 <sup>1</sup> / <sub>2</sub>	699
6.3	70 <sup>5</sup> / <sub>16</sub>	1792	52	1321	48 <sup>1</sup> / <sub>2</sub>	1232
6.4	91 <sup>5</sup> / <sub>16</sub>	2326	73	1854	69 <sup>1</sup> / <sub>2</sub>	1765
8.3	60 <sup>3</sup> / <sub>4</sub>	1543	39 <sup>11</sup> / <sub>16</sub>	1008	36 <sup>9</sup> / <sub>16</sub>	919
8.4	68 <sup>3</sup> / <sub>4</sub>	1746	47 <sup>5</sup> / <sub>16</sub>	1202	43 <sup>3</sup> / <sub>16</sub>	1113
8.5	77 <sup>5</sup> / <sub>16</sub>	1978	56 <sup>3</sup> / <sub>16</sub>	1443	53 <sup>5</sup> / <sub>16</sub>	1354
8.6	86 <sup>7</sup> / <sub>16</sub>	2207	65 <sup>9</sup> / <sub>16</sub>	1672	62 <sup>7</sup> / <sub>16</sub>	1583
8.7	96 <sup>7</sup> / <sub>16</sub>	2461	75 <sup>3</sup> / <sub>16</sub>	1926	72 <sup>5</sup> / <sub>16</sub>	1837
10.3	89	2261	75 <sup>1</sup> / <sub>4</sub>	1911	81	2057
10.4	96 <sup>1</sup> / <sub>2</sub>	2451	82 <sup>3</sup> / <sub>4</sub>	2102	88 <sup>1</sup> / <sub>2</sub>	2248
10.5	104	2642	90 <sup>1</sup> / <sub>4</sub>	2292	96	2438
12.4	96 <sup>3</sup> / <sub>4</sub>	2457	82 <sup>1</sup> / <sub>2</sub>	2096	88 <sup>5</sup> / <sub>16</sub>	2251
12.5	104 <sup>1</sup> / <sub>4</sub>	2648	90	2286	96 <sup>5</sup> / <sub>16</sub>	2442
14.4	97 <sup>5</sup> / <sub>16</sub>	2467	81 <sup>5</sup> / <sub>16</sub>	2080	88 <sup>3</sup> / <sub>4</sub>	2254
14.5	104 <sup>5</sup> / <sub>16</sub>	2657	89 <sup>5</sup> / <sub>16</sub>	2270	96 <sup>1</sup> / <sub>4</sub>	2445



**Note: Circulation heater mounting lug design and location in the assembly drawings shown are standard. Designs can be modified to fit customer installation. Consult Omega with your requirements.**





### CHF Series

**Self-contained heating units designed for optimum operating efficiency and performance—**

**Providing trouble-free service and application flexibility!**

All of the heat generated by the elements is immediately transferred to the medium being processed with minimal losses.

**Standard and optional features include...**

General purpose (NEMA 1) terminal housing is standard. Moisture proof (NEMA 4) and/or explosion resistant (NEMA 7) housings are optional. A set of installation and maintenance instructions along with a wiring diagram can be found inside the terminal housing of each unit.

Heating source—32 and 64 mm (1¼" and 2½") screw plug heaters are used on smaller units. 76 to 356 mm (3 to 14") size heaters use flanged immersion heaters. The flanges are made from forged steel rated for 150 lbs with raised face. Supplied with threaded eyebolts for ease of handling and installation. Optional stainless steel flanges or 300 lb ratings available.

Inlet-outlet connections are NPT pipe threads for 76 to 203 mm (3 to 8") circulation heaters (flanges are optional). Standard inlet-outlet connections on 254 mm (10") and larger units are 150 lb rated flanges.

Optional feature double-pole non-indicating bulb and capillary type thermostat can be located in the terminal box (standard) or attached to the insulation jacket as pictured. Solid state temperature controllers and indicating thermostats are available. Over-temperature protection can be provided by attaching a thermocouple to one of the elements.

Threaded mounting lugs to support the unit are welded to the steel vessel. Custom supports can be designed to fit your structure.

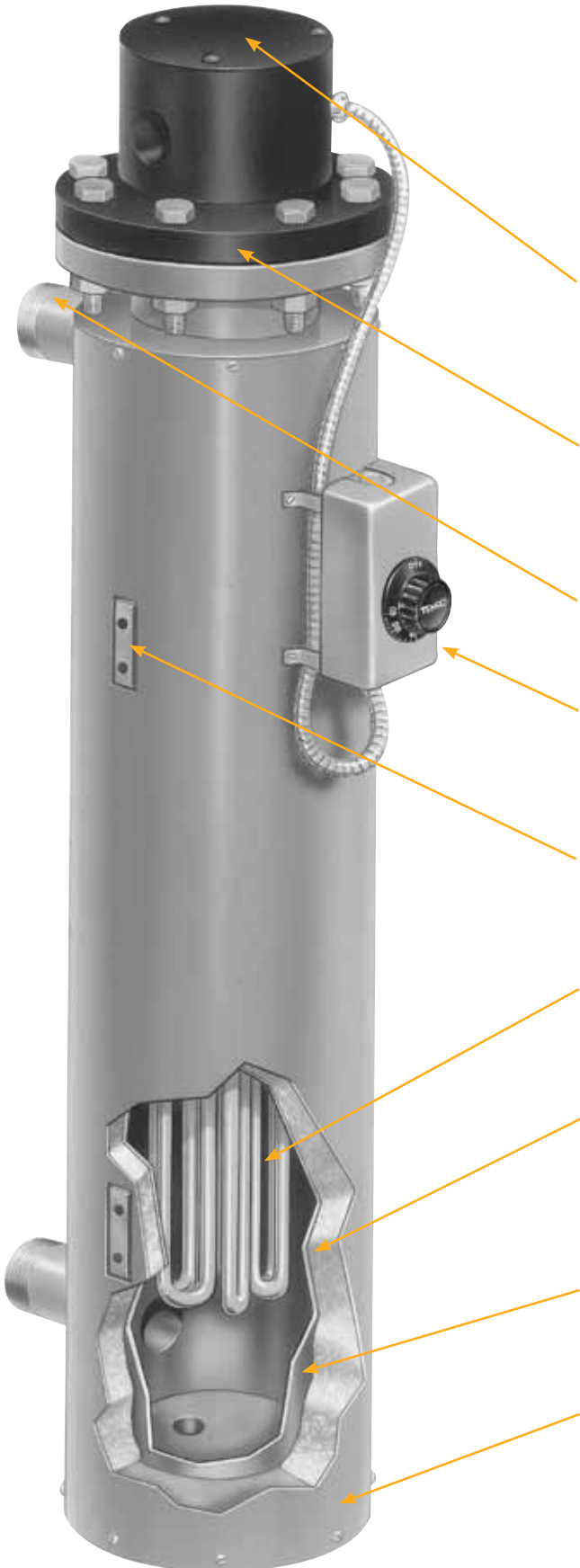
Wide selection of heating element sheath materials for maximum corrosion resistance to the medium being processed. On smaller circulation units with screw plug heaters, the element diameter is 8 or 12 mm (0.315 or 0.475"). On larger units with flanged heaters, the element diameter is 12 mm (0.475").

The vessel is surrounded with 25 mm (1") thick insulation rated to 399°C (750°F) to minimize heat loss. Additional insulation or a high temperature ceramic fiber insulation is optional. Vessels can also be supplied uninsulated.

Vessel material is SA53B or SA106B steel. Good for up to 399°C (750°F) operating temperature. For drainage and cleaning purposes, a drain plug is located in the base of the tank. Optional: stainless steel vessel.

Outer stainless steel sheet metal jacket protects the insulation from the environment and keeps it dry. Optional: Stainless steel outer jacket with a weather-tight seal.

**Note: Branch Circuit Wiring—Flange heater elements are wired into branch circuits having a maximum current of 48 Amps. The number of circuits is listed next to the heater's voltage and phase in the To Order tables. For different circuit wiring configurations, consult Omega.**





## Checklist for Selecting the Proper Circulation Heater

### ✓ Determine a Safe and Efficient Element Watt Density

**Element Watt Density** is the wattage dissipated per square inch of the element sheath surface and is calculated with the following formula:

$$\text{Watt Density} = \frac{\text{element wattage}}{\pi \times \text{element diameter} \times \text{element heated length}}$$

**For a particular application, element watt density will govern element sheath temperature. Factors to consider when choosing a suitable watt density are:**

1. Many materials are heat sensitive and can decompose or be damaged if the element is running too hot.
2. Air and other gases that are poor conductors of heat require watt densities matched to the velocity of the gas flow to prevent element overheating.
3. Mineral deposits when heating hard water and cleaning solutions can build up on the element sheath, acting as a heat insulator and raising the internal element temperature. If these deposits cannot be periodically removed, use a lower watt density element to increase heater life expectancy.

### ✓ Select the Element Sheath Material

#### Sheath Material Selection

**CORROSION.** In addition to selecting a sheath material that is compatible with the heated medium, other factors that affect corrosion need to be considered:

1. The temperature of the corrodent—As temperature increases the degree of corrosion increases. Also remember that usually the element temperature is higher than the material it is heating.
2. The degree of aeration to which a corrodent is exposed—Stagnant conditions can deprive the stainless steels of oxygen, which is required to maintain their corrosion resistant surface.
3. Velocity of the corrodent—Increased velocity can increase the corrosion rate.

#### Standard Element Sheath Materials

**Incoloy® 800** — A Nickel (30 to 35%), Chromium (19 to 23%), Iron alloy. The high nickel content of this alloy contributes to its resistance to scaling and corrosion. Used in air heating (also see Incoloy® 840) and immersion heating of potable water and other liquids that are not corrosive to an Incoloy® 800 sheath.

**Low Carbon Steel** — Applications include fluid heat transfer media, tar, high to low viscosity petroleum oils, asphalt, wax, molten salt, and other solutions not corrosive to a steel sheath.

**316 Stainless Steel** — A Chromium (16 to 18%), Nickel (11 to 14%), Iron Alloy with Molybdenum (2 to 3%) added to improve corrosion resistance in certain environments, especially those that would tend to cause pitting due to the presence of chlorides. Applications include deionized water.

**Copper** — Mainly used in clean water heating for washrooms, showers, rinse tanks and freeze protection of storage tanks.

#### Optional Element Sheath Materials

**304 Stainless Steel** — A Chromium (18 to 20%), Nickel (8 to 11%), Iron Alloy used in the food industry, sterilizing solutions, air heating and many organic and inorganic chemicals.

**321 Stainless Steel** — A Chromium (17 to 20%), Nickel (9 to 13%), Iron Alloy modified with the addition of titanium to prevent carbide precipitation and the resulting intergranular corrosion that can take place in certain mediums when operating in the 427 to 649°C (800 to 1200°F) temperature range.

**Incoloy® 840** — A Nickel (18 to 20%), Chromium (18 to 22%), Iron alloy. Incoloy 840 has about 10% less nickel than Incoloy 800. Used in many air heating applications where it has exhibited superior oxidation resistance at less cost than Incoloy 800.

**Incoloy® 825** — A Nickel (38 to 46%), Chromium (19.5 to 23.5%), Molybdenum (2 to 3%) Iron alloy. Consult Omega for more information.

#### Surface Treatments for Stainless Steel and Incoloy® Elements and Other Wetted Parts to Improve Corrosion Resistance

Flanged immersion heater surfaces in contact with the material being heated can be passivated or electro-polished to improve their resistance to corrosion.

Passivation removes surface contamination, usually iron, so that the optimum corrosion resistance of the stainless steel is maintained. Surface contamination would come from the small amount of steel that may be worn off a tool during the manufacturing process. Passivating is accomplished by dipping the heater in a warm solution of nitric acid.

Electro-Polishing is an electrochemical process that removes surface imperfections and contaminants, enhancing the corrosion resisting ability of the stainless steels. The resultant surface is clean, smooth and bright. Many medical and food applications require this finish.



✓ **Standard Terminal Housings**

Omega circulation heaters are supplied with a General Purpose Housing (NEMA 1) as standard unless otherwise specified.

Additional housing types include:

- Moisture Resistant (NEMA 4)
- Explosion Resistant (NEMA 7)
- Moisture/Explosion Resistant (NEMA 4/7)



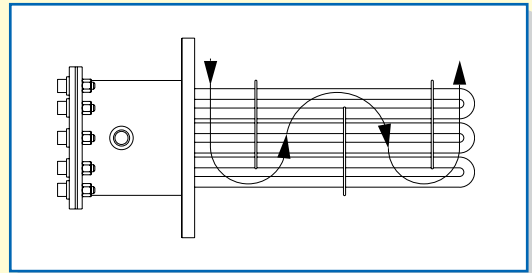
**Explosion resistant terminal housings are intended to provide containment of an explosion in the enclosure only. No portion of the heater assembly outside the enclosure is covered under this NEMA rating. Abnormal use of a heater which results in excessive temperature can create hazardous conditions such as a fire. Never perform any type of service nor remove the housing cover prior to disconnecting all electrical power to the heater.**

**Optional Terminal Housing Standoff Construction**



The electrical housing is separated from the flange by an air gap (six-inch standard) to lower the ambient temperature of the electrical wiring. This option is used on flanged immersion heaters where the flange temperature exceeds 250°C (482°F).

**Optional Circulation Heater Features**



**Flow Control Baffles**

Used on circulation tank heaters to aid heat transfer by forcing the liquid or gas back and forth across the elements. Baffles can be custom designed and positioned for your application.

**Temperature Control**

**Thermostats**

Thermostats are an optional feature on flanged immersion heaters. This type of control operates by expansion and contraction of a liquid in response to temperature change. Liquid contained within the sensing bulb and capillary flexes a diaphragm, causing the opening and closing of a snap action switch. For heating applications the contacts are normally closed and open on temperature rise.

**Installation Warnings and Recommendations**

1. Do not use the thermostat as a power switch. Use some other means of disconnecting power to the heater for servicing.
2. A Thermostat is not a fail-safe device. Use an approved high temperature limit control and/or pressure limit control for safe operation.
3. Avoid kinking or bending the capillary tube too sharply as this will alter the calibration and/or render the thermostat inoperable.
4. Excess capillary tube should be coiled neatly in junction box.
5. The capillary tube must never touch the thermostat contacts as this will create an electrical short capable of harming personnel and/or equipment.

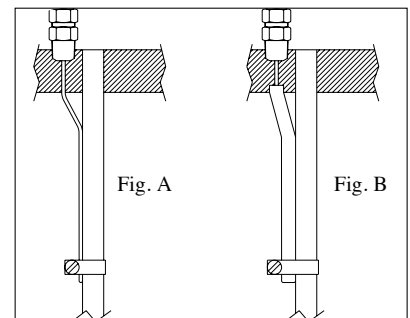
**Thermocouples**

Type J or Type K thermocouples can be supplied for process temperature or over-temperature control. Type J is reliable and accurate for temperatures up to 538°C (1000°F). Type K should be used for higher temperatures.

For measuring process temperatures the thermocouple can be mounted in a thermowell in the center of the element bundle. Note that a location somewhere away from the heater may give a more accurate measurement of process temperature.

For over-temperature protection the thermocouple is usually attached to one of the elements (Figure A) and any unusual rise in element temperature would shut the heater down. This thermocouple may also be mounted in a thermowell (Figure B), which is then attached to one of the heating elements if desired. This protects the thermocouple from the solution being heated and allows you to replace it without removing the heater, but does increase its response time.

Temperature and over-temperature controls for using the signal generated by thermocouples and how to select the best control for your application can be found at [omega.com/controllers](http://omega.com/controllers)



## Circulation Heater Installation Recommendations

Omega circulation heaters will have a long life and provide dependable, trouble-free service if properly installed, operated and maintained as per the following recommendations:

### Installation

1. Flange heaters are supplied with two drilled and tapped holes for threaded eye bolts, providing ease of handling during installation and flange removal during maintenance cleaning or heater replacement.
2. Replacement of heater is inevitable. Therefore, provide adequate space for installation, allowing ample room to remove the flange heater for cleaning or replacement.
3. In applications requiring the circulation heater to be fed by an inline pump, install the pump at the inlet end.
4. To maintain the lowest possible temperature at the terminal box, place the outlet at the end opposite to the terminal box. If your process temperature is circulating at 232°C (450°F) or above (at the nozzle closest to the flange), stand-off terminal box construction is recommended.
5. To prevent temperature and/or pressure buildup on closed loop circulation heater systems, adequate and strategically located thermocouples for temperature controllers and pressure relief valves should be installed. Never over-rate pressure relief valves beyond the pressure temperature rating of the flange being used.
6. During the process cycle, flow rate of the medium being heated should never be interrupted or reduced, thus creating an overheating condition. Excess temperature can result in damage to the medium being processed and premature heater failure.
7. Make sure that your circulation heater is equipped with the proper terminal housing for the environment in which the heater is being used. NEMA 1—general purpose, NEMA 4—moisture resistant, and NEMA 7—explosion resistant.

**Vertical Mounting—Liquids:**  
With terminal housing up and inlet pipe on the bottom, the heating elements will be immersed at all times to prevent premature failure.



**Horizontal Mounting—Liquids and Gases:**  
Always mount heater with inlet-outlet pipes facing up to ensure the heating elements will be immersed at all times to prevent premature failure. For liquid heating, outlet may be at either end. When heating gases the inlet should be closest to the terminal enclosure to minimize terminal box wiring temperatures.



**Vertical Mounting—Gases:**  
Mount with terminal enclosure and inlet pipe at bottom of tank to minimize terminal box wiring temperatures.

### Wiring

1. All heater installations must be properly earth grounded to eliminate electric shock hazard. Electrical wiring must be in accordance with Local and/or National Electrical Codes.
2. Circulation heaters are supplied standard with NEMA 1 terminal housings. All power to heaters must be disconnected before removing the terminal housing cover and performing any type of service.
3. Electrical connections on heater terminals must be kept tight. Loose connections will create arcing, over-heating, and eventually will destroy the heater terminal and cause premature heater failure.
4. If the amperage rating of your circulation heater exceeds the amperage capacity of the supplied thermostat, mercury relays or magnetic contactors should be used with the thermostat.
5. Over-temperature protection thermocouples require a separate conduit to the control panel for the thermocouple wire.
6. Omega offers a large selection of power control panels for circulation heaters. See [omega.com/controllers](http://omega.com/controllers)

### Maintenance

1. Never perform any type of service on the unit prior to disconnecting all electrical power and shutting off all intake lines.
2. Remove sludge deposits through the drain plug.
3. Check flange bolts for tightness.
4. Check terminal connections for tightness.
5. Check thermocouple or thermostat bulb for response to temperature changes. If defective, replace immediately.
6. Check for leaks.
7. Depending on operating conditions and medium being processed, the flange or screw plug heater should be periodically removed for physical inspection and cleaning of the element bundle.



## Circulation Tank Assembly Maximum Immersed Element Length

Standard circulation heaters shown in the tables have element immersion lengths determined by the element wattage and element watt density. The screw plug or flange heater containing the elements is matched to a standard circulation heater tank assembly to assure proper heat transfer and heated material flow. When designing a system

with a heater not shown on these pages the table below can be used to select a tank size based on the calculated immersion length. If a standard tank size is not suitable for your installation, Omega will design and manufacture a custom tank and heater assembly to satisfy the requirements of your application.

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
1½ NPT	1.1	18.0	457
	1.2	26.0	660
2½ NPT	2.1	25.5	648
	2.2	35.5	902
	2.3	48.0	1219
3" Flange	3.1	28.0	711
	3.2	38.0	965
	3.3	50.5	1283
4" Flange	4.1	26.5	673
	4.2	37.0	940
	4.3	58.0	1473
	4.4	79.0	2007
5" Flange	5.1	36.0	914
	5.2	43.0	1092
	5.3	54.5	1384
	5.4	68.0	1727
	5.5	85.0	2159
6" Flange	6.1	26.5	673
	6.2	37.0	940
	6.3	58.0	1473
	6.4	79.0	2007

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
8" Flange	8.1	32.5	826
	8.2	40.5	1029
	8.3	47.5	1207
	8.4	55.0	1397
	8.5	64.5	1638
	8.6	73.5	1867
	8.7	83.5	2121
10" Flange	10.1	60.0	1524
	10.2	67.0	1702
	10.3	73.0	1854
	10.4	82.0	2083
	10.5	90.0	2286
12" Flange	12.1	59.0	1499
	12.2	66.5	1689
	12.3	74.0	1880
	12.4	81.5	2070
	12.5	89.0	2261
14" Flange	14.1	58.0	1473
	14.2	65.5	1664
	14.3	73.0	1854
	14.4	80.5	2045
	14.5	88.0	2235

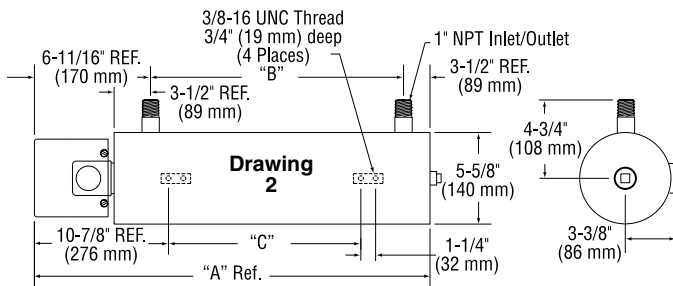
### 8 watts/in<sup>2</sup> (1.3 watts/cm<sup>2</sup>) — Typical Applications: Fuel Oils (Bunker C and Number 6)

- Steel Screw Plug and Steel 150 lb Flanged Heater Sizes
- Steel Sheath Heating Elements
- Steel Tank
- NEMA 1 Terminal Housing

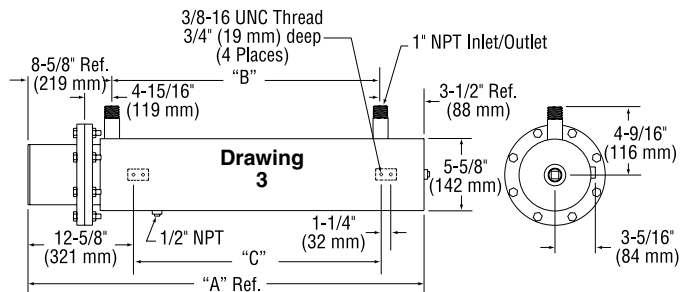
Note: 3-Phase only. Cannot be rewired for single phase.

Nominal Pipe Size	Dimensional Drawing Number	KW	Model Number					Approx Weight	
			120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)	lb	kg
2½ NPT 3 elements	2.2	2	—	—	CHF01100 (1)	—	CHF01101 (1)	37	17
	2.3	3	—	—	CHF01102 (1)	—	CHF01101 (1)	46	21
3"—150 lb 3 elements	3.2	2	—	—	CHF01104 (1)	—	CHF01105 (1)	62	28
	3.3	3	—	—	CHF01106 (1)	—	CHF01107 (1)	76	34

(C\*) = Number of Branch Circuits per heater



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
2.2	42 11/16	1084	32 1/2	826	26 1/2	673
2.3	55 5/16	1402	45	1143	39	991



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
3.2	44 5/8	1133	32 1/2	826	26 1/2	673
3.3	57 5/8	1451	45	1143	39	991



23 watts/in<sup>2</sup> (3.6 watts/cm<sup>2</sup>)—Typical Applications: Lightweight Oils, Degreasing Solutions, Heat Transfer Oils

**To Order Visit [omega.com/chf2](http://omega.com/chf2) for Pricing and Details**

Nominal Pipe Size	Model Number					Dim Drawing Number	KW	Approx Weight	
	120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)			lb	kg
1¼ NPT 2 elements	CHF01186	CHF01187 (1)	—	—	—	1.1	1.5	14	6
	CHF01188	CHF01189 (1)	—	—	—	1.2	2	18	8
2½ NPT 3 elements	—	CHF01190 (1)	CHF01191 (1)	CHF01192 (1)	CHF01193 (1)	2.1	3	28	13
	—	CHF01194 (1)	CHF01195 (1)	CHF01196 (1)	CHF01197 (1)	2.1	4.5	29	13
	—	CHF01198 (1)	CHF01199 (1)	CHF01200 (1)	CHF01201 (1)	2.2	6	37	17
	—	CHF01202 (1)	CHF01203 (1)	CHF01204 (1)	CHF01205 (1)	2.3	7.5	45	20
	—	CHF01206 (1)	CHF01207 (1)	CHF01208 (1)	CHF01209 (1)	2.3	9	46	21
3"—150 lb 3 elements	—	CHF01210 (1)	CHF01211 (1)	CHF01212 (1)	CHF01213 (1)	3.1	3	53	24
	—	CHF01214 (1)	CHF01215 (1)	CHF01216 (1)	CHF01217 (1)	3.1	4.5	54	24
	—	CHF01218 (1)	CHF01219 (1)	CHF01220 (1)	CHF01221 (1)	3.2	6	62	28
	—	CHF01222 (1)	CHF01223 (1)	CHF01224 (1)	CHF01225 (1)	3.3	7.5	74	34
	—	CHF01226 (1)	CHF01227 (1)	CHF01228 (1)	CHF01229 (1)	3.3	9	76	34
4"—150 lb 6 elements	—	CHF01230 (1)	CHF01231 (1)	CHF01232 (1)	CHF01233 (1)	4.1	6	78	35
	—	CHF01234 (1)	CHF01235 (1)	CHF01236 (1)	CHF01237 (1)	4.1	9	91	41
	—	CHF01238 (2)	CHF01239 (1)	CHF01240 (1)	CHF01241 (1)	4.2	12	94	43
	—	CHF01242 (2)	CHF01243 (1)	CHF01244 (1)	CHF01245 (1)	4.3	15	117	53
	—	CHF01246 (2)	CHF01247 (1)	CHF01248 (1)	CHF01249 (1)	4.3	18	120	54
	—	—	CHF01250 (2)	CHF01251 (2)	CHF01252 (1)	4.4	25	147	67
	—	—	CHF01253 (2)	CHF01254 (2)	CHF01255 (1)	4.4	30	151	68
5"—150 lb 6 elements	—	CHF01256 (2)	CHF01257 (1)	CHF01258 (1)	CHF01259 (1)	5.2	12	126	57
	—	CHF01260 (2)	CHF01261 (1)	CHF01262 (1)	CHF01263 (1)	5.2	15	128	58
	—	CHF01264 (2)	CHF01265 (1)	CHF01266 (1)	CHF01267 (1)	5.3	18	146	66
	—	CHF01268 (2)	CHF01269 (1)	CHF01270 (1)	CHF01271 (1)	5.3	20	147	67
	—	—	CHF01272 (2)	CHF01273 (2)	CHF01274 (1)	5.4	25	172	78
	—	—	CHF01275 (2)	CHF01276 (2)	CHF01277 (1)	5.5	30	192	87
5"—150 lb 9 elements	—	CHF01278 (3)	CHF01279 (1)	CHF01280 (1)	CHF01281 (1)	5.2	18	132	60
	—	CHF01282 (3)	CHF01283 (3)	CHF01284 (1)	CHF01285 (1)	5.2	23	135	61
	—	CHF01286 (3)	CHF01287 (3)	CHF01288 (3)	CHF01289 (1)	5.3	27	154	70
	—	—	CHF01290 (3)	CHF01291 (3)	CHF01292 (1)	5.4	38	183	83
	—	—	CHF01293 (3)	CHF01294 (3)	CHF01295 (3)	5.5	45	205	93
6"—150 lb 12 elements	—	CHF01296 (1)	CHF01297 (1)	CHF01298 (1)	CHF01299 (1)	6.1	12	127	58
	—	CHF01300 (2)	CHF01301 (1)	CHF01302 (1)	CHF01303 (1)	6.2	18	152	69
	—	CHF01304 (2)	CHF01305 (2)	CHF01306 (1)	CHF01307 (1)	6.2	24	157	71
	—	CHF01308 (2)	CHF01309 (2)	CHF01310 (2)	CHF01311 (1)	6.3	30	197	89
	—	CHF01312 (3)	CHF01313 (2)	CHF01314 (2)	CHF01315 (1)	6.3	36	202	92
	—	—	CHF01316 (4)	CHF01317 (3)	CHF01318 (2)	6.4	50	249	113
	—	—	CHF01319 (4)	CHF01320 (3)	CHF01321 (2)	6.4	60	257	117
6"—150 lb 15 elements (continued)	—	CHF01322 (3)	CHF01323 (1)	CHF01324 (1)	CHF01325 (1)	6.1	15	130	59
	—	CHF01326 (3)	CHF01327 (5)	CHF01328 (1)	CHF01329 (1)	6.2	23	156	71
	—	CHF01330 (3)	CHF01331 (5)	CHF01332 (3)	CHF01333 (1)	6.2	30	163	74



Nominal Pipe Size	Model Number					Dim Drawing Number	KW	Approx Weight	
	120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)			lb	kg
6" — 150 lb 15 elements	—	CHF01334 (5)	CHF01335 (5)	CHF01336 (3)	CHF01337 (1)	6.3	38	204	93
	—	CHF01338 (5)	CHF01339 (5)	CHF01340 (3)	CHF01341 (5)	6.3	45	211	96
	—	—	CHF01342 (5)	CHF01343 (3)	CHF01344 (5)	6.4	63	260	118
	—	—	CHF01345 (5)	CHF01346 (5)	CHF01347 (5)	6.4	75	270	122
8" — 150 lb 18 elements	—	CHF01348 (3)	CHF01349 (2)	CHF01350 (2)	CHF01351 (1)	8.2	30	241	109
	—	—	CHF01352 (2)	CHF01353 (2)	CHF01354 (1)	8.3	40	272	123
	—	—	CHF01355 (3)	CHF01356 (3)	CHF01357 (2)	8.4	50	300	136
	—	—	CHF01358 (3)	CHF01359 (3)	CHF01360 (2)	8.5	60	334	151
	—	—	CHF01361 (6)	CHF01362 (3)	CHF01363 (2)	8.6	70	367	166
	—	—	CHF01364 (6)	—	CHF01365 (2)	8.7	80	402	182
8" — 150 lb 24 elements	—	CHF01366 (4)	CHF01367 (2)	CHF01368 (2)	CHF01369 (1)	8.2	40	253	115
	—	—	CHF01370 (4)	CHF01371 (3)	CHF01372 (2)	8.3	53	287	130
	—	—	CHF01373 (4)	CHF01374 (3)	CHF01375 (2)	8.4	67	318	144
	—	—	CHF01376 (4)	CHF01377 (4)	CHF01378 (2)	8.5	80	356	161
	—	—	CHF01379 (8)	CHF01380 (6)	CHF01381 (4)	8.6	93	392	178
	—	—	CHF01382 (8)	—	CHF01383 (4)	8.7	107	428	194

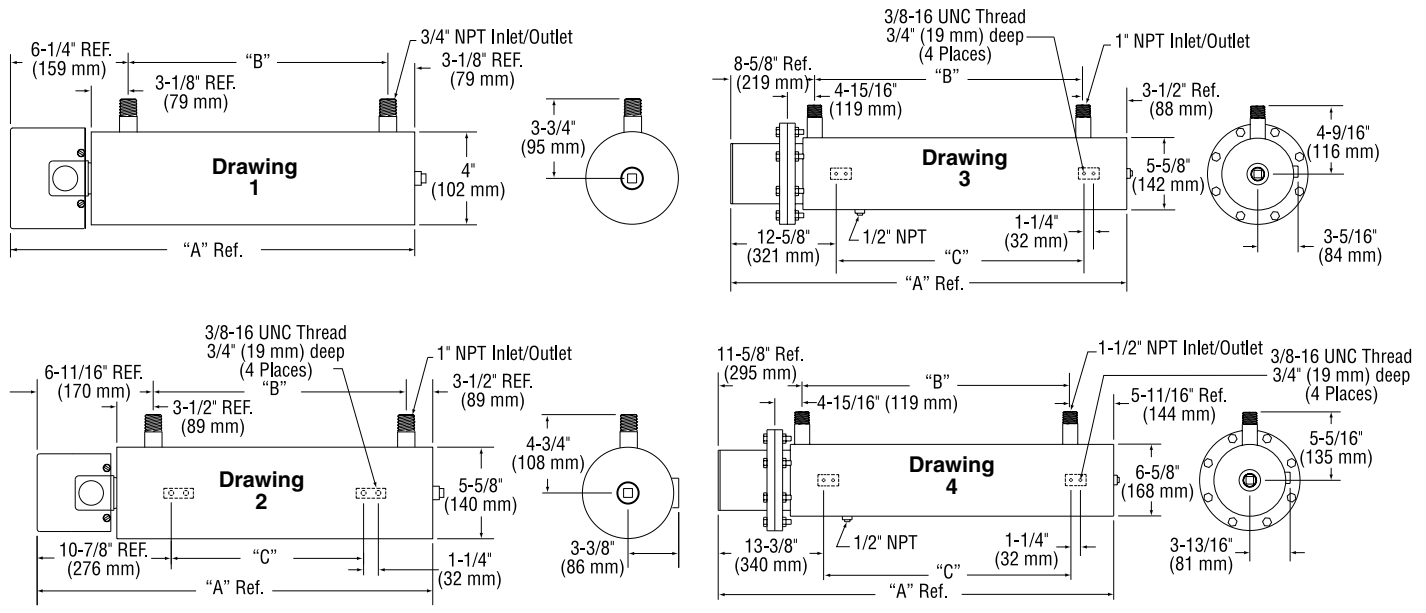
Ordering Examples: CHF01199, 6 KW, 240 Vac, 3 phase circulation heater.

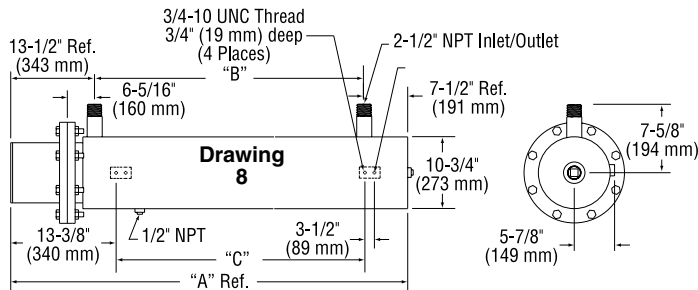
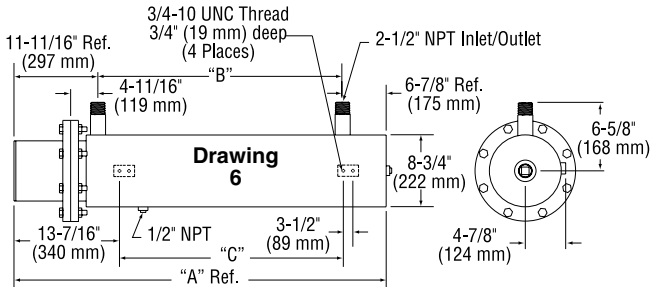
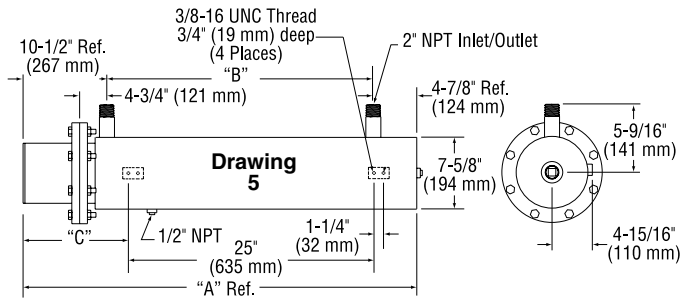
CHF01297, 12 KW, 240 Vac, 3 phase circulation heater.

(C\*) = Number of Branch Circuits per heater

Note: Nominal pipe size 203 mm (8") and larger are 20 watts/in<sup>2</sup> (3.1 watts/cm<sup>2</sup>)

**Note: Circulation heater mounting lug design and location in the assembly drawings shown are standard. Designs can be modified to fit customer installation. Consult Omega with your requirements.**





Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
1.1	24 <sup>3</sup> / <sub>8</sub>	619	15	381	—	—
1.2	32 <sup>3</sup> / <sub>8</sub>	822	23	584	—	—
2.1	32 <sup>11</sup> / <sub>16</sub>	830	22 <sup>1</sup> / <sub>2</sub>	572	16 <sup>1</sup> / <sub>2</sub>	419
2.2	42 <sup>11</sup> / <sub>16</sub>	1084	32 <sup>1</sup> / <sub>2</sub>	826	26 <sup>1</sup> / <sub>2</sub>	673
2.3	55 <sup>3</sup> / <sub>16</sub>	1402	45	1143	39	991
3.1	34 <sup>3</sup> / <sub>8</sub>	879	22 <sup>1</sup> / <sub>2</sub>	572	16 <sup>1</sup> / <sub>2</sub>	419
3.2	44 <sup>3</sup> / <sub>8</sub>	1133	32 <sup>1</sup> / <sub>2</sub>	826	26 <sup>1</sup> / <sub>2</sub>	673
3.3	57 <sup>3</sup> / <sub>8</sub>	1451	45	1143	39	991
4.1	37 <sup>3</sup> / <sub>16</sub>	960	20 <sup>1</sup> / <sub>2</sub>	521	17	432
4.2	48 <sup>3</sup> / <sub>16</sub>	1227	31	787	27 <sup>1</sup> / <sub>2</sub>	699
4.3	69 <sup>3</sup> / <sub>16</sub>	1761	52	1321	48 <sup>1</sup> / <sub>2</sub>	1232
4.4	90 <sup>3</sup> / <sub>16</sub>	2294	73	1854	69 <sup>1</sup> / <sub>2</sub>	1765
5.2	52 <sup>3</sup> / <sub>8</sub>	1330	37	940	15 <sup>1</sup> / <sub>4</sub>	387
5.3	63 <sup>3</sup> / <sub>8</sub>	1622	48 <sup>1</sup> / <sub>2</sub>	1232	21	533
5.4	77 <sup>1</sup> / <sub>4</sub>	1962	61 <sup>1</sup> / <sub>8</sub>	1572	27 <sup>1</sup> / <sub>2</sub>	698
5.5	90 <sup>1</sup> / <sub>4</sub>	2292	74 <sup>1</sup> / <sub>8</sub>	1902	34 <sup>1</sup> / <sub>4</sub>	870
6.1	39 <sup>1</sup> / <sub>16</sub>	992	20 <sup>1</sup> / <sub>2</sub>	521	17	432
6.2	49 <sup>9</sup> / <sub>16</sub>	1259	31	787	27 <sup>1</sup> / <sub>2</sub>	699
6.3	70 <sup>9</sup> / <sub>16</sub>	1792	52	1321	48 <sup>1</sup> / <sub>2</sub>	1232
6.4	91 <sup>9</sup> / <sub>16</sub>	2326	73	1854	69 <sup>1</sup> / <sub>2</sub>	1765
8.2	53 <sup>3</sup> / <sub>4</sub>	1365	32 <sup>11</sup> / <sub>16</sub>	830	29 <sup>3</sup> / <sub>16</sub>	741
8.3	60 <sup>3</sup> / <sub>4</sub>	1543	39 <sup>11</sup> / <sub>16</sub>	1008	36 <sup>3</sup> / <sub>16</sub>	919
8.4	68 <sup>3</sup> / <sub>4</sub>	1746	47 <sup>5</sup> / <sub>16</sub>	1202	43 <sup>9</sup> / <sub>16</sub>	1113
8.5	77 <sup>3</sup> / <sub>8</sub>	1978	56 <sup>3</sup> / <sub>16</sub>	1443	53 <sup>3</sup> / <sub>16</sub>	1354
8.6	86 <sup>3</sup> / <sub>8</sub>	2207	65 <sup>9</sup> / <sub>16</sub>	1672	62 <sup>3</sup> / <sub>16</sub>	1583
8.7	96 <sup>3</sup> / <sub>8</sub>	2461	75 <sup>9</sup> / <sub>16</sub>	1926	72 <sup>3</sup> / <sub>16</sub>	1837

**Note: Circulation heater mounting lug design and location in the assembly drawings shown are standard. Designs can be modified to fit customer installation. Consult Omega with your requirements.**



## CHF Series

**Self-contained heating units designed for optimum operating efficiency and performance—**

**Providing trouble-free service and application flexibility!**

All of the heat generated by the elements is immediately transferred to the medium being processed with minimal losses.

**Standard and optional features include...**

General purpose (NEMA 1) terminal housing is standard. Moisture proof (NEMA 4) and/or explosion resistant (NEMA 7) housings are optional. A set of installation and maintenance instructions along with a wiring diagram can be found inside the terminal housing of each unit.

Heating source—32 and 64 mm (1¼" and 2½") screw plug heaters are used on smaller units. 76 to 356 mm (3 to 14") size heaters use flanged immersion heaters. The flanges are made from forged steel rated for 150 lbs with raised face. Supplied with threaded eyebolts for ease of handling and installation. Optional stainless steel flanges or 300 lb ratings available.

Inlet-outlet connections are NPT pipe threads for 76 to 203 mm (3 to 8") circulation heaters (flanges are optional). Standard inlet-outlet connections on 254 mm (10") and larger units are 150 lb rated flanges.

Optional feature double-pole non-indicating bulb and capillary type thermostat can be located in the terminal box (standard) or attached to the insulation jacket as pictured. Solid state temperature controllers and indicating thermostats are available. Over-temperature protection can be provided by attaching a thermocouple to one of the elements.

Threaded mounting lugs to support the unit are welded to the steel vessel. Custom supports can be designed to fit your structure.

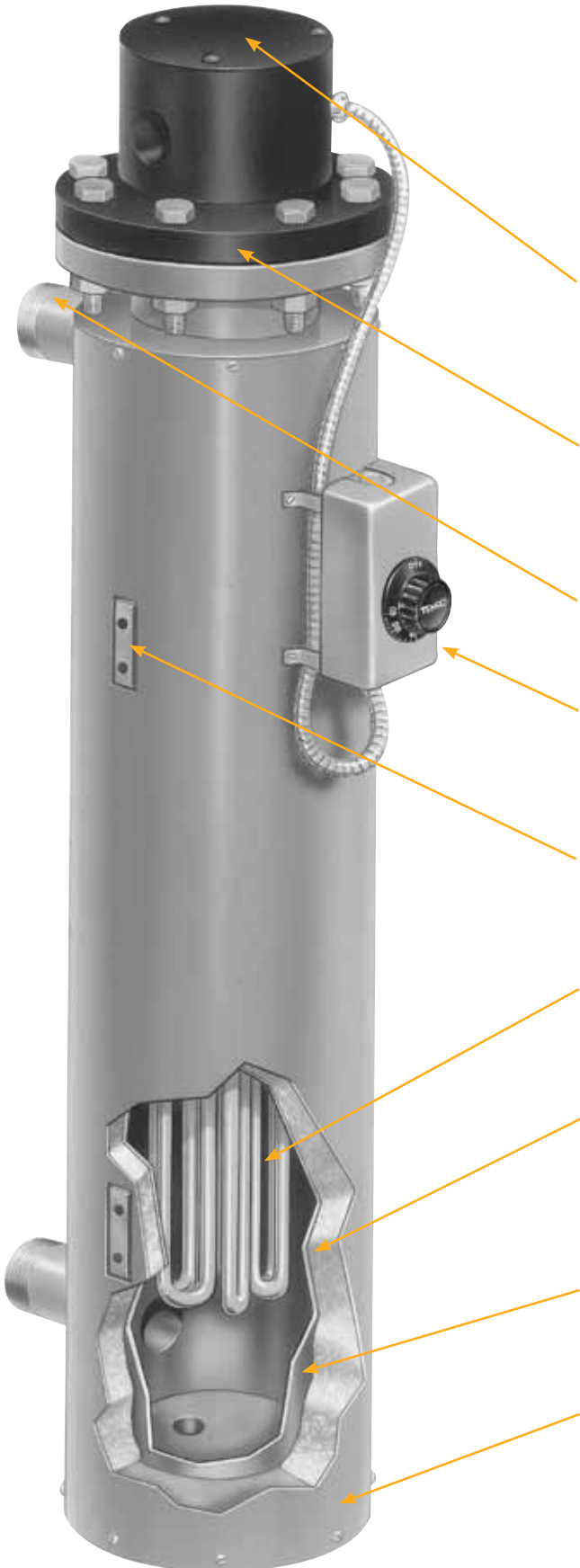
Wide selection of heating element sheath materials for maximum corrosion resistance to the medium being processed. On smaller circulation units with screw plug heaters, the element diameter is 8 or 12 mm (0.315 or 0.475"). On larger units with flanged heaters, the element diameter is 12 mm (0.475").

The vessel is surrounded with 25 mm (1") thick insulation rated to 399°C (750°F) to minimize heat loss. Additional insulation or a high temperature ceramic fiber insulation is optional. Vessels can also be supplied uninsulated.

Vessel material is SA53B or SA106B steel. Good for up to 399°C (750°F) operating temperature. For drainage and cleaning purposes, a drain plug is located in the base of the tank. Optional: stainless steel vessel.

Outer stainless steel sheet metal jacket protects the insulation from the environment and keeps it dry. Optional: Stainless steel outer jacket with a weather-tight seal.

**Note: Branch Circuit Wiring—Flange heater elements are wired into branch circuits having a maximum current of 48 Amps. The number of circuits is listed next to the heater's voltage and phase in the To Order tables. For different circuit wiring configurations, consult Omega.**





## Checklist for Selecting the Proper Circulation Heater

### ✓ Determine a Safe and Efficient Element Watt Density

**Element Watt Density** is the wattage dissipated per square inch of the element sheath surface and is calculated with the following formula:

$$\text{Watt Density} = \frac{\text{element wattage}}{\pi \times \text{element diameter} \times \text{element heated length}}$$

**For a particular application, element watt density will govern element sheath temperature. Factors to consider when choosing a suitable watt density are:**

1. Many materials are heat sensitive and can decompose or be damaged if the element is running too hot.
2. Air and other gases that are poor conductors of heat require watt densities matched to the velocity of the gas flow to prevent element overheating.
3. Mineral deposits when heating hard water and cleaning solutions can build up on the element sheath, acting as a heat insulator and raising the internal element temperature. If these deposits cannot be periodically removed, use a lower watt density element to increase heater life expectancy.

### ✓ Select the Element Sheath Material

#### Sheath Material Selection

**CORROSION.** In addition to selecting a sheath material that is compatible with the heated medium, other factors that affect corrosion need to be considered:

1. The temperature of the corrodent—As temperature increases the degree of corrosion increases. Also remember that usually the element temperature is higher than the material it is heating.
2. The degree of aeration to which a corrodent is exposed—Stagnant conditions can deprive the stainless steels of oxygen, which is required to maintain their corrosion resistant surface.
3. Velocity of the corrodent—Increased velocity can increase the corrosion rate.

#### Standard Element Sheath Materials

**Incoloy® 800** — A Nickel (30 to 35%), Chromium (19 to 23%), Iron alloy. The high nickel content of this alloy contributes to its resistance to scaling and corrosion. Used in air heating (also see Incoloy® 840) and immersion heating of potable water and other liquids that are not corrosive to an Incoloy® 800 sheath.

**Low Carbon Steel** — Applications include fluid heat transfer media, tar, high to low viscosity petroleum oils, asphalt, wax, molten salt, and other solutions not corrosive to a steel sheath.

**316 Stainless Steel** — A Chromium (16 to 18%), Nickel (11 to 14%), Iron Alloy with Molybdenum (2 to 3%) added to improve corrosion resistance in certain environments, especially those that would tend to cause pitting due to the presence of chlorides. Applications include deionized water.

**Copper** — Mainly used in clean water heating for washrooms, showers, rinse tanks and freeze protection of storage tanks.

#### Optional Element Sheath Materials

**304 Stainless Steel** — A Chromium (18 to 20%), Nickel (8 to 11%), Iron Alloy used in the food industry, sterilizing solutions, air heating and many organic and inorganic chemicals.

**321 Stainless Steel** — A Chromium (17 to 20%), Nickel (9 to 13%), Iron Alloy modified with the addition of titanium to prevent carbide precipitation and the resulting intergranular corrosion that can take place in certain mediums when operating in the 427 to 649°C (800 to 1200°F) temperature range.

**Incoloy® 840** — A Nickel (18 to 20%), Chromium (18 to 22%), Iron alloy. Incoloy 840 has about 10% less nickel than Incoloy 800. Used in many air heating applications where it has exhibited superior oxidation resistance at less cost than Incoloy 800.

**Incoloy® 825** — A Nickel (38 to 46%), Chromium (19.5 to 23.5%), Molybdenum (2 to 3%) Iron alloy. Consult Omega for more information.

#### Surface Treatments for Stainless Steel and Incoloy® Elements and Other Wetted Parts to Improve Corrosion Resistance

Flanged immersion heater surfaces in contact with the material being heated can be passivated or electro-polished to improve their resistance to corrosion.

Passivation removes surface contamination, usually iron, so that the optimum corrosion resistance of the stainless steel is maintained. Surface contamination would come from the small amount of steel that may be worn off a tool during the manufacturing process. Passivating is accomplished by dipping the heater in a warm solution of nitric acid.

Electro-Polishing is an electrochemical process that removes surface imperfections and contaminants, enhancing the corrosion resisting ability of the stainless steels. The resultant surface is clean, smooth and bright. Many medical and food applications require this finish.



✓ **Standard Terminal Housings**

Omega circulation heaters are supplied with a General Purpose Housing (NEMA 1) as standard unless otherwise specified.

Additional housing types include:

- Moisture Resistant (NEMA 4)
- Explosion Resistant (NEMA 7)
- Moisture/Explosion Resistant (NEMA 4/7)



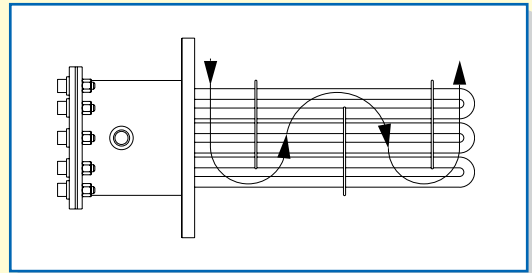
**Explosion resistant terminal housings are intended to provide containment of an explosion in the enclosure only. No portion of the heater assembly outside the enclosure is covered under this NEMA rating. Abnormal use of a heater which results in excessive temperature can create hazardous conditions such as a fire. Never perform any type of service nor remove the housing cover prior to disconnecting all electrical power to the heater.**

**Optional Terminal Housing Standoff Construction**



The electrical housing is separated from the flange by an air gap (six-inch standard) to lower the ambient temperature of the electrical wiring. This option is used on flanged immersion heaters where the flange temperature exceeds 250°C (482°F).

**Optional Circulation Heater Features**



**Flow Control Baffles**

Used on circulation tank heaters to aid heat transfer by forcing the liquid or gas back and forth across the elements. Baffles can be custom designed and positioned for your application.

**Temperature Control**

**Thermostats**

Thermostats are an optional feature on flanged immersion heaters. This type of control operates by expansion and contraction of a liquid in response to temperature change. Liquid contained within the sensing bulb and capillary flexes a diaphragm, causing the opening and closing of a snap action switch. For heating applications the contacts are normally closed and open on temperature rise.

**Installation Warnings and Recommendations**

1. Do not use the thermostat as a power switch. Use some other means of disconnecting power to the heater for servicing.
2. A Thermostat is not a fail-safe device. Use an approved high temperature limit control and/or pressure limit control for safe operation.
3. Avoid kinking or bending the capillary tube too sharply as this will alter the calibration and/or render the thermostat inoperable.
4. Excess capillary tube should be coiled neatly in junction box.
5. The capillary tube must never touch the thermostat contacts as this will create an electrical short capable of harming personnel and/or equipment.

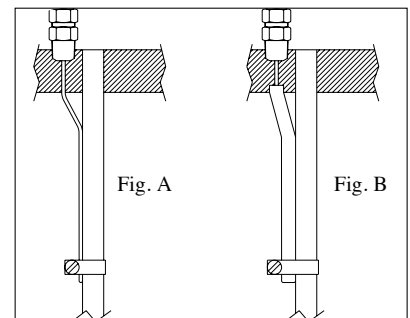
**Thermocouples**

Type J or Type K thermocouples can be supplied for process temperature or over-temperature control. Type J is reliable and accurate for temperatures up to 538°C (1000°F). Type K should be used for higher temperatures.

For measuring process temperatures the thermocouple can be mounted in a thermowell in the center of the element bundle. Note that a location somewhere away from the heater may give a more accurate measurement of process temperature.

For over-temperature protection the thermocouple is usually attached to one of the elements (Figure A) and any unusual rise in element temperature would shut the heater down. This thermocouple may also be mounted in a thermowell (Figure B), which is then attached to one of the heating elements if desired. This protects the thermocouple from the solution being heated and allows you to replace it without removing the heater, but does increase its response time.

Temperature and over-temperature controls for using the signal generated by thermocouples and how to select the best control for your application can be found at [omega.com/controllers](http://omega.com/controllers)





## Circulation Heater Installation Recommendations

Omega circulation heaters will have a long life and provide dependable, trouble-free service if properly installed, operated and maintained as per the following recommendations:

### Installation

1. Flange heaters are supplied with two drilled and tapped holes for threaded eye bolts, providing ease of handling during installation and flange removal during maintenance cleaning or heater replacement.
2. Replacement of heater is inevitable. Therefore, provide adequate space for installation, allowing ample room to remove the flange heater for cleaning or replacement.
3. In applications requiring the circulation heater to be fed by an inline pump, install the pump at the inlet end.
4. To maintain the lowest possible temperature at the terminal box, place the outlet at the end opposite to the terminal box. If your process temperature is circulating at 232°C (450°F) or above (at the nozzle closest to the flange), stand-off terminal box construction is recommended.
5. To prevent temperature and/or pressure buildup on closed loop circulation heater systems, adequate and strategically located thermocouples for temperature controllers and pressure relief valves should be installed. Never over-rate pressure relief valves beyond the pressure temperature rating of the flange being used.
6. During the process cycle, flow rate of the medium being heated should never be interrupted or reduced, thus creating an overheating condition. Excess temperature can result in damage to the medium being processed and premature heater failure.
7. Make sure that your circulation heater is equipped with the proper terminal housing for the environment in which the heater is being used. NEMA 1—general purpose, NEMA 4—moisture resistant, and NEMA 7—explosion resistant.

**Vertical Mounting—Liquids:**  
With terminal housing up and inlet pipe on the bottom, the heating elements will be immersed at all times to prevent premature failure.



**Horizontal Mounting—Liquids and Gases:**  
Always mount heater with inlet-outlet pipes facing up to ensure the heating elements will be immersed at all times to prevent premature failure. For liquid heating, outlet may be at either end. When heating gases the inlet should be closest to the terminal enclosure to minimize terminal box wiring temperatures.



**Vertical Mounting—Gases:**  
Mount with terminal enclosure and inlet pipe at bottom of tank to minimize terminal box wiring temperatures.

### Wiring

1. All heater installations must be properly earth grounded to eliminate electric shock hazard. Electrical wiring must be in accordance with Local and/or National Electrical Codes.
2. Circulation heaters are supplied standard with NEMA 1 terminal housings. All power to heaters must be disconnected before removing the terminal housing cover and performing any type of service.
3. Electrical connections on heater terminals must be kept tight. Loose connections will create arcing, over-heating, and eventually will destroy the heater terminal and cause premature heater failure.
4. If the amperage rating of your circulation heater exceeds the amperage capacity of the supplied thermostat, mercury relays or magnetic contactors should be used with the thermostat.
5. Over-temperature protection thermocouples require a separate conduit to the control panel for the thermocouple wire.
6. Omega offers a large selection of power control panels for circulation heaters. See [omega.com/controllers](http://omega.com/controllers)

### Maintenance

1. Never perform any type of service on the unit prior to disconnecting all electrical power and shutting off all intake lines.
2. Remove sludge deposits through the drain plug.
3. Check flange bolts for tightness.
4. Check terminal connections for tightness.
5. Check thermocouple or thermostat bulb for response to temperature changes. If defective, replace immediately.
6. Check for leaks.
7. Depending on operating conditions and medium being processed, the flange or screw plug heater should be periodically removed for physical inspection and cleaning of the element bundle.



## Circulation Tank Assembly Maximum Immersed Element Length

Standard circulation heaters shown in the tables have element immersion lengths determined by the element wattage and element watt density. The screw plug or flange heater containing the elements is matched to a standard circulation heater tank assembly to assure proper heat transfer and heated material flow. When designing a system

with a heater not shown on these pages the table below can be used to select a tank size based on the calculated immersion length. If a standard tank size is not suitable for your installation, Omega will design and manufacture a custom tank and heater assembly to satisfy the requirements of your application.

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
1½ NPT	1.1	18.0	457
	1.2	26.0	660
2½ NPT	2.1	25.5	648
	2.2	35.5	902
	2.3	48.0	1219
3" Flange	3.1	28.0	711
	3.2	38.0	965
	3.3	50.5	1283
4" Flange	4.1	26.5	673
	4.2	37.0	940
	4.3	58.0	1473
	4.4	79.0	2007
5" Flange	5.1	36.0	914
	5.2	43.0	1092
	5.3	54.5	1384
	5.4	68.0	1727
	5.5	85.0	2159
6" Flange	6.1	26.5	673
	6.2	37.0	940
	6.3	58.0	1473
	6.4	79.0	2007

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
8" Flange	8.1	32.5	826
	8.2	40.5	1029
	8.3	47.5	1207
	8.4	55.0	1397
	8.5	64.5	1638
	8.6	73.5	1867
	8.7	83.5	2121
10" Flange	10.1	60.0	1524
	10.2	67.0	1702
	10.3	73.0	1854
	10.4	82.0	2083
	10.5	90.0	2286
12" Flange	12.1	59.0	1499
	12.2	66.5	1689
	12.3	74.0	1880
	12.4	81.5	2070
	12.5	89.0	2261
14" Flange	14.1	58.0	1473
	14.2	65.5	1664
	14.3	73.0	1854
	14.4	80.5	2045
	14.5	88.0	2235

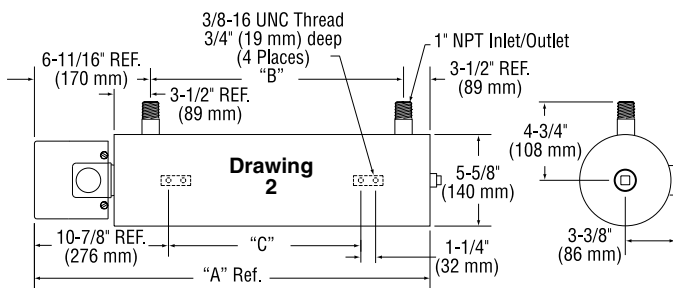
### 8 watts/in<sup>2</sup> (1.3 watts/cm<sup>2</sup>) — Typical Applications: Fuel Oils (Bunker C and Number 6)

- Steel Screw Plug and Steel 150 lb Flanged Heater Sizes
- Steel Sheath Heating Elements
- Steel Tank
- NEMA 1 Terminal Housing

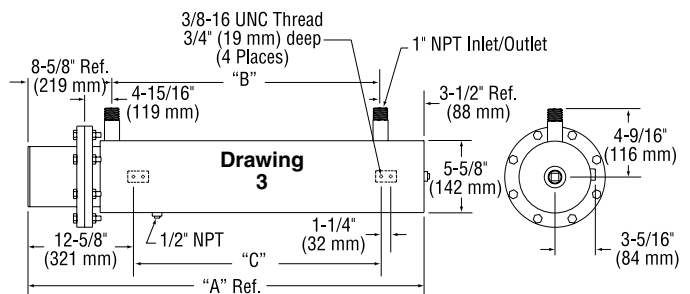
Note: 3-Phase only. Cannot be rewired for single phase.

Nominal Pipe Size	Dimensional Drawing Number	KW	Model Number					Approx Weight	
			120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)	lb	kg
2½ NPT 3 elements	2.2	2	—	—	CHF01100 (1)	—	CHF01101 (1)	37	17
	2.3	3	—	—	CHF01102 (1)	—	CHF01101 (1)	46	21
3"—150 lb 3 elements	3.2	2	—	—	CHF01104 (1)	—	CHF01105 (1)	62	28
	3.3	3	—	—	CHF01106 (1)	—	CHF01107 (1)	76	34

(C\*) = Number of Branch Circuits per heater



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
2.2	42 11/16	1084	32 1/2	826	26 1/2	673
2.3	55 5/16	1402	45	1143	39	991



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
3.2	44 5/8	1133	32 1/2	826	26 1/2	673
3.3	57 7/8	1451	45	1143	39	991



23 watts/in<sup>2</sup> (3.6 watts/cm<sup>2</sup>)—Typical Applications: Lightweight Oils, Degreasing Solutions, Heat Transfer Oils

- Steel Screw Plug and Steel 150 lb Flanged Heater Sizes
- Steel Sheath Heating Elements
- Steel Tank
- NEMA 1 Terminal Housing

**To Order Visit [omega.com/chf3](http://omega.com/chf3) for Pricing and Details**

Nominal Pipe Size	Model No.	Dimensional Drawing Number	KW	Approximate Weight	
	480V-3Ph (C*)			lb	kg
10"—150 lb 27 elements	CHF01384 (3)	10.3	90	537	244
	CHF01385 (3)	10.4	105	580	263
	CHF01386 (3)	10.5	120	623	283
12"—150 lb 36 elements	CHF01387 (4)	12.4	140	751	341
	CHF01388 (4)	12.5	160	793	360
14"—150 lb 45 elements	CHF01389 (5)	14.3	150	824	374
	CHF01390 (5)	14.4	175	885	401
	CHF01391 (5)	14.5	200	941	427

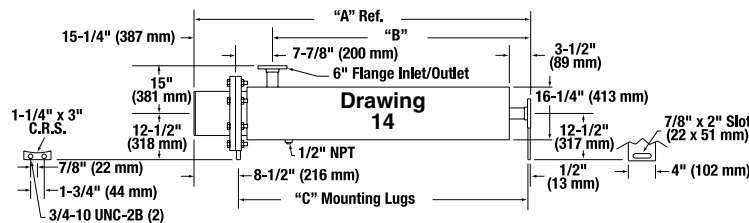
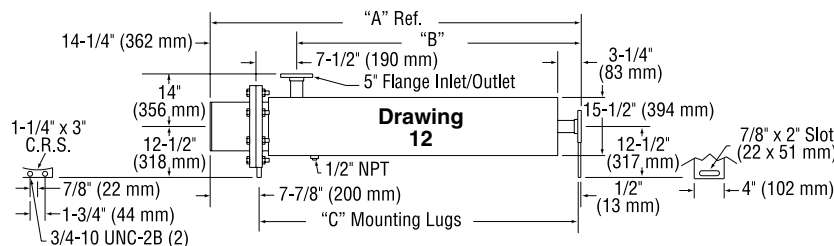
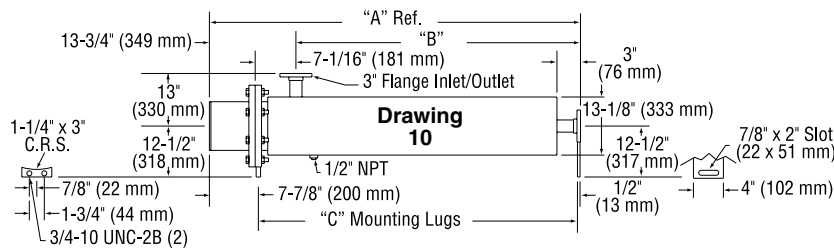
Ordering Example: CHF01386, 120 KW, 480 Vac, 3 phase circulation heater.

(C\*) = Number of Branch Circuits per heater

Note: Nominal pipe size 203 mm (8") and larger are 20 watts/in<sup>2</sup> (3.1 watts/cm<sup>2</sup>)

Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
10.3	89	2261	75¼	1911	81	2057
10.4	96½	2451	82¾	2102	88½	2248
10.5	104	2642	90¼	2292	96	2438
12.4	96¾	2457	82½	2096	88⅝	2251
12.5	104¼	2648	90	2286	96⅙	2442
14.3	89¾	2276	74¾	1889	81¼	2064
14.4	97⅞	2467	81⅞	2080	88¾	2254
14.5	104⅞	2657	89⅞	2270	96¼	2445

Note: Circulation heater mounting lug design and location in the assembly drawings shown are standard. Designs can be modified to fit customer installation. Consult Omega with your requirements.





**16 watts/in<sup>2</sup> (2.5 watts/cm<sup>2</sup>)—Typical Applications: Medium Weight Oils, Heat Transfer Oils, Liquid Paraffin**

- 304 Stainless Steel Screw Plug and Steel 150 lb Flanged Heater Sizes
  - Steel Tank
- Incoloy® 800 Sheath Heating Elements
  - NEMA 1 Terminal Housing

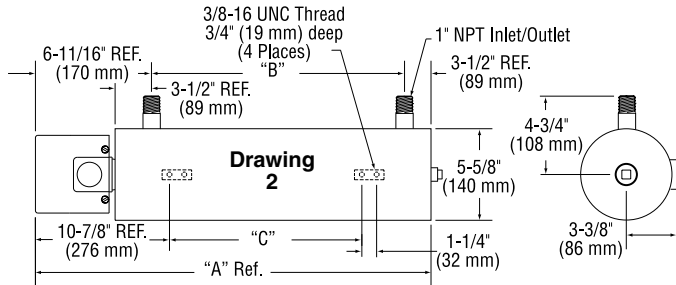
Note: 3-Phase only. Cannot be rewired for single phase.

**To Order Visit [omega.com/chf3](http://omega.com/chf3) for Pricing and Details**

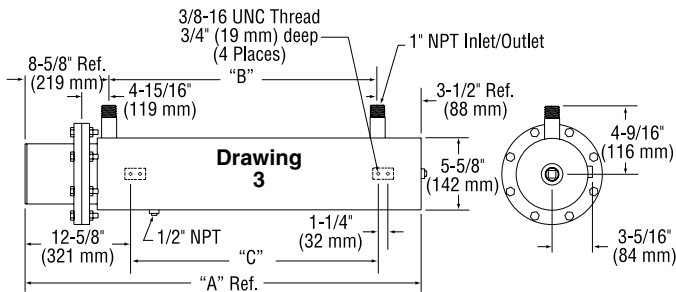
Nominal Pipe Size	Model No.		Dimensional Drawing Number	KW	Approximate Weight	
	240V-3Ph (C*)	480V-3Ph (C*)			lb	kg
2½ NPT 3 elements	CHF01392 (1)	CHF01393 (1)	2.1	2	28	13
	CHF01394 (1)	CHF01395 (1)	2.1	2.5	29	13
	CHF01396 (1)	CHF01397 (1)	2.1	3	30	14
	CHF01398 (1)	CHF01399 (1)	2.2	4	37	17
	CHF01400 (1)	CHF01401 (1)	2.3	5	45	20
	CHF01402 (1)	CHF01403 (1)	2.3	6	46	21
3"—150 lb 3 elements	CHF01404 (1)	CHF01405 (1)	3.1	2	53	24
	CHF01406 (1)	CHF01407 (1)	3.1	2.5	53	24
	CHF01408 (1)	CHF01409 (1)	3.2	3	61	28
	CHF01410 (1)	CHF01411 (1)	3.2	4	62	28
	CHF01412 (1)	CHF01413 (1)	3.3	5	74	34
	CHF01414 (1)	CHF01415 (1)	3.3	6	76	34

Ordering Example: CHF01396, 3 KW, 240 Vac, 3 phase circulation heater.

(C\*) = Number of Branch Circuits per heater



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
2.1	32 <sup>1</sup> / <sub>16</sub>	830	22 <sup>1</sup> / <sub>2</sub>	572	16 <sup>1</sup> / <sub>2</sub>	419
2.2	42 <sup>1</sup> / <sub>16</sub>	1084	32 <sup>1</sup> / <sub>2</sub>	826	26 <sup>1</sup> / <sub>2</sub>	673
2.3	55 <sup>7</sup> / <sub>16</sub>	1402	45	1143	39	991
3.1	34 <sup>5</sup> / <sub>16</sub>	879	22 <sup>1</sup> / <sub>2</sub>	572	16 <sup>1</sup> / <sub>2</sub>	419
3.2	44 <sup>9</sup> / <sub>16</sub>	1133	32 <sup>1</sup> / <sub>2</sub>	826	26 <sup>1</sup> / <sub>2</sub>	673
3.3	57 <sup>1</sup> / <sub>16</sub>	1451	45	1143	39	991



**Note: Circulation heater mounting lug design and location in the assembly drawings shown are standard. Designs can be modified to fit customer installation. Consult Omega with your requirements.**



## CHF Series

**Self-contained heating units designed for optimum operating efficiency and performance—**

### Providing trouble-free service and application flexibility!

All of the heat generated by the elements is immediately transferred to the medium being processed with minimal losses.

### Standard and optional features include...

General purpose (NEMA 1) terminal housing is standard. Moisture proof (NEMA 4) and/or explosion resistant (NEMA 7) housings are optional. A set of installation and maintenance instructions along with a wiring diagram can be found inside the terminal housing of each unit.

Heating source—32 and 64 mm (1¼" and 2½") screw plug heaters are used on smaller units. 76 to 356 mm (3 to 14") size heaters use flanged immersion heaters. The flanges are made from forged steel rated for 150 lbs with raised face. Supplied with threaded eyebolts for ease of handling and installation. Optional stainless steel flanges or 300 lb ratings available.

Inlet-outlet connections are NPT pipe threads for 76 to 203 mm (3 to 8") circulation heaters (flanges are optional). Standard inlet-outlet connections on 254 mm (10") and larger units are 150 lb rated flanges.

Optional feature double-pole non-indicating bulb and capillary type thermostat can be located in the terminal box (standard) or attached to the insulation jacket as pictured. Solid state temperature controllers and indicating thermostats are available. Over-temperature protection can be provided by attaching a thermocouple to one of the elements.

Threaded mounting lugs to support the unit are welded to the steel vessel. Custom supports can be designed to fit your structure.

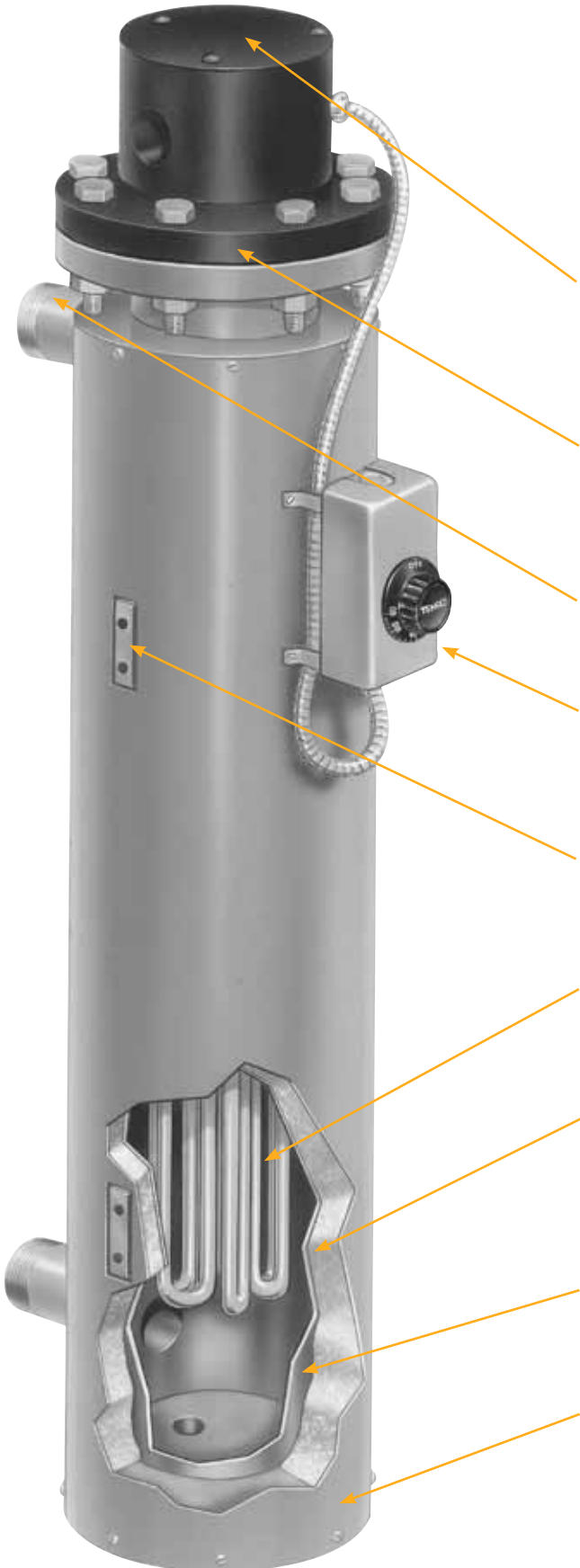
Wide selection of heating element sheath materials for maximum corrosion resistance to the medium being processed. On smaller circulation units with screw plug heaters, the element diameter is 8 or 12 mm (0.315 or 0.475"). On larger units with flanged heaters, the element diameter is 12 mm (0.475").

The vessel is surrounded with 25 mm (1") thick insulation rated to 399°C (750°F) to minimize heat loss. Additional insulation or a high temperature ceramic fiber insulation is optional. Vessels can also be supplied uninsulated.

Vessel material is SA53B or SA106B steel. Good for up to 399°C (750°F) operating temperature. For drainage and cleaning purposes, a drain plug is located in the base of the tank. Optional: stainless steel vessel.

Outer stainless steel sheet metal jacket protects the insulation from the environment and keeps it dry. Optional: Stainless steel outer jacket with a weather-tight seal.

**Note: Branch Circuit Wiring—Flange heater elements are wired into branch circuits having a maximum current of 48 Amps. The number of circuits is listed next to the heater's voltage and phase in the To Order tables. For different circuit wiring configurations, consult Omega.**



## Checklist for Selecting the Proper Circulation Heater

### ✓ Determine a Safe and Efficient Element Watt Density

**Element Watt Density** is the wattage dissipated per square inch of the element sheath surface and is calculated with the following formula:

$$\text{Watt Density} = \frac{\text{element wattage}}{\pi \times \text{element diameter} \times \text{element heated length}}$$

**For a particular application, element watt density will govern element sheath temperature. Factors to consider when choosing a suitable watt density are:**

1. Many materials are heat sensitive and can decompose or be damaged if the element is running too hot.
2. Air and other gases that are poor conductors of heat require watt densities matched to the velocity of the gas flow to prevent element overheating.
3. Mineral deposits when heating hard water and cleaning solutions can build up on the element sheath, acting as a heat insulator and raising the internal element temperature. If these deposits cannot be periodically removed, use a lower watt density element to increase heater life expectancy.

### ✓ Select the Element Sheath Material

#### Sheath Material Selection

**CORROSION.** In addition to selecting a sheath material that is compatible with the heated medium, other factors that affect corrosion need to be considered:

1. The temperature of the corrodent—As temperature increases the degree of corrosion increases. Also remember that usually the element temperature is higher than the material it is heating.
2. The degree of aeration to which a corrodent is exposed—Stagnant conditions can deprive the stainless steels of oxygen, which is required to maintain their corrosion resistant surface.
3. Velocity of the corrodent—Increased velocity can increase the corrosion rate.

#### Standard Element Sheath Materials

**Incoloy® 800** — A Nickel (30 to 35%), Chromium (19 to 23%), Iron alloy. The high nickel content of this alloy contributes to its resistance to scaling and corrosion. Used in air heating (also see Incoloy® 840) and immersion heating of potable water and other liquids that are not corrosive to an Incoloy® 800 sheath.

**Low Carbon Steel** — Applications include fluid heat transfer media, tar, high to low viscosity petroleum oils, asphalt, wax, molten salt, and other solutions not corrosive to a steel sheath.

**316 Stainless Steel** — A Chromium (16 to 18%), Nickel (11 to 14%), Iron Alloy with Molybdenum (2 to 3%) added to improve corrosion resistance in certain environments, especially those that would tend to cause pitting due to the presence of chlorides. Applications include deionized water.

**Copper** — Mainly used in clean water heating for washrooms, showers, rinse tanks and freeze protection of storage tanks.

#### Optional Element Sheath Materials

**304 Stainless Steel** — A Chromium (18 to 20%), Nickel (8 to 11%), Iron Alloy used in the food industry, sterilizing solutions, air heating and many organic and inorganic chemicals.

**321 Stainless Steel** — A Chromium (17 to 20%), Nickel (9 to 13%), Iron Alloy modified with the addition of titanium to prevent carbide precipitation and the resulting intergranular corrosion that can take place in certain mediums when operating in the 427 to 649°C (800 to 1200°F) temperature range.

**Incoloy® 840** — A Nickel (18 to 20%), Chromium (18 to 22%), Iron alloy. Incoloy 840 has about 10% less nickel than Incoloy 800. Used in many air heating applications where it has exhibited superior oxidation resistance at less cost than Incoloy 800.

**Incoloy® 825** — A Nickel (38 to 46%), Chromium (19.5 to 23.5%), Molybdenum (2 to 3%) Iron alloy. Consult Omega for more information.

#### Surface Treatments for Stainless Steel and Incoloy® Elements and Other Wetted Parts to Improve Corrosion Resistance

Flanged immersion heater surfaces in contact with the material being heated can be passivated or electro-polished to improve their resistance to corrosion.

Passivation removes surface contamination, usually iron, so that the optimum corrosion resistance of the stainless steel is maintained. Surface contamination would come from the small amount of steel that may be worn off a tool during the manufacturing process. Passivating is accomplished by dipping the heater in a warm solution of nitric acid.

Electro-Polishing is an electrochemical process that removes surface imperfections and contaminants, enhancing the corrosion resisting ability of the stainless steels. The resultant surface is clean, smooth and bright. Many medical and food applications require this finish.





✓ **Standard Terminal Housings**

Omega circulation heaters are supplied with a General Purpose Housing (NEMA 1) as standard unless otherwise specified.

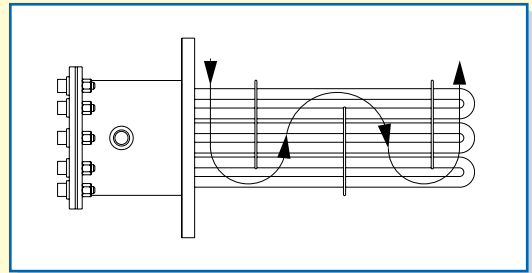
Additional housing types include:

- Moisture Resistant (NEMA 4)
- Explosion Resistant (NEMA 7)
- Moisture/Explosion Resistant (NEMA 4/7)



**Explosion resistant terminal housings are intended to provide containment of an explosion in the enclosure only. No portion of the heater assembly outside the enclosure is covered under this NEMA rating. Abnormal use of a heater which results in excessive temperature can create hazardous conditions such as a fire. Never perform any type of service nor remove the housing cover prior to disconnecting all electrical power to the heater.**

**Optional Circulation Heater Features**



**Flow Control Baffles**

Used on circulation tank heaters to aid heat transfer by forcing the liquid or gas back and forth across the elements. Baffles can be custom designed and positioned for your application.

**Optional Terminal Housing Standoff Construction**



The electrical housing is separated from the flange by an air gap (six-inch standard) to lower the ambient temperature of the electrical wiring. This option is used on flanged immersion heaters where the flange temperature exceeds 250°C (482°F).

**Temperature Control**

**Thermostats**

Thermostats are an optional feature on flanged immersion heaters. This type of control operates by expansion and contraction of a liquid in response to temperature change. Liquid contained within the sensing bulb and capillary flexes a diaphragm, causing the opening and closing of a snap action switch. For heating applications the contacts are normally closed and open on temperature rise.

**Installation Warnings and Recommendations**

1. Do not use the thermostat as a power switch. Use some other means of disconnecting power to the heater for servicing.
2. A Thermostat is not a fail-safe device. Use an approved high temperature limit control and/or pressure limit control for safe operation.
3. Avoid kinking or bending the capillary tube too sharply as this will alter the calibration and/or render the thermostat inoperable.
4. Excess capillary tube should be coiled neatly in junction box.
5. The capillary tube must never touch the thermostat contacts as this will create an electrical short capable of harming personnel and/or equipment.

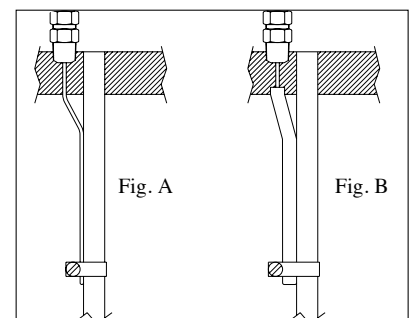
**Thermocouples**

Type J or Type K thermocouples can be supplied for process temperature or over-temperature control. Type J is reliable and accurate for temperatures up to 538°C (1000°F). Type K should be used for higher temperatures.

For measuring process temperatures the thermocouple can be mounted in a thermowell in the center of the element bundle. Note that a location somewhere away from the heater may give a more accurate measurement of process temperature.

For over-temperature protection the thermocouple is usually attached to one of the elements (Figure A) and any unusual rise in element temperature would shut the heater down. This thermocouple may also be mounted in a thermowell (Figure B), which is then attached to one of the heating elements if desired. This protects the thermocouple from the solution being heated and allows you to replace it without removing the heater, but does increase its response time.

Temperature and over-temperature controls for using the signal generated by thermocouples and how to select the best control for your application can be found at [omega.com/controllers](http://omega.com/controllers)



## Circulation Heater Installation Recommendations

Omega circulation heaters will have a long life and provide dependable, trouble-free service if properly installed, operated and maintained as per the following recommendations:

### Installation

1. Flange heaters are supplied with two drilled and tapped holes for threaded eye bolts, providing ease of handling during installation and flange removal during maintenance cleaning or heater replacement.
2. Replacement of heater is inevitable. Therefore, provide adequate space for installation, allowing ample room to remove the flange heater for cleaning or replacement.
3. In applications requiring the circulation heater to be fed by an inline pump, install the pump at the inlet end.
4. To maintain the lowest possible temperature at the terminal box, place the outlet at the end opposite to the terminal box. If your process temperature is circulating at 232°C (450°F) or above (at the nozzle closest to the flange), stand-off terminal box construction is recommended.
5. To prevent temperature and/or pressure buildup on closed loop circulation heater systems, adequate and strategically located thermocouples for temperature controllers and pressure relief valves should be installed. Never over-rate pressure relief valves beyond the pressure temperature rating of the flange being used.
6. During the process cycle, flow rate of the medium being heated should never be interrupted or reduced, thus creating an overheating condition. Excess temperature can result in damage to the medium being processed and premature heater failure.
7. Make sure that your circulation heater is equipped with the proper terminal housing for the environment in which the heater is being used. NEMA 1—general purpose, NEMA 4—moisture resistant, and NEMA 7—explosion resistant.

**Vertical Mounting—Liquids:**  
With terminal housing up and inlet pipe on the bottom, the heating elements will be immersed at all times to prevent premature failure.



**Horizontal Mounting—Liquids and Gases:**  
Always mount heater with inlet-outlet pipes facing up to ensure the heating elements will be immersed at all times to prevent premature failure. For liquid heating, outlet may be at either end. When heating gases the inlet should be closest to the terminal enclosure to minimize terminal box wiring temperatures.



**Vertical Mounting—Gases:**  
Mount with terminal enclosure and inlet pipe at bottom of tank to minimize terminal box wiring temperatures.

### Wiring

1. All heater installations must be properly earth grounded to eliminate electric shock hazard. Electrical wiring must be in accordance with Local and/or National Electrical Codes.
2. Circulation heaters are supplied standard with NEMA 1 terminal housings. All power to heaters must be disconnected before removing the terminal housing cover and performing any type of service.
3. Electrical connections on heater terminals must be kept tight. Loose connections will create arcing, over-heating, and eventually will destroy the heater terminal and cause premature heater failure.
4. If the amperage rating of your circulation heater exceeds the amperage capacity of the supplied thermostat, mercury relays or magnetic contactors should be used with the thermostat.
5. Over-temperature protection thermocouples require a separate conduit to the control panel for the thermocouple wire.
6. Omega offers a large selection of power control panels for circulation heaters. See [omega.com/controllers](http://omega.com/controllers)

### Maintenance

1. Never perform any type of service on the unit prior to disconnecting all electrical power and shutting off all intake lines.
2. Remove sludge deposits through the drain plug.
3. Check flange bolts for tightness.
4. Check terminal connections for tightness.
5. Check thermocouple or thermostat bulb for response to temperature changes. If defective, replace immediately.
6. Check for leaks.
7. Depending on operating conditions and medium being processed, the flange or screw plug heater should be periodically removed for physical inspection and cleaning of the element bundle.



## Circulation Tank Assembly Maximum Immersed Element Length

Standard circulation heaters shown in the tables have element immersion lengths determined by the element wattage and element watt density. The screw plug or flange heater containing the elements is matched to a standard circulation heater tank assembly to assure proper heat transfer and heated material flow. When designing a system

with a heater not shown on these pages the table below can be used to select a tank size based on the calculated immersion length. If a standard tank size is not suitable for your installation, Omega will design and manufacture a custom tank and heater assembly to satisfy the requirements of your application.

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
1½ NPT	1.1	18.0	457
	1.2	26.0	660
2½ NPT	2.1	25.5	648
	2.2	35.5	902
	2.3	48.0	1219
3" Flange	3.1	28.0	711
	3.2	38.0	965
	3.3	50.5	1283
4" Flange	4.1	26.5	673
	4.2	37.0	940
	4.3	58.0	1473
	4.4	79.0	2007
5" Flange	5.1	36.0	914
	5.2	43.0	1092
	5.3	54.5	1384
	5.4	68.0	1727
	5.5	85.0	2159
6" Flange	6.1	26.5	673
	6.2	37.0	940
	6.3	58.0	1473
	6.4	79.0	2007

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
8" Flange	8.1	32.5	826
	8.2	40.5	1029
	8.3	47.5	1207
	8.4	55.0	1397
	8.5	64.5	1638
	8.6	73.5	1867
	8.7	83.5	2121
10" Flange	10.1	60.0	1524
	10.2	67.0	1702
	10.3	73.0	1854
	10.4	82.0	2083
	10.5	90.0	2286
12" Flange	12.1	59.0	1499
	12.2	66.5	1689
	12.3	74.0	1880
	12.4	81.5	2070
	12.5	89.0	2261
14" Flange	14.1	58.0	1473
	14.2	65.5	1664
	14.3	73.0	1854
	14.4	80.5	2045
	14.5	88.0	2235

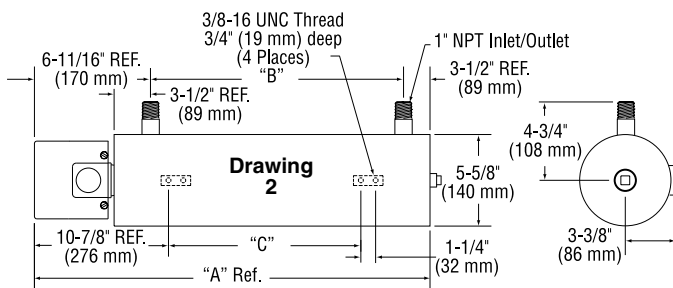
### 8 watts/in<sup>2</sup> (1.3 watts/cm<sup>2</sup>) — Typical Applications: Fuel Oils (Bunker C and Number 6)

- Steel Screw Plug and Steel 150 lb Flanged Heater Sizes
- Steel Sheath Heating Elements
- Steel Tank
- NEMA 1 Terminal Housing

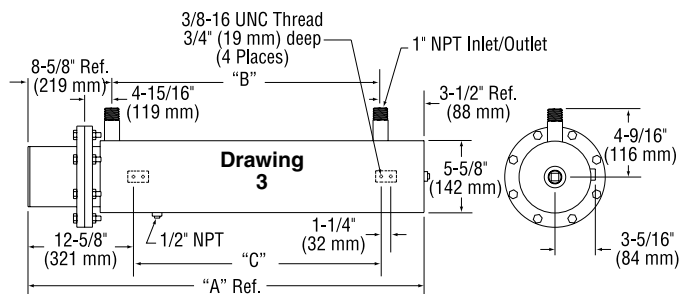
Note: 3-Phase only. Cannot be rewired for single phase.

Nominal Pipe Size	Dimensional Drawing Number	KW	Model Number					Approx Weight	
			120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)	lb	kg
2½ NPT 3 elements	2.2	2	—	—	CHF01100 (1)	—	CHF01101 (1)	37	17
	2.3	3	—	—	CHF01102 (1)	—	CHF01101 (1)	46	21
3"—150 lb 3 elements	3.2	2	—	—	CHF01104 (1)	—	CHF01105 (1)	62	28
	3.3	3	—	—	CHF01106 (1)	—	CHF01107 (1)	76	34

(C\*) = Number of Branch Circuits per heater



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
2.2	42 11/16	1084	32 1/2	826	26 1/2	673
2.3	55 5/16	1402	45	1143	39	991



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
3.2	44 5/8	1133	32 1/2	826	26 1/2	673
3.3	57 5/8	1451	45	1143	39	991



23 watts/in<sup>2</sup> (3.6 watts/cm<sup>2</sup>)—Typical Applications: Forced Air & Gases, Caustic Solutions, Degreasing Solutions

- 304 Stainless Steel Screw Plug and Steel 150 lb Flanged Heater Sizes
- Incoloy® 800 Sheath Heating Elements
- Steel Tank
- NEMA 1 Terminal Housing

**To Order Visit [omega.com/chf5](http://omega.com/chf5) for Pricing and Details**

Nominal Pipe Size	Model Number					Dim Drawing Number	KW	Approx Weight	
	120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)			lb	kg
1¼ NPT 2 elements	CHF01498	CHF01499 (1)	—	—	—	1.1	1	13	6
	CHF01500	CHF01501 (1)	—	—	—	1.1	1.5	13	6
	CHF01502	CHF01503 (1)	—	—	—	1.2	2	17	8
2½ NPT 3 elements	—	CHF01504 (1)	CHF01505 (1)	CHF01506 (1)	CHF01507 (1)	2.1	3	28	13
	—	CHF01508 (1)	CHF01509 (1)	CHF01510 (1)	CHF01511 (1)	2.2	4.5	35	16
	—	CHF01512 (1)	CHF01513 (1)	CHF01514 (1)	CHF01515 (1)	2.2	6	37	17
	—	CHF01516 (1)	CHF01517 (1)	CHF01518 (1)	CHF01519 (1)	2.3	7.5	45	20
	—	CHF01520 (1)	CHF01521 (1)	CHF01522 (1)	CHF01523 (1)	2.3	9	46	21
3"—150 lb 3 elements	—	CHF01524 (1)	CHF01525 (1)	CHF01526 (1)	CHF01527 (1)	3.1	3	53	24
	—	CHF01528 (1)	CHF01529 (1)	CHF01530 (1)	CHF01531 (1)	3.2	4.5	61	28
	—	CHF01532 (1)	CHF01533 (1)	CHF01534 (1)	CHF01535 (1)	3.2	6	62	28
	—	CHF01536 (1)	CHF01537 (1)	CHF01538 (1)	CHF01539 (1)	3.3	7.5	74	34
	—	CHF01540 (1)	CHF01541 (1)	CHF01542 (1)	CHF01543 (1)	3.3	9	76	34
4"—150 lb 6 elements	—	CHF01544 (1)	CHF01545 (1)	CHF01546 (1)	CHF01547 (1)	4.1	6	78	35
	—	CHF01548 (1)	CHF01549 (1)	CHF01550 (1)	CHF01551 (1)	4.2	9	91	41
	—	CHF01552 (2)	CHF01553 (1)	CHF01554 (1)	CHF01555 (1)	4.2	12	94	43
	—	CHF01556 (2)	CHF01557 (1)	CHF01558 (1)	CHF01559 (1)	4.3	15	117	53
	—	CHF01560 (2)	CHF01561 (1)	CHF01562 (1)	CHF01563 (1)	4.3	18	120	54
	—	—	CHF01564 (2)	CHF01565 (2)	CHF01566 (1)	4.4	25	147	67
	—	—	CHF01567 (2)	CHF01568 (2)	CHF01569 (1)	4.4	30	151	68
5"—150 lb 6 elements	—	CHF01570 (1)	CHF01571 (1)	CHF01572 (1)	CHF01573 (1)	5.1	9	114	52
	—	CHF01574 (2)	CHF01575 (1)	CHF01576 (1)	CHF01577 (1)	5.2	12	126	57
	—	CHF01578 (2)	CHF01579 (1)	CHF01580 (1)	CHF01581 (1)	5.2	15	128	58
	—	CHF01582 (2)	CHF01583 (1)	CHF01584 (1)	CHF01585 (1)	5.3	18	146	66
	—	—	CHF01586 (2)	CHF01587 (2)	CHF01588 (1)	5.4	25	172	78
	—	—	CHF01589 (2)	CHF01590 (2)	CHF01591 (1)	5.5	30	192	87
5"—150 lb 9 elements	—	CHF01592 (3)	CHF01593 (1)	CHF01594 (1)	CHF01595 (1)	5.1	14	119	54
	—	CHF01596 (3)	CHF01597 (1)	CHF01598 (1)	CHF01599 (1)	5.2	18	132	60
	—	CHF01600 (3)	CHF01601 (3)	CHF01602 (1)	CHF01603 (1)	5.2	23	135	61
	—	CHF01604 (3)	CHF01605 (3)	CHF01606 (3)	CHF01607 (1)	5.3	27	150	68
	—	—	CHF01608 (3)	CHF01609 (3)	CHF01610 (1)	5.4	38	183	83
	—	—	CHF01611 (3)	CHF01612 (3)	CHF01613 (3)	5.5	45	205	93
6"—150 lb 12 elements	—	CHF01614 (2)	CHF01615 (1)	CHF01616 (1)	CHF01617 (1)	6.1	12	127	58
	—	CHF01618 (2)	CHF01619 (1)	CHF01620 (1)	CHF01621 (1)	6.2	18	152	69
	—	CHF01622 (2)	CHF01623 (2)	CHF01624 (2)	CHF01625 (1)	6.2	24	157	71
	—	CHF01626 (3)	CHF01627 (2)	CHF01628 (2)	CHF01629 (1)	6.3	30	197	89
	—	CHF01630 (3)	CHF01631 (2)	CHF01632 (2)	CHF01633 (1)	6.3	36	202	92
	—	—	CHF01634 (4)	CHF01635 (4)	CHF01636 (2)	6.4	50	249	113
	—	—	CHF01637 (4)	CHF01638 (4)	CHF01639 (2)	6.4	60	257	117

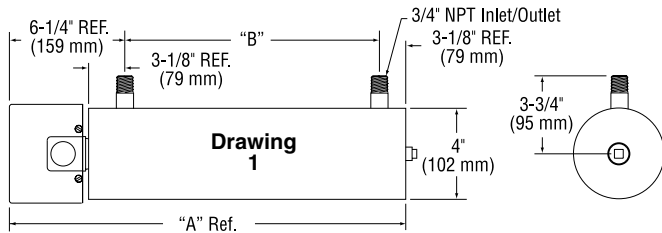


Nominal Pipe Size	Model Number					Dim Drawing Number	KW	Approx Weight	
	120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)			lb	kg
6"—150 lb 15 elements	—	CHF01640 (3)	CHF01641 (1)	CHF01642 (1)	CHF01643 (1)	6.1	15	130	59
	—	CHF01644 (3)	CHF01645 (5)	CHF01646 (1)	CHF01647 (1)	6.2	23	156	71
	—	CHF01648 (3)	CHF01649 (5)	CHF01650 (3)	CHF01651 (1)	6.2	30	163	74
	—	CHF01652 (5)	CHF01653 (5)	CHF01654 (3)	CHF01655 (1)	6.3	38	204	93
	—	CHF01656 (5)	CHF01657 (5)	CHF01658 (3)	CHF01659 (5)	6.3	45	211	96
	—	—	CHF01660 (5)	CHF01661 (3)	CHF01662 (5)	6.4	63	260	118
	—	—	CHF01663 (5)	CHF01664 (5)	CHF01665 (5)	6.4	75	270	122
8"—150 lb 18 elements	—	CHF01666 (3)	CHF01667 (2)	CHF01668 (2)	CHF01669 (1)	8.2	30	244	111
	—	—	CHF01670 (2)	CHF01671 (2)	CHF01672 (1)	8.3	40	274	124
	—	—	CHF01673 (3)	CHF01674 (3)	CHF01675 (2)	8.4	50	303	137
8"—150 lb 24 elements	—	CHF01676 (4)	CHF01677 (2)	CHF01678 (2)	CHF01679 (1)	8.2	40	253	115
	—	—	CHF01680 (4)	CHF01681 (3)	CHF01682 (2)	8.3	53	287	130
	—	—	CHF01683 (4)	CHF01684 (3)	CHF01685 (2)	8.4	67	318	144

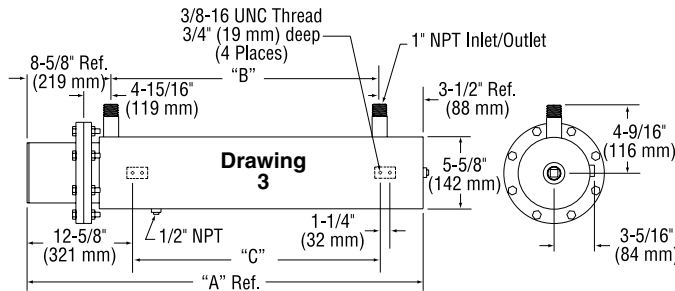
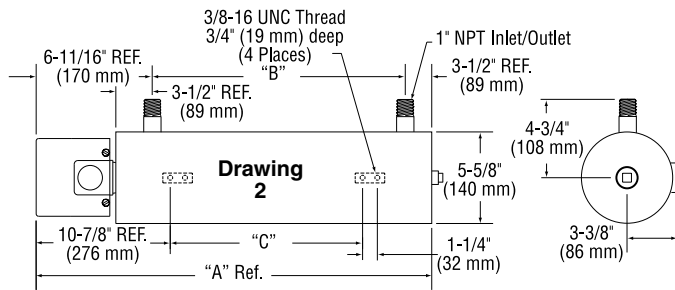
Ordering Example: CHF01643, 15 KW, 480 Vac, 3 phase circulation heater.

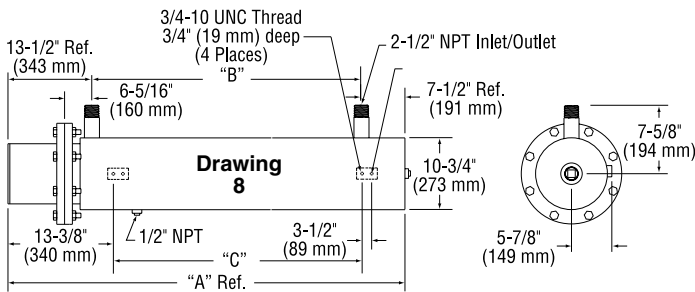
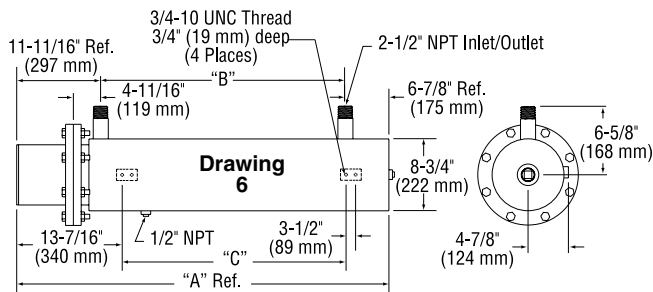
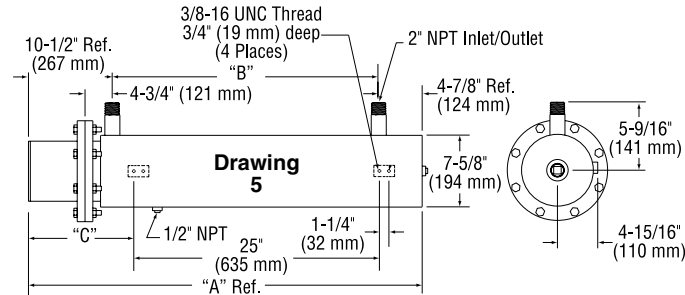
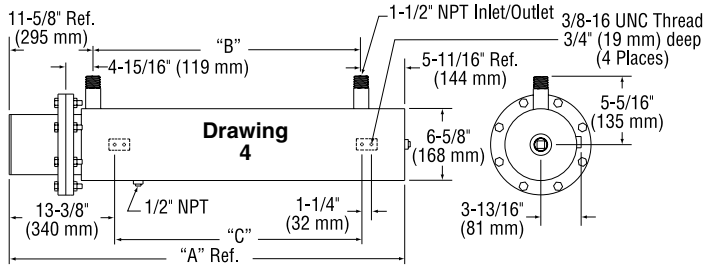
(C\*) = Number of Branch Circuits per heater

Note: Nominal pipe size 203 mm (8") and larger are 20 watts/in<sup>2</sup> (3.1 watts/cm<sup>2</sup>)



Note: Circulation heater mounting lug design and location in the assembly drawings shown are standard. Designs can be modified to fit customer installation. Consult Omega with your requirements.





Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
1.1	24 <sup>3</sup> / <sub>8</sub>	619	15	381	—	—
1.2	32 <sup>3</sup> / <sub>8</sub>	822	23	584	—	—
2.1	32 <sup>1</sup> / <sub>16</sub>	830	22 <sup>1</sup> / <sub>2</sub>	572	16 <sup>1</sup> / <sub>2</sub>	419
2.2	42 <sup>1</sup> / <sub>16</sub>	1084	32 <sup>1</sup> / <sub>2</sub>	826	26 <sup>1</sup> / <sub>2</sub>	673
2.3	55 <sup>3</sup> / <sub>16</sub>	1402	45	1143	39	991
3.1	34 <sup>3</sup> / <sub>8</sub>	879	22 <sup>1</sup> / <sub>2</sub>	572	16 <sup>1</sup> / <sub>2</sub>	419
3.2	44 <sup>5</sup> / <sub>8</sub>	1133	32 <sup>1</sup> / <sub>2</sub>	826	26 <sup>1</sup> / <sub>2</sub>	673
3.3	57 <sup>1</sup> / <sub>8</sub>	1451	45	1143	39	991
4.1	37 <sup>3</sup> / <sub>16</sub>	960	20 <sup>1</sup> / <sub>2</sub>	521	17	432
4.2	48 <sup>5</sup> / <sub>16</sub>	1227	31	787	27 <sup>1</sup> / <sub>2</sub>	699
4.3	69 <sup>5</sup> / <sub>16</sub>	1761	52	1321	48 <sup>1</sup> / <sub>2</sub>	1232
4.4	90 <sup>5</sup> / <sub>16</sub>	2294	73	1854	69 <sup>1</sup> / <sub>2</sub>	1765
5.1	45 <sup>3</sup> / <sub>8</sub>	1153	30	762	11 <sup>1</sup> / <sub>2</sub>	292
5.2	52 <sup>3</sup> / <sub>8</sub>	1330	37	940	15 <sup>1</sup> / <sub>4</sub>	387
5.3	63 <sup>3</sup> / <sub>8</sub>	1622	48 <sup>1</sup> / <sub>2</sub>	1232	21	533
5.4	77 <sup>1</sup> / <sub>4</sub>	1962	61 <sup>1</sup> / <sub>8</sub>	1572	27 <sup>1</sup> / <sub>2</sub>	698
5.5	90 <sup>1</sup> / <sub>4</sub>	2292	74 <sup>1</sup> / <sub>8</sub>	1902	34 <sup>1</sup> / <sub>4</sub>	870
6.1	39 <sup>1</sup> / <sub>16</sub>	992	20 <sup>1</sup> / <sub>2</sub>	521	17	432
6.2	49 <sup>1</sup> / <sub>16</sub>	1259	31	787	27 <sup>1</sup> / <sub>2</sub>	699
6.3	70 <sup>1</sup> / <sub>16</sub>	1792	52	1321	48 <sup>1</sup> / <sub>2</sub>	1232
6.4	91 <sup>1</sup> / <sub>16</sub>	2326	73	1854	69 <sup>1</sup> / <sub>2</sub>	1765
8.2	53 <sup>3</sup> / <sub>8</sub>	1365	32 <sup>1</sup> / <sub>16</sub>	830	29 <sup>3</sup> / <sub>16</sub>	741
8.3	60 <sup>3</sup> / <sub>8</sub>	1543	39 <sup>1</sup> / <sub>16</sub>	1008	36 <sup>3</sup> / <sub>16</sub>	919
8.4	68 <sup>3</sup> / <sub>8</sub>	1746	47 <sup>3</sup> / <sub>16</sub>	1202	43 <sup>3</sup> / <sub>16</sub>	1113

**Note: Circulation heater mounting lug design and location in the assembly drawings shown are standard. Designs can be modified to fit customer installation. Consult Omega with your requirements.**



23 watts/in<sup>2</sup> (3.6 watts/cm<sup>2</sup>)—Typical Applications: Forced Air & Gases, Caustic Solutions, Degreasing Solutions

**To Order Visit [omega.com/chf5](http://omega.com/chf5) for Pricing and Details**

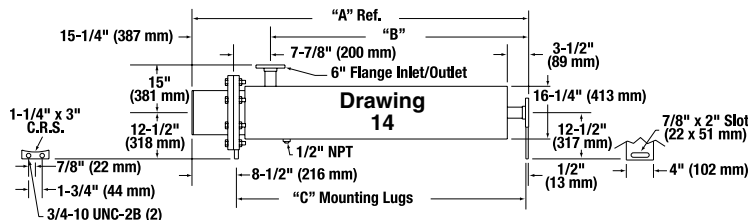
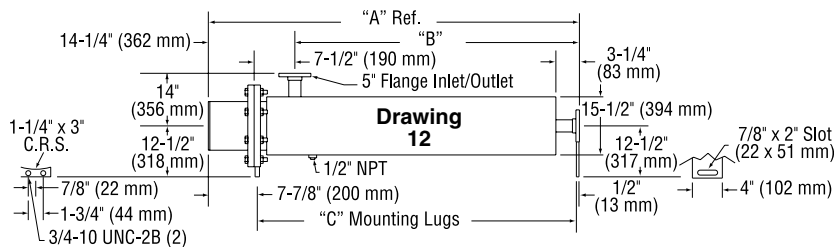
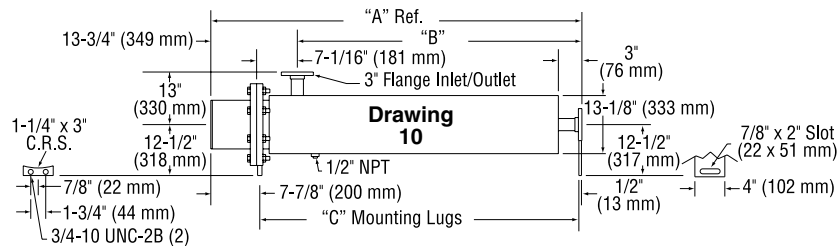
Nominal Pipe Size	Model Number					Dim Drawing Number	KW	Approx Weight	
	120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)			lb	kg
10"—150 lb 27 elements	—	—	<b>CHF01686 (3)</b>	—	<b>CHF01687 (3)</b>	10.1	1	440	200
	—	—	<b>CHF01688 (9)</b>	—	<b>CHF01689 (3)</b>	10.2	1.5	485	220
12"—150 lb 36 elements	—	—	—	—	<b>CHF01690 (3)</b>	12.1	3	550	250
	—	—	—	—	<b>CHF01691 (3)</b>	12.2	4.5	595	270
14"—150 lb 45 elements	—	—	—	—	<b>CHF01692 (3)</b>	14.1	3	675	307
	—	—	—	—	<b>CHF01693 (5)</b>	14.2	4.5	771	350

Ordering Examples: CHF01690, 3 KW, 480 Vac, 3 phase circulation heater.

(C\*) = Number of Branch Circuits per heater

Note: Nominal pipe size 203 mm (8") and larger are 20 watts/in<sup>2</sup> (3.1 watts/cm<sup>2</sup>)

Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
10.1	74	1880	60 <sup>3</sup> / <sub>4</sub>	1531	66	1676
10.2	81 <sup>1</sup> / <sub>2</sub>	2070	67 <sup>3</sup> / <sub>4</sub>	1721	73 <sup>1</sup> / <sub>2</sub>	1867
12.1	74 <sup>1</sup> / <sub>4</sub>	1886	60	1524	66 <sup>5</sup> / <sub>8</sub>	1680
12.2	81 <sup>3</sup> / <sub>4</sub>	2076	67 <sup>1</sup> / <sub>2</sub>	1715	73 <sup>5</sup> / <sub>8</sub>	1870
14.1	74 <sup>5</sup> / <sub>8</sub>	1895	59 <sup>5</sup> / <sub>8</sub>	1508	66 <sup>1</sup> / <sub>4</sub>	1683
14.2	82 <sup>1</sup> / <sub>2</sub>	2086	66 <sup>5</sup> / <sub>8</sub>	1699	73 <sup>3</sup> / <sub>4</sub>	1873





### CHF Series

**Self-contained heating units designed for optimum operating efficiency and performance—**

**Providing trouble-free service and application flexibility!**

All of the heat generated by the elements is immediately transferred to the medium being processed with minimal losses.

**Standard and optional features include...**

General purpose (NEMA 1) terminal housing is standard. Moisture proof (NEMA 4) and/or explosion resistant (NEMA 7) housings are optional. A set of installation and maintenance instructions along with a wiring diagram can be found inside the terminal housing of each unit.

Heating source—32 and 64 mm (1¼" and 2½") screw plug heaters are used on smaller units. 76 to 356 mm (3 to 14") size heaters use flanged immersion heaters. The flanges are made from forged steel rated for 150 lbs with raised face. Supplied with threaded eyebolts for ease of handling and installation. Optional stainless steel flanges or 300 lb ratings available.

Inlet-outlet connections are NPT pipe threads for 76 to 203 mm (3 to 8") circulation heaters (flanges are optional). Standard inlet-outlet connections on 254 mm (10") and larger units are 150 lb rated flanges.

Optional feature double-pole non-indicating bulb and capillary type thermostat can be located in the terminal box (standard) or attached to the insulation jacket as pictured. Solid state temperature controllers and indicating thermostats are available. Over-temperature protection can be provided by attaching a thermocouple to one of the elements.

Threaded mounting lugs to support the unit are welded to the steel vessel. Custom supports can be designed to fit your structure.

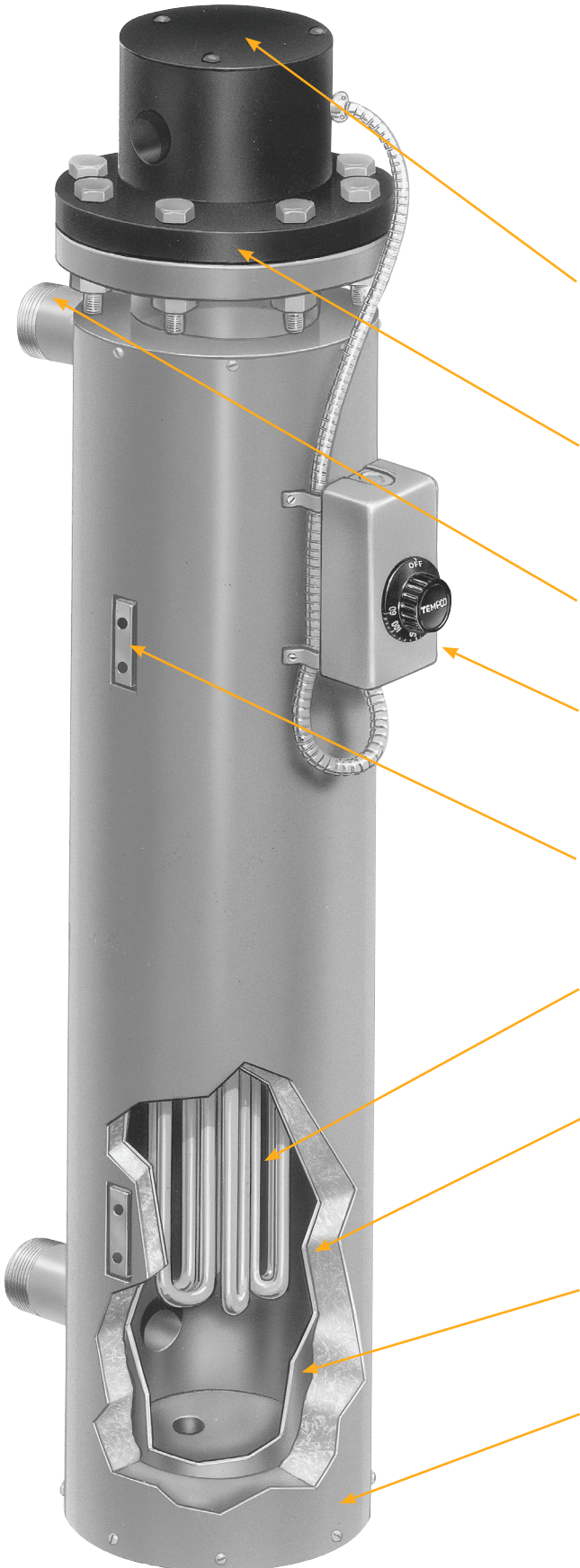
Wide selection of heating element sheath materials for maximum corrosion resistance to the medium being processed. On smaller circulation units with screw plug heaters, the element diameter is 8 or 12 mm (0.315 or 0.475"). On larger units with flanged heaters, the element diameter is 12 mm (0.475").

The vessel is surrounded with 25 mm (1") thick insulation rated to 399°C (750°F) to minimize heat loss. Additional insulation or a high temperature ceramic fiber insulation is optional. Vessels can also be supplied uninsulated.

Vessel material is SA53B or SA106B steel. Good for up to 399°C (750°F) operating temperature. For drainage and cleaning purposes, a drain plug is located in the base of the tank. Optional: stainless steel vessel.

Outer stainless steel sheet metal jacket protects the insulation from the environment and keeps it dry. Optional: Stainless steel outer jacket with a weather-tight seal.

**Note: Branch Circuit Wiring—Flange heater elements are wired into branch circuits having a maximum current of 48 Amps. The number of circuits is listed next to the heater's voltage and phase in the To Order tables. For different circuit wiring configurations, consult Omega.**





## Checklist for Selecting the Proper Circulation Heater

### ✓ Determine a Safe and Efficient Element Watt Density

**Element Watt Density** is the wattage dissipated per square inch of the element sheath surface and is calculated with the following formula:

$$\text{Watt Density} = \frac{\text{element wattage}}{\pi \times \text{element diameter} \times \text{element heated length}}$$

**For a particular application, element watt density will govern element sheath temperature. Factors to consider when choosing a suitable watt density are:**

1. Many materials are heat sensitive and can decompose or be damaged if the element is running too hot.
2. Air and other gases that are poor conductors of heat require watt densities matched to the velocity of the gas flow to prevent element overheating.
3. Mineral deposits when heating hard water and cleaning solutions can build up on the element sheath, acting as a heat insulator and raising the internal element temperature. If these deposits cannot be periodically removed, use a lower watt density element to increase heater life expectancy.

### ✓ Select the Element Sheath Material

#### Sheath Material Selection

**CORROSION.** In addition to selecting a sheath material that is compatible with the heated medium, other factors that affect corrosion need to be considered:

1. The temperature of the corrodent—As temperature increases the degree of corrosion increases. Also remember that usually the element temperature is higher than the material it is heating.
2. The degree of aeration to which a corrodent is exposed—Stagnant conditions can deprive the stainless steels of oxygen, which is required to maintain their corrosion resistant surface.
3. Velocity of the corrodent—Increased velocity can increase the corrosion rate.

#### Standard Element Sheath Materials

**Incoloy® 800** — A Nickel (30 to 35%), Chromium (19 to 23%), Iron alloy. The high nickel content of this alloy contributes to its resistance to scaling and corrosion. Used in air heating (also see Incoloy® 840) and immersion heating of potable water and other liquids that are not corrosive to an Incoloy® 800 sheath.

**Low Carbon Steel** — Applications include fluid heat transfer media, tar, high to low viscosity petroleum oils, asphalt, wax, molten salt, and other solutions not corrosive to a steel sheath.

**316 Stainless Steel** — A Chromium (16 to 18%), Nickel (11 to 14%), Iron Alloy with Molybdenum (2 to 3%) added to improve corrosion resistance in certain environments, especially those that would tend to cause pitting due to the presence of chlorides. Applications include deionized water.

**Copper** — Mainly used in clean water heating for washrooms, showers, rinse tanks and freeze protection of storage tanks.

#### Optional Element Sheath Materials

**304 Stainless Steel** — A Chromium (18 to 20%), Nickel (8 to 11%), Iron Alloy used in the food industry, sterilizing solutions, air heating and many organic and inorganic chemicals.

**321 Stainless Steel** — A Chromium (17 to 20%), Nickel (9 to 13%), Iron Alloy modified with the addition of titanium to prevent carbide precipitation and the resulting intergranular corrosion that can take place in certain mediums when operating in the 427 to 649°C (800 to 1200°F) temperature range.

**Incoloy® 840** — A Nickel (18 to 20%), Chromium (18 to 22%), Iron alloy. Incoloy 840 has about 10% less nickel than Incoloy 800. Used in many air heating applications where it has exhibited superior oxidation resistance at less cost than Incoloy 800.

**Incoloy® 825** — A Nickel (38 to 46%), Chromium (19.5 to 23.5%), Molybdenum (2 to 3%) Iron alloy. Consult Omega for more information.

#### Surface Treatments for Stainless Steel and Incoloy® Elements and Other Wetted Parts to Improve Corrosion Resistance

Flanged immersion heater surfaces in contact with the material being heated can be passivated or electro-polished to improve their resistance to corrosion.

Passivation removes surface contamination, usually iron, so that the optimum corrosion resistance of the stainless steel is maintained. Surface contamination would come from the small amount of steel that may be worn off a tool during the manufacturing process. Passivating is accomplished by dipping the heater in a warm solution of nitric acid.

Electro-Polishing is an electrochemical process that removes surface imperfections and contaminants, enhancing the corrosion resisting ability of the stainless steels. The resultant surface is clean, smooth and bright. Many medical and food applications require this finish.



✓ **Standard Terminal Housings**

Omega circulation heaters are supplied with a General Purpose Housing (NEMA 1) as standard unless otherwise specified.

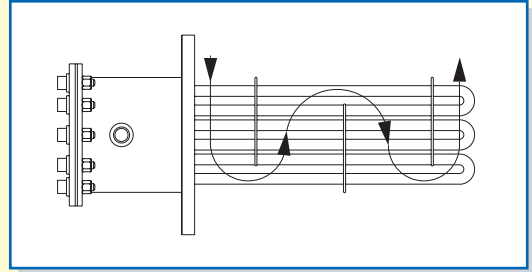
Additional housing types include:

- Moisture Resistant (NEMA 4)
- Explosion Resistant (NEMA 7)
- Moisture/Explosion Resistant (NEMA 4/7)



Explosion resistant terminal housings are intended to provide containment of an explosion in the enclosure only. No portion of the heater assembly outside the enclosure is covered under this NEMA rating. Abnormal use of a heater which results in excessive temperature can create hazardous conditions such as a fire. Never perform any type of service nor remove the housing cover prior to disconnecting all electrical power to the heater.

**Optional Circulation Heater Features**



**Flow Control Baffles**

Used on circulation tank heaters to aid heat transfer by forcing the liquid or gas back and forth across the elements. Baffles can be custom designed and positioned for your application.

**Optional Terminal Housing Standoff Construction**



The electrical housing is separated from the flange by an air gap (six-inch standard) to lower the ambient temperature of the electrical wiring. This option is used on flanged immersion heaters where the flange temperature exceeds 250°C (482°F).

**Temperature Control**

**Thermostats**

Thermostats are an optional feature on flanged immersion heaters. This type of control operates by expansion and contraction of a liquid in response to temperature change. Liquid contained within the sensing bulb and capillary flexes a diaphragm, causing the opening and closing of a snap action switch. For heating applications the contacts are normally closed and open on temperature rise.

**Installation Warnings and Recommendations**

1. Do not use the thermostat as a power switch. Use some other means of disconnecting power to the heater for servicing.
2. A Thermostat is not a fail-safe device. Use an approved high temperature limit control and/or pressure limit control for safe operation.
3. Avoid kinking or bending the capillary tube too sharply as this will alter the calibration and/or render the thermostat inoperable.
4. Excess capillary tube should be coiled neatly in junction box.
5. The capillary tube must never touch the thermostat contacts as this will create an electrical short capable of harming personnel and/or equipment.

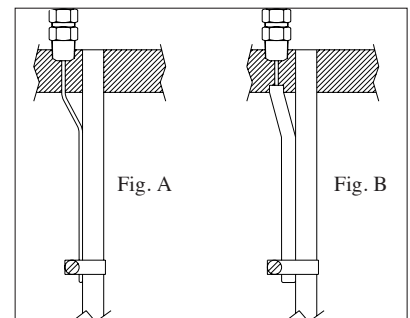
**Thermocouples**

Type J or Type K thermocouples can be supplied for process temperature or over-temperature control. Type J is reliable and accurate for temperatures up to 538°C (1000°F). Type K should be used for higher temperatures.

For measuring process temperatures the thermocouple can be mounted in a thermowell in the center of the element bundle. Note that a location somewhere away from the heater may give a more accurate measurement of process temperature.

For over-temperature protection the thermocouple is usually attached to one of the elements (Figure A) and any unusual rise in element temperature would shut the heater down. This thermocouple may also be mounted in a thermowell (Figure B), which is then attached to one of the heating elements if desired. This protects the thermocouple from the solution being heated and allows you to replace it without removing the heater, but does increase its response time.

Temperature and over-temperature controls for using the signal generated by thermocouples and how to select the best control for your application can be found at [omega.com/controllers](http://omega.com/controllers)



## Circulation Heater Installation Recommendations

Omega circulation heaters will have a long life and provide dependable, trouble-free service if properly installed, operated and maintained as per the following recommendations:

### Installation

1. Flange heaters are supplied with two drilled and tapped holes for threaded eye bolts, providing ease of handling during installation and flange removal during maintenance cleaning or heater replacement.
2. Replacement of heater is inevitable. Therefore, provide adequate space for installation, allowing ample room to remove the flange heater for cleaning or replacement.
3. In applications requiring the circulation heater to be fed by an inline pump, install the pump at the inlet end.
4. To maintain the lowest possible temperature at the terminal box, place the outlet at the end opposite to the terminal box. If your process temperature is circulating at 232°C (450°F) or above (at the nozzle closest to the flange), stand-off terminal box construction is recommended.
5. To prevent temperature and/or pressure buildup on closed loop circulation heater systems, adequate and strategically located thermocouples for temperature controllers and pressure relief valves should be installed. Never over-rate pressure relief valves beyond the pressure temperature rating of the flange being used.
6. During the process cycle, flow rate of the medium being heated should never be interrupted or reduced, thus creating an overheating condition. Excess temperature can result in damage to the medium being processed and premature heater failure.
7. Make sure that your circulation heater is equipped with the proper terminal housing for the environment in which the heater is being used. NEMA 1—general purpose, NEMA 4—moisture resistant, and NEMA 7—explosion resistant.

**Vertical Mounting—Liquids:**  
With terminal housing up and inlet pipe on the bottom, the heating elements will be immersed at all times to prevent premature failure.



**Horizontal Mounting—Liquids and Gases:**  
Always mount heater with inlet-outlet pipes facing up to ensure the heating elements will be immersed at all times to prevent premature failure. For liquid heating, outlet may be at either end. When heating gases the inlet should be closest to the terminal enclosure to minimize terminal box wiring temperatures.



**Vertical Mounting—Gases:** Mount with terminal enclosure and inlet pipe at bottom of tank to minimize terminal box wiring temperatures.

### Wiring

1. All heater installations must be properly earth grounded to eliminate electric shock hazard. Electrical wiring must be in accordance with Local and/or National Electrical Codes.
2. Circulation heaters are supplied standard with NEMA 1 terminal housings. All power to heaters must be disconnected before removing the terminal housing cover and performing any type of service.
3. Electrical connections on heater terminals must be kept tight. Loose connections will create arcing, over-heating, and eventually will destroy the heater terminal and cause premature heater failure.
4. If the amperage rating of your circulation heater exceeds the amperage capacity of the supplied thermostat, mercury relays or magnetic contactors should be used with the thermostat.
5. Over-temperature protection thermocouples require a separate conduit to the control panel for the thermocouple wire.
6. Omega offers a large selection of power control panels for circulation heaters. See [omega.com/controllers](http://omega.com/controllers)

### Maintenance

1. Never perform any type of service on the unit prior to disconnecting all electrical power and shutting off all intake lines.
2. Remove sludge deposits through the drain plug.
3. Check flange bolts for tightness.
4. Check terminal connections for tightness.
5. Check thermocouple or thermostat bulb for response to temperature changes. If defective, replace immediately.
6. Check for leaks.
7. Depending on operating conditions and medium being processed, the flange or screw plug heater should be periodically removed for physical inspection and cleaning of the element bundle.



## Circulation Tank Assembly Maximum Immersed Element Length

Standard circulation heaters shown in the tables have element immersion lengths determined by the element wattage and element watt density. The screw plug or flange heater containing the elements is matched to a standard circulation heater tank assembly to assure proper heat transfer and heated material flow. When designing a system

with a heater not shown on these pages the table below can be used to select a tank size based on the calculated immersion length. If a standard tank size is not suitable for your installation, Omega will design and manufacture a custom tank and heater assembly to satisfy the requirements of your application.

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
1½ NPT	1.1	18.0	457
	1.2	26.0	660
2½ NPT	2.1	25.5	648
	2.2	35.5	902
	2.3	48.0	1219
3" Flange	3.1	28.0	711
	3.2	38.0	965
	3.3	50.5	1283
4" Flange	4.1	26.5	673
	4.2	37.0	940
	4.3	58.0	1473
	4.4	79.0	2007
5" Flange	5.1	36.0	914
	5.2	43.0	1092
	5.3	54.5	1384
	5.4	68.0	1727
	5.5	85.0	2159
6" Flange	6.1	26.5	673
	6.2	37.0	940
	6.3	58.0	1473
	6.4	79.0	2007

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
8" Flange	8.1	32.5	826
	8.2	40.5	1029
	8.3	47.5	1207
	8.4	55.0	1397
	8.5	64.5	1638
	8.6	73.5	1867
	8.7	83.5	2121
10" Flange	10.1	60.0	1524
	10.2	67.0	1702
	10.3	73.0	1854
	10.4	82.0	2083
	10.5	90.0	2286
12" Flange	12.1	59.0	1499
	12.2	66.5	1689
	12.3	74.0	1880
	12.4	81.5	2070
	12.5	89.0	2261
14" Flange	14.1	58.0	1473
	14.2	65.5	1664
	14.3	73.0	1854
	14.4	80.5	2045
	14.5	88.0	2235

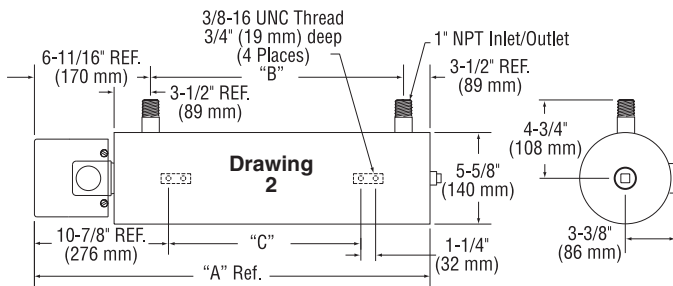
### 8 watts/in<sup>2</sup> (1.3 watts/cm<sup>2</sup>) — Typical Applications: Fuel Oils (Bunker C and Number 6)

- Steel Screw Plug and Steel 150 lb Flanged Heater Sizes
- Steel Tank
- Steel Sheath Heating Elements
- NEMA 1 Terminal Housing

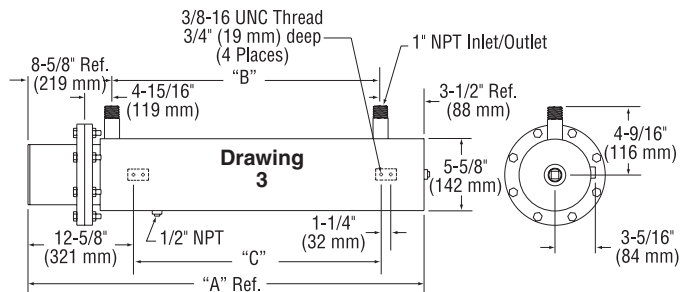
Note: 3-Phase only. Cannot be rewired for single phase.

Nominal Pipe Size	Dimensional Drawing Number	KW	Model Number					Approx Weight	
			120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)	lb	kg
2½ NPT 3 elements	2.2	2	—	—	CHF01100 (1)	—	CHF01101 (1)	37	17
	2.3	3	—	—	CHF01102 (1)	—	CHF01101 (1)	46	21
3" — 150 lb 3 elements	3.2	2	—	—	CHF01104 (1)	—	CHF01105 (1)	62	28
	3.3	3	—	—	CHF01106 (1)	—	CHF01107 (1)	76	34

(C\*) = Number of Branch Circuits per heater



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
2.2	42 11/16	1084	32 1/2	826	26 1/2	673
2.3	55 5/16	1402	45	1143	39	991



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
3.2	44 5/8	1133	32 1/2	826	26 1/2	673
3.3	57 5/8	1451	45	1143	39	991



**48 watts/in<sup>2</sup> (7.5 watts/cm<sup>2</sup>)—Typical Applications: Process Water**

- 304 Stainless Steel Screw Plug and Steel 150 lb Flanged Heater Sizes
  - Steel Tank
- Incoloy® 800 Sheath Heating Elements
  - NEMA 1 Terminal Housing

**To Order Visit [omega.com/chf6](http://omega.com/chf6) for Pricing and Details**

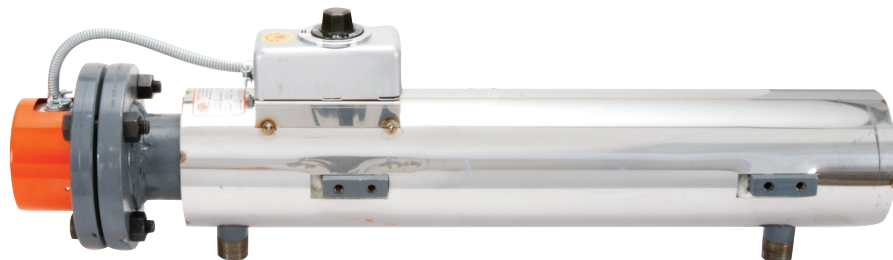
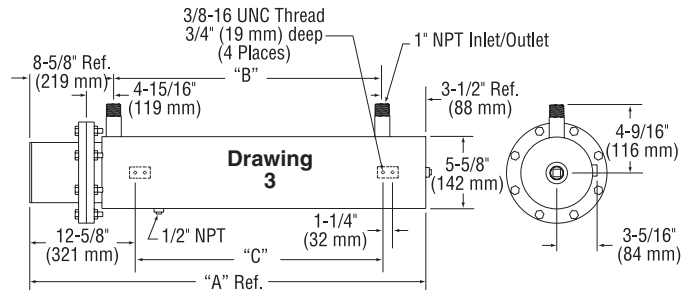
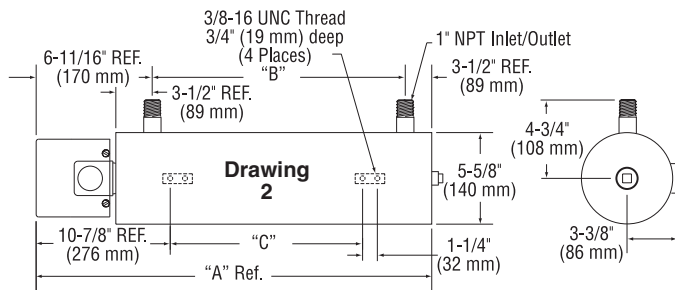
Nominal Pipe Size	Model Number					Dim Drawing Number	KW	Approx Weight	
	120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)			lb	kg
2½ NPT 3 elements	—	CHF01694 (1)	CHF01695 (1)	CHF01696 (1)	CHF01697 (1)	2.1	6	28	13
	—	CHF01698 (1)	CHF01699 (1)	CHF01700 (1)	CHF01701 (1)	2.1	7.5	29	13
	—	CHF01702 (1)	CHF01703 (1)	CHF01704 (1)	CHF01705 (1)	2.1	9	30	14
	—	—	CHF01706 (1)	CHF01707 (1)	CHF01708 (1)	2.2	12	37	17
	—	—	CHF01709 (1)	CHF01710 (1)	CHF01711 (1)	2.3	15	45	20
	—	—	CHF01712 (1)	CHF01713 (1)	CHF01714 (1)	2.3	18	46	21
3"—150 lb 3 elements	—	CHF01715 (1)	CHF01716 (1)	CHF01717 (1)	CHF01718 (1)	3.1	6	53	24
	—	CHF01719 (1)	CHF01720 (1)	CHF01721 (1)	CHF01722 (1)	3.1	7.5	53	24
	—	CHF01723 (1)	CHF01724 (1)	CHF01725 (1)	CHF01726 (1)	3.2	9	61	28
	—	—	CHF01727 (1)	CHF01728 (1)	CHF01729 (1)	3.2	12	62	28
	—	—	CHF01730 (1)	CHF01731 (1)	CHF01732 (1)	3.3	15	74	34
	—	—	CHF01733 (1)	CHF01734 (1)	CHF01735 (1)	3.3	18	76	34

**Ordering Example:** CHF01708, 12 KW, 480 Vac, 3 phase circulation heater.

**(C\*) = Number of Branch Circuits per heater**

Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
2.1	32 <sup>11</sup> / <sub>16</sub>	830	22 <sup>1</sup> / <sub>2</sub>	572	16 <sup>1</sup> / <sub>2</sub>	419
2.2	42 <sup>11</sup> / <sub>16</sub>	1084	32 <sup>1</sup> / <sub>2</sub>	826	26 <sup>1</sup> / <sub>2</sub>	673
2.3	55 <sup>5</sup> / <sub>16</sub>	1402	45	1143	39	991
3.1	34 <sup>5</sup> / <sub>8</sub>	879	22 <sup>1</sup> / <sub>2</sub>	572	16 <sup>1</sup> / <sub>2</sub>	419
3.2	44 <sup>5</sup> / <sub>8</sub>	1133	32 <sup>1</sup> / <sub>2</sub>	826	26 <sup>1</sup> / <sub>2</sub>	673
3.3	57 <sup>1</sup> / <sub>8</sub>	1451	45	1143	39	991

**Note:** Circulation heater mounting lug design and location in the assembly drawings shown are standard. Designs can be modified to fit customer installation. Consult Omega with your requirements.



Circulation heater with optional externally mounted thermostat.



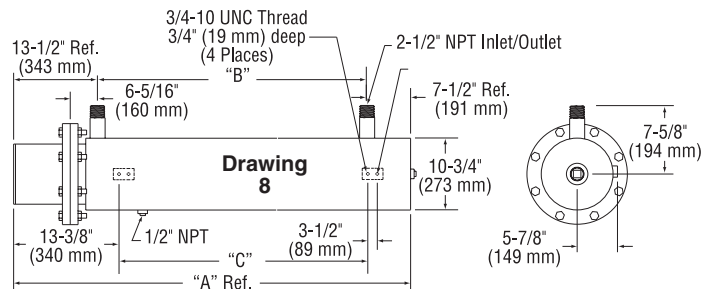
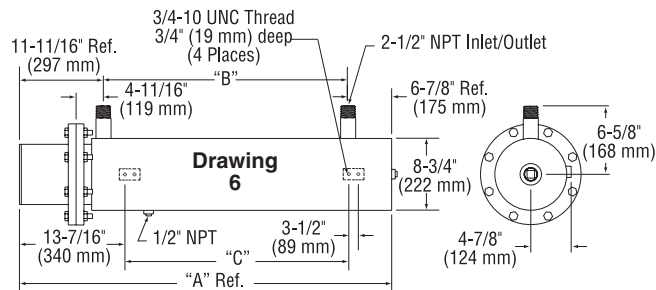
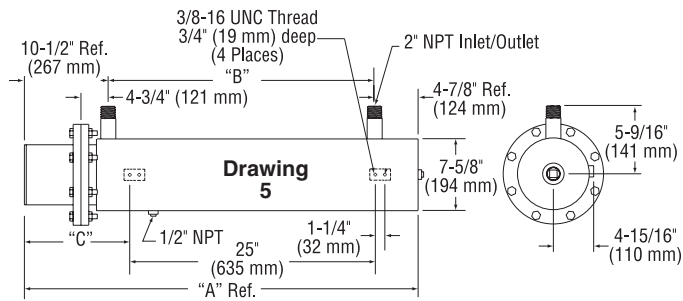
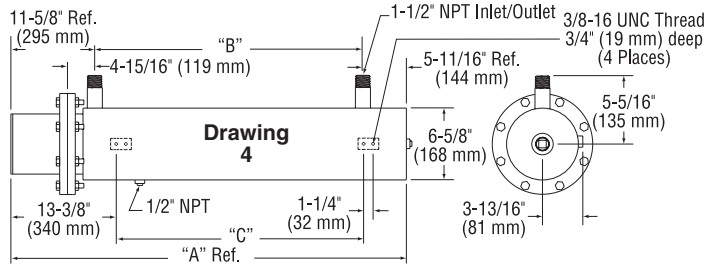
Nominal Pipe Size	Model Number					Dim Drawing Number	KW	Approx Weight	
	120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)			lb	kg
4"—150 lb 6 elements	—	CHF01736 (1)	CHF01737 (1)	CHF01738 (1)	CHF01739 (1)	4.1	9	76	34
	—	CHF01740 (2)	CHF01741 (1)	CHF01742 (1)	CHF01743 (1)	4.1	12	78	35
	—	CHF01744 (2)	CHF01745 (1)	CHF01746 (1)	CHF01747 (1)	4.1	15	79	36
	—	CHF01748 (2)	CHF01749 (1)	CHF01750 (1)	CHF01751 (1)	4.2	18	91	41
	—	CHF01752 (2)	CHF01753 (2)	CHF01754 (2)	CHF01755 (1)	4.2	24	94	43
	—	—	CHF01756 (2)	CHF01757 (2)	CHF01758 (1)	4.3	30	117	53
	—	—	CHF01759 (2)	CHF01760 (2)	CHF01761 (1)	4.3	36	120	54
5"—150 lb 6 elements	—	CHF01762 (2)	CHF01763 (2)	CHF01764 (2)	CHF01765 (1)	5.1	24	117	53
	—	—	CHF01766 (2)	CHF01767 (2)	CHF01768 (1)	5.2	30	128	58
	—	—	CHF01769 (2)	CHF01770 (2)	CHF01771 (1)	5.3	36	146	66
5"—150 lb 9 elements	—	—	CHF01772 (3)	CHF01773 (3)	CHF01774 (1)	5.1	36	123	56
	—	—	CHF01775 (3)	CHF01776 (3)	CHF01777 (3)	5.2	45	135	61
	—	—	CHF01778 (3)	CHF01779 (3)	CHF01780 (3)	5.3	54	154	70
6"—150 lb 12 elements	—	CHF01781 (2)	CHF01782 (1)	CHF01783 (1)	CHF01784 (1)	6.1	18	124	56
	—	CHF01785 (2)	CHF01786 (2)	CHF01787 (2)	CHF01788 (1)	6.1	24	127	58
	—	CHF01789 (3)	CHF01790 (2)	CHF01791 (2)	CHF01792 (1)	6.1	30	129	59
	—	CHF01793 (3)	CHF01794 (2)	CHF01795 (2)	CHF01796 (1)	6.2	36	152	69
	—	—	CHF01797 (4)	CHF01798 (3)	CHF01799 (2)	6.2	48	157	71
	—	—	CHF01800 (4)	CHF01801 (3)	CHF01802 (2)	6.3	60	197	89
	—	—	CHF01803 (4)	—	CHF01804 (2)	6.3	72	202	92
6"—150 lb 15 elements	—	CHF01805 (3)	CHF01806 (5)	CHF01807 (1)	CHF01808 (1)	6.1	23	126	57
	—	CHF01809 (3)	CHF01810 (5)	CHF01811 (3)	CHF01812 (1)	6.1	30	130	59
	—	CHF01813 (5)	CHF01814 (5)	CHF01815 (3)	CHF01816 (1)	6.1	38	132	60
	—	CHF01817 (5)	CHF01818 (5)	CHF01819 (3)	CHF01820 (5)	6.2	45	156	71
	—	—	CHF01821 (5)	CHF01822 (3)	CHF01823 (5)	6.2	60	163	74
	—	—	CHF01824 (5)	CHF01825 (5)	CHF01826 (5)	6.3	75	204	93
	—	—	CHF01827 (5)	—	CHF01828 (5)	6.3	90	211	96
8"—150 lb 18 elements	—	—	CHF01829 (3)	CHF01830 (3)	CHF01831 (2)	8.2	50	234	106
	—	—	CHF01832 (6)	—	CHF01833 (2)	8.3	75	264	120
	—	—	CHF01834 (6)	—	CHF01835 (3)	8.4	100	293	133
	—	—	CHF01836 (6)	—	CHF01837 (6)	8.5	125	327	148
	—	—	—	—	CHF01838 (6)	8.6	150	360	163
	—	—	—	—	CHF01839 (6)	8.7	175	395	179
	—	—	—	—	CHF01840 (6)	8.7	200	405	184
8"—150 lb 24 elements	—	—	CHF01841 (4)	CHF01842 (3)	CHF01843 (2)	8.2	67	243	110
	—	—	CHF01844 (8)	—	CHF01845 (4)	8.3	100	277	126
	—	—	CHF01846 (8)	—	CHF01847 (4)	8.4	133	308	140
	—	—	CHF01848 (8)	—	CHF01849 (8)	8.5	167	346	157
	—	—	—	—	CHF01850 (8)	8.6	200	382	173
	—	—	—	—	CHF01851 (8)	8.7	233	420	191
	—	—	—	—	CHF01852 (8)	8.7	267	433	196



Nominal Pipe Size	Model Number					Dim Drawing Number	KW	Approx Weight	
	120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)			lb	kg
10"—150 lb 27 elements	—	—	—	—	<b>CHF01853 (9)</b>	10.3	225	539	244
	—	—	—	—	<b>CHF01854 (9)</b>	10.5	262	615	279
12"—150 lb 36 elements	—	—	—	—	<b>CHF01855 (12)</b>	12.3	300	694	315
	—	—	—	—	<b>CHF01856 (12)</b>	12.5	350	782	355
14"—150 lb 45 elements	—	—	—	—	<b>CHF01857 (15)</b>	14.2	315	771	350
	—	—	—	—	<b>CHF01858 (15)</b>	14.3	375	827	375

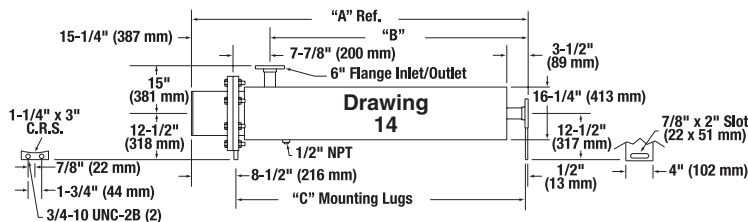
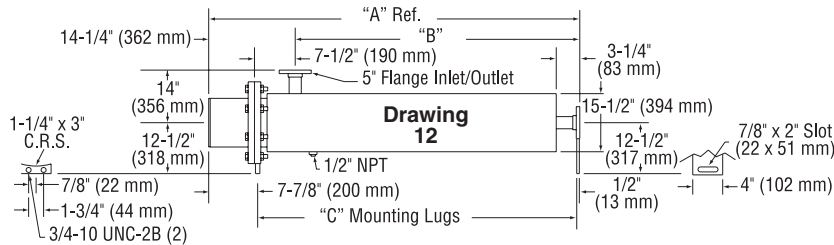
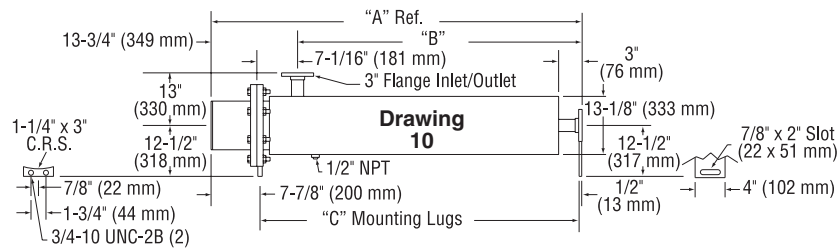
Ordering Example: CHF01788, 24 KW, 480 Vac, 3 phase circulation heater.

(C\*) = Number of Branch Circuits per heater





Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
4.1	37 <sup>13</sup> / <sub>16</sub>	960	20 <sup>1</sup> / <sub>2</sub>	521	17	432
4.2	48 <sup>5</sup> / <sub>16</sub>	1227	31	787	27 <sup>1</sup> / <sub>2</sub>	699
4.3	69 <sup>9</sup> / <sub>16</sub>	1761	52	1321	48 <sup>1</sup> / <sub>2</sub>	1232
5.1	45 <sup>3</sup> / <sub>8</sub>	1153	30	762	11 <sup>1</sup> / <sub>2</sub>	292
5.2	52 <sup>3</sup> / <sub>8</sub>	1330	37	940	15 <sup>1</sup> / <sub>4</sub>	387
5.3	63 <sup>7</sup> / <sub>8</sub>	1622	48 <sup>1</sup> / <sub>2</sub>	1232	21	533
6.1	39 <sup>1</sup> / <sub>16</sub>	992	20 <sup>1</sup> / <sub>2</sub>	521	17	432
6.2	49 <sup>9</sup> / <sub>16</sub>	1259	31	787	27 <sup>1</sup> / <sub>2</sub>	699
6.3	70 <sup>9</sup> / <sub>16</sub>	1792	52	1321	48 <sup>1</sup> / <sub>2</sub>	1232
8.2	53 <sup>3</sup> / <sub>4</sub>	1365	32 <sup>1</sup> / <sub>16</sub>	830	29 <sup>9</sup> / <sub>16</sub>	741
8.3	60 <sup>3</sup> / <sub>4</sub>	1543	39 <sup>1</sup> / <sub>16</sub>	1008	36 <sup>3</sup> / <sub>16</sub>	919
8.4	68 <sup>3</sup> / <sub>4</sub>	1746	47 <sup>9</sup> / <sub>16</sub>	1202	43 <sup>19</sup> / <sub>16</sub>	1113
8.5	77 <sup>7</sup> / <sub>8</sub>	1978	56 <sup>19</sup> / <sub>16</sub>	1443	53 <sup>3</sup> / <sub>16</sub>	1354
8.6	86 <sup>7</sup> / <sub>8</sub>	2207	65 <sup>19</sup> / <sub>16</sub>	1672	62 <sup>5</sup> / <sub>16</sub>	1583
8.7	96 <sup>7</sup> / <sub>8</sub>	2461	75 <sup>19</sup> / <sub>16</sub>	1926	72 <sup>5</sup> / <sub>16</sub>	1837
10.3	89	2261	75 <sup>1</sup> / <sub>4</sub>	1911	81	2057
10.5	104	2642	90 <sup>1</sup> / <sub>4</sub>	2292	96	2438
12.3	89 <sup>1</sup> / <sub>4</sub>	2267	75	1905	81 <sup>1</sup> / <sub>8</sub>	2061
12.5	104 <sup>1</sup> / <sub>4</sub>	2648	90	2286	96 <sup>1</sup> / <sub>8</sub>	2442
14.2	82 <sup>1</sup> / <sub>8</sub>	2086	66 <sup>3</sup> / <sub>8</sub>	1699	73 <sup>3</sup> / <sub>4</sub>	1873
14.3	89 <sup>5</sup> / <sub>8</sub>	2276	74 <sup>3</sup> / <sub>8</sub>	1889	81 <sup>1</sup> / <sub>4</sub>	2064



**Note: Circulation heater mounting lug design and location in the assembly drawings shown are standard. Designs can be modified to fit customer installation. Consult Omega with your requirements.**





## CHF Series

**Self-contained heating units designed for optimum operating efficiency and performance—**

**Providing trouble-free service and application flexibility!**

All of the heat generated by the elements is immediately transferred to the medium being processed with minimal losses.

**Standard and optional features include...**

General purpose (NEMA 1) terminal housing is standard. Moisture proof (NEMA 4) and/or explosion resistant (NEMA 7) housings are optional. A set of installation and maintenance instructions along with a wiring diagram can be found inside the terminal housing of each unit.

Heating source—32 and 64 mm (1¼" and 2½") screw plug heaters are used on smaller units. 76 to 356 mm (3 to 14") size heaters use flanged immersion heaters. The flanges are made from forged steel rated for 150 lbs with raised face. Supplied with threaded eyebolts for ease of handling and installation. Optional stainless steel flanges or 300 lb ratings available.

Inlet-outlet connections are NPT pipe threads for 76 to 203 mm (3 to 8") circulation heaters (flanges are optional). Standard inlet-outlet connections on 254 mm (10") and larger units are 150 lb rated flanges.

Optional feature double-pole non-indicating bulb and capillary type thermostat can be located in the terminal box (standard) or attached to the insulation jacket as pictured. Solid state temperature controllers and indicating thermostats are available. Over-temperature protection can be provided by attaching a thermocouple to one of the elements.

Threaded mounting lugs to support the unit are welded to the steel vessel. Custom supports can be designed to fit your structure.

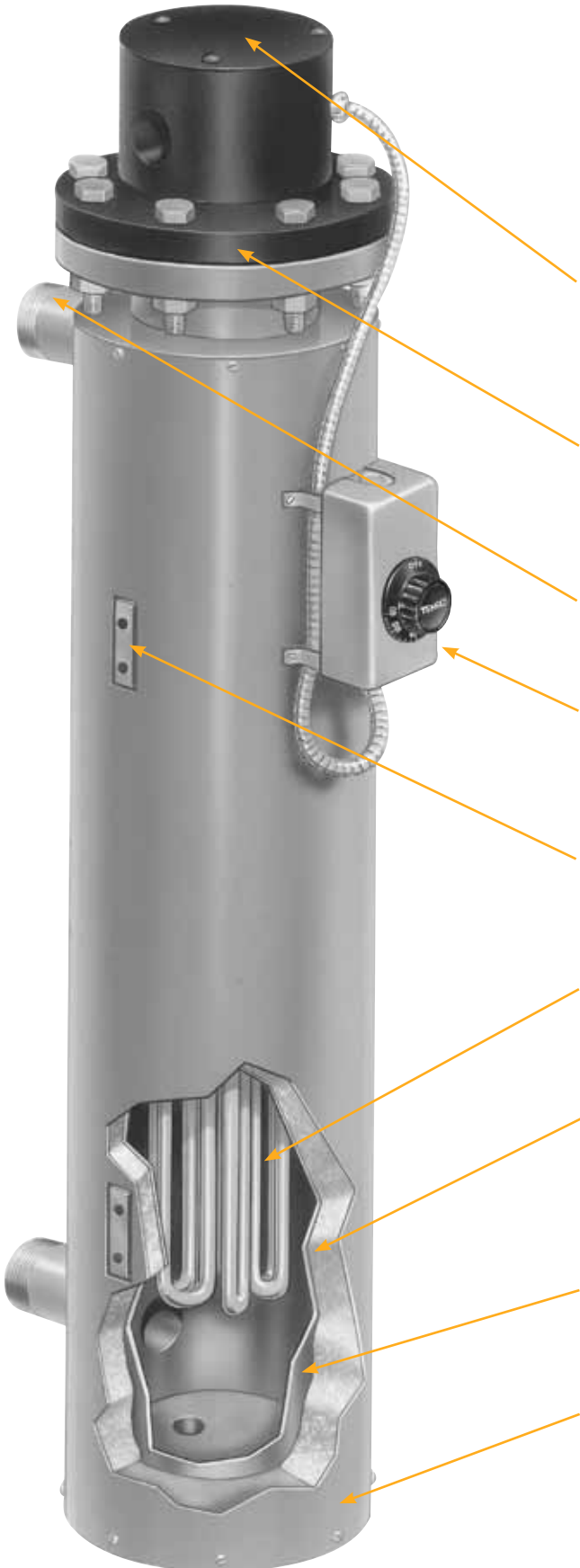
Wide selection of heating element sheath materials for maximum corrosion resistance to the medium being processed. On smaller circulation units with screw plug heaters, the element diameter is 8 or 12 mm (0.315 or 0.475"). On larger units with flanged heaters, the element diameter is 12 mm (0.475").

The vessel is surrounded with 25 mm (1") thick insulation rated to 399°C (750°F) to minimize heat loss. Additional insulation or a high temperature ceramic fiber insulation is optional. Vessels can also be supplied uninsulated.

Vessel material is SA53B or SA106B steel. Good for up to 399°C (750°F) operating temperature. For drainage and cleaning purposes, a drain plug is located in the base of the tank. Optional: stainless steel vessel.

Outer stainless steel sheet metal jacket protects the insulation from the environment and keeps it dry. Optional: Stainless steel outer jacket with a weather-tight seal.

**Note: Branch Circuit Wiring—Flange heater elements are wired into branch circuits having a maximum current of 48 Amps. The number of circuits is listed next to the heater's voltage and phase in the To Order tables. For different circuit wiring configurations, consult Omega.**



## Checklist for Selecting the Proper Circulation Heater

### ✓ Determine a Safe and Efficient Element Watt Density

**Element Watt Density** is the wattage dissipated per square inch of the element sheath surface and is calculated with the following formula:

$$\text{Watt Density} = \frac{\text{element wattage}}{\pi \times \text{element diameter} \times \text{element heated length}}$$

**For a particular application, element watt density will govern element sheath temperature. Factors to consider when choosing a suitable watt density are:**

1. Many materials are heat sensitive and can decompose or be damaged if the element is running too hot.
2. Air and other gases that are poor conductors of heat require watt densities matched to the velocity of the gas flow to prevent element overheating.
3. Mineral deposits when heating hard water and cleaning solutions can build up on the element sheath, acting as a heat insulator and raising the internal element temperature. If these deposits cannot be periodically removed, use a lower watt density element to increase heater life expectancy.

### ✓ Select the Element Sheath Material

#### Sheath Material Selection

**CORROSION.** In addition to selecting a sheath material that is compatible with the heated medium, other factors that affect corrosion need to be considered:

1. The temperature of the corrodent—As temperature increases the degree of corrosion increases. Also remember that usually the element temperature is higher than the material it is heating.
2. The degree of aeration to which a corrodent is exposed—Stagnant conditions can deprive the stainless steels of oxygen, which is required to maintain their corrosion resistant surface.
3. Velocity of the corrodent—Increased velocity can increase the corrosion rate.

#### Standard Element Sheath Materials

**Incoloy® 800** — A Nickel (30 to 35%), Chromium (19 to 23%), Iron alloy. The high nickel content of this alloy contributes to its resistance to scaling and corrosion. Used in air heating (also see Incoloy® 840) and immersion heating of potable water and other liquids that are not corrosive to an Incoloy® 800 sheath.

**Low Carbon Steel** — Applications include fluid heat transfer media, tar, high to low viscosity petroleum oils, asphalt, wax, molten salt, and other solutions not corrosive to a steel sheath.

**316 Stainless Steel** — A Chromium (16 to 18%), Nickel (11 to 14%), Iron Alloy with Molybdenum (2 to 3%) added to improve corrosion resistance in certain environments, especially those that would tend to cause pitting due to the presence of chlorides. Applications include deionized water.

**Copper** — Mainly used in clean water heating for washrooms, showers, rinse tanks and freeze protection of storage tanks.

#### Optional Element Sheath Materials

**304 Stainless Steel** — A Chromium (18 to 20%), Nickel (8 to 11%), Iron Alloy used in the food industry, sterilizing solutions, air heating and many organic and inorganic chemicals.

**321 Stainless Steel** — A Chromium (17 to 20%), Nickel (9 to 13%), Iron Alloy modified with the addition of titanium to prevent carbide precipitation and the resulting intergranular corrosion that can take place in certain mediums when operating in the 427 to 649°C (800 to 1200°F) temperature range.

**Incoloy® 840** — A Nickel (18 to 20%), Chromium (18 to 22%), Iron alloy. Incoloy 840 has about 10% less nickel than Incoloy 800. Used in many air heating applications where it has exhibited superior oxidation resistance at less cost than Incoloy 800.

**Incoloy® 825** — A Nickel (38 to 46%), Chromium (19.5 to 23.5%), Molybdenum (2 to 3%) Iron alloy. Consult Omega for more information.

#### Surface Treatments for Stainless Steel and Incoloy® Elements and Other Wetted Parts to Improve Corrosion Resistance

Flanged immersion heater surfaces in contact with the material being heated can be passivated or electro-polished to improve their resistance to corrosion.

Passivation removes surface contamination, usually iron, so that the optimum corrosion resistance of the stainless steel is maintained. Surface contamination would come from the small amount of steel that may be worn off a tool during the manufacturing process. Passivating is accomplished by dipping the heater in a warm solution of nitric acid.

Electro-Polishing is an electrochemical process that removes surface imperfections and contaminants, enhancing the corrosion resisting ability of the stainless steels. The resultant surface is clean, smooth and bright. Many medical and food applications require this finish.



✓ **Standard Terminal Housings**

Omega circulation heaters are supplied with a General Purpose Housing (NEMA 1) as standard unless otherwise specified.

Additional housing types include:

- Moisture Resistant (NEMA 4)
- Explosion Resistant (NEMA 7)
- Moisture/Explosion Resistant (NEMA 4/7)



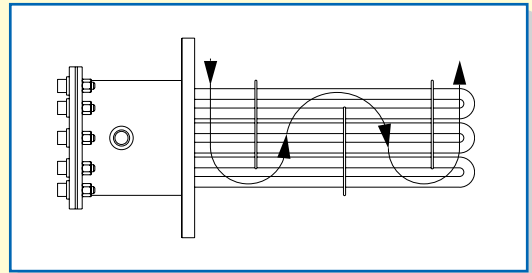
**Explosion resistant terminal housings are intended to provide containment of an explosion in the enclosure only. No portion of the heater assembly outside the enclosure is covered under this NEMA rating. Abnormal use of a heater which results in excessive temperature can create hazardous conditions such as a fire. Never perform any type of service nor remove the housing cover prior to disconnecting all electrical power to the heater.**

**Optional Terminal Housing Standoff Construction**



The electrical housing is separated from the flange by an air gap (six-inch standard) to lower the ambient temperature of the electrical wiring. This option is used on flanged immersion heaters where the flange temperature exceeds 250°C (482°F).

**Optional Circulation Heater Features**



**Flow Control Baffles**

Used on circulation tank heaters to aid heat transfer by forcing the liquid or gas back and forth across the elements. Baffles can be custom designed and positioned for your application.

**Temperature Control**

**Thermostats**

Thermostats are an optional feature on flanged immersion heaters. This type of control operates by expansion and contraction of a liquid in response to temperature change. Liquid contained within the sensing bulb and capillary flexes a diaphragm, causing the opening and closing of a snap action switch. For heating applications the contacts are normally closed and open on temperature rise.

**Installation Warnings and Recommendations**

1. Do not use the thermostat as a power switch. Use some other means of disconnecting power to the heater for servicing.
2. A Thermostat is not a fail-safe device. Use an approved high temperature limit control and/or pressure limit control for safe operation.
3. Avoid kinking or bending the capillary tube too sharply as this will alter the calibration and/or render the thermostat inoperable.
4. Excess capillary tube should be coiled neatly in junction box.
5. The capillary tube must never touch the thermostat contacts as this will create an electrical short capable of harming personnel and/or equipment.

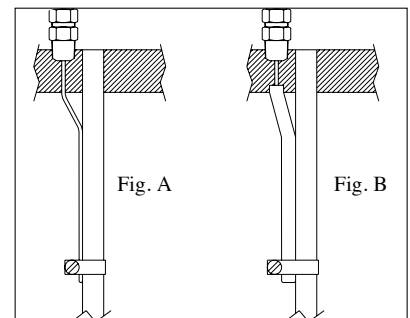
**Thermocouples**

Type J or Type K thermocouples can be supplied for process temperature or over-temperature control. Type J is reliable and accurate for temperatures up to 538°C (1000°F). Type K should be used for higher temperatures.

For measuring process temperatures the thermocouple can be mounted in a thermowell in the center of the element bundle. Note that a location somewhere away from the heater may give a more accurate measurement of process temperature.

For over-temperature protection the thermocouple is usually attached to one of the elements (Figure A) and any unusual rise in element temperature would shut the heater down. This thermocouple may also be mounted in a thermowell (Figure B), which is then attached to one of the heating elements if desired. This protects the thermocouple from the solution being heated and allows you to replace it without removing the heater, but does increase its response time.

Temperature and over-temperature controls for using the signal generated by thermocouples and how to select the best control for your application can be found at [omega.com/controllers](http://omega.com/controllers)



## Circulation Heater Installation Recommendations

Omega circulation heaters will have a long life and provide dependable, trouble-free service if properly installed, operated and maintained as per the following recommendations:

### Installation

1. Flange heaters are supplied with two drilled and tapped holes for threaded eye bolts, providing ease of handling during installation and flange removal during maintenance cleaning or heater replacement.
2. Replacement of heater is inevitable. Therefore, provide adequate space for installation, allowing ample room to remove the flange heater for cleaning or replacement.
3. In applications requiring the circulation heater to be fed by an inline pump, install the pump at the inlet end.
4. To maintain the lowest possible temperature at the terminal box, place the outlet at the end opposite to the terminal box. If your process temperature is circulating at 232°C (450°F) or above (at the nozzle closest to the flange), stand-off terminal box construction is recommended.
5. To prevent temperature and/or pressure buildup on closed loop circulation heater systems, adequate and strategically located thermocouples for temperature controllers and pressure relief valves should be installed. Never over-rate pressure relief valves beyond the pressure temperature rating of the flange being used.
6. During the process cycle, flow rate of the medium being heated should never be interrupted or reduced, thus creating an overheating condition. Excess temperature can result in damage to the medium being processed and premature heater failure.
7. Make sure that your circulation heater is equipped with the proper terminal housing for the environment in which the heater is being used. NEMA 1—general purpose, NEMA 4—moisture resistant, and NEMA 7—explosion resistant.

**Vertical Mounting—Liquids:**  
With terminal housing up and inlet pipe on the bottom, the heating elements will be immersed at all times to prevent premature failure.



**Horizontal Mounting—Liquids and Gases:**  
Always mount heater with inlet-outlet pipes facing up to ensure the heating elements will be immersed at all times to prevent premature failure. For liquid heating, outlet may be at either end. When heating gases the inlet should be closest to the terminal enclosure to minimize terminal box wiring temperatures.



**Vertical Mounting—Gases:** Mount with terminal enclosure and inlet pipe at bottom of tank to minimize terminal box wiring temperatures.

### Wiring

1. All heater installations must be properly earth grounded to eliminate electric shock hazard. Electrical wiring must be in accordance with Local and/or National Electrical Codes.
2. Circulation heaters are supplied standard with NEMA 1 terminal housings. All power to heaters must be disconnected before removing the terminal housing cover and performing any type of service.
3. Electrical connections on heater terminals must be kept tight. Loose connections will create arcing, over-heating, and eventually will destroy the heater terminal and cause premature heater failure.
4. If the amperage rating of your circulation heater exceeds the amperage capacity of the supplied thermostat, mercury relays or magnetic contactors should be used with the thermostat.
5. Over-temperature protection thermocouples require a separate conduit to the control panel for the thermocouple wire.
6. Omega offers a large selection of power control panels for circulation heaters. See [omega.com/controllers](http://omega.com/controllers)

### Maintenance

1. Never perform any type of service on the unit prior to disconnecting all electrical power and shutting off all intake lines.
2. Remove sludge deposits through the drain plug.
3. Check flange bolts for tightness.
4. Check terminal connections for tightness.
5. Check thermocouple or thermostat bulb for response to temperature changes. If defective, replace immediately.
6. Check for leaks.
7. Depending on operating conditions and medium being processed, the flange or screw plug heater should be periodically removed for physical inspection and cleaning of the element bundle.



## Circulation Tank Assembly Maximum Immersed Element Length

Standard circulation heaters shown in the tables have element immersion lengths determined by the element wattage and element watt density. The screw plug or flange heater containing the elements is matched to a standard circulation heater tank assembly to assure proper heat transfer and heated material flow. When designing a system

with a heater not shown on these pages the table below can be used to select a tank size based on the calculated immersion length. If a standard tank size is not suitable for your installation, Omega will design and manufacture a custom tank and heater assembly to satisfy the requirements of your application.

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
1½ NPT	1.1	18.0	457
	1.2	26.0	660
2½ NPT	2.1	25.5	648
	2.2	35.5	902
	2.3	48.0	1219
3" Flange	3.1	28.0	711
	3.2	38.0	965
	3.3	50.5	1283
4" Flange	4.1	26.5	673
	4.2	37.0	940
	4.3	58.0	1473
	4.4	79.0	2007
5" Flange	5.1	36.0	914
	5.2	43.0	1092
	5.3	54.5	1384
	5.4	68.0	1727
	5.5	85.0	2159
6" Flange	6.1	26.5	673
	6.2	37.0	940
	6.3	58.0	1473
	6.4	79.0	2007

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
8" Flange	8.1	32.5	826
	8.2	40.5	1029
	8.3	47.5	1207
	8.4	55.0	1397
	8.5	64.5	1638
	8.6	73.5	1867
	8.7	83.5	2121
10" Flange	10.1	60.0	1524
	10.2	67.0	1702
	10.3	73.0	1854
	10.4	82.0	2083
	10.5	90.0	2286
12" Flange	12.1	59.0	1499
	12.2	66.5	1689
	12.3	74.0	1880
	12.4	81.5	2070
	12.5	89.0	2261
14" Flange	14.1	58.0	1473
	14.2	65.5	1664
	14.3	73.0	1854
	14.4	80.5	2045
	14.5	88.0	2235

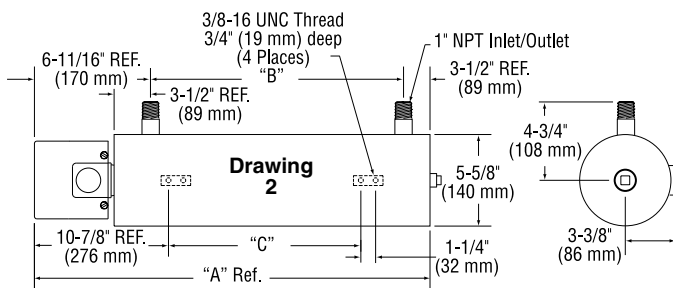
### 8 watts/in<sup>2</sup> (1.3 watts/cm<sup>2</sup>) — Typical Applications: Fuel Oils (Bunker C and Number 6)

- Steel Screw Plug and Steel 150 lb Flanged Heater Sizes
- Steel Sheath Heating Elements
- Steel Tank
- NEMA 1 Terminal Housing

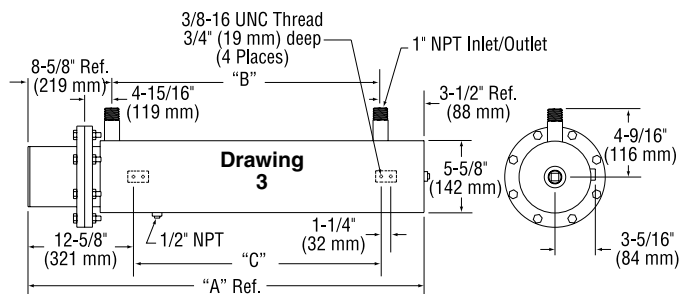
Note: 3-Phase only. Cannot be rewired for single phase.

Nominal Pipe Size	Dimensional Drawing Number	KW	Model Number					Approx Weight	
			120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)	lb	kg
2½ NPT 3 elements	2.2	2	—	—	CHF01100 (1)	—	CHF01101 (1)	37	17
	2.3	3	—	—	CHF01102 (1)	—	CHF01101 (1)	46	21
3" — 150 lb 3 elements	3.2	2	—	—	CHF01104 (1)	—	CHF01105 (1)	62	28
	3.3	3	—	—	CHF01106 (1)	—	CHF01107 (1)	76	34

(C\*) = Number of Branch Circuits per heater



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
2.2	42 11/16	1084	32 1/2	826	26 1/2	673
2.3	55 5/16	1402	45	1143	39	991



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
3.2	44 5/8	1133	32 1/2	826	26 1/2	673
3.3	57 5/8	1451	45	1143	39	991



60 watts/in<sup>2</sup> (9.3 watts/cm<sup>2</sup>)—Typical Applications: Clean Water

- Brass Screw Plug and Steel 150 lb Flanged Heater Sizes
- Steel Tank
- Copper Sheath Heating Elements
- NEMA 1 Terminal Housing

**To Order Visit [omega.com/chf7](http://omega.com/chf7) for Pricing and Details**

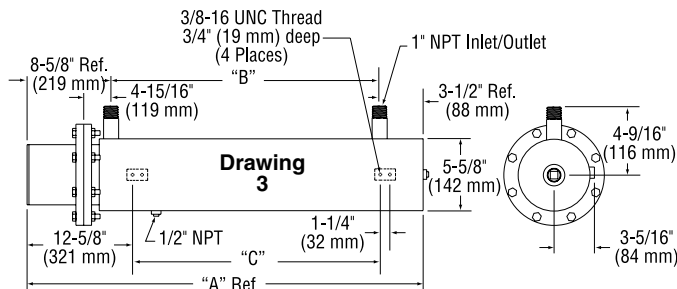
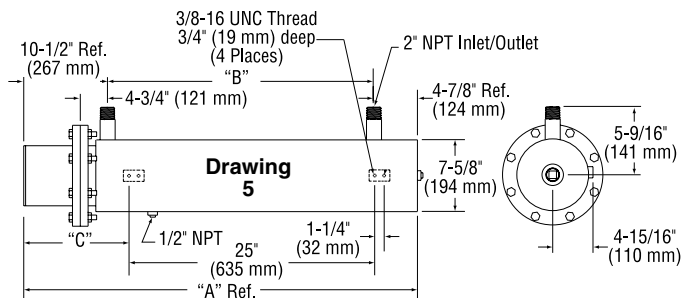
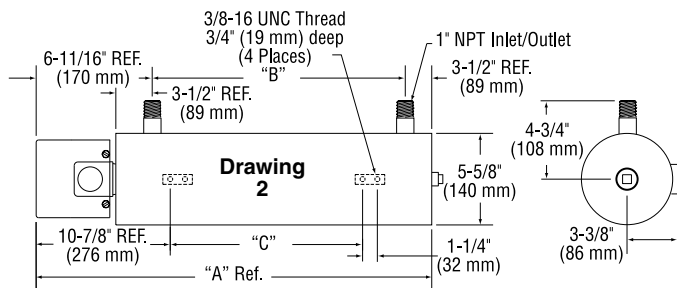
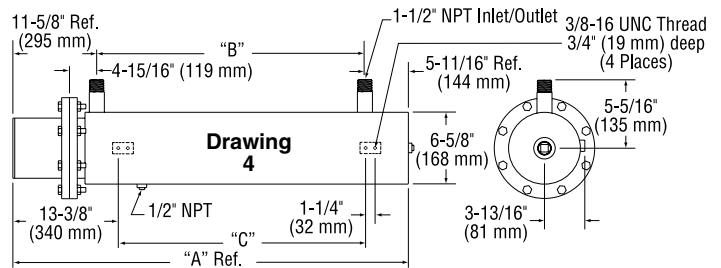
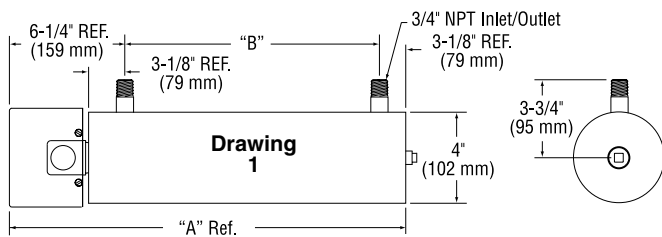
Nominal Pipe Size	Model Number					Dim Drawing Number	KW	Approx Weight	
	120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)			lb	kg
1¼ NPT 2 elements	CHF01859	CHF01860 (1)	—	—	—	1.1	3	14	6
	—	CHF01861 (1)	—	—	—	1.1	4	14	6
	—	CHF01862 (1)	—	—	—	1.2	5	17	8
	—	CHF01863 (1)	—	—	—	1.2	6	18	8
2½ NPT 3 elements	—	CHF01864 (1)	CHF01865 (1)	CHF01866 (1)	CHF01867 (1)	2.1	6	26	12
	—	CHF01868 (1)	CHF01869 (1)	CHF01870 (1)	CHF01871 (1)	2.1	7.5	26	12
	—	CHF01872 (1)	CHF01873 (1)	CHF01874 (1)	CHF01875 (1)	2.1	9	27	12
	—	—	CHF01877 (1)	CHF01878 (1)	CHF01879 (1)	2.2	12	34	15
	—	—	CHF01881 (1)	CHF01882 (1)	CHF01883 (1)	2.2	15	35	16
	—	—	CHF01885 (1)	CHF01886 (1)	CHF01887 (1)	2.3	18	43	20
3"—150 lb 3 elements	—	CHF01888 (1)	CHF01889 (1)	CHF01890 (1)	CHF01891 (1)	3.1	6	52	24
	—	CHF01892 (1)	CHF01893 (1)	CHF01894 (1)	CHF01895 (1)	3.1	9	53	24
	—	—	CHF01896 (1)	CHF01897 (1)	CHF01898 (1)	3.2	12	61	28
	—	—	CHF01899 (1)	CHF01900 (1)	CHF01901 (1)	3.2	15	67	30
	—	—	CHF01902 (1)	CHF01903 (1)	CHF01904 (1)	3.3	18	74	34
	—	—	—	—	—	—	—	—	—
4"—150 lb 6 elements	—	CHF01905 (2)	CHF01906 (1)	CHF01907 (1)	CHF01908 (1)	4.1	12	77	35
	—	CHF01909 (2)	CHF01910 (1)	CHF01911 (1)	CHF01912 (1)	4.1	18	79	36
	—	CHF01913 (2)	CHF01914 (2)	CHF01915 (2)	CHF01916 (1)	4.2	24	92	42
	—	—	CHF01917 (2)	CHF01918 (2)	CHF01919 (1)	4.2	30	94	43
	—	—	CHF01920 (2)	CHF01921 (2)	CHF01922 (1)	4.3	36	117	53
	—	—	—	—	CHF01923 (2)	4.3	50	121	55
	—	—	—	—	CHF01924 (2)	4.4	60	145	66
	—	—	—	—	—	—	—	—	—
5"—150 lb 6 elements	—	CHF01925 (2)	CHF01926 (2)	CHF01927 (2)	CHF01928 (1)	5.1	24	115	52
	—	—	CHF01929 (2)	CHF01930 (2)	CHF01931 (1)	5.1	30	117	53
	—	—	CHF01932 (2)	CHF01933 (2)	CHF01934 (1)	5.2	36	128	58
	—	—	—	—	CHF01935 (2)	5.3	50	167	76
	—	—	—	—	CHF01936 (2)	5.4	60	196	89
	—	—	—	—	—	—	—	—	—
5"—150 lb 9 elements	—	—	CHF01937 (3)	CHF01938 (3)	CHF01939 (3)	5.1	36	120	54
	—	—	CHF01940 (3)	CHF01941 (3)	CHF01942 (3)	5.1	45	122	55
	—	—	CHF01943 (3)	CHF01944 (3)	CHF01945 (3)	5.2	54	134	61
	—	—	—	—	CHF01946 (3)	5.3	75	176	80
	—	—	—	—	CHF01947 (3)	5.4	90	197	89
6"—150 lb 12 elements	—	CHF01948 (2)	CHF01949 (2)	CHF01950 (2)	CHF01951 (1)	6.1	24	125	57
	—	CHF01952 (3)	CHF01953 (2)	CHF01954 (2)	CHF01955 (1)	6.1	36	129	59
	—	—	CHF01956 (4)	CHF01957 (3)	CHF01958 (2)	6.2	48	153	69
	—	—	CHF01959 (4)	CHF01960 (3)	CHF01961 (2)	6.2	60	157	71
	—	—	CHF01962 (4)	—	CHF01963 (2)	6.3	72	196	89
	—	—	—	—	CHF01964 (2)	6.3	100	204	93
	—	—	—	—	—	—	—	—	—
	—	—	—	—	CHF01965 (4)	6.4	120	246	112



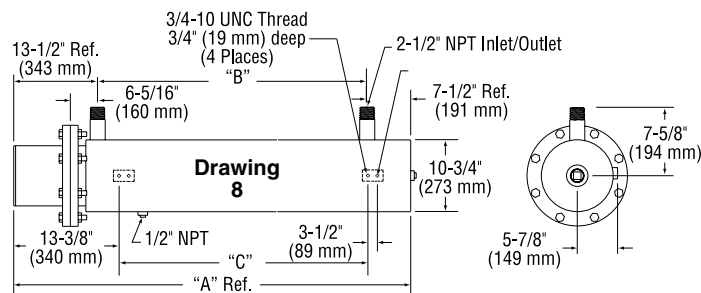
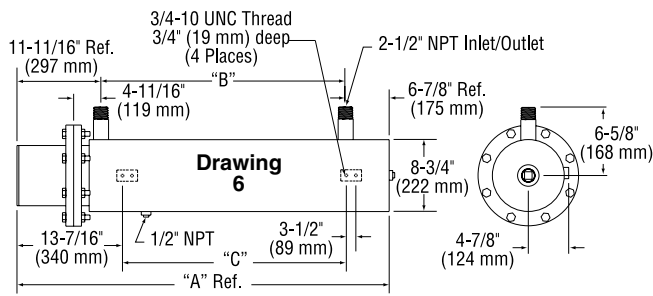
Nominal Pipe Size	Model Number					Dim Drawing Number	KW	Approx Weight	
	120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)			lb	kg
6"—150 lb 15 elements	—	CHF01966 (3)	CHF01967 (5)	CHF01968 (3)	CHF01969 (1)	6.1	30	128	58
	—	CHF01970 (5)	CHF01971 (5)	CHF01972 (3)	CHF01973 (5)	6.1	45	133	60
	—	—	CHF01974 (5)	CHF01975 (3)	CHF01976 (5)	6.2	60	158	72
	—	—	CHF01977 (5)	CHF01978 (5)	CHF01979 (5)	6.2	75	163	74
	—	—	CHF01980 (5)	—	CHF01981 (5)	6.3	90	202	92
	—	—	—	—	CHF01982 (5)	6.3	125	213	97
	—	—	—	—	CHF01983 (5)	6.4	150	257	117
8"—150 lb 18 elements	—	—	CHF01984 (3)	CHF01985 (3)	CHF01986 (2)	8.1	50	210	95
	—	—	CHF01987 (6)	—	CHF01988 (2)	8.2	75	238	108
	—	—	CHF01989 (6)	—	CHF01990 (3)	8.3	100	266	121
	—	—	CHF01991 (6)	—	CHF01992 (6)	8.4	125	294	133
	—	—	—	—	CHF01993 (6)	8.5	150	326	148
	—	—	—	—	CHF01994 (6)	8.6	175	358	162
	—	—	—	—	CHF01995 (6)	8.7	200	391	177

Ordering Example: CHF01865, 6 KW, 240 Vac, 3 phase circulation heater.

(C\*) = Number of Branch Circuits per heater



**Note: Circulation heater mounting lug design and location in the assembly drawings shown are standard. Designs can be modified to fit customer installation. Consult Omega with your requirements.**



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
1.1	24 <sup>3</sup> / <sub>8</sub>	619	15	381		
1.2	32 <sup>3</sup> / <sub>8</sub>	822	23	584		
2.1	32 <sup>11</sup> / <sub>16</sub>	830	22 <sup>1</sup> / <sub>2</sub>	572	16 <sup>1</sup> / <sub>2</sub>	419
2.2	42 <sup>11</sup> / <sub>16</sub>	1084	32 <sup>1</sup> / <sub>2</sub>	826	26 <sup>1</sup> / <sub>2</sub>	673
2.3	55 <sup>3</sup> / <sub>16</sub>	1402	45	1143	39	991
3.1	34 <sup>5</sup> / <sub>8</sub>	879	22 <sup>1</sup> / <sub>2</sub>	572	16 <sup>1</sup> / <sub>2</sub>	419
3.2	44 <sup>5</sup> / <sub>8</sub>	1133	32 <sup>1</sup> / <sub>2</sub>	826	26 <sup>1</sup> / <sub>2</sub>	673
3.3	57 <sup>1</sup> / <sub>8</sub>	1451	45	1143	39	991
4.1	37 <sup>13</sup> / <sub>16</sub>	960	20 <sup>1</sup> / <sub>2</sub>	521	17	432
4.2	48 <sup>5</sup> / <sub>16</sub>	1227	31	787	27 <sup>1</sup> / <sub>2</sub>	699
4.3	69 <sup>5</sup> / <sub>16</sub>	1761	52	1321	48 <sup>1</sup> / <sub>2</sub>	1232
4.4	90 <sup>5</sup> / <sub>16</sub>	2294	73	1854	69 <sup>1</sup> / <sub>2</sub>	1765
5.1	45 <sup>3</sup> / <sub>8</sub>	1153	30	762	11 <sup>1</sup> / <sub>2</sub>	292
5.2	52 <sup>3</sup> / <sub>8</sub>	1330	37	940	15 <sup>1</sup> / <sub>2</sub>	387
5.3	63 <sup>3</sup> / <sub>8</sub>	1622	48 <sup>1</sup> / <sub>2</sub>	1232	21	533
5.4	77 <sup>1</sup> / <sub>4</sub>	1962	61 <sup>1</sup> / <sub>8</sub>	1572	27 <sup>1</sup> / <sub>2</sub>	698
6.1	39 <sup>1</sup> / <sub>16</sub>	992	20 <sup>1</sup> / <sub>2</sub>	521	17	432
6.2	49 <sup>1</sup> / <sub>16</sub>	1259	31	787	27 <sup>1</sup> / <sub>2</sub>	699
6.3	70 <sup>9</sup> / <sub>16</sub>	1792	52	1321	48 <sup>1</sup> / <sub>2</sub>	1232
6.4	91 <sup>1</sup> / <sub>16</sub>	2326	73	1854	69 <sup>1</sup> / <sub>2</sub>	1765
8.1	46	1168	24 <sup>11</sup> / <sub>16</sub>	627	21 <sup>3</sup> / <sub>16</sub>	538
8.2	53 <sup>3</sup> / <sub>4</sub>	1365	32 <sup>11</sup> / <sub>16</sub>	830	29 <sup>9</sup> / <sub>16</sub>	741
8.3	60 <sup>3</sup> / <sub>4</sub>	1543	39 <sup>11</sup> / <sub>16</sub>	1008	36 <sup>3</sup> / <sub>16</sub>	919
8.4	68 <sup>3</sup> / <sub>4</sub>	1746	47 <sup>5</sup> / <sub>16</sub>	1202	43 <sup>13</sup> / <sub>16</sub>	1113
8.5	77 <sup>7</sup> / <sub>8</sub>	1978	56 <sup>13</sup> / <sub>16</sub>	1443	53 <sup>3</sup> / <sub>16</sub>	1354
8.6	86 <sup>7</sup> / <sub>8</sub>	2207	65 <sup>13</sup> / <sub>16</sub>	1672	62 <sup>5</sup> / <sub>16</sub>	1583
8.7	96 <sup>7</sup> / <sub>8</sub>	2461	75 <sup>13</sup> / <sub>16</sub>	1926	72 <sup>5</sup> / <sub>16</sub>	1837

**Note: Circulation heater mounting lug design and location in the assembly drawings shown are standard. Designs can be modified to fit customer installation. Consult Omega with your requirements.**





### CHF Series

**Self-contained heating units designed for optimum operating efficiency and performance—**

**Providing trouble-free service and application flexibility!**

All of the heat generated by the elements is immediately transferred to the medium being processed with minimal losses.

**Standard and optional features include...**

General purpose (NEMA 1) terminal housing is standard. Moisture proof (NEMA 4) and/or explosion resistant (NEMA 7) housings are optional. A set of installation and maintenance instructions along with a wiring diagram can be found inside the terminal housing of each unit.

Heating source—32 and 64 mm (1¼" and 2½") screw plug heaters are used on smaller units. 76 to 356 mm (3 to 14") size heaters use flanged immersion heaters. The flanges are made from forged steel rated for 150 lbs with raised face. Supplied with threaded eyebolts for ease of handling and installation. Optional stainless steel flanges or 300 lb ratings available.

Inlet-outlet connections are NPT pipe threads for 76 to 203 mm (3 to 8") circulation heaters (flanges are optional). Standard inlet-outlet connections on 254 mm (10") and larger units are 150 lb rated flanges.

Optional feature double-pole non-indicating bulb and capillary type thermostat can be located in the terminal box (standard) or attached to the insulation jacket as pictured. Solid state temperature controllers and indicating thermostats are available. Over-temperature protection can be provided by attaching a thermocouple to one of the elements.

Threaded mounting lugs to support the unit are welded to the steel vessel. Custom supports can be designed to fit your structure.

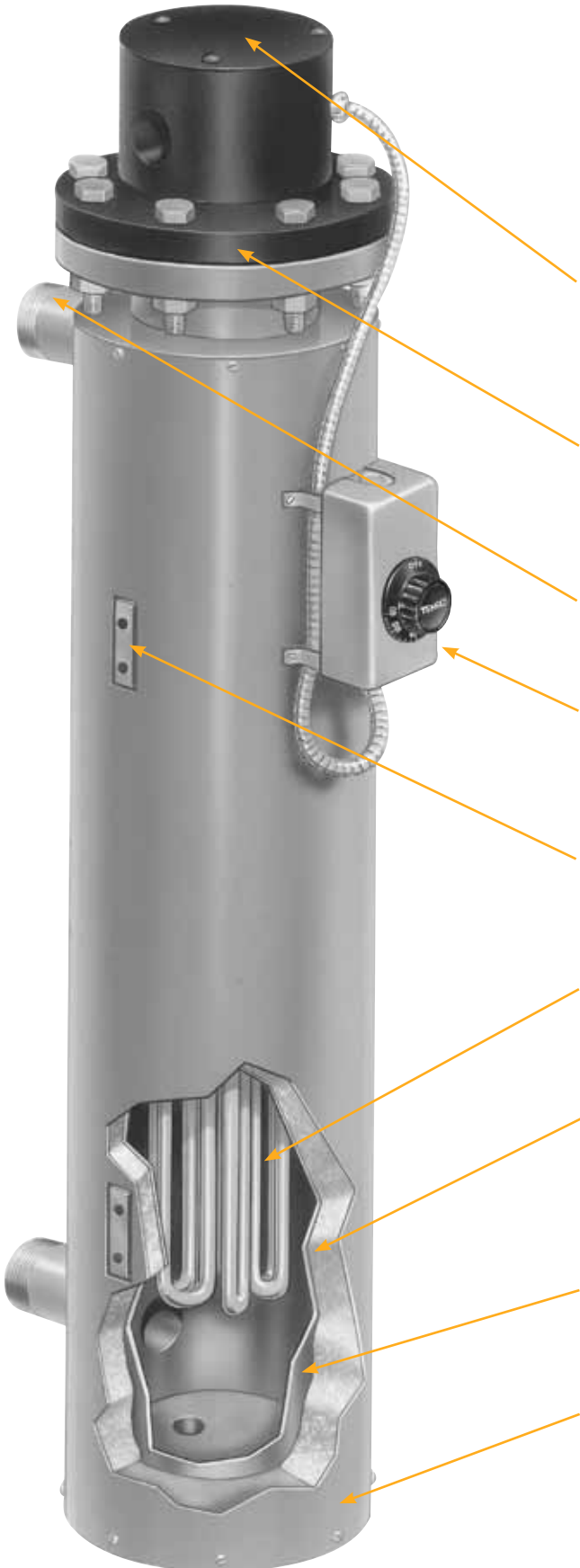
Wide selection of heating element sheath materials for maximum corrosion resistance to the medium being processed. On smaller circulation units with screw plug heaters, the element diameter is 8 or 12 mm (0.315 or 0.475"). On larger units with flanged heaters, the element diameter is 12 mm (0.475").

The vessel is surrounded with 25 mm (1") thick insulation rated to 399°C (750°F) to minimize heat loss. Additional insulation or a high temperature ceramic fiber insulation is optional. Vessels can also be supplied uninsulated.

Vessel material is SA53B or SA106B steel. Good for up to 399°C (750°F) operating temperature. For drainage and cleaning purposes, a drain plug is located in the base of the tank. Optional: stainless steel vessel.

Outer stainless steel sheet metal jacket protects the insulation from the environment and keeps it dry. Optional: Stainless steel outer jacket with a weather-tight seal.

**Note: Branch Circuit Wiring—Flange heater elements are wired into branch circuits having a maximum current of 48 Amps. The number of circuits is listed next to the heater's voltage and phase in the To Order tables. For different circuit wiring configurations, consult Omega.**



## Checklist for Selecting the Proper Circulation Heater

### ✓ Determine a Safe and Efficient Element Watt Density

**Element Watt Density** is the wattage dissipated per square inch of the element sheath surface and is calculated with the following formula:

$$\text{Watt Density} = \frac{\text{element wattage}}{\pi \times \text{element diameter} \times \text{element heated length}}$$

**For a particular application, element watt density will govern element sheath temperature. Factors to consider when choosing a suitable watt density are:**

1. Many materials are heat sensitive and can decompose or be damaged if the element is running too hot.
2. Air and other gases that are poor conductors of heat require watt densities matched to the velocity of the gas flow to prevent element overheating.
3. Mineral deposits when heating hard water and cleaning solutions can build up on the element sheath, acting as a heat insulator and raising the internal element temperature. If these deposits cannot be periodically removed, use a lower watt density element to increase heater life expectancy.

### ✓ Select the Element Sheath Material

#### Sheath Material Selection

**CORROSION.** In addition to selecting a sheath material that is compatible with the heated medium, other factors that affect corrosion need to be considered:

1. The temperature of the corrodent—As temperature increases the degree of corrosion increases. Also remember that usually the element temperature is higher than the material it is heating.
2. The degree of aeration to which a corrodent is exposed—Stagnant conditions can deprive the stainless steels of oxygen, which is required to maintain their corrosion resistant surface.
3. Velocity of the corrodent—Increased velocity can increase the corrosion rate.

#### Standard Element Sheath Materials

**Incoloy® 800** — A Nickel (30 to 35%), Chromium (19 to 23%), Iron alloy. The high nickel content of this alloy contributes to its resistance to scaling and corrosion. Used in air heating (also see Incoloy® 840) and immersion heating of potable water and other liquids that are not corrosive to an Incoloy® 800 sheath.

**Low Carbon Steel** — Applications include fluid heat transfer media, tar, high to low viscosity petroleum oils, asphalt, wax, molten salt, and other solutions not corrosive to a steel sheath.

**316 Stainless Steel** — A Chromium (16 to 18%), Nickel (11 to 14%), Iron Alloy with Molybdenum (2 to 3%) added to improve corrosion resistance in certain environments, especially those that would tend to cause pitting due to the presence of chlorides. Applications include deionized water.

**Copper** — Mainly used in clean water heating for washrooms, showers, rinse tanks and freeze protection of storage tanks.

#### Optional Element Sheath Materials

**304 Stainless Steel** — A Chromium (18 to 20%), Nickel (8 to 11%), Iron Alloy used in the food industry, sterilizing solutions, air heating and many organic and inorganic chemicals.

**321 Stainless Steel** — A Chromium (17 to 20%), Nickel (9 to 13%), Iron Alloy modified with the addition of titanium to prevent carbide precipitation and the resulting intergranular corrosion that can take place in certain mediums when operating in the 427 to 649°C (800 to 1200°F) temperature range.

**Incoloy® 840** — A Nickel (18 to 20%), Chromium (18 to 22%), Iron alloy. Incoloy 840 has about 10% less nickel than Incoloy 800. Used in many air heating applications where it has exhibited superior oxidation resistance at less cost than Incoloy 800.

**Incoloy® 825** — A Nickel (38 to 46%), Chromium (19.5 to 23.5%), Molybdenum (2 to 3%) Iron alloy. Consult Omega for more information.

#### Surface Treatments for Stainless Steel and Incoloy® Elements and Other Wetted Parts to Improve Corrosion Resistance

Flanged immersion heater surfaces in contact with the material being heated can be passivated or electro-polished to improve their resistance to corrosion.

Passivation removes surface contamination, usually iron, so that the optimum corrosion resistance of the stainless steel is maintained. Surface contamination would come from the small amount of steel that may be worn off a tool during the manufacturing process. Passivating is accomplished by dipping the heater in a warm solution of nitric acid.

Electro-Polishing is an electrochemical process that removes surface imperfections and contaminants, enhancing the corrosion resisting ability of the stainless steels. The resultant surface is clean, smooth and bright. Many medical and food applications require this finish.



✓ **Standard Terminal Housings**

Omega circulation heaters are supplied with a General Purpose Housing (NEMA 1) as standard unless otherwise specified.

Additional housing types include:

- Moisture Resistant (NEMA 4)
- Explosion Resistant (NEMA 7)
- Moisture/Explosion Resistant (NEMA 4/7)



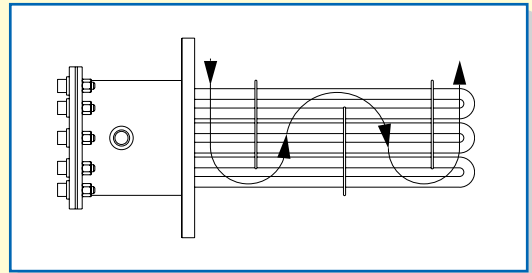
**Explosion resistant terminal housings are intended to provide containment of an explosion in the enclosure only. No portion of the heater assembly outside the enclosure is covered under this NEMA rating. Abnormal use of a heater which results in excessive temperature can create hazardous conditions such as a fire. Never perform any type of service nor remove the housing cover prior to disconnecting all electrical power to the heater.**

**Optional Terminal Housing Standoff Construction**



The electrical housing is separated from the flange by an air gap (six-inch standard) to lower the ambient temperature of the electrical wiring. This option is used on flanged immersion heaters where the flange temperature exceeds 250°C (482°F).

**Optional Circulation Heater Features**



**Flow Control Baffles**

Used on circulation tank heaters to aid heat transfer by forcing the liquid or gas back and forth across the elements. Baffles can be custom designed and positioned for your application.

**Temperature Control**

**Thermostats**

Thermostats are an optional feature on flanged immersion heaters. This type of control operates by expansion and contraction of a liquid in response to temperature change. Liquid contained within the sensing bulb and capillary flexes a diaphragm, causing the opening and closing of a snap action switch. For heating applications the contacts are normally closed and open on temperature rise.

**Installation Warnings and Recommendations**

1. Do not use the thermostat as a power switch. Use some other means of disconnecting power to the heater for servicing.
2. A Thermostat is not a fail-safe device. Use an approved high temperature limit control and/or pressure limit control for safe operation.
3. Avoid kinking or bending the capillary tube too sharply as this will alter the calibration and/or render the thermostat inoperable.
4. Excess capillary tube should be coiled neatly in junction box.
5. The capillary tube must never touch the thermostat contacts as this will create an electrical short capable of harming personnel and/or equipment.

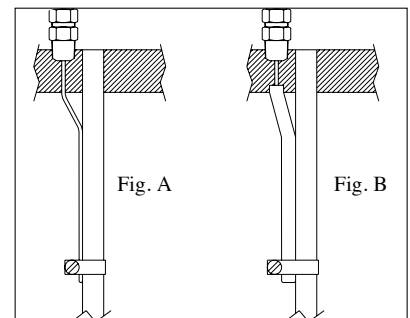
**Thermocouples**

Type J or Type K thermocouples can be supplied for process temperature or over-temperature control. Type J is reliable and accurate for temperatures up to 538°C (1000°F). Type K should be used for higher temperatures.

For measuring process temperatures the thermocouple can be mounted in a thermowell in the center of the element bundle. Note that a location somewhere away from the heater may give a more accurate measurement of process temperature.

For over-temperature protection the thermocouple is usually attached to one of the elements (Figure A) and any unusual rise in element temperature would shut the heater down. This thermocouple may also be mounted in a thermowell (Figure B), which is then attached to one of the heating elements if desired. This protects the thermocouple from the solution being heated and allows you to replace it without removing the heater, but does increase its response time.

Temperature and over-temperature controls for using the signal generated by thermocouples and how to select the best control for your application can be found at [omega.com/controllers](http://omega.com/controllers)



## Circulation Heater Installation Recommendations

Omega circulation heaters will have a long life and provide dependable, trouble-free service if properly installed, operated and maintained as per the following recommendations:

### Installation

1. Flange heaters are supplied with two drilled and tapped holes for threaded eye bolts, providing ease of handling during installation and flange removal during maintenance cleaning or heater replacement.
2. Replacement of heater is inevitable. Therefore, provide adequate space for installation, allowing ample room to remove the flange heater for cleaning or replacement.
3. In applications requiring the circulation heater to be fed by an inline pump, install the pump at the inlet end.
4. To maintain the lowest possible temperature at the terminal box, place the outlet at the end opposite to the terminal box. If your process temperature is circulating at 232°C (450°F) or above (at the nozzle closest to the flange), stand-off terminal box construction is recommended.
5. To prevent temperature and/or pressure buildup on closed loop circulation heater systems, adequate and strategically located thermocouples for temperature controllers and pressure relief valves should be installed. Never over-rate pressure relief valves beyond the pressure temperature rating of the flange being used.
6. During the process cycle, flow rate of the medium being heated should never be interrupted or reduced, thus creating an overheating condition. Excess temperature can result in damage to the medium being processed and premature heater failure.
7. Make sure that your circulation heater is equipped with the proper terminal housing for the environment in which the heater is being used. NEMA 1—general purpose, NEMA 4—moisture resistant, and NEMA 7—explosion resistant.

**Vertical Mounting—Liquids:**  
With terminal housing up and inlet pipe on the bottom, the heating elements will be immersed at all times to prevent premature failure.



**Horizontal Mounting—Liquids and Gases:**  
Always mount heater with inlet-outlet pipes facing up to ensure the heating elements will be immersed at all times to prevent premature failure. For liquid heating, outlet may be at either end. When heating gases the inlet should be closest to the terminal enclosure to minimize terminal box wiring temperatures.



**Vertical Mounting—Gases:**  
Mount with terminal enclosure and inlet pipe at bottom of tank to minimize terminal box wiring temperatures.

### Wiring

1. All heater installations must be properly earth grounded to eliminate electric shock hazard. Electrical wiring must be in accordance with Local and/or National Electrical Codes.
2. Circulation heaters are supplied standard with NEMA 1 terminal housings. All power to heaters must be disconnected before removing the terminal housing cover and performing any type of service.
3. Electrical connections on heater terminals must be kept tight. Loose connections will create arcing, over-heating, and eventually will destroy the heater terminal and cause premature heater failure.
4. If the amperage rating of your circulation heater exceeds the amperage capacity of the supplied thermostat, mercury relays or magnetic contactors should be used with the thermostat.
5. Over-temperature protection thermocouples require a separate conduit to the control panel for the thermocouple wire.
6. Omega offers a large selection of power control panels for circulation heaters. See [omega.com/controllers](http://omega.com/controllers)

### Maintenance

1. Never perform any type of service on the unit prior to disconnecting all electrical power and shutting off all intake lines.
2. Remove sludge deposits through the drain plug.
3. Check flange bolts for tightness.
4. Check terminal connections for tightness.
5. Check thermocouple or thermostat bulb for response to temperature changes. If defective, replace immediately.
6. Check for leaks.
7. Depending on operating conditions and medium being processed, the flange or screw plug heater should be periodically removed for physical inspection and cleaning of the element bundle.



## Circulation Tank Assembly Maximum Immersed Element Length

Standard circulation heaters shown in the tables have element immersion lengths determined by the element wattage and element watt density. The screw plug or flange heater containing the elements is matched to a standard circulation heater tank assembly to assure proper heat transfer and heated material flow. When designing a system

with a heater not shown on these pages the table below can be used to select a tank size based on the calculated immersion length. If a standard tank size is not suitable for your installation, Omega will design and manufacture a custom tank and heater assembly to satisfy the requirements of your application.

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
1½ NPT	1.1	18.0	457
	1.2	26.0	660
2½ NPT	2.1	25.5	648
	2.2	35.5	902
	2.3	48.0	1219
3" Flange	3.1	28.0	711
	3.2	38.0	965
	3.3	50.5	1283
4" Flange	4.1	26.5	673
	4.2	37.0	940
	4.3	58.0	1473
	4.4	79.0	2007
5" Flange	5.1	36.0	914
	5.2	43.0	1092
	5.3	54.5	1384
	5.4	68.0	1727
	5.5	85.0	2159
6" Flange	6.1	26.5	673
	6.2	37.0	940
	6.3	58.0	1473
	6.4	79.0	2007

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
8" Flange	8.1	32.5	826
	8.2	40.5	1029
	8.3	47.5	1207
	8.4	55.0	1397
	8.5	64.5	1638
	8.6	73.5	1867
	8.7	83.5	2121
10" Flange	10.1	60.0	1524
	10.2	67.0	1702
	10.3	73.0	1854
	10.4	82.0	2083
	10.5	90.0	2286
12" Flange	12.1	59.0	1499
	12.2	66.5	1689
	12.3	74.0	1880
	12.4	81.5	2070
	12.5	89.0	2261
14" Flange	14.1	58.0	1473
	14.2	65.5	1664
	14.3	73.0	1854
	14.4	80.5	2045
	14.5	88.0	2235

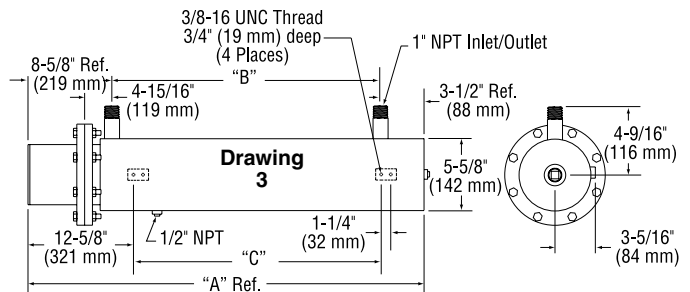
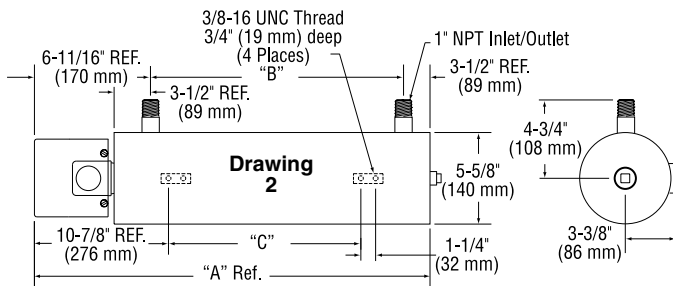
### 8 watts/in<sup>2</sup> (1.3 watts/cm<sup>2</sup>)—Typical Applications: Fuel Oils (Bunker C and Number 6)

- Steel Screw Plug and Steel 150 lb Flanged Heater Sizes
- Steel Sheath Heating Elements
- Steel Tank
- NEMA 1 Terminal Housing

Note: 3-Phase only. Cannot be rewired for single phase.

Nominal Pipe Size	Dimensional Drawing Number	KW	Model Number					Approx Weight	
			120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)	lb	kg
2½ NPT 3 elements	2.2	2	—	—	CHF01100 (1)	—	CHF01101 (1)	37	17
	2.3	3	—	—	CHF01102 (1)	—	CHF01101 (1)	46	21
3"—150 lb 3 elements	3.2	2	—	—	CHF01104 (1)	—	CHF01105 (1)	62	28
	3.3	3	—	—	CHF01106 (1)	—	CHF01107 (1)	76	34

(C\*) = Number of Branch Circuits per heater



Drawing Number	"A" inch	"A" mm	"B" inch	"B" mm	"C" inch	"C" mm
2.2	42 11/16	1084	32 1/2	826	26 1/2	673
2.3	55 5/16	1402	45	1143	39	991

Drawing Number	"A" inch	"A" mm	"B" inch	"B" mm	"C" inch	"C" mm
3.2	44 5/8	1133	32 1/2	826	26 1/2	673
3.3	57 5/8	1451	45	1143	39	991



60 watts/in<sup>2</sup> (9.3 watts/cm<sup>2</sup>)—Typical Applications: Deionized Water, Demineralized Water

- 316 Stainless Steel Screw Plug and 316 Stainless Steel 150 lb Flanged Heater Sizes
- 316 Stainless Steel Sheath Heating Elements      ● 316 Stainless Steel Tank      ● NEMA 1 Terminal Housing

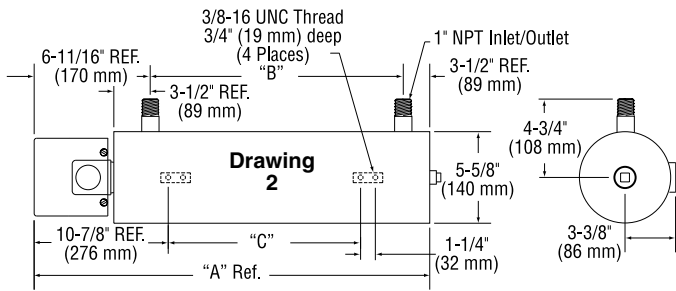
<b>To Order Visit <a href="http://omega.com/chf8">omega.com/chf8</a> for Pricing and Details</b>									
Nominal Pipe Size	Model Number					Dim Drawing Number	KW	Approx Weight	
	120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)			lb	kg
2½ NPT 3 elements	—	CHF01996 (1)	CHF01997 (1)	CHF01998 (1)	CHF01999 (1)	2.1	6	28	13
	—	CHF02000 (1)	CHF02001 (1)	CHF02002 (1)	CHF02003 (1)	2.1	7.5	28	13
	—	CHF02004 (1)	CHF02005 (1)	CHF02006 (1)	CHF02007 (1)	2.1	9	29	13
	—	—	CHF02009 (1)	CHF02010 (1)	CHF02011 (1)	2.2	12	36	16
	—	—	CHF02013 (1)	CHF02014 (1)	CHF02015 (1)	2.2	15	37	17
	—	—	CHF02017 (1)	CHF02018 (1)	CHF02019 (1)	2.3	18	38	17
4"—150 lb 6 elements	—	—	CHF02021 (1)	CHF02022 (1)	CHF02023 (1)	4.1	12	77	35
	—	—	CHF02025 (1)	CHF02026 (1)	CHF02027 (1)	4.1	18	79	36
	—	—	CHF02029 (2)	CHF02030 (2)	CHF02031 (1)	4.2	24	92	42
	—	—	CHF02032 (2)	CHF02033 (2)	CHF02034 (1)	4.2	30	94	42
	—	—	CHF02035 (2)	CHF02036 (2)	CHF02037 (1)	4.3	36	117	53
	—	—	—	—	CHF02038 (2)	4.3	50	121	55
	—	—	—	—	CHF02039 (2)	4.4	60	145	66
6"—150 lb 12 elements	—	CHF02040 (3)	CHF02041 (2)	CHF02042 (2)	CHF02043 (1)	6.1	24	126	57
	—	CHF02044 (3)	CHF02045 (2)	CHF02046 (2)	CHF02047 (1)	6.1	36	130	59
	—	—	CHF02048 (4)	CHF02049 (3)	CHF02050 (2)	6.2	48	153	69
	—	—	CHF02051 (4)	CHF02052 (3)	CHF02053 (2)	6.2	60	157	71
	—	—	CHF02054 (4)	—	CHF02055 (2)	6.3	72	196	89
	—	—	—	—	CHF02056 (4)	6.3	100	205	93
	—	—	—	—	CHF02057 (4)	6.4	120	246	112
6"—150 lb 15 elements	—	CHF02058 (3)	CHF02059 (5)	CHF02060 (3)	CHF02061 (1)	6.1	30	128	58
	—	CHF02062 (5)	CHF02063 (5)	CHF02064 (3)	CHF02065 (5)	6.1	45	133	60
	—	—	CHF02066 (5)	CHF02067 (3)	CHF02068 (5)	6.2	60	158	72
	—	—	CHF02069 (5)	CHF02070 (5)	CHF02071 (5)	6.2	75	163	74
	—	—	CHF02072 (5)	—	CHF02073 (5)	6.3	90	202	92
	—	—	—	—	CHF02074 (5)	6.3	125	213	97
	—	—	—	—	CHF02075 (5)	6.4	150	257	117

Ordering Example: CHF02005, 9 KW, 240 Vac, 3 phase circulation heater.

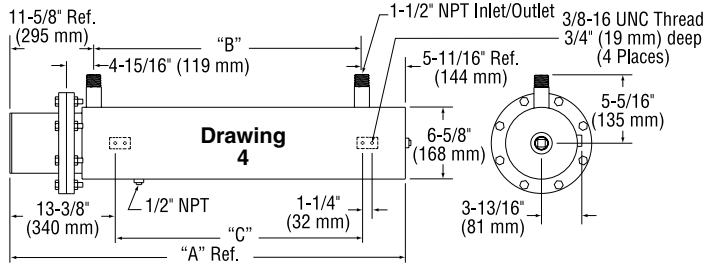
(C\*) = Number of Branch Circuits per heater



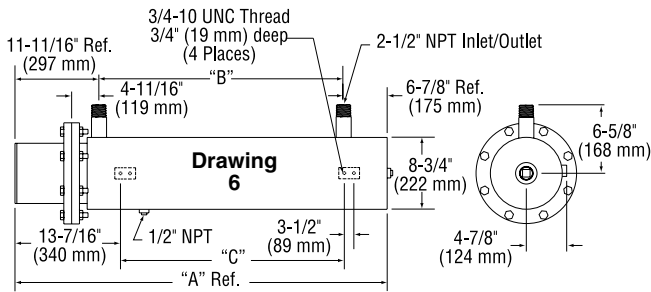
CHF02064, 45 KW, 480 Vac  
1 phase circulation heater.



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
2.1	32 <sup>1</sup> / <sub>16</sub>	830	22 <sup>1</sup> / <sub>2</sub>	572	16 <sup>1</sup> / <sub>2</sub>	419
2.2	42 <sup>1</sup> / <sub>16</sub>	1084	32 <sup>1</sup> / <sub>2</sub>	826	26 <sup>1</sup> / <sub>2</sub>	673
2.3	55 <sup>3</sup> / <sub>16</sub>	1402	45	1143	39	991
4.1	37 <sup>19</sup> / <sub>16</sub>	960	20 <sup>1</sup> / <sub>2</sub>	521	17	432
4.2	48 <sup>5</sup> / <sub>16</sub>	1227	31	787	27 <sup>1</sup> / <sub>2</sub>	699
4.3	69 <sup>5</sup> / <sub>16</sub>	1761	52	1321	48 <sup>1</sup> / <sub>2</sub>	1232
4.4	90 <sup>5</sup> / <sub>16</sub>	2294	73	1854	69 <sup>1</sup> / <sub>2</sub>	1765
6.1	39 <sup>1</sup> / <sub>16</sub>	992	20 <sup>1</sup> / <sub>2</sub>	521	17	432
6.2	49 <sup>9</sup> / <sub>16</sub>	1259	31	787	27 <sup>1</sup> / <sub>2</sub>	699
6.3	70 <sup>9</sup> / <sub>16</sub>	1792	52	1321	48 <sup>1</sup> / <sub>2</sub>	1232
6.4	91 <sup>9</sup> / <sub>16</sub>	2326	73	1854	69 <sup>1</sup> / <sub>2</sub>	1765



**Note: Circulation heater mounting lug design and location in the assembly drawings shown are standard. Designs can be modified to fit customer installation. Consult Omega with your requirements.**





## CHF Series

**Self-contained heating units designed for optimum operating efficiency and performance—**

**Providing trouble-free service and application flexibility!**

All of the heat generated by the elements is immediately transferred to the medium being processed with minimal losses.

**Standard and optional features include...**

General purpose (NEMA 1) terminal housing is standard. Moisture proof (NEMA 4) and/or explosion resistant (NEMA 7) housings are optional. A set of installation and maintenance instructions along with a wiring diagram can be found inside the terminal housing of each unit.

Heating source—32 and 64 mm (1¼" and 2½") screw plug heaters are used on smaller units. 76 to 356 mm (3 to 14") size heaters use flanged immersion heaters. The flanges are made from forged steel rated for 150 lbs with raised face. Supplied with threaded eyebolts for ease of handling and installation. Optional stainless steel flanges or 300 lb ratings available.

Inlet-outlet connections are NPT pipe threads for 76 to 203 mm (3 to 8") circulation heaters (flanges are optional). Standard inlet-outlet connections on 254 mm (10") and larger units are 150 lb rated flanges.

Optional feature double-pole non-indicating bulb and capillary type thermostat can be located in the terminal box (standard) or attached to the insulation jacket as pictured. Solid state temperature controllers and indicating thermostats are available. Over-temperature protection can be provided by attaching a thermocouple to one of the elements.

Threaded mounting lugs to support the unit are welded to the steel vessel. Custom supports can be designed to fit your structure.

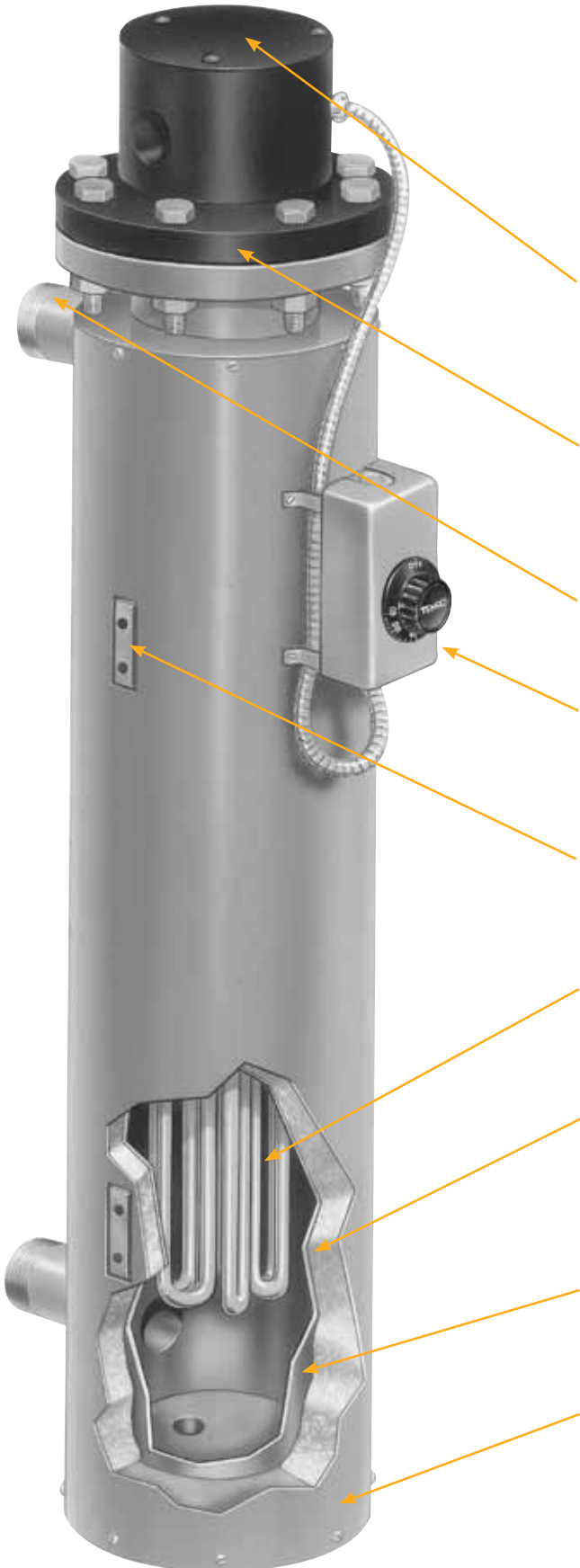
Wide selection of heating element sheath materials for maximum corrosion resistance to the medium being processed. On smaller circulation units with screw plug heaters, the element diameter is 8 or 12 mm (0.315 or 0.475"). On larger units with flanged heaters, the element diameter is 12 mm (0.475").

The vessel is surrounded with 25 mm (1") thick insulation rated to 399°C (750°F) to minimize heat loss. Additional insulation or a high temperature ceramic fiber insulation is optional. Vessels can also be supplied uninsulated.

Vessel material is SA53B or SA106B steel. Good for up to 399°C (750°F) operating temperature. For drainage and cleaning purposes, a drain plug is located in the base of the tank. Optional: stainless steel vessel.

Outer stainless steel sheet metal jacket protects the insulation from the environment and keeps it dry. Optional: Stainless steel outer jacket with a weather-tight seal.

**Note: Branch Circuit Wiring—Flange heater elements are wired into branch circuits having a maximum current of 48 Amps. The number of circuits is listed next to the heater's voltage and phase in the To Order tables. For different circuit wiring configurations, consult Omega.**





## Checklist for Selecting the Proper Circulation Heater

### ✓ Determine a Safe and Efficient Element Watt Density

**Element Watt Density** is the wattage dissipated per square inch of the element sheath surface and is calculated with the following formula:

$$\text{Watt Density} = \frac{\text{element wattage}}{\pi \times \text{element diameter} \times \text{element heated length}}$$

**For a particular application, element watt density will govern element sheath temperature. Factors to consider when choosing a suitable watt density are:**

1. Many materials are heat sensitive and can decompose or be damaged if the element is running too hot.
2. Air and other gases that are poor conductors of heat require watt densities matched to the velocity of the gas flow to prevent element overheating.
3. Mineral deposits when heating hard water and cleaning solutions can build up on the element sheath, acting as a heat insulator and raising the internal element temperature. If these deposits cannot be periodically removed, use a lower watt density element to increase heater life expectancy.

### ✓ Select the Element Sheath Material

#### Sheath Material Selection

**CORROSION.** In addition to selecting a sheath material that is compatible with the heated medium, other factors that affect corrosion need to be considered:

1. The temperature of the corrodent—As temperature increases the degree of corrosion increases. Also remember that usually the element temperature is higher than the material it is heating.
2. The degree of aeration to which a corrodent is exposed—Stagnant conditions can deprive the stainless steels of oxygen, which is required to maintain their corrosion resistant surface.
3. Velocity of the corrodent—Increased velocity can increase the corrosion rate.

#### Standard Element Sheath Materials

**Incoloy® 800** — A Nickel (30 to 35%), Chromium (19 to 23%), Iron alloy. The high nickel content of this alloy contributes to its resistance to scaling and corrosion. Used in air heating (also see Incoloy® 840) and immersion heating of potable water and other liquids that are not corrosive to an Incoloy® 800 sheath.

**Low Carbon Steel** — Applications include fluid heat transfer media, tar, high to low viscosity petroleum oils, asphalt, wax, molten salt, and other solutions not corrosive to a steel sheath.

**316 Stainless Steel** — A Chromium (16 to 18%), Nickel (11 to 14%), Iron Alloy with Molybdenum (2 to 3%) added to improve corrosion resistance in certain environments, especially those that would tend to cause pitting due to the presence of chlorides. Applications include deionized water.

**Copper** — Mainly used in clean water heating for washrooms, showers, rinse tanks and freeze protection of storage tanks.

#### Optional Element Sheath Materials

**304 Stainless Steel** — A Chromium (18 to 20%), Nickel (8 to 11%), Iron Alloy used in the food industry, sterilizing solutions, air heating and many organic and inorganic chemicals.

**321 Stainless Steel** — A Chromium (17 to 20%), Nickel (9 to 13%), Iron Alloy modified with the addition of titanium to prevent carbide precipitation and the resulting intergranular corrosion that can take place in certain mediums when operating in the 427 to 649°C (800 to 1200°F) temperature range.

**Incoloy® 840** — A Nickel (18 to 20%), Chromium (18 to 22%), Iron alloy. Incoloy 840 has about 10% less nickel than Incoloy 800. Used in many air heating applications where it has exhibited superior oxidation resistance at less cost than Incoloy 800.

**Incoloy® 825** — A Nickel (38 to 46%), Chromium (19.5 to 23.5%), Molybdenum (2 to 3%) Iron alloy. Consult Omega for more information.

#### Surface Treatments for Stainless Steel and Incoloy® Elements and Other Wetted Parts to Improve Corrosion Resistance

Flanged immersion heater surfaces in contact with the material being heated can be passivated or electro-polished to improve their resistance to corrosion.

Passivation removes surface contamination, usually iron, so that the optimum corrosion resistance of the stainless steel is maintained. Surface contamination would come from the small amount of steel that may be worn off a tool during the manufacturing process. Passivating is accomplished by dipping the heater in a warm solution of nitric acid.

Electro-Polishing is an electrochemical process that removes surface imperfections and contaminants, enhancing the corrosion resisting ability of the stainless steels. The resultant surface is clean, smooth and bright. Many medical and food applications require this finish.



✓ **Standard Terminal Housings**

Omega circulation heaters are supplied with a General Purpose Housing (NEMA 1) as standard unless otherwise specified.

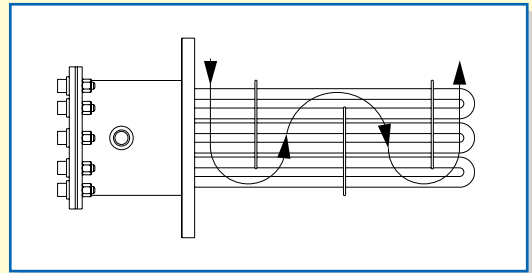
Additional housing types include:

- Moisture Resistant (NEMA 4)
- Explosion Resistant (NEMA 7)
- Moisture/Explosion Resistant (NEMA 4/7)



**Explosion resistant terminal housings are intended to provide containment of an explosion in the enclosure only. No portion of the heater assembly outside the enclosure is covered under this NEMA rating. Abnormal use of a heater which results in excessive temperature can create hazardous conditions such as a fire. Never perform any type of service nor remove the housing cover prior to disconnecting all electrical power to the heater.**

**Optional Circulation Heater Features**



**Flow Control Baffles**

Used on circulation tank heaters to aid heat transfer by forcing the liquid or gas back and forth across the elements. Baffles can be custom designed and positioned for your application.

**Optional Terminal Housing Standoff Construction**



The electrical housing is separated from the flange by an air gap (six-inch standard) to lower the ambient temperature of the electrical wiring. This option is used on flanged immersion heaters where the flange temperature exceeds 250°C (482°F).

**Temperature Control**

**Thermostats**

Thermostats are an optional feature on flanged immersion heaters. This type of control operates by expansion and contraction of a liquid in response to temperature change. Liquid contained within the sensing bulb and capillary flexes a diaphragm, causing the opening and closing of a snap action switch. For heating applications the contacts are normally closed and open on temperature rise.

**Installation Warnings and Recommendations**

1. Do not use the thermostat as a power switch. Use some other means of disconnecting power to the heater for servicing.
2. A Thermostat is not a fail-safe device. Use an approved high temperature limit control and/or pressure limit control for safe operation.
3. Avoid kinking or bending the capillary tube too sharply as this will alter the calibration and/or render the thermostat inoperable.
4. Excess capillary tube should be coiled neatly in junction box.
5. The capillary tube must never touch the thermostat contacts as this will create an electrical short capable of harming personnel and/or equipment.

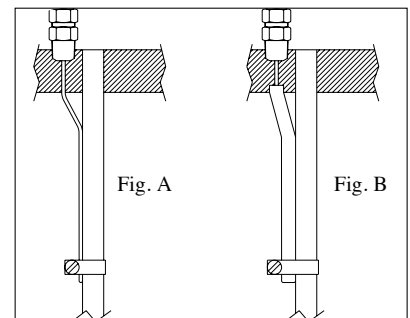
**Thermocouples**

Type J or Type K thermocouples can be supplied for process temperature or over-temperature control. Type J is reliable and accurate for temperatures up to 538°C (1000°F). Type K should be used for higher temperatures.

For measuring process temperatures the thermocouple can be mounted in a thermowell in the center of the element bundle. Note that a location somewhere away from the heater may give a more accurate measurement of process temperature.

For over-temperature protection the thermocouple is usually attached to one of the elements (Figure A) and any unusual rise in element temperature would shut the heater down. This thermocouple may also be mounted in a thermowell (Figure B), which is then attached to one of the heating elements if desired. This protects the thermocouple from the solution being heated and allows you to replace it without removing the heater, but does increase its response time.

Temperature and over-temperature controls for using the signal generated by thermocouples and how to select the best control for your application can be found at [omega.com/controllers](http://omega.com/controllers)



## Circulation Heater Installation Recommendations

Omega circulation heaters will have a long life and provide dependable, trouble-free service if properly installed, operated and maintained as per the following recommendations:

### Installation

1. Flange heaters are supplied with two drilled and tapped holes for threaded eye bolts, providing ease of handling during installation and flange removal during maintenance cleaning or heater replacement.
2. Replacement of heater is inevitable. Therefore, provide adequate space for installation, allowing ample room to remove the flange heater for cleaning or replacement.
3. In applications requiring the circulation heater to be fed by an inline pump, install the pump at the inlet end.
4. To maintain the lowest possible temperature at the terminal box, place the outlet at the end opposite to the terminal box. If your process temperature is circulating at 232°C (450°F) or above (at the nozzle closest to the flange), stand-off terminal box construction is recommended.
5. To prevent temperature and/or pressure buildup on closed loop circulation heater systems, adequate and strategically located thermocouples for temperature controllers and pressure relief valves should be installed. Never over-rate pressure relief valves beyond the pressure temperature rating of the flange being used.
6. During the process cycle, flow rate of the medium being heated should never be interrupted or reduced, thus creating an overheating condition. Excess temperature can result in damage to the medium being processed and premature heater failure.
7. Make sure that your circulation heater is equipped with the proper terminal housing for the environment in which the heater is being used. NEMA 1—general purpose, NEMA 4—moisture resistant, and NEMA 7—explosion resistant.

**Vertical Mounting—Liquids:**  
With terminal housing up and inlet pipe on the bottom, the heating elements will be immersed at all times to prevent premature failure.



**Horizontal Mounting—Liquids and Gases:**  
Always mount heater with inlet-outlet pipes facing up to ensure the heating elements will be immersed at all times to prevent premature failure. For liquid heating, outlet may be at either end. When heating gases the inlet should be closest to the terminal enclosure to minimize terminal box wiring temperatures.



**Vertical Mounting—Gases:**  
Mount with terminal enclosure and inlet pipe at bottom of tank to minimize terminal box wiring temperatures.

### Wiring

1. All heater installations must be properly earth grounded to eliminate electric shock hazard. Electrical wiring must be in accordance with Local and/or National Electrical Codes.
2. Circulation heaters are supplied standard with NEMA 1 terminal housings. All power to heaters must be disconnected before removing the terminal housing cover and performing any type of service.
3. Electrical connections on heater terminals must be kept tight. Loose connections will create arcing, over-heating, and eventually will destroy the heater terminal and cause premature heater failure.
4. If the amperage rating of your circulation heater exceeds the amperage capacity of the supplied thermostat, mercury relays or magnetic contactors should be used with the thermostat.
5. Over-temperature protection thermocouples require a separate conduit to the control panel for the thermocouple wire.
6. Omega offers a large selection of power control panels for circulation heaters. See [omega.com/controllers](http://omega.com/controllers)

### Maintenance

1. Never perform any type of service on the unit prior to disconnecting all electrical power and shutting off all intake lines.
2. Remove sludge deposits through the drain plug.
3. Check flange bolts for tightness.
4. Check terminal connections for tightness.
5. Check thermocouple or thermostat bulb for response to temperature changes. If defective, replace immediately.
6. Check for leaks.
7. Depending on operating conditions and medium being processed, the flange or screw plug heater should be periodically removed for physical inspection and cleaning of the element bundle.



## Circulation Tank Assembly Maximum Immersed Element Length

Standard circulation heaters shown in the tables have element immersion lengths determined by the element wattage and element watt density. The screw plug or flange heater containing the elements is matched to a standard circulation heater tank assembly to assure proper heat transfer and heated material flow. When designing a system

with a heater not shown on these pages the table below can be used to select a tank size based on the calculated immersion length. If a standard tank size is not suitable for your installation, Omega will design and manufacture a custom tank and heater assembly to satisfy the requirements of your application.

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
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	2.2	35.5	902
	2.3	48.0	1219
3" Flange	3.1	28.0	711
	3.2	38.0	965
	3.3	50.5	1283
4" Flange	4.1	26.5	673
	4.2	37.0	940
	4.3	58.0	1473
	4.4	79.0	2007
5" Flange	5.1	36.0	914
	5.2	43.0	1092
	5.3	54.5	1384
	5.4	68.0	1727
	5.5	85.0	2159
6" Flange	6.1	26.5	673
	6.2	37.0	940
	6.3	58.0	1473
	6.4	79.0	2007

Nominal Pipe Size	Dimension Drawing Number	Maximum Immersed Element Length	
		inch	mm
8" Flange	8.1	32.5	826
	8.2	40.5	1029
	8.3	47.5	1207
	8.4	55.0	1397
	8.5	64.5	1638
	8.6	73.5	1867
	8.7	83.5	2121
10" Flange	10.1	60.0	1524
	10.2	67.0	1702
	10.3	73.0	1854
	10.4	82.0	2083
	10.5	90.0	2286
12" Flange	12.1	59.0	1499
	12.2	66.5	1689
	12.3	74.0	1880
	12.4	81.5	2070
	12.5	89.0	2261
14" Flange	14.1	58.0	1473
	14.2	65.5	1664
	14.3	73.0	1854
	14.4	80.5	2045
	14.5	88.0	2235

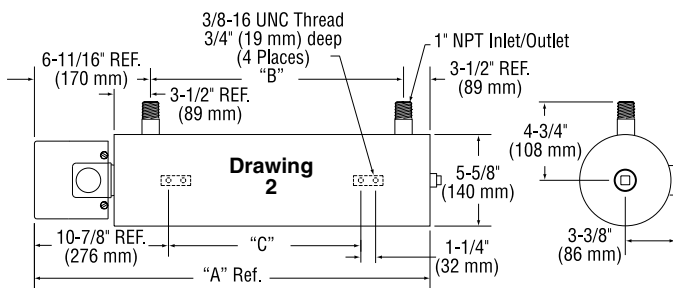
### 8 watts/in<sup>2</sup> (1.3 watts/cm<sup>2</sup>)—Typical Applications: Fuel Oils (Bunker C and Number 6)

- Steel Screw Plug and Steel 150 lb Flanged Heater Sizes
- Steel Sheath Heating Elements
- Steel Tank
- NEMA 1 Terminal Housing

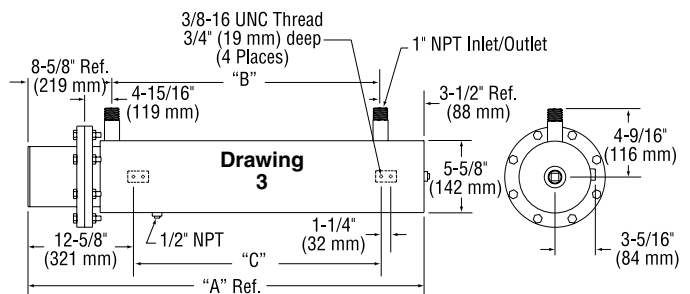
Note: 3-Phase only. Cannot be rewired for single phase.

Nominal Pipe Size	Dimensional Drawing Number	KW	Model Number					Approx Weight	
			120V	240V-1Ph (C*)	240V-3Ph (C*)	480V-1Ph (C*)	480V-3Ph (C*)	lb	kg
2½ NPT 3 elements	2.2	2	—	—	CHF01100 (1)	—	CHF01101 (1)	37	17
	2.3	3	—	—	CHF01102 (1)	—	CHF01101 (1)	46	21
3"—150 lb 3 elements	3.2	2	—	—	CHF01104 (1)	—	CHF01105 (1)	62	28
	3.3	3	—	—	CHF01106 (1)	—	CHF01107 (1)	76	34

(C\*) = Number of Branch Circuits per heater



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
2.2	42 11/16	1084	32 1/2	826	26 1/2	673
2.3	55 5/16	1402	45	1143	39	991



Drawing Number	"A"		"B"		"C"	
	inch	mm	inch	mm	inch	mm
3.2	44 5/8	1133	32 1/2	826	26 1/2	673
3.3	57 5/8	1451	45	1143	39	991



## Mightybooster™ Circulation Heater — Point of Use

### Typical Applications: Clean Water, Aqueous Solutions

- Integral 15°C (60°F) to 82°C (180°F) Thermostat
- NEMA 1 Terminal Housing
- Insulated Carbon Steel or Bronze Vessel
- 1 NPT Inlet and Outlet
- Copper Sheath Heating Elements and Brass Screw Plug
- Watt Density of 60 watts/in<sup>2</sup> (9.3 watts/cm<sup>2</sup>)

To Order Visit <a href="http://omega.com/chf9">omega.com/chf9</a> for Pricing and Details								
Vessel Material	Model No. 120/240V	KW	"A" OAL		"B" Inlet/Outlet		Approx Weight	
			inch	mm	inch	mm	lb	kg
Carbon Steel	CHF02097	1.5	18	457	12 <sup>3</sup> / <sub>8</sub>	314	8	3.6
	CHF02098	2.0	18	457	12 <sup>3</sup> / <sub>8</sub>	314	8	3.6
	CHF02099	2.5	22	559	16 <sup>3</sup> / <sub>8</sub>	416	11	5.0
	CHF02100	3.0	22	559	16 <sup>3</sup> / <sub>8</sub>	416	11	5.0
Bronze	CHF02101	1.5	18	457	12 <sup>3</sup> / <sub>8</sub>	314	12.5	5.7
	CHF02102	2.0	18	457	12 <sup>3</sup> / <sub>8</sub>	314	12.5	5.7
	CHF02103	2.5	22	559	16 <sup>3</sup> / <sub>8</sub>	416	14.5	6.6
	CHF02104	3.0	22	559	16 <sup>3</sup> / <sub>8</sub>	416	14.5	6.6

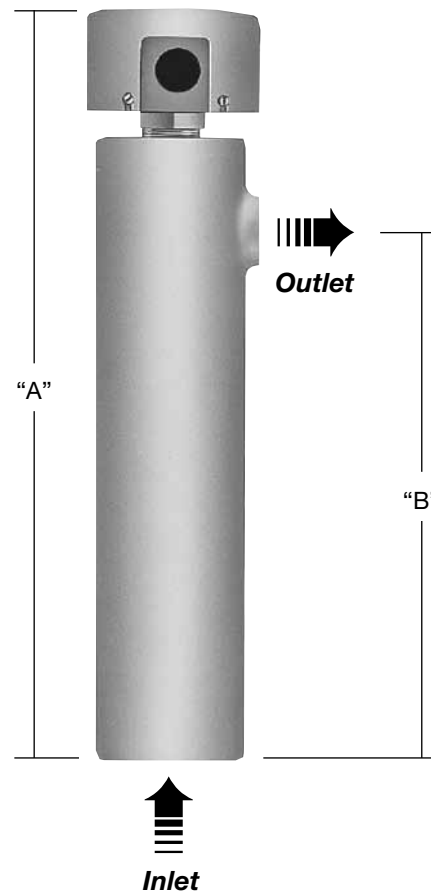
Ordering Example: CHF02098, 2 KW, 240 Vac circulation heater.

### Typical Applications: Lubricating Oils

- Integral 65°C (150°F) to 300°C (560°F) Thermostat
- NEMA 1 Terminal Housing
- Insulated Carbon Steel Vessel
- 1 NPT Inlet and Outlet
- Steel Sheath Heating Elements and Steel Screw Plug
- Watt Density of 23 watts/in<sup>2</sup> (3.6 watts/cm<sup>2</sup>)

To Order Visit <a href="http://omega.com/chf9">omega.com/chf9</a> for Pricing and Details								
Vessel Material	Model No. 120/240V	KW	"A" OAL		"B" Inlet/Outlet		Approx Weight	
			inch	mm	inch	mm	lb	kg
Carbon Steel	CHF02105	0.5	22	559	16 <sup>3</sup> / <sub>8</sub>	416	11	5.0
	CHF02106	0.75	22	559	16 <sup>3</sup> / <sub>8</sub>	416	11	5.0
	CHF02107	1.0	22	559	16 <sup>3</sup> / <sub>8</sub>	416	11	5.0

Ordering Example: CHF02107, 1 KW, 120 Vac circulation heater.



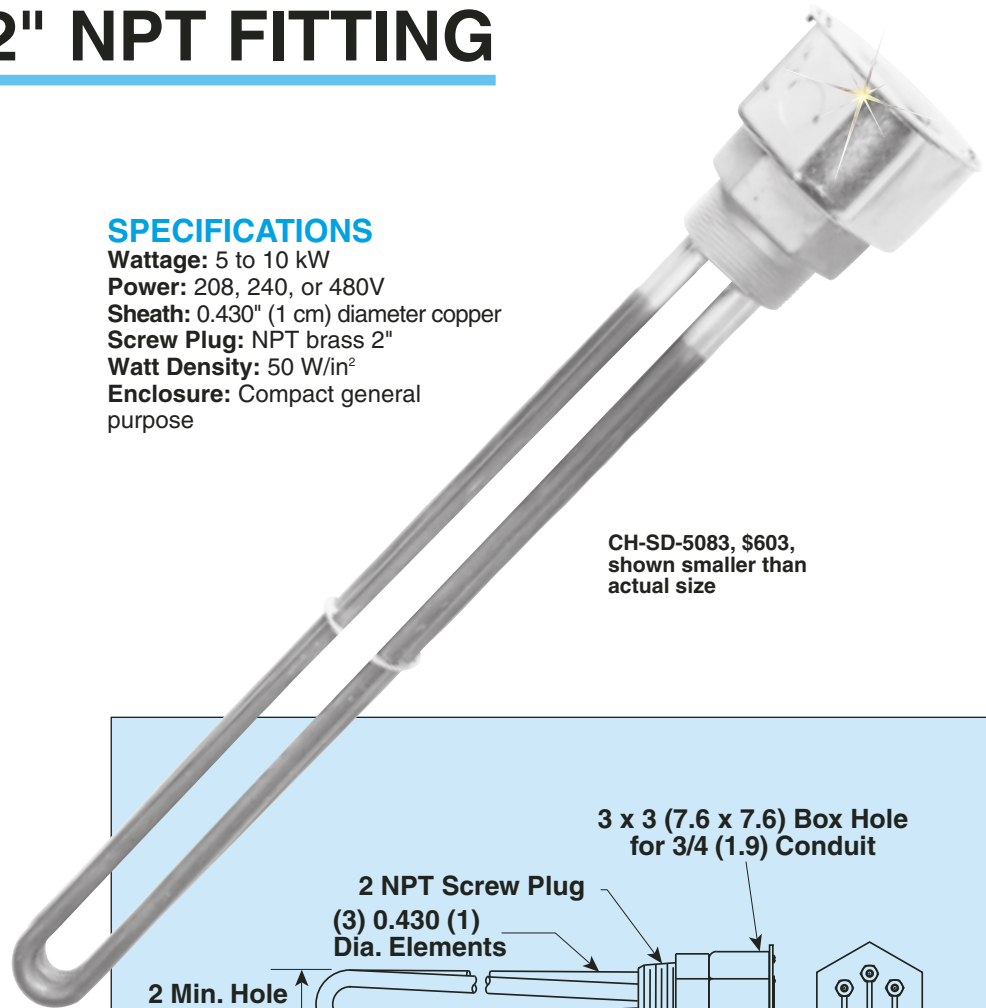
# COMPACT IMMERSION HEATER FOR DIFFICULT CLEAN LIQUIDS—2" NPT FITTING

CH-SD Series  
Starts at  
**\$603**



## SPECIFICATIONS

**Wattage:** 5 to 10 kW  
**Power:** 208, 240, or 480V  
**Sheath:** 0.430" (1 cm) diameter copper  
**Screw Plug:** NPT brass 2"  
**Watt Density:** 50 W/in<sup>2</sup>  
**Enclosure:** Compact general purpose

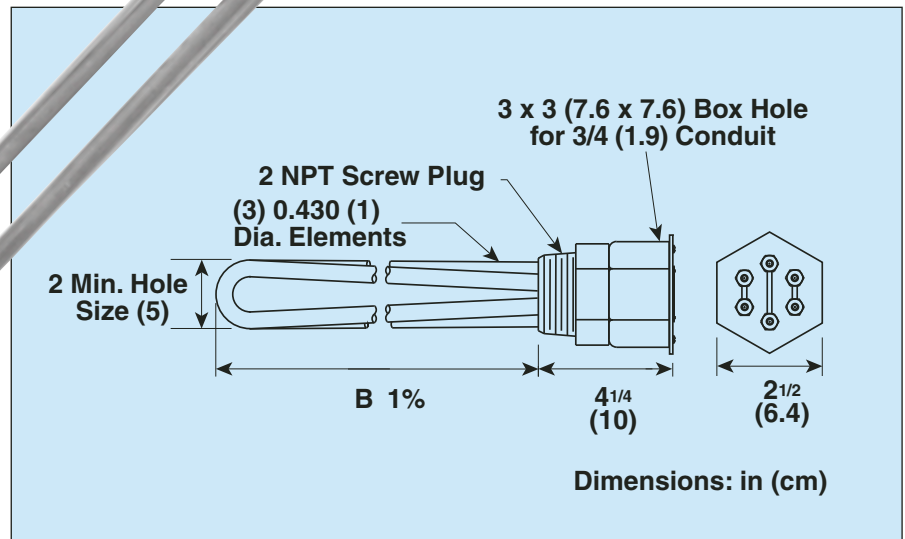


CH-SD-5083, \$603, shown smaller than actual size

- ✓ Incoloy Sheath for Compatibility with More Difficult Clean Liquids
- ✓ 2" NPT Brass Screwplug with Compact 3 Element Design
- ✓ 5 to 10 kw
- ✓ General Purpose, NEMA-1 Rated Enclosure

The OMEGALUX® CH-SD Series features a compact 3 element heater design with a 2" brass screw plug. The Incoloy sheath allows compatibility with difficult clean liquids. A popular application for CH-SD Series is heating for industrial dishwashing equipment.

*Note: This immersion heater should be used with an approved temperature control device to assure safe operation. See the Temperature Section for our selection of process controllers.*



## ALL MODELS STOCKED FOR FAST DELIVERY

To Order (Specify Model Number)								
kW	Volts	Phase	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B in. (cm)	Model No.	Price	Wt. lb. (kg)
5	208	3	50	3	12 <sup>7</sup> / <sub>8</sub> (33)	CH-SD-5083	\$603	9 (4)
5	240	3	50	3	12 <sup>7</sup> / <sub>8</sub> (33)	CH-SD-5043	603	9 (4)
5	480	3	50	3	12 <sup>7</sup> / <sub>8</sub> (33)	CH-SD-5053	603	9 (4)
5	208	1	50	3	12 <sup>7</sup> / <sub>8</sub> (33)	CH-SD-508	603	9 (4)
5	240	1	50	3	12 <sup>7</sup> / <sub>8</sub> (33)	CH-SD-504	603	9 (4)
7.5	208	3	50	3	18 <sup>3</sup> / <sub>8</sub> (47)	CH-SD-7583	618	10 (5)
7.5	240	3	50	3	18 <sup>3</sup> / <sub>8</sub> (47)	CH-SD-7543	618	10 (5)
10	208	3	50	3	20 (51)	CH-SD-10083	628	10 (5)
10	240	3	50	3	20 (51)	CH-SD-10043	628	10 (5)
10	480	3	50	3	20 (51)	CH-SD-10053	628	10 (5)

Ordering Example: CH-SD-504, 240 volt, 5 kW heater, \$603.

**CAUTION AND WARNING!**  
 Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.



**UNITED STATES**

[www.omega.com](http://www.omega.com)  
1-800-TC-OMEGA  
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Karviná, Czech Republic  
596-311-899

**BENELUX**

[www.omega.nl](http://www.omega.nl)  
Amstelveen, NL  
0800-099-33-44



**More than 100,000 Products Available!**

• **Temperature**

Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

• **Flow and Level**

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

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• **Data Acquisition**

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

• **Pressure, Strain and Force**

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

• **Heaters**

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

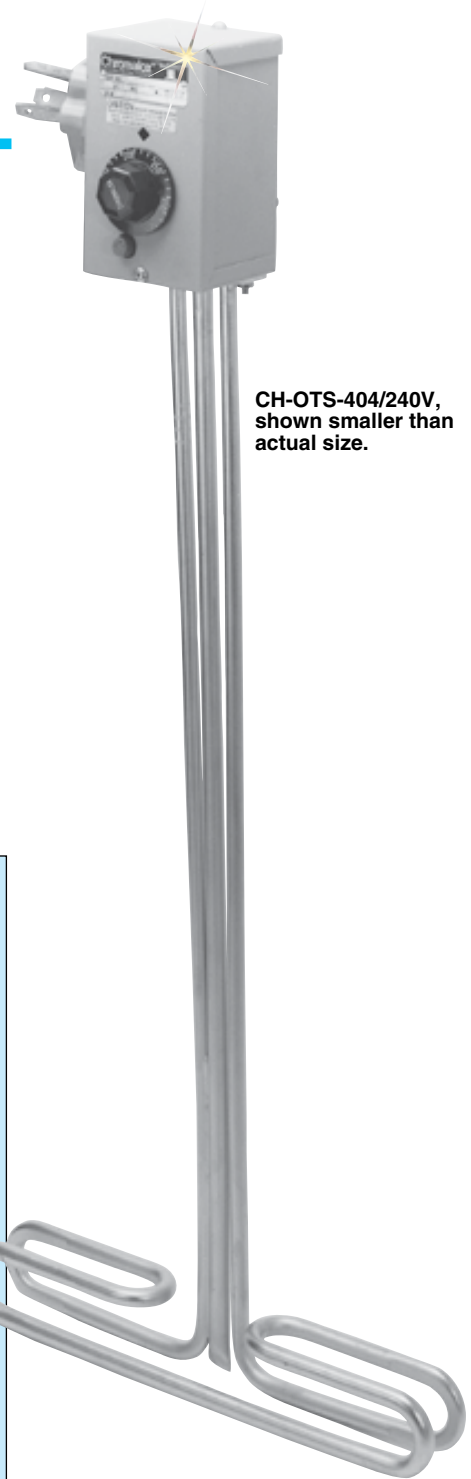
# PORTABLE TANK HEATER

CH-OTS Series

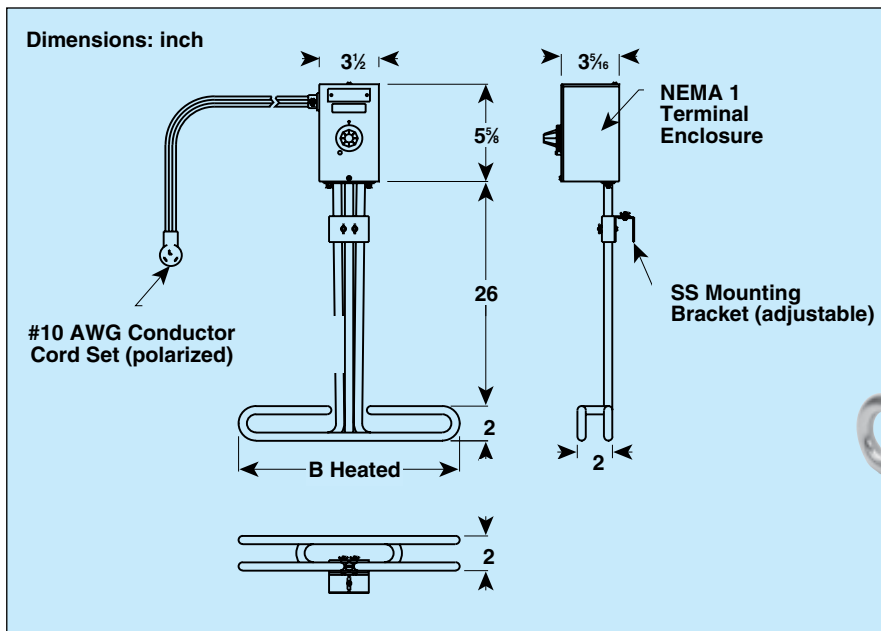
- ✓ Copper Sheath Nickel Plated Elements
- ✓ High Watt Density (49 to 58 W/in<sup>2</sup>)
- ✓ 4 and 6 kW
- ✓ 208 and 240V, Single Phase

## FEATURES

- ✓ 660 mm (26") Riser (Unheated Section)
- ✓ Integral Control 16 to 121°C (60 to 250°F)
- ✓ Manual Reset Cutout (Set @ 50°F Above Temperature Setpoint)
- ✓ Built-In Pilot Light
- ✓ 914 mm (36") Long Cord with 10 to 30P Plug



CH-OTS-404/240V, shown smaller than actual size.



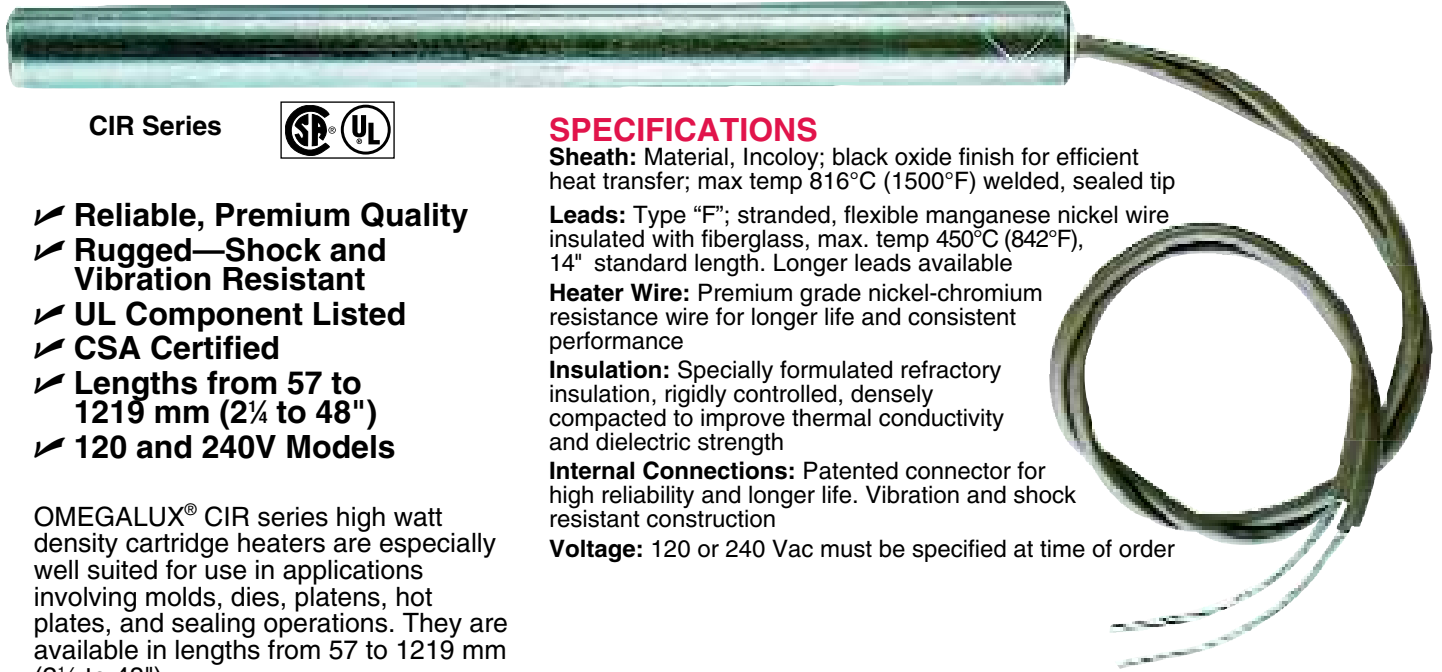
To Order						
kW	Volts	W/in <sup>2</sup>	Phase	DIM B (inch)	Copper	Wt (lb)
					Model No.	
4	240	49	1	14	CH-OTS-404/240V	10
6	208	58	1	17	CH-OTS-608/208V	10
6	240	58	1	17	CH-OTS-604/240V	10

Ordering Example: CH-OTS-608/208V, 208V, 6 kW, 1 phase portable tank heater.



# HIGH WATT DENSITY CARTRIDGE HEATERS— $\frac{3}{4}$ " Diameter

## With Incoloy Sheath



CIR Series



- ✓ **Reliable, Premium Quality**
- ✓ **Rugged—Shock and Vibration Resistant**
- ✓ **UL Component Listed**
- ✓ **CSA Certified**
- ✓ **Lengths from 57 to 1219 mm ( $2\frac{1}{4}$  to 48")**
- ✓ **120 and 240V Models**

OMEGALUX® CIR series high watt density cartridge heaters are especially well suited for use in applications involving molds, dies, platens, hot plates, and sealing operations. They are available in lengths from 57 to 1219 mm ( $2\frac{1}{4}$  to 48").

### SPECIFICATIONS

**Sheath:** Material, Incoloy; black oxide finish for efficient heat transfer; max temp 816°C (1500°F) welded, sealed tip

**Leads:** Type "F"; stranded, flexible manganese nickel wire insulated with fiberglass, max. temp 450°C (842°F), 14" standard length. Longer leads available

**Heater Wire:** Premium grade nickel-chromium resistance wire for longer life and consistent performance

**Insulation:** Specially formulated refractory insulation, rigidly controlled, densely compacted to improve thermal conductivity and dielectric strength

**Internal Connections:** Patented connector for high reliability and longer life. Vibration and shock resistant construction

**Voltage:** 120 or 240 Vac must be specified at time of order

$\frac{3}{4}$ " Nominal Diameter CIR Series (Actual Diameter & Tolerance: 0.747"  $\pm$  0.005)

### To Order

Shth. Lgth.	Watts	W/ in <sup>2</sup>	Model Number	Wt. lb.	Shth. Lgth.	Watts	W/ in <sup>2</sup>	Model Number	Wt. lb.	Shth. Lgth.	Watts	W/ in <sup>2</sup>	Model Number	Wt. lb.
2 $\frac{1}{4}$	200	49	CIR-5022/120	0.18	7 $\frac{1}{2}$	450	27	CIR-5077/240	0.61	15	1500	44	CIR-5150/240	1.15
2 $\frac{3}{8}$	200	45	CIR-5023/*	0.19	7 $\frac{1}{2}$	1300	78	CIR-5076/*	0.61	16	1800	49	CIR-5162/240	1.23
3	250	43	CIR-5031/120	0.23	8	500	28	CIR-5085/*	0.64	16	4700	128	CIR-5165/240	1.23
3	500	85	CIR-5030/*	0.23	8	1000	57	CIR-5080/240	0.64	17 $\frac{1}{4}$	850	21	CIR-5177/240	1.36
3 $\frac{1}{4}$	250	39	CIR-5033/*	0.26	8	1500	85	CIR-5081/240	0.64	18	1500	36	CIR-5180/240	1.38
3 $\frac{1}{4}$	650	101	CIR-5032/*	0.26	8	2000	113	CIR-5082/240	0.64	18	2000	48	CIR-5182/240	1.38
4	250	31	CIR-5042/120	0.32	9 $\frac{1}{2}$	500	25	CIR-5091/240	0.73	18	5000	122	CIR-5185/240	1.38
4	500	61	CIR-5040/240	0.32	10	1000	45	CIR-5100/240	0.79	20	1150	25	CIR-5202/240	1.53
4	1000	122	CIR-5041/240	0.32	10	2000	90	CIR-5102/240	0.79	20	2000	44	CIR-5201/240	1.53
4 $\frac{1}{4}$	350	35	CIR-5047/240	0.38	10 $\frac{1}{2}$	550	23	CIR-5106/240	0.83	20	2250	49	CIR-5203/240	1.53
5	300	28	CIR-5052/120	0.39	10 $\frac{1}{2}$	2000	85	CIR-5105/*	0.83	20	3850	84	CIR-5200/240	1.53
5	500	47	CIR-5051/240	0.39	11 $\frac{1}{2}$	600	22	CIR-5118/240	0.91	20	5000	110	CIR-5205/240	1.53
5	1000	95	CIR-5050/*	0.39	12	1000	37	CIR-5120/240	0.92	24	2500	42	CIR-5241/240	1.84
6	350	27	CIR-5061/240	0.48	12	2000	74	CIR-5121/240	0.92	24	1375	25	CIR-5243/240	1.84
6	500	39	CIR-5065/*	0.48	12	3000	111	CIR-5122/240	0.92	24	2500	42	CIR-5242/240	1.84
6	750	58	CIR-5062/240	0.48	12	4000	148	CIR-5124/240	0.92	24	2750	50	CIR-5244/240	1.84
6	1000	78	CIR-5067/240	0.48	13 $\frac{1}{2}$	650	21	CIR-5135/240	1.02	24	4600	83	CIR-5240/240	1.84
6	1100	85	CIR-5060/*	0.48	13 $\frac{1}{2}$	2500	83	CIR-5134/240	1.02	24	5000	85	CIR-5245/240	1.84
6	1500	117	CIR-5068/240	0.48	14	1250	40	CIR-5141/240	1.07	30	4800	69	CIR-5300/240	2.30
6	2000	155	CIR-5069/240	0.48	14	2500	80	CIR-5142/240	1.07	36	2500	30	CIR-5362/240	2.75
7	500	33	CIR-5075/*	0.57	14	4500	142	CIR-5144/240	1.07	36	4900	59	CIR-5360/240	2.75
7	1000	66	CIR-5072/240	0.57	14 $\frac{1}{2}$	750	22	CIR-5148/240	1.14	48	5000	45	CIR-5480/240	3.70

\*Specify voltage. Insert "120" for 120 Vac or "240" for 240 Vac. Those model numbers that contain 120 or 240 are only available in that voltage.

Note:  $\frac{3}{4}$ " diameter CIR series cartridge heaters use 10 AWG stranded lead wire.

Ordering Example: CIR-5023/240, cartridge heater with 2 $\frac{3}{8}$ " sheath, 200 watts, 45 W/in<sup>2</sup> and 240 Vac.

# HIGH WATT DENSITY CARTRIDGE HEATERS WITH INCOLOY® SHEATH 3/8" DIAMETER

## CIR Series

- ✓ Premium Quality
- ✓ Rugged Construction
- ✓ 120 and 240V Models Available
- ✓ Lengths from 1¼ to 24" (3 to 61 cm)

OMEGALUX® CIR series high watt density cartridge heaters are especially well suited for use in applications involving molds, dies, platens, hot plates, and sealing operations. They are available in lengths from 1¼ to 24" (3 to 61 cm).

## SPECIFICATIONS

**Sheath:** Material, Incoloy; black oxide finish for efficient heat transfer; maximum temperature 816°C (1500°F) welded, sealed tip

**Leads:** Type "F"; stranded, flexible manganese nickel wire insulated with fiberglass, maximum temperature 450°C (842°F), 14" standard length; longer leads available

**Heater Wire:** Premium grade nickel-chromium resistance wire for longer life, and consistent performance

**Insulation:** Specially formulated refractory insulation, rigidly controlled, densely compacted to improve thermal conductivity and dielectric strength

**Internal Connections:** Connector for high reliability and longer life; vibration and shock resistant construction

**Voltage:** 120 or 240 Vac, must be specified at time of order

3/8" Nominal Diameter CIR Series  
(Actual Diameter and Tolerance: 0.373" ±0.005")

## To Order

Sheath in (cm)	Watt	W/in <sup>2</sup>	Model No.	Weight lb (kg)	Stht. in (cm)	Watt	W/in <sup>2</sup>	Model No.	Weight lb (kg)	Sheath in (cm)	Watt	W/in <sup>2</sup>	Model No.	Weight lb (kg)
1¼(3)	100	114	CIR-2013/120	0.05 (0.2)	2½(6)	250	107	CIR-20251/*	0.10 (0.05)	5 (13)	750	142	CIR-2054/240	0.20 (0.09)
1¼(3)	125	143	CIR-20131/120	0.05 (0.2)	2½(6)	300	129	CIR-2029/*	0.10 (0.05)	5 (13)	1000	190	CIR-2056/240	0.20 (0.09)
1¼(3)	150	171	CIR-2012/*	0.05 (0.2)	2½(6)	400	171	CIR-2026/*	0.10 (0.05)	5¼(13)	200	44	CIR-2057/240	0.21 (0.1)
1¼(3)	200	228	CIR-2014/*	0.05 (0.2)	2½(6)	500	214	CIR-20252/*	0.10 (0.05)	5½(14)	600	102	CIR-2058/240	0.22 (0.1)
1½(4)	50	43	CIR-2018/120	0.06 (0.3)	2¾(7)	250	91	CIR-20253/120	0.11 (0.05)	5½(14)	1000	171	CIR-2059/240	0.24 (0.1)
1½(4)	85	73	CIR-2016/120	0.06 (0.3)	2¾(7)	300	109	CIR-20254/240	0.11 (0.05)	6 (15)	200	31	CIR-2064/120	0.24 (0.1)
1½(4)	100	85	CIR-20151/*	0.06 (0.3)	3 (8)	100	34	CIR-2032/*	0.12 (0.05)	6 (15)	250	39	CIR-2061/*	0.24 (0.1)
1½(4)	130	111	CIR-20152/240	0.06 (0.3)	3 (8)	150	51	CIR-2033/*	0.12 (0.05)	6 (15)	400	62	CIR-2065/*	0.24 (0.1)
1½(4)	150	129	CIR-2019/*	0.06 (0.3)	3 (8)	200	68	CIR-2031/*	0.12 (0.05)	6 (15)	500	78	CIR-2060/*	0.24 (0.1)
1½(4)	200	171	CIR-2015/*	0.06 (0.3)	3 (8)	250	85	CIR-2034/*	0.12 (0.05)	6 (15)	600	93	CIR-2066/*	0.24 (0.1)
1½(4)	250	214	CIR-20191/*	0.06 (0.3)	3 (8)	300	103	CIR-20301/*	0.12 (0.05)	6 (15)	750	117	CIR-2062/240	0.24 (0.1)
1¾(4)	125	85	CIR-2017/120	0.06 (0.3)	3 (8)	400	137	CIR-20302/*	0.12 (0.05)	6 (15)	1000	155	CIR-2063/240	0.24 (0.1)
1¾(4)	175	120	CIR-20171/120	0.06 (0.3)	3 (8)	500	171	CIR-2030/*	0.12 (0.05)	6½(17)	600	85	CIR-2067/240	0.26 (0.1)
1¾(4)	250	170	CIR-20172/*	0.06 (0.3)	3 (8)	600	205	CIR-2036/240	0.12 (0.05)	6½(17)	1000	143	CIR-2068/240	0.26 (0.1)
1⅞(5)	200	128	CIR-20173/120	0.06 (0.3)	3½(9)	250	71	CIR-2037/*	0.14 (0.06)	7 (18)	250	33	CIR-2070/*	0.28 (0.1)
2 (5)	50	29	CIR-20201/120	0.07 (0.3)	3½(9)	300	86	CIR-2038/*	0.14 (0.06)	7 (18)	600	79	CIR-2076/*	0.28 (0.1)
2 (5)	75	42	CIR-20209/120	0.07 (0.3)	3½(9)	500	142	CIR-2035/*	0.14 (0.06)	7 (18)	1000	131	CIR-2079/240	0.28 (0.1)
2 (5)	100	57	CIR-20202/*	0.07 (0.3)	3⅞(10)	150	37	CIR-2039/120	0.15 (0.07)	7½(19)	600	73	CIR-2075/240	0.30 (0.1)
2 (5)	150	85	CIR-2021/*	0.07 (0.3)	3⅞(10)	500	128	CIR-20303/240	0.15 (0.07)	7½(19)	1000	122	CIR-2077/240	0.30 (0.1)
2 (5)	200	114	CIR-20203/*	0.07 (0.3)	4 (10)	125	30	CIR-2045/*	0.16 (0.07)	8 (20)	300	34	CIR-2081/*	0.32 (0.1)
2 (5)	250	142	CIR-2020/*	0.07 (0.3)	4 (10)	150	37	CIR-2041/*	0.16 (0.07)	8 (20)	400	45	CIR-2082/120	0.32 (0.1)
2 (5)	300	171	CIR-20204/*	0.07 (0.3)	4 (10)	175	44	CIR-2046/120	0.16 (0.07)	8 (20)	500	57	CIR-2085/*	0.32 (0.1)
2 (5)	350	199	CIR-20205/*	0.07 (0.3)	4 (10)	200	51	CIR-2044/240	0.16 (0.07)	8 (20)	600	68	CIR-2086/*	0.32 (0.1)
2 (5)	400	228	CIR-20206/*	0.07 (0.3)	4 (10)	250	61	CIR-2042/*	0.16 (0.07)	8 (20)	700	80	CIR-2080/*	0.32 (0.1)
2 (5)	500	262	CIR-20207/*	0.07 (0.3)	4 (10)	300	73	CIR-2040/*	0.16 (0.07)	8 (20)	1000	115	CIR-2089/240	0.32 (0.1)
2¼(6)	75	37	CIR-20225/120	0.08 (0.4)	4 (10)	400	102	CIR-2047/*	0.16 (0.07)	9½(24)	600	57	CIR-2090/240	0.38 (0.2)
2¼(6)	100	49	CIR-20221/*	0.08 (0.4)	4 (10)	450	110	CIR-2048/240	0.16 (0.07)	9½(24)	1000	97	CIR-2091/240	0.38 (0.2)
2¼(6)	125	61	CIR-2023/*	0.08 (0.4)	4 (10)	500	122	CIR-2043/*	0.16 (0.07)	10 (25)	400	36	CIR-2102/120	0.40 (0.2)
2¼(6)	150	73	CIR-20222/*	0.08 (0.4)	4 (10)	550	133	CIR-2049/120	0.16 (0.07)	10 (25)	600	54	CIR-2100/*	0.40 (0.2)
2¼(6)	175	86	CIR-20226/120	0.08 (0.4)	4½(11)	300	64	CIR-20401/*	0.18 (0.08)	10 (25)	1000	90	CIR-2101/240	0.40 (0.2)
2¼(6)	200	98	CIR-20223/*	0.08 (0.4)	4½(11)	500	106	CIR-20402/*	0.18 (0.08)	12 (30)	500	30	CIR-2122/120	0.48 (0.2)
2¼(6)	250	122	CIR-2022/*	0.08 (0.4)	4⅞(12)	300	58	CIR-20403/240	0.19 (0.09)	12 (30)	600	45	CIR-2123/*	0.48 (0.2)
2¼(6)	300	147	CIR-20224/*	0.08 (0.4)	4⅞(12)	500	97	CIR-20404/240	0.19 (0.09)	12 (30)	900	67	CIR-2120/*	0.48 (0.2)
2¼(6)	350	172	CIR-20227/*	0.08 (0.4)	5 (13)	150	29	CIR-2055/*	0.20 (0.09)	12 (30)	1000	74	CIR-2121/240	0.48 (0.2)
2½(6)	75	34	CIR-2025/120	0.09 (0.4)	5 (13)	200	88	CIR-2051/*	0.20 (0.09)	15 (38)	1100	65	CIR-2150/240	0.80 (0.4)
2½(6)	165	75	CIR-2024/*	0.09 (0.4)	5 (13)	300	57	CIR-2052/*	0.20 (0.09)	20 (51)	1300	57	CIR-2200/240	0.80 (0.4)
2½(6)	100	43	CIR-2027/240	0.10 (0.05)	5 (13)	400	76	CIR-2050/*	0.20 (0.09)	24 (61)	1500	55	CIR-2240/240	0.90 (0.4)
2½(6)	200	86	CIR-2028/*	0.10 (0.05)	5 (13)	500	95	CIR-2053/*	0.20 (0.09)					

\*Designate voltage, insert "120" for 120 Vac or "240" for 240 Vac. Those model numbers containing 120 or 240 are only available in that voltage.  
†Consult Sales.

Note: 3/8" (1 cm) diameter CIR series cartridge heaters use 17 AWG stranded lead wire.

Ordering Example: CIR-2054/240, 5" (13 cm), high watt density cartridge heater.

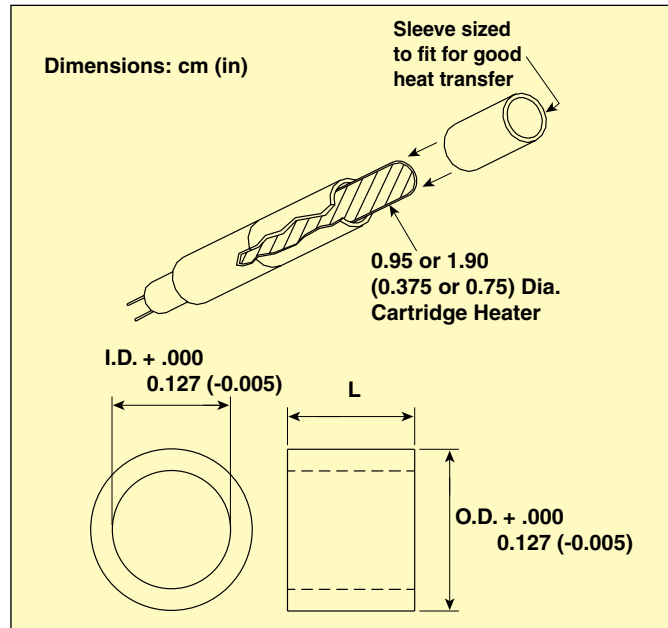
# CARTRIDGE HEATER SLEEVE ADAPTOR

## For 3/8" and 3/4" Cartridge Heaters

### FEATURES

- ✔ 1 cm (3/8") diameter cartridge heaters can be sleeved to fit 1.3 cm (1/2") and 1.6 cm (5/8") diameter holes, allowing one diameter to fit most applications.
- ✔ 1.9 cm (3/4") I.D. sleeves permit installation of OMEGALUX® CIR hi-watt density heaters in 3.2 cm (1 1/4") diameter holes to replace old-style large diameter heaters.
- ✔ Makes removal of heaters easier—no more drilling, hammering, etc.
- ✔ Made of steel, these pressed powder metal sleeves have been designed and fully tested to assure proper transfer of heat from the cartridge heater to the work.
- ✔ 427°C (800°F) maximum work temperature. For higher work temperatures, contact OMEGALUX.

*Ordering Example: CHSA-1, sleeve adaptor.*



To Order			
Model No.	I.D. cm (in)	O.D.	Length. cm (in)
CHSA-1	0.95 (3/8)	0.4981	2.54 (1)
CHSA-2	0.95 (3/8)	0.6221	2.54 (1)
CHSA-3	1.90 (3/4)	1 1/4	2.54 (1)

## Heat Transfer and Release Coating

OMEGALUX HTRC is used for improving heat transfer and release in the following applications:

- ✔ Cartridge Units in Drilled Holes
- ✔ Tubular Units in Drilled Holes, Grooves or Clamp-On Surfaces
- ✔ Strip and Ring Heaters in Grooves or Clamped on to Rough Surfaces

Laboratory tests have demonstrated that in high temperature applications, improved heat transfer can lower the internal wire temperature to provide up to 100% improvement in heater life. OMEGALUX HTRC is recommended for use in the above applications where sheath temperature of the heater is expected to exceed 398°C (750°F). HTRC has an excellent transfer coefficient approaching that of aluminum.

**Maximum Use Temperature:** 982°C (1800°F).

**Shelf Life:** Greater than one year.

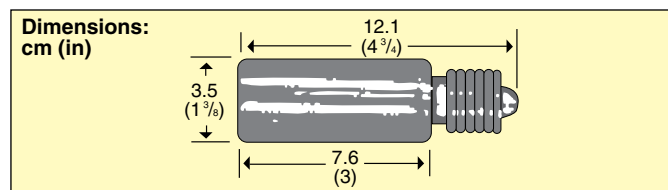
To Order	
Model No.	Description
HTRC	Heat transfer and release coating, 4 fl oz

*Ordering Example: HTRC, heat transfer and release coating.*

## Unique Space Heater SCB Series

- ✔ Fits in Standard Lamp Socket
- ✔ 120 or 240 Volts
- ✔ Available from 50 to 200 Watts
- ✔ Brass Sheath

Edison screw base installs in standard lamp socket for simple installation—to prevent moisture accumulation, mildew, freezing—in clothes lockers, fire extinguisher, cabinets, and control boxes. Also used in resistor banks.



To Order		
Model No.	Watts	Wt. kg (oz)
SCB-50/120	50	4 (9)
SCB-75/*	75	4 (9)
SCB-100/*	100	4 (9)
SCB-150/*	150	4 (9)
SCB-200/*	200	4 (9)

\*Specify voltage insert "120" for 120 Vac or "240" for 240 Vac. Those model numbers containing /120 are available only in that voltage.

*Ordering Examples: SCB-75/120 space heater, 120V.*

*SCB-200/240. space heater. 240V.*



# WATER-CIRCULATING TEMPERATURE CONTROLLER

## CMX Series

- Water and Water/Glycol Solutions to 121°C (250°F)
- 4.5 to 24 kW (15 to 82 Mbh)
- 240 and 480V, 3-Phase, 60 Hz
- 57 kg (125 lb) Carbon Steel Construction
- Heavy-Duty 0.430" Dia. Incoloy Sheath Elements
- ¾ hp Cast-Iron Bronze Fitted Centrifugal Pump (30 GPM @ 20 psi TDH)
- Dual Digital Display: PID Temperature and Process Control
- Built-In Indicators for Pump Overload, Low Water Pressure, and Overtemperature
- Portable Cabinet with Casters
- Easy-to-Access Service Features
- NEMA 1 (IP23) Electrical Enclosure with 120V Control Transformer and Magnetic Contactors
- Dual Pressure Gauges Monitor Pressure to and From Process
- Open- or Closed-Loop Cooling (3.8 ft<sup>2</sup> Heat Exchanger)
- Automatic Air Purge Valve
- Large-Diameter (1¼ NPT) Piping Connections
- ASME 125 psig Relief Valve

## APPLICATIONS

OMEGA's CMX Series water-circulating temperature controllers are compact, versatile, and completely self-contained water heating and cooling systems. They can be used for any application that requires precise temperature control of a heating and cooling water circulation system, but are particularly useful in the plastics industry as mold temperature controllers. Applications include the following:

- Injection molding machines—thermoplastics and thermosets
- Platens and dies
- Rolls, laminating, and calendering
- Pipeline heating and tracing
- Jacketed vessels and tanks

The built-in electronic temperature and process controller features separate PID algorithms for heat and cool control modes, dual display of setpoint and process temperatures, and simple configuration parameters with alphanumeric cues. Even though these systems are sophisticated and state of the art, they are still easy to use and require very little training to program and operate. Standard NPT-threaded piping connections allow for convenient hook-up to external piping.



CMX-250-4/240-NM shown smaller than actual size.

## OPTIONS

- Alternative voltages available for 208 and 575V, 3-phase, 60 Hz, and 240, 380 and 415V, 3-phase, 50 Hz distribution systems
- Alternative pumps rated 1.5, 3, 5 or 7.5 hp with pumping capacities to 80 GPM @ 70 psi TDH
- Power controllers—electronic solid state (SCR)
- Surge reduction valve
- Digital communication interface
- Expanded open- or closed-loop cooling
- High temperature operation to 275°F
- Electrical enclosure door interlock
- IEC-style "dry contact" power contactor

## To Order

Model No.	kW	V	Phase	Pump Motor (hp)	Dimensions: (inch)			Cooling Type	Wt. (lb)
					H	W	D		
CMX-250-4/240-NM	4.5	240	3	¾	29	15	25	Open loop	200
CMX-250-4/480-NM	4.5	480	3	¾	29	15	25	Open loop	200
CMX-250-4C/240-NM	4.5	240	3	¾	29	15	25	Closed loop	215
CMX-250-4C/480-NM	4.5	480	3	¾	29	15	25	Closed loop	215
CMX-250-9/240-NM	9	240	3	¾	29	15	25	Open loop	200
CMX-250-9/480-NM	9	480	3	¾	29	15	25	Open loop	200
CMX-250-9C/240-NM	9	240	3	¾	29	15	25	Closed loop	215
CMX-250-9C/480-NM	9	480	3	¾	29	15	25	Closed loop	215
CMX-250-12/240-NM	12	240	3	¾	29	15	25	Open loop	200
CMX-250-12/480-NM	12	480	3	¾	29	15	25	Open loop	200
CMX-250-12C/480-NM	12	480	3	¾	29	15	25	Closed loop	215
CMX-250-12C/240-NM	12	240	3	¾	29	15	25	Closed loop	215
CMX-250-18/240-NM	18	240	3	¾	29	15	25	Open loop	200
CMX-250-18/480-NM	18	480	3	¾	29	15	25	Open loop	200
CMX-250-18C/240-NM	18	480	3	¾	29	15	25	Closed loop	215
CMX-250-18C/480-NM	18	480	3	¾	29	15	25	Closed loop	215
CMX-250-24/240-NM	24	240	3	¾	29	15	25	Open loop	200
CMX-250-24/480-NM	24	480	3	¾	29	15	25	Open loop	200
CMX-250-24C/240-NM	24	240	3	¾	29	15	25	Closed loop	215
CMX-250-24C/480-NM	24	480	3	¾	29	15	25	Closed loop	215

Ordering Examples: CMX-250-12/240-NM, 12 kW, 240V.

CMX-250-4/480-NM, 4.5 kW, 480V

## CR27 Series



- ✓ Compact Fan Heater in PTC Technology
- ✓ Heating Power Adjusts to Ambient Temperature
- ✓ Integrated Adjustable Thermostat and Control Light
- ✓ DIN Rail Mountable

An easy DIN rail mountable design makes the CR27 Series fan heater an ideal accessory for any enclosure. The CR27 maintains minimum operating temperatures in enclosures and helps to prevent failure of electronic components caused by condensation and corrosion.

To determine the required heater size follow this equation:

$$PH = (A \times \Delta T \times k) - Pv$$

**PH** = Required heating power for your application in Watts (W)

**Pv** = Heating power generated by existing components (e.g. a transformer) in Watts (W)

**A** = Exposed enclosure surface area square meters (m<sup>2</sup>)

**ΔT** = Temperature differential between the desired minimum interior temperature and lowest possible external temperature of the enclosure in Kelvin (K),  
1.8°F = 1°C = 1K

**k** = Heat transmission coefficient of the enclosure material used:

Stainless Steel: 3.7 W/m<sup>2</sup>K

Painted Steel: 5.5 W/m<sup>2</sup>K

Aluminum: 12 W/m<sup>2</sup>K

Polyester/Plastic: 3.5 W/m<sup>2</sup>K

For outdoor applications it is recommended to double the heating power.

### Specifications

**Heating Element:** PTC-semiconductor/resistor, self-regulating with changing ambient temperature (see graph)

**Thermostat Range:** 0 to 60°C (32 to 140°F)

**Overheat Protection:** Built-in temperature limit in case of fan failure

**Function Control Light:** LED

**Housing:** Plastic, UL94V-0

**Dimensions:**  
165 H x 100 W x 128 mm D  
(6.5 x 3.94 x 5")

**Connection:** 2-pole terminal, 2.5 mm<sup>2</sup> (AWG 14 max)

**Mounting:** Clip for 35 mm DIN rail (EN 50022)

**Protection Class:** II (double insulated)

**Protection Type:** NEMA 2 (IP20)

**Axial Fan (Ball Bearing):**

**CR2700900,**  
**CR2700901:**  
35 m<sup>3</sup>/h (20 cfm)

**CR2701900,**  
**CR2701901:**  
45 m<sup>3</sup>/h (26 cfm)

**Max Current (Inrush):**

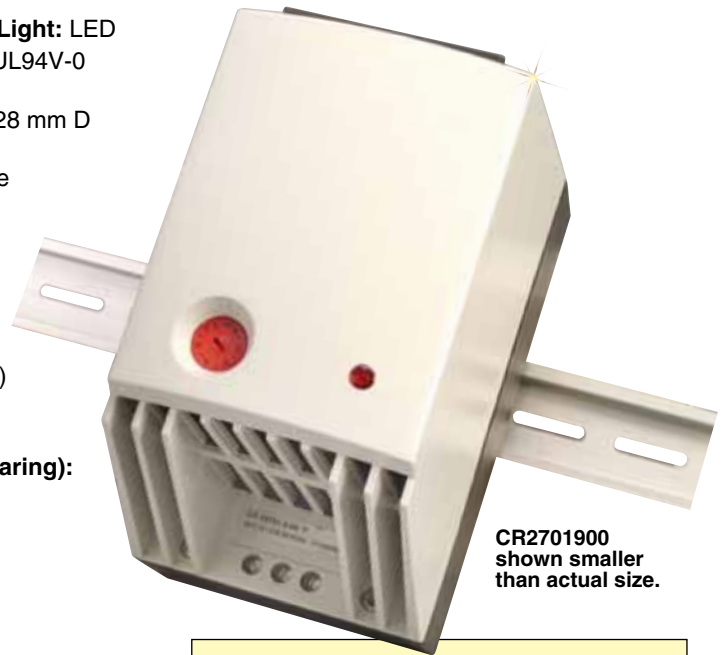
**CR2700900,**  
**CR2700901:** 14 A

**CR2701900,**  
**CR2701901:** 15 A

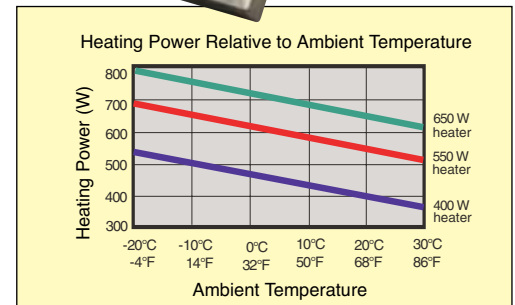
**Weight:**

**CR2700900,**  
**CR2700901:** 0.9 kg (2 lb)

**CR2701900,**  
**CR2701901:** 1.1 kg (2.4 lb)

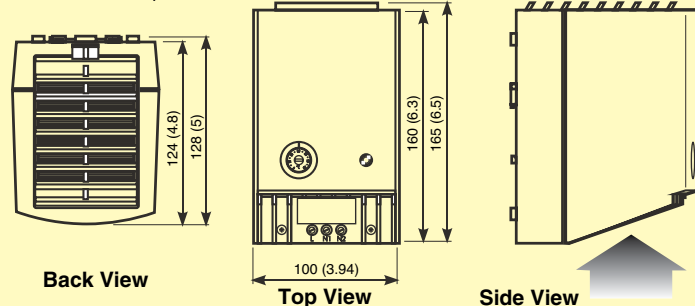


CR2701900 shown smaller than actual size.



**Dimensions: mm (inch)**

For spacing, add 51 mm (2") clearance to heat sensitive parts



### To Order

Model No.	Description
CR2700900	Fan heater, 550 W, 120 Vac, with adjustable thermostat 32 to 140°F
CR2700901	Fan heater, 550 W, 120 Vac, with adjustable thermostat 0 to 60°C
CR2701900	Fan heater, 650 W, 120 Vac, with adjustable thermostat 32 to 140°F
CR2701901	Fan heater, 650 W, 120 Vac, with adjustable thermostat 0 to 60°C
XBANS3575P	DIN rail 35 x 7.5 mm x 2 m (1.4 x 0.30" x 6') slotted

Comes complete with operator's manual.

**Ordering Examples:** CR2700900, fan heater, 550 W, 120 Vac, with adjustable thermostat 32 to 140°F.

CR2701901, fan heater, 650 W, 120V, with adjustable thermostat, 0 to 60°C.

# FOR PANEL, DIN RAIL OR FOOT-MOUNT

## CR030/CR130 Series



- ✓ Compact DIN Rail, Panel Mount or Foot-Mounted Fan Heater
- ✓ Maintains Minimum Operating Temperatures in Enclosures
- ✓ Helps to Prevent Failure of Electronic Components Caused by Condensation and Corrosion
- ✓ Built-In Overheat Protection
- ✓ Integrated Adjustable Thermostat
- ✓ Double Insulated Plastic Housing



CR030599 shown smaller than actual size.



CR130599 shown smaller than actual size.

## Specifications

**Heating Element:** High performance cartridge heater

**Heat Sink:** Extruded aluminum profile

**Overheat Protection:** Built-in temperature limiter

**Axial Fan (Ball Bearing):** Service life 50,000h @ 25°C (77°F)

**Air Flow, Free Blowing:** 160 m³/h (94 cfm)

**Connection:** 2-pole terminal AWG 16 max (1.5 mm²) with strain relief, clamping torque 0.8 Nm max

### Mounting:

**CR030:** M5 screws (not included)

**CR130:** Clip for 35 mm DIN rail, EN 60 715 or M6 screws (not included)

**Position:** Preferably horizontal

**Wiring Compartment:** Plastic, UL94V-0, black

### Dimensions:

**CR030:** 168 x 145 x 99 mm (6.6 x 5.7 x 3.9")

**CR130:** 182 x 160 x 99 mm (7.2 x 6.3 x 3.9")

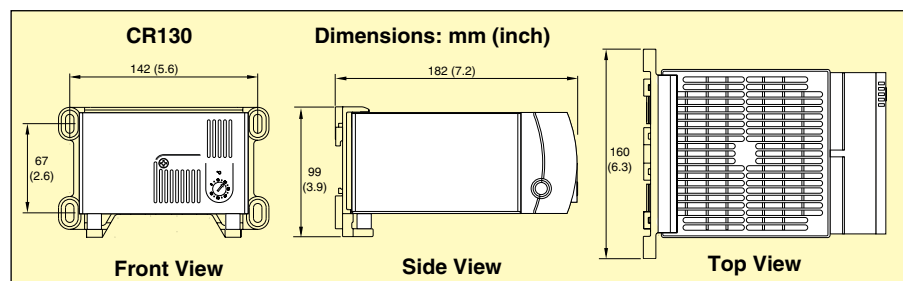
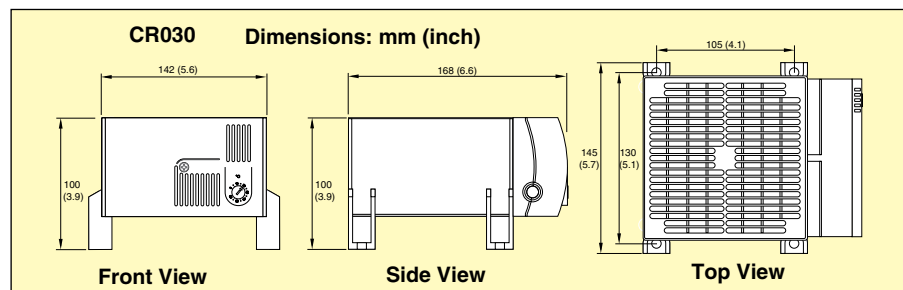
**Weight:** 1.4 kg (3.1 lb)

**Operating Temperature:** 0 to 60°C (32 to 140°F)

**Storage Temperature:** -45 to 70°C (-49 to 158°F)

**Protection Class:** II (double isolated)

**Protection Type:** NEMA 2 (IP20)



## To Order

Model No.	Description
CR030599	Fan heaters, 950 W, 120 Vac with adjustable thermostat 0 to 60°C (32 to 140°F), foot mount
CR130599	Fan heaters, 950 W, 120 Vac with adjustable thermostat 0 to 60°C (32 to 140°F), DIN or panel mount
XBANS3575P	DIN rail 35 x 7.5 mm x 2 m (1.4 x 0.30" x 6') slotted

Comes complete with operator's manual.

**Ordering Examples:** CR030599, foot-mounted fan heater.

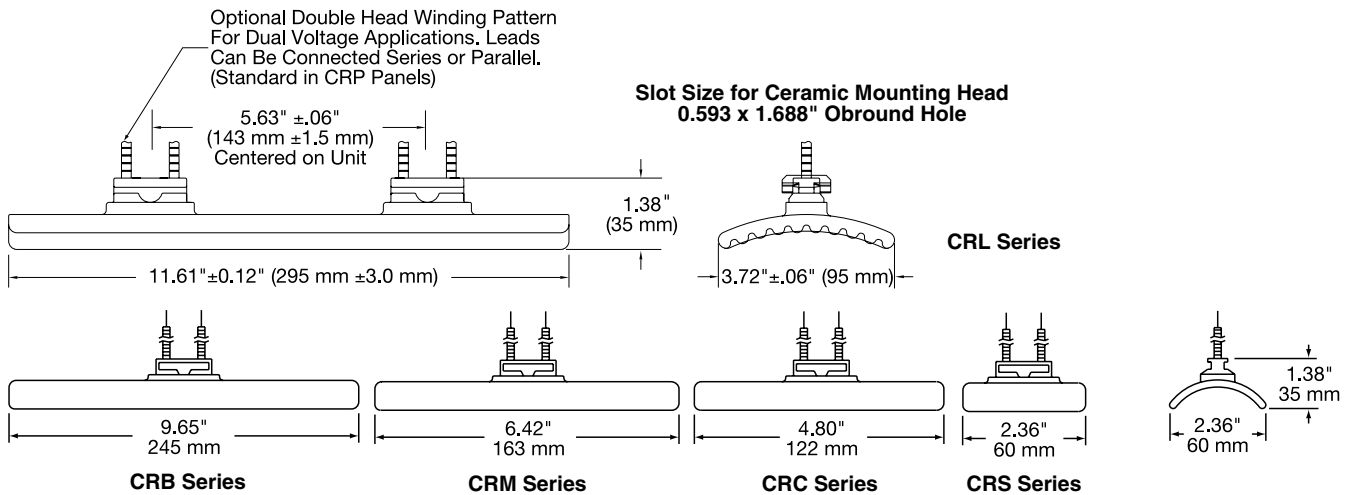
CR130599, DIN or panel mounted fan heater.



## Curved Face Ceramic Radiant Heaters

### Ceramic E-Mitters

- 5 Standard Solid Curved Face Sizes to Accomodate a Wide Range of New or Existing Applications
- Universal Mount Designed to be Dropped into Existing Systems Regardless of Manufacturer
- Standard Colors are Metamorphing Rose (Cold) to Grey (Hot), and Traditional White. Optional Colors are Metamorphing Yellow (Cold) to Orange (Hot), and Black
- Standard Stocked Voltage: 120 or 220/240V as Noted; Other Voltages are Available
- Available with Built-In Type K Thermocouple— Type J Thermocouple and Low Noise Options are Also Available
- Long Operating Life—Over 10,000-Plus Hours of Continuous Operation Under Normal Conditions
- Performance is Unaffected By Vibration or Adverse Atmospheric Conditions
- 2.5 to 6  $\mu$ m Infrared Radiation Wavelength



### Custom Engineered/Manufactured Heaters

Understanding that an electric heater can be very application specific, for sizes and ratings not listed, OMEGA® can manufacture a Ceramic E-Mitter to meet your requirements.

### Please Specify the Following:

- **Colors:** Standard are metamorphing rose and straight white, optional are metamorphing yellow and straight black
- **Wattage:** Up to 43 watts/in<sup>2</sup> (6.7 watts/cm<sup>2</sup>)
- **Voltage:** 120, 208, 240, 277, 480 Vac and others (dependent on design)
- **Thermocouple:** Standard Type K (Type J optional) or Low Noise Type K (Type J optional)

## Accessories and Custom Configurations

- Designed for use with E-Mitters CRB and CRC
- Lightweight Extruded Aluminum Housing with 5/16-18 Mounting Bolts
- E-Mitters are Easily Replaced by Removing the Top Cover
- Internal Mounting Hole Pattern Simplifies Mixing and Matching E-Mitter Sizes and Ratings
- Space Between Reflector and Housing Wall Offers a Good Thermal Barrier to Protect the Wiring Area
- This CRA Structural Housing can be Used with any Manufacturer's Standard 60 × 245 mm (2.36 x 9.64") or 60 × 122 mm (2.36 x 4.8") Heaters
- Wiring Entrance 22 mm (7/8") Diameter at both ends, for 13 mm (1/2") Trade Size Electrical Fittings

### Easiest Replacement of Heaters in the Industry

E-Mitters are easily replaced by removing the top cover. Wiring entrance side covers are not affected. The heater lead wires are insulated with ceramic beads and connected to ceramic terminal blocks. Heaters can be wired to function individually or grouped into heating zones.

**DANGER:** Hazard of Fire. These heaters are not for use in atmospheres where flammable vapors, gases or liquids are present as defined in the National Electrical Code. Where solvents, water, etc. are being evaporated from the process it is necessary to provide substantial quantities of ventilating air to carry away all resulting vapors.



**Steps to Design a Custom CRA E-Mitter Linear Assembly from Standard Components**

- 1) Select the Housing
- 2) Select the E-Mitters Series
- 3) Select the Reflectors
- 4) Select the Terminal Blocks

**WARNING:** Hazard of Electric Shock. Installation must be grounded to earth to avoid shock hazard. Disconnect power to installation before servicing or installing heater.

**WARNING:** Do not use Copper Wire to make connections inside this heater. High temperatures will oxidize copper. Use of nickel plated or nickel clad insulated copper wire is recommended. Wire insulation rating must be suitable for the ambient temperature of the wiring installation.

## Standard CRK Linear Housings



Standard housings are available from as assembled stock in 0.3 m (10"), 0.51 m (20"), 0.8 m (30"), 1.02 m (40") and 1.3 m (50") lengths. Other housing lengths can be made to your requirements.

### Standard Housing Lengths Table

Housing Model Number	Nominal Housing Length		"A" Dim. inch	Examples of Possible E-Mitter Configurations	Maximum Power KW
	inch	mm			
CRK00024	5	127	5.19	1 CRC	0.5
CRK00001	10	254	10.13	1 CRB	1
CRK00023	15	381	15.06	3 CRCs (1 CRB and 1 CRC)	1.5
CRK00002	20	508	20.00	2 CRBs (1 CRB and 2 CRCs)	2
CRK00022	25	635	24.94	5 CRCs a combination of (CRBs and CRCs)	2.5
CRK00003	30	762	29.88	3 CRBs a combination of (CRBs and CRCs)	3
CRK00019	35	889	34.81	7 CRCs a combination of (CRBs and CRCs)	3.5
CRK00004	40	1016	39.75	4 CRBs a combination of (CRBs and CRCs)	4
CRK00021	50	1270	49.3	5 CRBs a combination of (CRBs and CRCs)	5
CRK00027	60	1524	59.50	6 CRBs a combination of (CRBs and CRCs)	6
CRK00029	70	1778	69.38	7 CRBs a combination of (CRBs and CRCs)	7

CRK housings come complete with housing body, end plates, 5/16-18 mounting bolts, cover and ground lug.

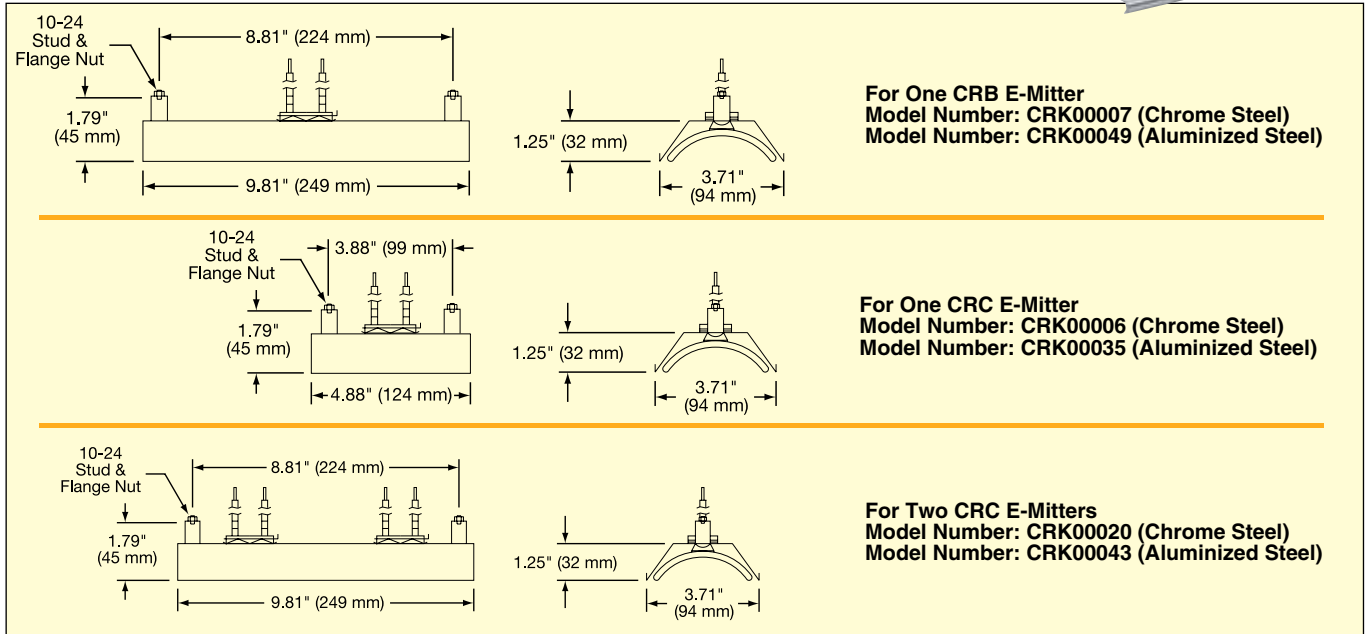
**Note:** These housings do not include the reflectors needed for mounting the heaters or the terminal block (Model number EHD-108-101) required for wiring each heater.





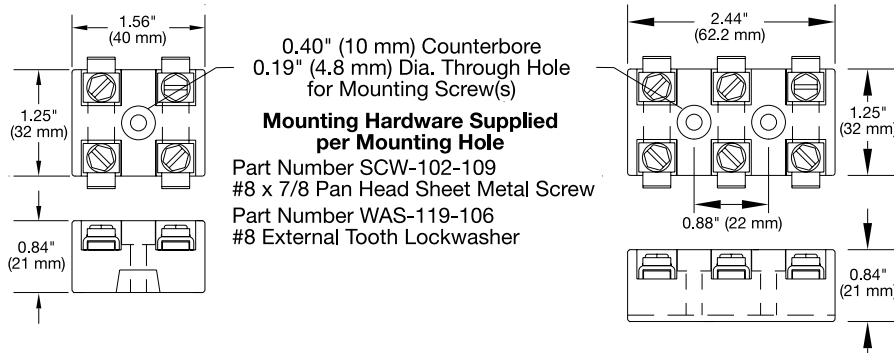
## Reflectors for Ceramic E-Mitters For CRB and CRC E-Mitters

- Designed to Withstand Bending and Heat Distortion
- Made from Highly Polished Chrome Steel or Optional Aluminized Steel for Extreme Temperatures and Harsh Environments
- Will Withstand High Operating Temperatures
- Available in Three Standard Sizes; Includes Standoffs and Hardware
- Easy Installation into CRA Linear Structural Housing Assemblies (Except CRK00032)



## Standard Ceramic Terminal Block for Internal Wiring For Internal Connections Within Heater Assemblies, CRA Linear Structural Housings and ARA Arrays

- Maximum Voltage: 600 Vac
- Maximum Current: 20 Amps
- Maximum Temperature: 450°C (842°F)
- AWG: 20 to 12 ga. wire
- Hardware: Stainless Steel
- Body Material: Steatite



## Curved Face Ceramic E-Mitters

60 x 245 mm (2.36 x 9.65")

### CRB Series

#### Optional Features

- Additional Power or Thermocouple Lead Lengths
- Two-Piece Wave Mounting Clip
- Reflectors and Other Accessories
- Arrays and Power/Temperature Control Panels



CRB Series in rose (cold) to grey (hot) shown smaller than actual size.

### Watts/Square Inch vs. Temperature Data

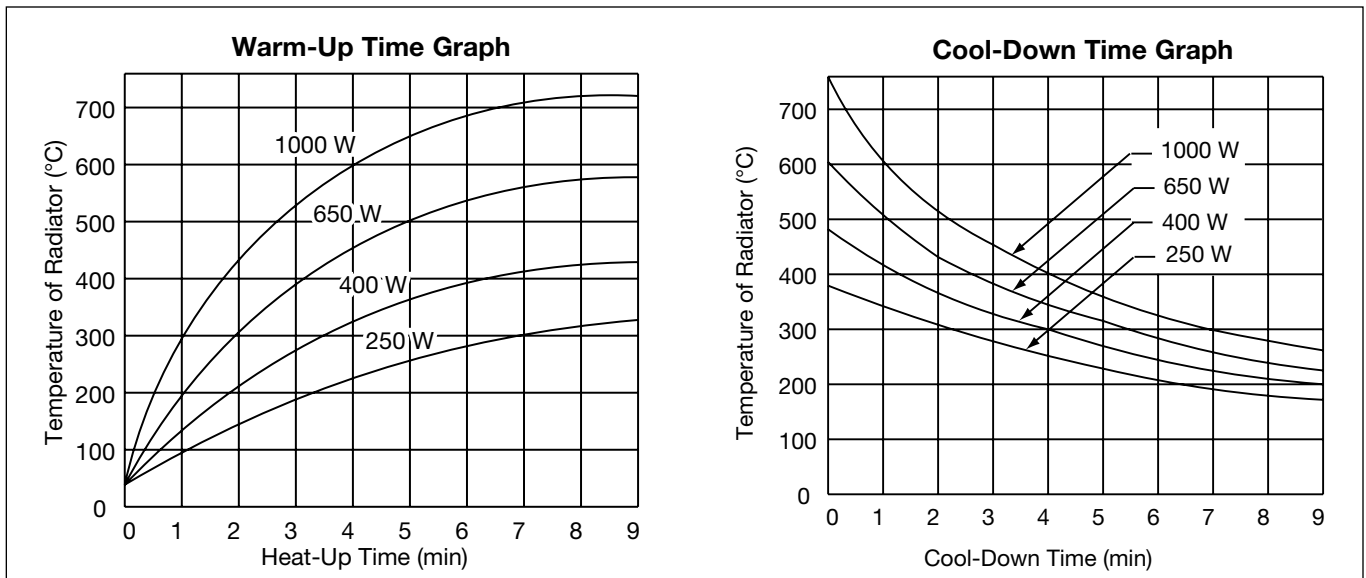
Watts	Surface Watts/in <sup>2</sup> *	Heater Body °F Rise	Heater Body Temp @ 72°F**	Primary Emitted Wavelength*** (μm)
100	4.32	357	429	5.87
125	5.40	426	498	5.45
150	6.48	488	560	5.11
163	7.04	518	590	4.97
200	8.64	596	668	4.63
250	10.80	684	756	4.29
300	12.95	756	828	4.05
325	14.03	788	860	3.95
350	15.11	817	889	3.87
400	17.27	870	942	3.72
500	21.59	960	1032	3.50
600	25.91	1043	1115	3.31
650	28.07	1084	1156	3.23
700	30.23	1126	1198	3.15
750	32.39	1169	1241	3.07
800	34.55	1211	1283	2.99
875	37.78	1271	1343	2.89
900	38.86	1290	1362	2.86
1000	43.18	1348	1420	2.78

\* Watt density calculated using heater face surface area.

\*\* E-Mitter heater body temperature as measured with internal thermocouple when mounted facedown in stock CRK reflector and operating in 22°C (72°F) room ambient.

\*\*\* Peak infrared radiation wavelength as calculated from Wien's Law, for operating temperature shown. Expressed in microns (μm).

### Typical Heating and Cooling Behavior of CRB Ceramic E-Mitters





CRB Series in rose (cold) to grey (hot) shown smaller than actual size.

**Semi-Finished Stock CRB E-Mitters (Five Business Day Manufacturing)**

Semi-Finished Series CRB E-Mitters listed to the right are stocked ready for color glazing. Colors available are metamorphing rose (cold) to grey (hot), traditional white, metamorphing yellow (cold) to orange (hot), and black.

They can be terminated with beaded leads up to 152 mm (6") long with spliced-on lead wire for lengths beyond 152 mm (6") and straight, ring, or spade terminals. Some are available with a thermocouple (any length).

A part number will be assigned at time of order.

Wattage	Voltage	Watt Density*		Heater Body** Temperature (Typical)		Optional Thermocouple (Any Length)
		Watts/in <sup>2</sup>	Watts/cm <sup>2</sup>	°F	°C	
400	230	17.27	2.68	942	506	N/A
650	230	28.07	4.35	1156	624	Type K
650	480	28.07	4.35	1156	624	N/A
1000	230	43.18	6.69	1420	771	Type K
1000	480	43.18	6.69	1420	771	Type J or K

**Standard (Non-Stock) CRB E-Mitters**

E-Mitters listed have 89 mm (3.5") ceramic bead insulated leads, #8-10 spade terminals, and a one-piece spring clip for mounting.

**To Order Visit [omega.com/crb\\_series](http://omega.com/crb_series) for Pricing and Details**

Model Number		Wattage	Voltage Vac	Color	Watt Density*		Heater Body Temperature** (Typical Operating)	
Without Thermocouple	Standard Type K Thermocouple				Watts/in <sup>2</sup>	Watts/cm <sup>2</sup>	°F	°C
CRB10216	CRB10217	150	220/240	Rose to Grey	6.48	1.00	560	293
CRB00216	CRB00217	150	220/240	White	6.48	1.00	560	293
CRB10006	CRB10008	250	220/240	Rose to Grey	10.80	1.67	756	402
CRB00006	CRB00008	250	220/240	White	10.80	1.67	756	402
CRB10014	CRB10016	400	220/240	Rose to Grey	17.27	2.68	942	506
CRB00014	CRB00016	400	220/240	White	17.27	2.68	942	506
CRB10020	CRB10022	650	120	Rose to Grey	28.07	4.35	1156	624
CRB00020	CRB00022	650	120	White	28.07	4.35	1156	624
CRB10023	CRB10025	650	220/240	Rose to Grey	28.07	4.35	1156	624
CRB00023	CRB00025	650	220/240	White	28.07	4.35	1156	624
CRB10088	CRB10165	650	480	Rose to Grey	28.07	4.35	1156	624
CRB00088	CRB00165	650	480	White	28.07	4.35	1156	624
CRB10028	CRB10030	1000	120	Rose to Grey	43.18	6.69	1420	771
CRB00028	CRB00030	1000	120	White	43.18	6.69	1420	771
CRB10031	CRB10033	1000	220/240	Rose to Grey	43.18	6.69	1420	771
CRB00031	CRB00033	1000	220/240	White	43.18	6.69	1420	771
CRB10089	CRB10045	1000	480	Rose to Grey	43.18	6.69	1420	771
CRB00089	CRB00045	1000	480	White	43.18	6.69	1420	771

\* Watt density calculated using heater face surface area.

\*\* E-Mitter heater body temperature as measured with internal thermocouple when mounted face down in stock CRK reflector and operating in 22°C (72°F) room ambient.

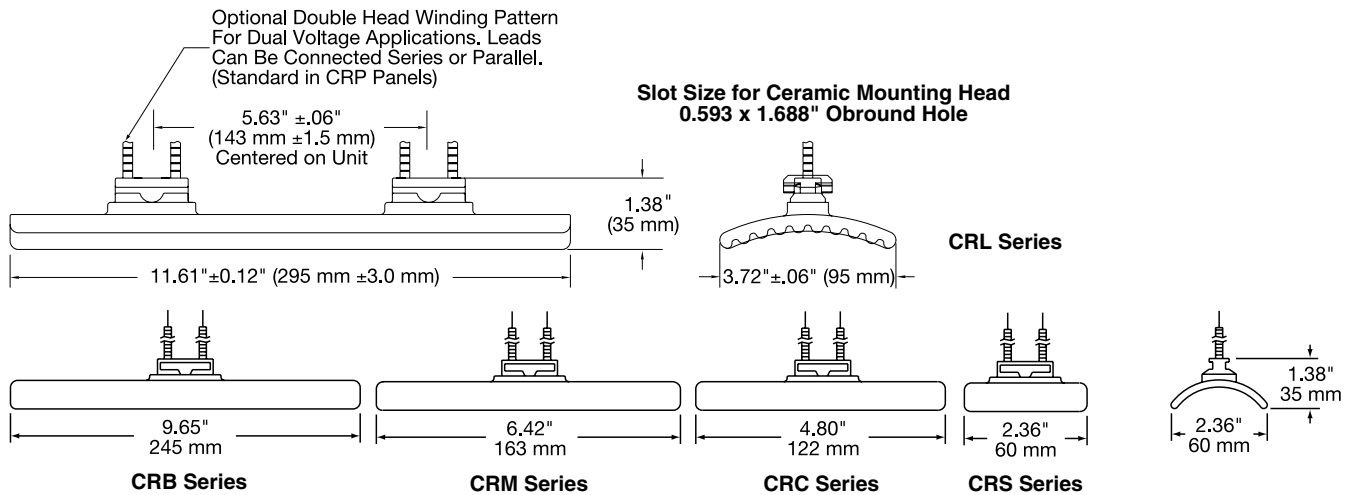
Ordering Example: CRB10216, curved faced radiant heater, 150 W 220/240 Vac, rose to grey.



## Curved Face Ceramic Radiant Heaters

### Ceramic E-Mitters

- 5 Standard Solid Curved Face Sizes to Accomodate a Wide Range of New or Existing Applications
- Universal Mount Designed to be Dropped into Existing Systems Regardless of Manufacturer
- Standard Colors are Metamorphing Rose (Cold) to Grey (Hot), and Traditional White. Optional Colors are Metamorphing Yellow (Cold) to Orange (Hot), and Black
- Standard Stocked Voltage: 120 or 220/240V as Noted; Other Voltages are Available
- Available with Built-In Type K Thermocouple— Type J Thermocouple and Low Noise Options are Also Available
- Long Operating Life—Over 10,000-Plus Hours of Continuous Operation Under Normal Conditions
- Performance is Unaffected By Vibration or Adverse Atmospheric Conditions
- 2.5 to 6  $\mu$ m Infrared Radiation Wavelength



### Custom Engineered/Manufactured Heaters

Understanding that an electric heater can be very application specific, for sizes and ratings not listed, OMEGA® can manufacture a Ceramic E-Mitter to meet your requirements.

### Please Specify the Following:

- **Colors:** Standard are metamorphing rose and straight white, optional are metamorphing yellow and straight black
- **Wattage:** Up to 43 watts/in<sup>2</sup> (6.7 watts/cm<sup>2</sup>)
- **Voltage:** 120, 208, 240, 277, 480 Vac and others (dependent on design)
- **Thermocouple:** Standard Type K (Type J optional) or Low Noise Type K (Type J optional)

## Accessories and Custom Configurations

- Designed for use with E-Mitters CRB and CRC
- Lightweight Extruded Aluminum Housing with 5/16-18 Mounting Bolts
- E-Mitters are Easily Replaced by Removing the Top Cover
- Internal Mounting Hole Pattern Simplifies Mixing and Matching E-Mitter Sizes and Ratings
- Space Between Reflector and Housing Wall Offers a Good Thermal Barrier to Protect the Wiring Area
- This CRA Structural Housing can be Used with any Manufacturer's Standard 60 x 245 mm (2.36 x 9.64") or 60 x 122 mm (2.36 x 4.8") Heaters
- Wiring Entrance 22 mm (7/8") Diameter at both ends, for 13 mm (1/2") Trade Size Electrical Fittings

### Easiest Replacement of Heaters in the Industry

E-Mitters are easily replaced by removing the top cover. Wiring entrance side covers are not affected. The heater lead wires are insulated with ceramic beads and connected to ceramic terminal blocks. Heaters can be wired to function individually or grouped into heating zones.

**DANGER:** Hazard of Fire. These heaters are not for use in atmospheres where flammable vapors, gases or liquids are present as defined in the National Electrical Code. Where solvents, water, etc. are being evaporated from the process it is necessary to provide substantial quantities of ventilating air to carry away all resulting vapors.



**Steps to Design a Custom CRA E-Mitter Linear Assembly from Standard Components**

- 1) Select the Housing
- 2) Select the E-Mitters Series
- 3) Select the Reflectors
- 4) Select the Terminal Blocks

**WARNING:** Hazard of Electric Shock. Installation must be grounded to earth to avoid shock hazard. Disconnect power to installation before servicing or installing heater.

**WARNING:** Do not use Copper Wire to make connections inside this heater. High temperatures will oxidize copper. Use of nickel plated or nickel clad insulated copper wire is recommended. Wire insulation rating must be suitable for the ambient temperature of the wiring installation.

## Standard CRK Linear Housings



**Standard housings are available from as assembled stock in 0.3 m (10"), 0.51 m (20"), 0.8 m (30"), 1.02 m (40") and 1.3 m (50") lengths. Other housing lengths can be made to your requirements.**

### Standard Housing Lengths Table

Housing Model Number	Nominal Housing Length		"A" Dim. inch	Examples of Possible E-Mitter Configurations	Maximum Power KW
	inch	mm			
CRK00024	5	127	5.19	1 CRC	0.5
CRK00001	10	254	10.13	1 CRB	1
CRK00023	15	381	15.06	3 CRCs (1 CRB and 1 CRC)	1.5
CRK00002	20	508	20.00	2 CRBs (1 CRB and 2 CRCs)	2
CRK00022	25	635	24.94	5 CRCs a combination of (CRBs and CRCs)	2.5
CRK00003	30	762	29.88	3 CRBs a combination of (CRBs and CRCs)	3
CRK00019	35	889	34.81	7 CRCs a combination of (CRBs and CRCs)	3.5
CRK00004	40	1016	39.75	4 CRBs a combination of (CRBs and CRCs)	4
CRK00021	50	1270	49.3	5 CRBs a combination of (CRBs and CRCs)	5
CRK00027	60	1524	59.50	6 CRBs a combination of (CRBs and CRCs)	6
CRK00029	70	1778	69.38	7 CRBs a combination of (CRBs and CRCs)	7

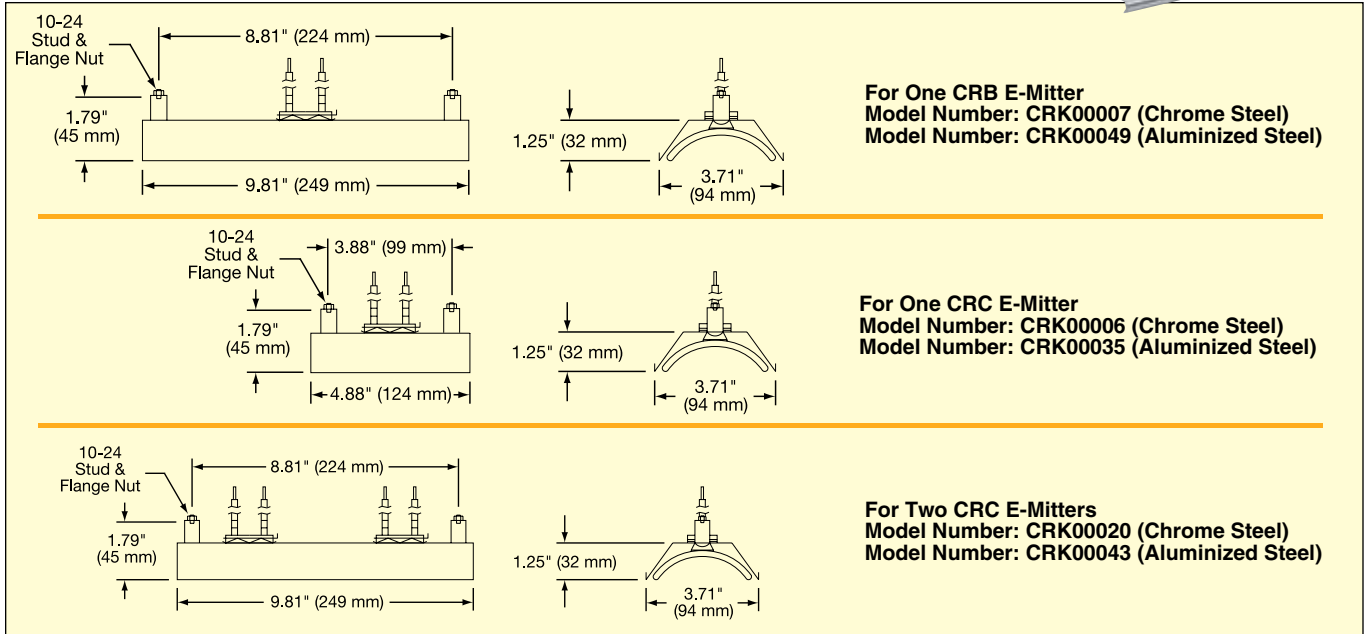
CRK housings come complete with housing body, end plates, 5/16-18 mounting bolts, cover and ground lug.

**Note:** These housings do not include the reflectors needed for mounting the heaters or the terminal block (Model number EHD-108-101) required for wiring each heater.



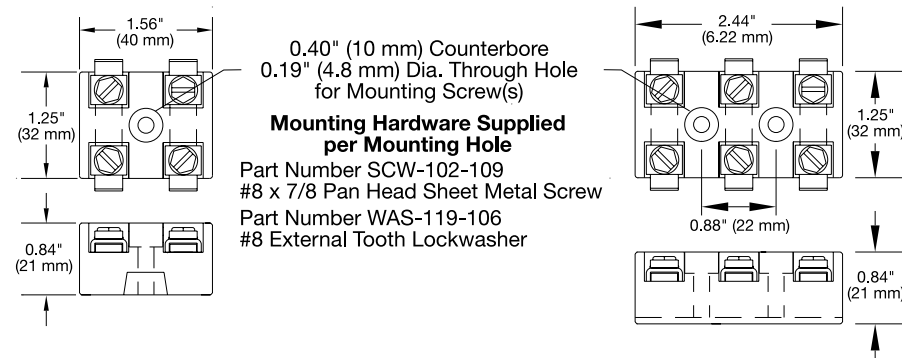
## Reflectors for Ceramic E-Mitters For CRB and CRC E-Mitters

- Designed to Withstand Bending and Heat Distortion
- Made from Highly Polished Chrome Steel or Optional Aluminized Steel for Extreme Temperatures and Harsh Environments
- Will Withstand High Operating Temperatures
- Available in Three Standard Sizes; Includes Standoffs and Hardware
- Easy Installation into CRA Linear Structural Housing Assemblies (Except CRK00032)



## Standard Ceramic Terminal Block for Internal Wiring For Internal Connections Within Heater Assemblies, CRA Linear Structural Housings and ARA Arrays

- Maximum Voltage: 600 Vac
- Maximum Current: 20 Amps
- Maximum Temperature: 450°C (842°F)
- AWG: 20 to 12 ga. wire
- Hardware: Stainless Steel
- Body Material: Steatite



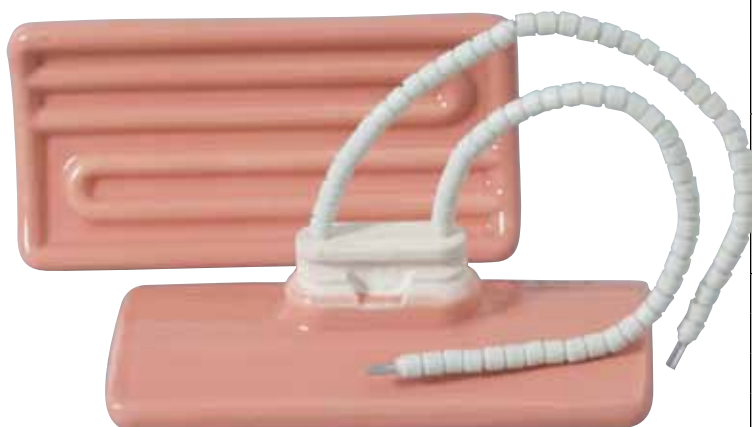


## Curved Face Ceramic E-Mitters 60 x 122 mm (2.36 x 4.80")

### CRC Series

#### Optional Features

- Additional Power or Thermocouple Lead Lengths
- Two-Piece Wave Mounting Clip
- Reflectors and Other Accessories
- Arrays and Power/Temperature Control Panels



CRC Series in rose (cold) to grey (hot) shown smaller than actual size.

#### Watts/Square Inch vs. Temperature Data

Watts	Surface Watts/in <sup>2</sup> *	Heater Body °F Rise	Heater Body Temp @ 72°F**	Primary Emitted Wavelength*** (µm)
100	8.64	596	668	4.63
125	10.80	684	756	4.29
150	12.95	756	828	4.05
163	14.08	789	861	3.95
200	17.27	870	942	3.72
250	21.59	960	1032	3.50
300	25.91	1043	1115	3.31
325	28.07	1084	1156	3.23
350	30.23	1126	1198	3.15
375	32.39	1169	1241	3.07
400	34.55	1211	1283	2.99
500	43.18	1348	1420	2.78

E-Mitters listed have 89 mm (3.5") ceramic bead insulated leads, #8-10 spade terminals, and a one-piece spring clip for mounting.

### To Order Visit [omega.com/crc\\_series](http://omega.com/crc_series) for Pricing and Details

Model Number			Wattage	Voltage	Color	Watt Density*		Heater Body Temperature** (Typical Operating)	
Without Thermocouple	Standard Type K Thermocouple	With Type J Thermocouple				(Watts/in <sup>2</sup> )	(Watts/cm <sup>2</sup> )	°F	°C
CRC10005	CRC10007	—	125	220/240	Rose to Grey	10.80	1.67	756	402
CRC00005	CRC00007	—	125	220/240	White	10.80	1.67	756	402
CRC10013	CRC10015	—	200	220/240	Rose to Grey	17.27	2.68	942	506
CRC00013	CRC00015	—	200	220/240	White	17.27	2.68	942	506
CRC10018	CRC10020	—	325	120	Rose to Grey	28.07	4.35	1156	624
CRC00018	CRC00020	—	325	120	White	28.07	4.35	1156	624
CRC10021	CRC10023	—	325	220/240	Rose to Grey	28.07	4.35	1156	624
CRC00021	CRC00023	—	325	220/240	White	28.07	4.35	1156	624
CRC10064	CRC10140	CRC10014	325	480	Rose to Grey	28.07	4.35	1156	624
CRC00064	CRC00140	—	325	480	White	28.07	4.35	1156	624
CRC10024	CRC10026	—	500	120	Rose to Grey	43.18	6.69	1420	771
CRC00024	CRC00026	—	500	120	White	43.18	6.69	1420	771
CRC10027	CRC10029	—	500	220/240	Rose to Grey	43.18	6.69	1420	771
CRC00027	CRC00029	—	500	220/240	White	43.18	6.69	1420	771
CRC10066	CRC10141	—	500	480	Rose to Grey	43.18	6.69	1420	771

\* Watt density calculated using heater face surface area.

\*\* E-Mitter [operating in 22°C (72°F) ambient] body temperature measured with internal thermocouple.

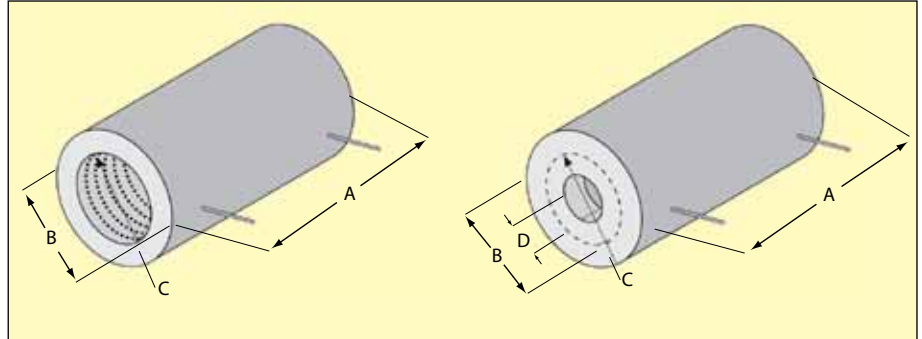
\*\*\* Peak infrared radiation wavelength as calculated from Wien's Law, for operating temperature shown. Expressed in microns (µm).

Ordering Example: CRC10007, radiant heater with K thermocouple, 125 watts, 220/240 Vac rose to grey.

# HIGH-TEMPERATURE, LOW-MASS, VACUUM-FORMED CERAMIC RADIANT HEATERS

## Full Cylinder Heaters

### CRFC Series



- ✓ Rated to 982°C (1800°F)
- ✓ Fast Heat-Up and Cool Down
- ✓ Greater Temperature Uniformity
- ✓ Lower Operating Costs
- ✓ Heating Element and Insulation in One

### APPLICATIONS

- ✓ Tube Furnaces
- ✓ Annealing Ovens
- ✓ Pipe Heating

OMEGALUX® CRFC and CRWS Series radiant heaters are produced using high-quality and high-purity, vacuum-formed ceramic fiber, with low-sodium inorganic bond. Helically wound iron-chrome-aluminum wire elements assure top quality in this extra-efficient, low watt density series. The helically wound wire is embedded into the vacuum-formed ceramic fiber.

### SPECIFICATIONS

**Full and Semi Cylinders Models:**  
**Wattage:** 220 to 9500 Watts  
**Voltage:** 60, 120 and 240 Vac  
**Leads:** 10 Standard

*Note: CR Series heaters are intended for "radiant" heat. Never let material to be heated come into contact with the face of the heater. It is recommended that the OD of tubes, pipes, or circular items to be used with the circular heaters be kept a minimum of 1/2" under the nominal inside "C" dimension.*

To Order							
		Dimensions in cm (" )				Without Vestibules	With Vestibules
Watts	Volts	A*	B	C	D	Model No.	Model No.
220	60	15 (6)	8 (3)	2 (0.75)	0.6 (0.25)	CRFC-756/60-A	CRFC-756/60-C-A
440	120	30 (12)	8 (3)	2 (0.75)	0.6 (0.25)	CRFC-7512/120-A	CRFC-7512/120-C-A
250	60	15 (6)	8 (3)	3 (1)	1 (0.5)	CRFC-16/60-A	CRFC-16/60-C-A
500	120	30 (12)	8 (3)	3 (1)	1 (0.5)	CRFC-112/120-A	CRFC-112/120-C-A
300	60	15 (6)	8 (3)	3 (1.25)	2 (0.75)	CRFC-1256/60-A	CRFC-1256/60-C-A
600	120	30 (12)	8 (3)	3 (1.25)	2 (0.75)	CRFC-12512/120-A	CRFC-12512/120-C-A
350	60	15 (6)	9 (3.5)	4 (1.5)	3 (1)	CRFC-156/60-A	CRFC-156/60-C-A
650	120	30 (12)	9 (3.5)	4 (1.5)	3 (1)	CRFC-1512/120-A	CRFC-1512/120-C-A
435	120	15 (6)	10 (4)	5 (2)	4 (1.5)	CRFC-26/120-A	CRFC-26/120-C-A
870	120	30 (12)	10 (4)	5 (2)	4 (1.5)	CRFC-212/120-A	CRFC-212/120-C-A
700	115	15 (6)	13 (5)	8 (3)	5 (2)	CRFC-36/115-A	CRFC-36/115-C-A
1400	240	30 (12)	13 (5)	8 (3)	5 (2)	CRFC-312/240-A	CRFC-312/240-C-A
2100	240	46 (18)	13 (5)	8 (3)	5 (2)	CRFC-318/240-A	CRFC-318/240-C-A
900	240	15 (6)	18 (7)	10 (4)	6 (2.5)	CRFC-46/240-A	CRFC-46/240-C-A
1800	240	30 (12)	18 (7)	10 (4)	6 (2.5)	CRFC-412/240-A	CRFC-412/240-C-A
2700	240	46 (18)	18 (7)	10 (4)	6 (2.5)	CRFC-418/240-A	CRFC-418/240-C-A
1130	240	15 (6)	23 (9)	13 (5)	9 (3.5)	CRFC-56/240-A	CRFC-56/240-C-A
2260	240	30 (12)	23 (9)	13 (5)	9 (3.5)	CRFC-512/240-A	CRFC-512/240-C-A
3390	240**	46 (18)	23 (9)	13 (5)	9 (3.5)	CRFC-518/240-A	CRFC-518/240-C-A
4520	240**	61 (24)	23 (9)	13 (5)	9 (3.5)	CRFC-524/240-A	CRFC-524/240-C-A
1350	240	15 (6)	25 (10)	15 (6)	11 (4.5)	CRFC-66/240-A	CRFC-66/240-C-A
2700	240**	30 (12)	25 (10)	15 (6)	11 (4.5)	CRFC-612/240-A	CRFC-612/240-C-A
4000	240**	46 (18)	25 (10)	15 (6)	11 (4.5)	CRFC-618/240-A	CRFC-618/240-C-A

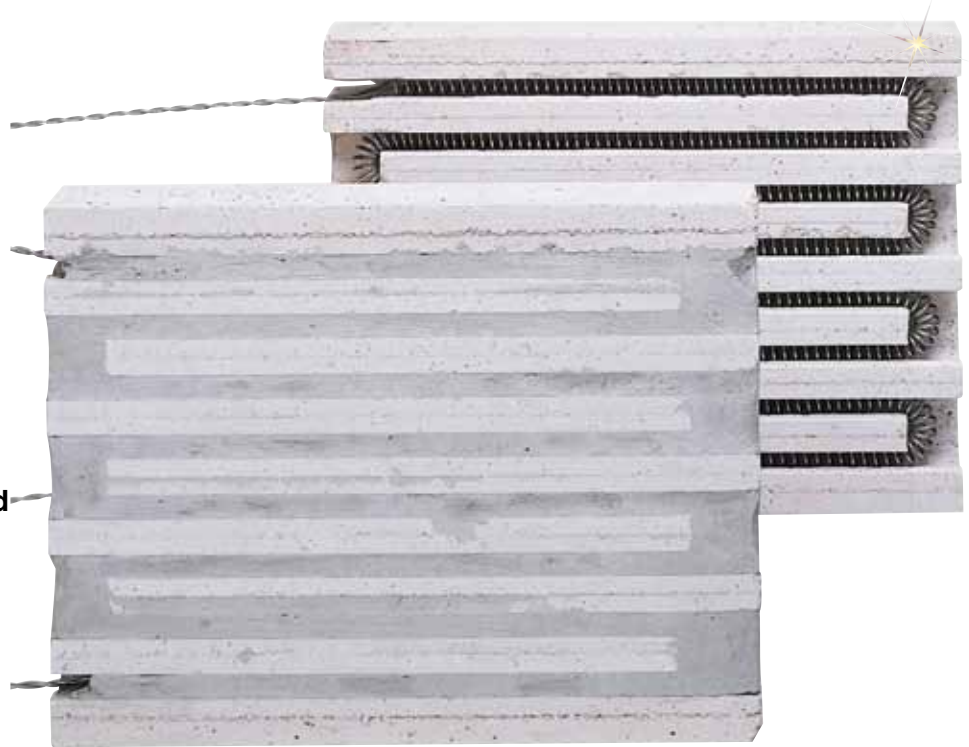
\* Add 3" for units with vestibules. \*\* Dual 240 Vac circuits.

Ordering Example: CRFC-156/60-A, 350 watt heater with 4 cm (1.5") ID, 15 cm (6") long without vestibules.



# CERAMIC HEATER PLATES

## CRHF Series With Flange



- ✓ 980°C (1800°F) Operating Temperature for Embedded Heating Element Construction
- ✓ 980°C (1800°F) Operating Temperature for Exposed Element Construction
- ✓ Imbedded Heating Elements Standard
- ✓ Optional Exposed Heating Elements

Imbedded heating elements standard, exposed optional, no additional cost.

CRHF-18650/230 shown smaller than actual size.

## With Flanges

### To Order

Model Number	Wattage	Dimensions: mm (in)				Voltage	Weight kg (lb)
		A	B	C	D		
CRHF-18650/230	2700	457 (18)	168 (6 $\frac{5}{8}$ )	38 (1 $\frac{1}{2}$ )	244 (9 $\frac{5}{8}$ )	230	9.8 (21.6)
CRHF-21650/230	3150	533 (21)	168 (6 $\frac{5}{8}$ )	38 (1 $\frac{1}{2}$ )	244 (9 $\frac{5}{8}$ )	230	11.4 (25.2)
CRHF-24650/230	3600	610 (24)	168 (6 $\frac{5}{8}$ )	38 (1 $\frac{1}{2}$ )	244 (9 $\frac{5}{8}$ )	230	13.1 (28.8)
CRHF-121250/230	3600	305 (12)	321 (12 $\frac{5}{8}$ )	38 (1 $\frac{1}{2}$ )	397 (15 $\frac{5}{8}$ )	230	10.6 (23.4)
CRHF-151250/230	4500	381 (15)	321 (12 $\frac{5}{8}$ )	38 (1 $\frac{1}{2}$ )	397 (15 $\frac{5}{8}$ )	230	13.3 (29.3)
CRHF-181250/230	5400	457 (18)	321 (12 $\frac{5}{8}$ )	38 (1 $\frac{1}{2}$ )	397 (15 $\frac{5}{8}$ )	230	15.9 (35.1)
CRHF-211250/230	6300	533 (21)	321 (12 $\frac{5}{8}$ )	38 (1 $\frac{1}{2}$ )	397 (15 $\frac{5}{8}$ )	230	18.6 (41)
CRHF-241250/230	7200	610 (24)	321 (12 $\frac{5}{8}$ )	38 (1 $\frac{1}{2}$ )	397 (15 $\frac{5}{8}$ )	230*	21.2 (46.8)
CRHF-181850/230	7100	457 (18)	473 (18 $\frac{5}{8}$ )	51 (2)	549 (21 $\frac{5}{8}$ )	230*	28.2 (62.1)
CRHF-211850/230	9450	533 (21)	473 (18 $\frac{5}{8}$ )	51 (2)	549 (21 $\frac{5}{8}$ )	230*	32.8 (72.4)
CRHF-241850/460	10800	610 (24)	473 (18 $\frac{5}{8}$ )	51 (2)	549 (21 $\frac{5}{8}$ )	460	37.6 (82.8)
CRHF-242450/460	14400	610 (24)	625 (24 $\frac{5}{8}$ )	51 (2)	702 (27 $\frac{3}{4}$ )	460†	48 (105.8)

Comes complete with operator's manual.

\* These heaters contain two 230V circuits which may be wired in parallel for 230V operation or in series for 460V operation.

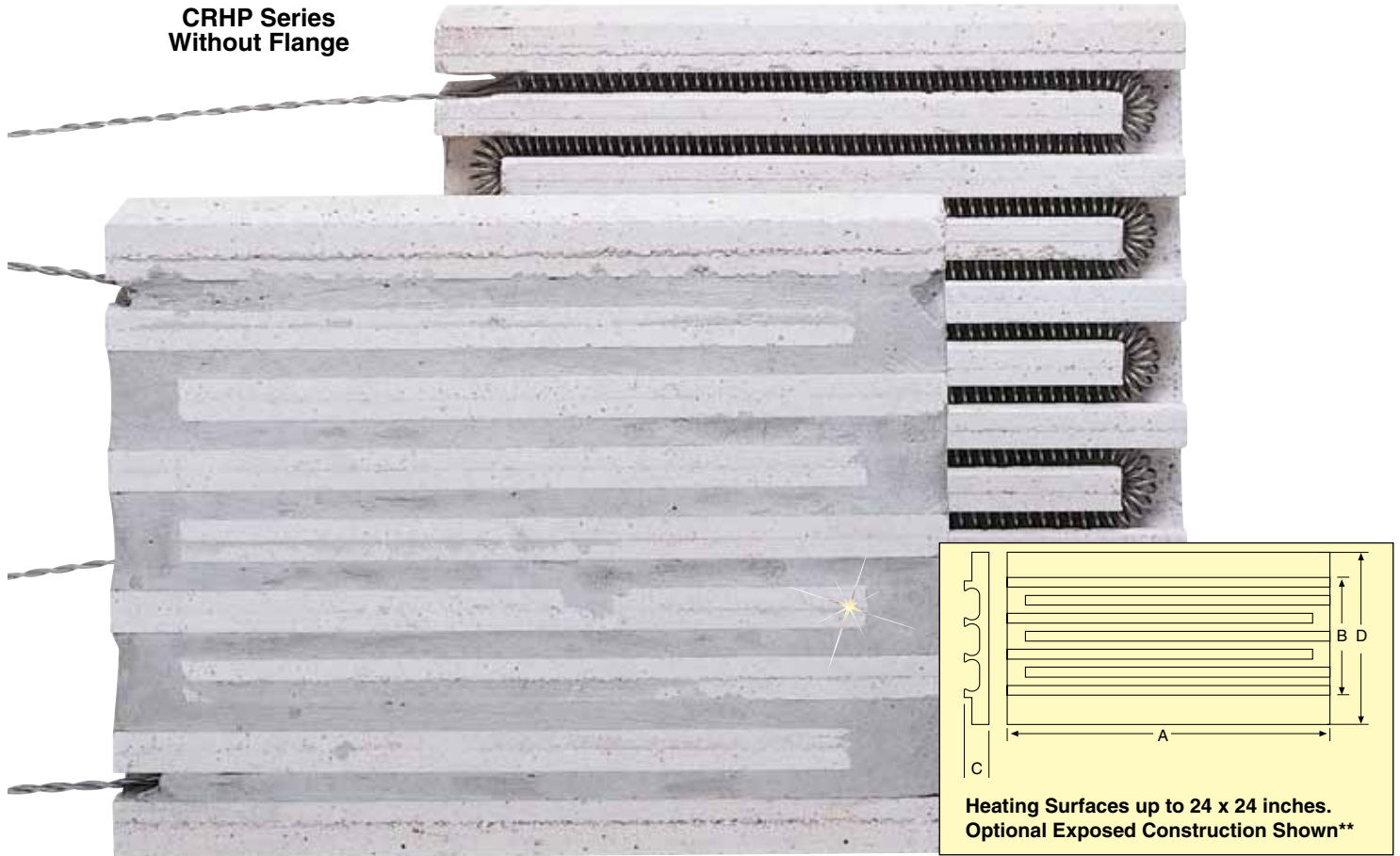
\*\* Add suffix "-E" for exposed element construction, same price.

† Indicates heater containing two 460V circuits.

Ordering Examples: CRHF-21650/230, flanged ceramic heater plate, 3150 Watts, 230 Vac.

CRHF-21650/230-E, flanged ceramic heater plate, 3150 Watts, 230 Vac.

**CRHP Series  
Without Flange**



Heating Surfaces up to 24 x 24 inches.  
Optional Exposed Construction Shown\*\*

OMEGALUX® ceramic heater plates provide surface temperatures of up to 980°C (1800°F). The large, 16 mm (5/8") ID grooves permit the use of exceptionally heavy gauge heating wire for low element watt densities and high wattage per square inch of radiating surface. The elements can be imbedded in ceramic, or exposed, depending on requirements.

Special sizes, shapes, wattages, voltages, thermocouple access holes and extra long braided leads are available. Contact OMEGALUX Sales department for ordering information.

**Without Flanges**

To Order						
Model Number	Wattage	Dimensions: mm (in)			Voltage	Wt. lb (kg)
		A	B	C		
CRHP-12650/230	1800	305 (12)	168 (6 5/8)	38 (1 1/2)	230	4.5 (9.9)
CRHP-15650/230	2250	381 (15)	168 (6 5/8)	38 (1 1/2)	230	5.6 (12.4)
CRHP-18650/230	2700	457 (18)	68 (6 5/8)	38 (1 1/2)	230	6.8 (14.9)
CRHP-21650/230	3150	533 (21)	68 (6 5/8)	38 (1 1/2)	230	7.9 (17.5)
CRHP-24650/230	3600	610 (24)	68 (6 5/8)	38 (1 1/2)	230	9 (19.8)
CRHP-121250/230	3600	305 (12)	321 (12 5/8)	38 (1 1/2)	230	8.6 (18.9)
CRHP-151250/230	4500	381 (15)	321 (12 5/8)	38 (1 1/2)	230	10.8 (23.8)
CRHP-181250/230	5400	457 (18)	321 (12 5/8)	38 (1 1/2)	230	12.8 (28.4)
CRHP-211250/230	4500	533 (21)	321 (12 5/8)	38 (1 1/2)	230	15 (33.1)
CRHP-241250/230	7200	610 (24)	321 (12 5/8)	38 (1 1/2)	230*	17.1 (37.8)
CRHP-181850/230	7100	457 (18)	473 (18 5/8)	51 (2)	230*	24.3 (53.6)
CRHP-211850/230	9450	533 (21)	473 (18 5/8)	51 (2)	230*	28.4 (62.6)
CRHP-241850/460	10800	610 (24)	473 (18 5/8)	51 (2)	460	32.3 (71.3)
CRHP-242450/460	14400	610 (24)	625 (24 5/8)	51 (2)	460†	42.8 (94.3)

Comes complete with operator's manual.

\*These heaters contain two 230V circuits which may be wired in parallel for 230V operation or in series for 460V operation.

\*\*Add suffix "-E" for exposed element construction, same price.

† Indicates heater containing two 460V circuits.

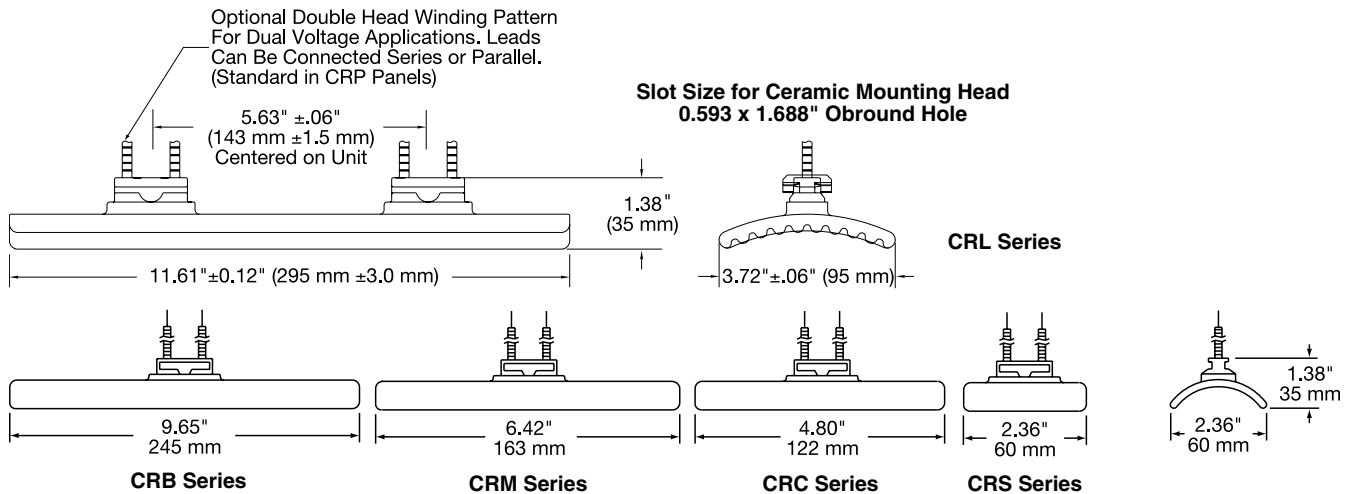
Ordering Example: CRHP-21650/230, ceramic heater plate, 3150 Watts, 230 Vac.



## Curved Face Ceramic Radiant Heaters

### Ceramic E-Mitters

- 5 Standard Solid Curved Face Sizes to Accomodate a Wide Range of New or Existing Applications
- Universal Mount Designed to be Dropped into Existing Systems Regardless of Manufacturer
- Standard Colors are Metamorphing Rose (Cold) to Grey (Hot), and Traditional White. Optional Colors are Metamorphing Yellow (Cold) to Orange (Hot), and Black
- Standard Stocked Voltage: 120 or 220/240V as Noted; Other Voltages are Available
- Available with Built-In Type K Thermocouple— Type J Thermocouple and Low Noise Options are Also Available
- Long Operating Life—Over 10,000-Plus Hours of Continuous Operation Under Normal Conditions
- Performance is Unaffected By Vibration or Adverse Atmospheric Conditions
- 2.5 to 6  $\mu\text{m}$  Infrared Radiation Wavelength



### Custom Engineered/Manufactured Heaters

Understanding that an electric heater can be very application specific, for sizes and ratings not listed, OMEGA<sup>®</sup> can manufacture a Ceramic E-Mitter to meet your requirements.

### Please Specify the Following:

- **Colors:** Standard are metamorphing rose and straight white, optional are metamorphing yellow and straight black
- **Wattage:** Up to 43 watts/in<sup>2</sup> (6.7 watts/cm<sup>2</sup>)
- **Voltage:** 120, 208, 240, 277, 480 Vac and others (dependent on design)
- **Thermocouple:** Standard Type K (Type J optional) or Low Noise Type K (Type J optional)

## Curved Face Ceramic E-Mitters 95 x 295 mm (3.72 x 11.61")

### CRL Series

#### Optional Features

- Additional Power or Thermocouple Lead Lengths
- Two-Piece Wave Mounting Clip
- Reflectors and Other Accessories
- Arrays and Power/Temperature Control Panels

E-Mitters listed have 152 mm (6") ceramic bead insulated leads, #8-10 spade terminals, and one-piece spring clips for mounting in 20 or 22 gauge sheet metal.



CRL Series in rose (cold) to grey (hot) shown smaller than actual size.

**To Order Visit [omega.com/crl\\_series](http://omega.com/crl_series) for Pricing and Details**

Model Number			Wattage	Voltage Vac	Color	Watt Density*		Heater Body Temperature**		Peak Emitted Wavelength***
Without Thermocouple	Standard Type K Thermocouple	Low Noise Type K Thermocouple				W/in <sup>2</sup>	W/cm <sup>2</sup>	°F	°C	
CRL20021	—	CRL20022	500	120	Yellow to Orange	11.9	1.9	796	424	4.15
CRL10009	CRL10010	—	500	220 to 240	Rose to Grey	11.9	1.9	796	424	4.15
CRL00009	CRL00010	—	500	220 to 240	White	11.9	1.9	796	424	4.15
CRL20023	—	CRL20024	500	240/480	Yellow to Orange	11.9	1.9	796	424	4.15
CRL20025	—	CRL20026	750	120	Yellow to Orange	17.9	2.8	956	513	3.68
CRL10011	CRL10012	—	750	220 to 240	Rose to Grey	17.9	2.8	956	513	3.68
CRL00011	CRL00012	—	750	220 to 240	White	17.9	2.8	956	513	3.68
CRL20027	—	CRL20028	750	240/480	Yellow to Orange	17.9	2.8	956	513	3.68
CRL10001	CRL10002	—	950	220 to 240	Rose to Grey	22.7	3.5	1053	567	3.45
CRL00001	CRL00002	—	950	220 to 240	White	22.7	3.5	1053	567	3.45
CRL10013	CRL10014	—	1000	220 to 240	Rose to Grey	23.9	3.7	1076	580	3.40
CRL00013	CRL00014	—	1000	220 to 240	White	23.9	3.7	1076	580	3.40
CRL20029	—	CRL20030	1000	240/480	Yellow to Orange	23.9	3.7	1076	580	3.40
CRL10003	CRL10004	—	1150	220 to 240	Rose to Grey	27.5	4.3	1145	618	3.25
CRL00003	CRL00004	—	1150	220 to 240	White	27.5	4.3	1145	618	3.25
CRL20031	—	CRL20032	1250	240/480	Yellow to Orange	29.9	4.6	1191	644	3.16
CRL10015	CRL10016	—	1400	480	Rose to Grey	33.5	5.2	1262	683	3.03
CRL00015	CRL00016	—	1400	480	White	33.5	5.2	1262	683	3.03
CRL20033	—	CRL20034	1500	240/480	Yellow to Orange	35.9	5.6	1308	709	2.95
CRL10017	CRL10018	—	1600	480	Rose to Grey	38.2	5.9	1351	733	2.88
CRL00017	CRL00018	—	1600	480	White	38.2	5.9	1351	733	2.88
CRL10019	CRL10020	—	1800	480	Rose to Grey	43.0	6.7	1418	770	2.78
CRL00019	CRL00020	—	1800	480	White	43.0	6.7	1418	770	2.78

\* Watt density calculated using heater face surface area.

\*\* E-Mitter heater body temperature as measured with internal thermocouple when mounted facedown in stock CRK reflector and operating in 22°C (72°F) room ambient.

\*\*\* Peak infrared radiation wavelength as calculated from Wien's Law, for operating temperature shown. Expressed in microns (μm).

**Notes:** All 240/480V heaters have two windings for dual voltage use. (Parallel connected for 240V and series connected for 480V) 120V heaters are single winding designs Units with an internal "low noise" style thermocouple have 12" leads. Standard Type "K" thermocouple units also available. Heaters with yellow to orange color are exact replacements for heaters in CRP Modular 12 x 12 CRP Radiant Panels.

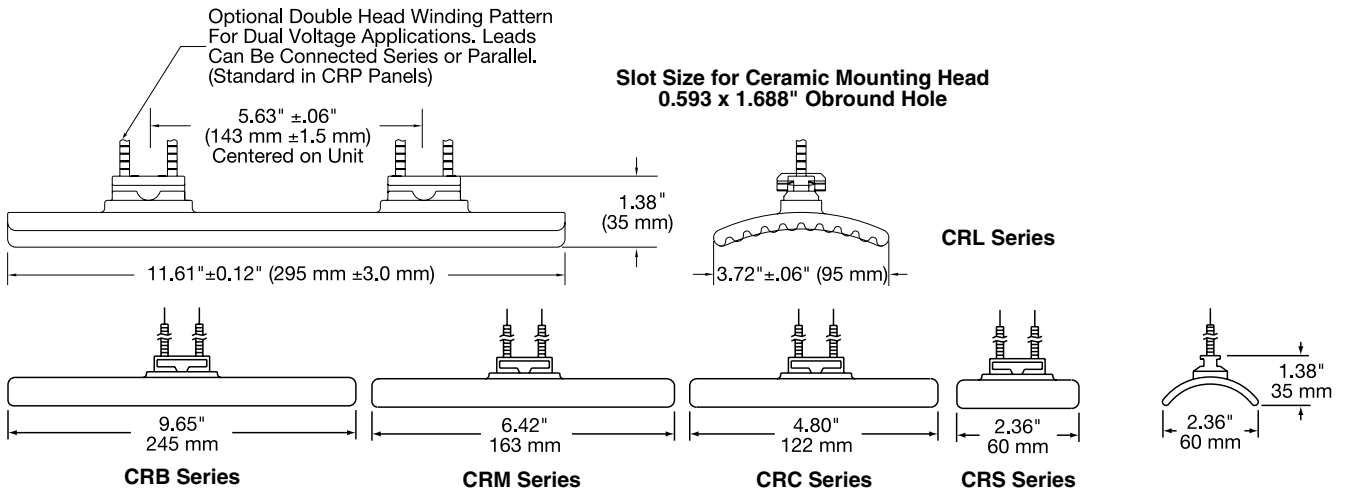
**Ordering Example:** CRL10010, radiant heater with K thermocouple, 120 Vac, yellow to orange color.



## Curved Face Ceramic Radiant Heaters

### Ceramic E-Mitters

- Standard Solid Curved Face Sizes to Accomodate a Wide Range of New or Existing Applications
- Universal Mount Designed to be Dropped into Existing Systems Regardless of Manufacturer
- Standard Colors are Metamorphing Rose (Cold) to Grey (Hot), and Traditional White. Optional Colors are Metamorphing Yellow (Cold) to Orange (Hot), and Black
- Standard Stocked Voltage: 120 or 220/240V as Noted; Other Voltages are Available
- Available with Built-In Type K Thermocouple— Type J Thermocouple and Low Noise Options are Also Available
- Long Operating Life—Over 10,000-Plus Hours of Continuous Operation Under Normal Conditions
- Performance is Unaffected By Vibration or Adverse Atmospheric Conditions
- 2.5 to 6  $\mu$ m Infrared Radiation Wavelength



### Custom Engineered/Manufactured Heaters

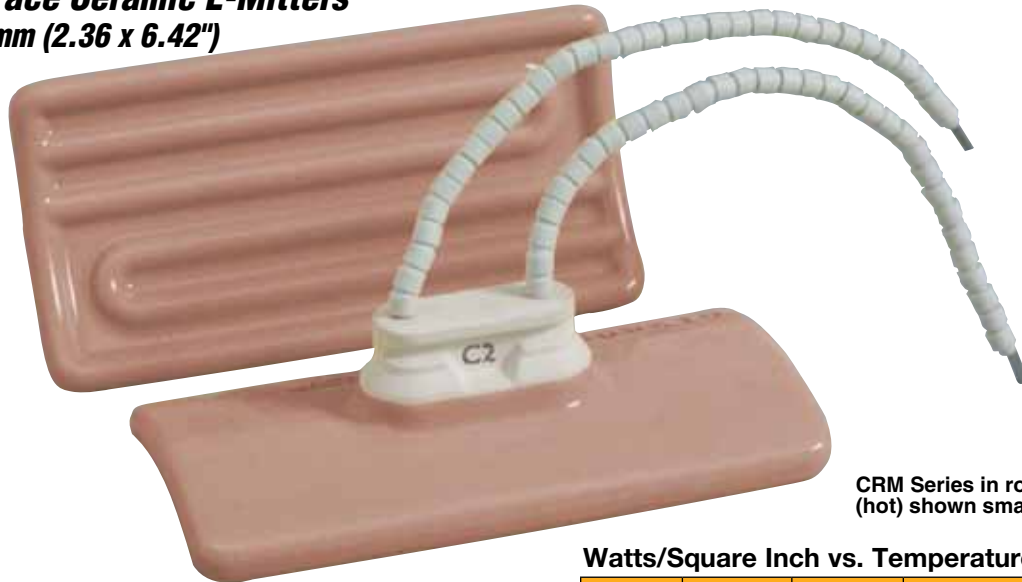
Understanding that an electric heater can be very application specific, for sizes and ratings not listed, OMEGA® can manufacture a Ceramic E-Mitter to meet your requirements.

### Please Specify the Following:

- **Colors:** Standard are metamorphing rose and straight white, optional are metamorphing yellow and straight black
- **Wattage:** Up to 43 watts/in<sup>2</sup> (6.7 watts/cm<sup>2</sup>)
- **Voltage:** 120, 208, 240, 277, 480 Vac and others (dependent on design)
- **Thermocouple:** Standard Type K (Type J optional) or Low Noise Type K (Type J optional)



**Curved Face Ceramic E-Mitters**  
**60 x 163 mm (2.36 x 6.42")**



CRM Series in rose (cold) to grey (hot) shown smaller than actual size.

**CRM Series E-Mitters**

**Optional Features**

- Additional Power or Thermocouple Lead Lengths
- Two-Piece Wave Mounting Clip
- Reflectors and Other Accessories
- Arrays and Power/Temperature Control Panels

**Watts/Square Inch vs. Temperature Data**

Watts	Surface Watts/in <sup>2</sup> *	Heater Body °F Rise	Heater Body Temp @ 72°F**	Primary Emitted Wavelength*** (µm)
100	6.46	487	559	5.12
150	9.68	641	713	4.45
200	12.91	755	827	4.05
250	16.14	843	915	3.79
300	19.37	915	987	3.60
350	22.60	979	1051	3.45
400	25.82	1041	1113	3.32
450	29.05	1103	1175	3.19
500	32.28	1167	1239	3.07
550	35.51	1230	1302	2.96
600	38.74	1288	1360	2.87
650	41.96	1335	1407	2.79

E-Mitters listed have 89 mm (3.5") ceramic bead insulated leads, #8-10 spade terminals, and a one-piece spring clip for mounting.

<b>To Order Visit <a href="http://omega.com/crm_series">omega.com/crm_series</a> for Pricing and Details</b>								
Model Number		Wattage	Voltage	Color	Watt Density*		Heater Body Temperature** (Typical Operating)	
Without Thermocouple	Standard Type K Thermocouple				Watts/in <sup>2</sup>	Watts/cm <sup>2</sup>	°F	°C
CRM10008	CRM10011	425	120	Rose to Grey	27.44	4.25	1144	618
CRM00008	CRM00011	425	120	White	27.44	4.25	1144	618
CRM10009	CRM10012	500	120	Rose to Grey	32.28	5.00	1239	671
CRM00009	CRM00012	500	120	White	32.28	5.00	1239	671
CRM10010	CRM10013	600	220/240	Rose to Grey	38.74	6.00	1360	738
CRM00010	CRM00013	600	220/240	White	38.74	6.00	1360	738

\* Watt density calculated using heater face surface area.

\*\* E-Mitter heater body temperature as measured with internal thermocouple when mounted face down in stock CRK reflector and operating in 22°C (72°F) room ambient.

\*\*\* Peak infrared radiation wavelength as calculated from Wien's Law, for operating temperature shown. Expressed in microns (µm).

Ordering Example: CRM10008, curved faced radiant heater, 428 W, 120 Vac, rose to grey.



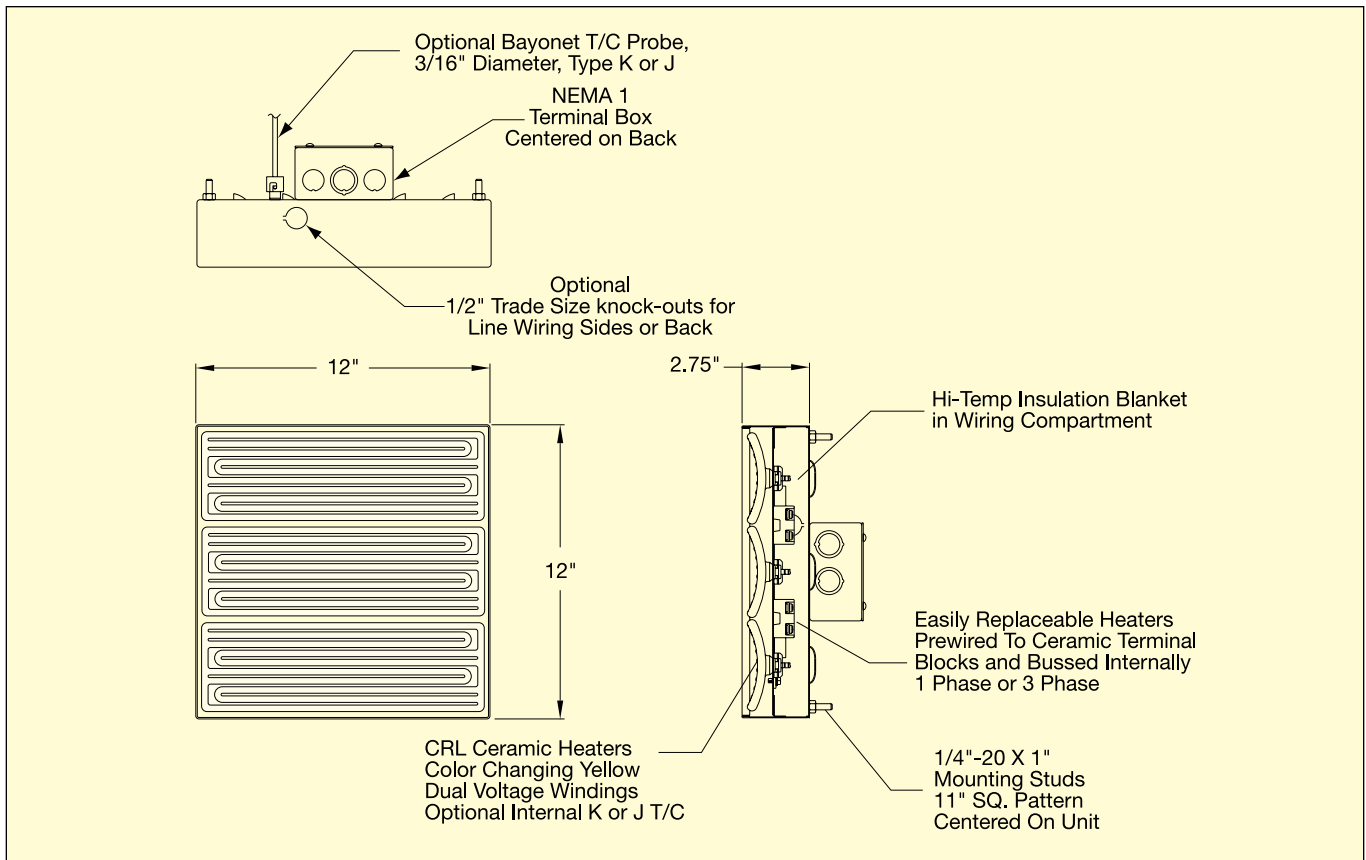
**CRP Panel Heater**  
**0.3 x 0.3 m (12 x 12") Modular Panels**

**CRP Series**

- New Cost Effective and Self-Contained Ceramic Infrared Panel Heater
- Offers Ease of Installation and Trouble-Free Performance
- Standard Colors are Metamorphing Yellow (Cold) to Orange (Hot), and Traditional White. Optional Colors are Metamorphing Rose (Cold) to Grey (Hot) and Black
- Low Profile 20 gallon Aluminized Steel or Stainless Steel Housing
- Standard Stocked Voltage: 120, 220 to 240V or 480V as Noted; Other Voltages are Available
- Low Noise Type K Thermocouple Mounted Internally in Center Heater. Optional Type J Thermocouple is also Available
- Watt Density Range: From 11 watts/in<sup>2</sup> to 35 watts/in<sup>2</sup>
- Standard Operating Temperature Range 399 to 704°C (750 to 1300°F)
- Best When used at Radiation Distances of 102 to 254 mm (4 to 10") From Application
- Performance is Unaffected By Vibration or Adverse Atmospheric Conditions.
- 3 to 6 μm Infrared Radiation Wavelength
- Made to Order/Custom Products Available



**Three CRL E-Mitter heaters in one panel. Metamorphing yellow to orange.**





## CRP Panel Heater Standard Ratings of Modular 0.3 x 0.3 m (12 x 12") Radiant Panels

Aluminized Steel Housing with NEMA 1 Terminal Box (4 in<sup>2</sup> x 2 1/2" deep)

To Order Visit <a href="http://omega.com/crp_series">omega.com/crp_series</a> for Pricing and Details											
120V		240V-1Ph		240V-3Ph		480V-1Ph		480V-3Ph		KW	Watt Density (W/in <sup>2</sup> )
No T/C	K T/C	No T/C	K T/C	No T/C	K T/C	No T/C	K T/C	No T/C	K T/C		
Model No.											
CRP20001	CRP20002	CRP20003	CRP20004	CRP20005	CRP20006	CRP20007	CRP20008	CRP20009	CRP20010	1.50	11.6
CRP20011	CRP20012	CRP20013	CRP20014	CRP20015	CRP20016	CRP20017	CRP20018	CRP20019	CRP20020	2.25	17.4
—	—	CRP20021	CRP20022	CRP20023	CRP20024	CRP20025	CRP20026	CRP20027	CRP20028	3.00	23.0
—	—	CRP20029	CRP20030	CRP20031	CRP20032	CRP20033	CRP20034	CRP20035	CRP20036	3.75	29.0
—	—	CRP20037	CRP20038	CRP20039	CRP20040	CRP20041	CRP20042	CRP20043	CRP20044	4.50	35.0

Note: K thermocouple panels have one low noise internal thermocouple in center heater with extension wires routed into rear terminal box.

Ordering Example: CRP20002, 1.5 KW, 120 Vac radiant panel heater with K thermocouple.

## Stainless Steel Housing with NEMA 1 Terminal Box (Medical or Food Applications)

120V		240V-1Ph		240V-3Ph		480V-1Ph		480V-3Ph		KW	Watt Density (W/in <sup>2</sup> )
No T/C	K T/C	No T/C	K T/C	No T/C	K T/C	No T/C	K T/C	No T/C	K T/C		
Model No.											
CRP20045	CRP20046	CRP20047	CRP20048	CRP20049	CRP20050	CRP20051	CRP20052	CRP20053	CRP20054	1.50	11.6
CRP20055	CRP20056	CRP20057	CRP20058	CRP20059	CRP20060	CRP20061	CRP20062	CRP20063	CRP20064	2.25	17.4
—	—	CRP20065	CRP20066	CRP20067	CRP20068	CRP20069	CRP20070	CRP20071	CRP20072	3.00	23.0
—	—	CRP20073	CRP20074	CRP20075	CRP20076	CRP20077	CRP20078	CRP20079	CRP20080	3.75	29.0
—	—	CRP20081	CRP20082	CRP20083	CRP20084	CRP20085	CRP20086	CRP20087	CRP20088	4.50	35.0

Note: K thermocouple panels have one low noise internal thermocouple in center heater with extension wires routed into rear terminal box.

Ordering Example: CRP20056, 2.25 KW, 120 Vac radiant panel heater with K thermocouple.

## Replacement Heaters for Standard Modular 0.3 x 0.3 m (12 x 12") CRP Radiant Panels

120V		240V-1Ph		Panel KW	Heater Watts
No T/C	K T/C	No T/C	K T/C		
Model No.					
CRL20021	CRL20022	CRL20023	CRL20024	1.50	500
CRL20025	CRL20026	CRL20027	CRL20028	2.25	750
—	—	CRL20029	CRL20030	3.00	1000
—	—	CRL20031	CRL20032	3.75	1250
—	—	CRL20033	CRL20034	4.50	1500

Note: All 240/480V heaters have two windings for dual voltage use.

(Parallel connected for 240V and series connected for 480V).

120V heaters are single winding designs.

K thermocouple units have an internal "low noise" style thermocouple with 0.3 m (12") leads.

Ordering Example: CRL20022, 1.5 KW replacement heater.

## Standard Panel Specifications

KW	Panel Watt Density***	Typical Operating Temperature**		Primary Emitted Wavelength*
		°F	°C	
1.50	12.0	796	424	4.2
2.25	18.0	956	513	3.7
3.00	24.0	1076	580	3.4
3.75	30.0	1191	644	3.2
4.50	36.0	1308	709	3.0

\* Peak infrared radiation wavelength as calculated from Wien's Law, for operating temperature shown. Expressed in microns (µm). Operating temperature based on room ambient testing @ 22°C (72°F).

\*\* E-Mitter heater body temperature as measured with internal thermocouple when mounted facedown in stock CRK reflector and operating in 22°C (72°F) room ambient.

\*\*\* Watt density calculated using total heater face surface area within panel.

DANGER: Hazard of Fire. These heaters are not for use in atmospheres where flammable vapors, gases or liquids are present as defined in the National Electrical Code. Where solvents, water, etc. are being evaporated from the process it is necessary to provide substantial quantities of ventilating air to carry away all resulting vapors.



WARNING: Hazard of Electric Shock. Installation must be grounded to earth to avoid shock hazard. Disconnect power to installation before servicing or installing heater.

WARNING: Do not use Copper Wire to make connections inside this heater. High temperatures will oxidize copper. Use of nickel plated or nickel clad insulated copper wire is recommended. Wire insulation rating must be suitable for the ambient temperature of the wiring installation.

Installation: Do not mount CRP Panel Heaters closer than 6 inches to any structural material that does not have at least a 200°C (392°F) continuous temperature rating.





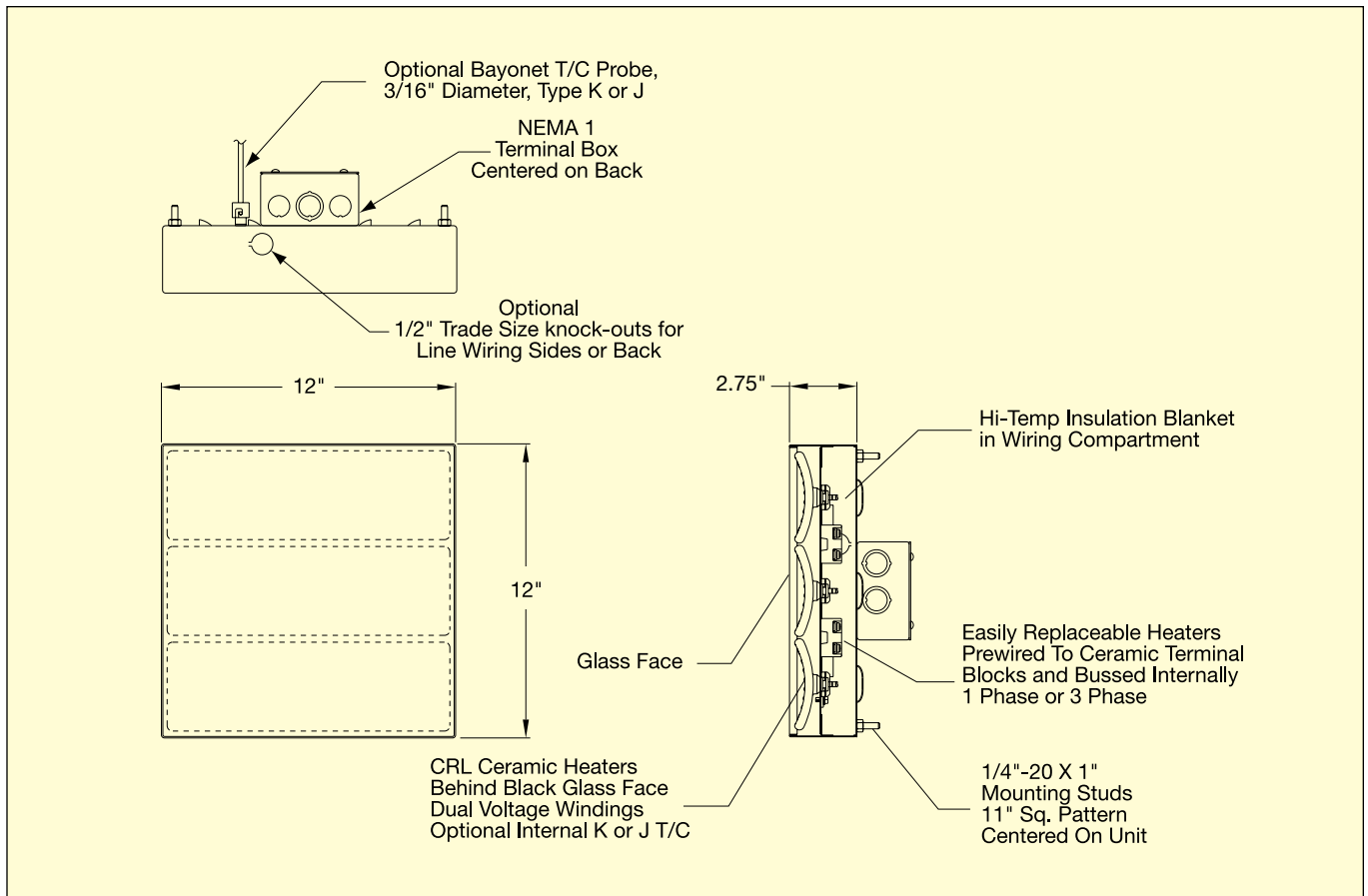
**Panel Heater with Glass Face**  
**0.3 x 0.3 m (12 x 12") Modular Glass Face Panels Standard Ratings**

**CRP Series**

- Dark Red Face Glass is Standard; Glass Provides for Ease of Cleaning
- Low Profile 20 Gauge Aluminized Steel or Stainless Steel Housing
- Standard Stocked Voltage: 120, 220 to 240V or 480V as Noted; Other Voltages are Available
- Low Noise Type K Thermocouple Mounted Internally in Center Heater. Optional Type J Thermocouple is Also Available.
- Watt Density Range: From 11 watts/in<sup>2</sup> to 35 watts/in<sup>2</sup>
- Standard Operating Temperature Range 399 to 704°C (750 to 1300°F)
- Best When used at Radiation Distances of 102 to 254 mm (4 to 10") From Application
- Performance is Unaffected by Vibration or Adverse Atmospheric Conditions.
- 3 to 6 μm Infrared Radiation Wavelength
- Optional Clear Face Glass is Available  
If Required Please Specify When Ordering
- Made to Order/Custom Products Available



Three CRL E-Mitter heaters behind an emitting dark red glass face.





## CRP Panels with Glass Face Standard Ratings of Modular 0.3 x 0.3 m (12 x 12") CRP Glass Faced Radiant Panels

Aluminized Steel Housing with NEMA 1 Terminal Box (4 in<sup>2</sup> x 2.13" deep)

To Order Visit <a href="http://omega.com/crp_series">omega.com/crp_series</a> for Pricing and Details											
120V		240V-1Ph		240V-3Ph		480V-1Ph		480V-3Ph		KW	Watt Density (W/in <sup>2</sup> )
No T/C	K T/C	No T/C	K T/C	No T/C	K T/C	No T/C	K T/C	No T/C	K T/C		
Model No.											
CRP20089	CRP20090	CRP20091	CRP20092	CRP20093	CRP20094	CRP20095	CRP20096	CRP20097	CRP20098	1.50	11.6
CRP20099	CRP20100	CRP20101	CRP20102	CRP20103	CRP20104	CRP20105	CRP20106	CRP20107	CRP20108	2.25	17.4
—	—	CRP20109	CRP20110	CRP20111	CRP20112	CRP20113	CRP20114	CRP20115	CRP20116	3.00	23.0
—	—	CRP20117	CRP20118	CRP20119	CRP20120	CRP20121	CRP20122	CRP20123	CRP20124	3.75	29.0
—	—	CRP20125	CRP20126	CRP20127	CRP20128	CRP20129	CRP20130	CRP20131	CRP20132	4.50	35.0

Note: K thermocouple panels have one low noise internal thermocouple in center heater with extension wires routed into rear terminal box.

Ordering Example: CRP20090, 1.5 KW, glass face radiant heater, 120 Vac with K thermocouple.

Stainless Steel Housing with NEMA 1 Terminal Box (4 in<sup>2</sup> x 2.13" deep)

120V		240V-1Ph		240V-3Ph		480V-1Ph		480V-3Ph		KW	Watt Density (W/in <sup>2</sup> )
No T/C	K T/C	No T/C	K T/C	No T/C	K T/C	No T/C	K T/C	No T/C	K T/C		
Model No.											
CRP20133	CRP20134	CRP20135	CRP20136	CRP20137	CRP20138	CRP20139	CRP20140	CRP20141	CRP20142	1.50	11.6
CRP20143	CRP20144	CRP20145	CRP20146	CRP20147	CRP20148	CRP20149	CRP20150	CRP20151	CRP20152	2.25	17.4
—	—	CRP20153	CRP20154	CRP20155	CRP20156	CRP20157	CRP20158	CRP20159	CRP20160	3.00	23.0
—	—	CRP20161	CRP20162	CRP20163	CRP20164	CRP20165	CRP20166	CRP20167	CRP20168	3.75	29.0
—	—	CRP20169	CRP20170	CRP20171	CRP20172	CRP20173	CRP20174	CRP20175	CRP20176	4.50	35.0

Note: K thermocouple panels have one low noise internal thermocouple in center heater with extension wires routed into rear terminal box.

Ordering Example: CRP20144, 2.25 KW, glass face radiant heater, 120 Vac with K thermocouple.

### Replacement Heaters for Standard Modular 0.3 x 0.3 m (12 x 12") CRP Radiant Panels

120V		240-480V		Panel KW	Heater Watts
No T/C	K T/C	No T/C	K T/C		
Model No.					
CRL20021	CRL20022	CRL20023	CRL20024	1.50	500
CRL20025	CRL20026	CRL20027	CRL20028	2.25	750
—	—	CRL20029	CRL20030	3.00	1000
—	—	CRL20031	CRL20032	3.75	1250
—	—	CRL20033	CRL20034	4.50	1500

Note: All 240/480V heaters have two windings for dual voltage use. (Parallel connected for 240V & series connected for 480V.)  
120V heaters are single winding designs.

K thermocouple units have an internal "low noise" style thermocouple with 0.3 m (12") leads.

Ordering Example: CRL20022, 500 W replacement heater with K thermocouple.

DANGER: Hazard of Fire. These heaters are not for use in atmospheres where flammable vapors, gases or liquids are present as defined in the National Electrical Code. Where solvents, water, etc. are being evaporated from the process it is necessary to provide substantial quantities of ventilating air to carry away all resulting vapors.



### CRP Replacement Glass

Model No	Color
GLS-101-101	Dark red clear
GLS-101-102	Clear

WARNING: Hazard of Electric Shock. Installation must be grounded to earth to avoid shock hazard. Disconnect power to installation before servicing or installing heater.

WARNING: Do not use Copper Wire to make connections inside this heater. High temperatures will oxidize copper. Use of nickel plated or nickel clad insulated copper wire is recommended. Wire insulation rating must be suitable for the ambient temperature of the wiring installation.

Installation: Do not mount CRP Panel Heaters closer than 6 inches to any structural material that does not have at least a 200°C (392°F) continuous temperature rating.

# CERAMIC RIBBON HEATERS

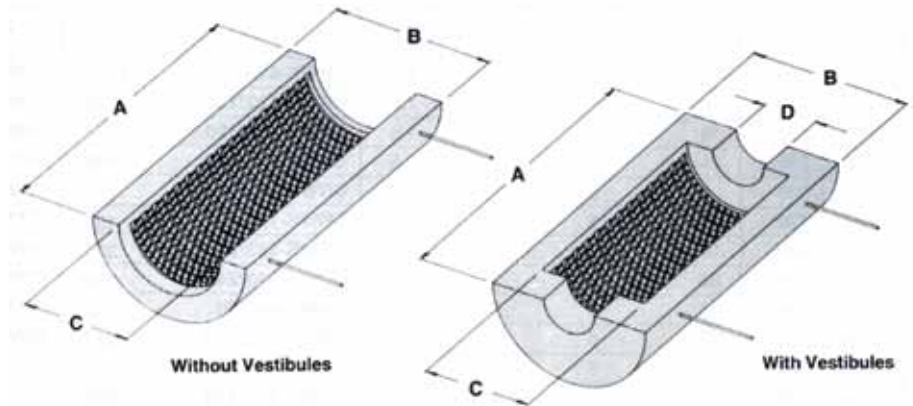
## Ultra-High Temperature, Helically Wound

### CRRS Series

- ✓ Helically Wound Ribbon Iron-Chrome-Aluminum
- ✓ Rated to 1800°F (900°C)
- ✓ Low Mass Vacuum Formed Ceramic Fiber
- ✓ Use Two Semi-Cylindrical Units to Form a Full Cylinder

### APPLICATIONS

- ✓ Pipe Heating
- ✓ Process Air Heating
- ✓ Calibration Ovens
- ✓ Strain Annealing Ovens
- ✓ Tube Furnace



With the CRRS and CRFP Series the helically wound iron-chrome-aluminum ribbon elements are mounted in ridges which permits heat dissipation in three directions, thereby transferring more radiant heat energy to work chamber and load. Using this design effectively triples the radiant heating surface. The unique design allows for two semi-cylindrical units to be combined to form a full cylinder heating element.

### SPECIFICATIONS

**Semi-Cylindrical Helically Wound Ribbon Models:**

**Wattage:** 800 to 9500 Watts

**Voltage:** 120 and 240 Vac single and dual circuits

### SEMI-CYLINDRICAL HELICALLY WOUND RIBBON MODELS

To Order							
Watts	Volts	Dimensions: cm (in)				Without Vestibules	With Vestibules
		A DIM*	B DIM	C DIM	D DIM	Model No.	Model No.
800	120	15 (6)	28 (11)	18 (7)	13 (5)	CRRS-67/120-A	CRRS-67/120C-A
1600	240	30 (12)	28 (11)	18 (7)	13 (5)	CRRS-127/240-A	CRRS-127/240C-A
2400	240	46 (18)	28 (11)	18 (7)	13 (5)	CRRS-187/240-A	CRRS-187/240C-A
3200	240	61 (24)	28 (11)	18 (7)	13 (5)	CRRS-247/240-A	CRRS-247/240C-A
900	120	15 (6)	30 (12)	20 (8)	15 (6)	CRRS-68/120-A	CRRS-68/120C-A
1800	240	30 (12)	30 (12)	20 (8)	15 (6)	CRRS-128/240-A	CRRS-128/240C-A
2700	240	46 (18)	30 (12)	20 (8)	15 (6)	CRRS-188/240-A	CRRS-188/240C-A
3600	240	61 (24)***	30 (12)	20 (8)	15 (6)	CRRS-248/240-A	CRRS-248/240C-A
2250	240	30 (12)	36 (14)	25 (10)	20 (8)	CRRS-1210/240-A	CRRS-1210/240C-A
3375	240	46 (18)	36 (14)	25 (10)	20 (8)	CRRS-1810/240-A	CRRS-1810/240C-A
4500	240	61 (24)***	36 (14)	25 (10)	20 (8)	CRRS-2410/240-A	CRRS-2410/240C-A
2700	240	30 (12)	41 (16)	30 (12)	25 (10)	CRRS-1212/240-A	CRRS-1212/240C-A
4050	240	46 (18)	41 (16)	30 (12)	25 (10)	CRRS-1812/240-A	CRRS-1812/240C-A
5400	240	61 (30)	12 (25)	12 (35)	25 (10)	CRRS-2412/240-A	CRRS-2412/240C-A
3400	240	30 (12)	48 (19)	38 (15)	33 (13)	CRRS-1215/240-A	CRRS-1215/240C-A
5100	240	46 (18)	48 (19)	38 (15)	33 (13)	CRRS-1815/240-A	CRRS-1815/240C-A
6800	240**	61 (24)***	48 (19)	38 (15)	33 (13)	CRRS-2415/240-A	CRRS-2415/240C-A
4100	240	30 (12)	56 (22)	46 (18)	41 (16)	CRRS-1218/240-A	CRRS-1218/240C-A
6150	240**	46 (18)	56 (22)	46 (18)	41 (16)	CRRS-1818/240-A	CRRS-1818/240C-A
8200	240**	61 (24)***	56 (22)	46 (18)	41 (16)	CRRS-2418/240-A	CRRS-2418/240C-A
4750	240	30 (12)	64 (25)	53 (21)	48 (19)	CRRS-1221/240-A	CRRS-1221/240C-A
7125	240**	46 (18)	64 (25)	53 (21)	48 (19)	CRRS-1821/240-A	CRRS-1821/240C-A
9500	240**	61 (24)***	64 (25)	53 (21)	48 (19)	CRRS-2421/240-A	CRRS-2421/240C-A

\* Add 3" for units with vestibules.

\*\* Dual 240 Vac circuits.

\*\*\* Using two 12" long heaters; the indicated wattage is the total of two 12" long heaters.

Ordering Example: CRRS-67/120C-A, 800 watt 120 Vac heater, 6" long with a 7" ID and 3" unheated vestibules.

# CERAMIC RIBBON HEATERS

## Flat Plate Ceramic Heating Elements

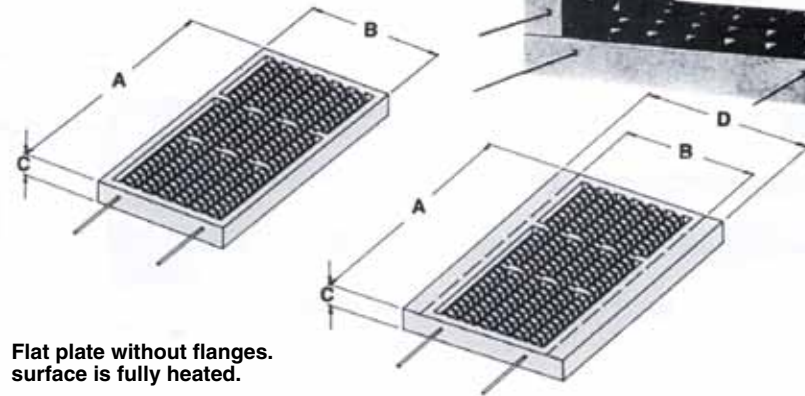
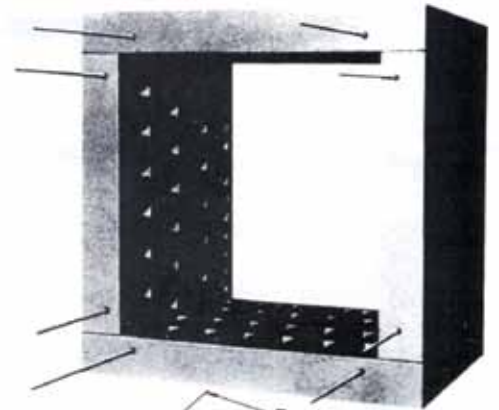
### CRFP Series

- ✓ Rated to 1800°F (900°C)
- ✓ Helically Wound Ribbon Iron-Chrome-Aluminum
- ✓ Low Mass Vacuum Formed Ceramic Fiber
- ✓ Optional Unheated Flanges
- ✓ Low Watt Density
- ✓ Fast Heat-Up and Cool Down

### APPLICATIONS FOR CRFP MODELS

- ✓ Heat Treating Furnaces
- ✓ Fluidized Bed Furnaces
- ✓ Process Air Heating
- ✓ Pipe Heating

Two flat plate fiber heaters matched with 2 flanged flat plate fiber heaters to form box with 4 heated sides. Many sizes of heaters available to form square or rectangular shaped chambers of various depths.



### SPECIFICATIONS

Flat Plate Models:

Wattage: 300 to 6200 Watts

Voltage: 60, 120, and 240 Vac Single and dual/circuits

Flat plate with unheated flanges. All flange plates have 51 mm (2") wide unheated flanges on each side of heated area.

### CRFP Series—Flat Plate Models

To Order							
Watts	Volts	Dimensions: cm (in)				Without Flanges	With Flanges
		A DIM	B DIM	C DIM	D DIM	Model No.	Model No.
300	60	15 (6)	10 (4)	5 (2)	20 (8)	CRFP-64/60-A	CRFP-64/60-C-A
600	120	3 (12)	10 (4)	5 (2)	20 (8)	CRFP-124/120-A	CRFP-124/120-C-A
400	60	15 (6)	15 (6)	5 (2)	25 (10)	CRFP-66/60-A	CRFP-66/60-C-A
800	120	30 (12)	15 (6)	5 (2)	25 (10)	CRFP-126/120-A	CRFP-126/120-C-A
1250	120	46 (18)	15 (6)	5 (2)	25 (10)	CRFP-186/120-A	CRFP-186/120-C-A
1650	240	61 (24)	15 (6)	5 (2)	25 (10)	CRFP-246/240-A	CRFP-246/240-C-A
1100	120	30 (12)	20 (8)	5 (2)	30 (12)	CRFP-128/120-A	CRFP-128/120-C-A
1650	240	46 (18)	20 (8)	5 (2)	30 (12)	CRFP-188/240-A	CRFP-188/240-C-A
2200	240	61 (24)	20 (8)	5 (2)	30 (12)	CRFP-248/240-A	CRFP-248/240-C-A
1375	240	30 (12)	25 (10)	5 (2)	36 (14)	CRFP-1210/240-A	CRFP-1210/240-C-A
2050	240	46 (18)	25 (10)	5 (2)	36 (14)	CRFP-1810/240-A	CRFP-1810/240-C-A
2750	240	61 (24)	25 (10)	5 (2)	36 (14)	CRFP-2410/240-A	CRFP-2410/240-C-A
3400	240	76 (30)	25 (10)	5 (2)	36 (14)	CRFP-3010/240-A	CRFP-3010/240-C-A
1650	240	30 (12)	30 (12)	5 (2)	41 (16)	CRFP-1212/240-A	CRFP-1212/240-C-A
2460	240	46 (18)	30 (12)	5 (2)	41 (16)	CRFP-1812/240-A	CRFP-1812/240-C-A
3280	240	61 (24)	30 (12)	5 (2)	41 (16)	CRFP-2412/240-A	CRFP-2412/240-C-A
4100	240	76 (30)	30 (12)	5 (2)	41 (16)	CRFP-3012/240-A	CRFP-3012/240-C-A
3700	240	46 (18)	46 (18)	5 (2)	56 (22)	CRFP-1818/240-A	CRFP-1818/240-C-A
5000	240	61 (24)	46 (18)	5 (2)	56 (22)	CRFP-2418/240-A	CRFP-2418/240-C-A
6200	240*	76 (30)	46 (18)	5 (2)	56 (22)	CRFP-3018/240-A	CRFP-3018/240-C-A

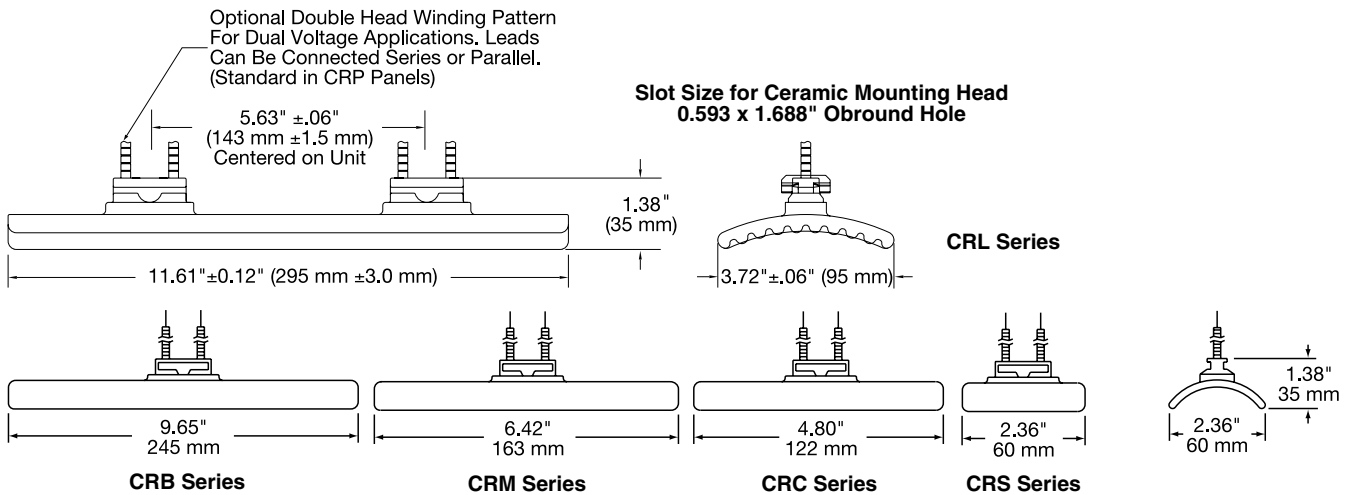
\* Dual 240 Vac circuits.



## Curved Face Ceramic Radiant Heaters

### Ceramic E-Mitters

- 5 Standard Solid Curved Face Sizes to Accomodate a Wide Range of New or Existing Applications
- Universal Mount Designed to be Dropped into Existing Systems Regardless of Manufacturer
- Standard Colors are Metamorphing Rose (Cold) to Grey (Hot), and Traditional White. Optional Colors are Metamorphing Yellow (Cold) to Orange (Hot), and Black
- Standard Stocked Voltage: 120 or 220/240V as Noted; Other Voltages are Available
- Available with Built-In Type K Thermocouple— Type J Thermocouple and Low Noise Options are Also Available
- Long Operating Life—Over 10,000-Plus Hours of Continuous Operation Under Normal Conditions
- Performance is Unaffected By Vibration or Adverse Atmospheric Conditions
- 2.5 to 6  $\mu$ m Infrared Radiation Wavelength



### Custom Engineered/Manufactured Heaters

Understanding that an electric heater can be very application specific, for sizes and ratings not listed, OMEGA® can manufacture a Ceramic E-Mitter to meet your requirements.

### Please Specify the Following:

- **Colors:** Standard are metamorphing rose and straight white, optional are metamorphing yellow and straight black
- **Wattage:** Up to 43 watts/in<sup>2</sup> (6.7 watts/cm<sup>2</sup>)
- **Voltage:** 120, 208, 240, 277, 480 Vac and others (dependent on design)
- **Thermocouple:** Standard Type K (Type J optional) or Low Noise Type K (Type J optional)

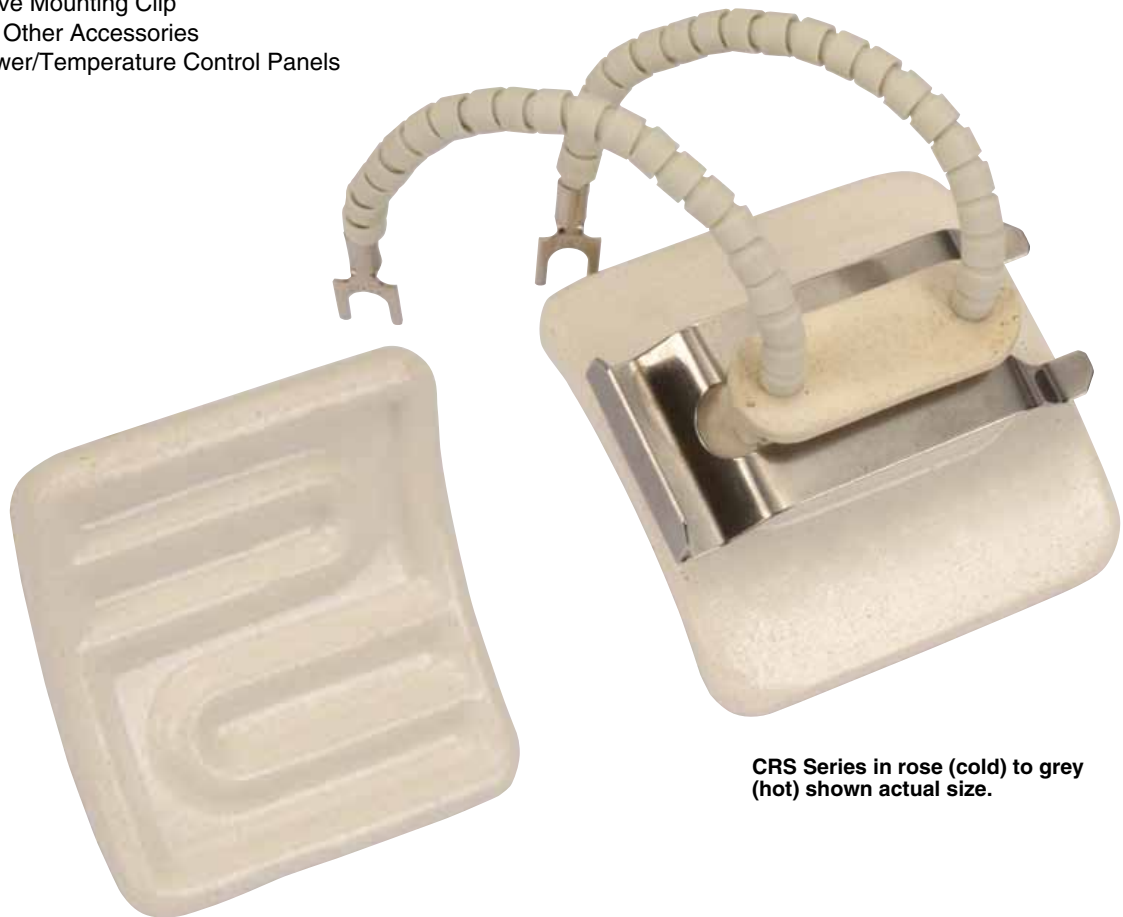


## Curved Face Ceramic E-Mitters 60 x 60 mm (2.36 x 2.36")

### CRS Series E-Mitters

#### Optional Features

- Additional Power or Thermocouple Lead Lengths
- Two-Piece Wave Mounting Clip
- Reflectors and Other Accessories
- Arrays and Power/Temperature Control Panels



CRS Series in rose (cold) to grey (hot) shown actual size.

E-Mitters listed have 88.9 mm (3.5") ceramic bead insulated leads, #8-10 spade terminals, and a one-piece spring clip for mounting.

**To Order Visit [omega.com/crs\\_series](http://omega.com/crs_series) for Pricing and Details**

Model Number		Wattage	Voltage	Color	Watt Density*	
Without Thermocouple	Standard Type K Thermocouple				Watts/in <sup>2</sup>	Watts/cm <sup>2</sup>
CRS00002	CRS00009	162	120	White	28.07	4.35
CRS00005	CRS00012	162	220/240	White	28.07	4.35
CRS00003	CRS00010	250	120	White	43.18	6.69
CRS00006	CRS00013	250	220/240	White	43.18	6.69

\*Watt density calculated using heater face surface area.

Ordering Example: CRS00009, radiant heater with K thermocouple, 162 W, 120 Vac, white color.



**Series CRT E-Mitters**  
**Bulb Style Radiant Heater**

**CRT Series**

- Prevent Moisture Accumulation and Freezing in Electrical Control Boxes
- Prevent Moisture Accumulation, Mildew and Freezing in Clothes Lockers
- Resistor Banks
- Incubators

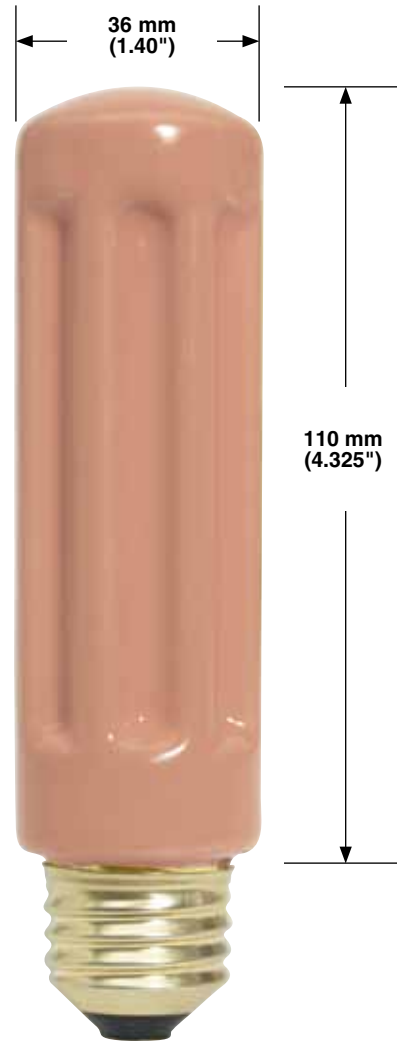
**Series CRT — Tube Shaped E-Mitter**

OMEGA's Screw-In Bulb Series CRT E-Mitter is a hollow, tube-shaped ceramic heater ideally suited for wide area heating.

Standard colors are metamorphing rose and straight white; optional are metamorphing yellow and straight black.



**CRK00016 Screw-In Base**  
Ceramic receptacle for use with screw-in bulb E-Mitters.



**Stock CRT E-Mitters**

<b>To Order Visit <a href="http://omega.com/crt_series">omega.com/crt_series</a> for Pricing and Details</b>				
Model No.		Wattage	*Surface Temperature (Typical)	
120V	240V		°F	°C
CRT10100	—	50	464	240
CRT10101	CRT10106	75	567	297
CRT10102	CRT10107	100	671	355
CRT10103	CRT10108	150	824	440
CRT10104	CRT10109	200	937	503
CRT10105	CRT10110	250	1049	565

\* E-Mitter (operating in 22°C (72°F) ambient) surface temperature measured with a thermocouple.

**Ordering Example:** CRT10103, 150 W, bulb style radiant heater.

**Custom Engineered/Manufactured Heaters**

Understanding that an electric heater can be very application specific, for sizes and ratings not listed, OMEGA® can manufacture a CRT E-Mitter to meet your requirements.

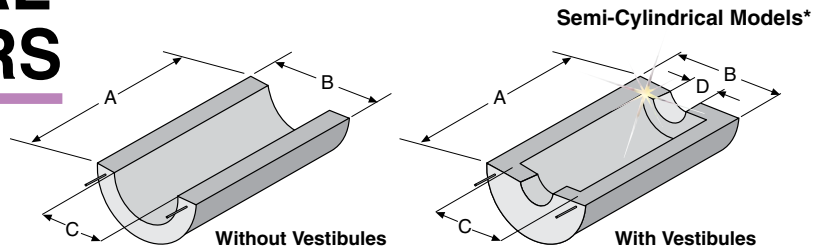
**Please Specify the Following:**

- **Colors:** Standard are metamorphing rose and straight white, optional are metamorphing yellow and straight black
- **Housing:** NEMA 1 or NEMA 4 (if required)
- **Voltage:** 120 or 240 Vac
- **Wattage:** 250W maximum

# SEMI-CYLINDRICAL CERAMIC HEATERS

CRWS Series

- ✓ Rated to 982°C (1800°F)
- ✓ Helically Wound Iron-Chrome-Aluminum Wire



## To Order

		Dimensions in cm (")				Without Vestibules	With Vestibules
Watts	Volts	A*	B	C	D	Model No.	Model No.
300	60	15 (6)	10 (4)	5 (2)	4 (1.5)	CRWS-62/60-A	CRWS-62/60-C-A
600	120	30 (12)	10 (4)	5 (2)	4 (1.5)	CRWS-122/120-A	CRWS-122/120-C-A
900	120	46 (18)	10 (4)	5 (2)	4 (1.5)	CRWS-182/120-A	CRWS-182/120-C-A
1200	240	61 (24)	10 (4)	5 (2)	4 (1.5)	CRWS-242/240-A	CRWS-242/240-C-A
425	120	15 (6)	13 (5)	8 (3)	5 (2)	CRWS-63/120-A	CRWS-63/120-C-A
850	120	30 (12)	13 (5)	8 (3)	5 (2)	CRWS-123/120-A	CRWS-123/120-C-A
1275	240	46 (18)	13 (5)	8 (3)	5 (2)	CRWS-183/240-A	CRWS-183/240-C-A
1700	240	61 (24)	13 (5)	8 (3)	5 (2)	CRWS-243/240-A	CRWS-243/240-C-A
565	120	15 (6)	15 (6)	10 (4)	6 (2.5)	CRWS-64/120-A	CRWS-64/120-C-A
1130	120	30 (12)	15 (6)	10 (4)	6 (2.5)	CRWS-124/120-A	CRWS-124/120-C-A
1700	240	46 (18)	15 (6)	10 (4)	6 (2.5)	CRWS-184/240-A	CRWS-184/240-C-A
2250	240	61 (24)	15 (6)	10 (4)	6 (2.5)	CRWS-244/240-A	CRWS-244/240-C-A
650	120	15 (6)	23 (9)	13 (5)	9 (3.5)	CRWS-65/120-A	CRWS-65/120-C-A
1300	240	30 (12)	23 (9)	13 (5)	9 (3.5)	CRWS-125/120-A	CRWS-125/120-C-A
1950	240	46 (18)	23 (9)	13 (5)	9 (3.5)	CRWS-185/240-A	CRWS-185/240-C-A
2600	240	61 (24)	23 (9)	13 (5)	9 (3.5)	CRWS-245/240-A	CRWS-245/240-C-A
850	120	15 (6)	25 (10)	15 (6)	10 (4)	CRWS-66/120-A	CRWS-66/120-C-A
1700	240	30 (12)	25 (10)	15 (6)	10 (4)	CRWS-126/240-A	CRWS-126/240-C-A
2550	240	46 (18)	25 (10)	15 (6)	10 (4)	CRWS-186/240-A	CRWS-186/240-C-A
3400	240**	61 (24)	25 (10)	15 (6)	10 (4)	CRWS-246/240-A	CRWS-246/240-C-A
920	240	15 (6)	28 (11)	18 (7)	13 (5)	CRWS-67/240-A	CRWS-67/240-C-A
1840	240	30 (12)	28 (11)	18 (7)	13 (5)	CRWS-127/240-A	CRWS-127/240-C-A
2760	240	46 (18)	28 (11)	18 (7)	13 (5)	CRWS-187/240-A	CRWS-187/240-C-A
3680	240**	61 (24)	28 (11)	18 (7)	13 (5)	CRWS-247/240-A	CRWS-247/240-C-A
1100	240	15 (6)	30 (12)	20 (8)	15 (6)	CRWS-68/240-A	CRWS-68/240-C-A
2200	240	30 (12)	30 (12)	20 (8)	15 (6)	CRWS-128/240-A	CRWS-128/240-C-A
3300	240	46 (18)	30 (12)	20 (8)	15 (6)	CRWS-188/240-A	CRWS-188/240-C-A
4400	240**	61*** (24)	30 (12)	20 (8)	15 (6)	CRWS-248/240-A	CRWS-248/240-C-A
2250	240	30 (12)	36 (14)	25 (10)	20 (8)	CRWS-1210/240-A	CRWS-1210/240-C-A
3400	240**	46 (18)	36 (14)	25 (10)	20 (8)	CRWS-1810/240-A	CRWS-1810/240-C-A
4500	240**	61*** (24)	36 (14)	25 (10)	20 (8)	CRWS-2410/240-A	CRWS-2410/240-C-A
2700	240	30 (12)	41 (16)	30 (12)	25 (10)	CRWS-1212/240-A	CRWS-1212/240-C-A
4050	240**	46 (18)	41 (16)	30 (12)	25 (10)	CRWS-1812/240-A	CRWS-1812/240-C-A
5400	240**	61*** (24)	41 (16)	30 (12)	25 (10)	CRWS-2412/240-A	CRWS-2412/240-C-A
3400	240**	30 (12)	48 (19)	38 (15)	33 (13)	CRWS-1215/240-A	CRWS-1215/240-C-A
5100	240**	46 (18)	48 (19)	38 (15)	33 (13)	CRWS-1815/240-A	CRWS-1815/240-C-A
6800	240**	61*** (24)	48 (19)	38 (15)	33 (13)	CRWS-2415/240-A	CRWS-2415/240-C-A
4100	240**	30 (12)	56 (22)	46 (18)	41 (16)	CRWS-1218/240-A	CRWS-1218/240-C-A
6150	240**	46 (18)	56 (22)	46 (18)	41 (16)	CRWS-1818/240-A	CRWS-1818/240-C-A
8200	240**	61*** (24)	56 (22)	46 (18)	41 (16)	CRWS-2418/240-A	CRWS-2418/240-C-A
4750	240**	30 (12)	64 (25)	53 (21)	48 (19)	CRWS-1221/240-A	CRWS-1221/240-C-A
7125	240**	46 (18)	64 (25)	53 (21)	48 (19)	CRWS-1821/240-A	CRWS-1821/240-C-A
9500	240**	61*** (24)	64 (25)	53 (21)	48 (19)	CRWS-2421/240-A	CRWS-2421/240-C-A

\* Add 3" for units with vestibules. \*\* Dual 240 Vac circuits.

\*\*\* Using two 30 cm (12") long heaters; the indicated wattage is a total of two 30 cm (12") long heaters.

Ordering Example: CRWS-67/240-A, 920 Watt, 240 Vac heater, 15 cm (6") long, 18 cm (7") ID.





# 50 TO 150 W

**CS060 Series  
 Starts at  
 \$48**



- Low Surface Temperature
- Quick Mounting Due to DIN Rail Mountable
- Double Insulated (Plastic)
- Wide Voltage Range
- Small Size

Touch-safe heater for the use in enclosures with electrical/electronic components. The design of the heater supports the natural convection which results in a high air-current of warm air. The surface temperatures on the accessible side surfaces of the housing are kept down as a result of the heater design. Our complete range of thermostats and hygrostats can directly be connected to the heater CS060. This heater is also available in a version with plug-in thermostat requiring no additional wiring (CSF060). Both versions are designed for permanent operation.



CS0600, \$48, shown larger than actual size.

## SPECIFICATIONS

**Operating Voltage:** 120 to 240 Vac/Vdc\* (min 110V, max 265V)

**Heating Capacity:** See table

**Heating Element:** PTC resistor: temperature limiting

**Surface Temperature:** <80°C (176°F), except upper protective grille

**Connection:** 4-pole terminal 2.5 mm<sup>2</sup> (1.0 in<sup>2</sup>), torque 0.8 Nm max

**Casing:** Plastic according to UL94 V-0, black

**Mounting:** DIN clip for 35 mm (1.4") DIN rail, EN 50022

**Fitting Position:** Vertical Temperature

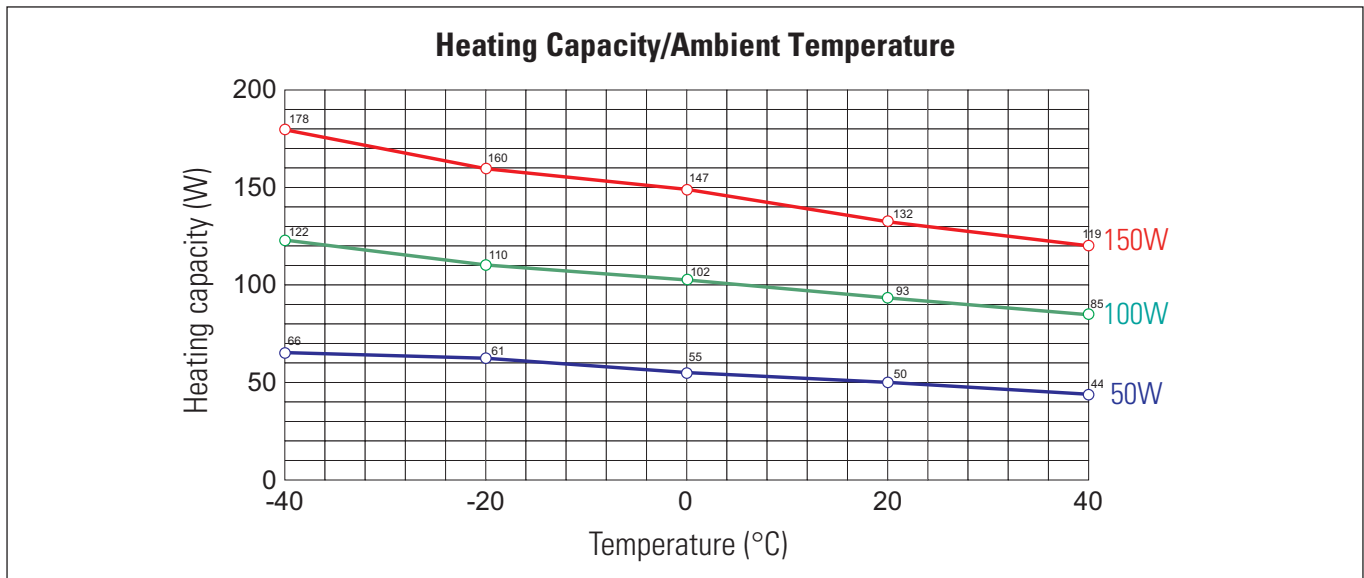
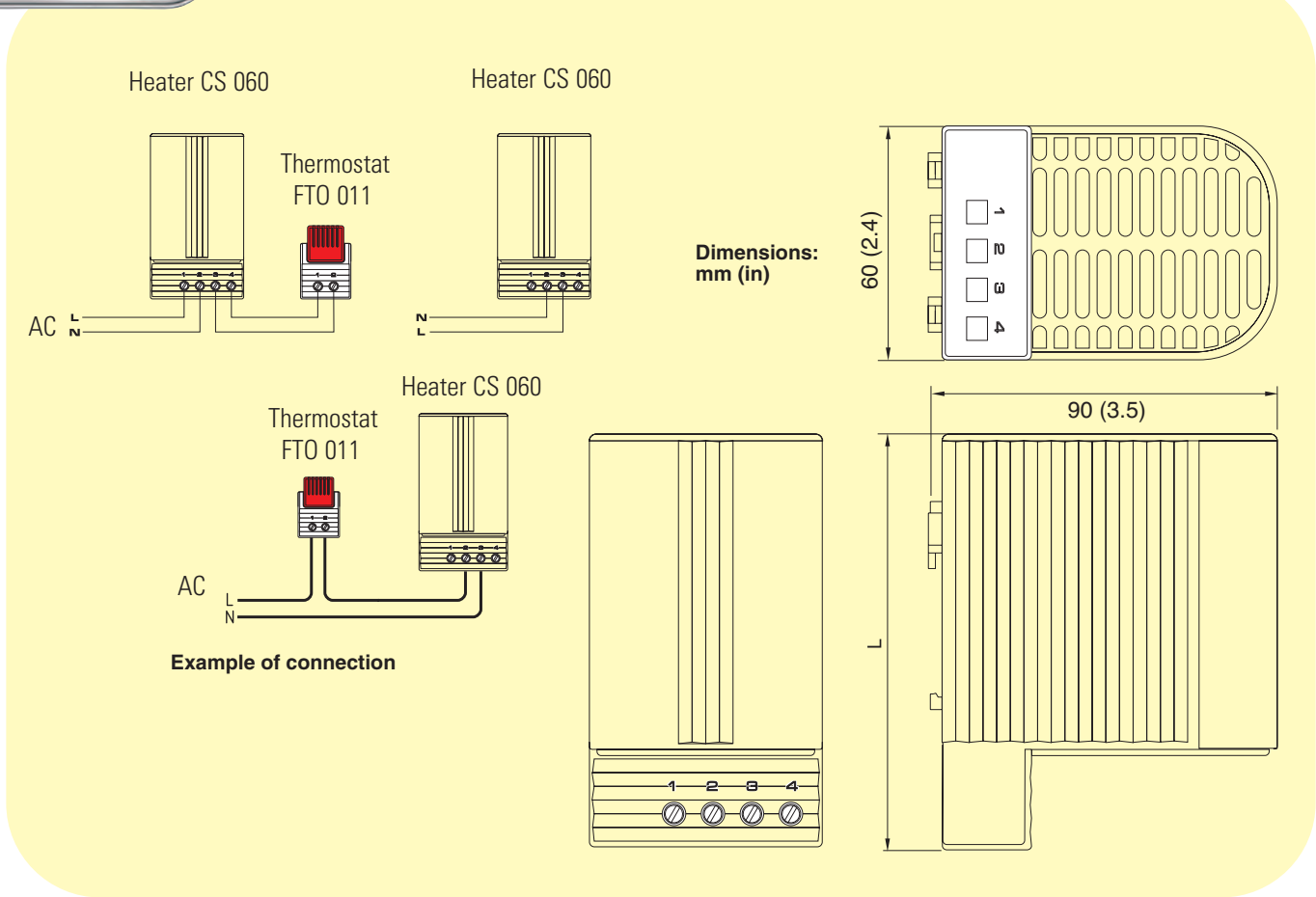
**Operating:** -20 to 70°C (-4 to 158°F)  
**Storage:** -45 to 70°C (-49 to 158°F)

**Protection Type/Protection Class:** NEMA 2 (IP20)/II (double insulated)  
**Approvals:** VDE

*Note: Other voltages on request  
 \* Operating with voltages below 140 Vac/Vdc reduces heating performance by approximately 10%.*

Model No.	CS0600	CS0601	CS0602
<b>Heating Capacity<sup>1</sup></b>	50 W	100 W	150 W
<b>Inrush Current Max</b>	2.5 A	4.5 A	8 A
<b>Air Outlet Temperature<sup>2</sup></b>	86°C (186.8°F)	120°C (248°F)	145°C (293°F)
<b>Dimensions</b>	110 x 60 x 90 mm (4.3 x 2.4 x 3.5")	110 x 60 x 90 mm (4.3 x 2.4 x 3.5")	150 x 60 x 90 mm (5.9 x 2.4 x 3.5")
<b>Weight (Approx)</b>	0.30 kg (10.6 oz)	0.30 kg (10.6 oz)	0.50 kg (17.6 oz)

<sup>1</sup> Ambient temperature: See heating capacity/ambient temperature diagram  
<sup>2</sup> Measured 50 mm (2") above protective grille



To Order (Specify Model Number)		AVAILABLE FOR FAST DELIVERY!
MODEL NO.	PRICE	DESCRIPTION
CS0600	\$48	Enclosure heater, 50 W, 120 to 240 Vac/Vdc
CS0601	69	Enclosure heater, 100 W, 120 to 240 Vac/Vdc
CS0602	79	Enclosure heater, 150 W, 120 to 240 Vac/Vdc

Comes complete with operator's manual.  
**Ordering Example: CS0600, enclosure heater, \$48.**



**UNITED STATES**

[www.omega.com](http://www.omega.com)  
1-800-TC-OMEGA  
Stamford, CT.

**CANADA**

[www.omega.ca](http://www.omega.ca)  
Laval(Quebec)  
1-800-TC-OMEGA

**GERMANY**

[www.omega.de](http://www.omega.de)  
Deckenpfronn, Germany  
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Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# 50 TO 150 W

## CSF060 Series



- Low Surface Temperature
- Integrated Thermostat
- DIN Rail Mountable Allows for Quick Mounting
- Double Insulated (Plastic)
- Wide Voltage Range
- Small Size

Touch-safe heater for the use in enclosures with electrical/electronic components. The design of the heater supports the natural convection which results in a high air-current of warm air. The surface temperatures on the accessible side surfaces of the housing are kept down as a result of the heater design. This model with plug-in thermostat does not require additional wiring. The heaters are designed for permanent operation. This heater is also available in a version without thermostat (CS 060).



CSF06001 shown larger than actual size.

### SPECIFICATIONS

**Operating Voltage:** 120 to 240 Vac\* (min 110V, max 265V)

**Heating Capacity:** See table

**Heating Element:** PTC resistor: temperature limiting

**Surface Temperature:** <80°C (176°F), except upper protective grille

**Connection:** 4-pole terminal 2.5 mm<sup>2</sup>, (0.10 in<sup>2</sup>) torque 0.8 Nm max

**Casing:** Plastic according to UL94 V-0, black

**Mounting:** Clip for 35 mm (1.4") DIN rail, EN 50022

**Fitting Position:** Vertical  
**Temperature**

**Operating:** -40 to 70°C (-40 to 158°F)

**Storage:** -45 to 70°C (-49 to 158°F)

**Protection Type/Protection Class:**  
 NEMA 2 (IP20)/II (double insulated)  
**Approvals:** VDE

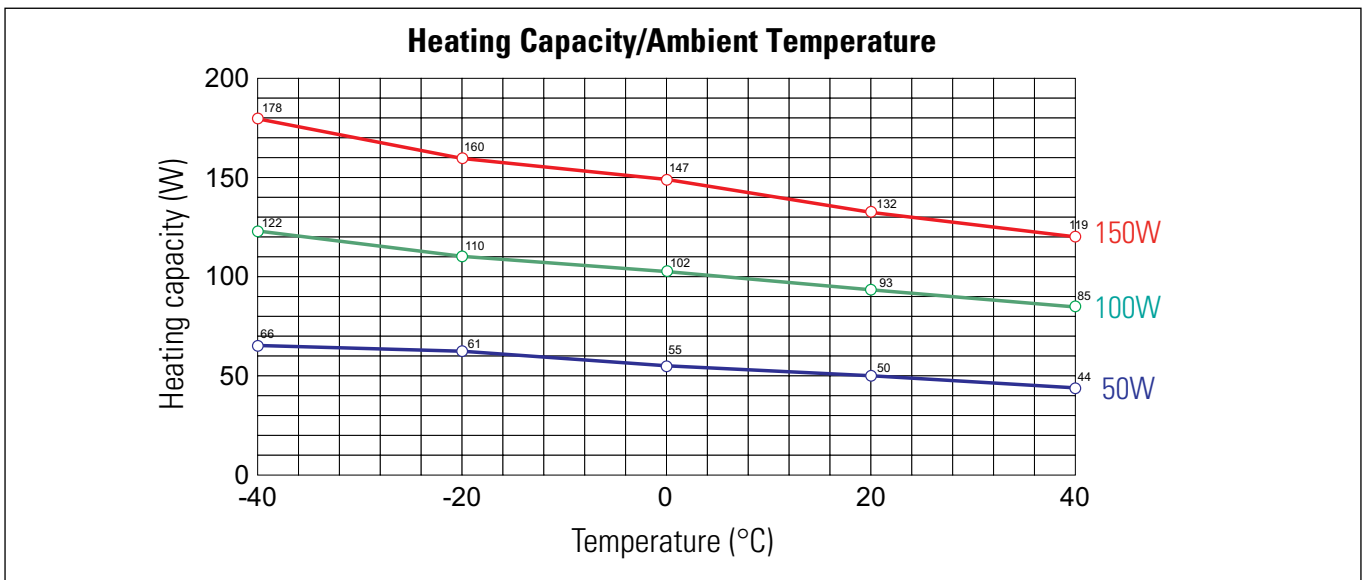
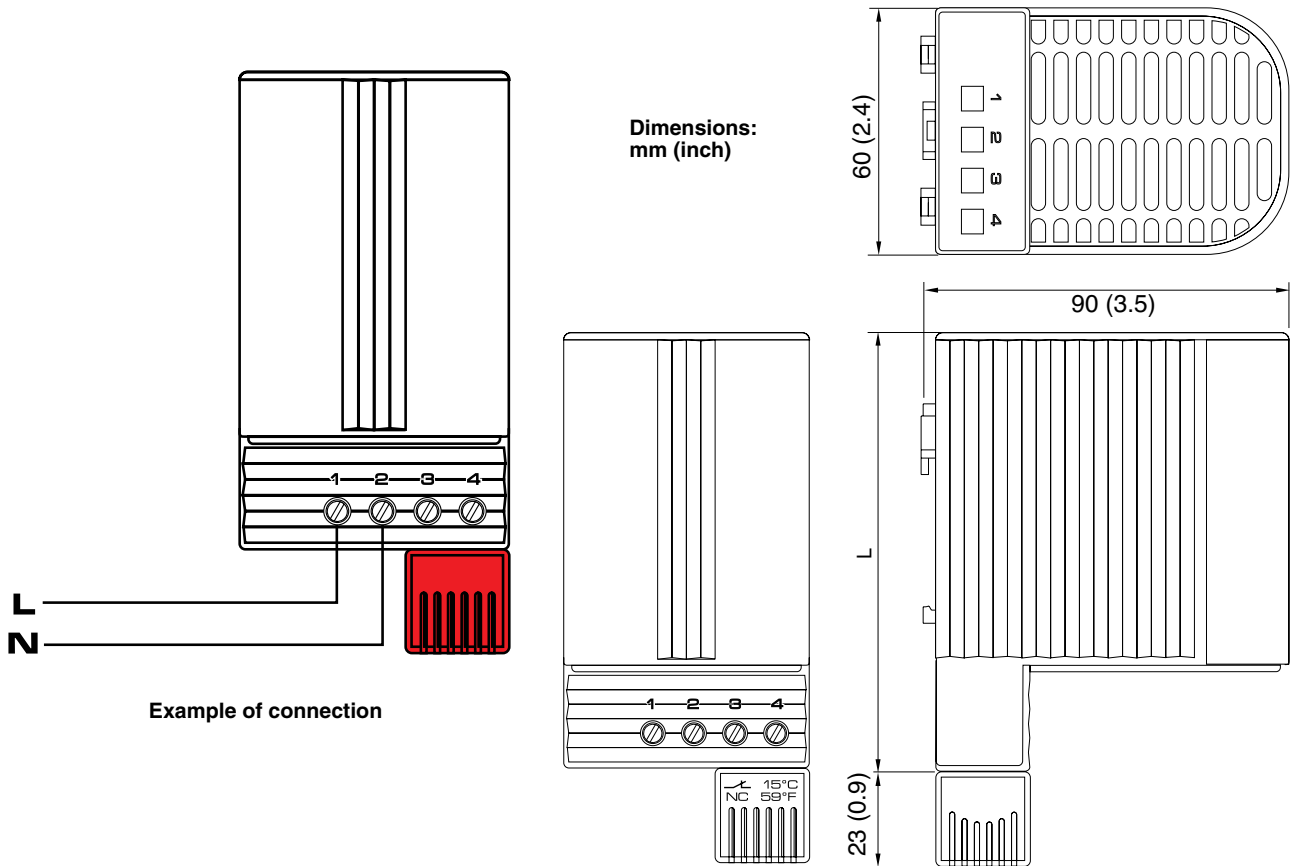
*Note: Other voltages on request  
 \* Operating with voltages below 140 Vac reduces heating performance by approximately 10%.*

Model No.	CSF06001	CSF06011	CSF06021
<b>Heating Capacity<sup>1</sup></b>	50 W	100 W	150 W
<b>Inrush Current Max</b>	2.5 A	4.5 A	8 A
<b>Air Outlet Temperature<sup>2</sup></b>	86°C (186.8°F)	120°C (248°F)	145°C (293°F)
<b>Switch-Off Temperature<sup>3</sup></b>	15°C (59°F)	15°C (59°F)	15°C (59°F)
<b>Starting Temperature<sup>3</sup></b>	5°C (41°F)	5°C (41°F)	5°C (41°F)
<b>Dimensions</b>	110 x 60 x 90 mm (4.3 x 2.4 x 3.5")	110 x 60 x 90 mm (4.3 x 2.4 x 3.5")	150 x 60 x 90 mm (5.9 x 2.4 x 3.5")
<b>Weight (Approx)</b>	0.30 kg (10.6 oz)	0.30 kg (10.6 oz)	0.50 kg (17.6 oz)

<sup>1</sup> Ambient temperature: See heating capacity/ambient temperature diagram

<sup>2</sup> Measured 50 mm (2.0") above protective grille

<sup>3</sup> Tolerance of ±5K



**To Order** Visit [omega.com/csf060\\_series](http://omega.com/csf060_series) for Pricing and Details

MODEL NO.	DESCRIPTION
CSF06001	Enclosure heater, 50 W, 120 to 240 Vac, with fixed point thermostat 15°C (59°F) open/5°C (41°F) close
CSF06011	Enclosure heater, 100 W, 120 to 240 Vac, with fixed point thermostat 15°C (59°F) open/5°C (41°F) close
CSF06021	Enclosure heater, 150 W, 120 to 240 Vac, with fixed point thermostat 15°C (59°F) open/5°C (41°F) close

Comes complete with operator's manual.  
Ordering Example: CSF06001, enclosure heater.



## Ceramic Insulated Finned Strip Heaters

### CSF1 Series

- Rugged, Durable Construction
- Stainless Steel Sheath
- Nickel-Plated Steel Fins (Stainless Steel Optional)
- Various Terminations
- Trouble-Free Installation
- Various Sizes in Stock

#### Typical Applications

- Duct Heating
- Space Heaters
- Drying Ovens
- Food Warmers
- Dehumidifier
- Shrinking Tunnels
- Air Heating
- Heat Curing

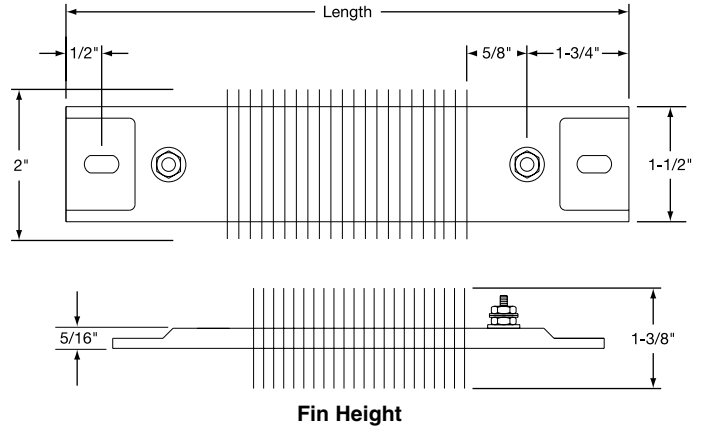
OMEGA® finned strip heaters are extremely efficient and dependable as a heat source for hundreds of industrial and commercial applications. They are used for both forced (mounted in a duct) and natural convection air heating (mounted at the bottom of cabinet type ovens).

The finned strip heater's basic design consists of a helically wound resistance coil placed in a specially designed ceramic insulator. The resistance coil is mechanically connected to the screw terminal for positive connection. Stainless steel rectangular tubing is used to house the heater assembly. All remaining voids are filled with high purity magnesium oxide to increase thermal conductivity and dielectric strength.

Nickel-plated steel fins (stainless steel optional) are mounted to the rectangular tubing. The fins have been specially designed to provide maximum surface contact for good heat



Type T1



dissipation into the finned cross sections, thus resulting in rapid heat transfer to the air.

OMEGA finned strip heaters are manufactured in a full line of standard sizes, electrical ratings and terminations, or can be made to your specifications.

## Specifications and Tolerances

If tighter tolerances are required consult OMEGA.

### Performance Ratings

**Maximum Sheath Temperature:** 650°C (1200°F)

**Maximum Watt Density:**

Still Air	Max Watt/cm <sup>2</sup>	Max Watt/in <sup>2</sup>
Up to 149°C (300°F)	3.1	20
149 to 316°C (300 to 600°F)	2.5	16
316 to 427°C (600 to 800°F)	1.6	10
Moving Air	Max Watt/cm <sup>2</sup>	Max Watt/in <sup>2</sup>
At 3 m/sec, up to 93°C (600/minute, up to 200°F)	6.2	40
At 3 m/sec, up to 204°C (600/minute, up to 400°F)	4.7	30
At 3 m/sec, up to 316°C (600/minute, up to 600°F)	3.1	20

### Electrical Specifications

**Maximum Voltage:** 480 Vac (when applicable)

**Maximum Amperage:** 25 A

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### Material Specifications and Physical Sizes

**Sheath:** 304 stainless steel

**Fins:** Nickel plated steel (stainless steel optional)

**Screw Terminals:** Stainless steel 10-32 UNF threads

**Width Including Fins:** 51 mm (2")

**Height Including Fins:** 35 mm (1 3/8")

**Length Tolerance:** Up to 0.61 m (24") ±1/16", over 0.61 m (24") ±1/8"

**Mounting Slot Size:** Standard 8 x 13 mm (5/16 x 1/2")

**Slot Size For Secondary Insulating Bushing:** 13 x 16 mm (1/2 x 5/8") for 300V and above



## Secondary Insulating Bushings

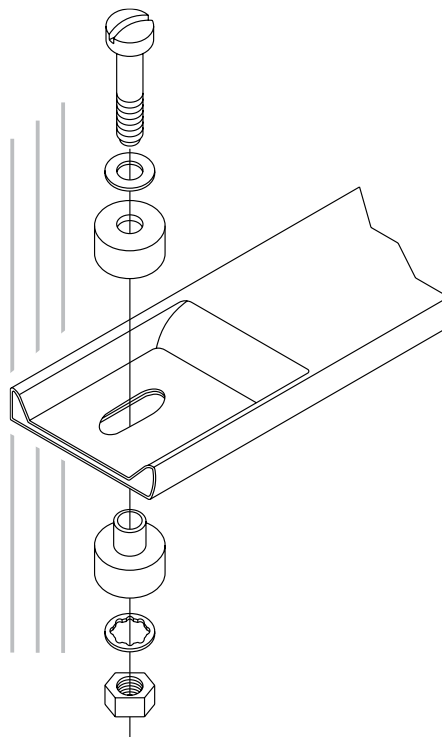
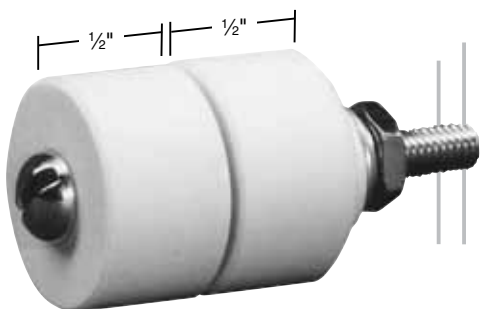
Secondary insulating ceramic bushings increase the effective space between the heater and grounded surface for electrical clearance at high voltages. They must be used on the mounting tabs when the finned heater is connected in series or in direct line voltage above 300V.

When insulating bushings are required, a 13 x 16 (1/2" x 5/8") slot is substituted for the standard slot size 8 x 13 mm (5/16" x 1/2").

### Insulating Bushing Assembly

**Model Number: CERR-1001**

*Note: Two assemblies are required for each heater.*



**CAUTION:** When using secondary insulating bushings, the heater must be guarded to avoid any accidental contact. The guard must be electrically isolated from the heater and must be properly grounded.

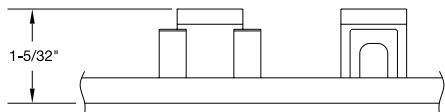
## Ceramic Covers for Insulating Screw Terminals

### Igloo™ Ceramic Covers

Igloo ceramic terminal covers consist of two individual ceramic parts. With a tight-fitting cap and a solid base, an Igloo cover will fully insulate any standard 10-32 terminal lug used for electrical wiring hookups.

Igloo covers can be assembled on all channel strip and finned strip heaters with Type T1 and Type T4 screw terminals. Mica strip heaters with screw terminals that have a minimum center to center distance of 22 mm (7/8") can also be assembled with Igloo covers.

Three different types of Igloo bases are available for your wiring convenience. Double port in-line, double port 90° and single port.



**Type C6**  
Double Port In-Line  
Model Number:  
CER-101-104



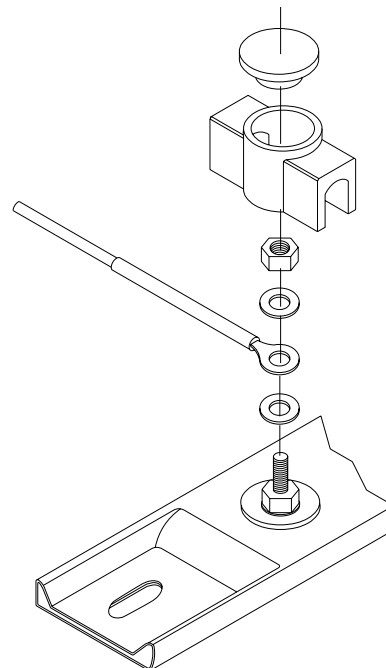
**Type C7**  
Double Port 90°  
Model Number:  
CER-101-106



**Type C8**  
Single Port  
Model Number:  
CER-101-107



**Ceramic Cap**  
Thread 10-32  
Model Number:  
CER-102-101





## Finned Strip Heaters—T1 Termination



<b>To Order Visit <a href="http://omega.com/csf1">omega.com/csf1</a> for Pricing and Details</b>						
Model No.		Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
CSF00121	CSF00122	266.7	10½	500	5	34
CSF00123	CSF00124	266.7	10½	725	7	45
CSF00131	CSF00132	304.8	12	900	6	40
CSF00232	CSF00249	355.6	14	750	4	28
CSF00135	CSF00136	355.6	14	1100	6	37
CSF00139	CSF00140	387.4	15¼	1250	6	37
CSF00144	CSF00145	454.0	17⅞	1550	6	38
—	CSF00159	603.3	23¾	2200	5	30
—	CSF00165	647.7	25½	2400	5	35
—	CSF00176	774.7	30½	2800	5	29
—	CSF00217	1079.5	42½	4150	5	31

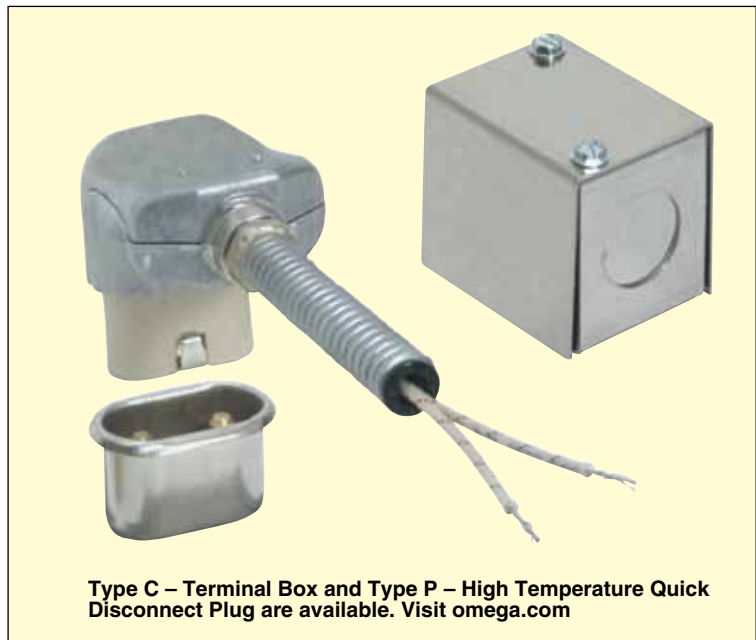
Ordering Example: CSF00121, 500 watt, 120 Vac, finned strip heater.

### Custom Engineered/Manufactured Heaters

An electric heater can be very application specific; for sizes and ratings not listed, OMEGA will design and manufacture a finned strip heater to meet your requirements.

#### Please Specify the Following:

- Type of Application
- Termination Type
- Length
- Secondary Bushings (see page 2)
- Wattage
- Igloo™ Ceramic Terminal Covers
- Voltage



Type C – Terminal Box and Type P – High Temperature Quick Disconnect Plug are available. Visit [omega.com](http://omega.com)





## Ceramic Insulated Finned Strip Heaters

### CSF2 Series

- Rugged, Durable Construction
- Stainless Steel Sheath
- Nickel-Plated Steel Fins (Stainless Steel Optional)
- Various Terminations
- Trouble-Free Installation
- Various Sizes in Stock

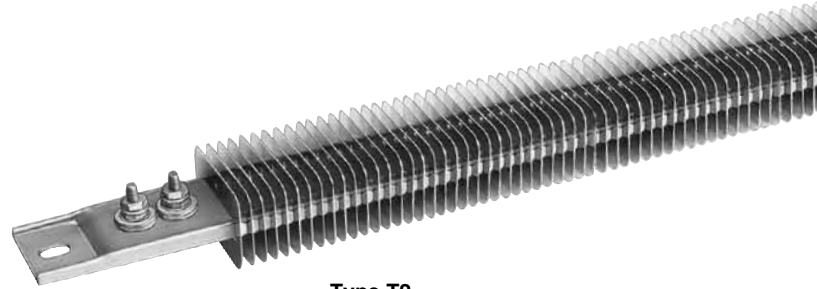
#### Typical Applications

- Duct Heating
- Space Heaters
- Drying Ovens
- Food Warmers
- Dehumidifier
- Shrinking Tunnels
- Air Heating
- Heat Curing

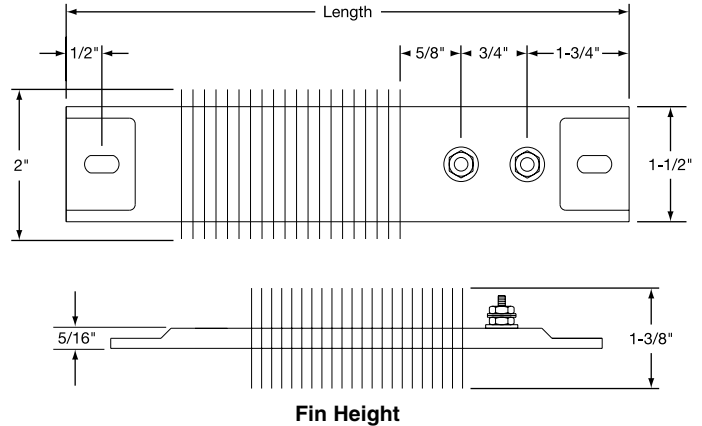
OMEGA® finned strip heaters are extremely efficient and dependable as a heat source for hundreds of industrial and commercial applications. They are used for both forced (mounted in a duct) and natural convection air heating (mounted at the bottom of cabinet type ovens).

The finned strip heater's basic design consists of a helically wound resistance coil placed in a specially designed ceramic insulator. The resistance coil is mechanically connected to the screw terminal for positive connection. Stainless steel rectangular tubing is used to house the heater assembly. All remaining voids are filled with high purity magnesium oxide to increase thermal conductivity and dielectric strength.

Nickel-plated steel fins (stainless steel optional) are mounted to the rectangular tubing. The fins have been specially designed to provide maximum surface contact for good heat



Type T2



dissipation into the finned cross sections, thus resulting in rapid heat transfer to the air.

OMEGA finned strip heaters are manufactured in a full line of standard sizes, electrical ratings and terminations, or can be made to your specifications.

## Specifications and Tolerances

If tighter tolerances are required consult OMEGA.

### Performance Ratings

**Maximum Sheath Temperature:** 650°C (1200°F)

**Maximum Watt Density:**

Still Air	Max Watt/cm <sup>2</sup>	Max Watt/in <sup>2</sup>
Up to 149°C (300°F)	3.1	20
149 to 316°C (300 to 600°F)	2.5	16
316 to 427°C (600 to 800°F)	1.6	10
Moving Air	Max Watt/cm <sup>2</sup>	Max Watt/in <sup>2</sup>
At 3 m/sec, up to 93°C (600/minute, up to 200°F)	6.2	40
At 3 m/sec, up to 204°C (600/minute, up to 400°F)	4.7	30
At 3 m/sec, up to 316°C (600/minute, up to 600°F)	3.1	20

### Electrical Specifications

**Maximum Voltage:** 480 Vac (when applicable)

**Maximum Amperage:** 25 A

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### Material Specifications and Physical Sizes

**Sheath:** 304 stainless steel

**Fins:** Nickel plated steel (stainless steel optional)

**Screw Terminals:** Stainless steel 10-32 UNF threads

**Width Including Fins:** 51 mm (2")

**Height Including Fins:** 35 mm (1 3/8")

**Length Tolerance:** Up to 0.61 m (24") ±1/16", over 0.61 m (24") ±1/8"

**Mounting Slot Size:** Standard 8 x 13 mm (5/16 x 1/2")

**Slot Size For Secondary Insulating Bushing:** 13 x 16 mm (1/2 x 5/8") for 300V and above

## Secondary Insulating Bushings

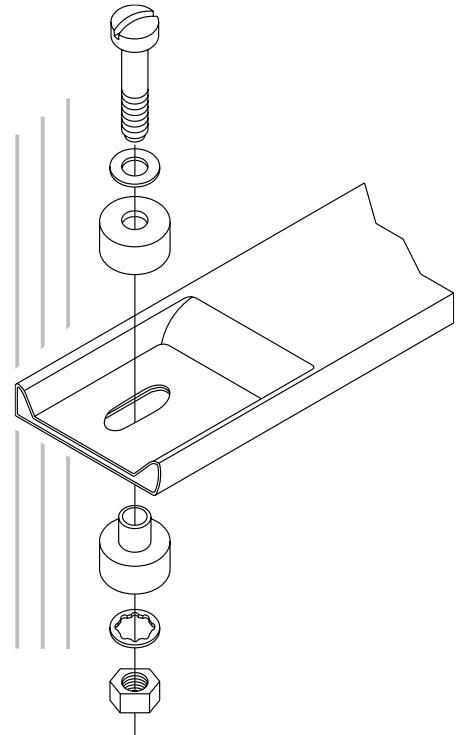
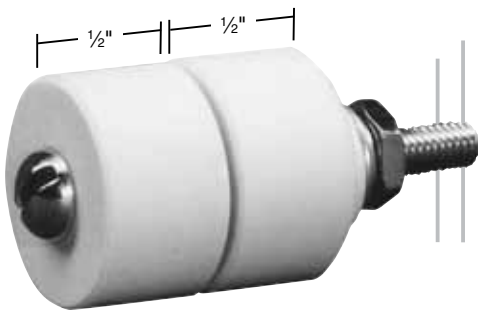
Secondary insulating ceramic bushings increase the effective space between the heater and grounded surface for electrical clearance at high voltages. They must be used on the mounting tabs when the finned heater is connected in series or in direct line voltage above 300V.

When insulating bushings are required, a 13 x 16 ( $\frac{1}{2} \times \frac{5}{8}$ ) slot is substituted for the standard slot size 8 x 13 mm ( $\frac{5}{16} \times \frac{1}{2}$ ).

### Insulating Bushing Assembly

**Model Number: CERR-1001**

*Note: Two assemblies are required for each heater.*



**CAUTION:** When using secondary insulating bushings, the heater must be guarded to avoid any accidental contact. The guard must be electrically isolated from the heater and must be properly grounded.

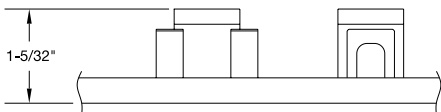
## Ceramic Covers for Insulating Screw Terminals

### Igloo™ Ceramic Covers

Igloo ceramic terminal covers consist of two individual ceramic parts. With a tight-fitting cap and a solid base, an Igloo cover will fully insulate any standard 10-32 terminal lug used for electrical wiring hookups.

Igloo covers can be assembled on all channel strip and finned strip heaters with Type T1 and Type T4 screw terminals. Mica strip heaters with screw terminals that have a minimum center to center distance of 22 mm ( $\frac{7}{8}$ " can also be assembled with Igloo covers.

Three different types of Igloo bases are available for your wiring convenience. Double port in-line, double port 90° and single port.



**Type C6**  
Double Port In-Line  
Model Number:  
CER-101-104



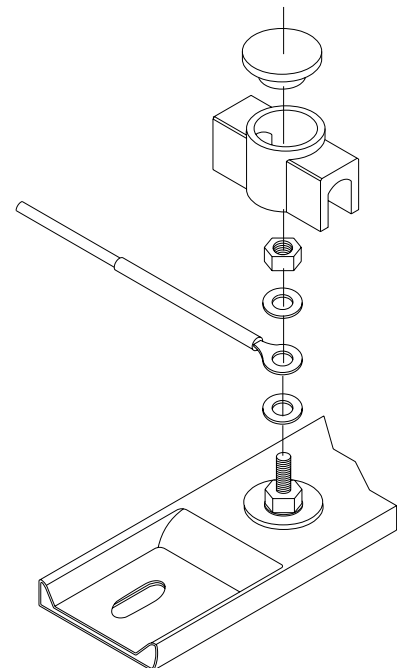
**Type C7**  
Double Port 90°  
Model Number:  
CER-101-106



**Type C8**  
Single Port  
Model Number:  
CER-101-107

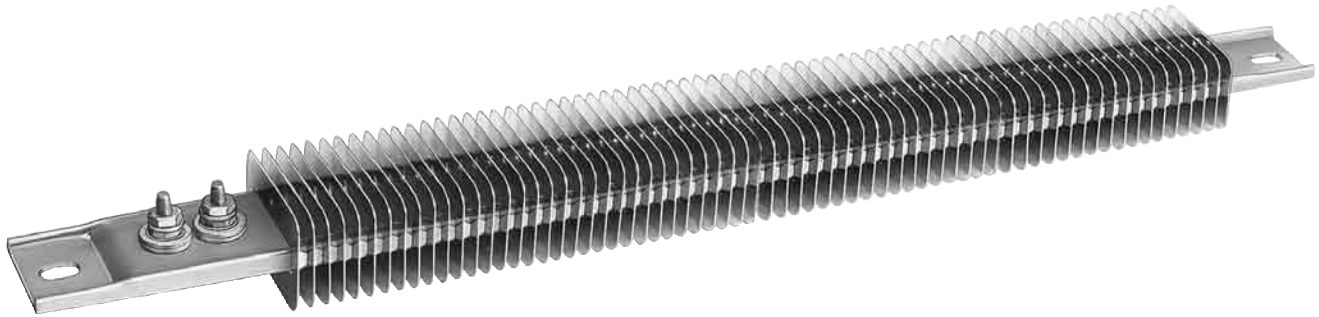


**Ceramic Cap**  
Thread 10-32  
Model Number:  
CER-102-101





## Finned Strip Heaters—T2 Termination



**To Order Visit [omega.com/csf2](http://omega.com/csf2) for Pricing and Details**

Model No.		Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
CSF00127	CSF00128	266.7	10½	725	6	36
CSF00133	CSF00134	304.8	12	900	6	36
CSF00137	CSF00138	355.6	14	1100	5	32
CSF00141	CSF00142	387.4	15¼	1250	5	34
CSF00146	CSF00147	454.0	17⅞	1550	5	33
CSF00151	CSF00152	495.3	19½	1700	5	30
—	CSF00166	647.7	25½	2400	5	33
—	CSF00177	774.7	30½	2800	5	31

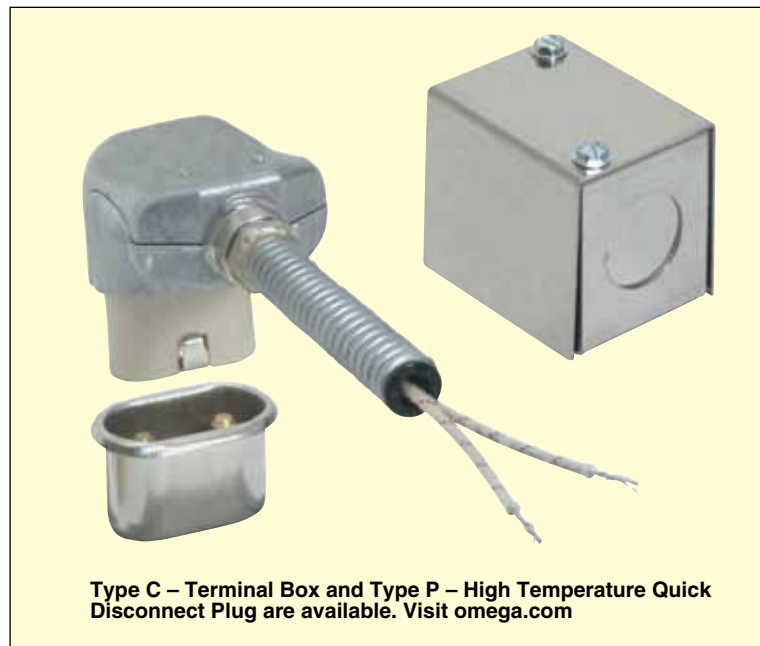
*Ordering Example: CSF00133, 900 watt, 120 Vac, finned strip heater.*

### Custom Engineered/Manufactured Heaters

An electric heater can be very application specific; for sizes and ratings not listed, OMEGA will design and manufacture a finned strip heater to meet your requirements.

#### Please Specify the Following:

- Type of Application
- Termination Type
- Length
- Secondary Bushings (see page 2)
- Wattage
- Igloo™ Ceramic Terminal Covers
- Voltage



Type C – Terminal Box and Type P – High Temperature Quick Disconnect Plug are available. Visit [omega.com](http://omega.com)



## Ceramic Insulated Finned Strip Heaters

### CSF3 Series

- Rugged, Durable Construction
- Stainless Steel Sheath
- Nickel-Plated Steel Fins (Stainless Steel Optional)
- Various Terminations
- Trouble-Free Installation
- Various Sizes in Stock

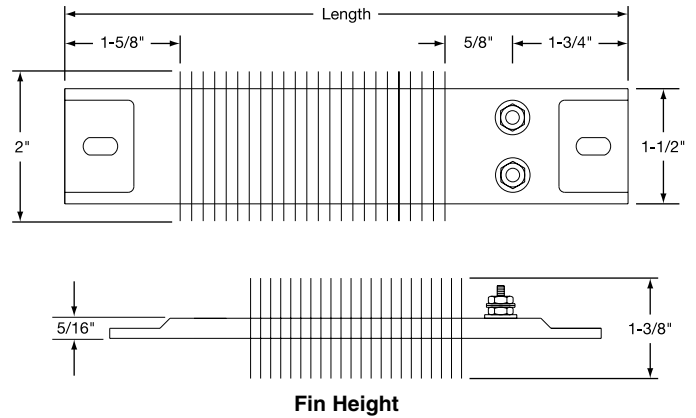
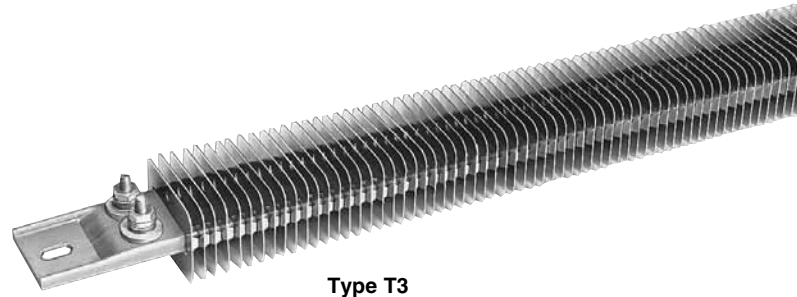
#### Typical Applications

- Duct Heating
- Space Heaters
- Drying Ovens
- Food Warmers
- Dehumidifier
- Shrinking Tunnels
- Air Heating
- Heat Curing

OMEGA® finned strip heaters are extremely efficient and dependable as a heat source for hundreds of industrial and commercial applications. They are used for both forced (mounted in a duct) and natural convection air heating (mounted at the bottom of cabinet type ovens).

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Nickel-plated steel fins (stainless steel optional) are mounted to the rectangular tubing. The fins have been specially designed to provide maximum surface contact for good heat



dissipation into the finned cross sections, thus resulting in rapid heat transfer to the air.

OMEGA finned strip heaters are manufactured in a full line of standard sizes, electrical ratings and terminations, or can be made to your specifications.

## Specifications and Tolerances

If tighter tolerances are required consult OMEGA.

### Performance Ratings

**Maximum Sheath Temperature:** 650°C (1200°F)

**Maximum Watt Density:**

Still Air	Max Watt/cm <sup>2</sup>	Max Watt/in <sup>2</sup>
Up to 149°C (300°F)	3.1	20
149 to 316°C (300 to 600°F)	2.5	16
316 to 427°C (600 to 800°F)	1.6	10
Moving Air	Max Watt/cm <sup>2</sup>	Max Watt/in <sup>2</sup>
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### Electrical Specifications

**Maximum Voltage:** 480 Vac (when applicable)

**Maximum Amperage:** 25 A

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### Material Specifications and Physical Sizes

**Sheath:** 304 stainless steel

**Fins:** Nickel plated steel (stainless steel optional)

**Screw Terminals:** Stainless steel 10-32 UNF threads

**Width Including Fins:** 51 mm (2")

**Height Including Fins:** 35 mm (1 3/8")

**Length Tolerance:** Up to 0.61 m (24") ±1/16", over 0.61 m (24") ±1/8"

**Mounting Slot Size:** Standard 8 x 13 mm (5/16 x 1/2")

**Slot Size For Secondary Insulating Bushing:** 13 x 16 mm (1/2 x 5/8") for 300V and above



## Secondary Insulating Bushings

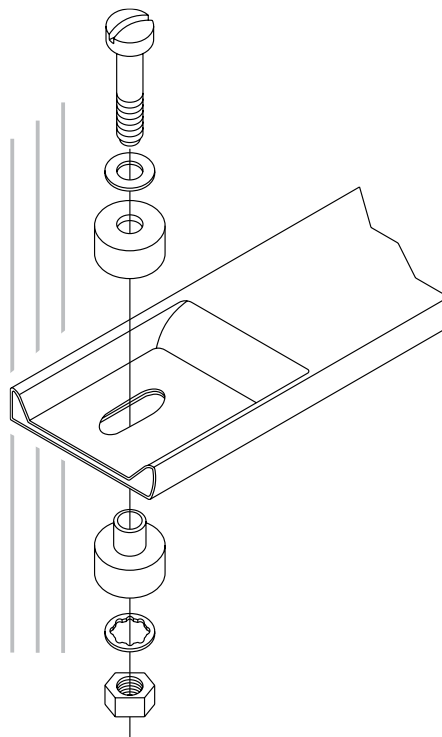
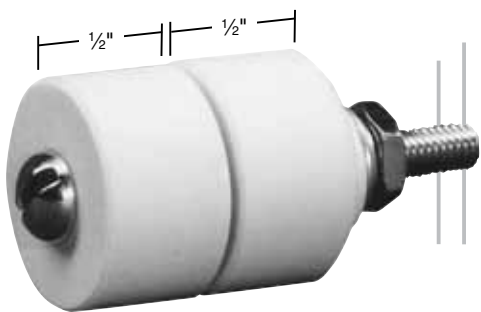
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When insulating bushings are required, a 13 x 16 (1/2" x 5/8") slot is substituted for the standard slot size 8 x 13 mm (5/16" x 1/2").

### Insulating Bushing Assembly

**Model Number: CERR-1001**

*Note: Two assemblies are required for each heater.*



**CAUTION:** When using secondary insulating bushings, the heater must be guarded to avoid any accidental contact. The guard must be electrically isolated from the heater and must be properly grounded.

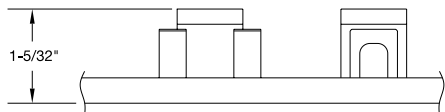
## Ceramic Covers for Insulating Screw Terminals

### Igloo™ Ceramic Covers

Igloo ceramic terminal covers consist of two individual ceramic parts. With a tight-fitting cap and a solid base, an Igloo cover will fully insulate any standard 10-32 terminal lug used for electrical wiring hookups.

Igloo covers can be assembled on all channel strip and finned strip heaters with Type T1 and Type T4 screw terminals. Mica strip heaters with screw terminals that have a minimum center to center distance of 22 mm (7/8") can also be assembled with Igloo covers.

Three different types of Igloo bases are available for your wiring convenience. Double port in-line, double port 90° and single port.



**Type C6**  
Double Port In-Line  
Model Number:  
CER-101-104



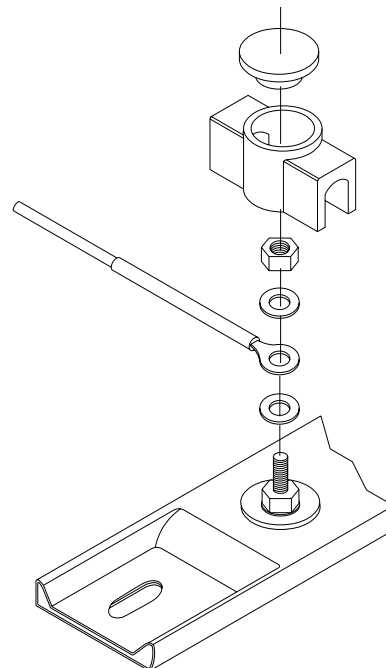
**Type C7**  
Double Port 90°  
Model Number:  
CER-101-106



**Type C8**  
Single Port  
Model Number:  
CER-101-107

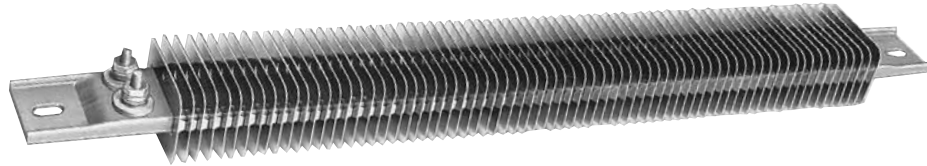


**Ceramic Cap**  
Thread 10-32  
Model Number:  
CER-102-101





## Finned Strip Heaters—T3 Termination



**To Order Visit [omega.com/csf3](http://omega.com/csf3) for Pricing and Details**

Model No.		Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
CSF00001	CSF00002	266.7	10½	500	3	21
CSF00003	CSF00004	266.7	10½	725	5	31
CSF00005	—	304.8	12	500	3	17
—	CSF00007	304.8	12	650	3	23
CSF00008	CSF00009	304.8	12	900	5	31
CSF00010	CSF00011	355.6	14	750	3	21
CSF00012	CSF00013	355.6	14	1100	5	31
CSF00014	CSF00015	387.4	15¼	1250	5	31
CSF00016	CSF00017	454.0	17⅞	1550	5	31
CSF00018	CSF00019	495.3	19½	1700	5	31
CSF00024	CSF00025	533.4	21	1900	5	31
—	CSF00026	603.3	23¾	2200	5	31
—	CSF00027	647.7	25½	2400	5	32
—	CSF00028	679.5	26¾	2500	5	30
—	CSF00031	774.7	30½	2800	5	30
—	CSF00033	850.9	33½	3150	5	30
—	CSF00034	911.2	35⅞	3450	5	31
—	CSF00036	1079.5	42½	4150	5	31

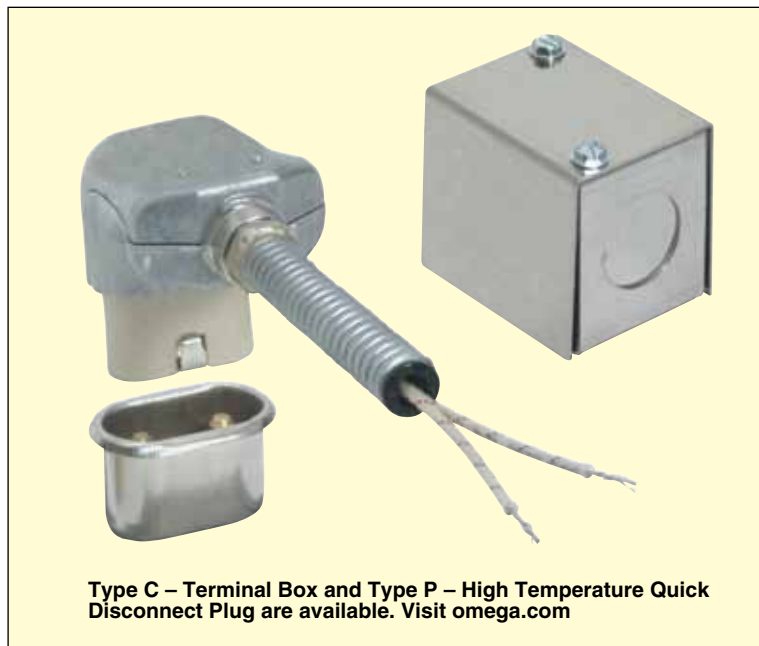
**Ordering Example:** CSF00005, 500 watt, 120 Vac, finned strip heater.

### Custom Engineered/Manufactured Heaters

An electric heater can be very application specific; for sizes and ratings not listed, OMEGA will design and manufacture a finned strip heater to meet your requirements.

#### Please Specify the Following:

- Type of Application
- Termination Type
- Length
- Secondary Bushings (see page 2)
- Wattage
- Igloo™ Ceramic Terminal Covers
- Voltage



Type C – Terminal Box and Type P – High Temperature Quick Disconnect Plug are available. Visit [omega.com](http://omega.com)



## Ceramic Insulated Finned Strip Heaters

### CSF4 Series

- Rugged, Durable Construction
- Stainless Steel Sheath
- Nickel-Plated Steel Fins (Stainless Steel Optional)
- Various Terminations
- Trouble-Free Installation
- Various Sizes in Stock

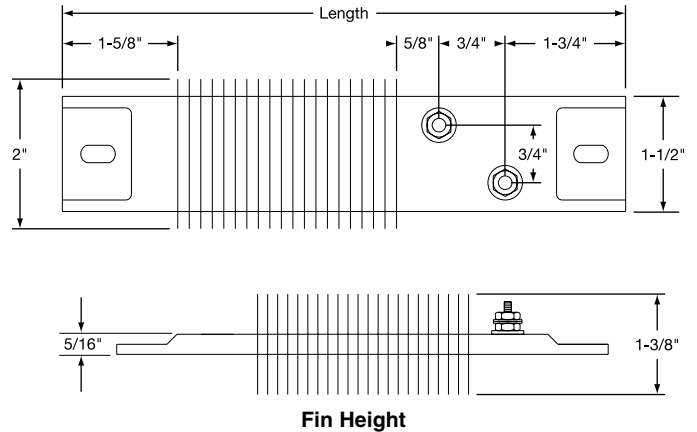
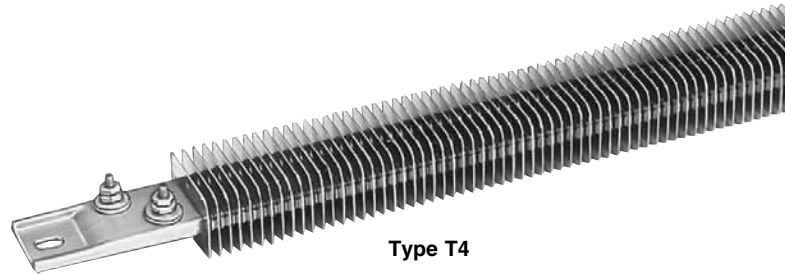
#### Typical Applications

- Duct Heating
- Space Heaters
- Drying Ovens
- Food Warmers
- Dehumidifier
- Shrinking Tunnels
- Air Heating
- Heat Curing

OMEGA® finned strip heaters are extremely efficient and dependable as a heat source for hundreds of industrial and commercial applications. They are used for both forced (mounted in a duct) and natural convection air heating (mounted at the bottom of cabinet type ovens).

The finned strip heater's basic design consists of a helically wound resistance coil placed in a specially designed ceramic insulator. The resistance coil is mechanically connected to the screw terminal for positive connection. Stainless steel rectangular tubing is used to house the heater assembly. All remaining voids are filled with high purity magnesium oxide to increase thermal conductivity and dielectric strength.

Nickel-plated steel fins (stainless steel optional) are mounted to the rectangular tubing. The fins have been specially designed to provide maximum surface contact for good heat



dissipation into the finned cross sections, thus resulting in rapid heat transfer to the air.

OMEGA finned strip heaters are manufactured in a full line of standard sizes, electrical ratings and terminations, or can be made to your specifications.

## Specifications and Tolerances

If tighter tolerances are required consult OMEGA.

### Performance Ratings

**Maximum Sheath Temperature:** 650°C (1200°F)

**Maximum Watt Density:**

Still Air	Max Watt/cm <sup>2</sup>	Max Watt/in <sup>2</sup>
Up to 149°C (300°F)	3.1	20
149 to 316°C (300 to 600°F)	2.5	16
316 to 427°C (600 to 800°F)	1.6	10
Moving Air	Max Watt/cm <sup>2</sup>	Max Watt/in <sup>2</sup>
At 3 m/sec, up to 93°C (600/minute, up to 200°F)	6.2	40
At 3 m/sec, up to 204°C (600/minute, up to 400°F)	4.7	30
At 3 m/sec, up to 316°C (600/minute, up to 600°F)	3.1	20

### Electrical Specifications

**Maximum Voltage:** 480 Vac (when applicable)

**Maximum Amperage:** 25 A

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### Material Specifications and Physical Sizes

**Sheath:** 304 stainless steel

**Fins:** Nickel plated steel (stainless steel optional)

**Screw Terminals:** Stainless steel 10-32 UNF threads

**Width Including Fins:** 51 mm (2")

**Height Including Fins:** 35 mm (1 3/8")

**Length Tolerance:** Up to 0.61 m (24") ±1/16", over 0.61 m (24") ±1/8"

**Mounting Slot Size:** Standard 8 x 13 mm (5/16 x 1/2")

**Slot Size For Secondary Insulating Bushing:** 13 x 16 mm (1/2 x 5/8") for 300V and above



## Secondary Insulating Bushings

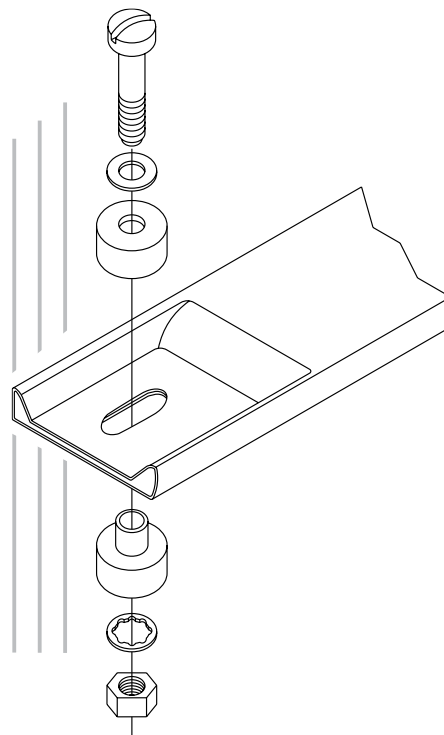
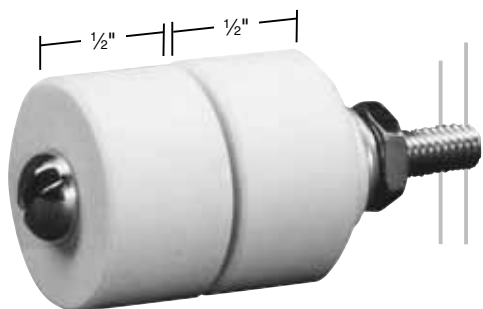
Secondary insulating ceramic bushings increase the effective space between the heater and grounded surface for electrical clearance at high voltages. They must be used on the mounting tabs when the finned heater is connected in series or in direct line voltage above 300V.

When insulating bushings are required, a 13 x 16 ( $\frac{1}{2} \times \frac{5}{8}$ ) slot is substituted for the standard slot size 8 x 13 mm ( $\frac{5}{16} \times \frac{1}{2}$ ).

### Insulating Bushing Assembly

**Model Number: CERR-1001**

*Note: Two assemblies are required for each heater.*



**CAUTION:** When using secondary insulating bushings, the heater must be guarded to avoid any accidental contact. The guard must be electrically isolated from the heater and must be properly grounded.

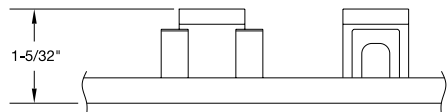
## Ceramic Covers for Insulating Screw Terminals

### Igloo™ Ceramic Covers

Igloo ceramic terminal covers consist of two individual ceramic parts. With a tight-fitting cap and a solid base, an Igloo cover will fully insulate any standard 10-32 terminal lug used for electrical wiring hookups.

Igloo covers can be assembled on all channel strip and finned strip heaters with Type T1 and Type T4 screw terminals. Mica strip heaters with screw terminals that have a minimum center to center distance of 22 mm ( $\frac{7}{8}$ " ) can also be assembled with Igloo covers.

Three different types of Igloo bases are available for your wiring convenience. Double port in-line, double port 90° and single port.



**Type C6**  
Double Port In-Line  
Model Number:  
CER-101-104



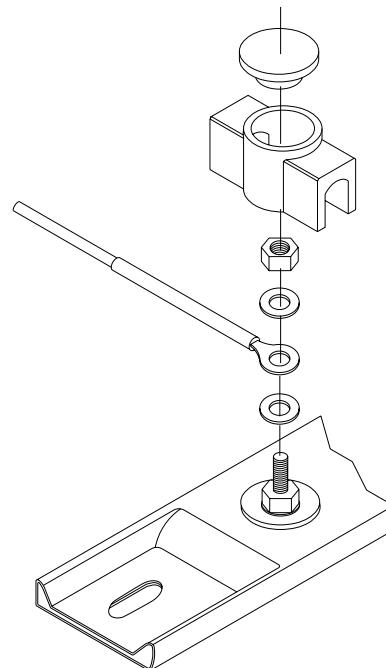
**Type C7**  
Double Port 90°  
Model Number:  
CER-101-106



**Type C8**  
Single Port  
Model Number:  
CER-101-107



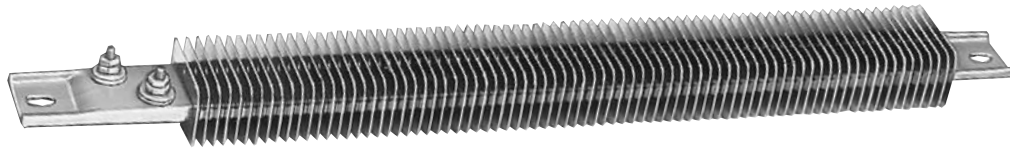
**Ceramic Cap**  
Thread 10-32  
Model Number:  
CER-102-101







## Finned Strip Heaters—T4 Termination



**To Order Visit [omega.com/csf4](http://omega.com/csf4) for Pricing and Details**

Model No.		Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
CSF00252	—	215.9	8½	250	3	18
—	CSF00039	266.7	10½	350	3	17
CSF00129	CSF00130	266.7	10½	500	4	24
CSF00042	—	266.7	10½	600	4	29
CSF00044	CSF00045	266.7	10½	725	5	35
CSF00209	—	266.7	10½	850	6	40
CSF00047	—	304.8	12	500	3	19
CSF00053	CSF00054	304.8	12	900	5	34
CSF00056	CSF00057	355.6	14	750	3	23
CSF00060	CSF00061	355.6	14	1100	5	33
CSF00065	—	387.4	15¼	1000	4	27
CSF00143	CSF00067	387.4	15¼	1250	5	33
CSF00071	—	454.0	17⅞	1000	3	21
CSF00073	—	454.0	17⅞	1300	4	28
CSF00148	CSF00075	454.0	17⅞	1550	5	33
—	CSF00077	495.3	19½	1250	4	24
—	CSF00080	495.3	19½	1700	5	32
CSF00158	CSF00085	533.4	21	1900	5	33
—	CSF00088	603.3	23¾	1450	3	22
—	CSF00090	603.3	23¾	2200	5	33
—	CSF00100	679.5	26¾	2500	5	32
—	CSF00102	774.7	30½	1800	3	20
—	CSF00104	774.7	30½	2800	5	31
—	CSF00180	850.9	33½	3150	5	31
—	CSF00350	911.2	35⅞	2000	3	18
—	CSF00110	911.2	35⅞	3450	5	31
—	CSF00117	1079.5	42½	4150	5	31

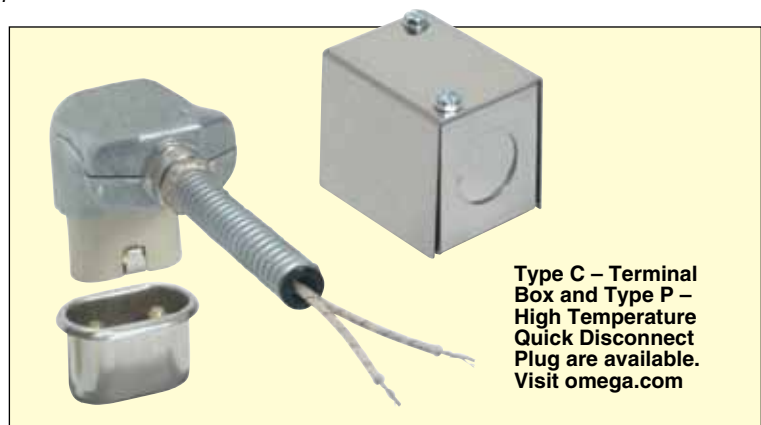
Ordering Example: CSF00252, 250 watt, 120 Vac, finned strip heater.

### Custom Engineered/Manufactured Heaters

An electric heater can be very application specific; for sizes and ratings not listed, OMEGA will design and manufacture a finned strip heater to meet your requirements.

#### Please Specify the Following:

- Type of Application
- Termination Type
- Length
- Secondary Bushings (see page 2)
- Wattage
- Igloo™ Ceramic Terminal Covers
- Voltage



Type C – Terminal Box and Type P – High Temperature Quick Disconnect Plug are available. Visit [omega.com](http://omega.com)

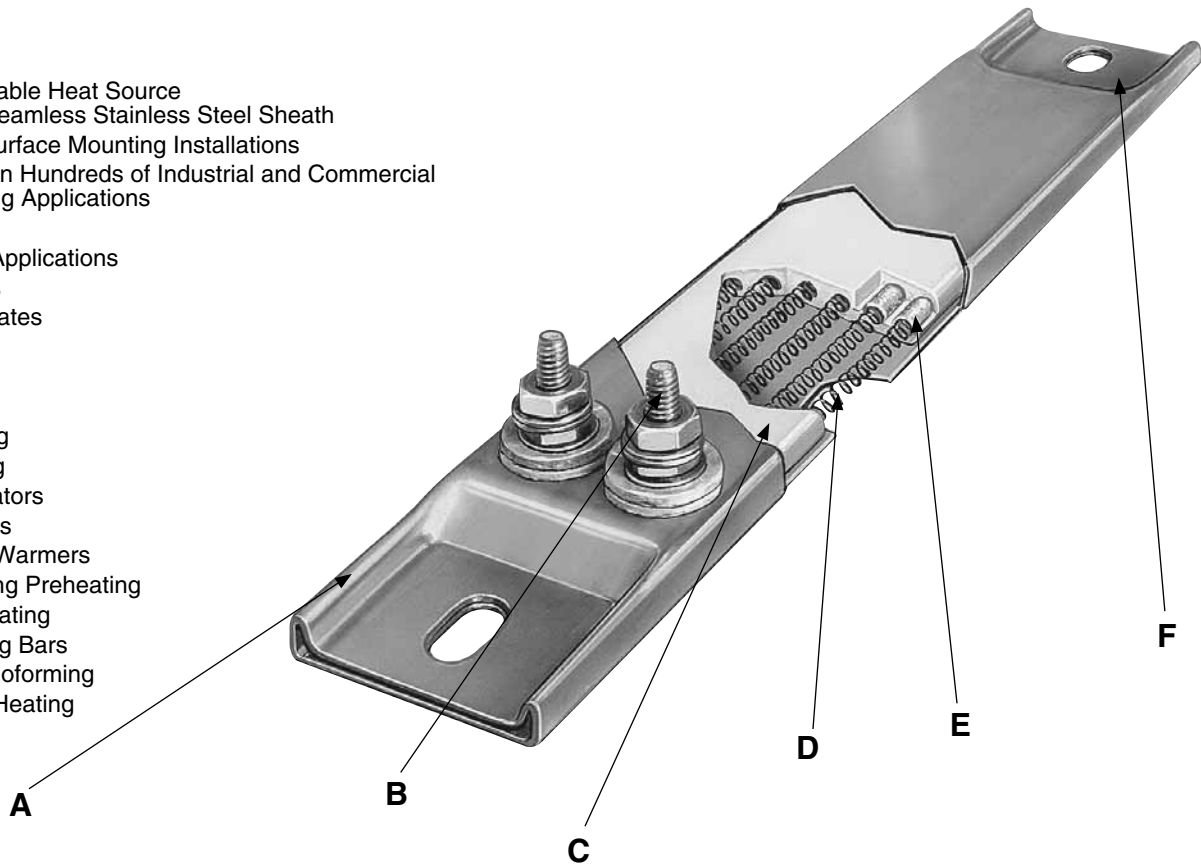


## Channel Strip Heaters Ceramic Insulated

- A Reliable Heat Source with Seamless Stainless Steel Sheath
- Flat Surface Mounting Installations
- Used in Hundreds of Industrial and Commercial Heating Applications

### Typical Applications

- Ovens
- Hot Plates
- Dies
- Molds
- Drying
- Melting
- Baking
- Incubators
- Platens
- Food Warmers
- Welding Preheating
- Air Heating
- Sealing Bars
- Thermoforming
- Tank Heating



**A** Type 304 Stainless Steel sheath provides the best combination of physical strength and resistance to high temperatures and chemical corrosion. Dependable at sheath temperatures of up to 650°C (1200°F).

**B** Stainless Steel 10-32 threaded screws are standard and are securely fastened. Various termination configurations and options are available.

**C** Specially selected and designed ceramic insulator houses the resistance wire coil, insulating it from the outer sheath.

**D** Helically wound resistance wire coil made from nickel-chrome wire is evenly stretched and precisely strung through the ceramic insulator, providing uniform heat. Resistance wire is then mechanically connected to screw terminals or lead wires for a strong positive joint.

**E** A custom mixture of several high purity magnesium oxide grain sizes, chosen to increase thermal conductivity and dielectric strength, are used to fill all remaining space inside and around the ceramic insulator. Voids are densely packed.

**F** Channel strip heaters are available with or without mounting tabs. If without, the ends are silver soldered shut to prevent moisture and contaminants from entering the heater. Tabs are not available on 6.35 thick x 16 mm wide (¼ x ⅝") heaters.

### Agency Approvals

Channel Strip Heaters have been certified as Recognized Components by Underwriters Laboratories (File Number E65652) under CCN KSOT2/8 to meet UL standard 499 and Canadian Standard C22.2, No 72.

This file specifies the end use limitations and conditions of acceptability for the use of this type of heater. For additional information consult OMEGA.

*If you require UL, CSA, or other NRTL Agency Approvals, please specify when ordering.*



## Channel Strip Heaters Ceramic Insulated

Channel Strip Heaters have proven to be extremely efficient and dependable as a heat source for surface heating in hundreds of industrial and commercial applications. The rectangular tube gives full surface contact when used in a milled slot to provide maximum heat transfer area.

For surface mounting installations, channel strip heaters must be securely clamped along their entire length to a smooth metal surface. When supported by mounting tabs, the terminal end should be secured firmly. Opposite end should be loose to allow for thermal expansion.

### PERFORMANCE RATINGS

**Maximum Sheath Temperature:** 650°C (1200°F)

**Nominal Watt Density:** 20 Watts/in<sup>2</sup> (3.1 Watts/cm<sup>2</sup>)

**Maximum Watt Density:** 45 Watts/in<sup>2</sup> (dependent on design parameters)

### ELECTRICAL SPECIFICATIONS

**Maximum Voltage:** 480 Vac (dependent on design parameters)

**Maximum Recommended Voltage with Leads:** 480V

**Maximum Amperage:**

**Lead Wire Termination:** 10 amp

**Screw Terminations:** 10-32UNF—25 amp

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### PHYSICAL SIZE CONSTRUCTION LIMITATIONS

**Width:**

**16 mm ( $\frac{5}{8}$ " ) Wide Heaters:** +0.000, -0.005"

**25 mm and 38 mm (1 and 1½" ) Wide Heaters:**  
+0.000, -0.010"

**Thickness:**

**6 mm ( $\frac{1}{4}$ " ) Thick Heaters:** +0.000, -0.005"

**8 and 10 mm ( $\frac{5}{16}$  and  $\frac{3}{8}$ " ) Thick Heaters:** +0.000, -0.008"  
[10 mm ( $\frac{3}{8}$ " ) thick heaters have radius corners]

**Length:**

**Up to 24":**  $\pm\frac{1}{16}$ "

**Over 24":**  $\pm\frac{1}{8}$ "

**Mounting Slot Size:** Standard 8 x 13 mm ( $\frac{5}{16}$  x  $\frac{1}{2}$ " )

**Special Bushings:** 13 x 16 mm ( $\frac{1}{2}$  x  $\frac{5}{8}$ " )

Standard Specifications and Tolerances of Channel Strip Heaters If tighter tolerances are required, consult OMEGA.

### OMEGA Offers Channel Strip Heaters in Four Rectangular Sizes



16 W x 6 mm thick ( $\frac{5}{8}$ " x  $\frac{1}{4}$ " ).  
Available without mounting tabs only.



25 W x 8 mm thick (1" x  $\frac{5}{16}$ " ).  
Available with or without mounting tabs. When supplied with Type L lead wire termination, mounting tabs are not available.



38 W x 8 mm thick (1½" x  $\frac{5}{16}$ " ).  
Available with or without mounting tabs. When supplied with Type L lead wire termination, mounting tabs are not available.



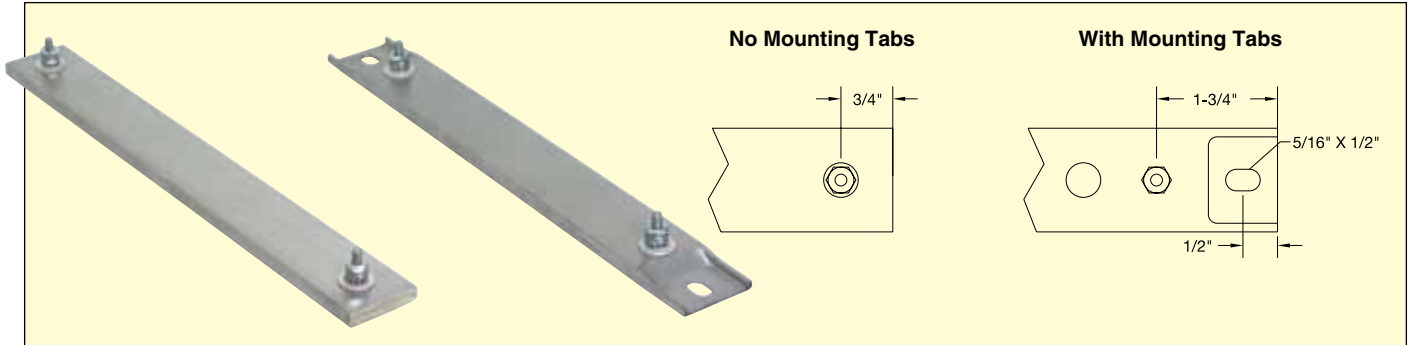
38 W x 10 mm thick (1½" x  $\frac{3}{8}$ " ).  
Available with or without mounting tabs. When supplied with Type L lead wire termination, mounting tabs are not available. [10 mm ( $\frac{3}{8}$ " ) thick heaters have radius corners]



## Channel Strip Heaters Screw Terminal Terminations

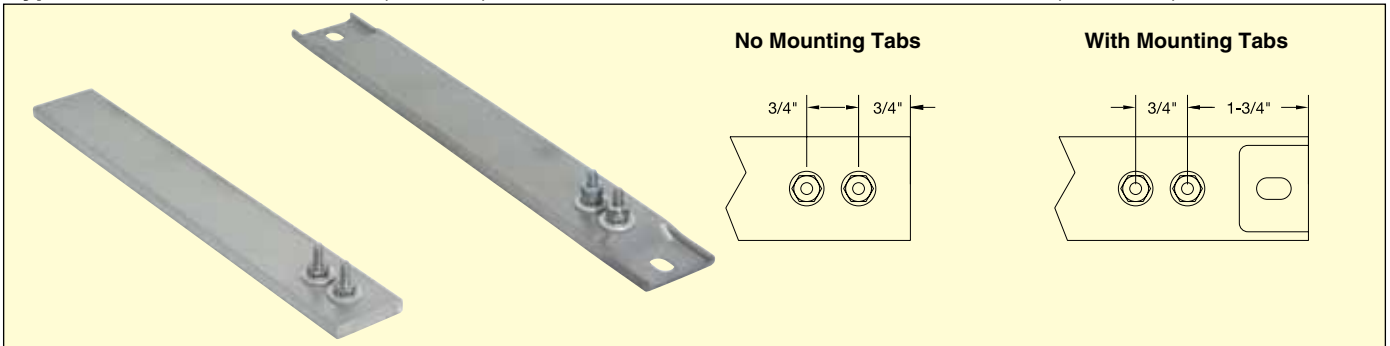
**Type T1** 10-32 Screw Terminals at each end

Available on 25 and 38 mm (1 and 1½") wide heaters



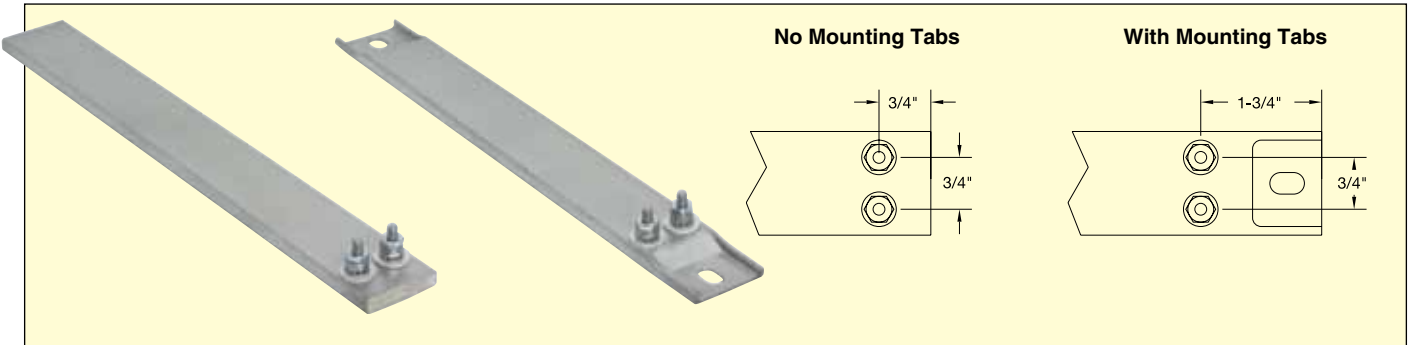
**Type T2** 10-32 Screw Terminals (Tandem) at one end

Available on 25 and 38 mm (1 and 1½") wide heaters



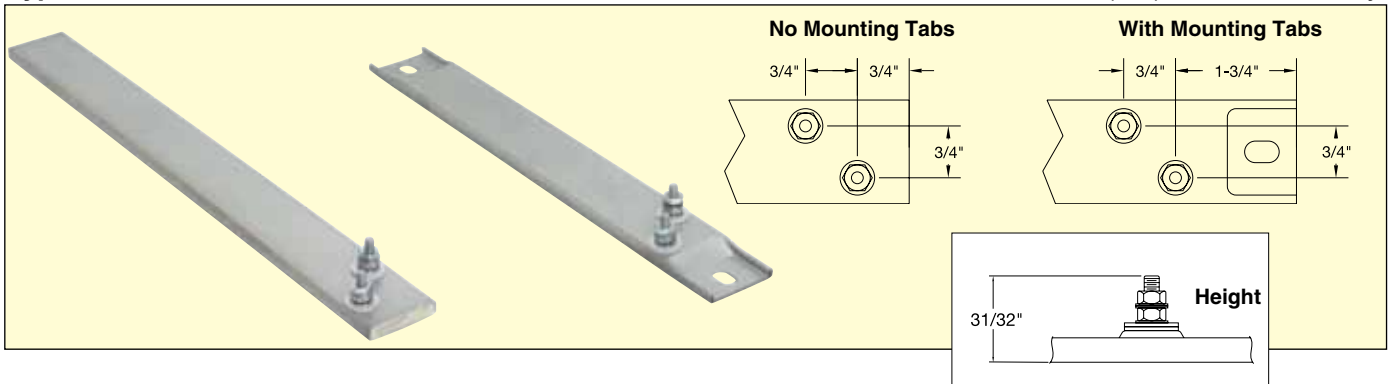
**Type T3** 10-32 Screw Terminals (Parallel) at one end

Available on 38 mm (1½") wide heaters only



**Type T4** 10-32 Terminals offset at one end

Available on 38 mm (1½") wide heaters only



## Channel Strip Heaters Lead Wire Terminations

Type L

### Type L

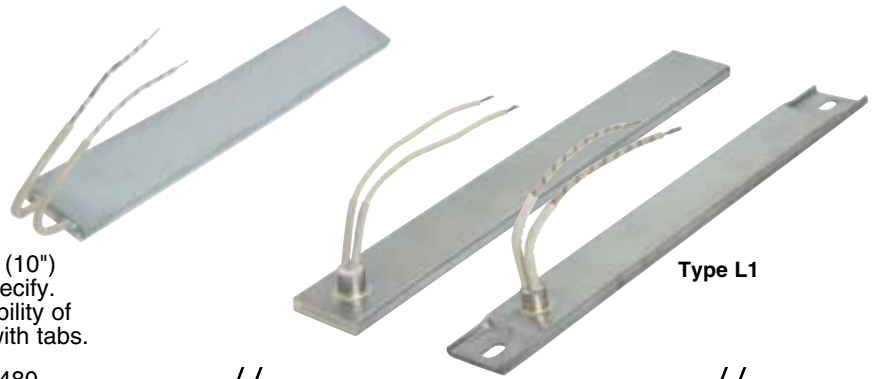
Flexible lead wires exit from end of heater. 254 mm (10") long leads standard; if longer leads are required, specify. Recommended only for tight quarters or where flexibility of the lead wire is required. Not available on heaters with tabs.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

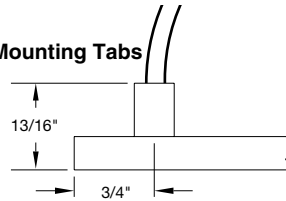
### Type L1

Flexible lead wires exit from top of heater. 254 mm (10") long leads standard; if longer leads are required, specify.

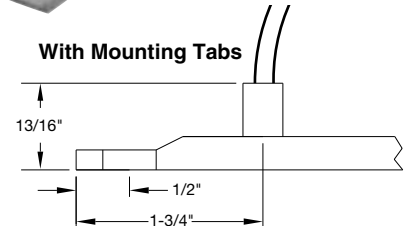
**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480



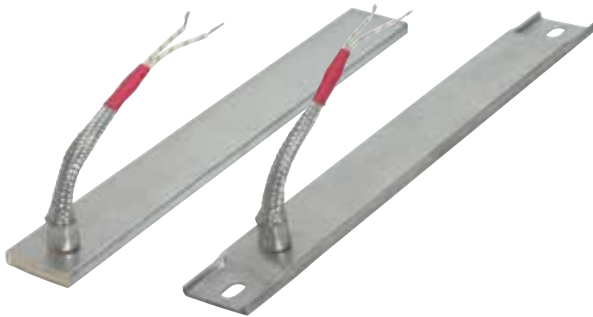
No Mounting Tabs



With Mounting Tabs



Type W1

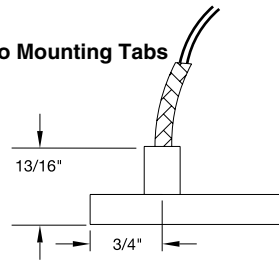


### Type W1

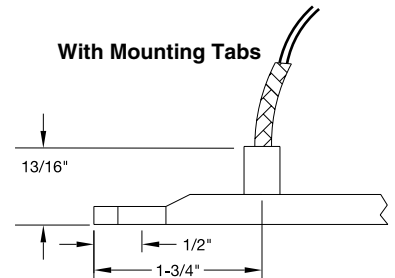
Wire braid provides strength and protection to the lead wire insulation, offering sharp bending not possible with armor cable. 254 mm (10") of wire braid over 12" long leads is standard; if longer leads or braid are required, specify.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

No Mounting Tabs



With Mounting Tabs



### Type W2

Stainless steel braid over each lead wire offers sharp bending not possible with armor cable, as well as abrasion protection. 254 mm (10") long leads standard; if longer leads are required, specify. Not available on heaters with tabs.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

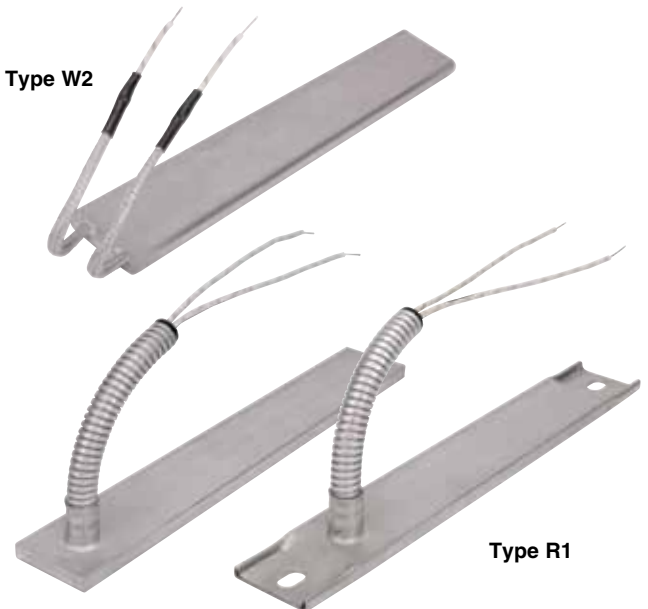
### Type R1

Armor cable provides strength and prevents contamination from getting into the heater. 254 mm (10") of armor over 305 mm (12") long leads are standard; if longer leads or armor are required, please specify.

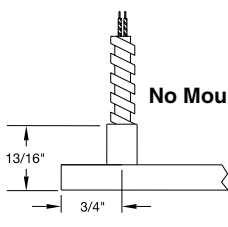
**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

**Type R1A:** Galvanized cable **Type R2A:** Stainless steel cable

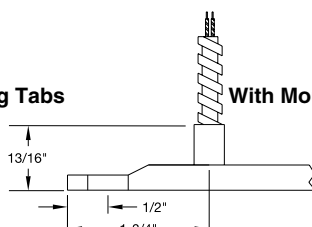
Type W2



No Mounting Tabs



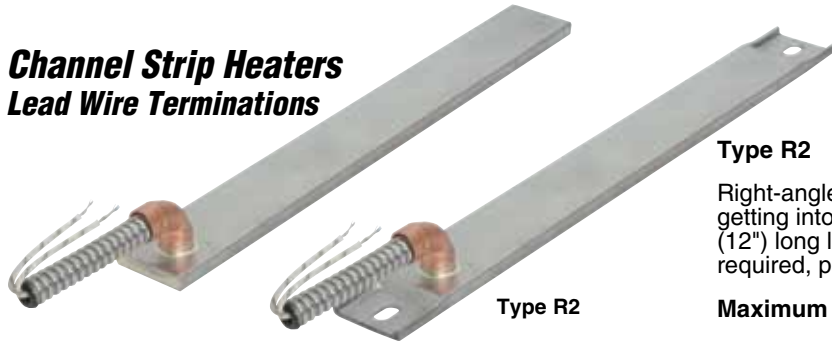
With Mounting Tabs



Type R1



## Channel Strip Heaters Lead Wire Terminations

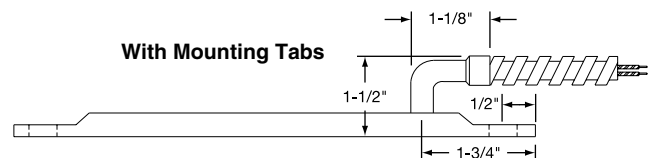
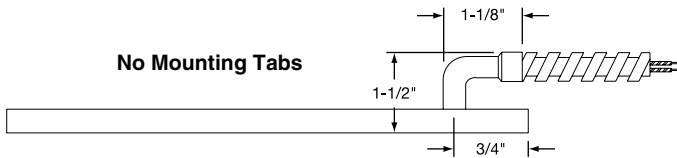


### Type R2

Right-angle armor cable prevents contamination from getting into the heater. 254 mm (10") of armor over 305 mm (12") long leads is standard; if longer leads or armor are required, please specify.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

- Type R2A** Galvanized cable
- Type R2B** Stainless steel cable
- Type R2C** Elbow and leads only (no cable)



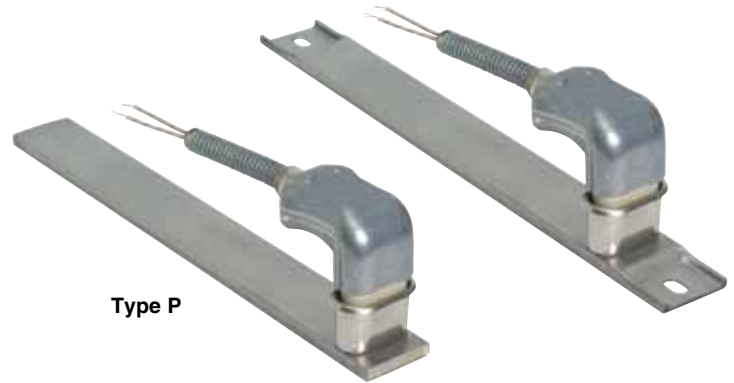
## Terminal Protection

### Type P

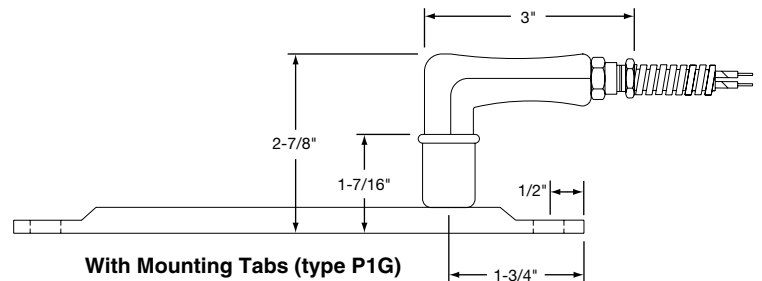
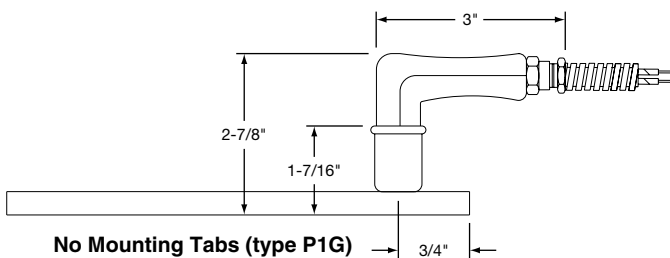
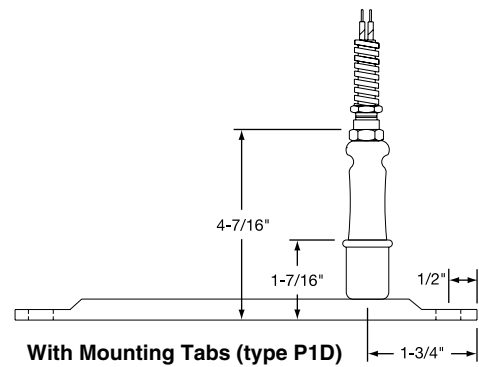
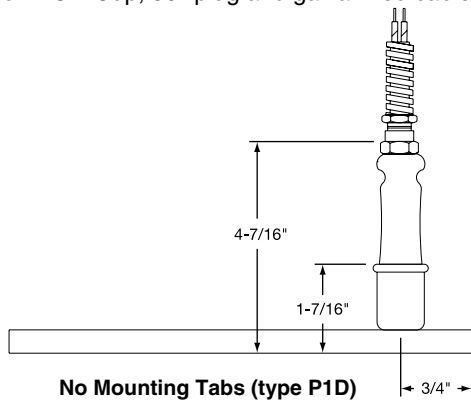
High-Temperature Quick Disconnect Plug. If armor protected lead wires are required, specify armor and lead length. Available on 38 mm (1 1/2") wide heaters only.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 250

- Type P1A** Cup only (UT900)
- Type P1B** Cup and straight plug (H900)
- Type P1C** Cup and 90° plug (HW900)
- Type P1D** Cup, straight plug and galvanized cable
- Type P1G** Cup, 90° plug and galvanized cable



Type P



**Caution:** Exposed electrical wiring on Strip Heaters is a violation of electrical safety codes, including O.S.H.A.

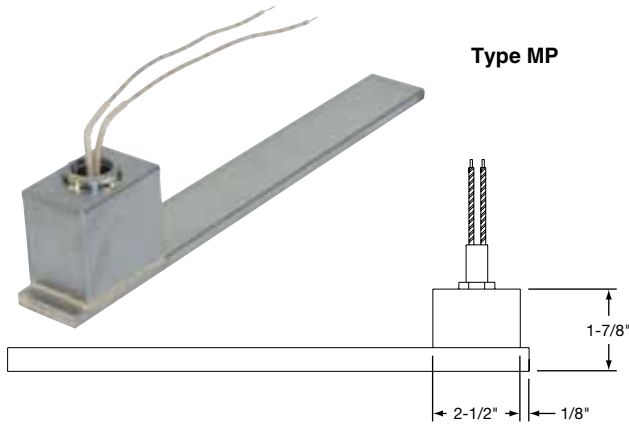
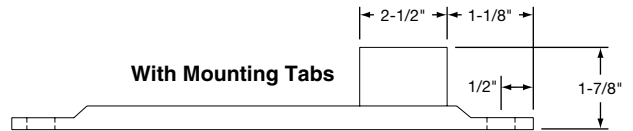
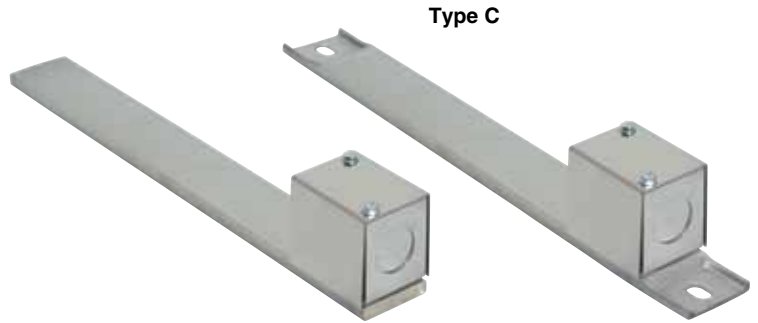


## Channel Strip Heaters Terminal Protection

### Type C

Terminal box has a 13 mm (1/2") trade size knockout (actual diameter 22 mm (7/8")). Box provides excellent protection to exposed terminals. If armor-protected lead wires are required, specify armor and lead length. Available on 25 and 38 mm (1 and 1 1/2") wide heaters.

- Type CA** No cable or braid
- Type CB** Galvanized cable
- Type CC** Stainless steel cable
- Type CD** Wire braid



### Type MP

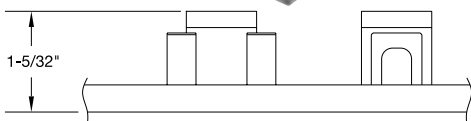
Specially designed box is welded to the Channel Strip Heater and potted with epoxy. The ends of the heater are also welded. Leads exit through a 1/2 NPT nut that can be located at the top or in the front of the box. Armor cable can be supplied with the male fitting, providing a completely sealed channel strip. Available on 38 mm (1 1/2") wide heaters only.

254 mm (10") long leads standard; if longer leads are required, specify.

**Maximum Amps: 25 Maximum Volts: 480**

## Ceramic Covers for Insulating Terminals

Igloo™ Ceramic terminal covers consist of two individual ceramic parts. With a tight-fitting cap and a solid base, an Igloo cover will fully insulate any standard 10-32 terminal lug used for electrical wiring hookups. Igloo covers can be assembled on all Channel Strip heaters with Type 1 and Type 4 screw terminals.



Ceramic Cap



Thread 10-32  
Part Number  
CER-102-101

**Type C6**  
Double Port In-Line  
Part Number: CER-101-104



**Type C7**  
Double Port 90°  
Part Number: CER-101-106



Three different types of Igloo bases are available for your wiring convenience. Double Port In-Line, Double Port 90° and Single Port.

When ordering, specify the type of Igloo.



**Type C8**  
Single Port  
Part Number:  
CER-101-107



**Channel Strip**  
**25.4 x 16 mm (1 x 5/16")**

Part numbers shown are for heaters with T2 Terminals and Mounting Tabs.



<b>To Order Visit <a href="http://omega.com/csh2_series">omega.com/csh2_series</a> for Pricing and Details</b>						
Model No.		Length		Wattage	Watt Density	
120V	240V	in	mm		Watt/in <sup>2</sup>	Watt/cm <sup>2</sup>
CSH00021	—	8	203.2	250	13	2
CSH00022	—	9½	241.3	300	13	2
CSH00023	—	11	279.4	350	13	2
CSH00024	CSH00025	12	304.8	400	13	2
CSH00026	CSH00027	14	355.6	450	13	2
CSH00028	CSH00029	15¼	387.4	500	13	2
CSH00030	CSH00031	17¾	454.0	600	13	2
CSH00032	CSH00033	19½	495.3	600	12	2
CSH00034	CSH00035	21	533.4	750	14	2
CSH00036	CSH00037	22½	571.5	750	13	2
CSH00038	CSH00039	23¾	603.3	800	13	2
CSH00040	CSH00041	25½	647.7	900	14	2
CSH00042	CSH00043	27½	698.5	900	13	2
CSH00044	CSH00045	28¾	730.3	1000	13	2
CSH00046	CSH00047	30½	774.7	1000	13	2
CSH00048	CSH00049	33½	850.9	1000	12	2
CSH00050	CSH00051	35¾	911.2	1000	11	2
CSH00052	CSH00053	38½	977.9	1250	13	2



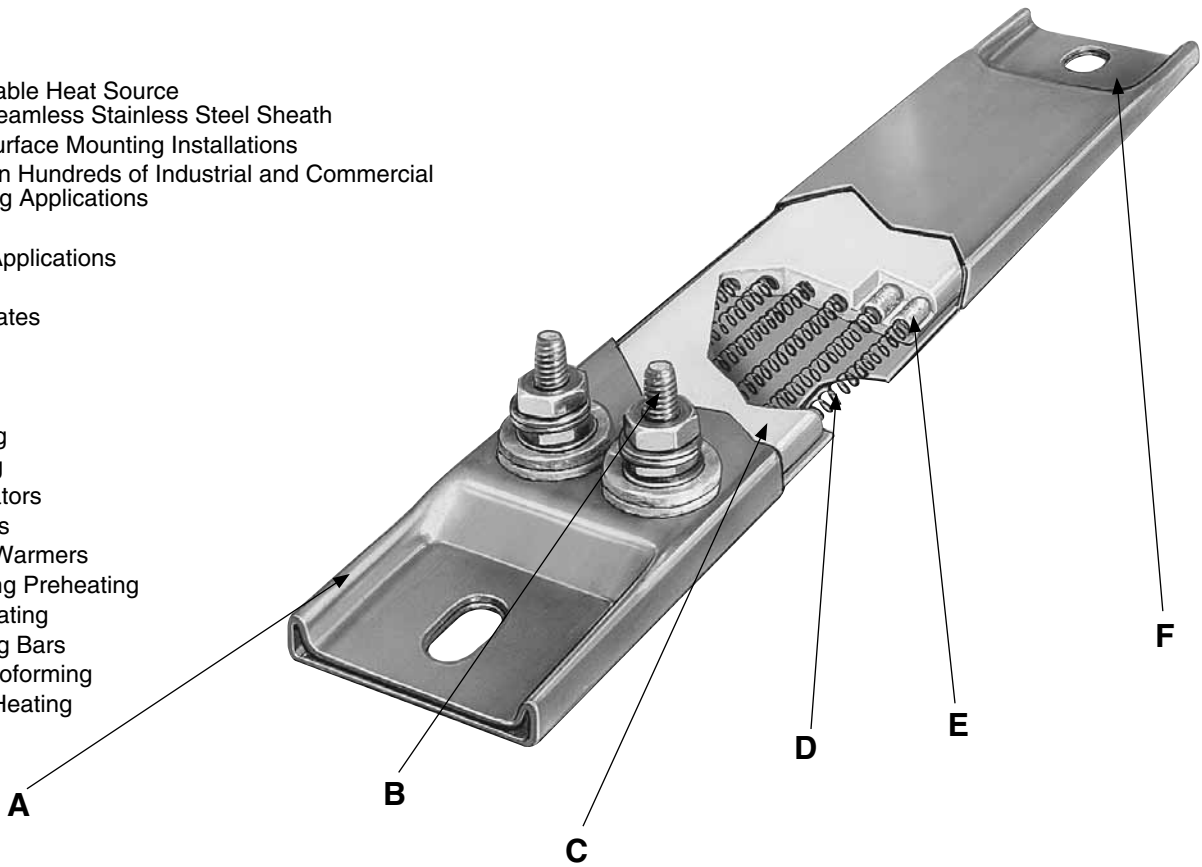


## Channel Strip Heaters Ceramic Insulated

- A Reliable Heat Source with Seamless Stainless Steel Sheath
- Flat Surface Mounting Installations
- Used in Hundreds of Industrial and Commercial Heating Applications

### Typical Applications

- Ovens
- Hot Plates
- Dies
- Molds
- Drying
- Melting
- Baking
- Incubators
- Platens
- Food Warmers
- Welding Preheating
- Air Heating
- Sealing Bars
- Thermoforming
- Tank Heating



**A** Type 304 Stainless Steel sheath provides the best combination of physical strength and resistance to high temperatures and chemical corrosion. Dependable at sheath temperatures of up to 650°C (1200°F).

**B** Stainless Steel 10-32 threaded screws are standard and are securely fastened. Various termination configurations and options are available.

**C** Specially selected and designed ceramic insulator houses the resistance wire coil, insulating it from the outer sheath.

**D** Helically wound resistance wire coil made from nickel-chrome wire is evenly stretched and precisely strung through the ceramic insulator, providing uniform heat. Resistance wire is then mechanically connected to screw terminals or lead wires for a strong positive joint.

**E** A custom mixture of several high purity magnesium oxide grain sizes, chosen to increase thermal conductivity and dielectric strength, are used to fill all remaining space inside and around the ceramic insulator. Voids are densely packed.

**F** Channel strip heaters are available with or without mounting tabs. If without, the ends are silver soldered shut to prevent moisture and contaminants from entering the heater. Tabs are not available on 6.35 thick x 16 mm wide (¼ x ⅝") heaters.



## Channel Strip Heaters Ceramic Insulated

Channel Strip Heaters have proven to be extremely efficient and dependable as a heat source for surface heating in hundreds of industrial and commercial applications. The rectangular tube gives full surface contact when used in a milled slot to provide maximum heat transfer area.

For surface mounting installations, channel strip heaters must be securely clamped along their entire length to a smooth metal surface. When supported by mounting tabs, the terminal end should be secured firmly. Opposite end should be loose to allow for thermal expansion.

### PERFORMANCE RATINGS

**Maximum Sheath Temperature:** 650°C (1200°F)

**Nominal Watt Density:** 20 Watts/in<sup>2</sup> (3.1 Watts/cm<sup>2</sup>)

**Maximum Watt Density:** 45 Watts/in<sup>2</sup> (dependent on design parameters)

### ELECTRICAL SPECIFICATIONS

**Maximum Voltage:** 480 Vac (dependent on design parameters)

**Maximum Recommended Voltage with Leads:** 480V

**Maximum Amperage:**

**Lead Wire Termination:** 10 amp

**Screw Terminations:** 10-32UNF—25 amp

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### PHYSICAL SIZE CONSTRUCTION LIMITATIONS

**Width:**

**16 mm ( $\frac{5}{8}$ " ) Wide Heaters:** +0.000, -0.005"

**25 mm and 38 mm (1 and 1½" ) Wide Heaters:** +0.000, -0.010"

**Thickness:**

**6 mm ( $\frac{1}{4}$ " ) Thick Heaters:** +0.000, -0.005"

**8 and 10 mm ( $\frac{5}{16}$  and  $\frac{3}{8}$ " ) Thick Heaters:** +0.000, -0.008"  
[10 mm ( $\frac{3}{8}$ " ) thick heaters have radius corners]

**Length:**

**Up to 24":**  $\pm\frac{1}{16}$ "

**Over 24":**  $\pm\frac{1}{8}$ "

**Mounting Slot Size:** Standard 8 x 13 mm ( $\frac{5}{16}$  x  $\frac{1}{2}$ " )

**Special Bushings:** 13 x 16 mm ( $\frac{1}{2}$  x  $\frac{5}{8}$ " )

Standard Specifications and Tolerances of Channel Strip Heaters If tighter tolerances are required, consult OMEGA.

### OMEGA Offers Channel Strip Heaters in Four Rectangular Sizes



16 W x 6 mm thick ( $\frac{5}{8}$ " x  $\frac{1}{4}$ " ).  
Available without mounting tabs only.



25 W x 8 mm thick (1" x  $\frac{5}{16}$ " ).  
Available with or without mounting tabs. When supplied with Type L lead wire termination, mounting tabs are not available.



38 W x 8 mm thick (1½" x  $\frac{5}{16}$ " ).  
Available with or without mounting tabs. When supplied with Type L lead wire termination, mounting tabs are not available.



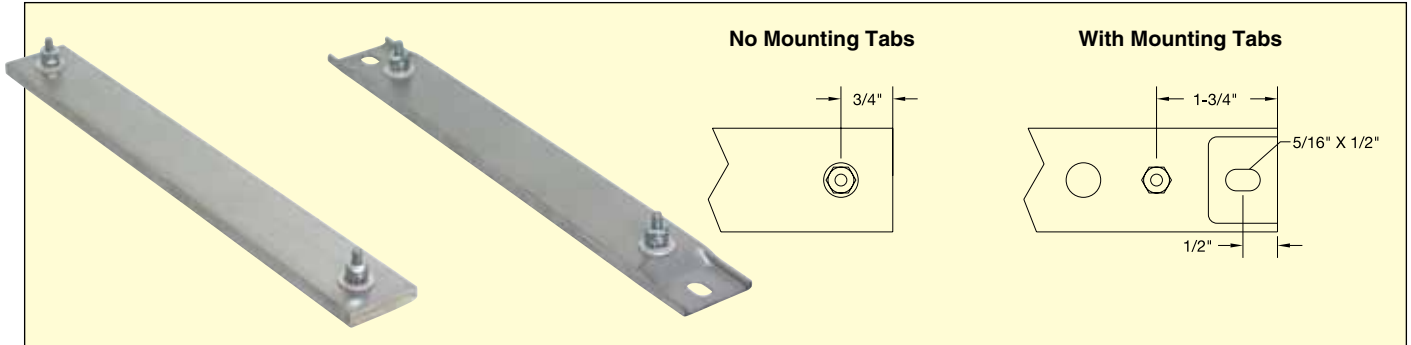
38 W x 10 mm thick (1½" x  $\frac{3}{8}$ " ).  
Available with or without mounting tabs. When supplied with Type L lead wire termination, mounting tabs are not available. [10 mm ( $\frac{3}{8}$ " ) thick heaters have radius corners]



## Channel Strip Heaters Screw Terminal Terminations

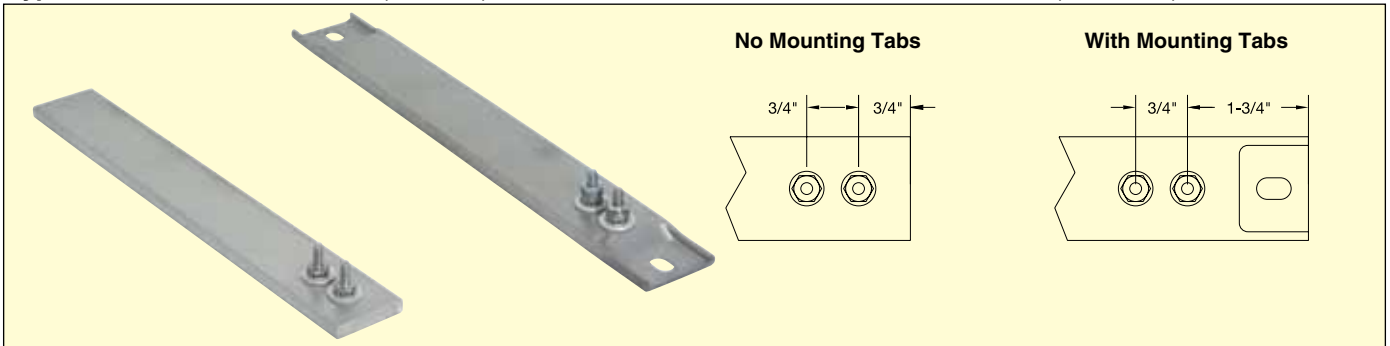
**Type T1** 10-32 Screw Terminals at each end

Available on 25 and 38 mm (1 and 1½") wide heaters



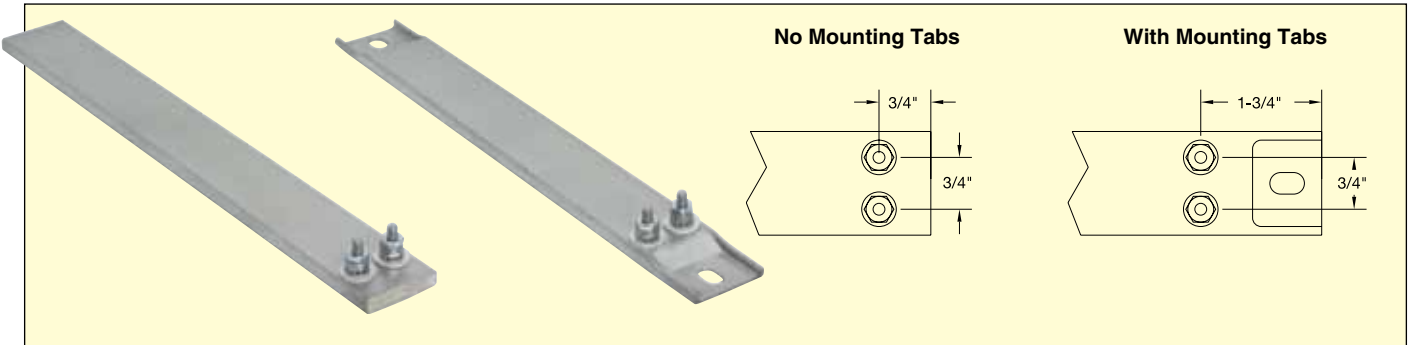
**Type T2** 10-32 Screw Terminals (Tandem) at one end

Available on 25 and 38 mm (1 and 1½") wide heaters



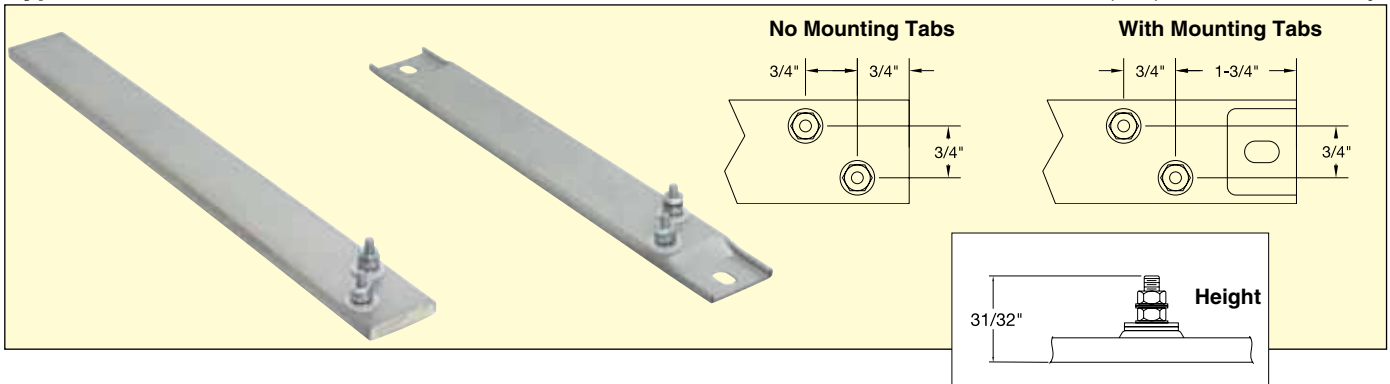
**Type T3** 10-32 Screw Terminals (Parallel) at one end

Available on 38 mm (1½") wide heaters only



**Type T4** 10-32 Terminals offset at one end

Available on 38 mm (1½") wide heaters only





## Channel Strip Heaters Lead Wire Terminations

Type L



### Type L

Flexible lead wires exit from end of heater. 254 mm (10") long leads standard; if longer leads are required, specify. Recommended only for tight quarters or where flexibility of the lead wire is required. Not available on heaters with tabs.

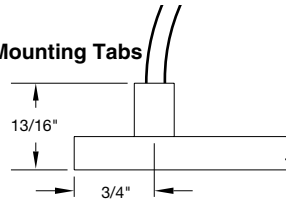
**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

### Type L1

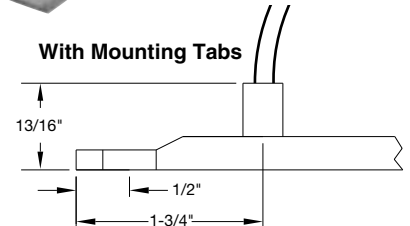
Flexible lead wires exit from top of heater. 254 mm (10") long leads standard; if longer leads are required, specify.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

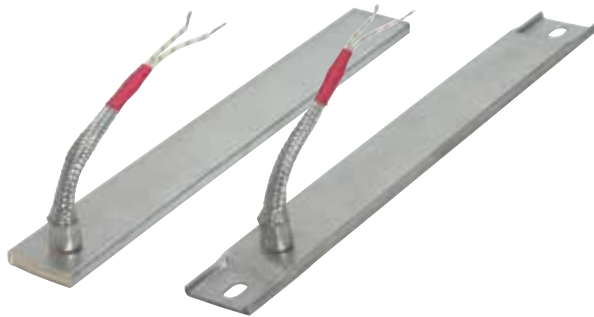
No Mounting Tabs



With Mounting Tabs



Type W1

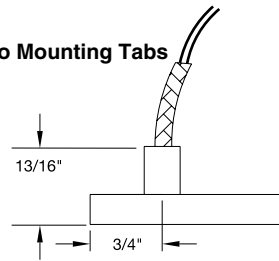


### Type W1

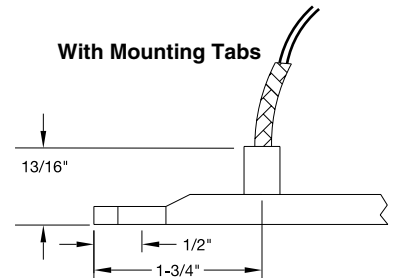
Wire braid provides strength and protection to the lead wire insulation, offering sharp bending not possible with armor cable. 254 mm (10") of wire braid over 12" long leads is standard; if longer leads or braid are required, specify.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

No Mounting Tabs



With Mounting Tabs



### Type W2

Stainless steel braid over each lead wire offers sharp bending not possible with armor cable, as well as abrasion protection. 254 mm (10") long leads standard; if longer leads are required, specify. Not available on heaters with tabs.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

### Type R1

Armor cable provides strength and prevents contamination from getting into the heater. 254 mm (10") of armor over 305 mm (12") long leads are standard; if longer leads or armor are required, please specify.

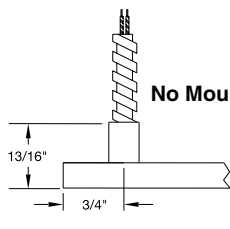
**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

**Type R1A:** Galvanized cable **Type R2A:** Stainless steel cable

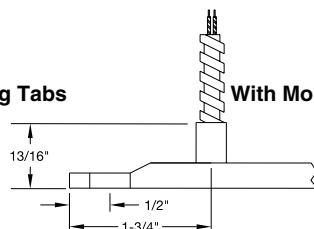
Type W2



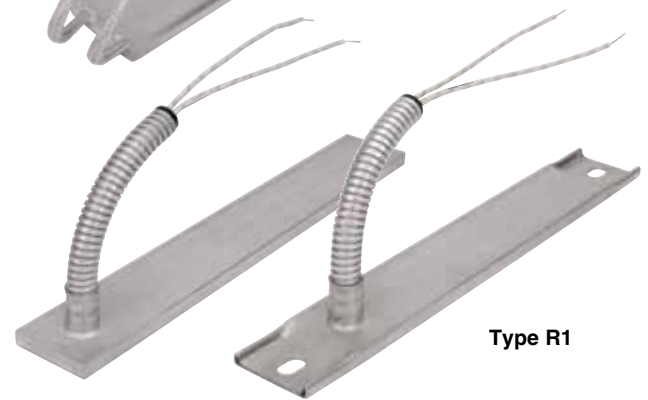
No Mounting Tabs



With Mounting Tabs

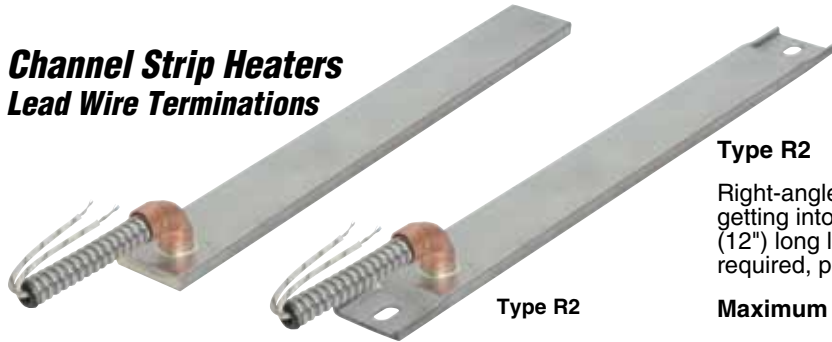


Type R1





## Channel Strip Heaters Lead Wire Terminations

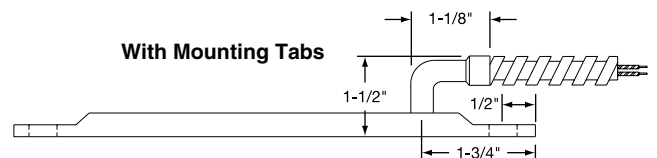
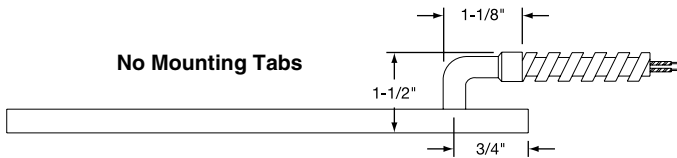


### Type R2

Right-angle armor cable prevents contamination from getting into the heater. 254 mm (10") of armor over 305 mm (12") long leads is standard; if longer leads or armor are required, please specify.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

- Type R2A** Galvanized cable
- Type R2B** Stainless steel cable
- Type R2C** Elbow and leads only (no cable)



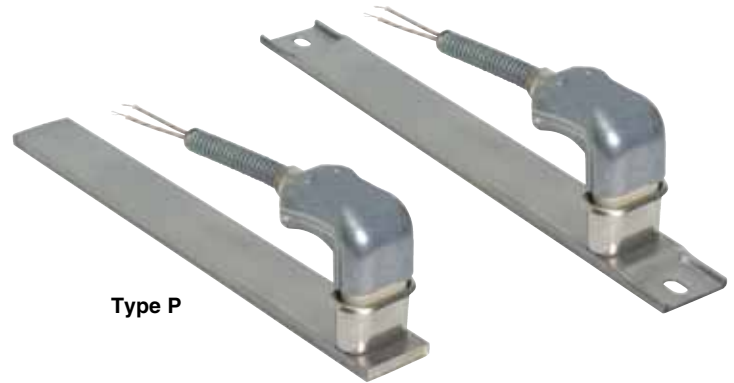
## Terminal Protection

### Type P

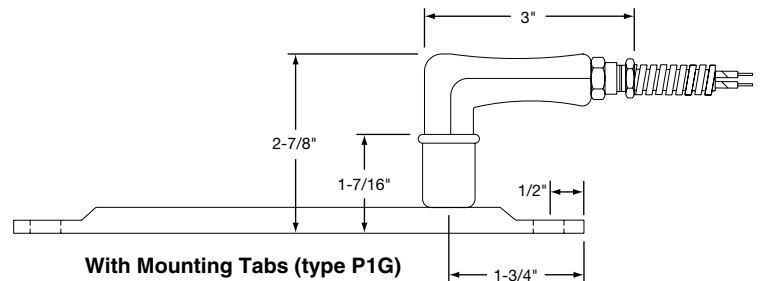
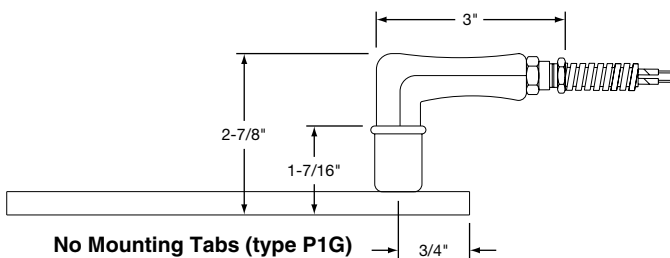
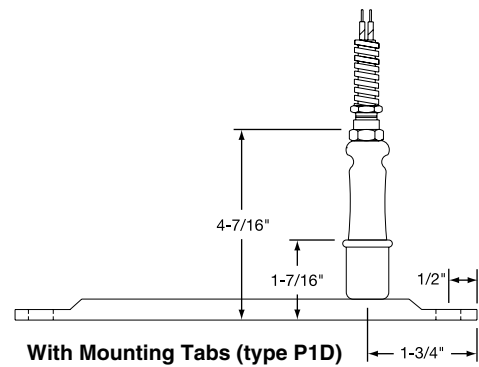
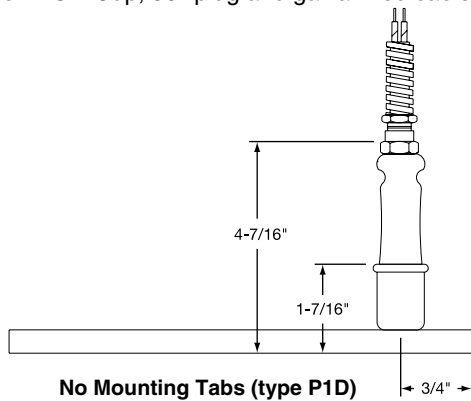
High-Temperature Quick Disconnect Plug. If armor protected lead wires are required, specify armor and lead length. Available on 38 mm (1 1/2") wide heaters only.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 250

- Type P1A** Cup only (UT900)
- Type P1B** Cup and straight plug (H900)
- Type P1C** Cup and 90° plug (HW900)
- Type P1D** Cup, straight plug and galvanized cable
- Type P1G** Cup, 90° plug and galvanized cable



Type P



**Caution:** Exposed electrical wiring on Strip Heaters is a violation of electrical safety codes, including O.S.H.A.

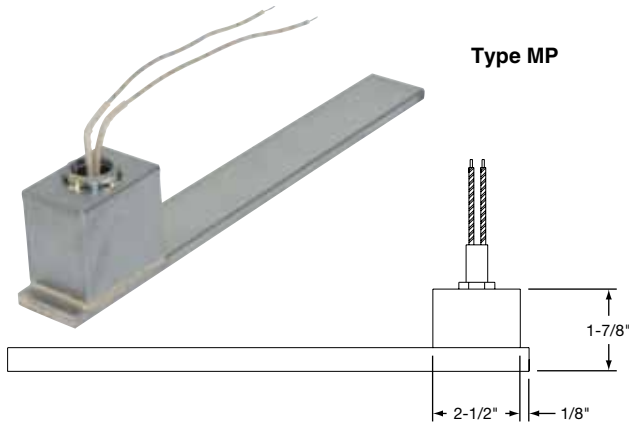
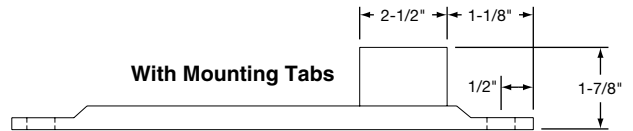
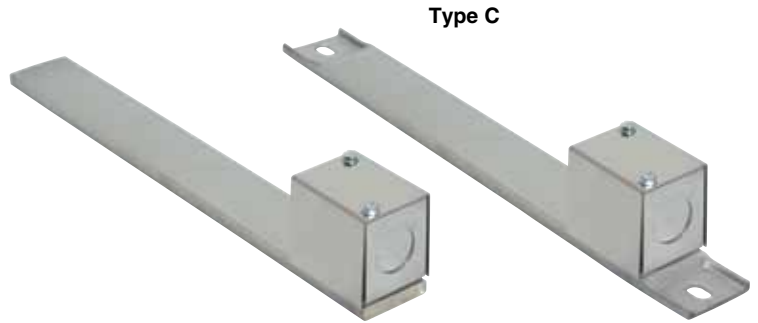


## Channel Strip Heaters Terminal Protection

### Type C

Terminal box has a 13 mm (1/2") trade size knockout (actual diameter 22 mm (7/8"). Box provides excellent protection to exposed terminals. If armor-protected lead wires are required, specify armor and lead length. Available on 25 and 38 mm (1 and 1 1/2") wide heaters.

- Type CA** No cable or braid
- Type CB** Galvanized cable
- Type CC** Stainless steel cable
- Type CD** Wire braid



### Type MP

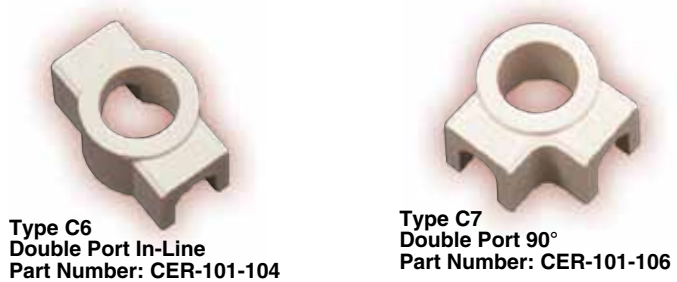
Specially designed box is welded to the Channel Strip Heater and potted with epoxy. The ends of the heater are also welded. Leads exit through a 1/2 NPT nut that can be located at the top or in the front of the box. Armor cable can be supplied with the male fitting, providing a completely sealed channel strip. Available on 38 mm (1 1/2") wide heaters only.

254 mm (10") long leads standard; if longer leads are required, specify.

**Maximum Amps: 25 Maximum Volts: 480**

## Ceramic Covers for Insulating Terminals

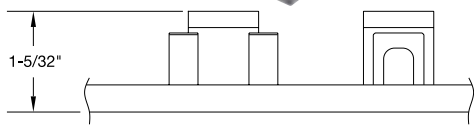
Igloo™ Ceramic terminal covers consist of two individual ceramic parts. With a tight-fitting cap and a solid base, an Igloo cover will fully insulate any standard 10-32 terminal lug used for electrical wiring hookups. Igloo covers can be assembled on all Channel Strip heaters with Type 1 and Type 4 screw terminals.



**Type C6**  
Double Port In-Line  
Part Number: CER-101-104

**Type C7**  
Double Port 90°  
Part Number: CER-101-106

**Type C8**  
Single Port  
Part Number: CER-101-107



**Ceramic Cap**  
Thread 10-32  
Part Number CER-102-101

Three different types of Igloo bases are available for your wiring convenience. Double Port In-Line, Double Port 90° and Single Port.

When ordering, specify the type of Igloo.



## Channel Strip

38.1 x 7.94 mm (1½ x 5/16")

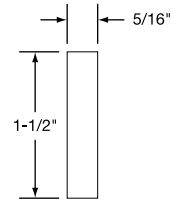
Part numbers shown are for heaters with T4 Terminals and Mounting Tabs

To Order Visit [omega.com/csh3\\_series](http://omega.com/csh3_series) for Pricing and Details

Model No.		Length		Wattage	Watt Density	
120V	240V	inch	mm		Watt/in <sup>2</sup>	Watt/cm <sup>2</sup>
CSH00338	CSH00339	5¼	133.4	125	28	4
CSH00318	CSH00321	6	152.4	150	21	3
CSH00054	CSH00055	7½	190.5	150	15	2
CSH00056	CSH00057	7½	190.5	200	20	3
CSH00058	CSH00059	8	203.2	150	13	2
CSH00060	CSH00061	8	203.2	175	15	2
CSH00062	CSH00063	8	203.2	250	21	3
CSH00064	CSH00065	8	203.2	400	34	5
CSH00066	CSH00067	8	203.2	500	42	7
CSH00068	CSH00069	10½	266.7	250	12	2
CSH00070	CSH00071	10½	266.7	350	17	3
CSH00072	CSH00073	10½	266.7	400	19	3
CSH00074	CSH00075	12	304.8	250	10	1
CSH00076	CSH00077	12	304.8	350	13	2
CSH00078	CSH00079	12	304.8	500	19	3
CSH00080	CSH00081	14	355.6	300	9	1
CSH00082	CSH00083	14	355.6	500	15	2
CSH00084	CSH00085	15¼	387.4	325	9	1
CSH00086	CSH00087	15¼	387.4	500	13	2
CSH00088	CSH00089	17¼	454.2	350	7	1
CSH00090	CSH00091	17¼	454.2	375	8	1
CSH00092	CSH00093	17¼	454.2	500	11	2
CSH00094	CSH00095	17¼	454.2	750	16	2
CSH00096	CSH00097	17¼	454.2	1000	21	3
CSH00098	CSH00099	19½	495.3	350	7	1
CSH00100	CSH00101	19½	495.3	500	9	1
CSH00102	CSH00103	19½	495.3	750	14	2
CSH00104	CSH00105	19½	495.3	1000	19	3
CSH00329	CSH00333	19½	495.3	1200	23	4

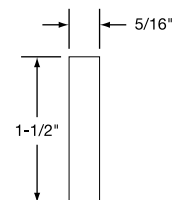
Part numbers shown are for heaters with T3 Terminals and Mounting Tabs.

Model No.		Length		Wattage	Watt Density	
120V	240V	inch	mm		Watt/in <sup>2</sup>	Watt/cm <sup>2</sup>
CSH00336	CSH00337	5¼	133.4	125	28	4
CSH00159	CSH00160	5½	139.7	125	23	4
CSH00161	CSH00162	5½	139.7	250	46	7
CSH00163	CSH00164	5¾	146.1	300	47	7
CSH00165	CSH00166	6	152.4	150	21	3
CSH00167	CSH00168	6	152.4	300	41	6
CSH00169	CSH00170	8	203.2	150	10	2
CSH00323	CSH00324	8	203.2	500	32	5
CSH00172	CSH00173	10½	266.7	250	11	2
CSH00346	CSH00174	12	304.8	350	12	2
CSH00175	CSH00176	14	355.6	500	14	2
CSH00177	CSH00178	17¼	454.2	750	15	2
CSH00328	CSH00332	19½	495.3	1200	21	3
CSH00179	CSH00180	23¾	603.3	750	10	2
CSH00181	CSH00182	29¼	743.0	750	8	1
CSH00183	CSH00184	34¾	879.5	1000	9	1
CSH00185	CSH00186	35¾	911.4	1000	9	1
CSH00187	CSH00188	37¼	946.2	1500	12	2



Part numbers shown are for heaters with T4 Terminals and Mounting Tabs

Model No.		Length		Wattage	Watt Density	
120V	240V	inch	mm		Watt/in <sup>2</sup>	Watt/cm <sup>2</sup>
CSH00106	CSH00107	21	533.4	500	8	1
CSH00108	CSH00109	21	533.4	750	13	2
CSH00110	CSH00111	23¾	603.3	500	7	1
CSH00112	CSH00113	23¾	603.3	750	11	2
CSH00114	CSH00115	23¾	603.3	1000	15	2
CSH00116	CSH00117	23¾	603.3	1500	22	3
CSH00118	CSH00119	25½	647.7	500	7	1
CSH00120	CSH00121	25½	647.7	750	10	2
CSH00122	CSH00123	25½	647.7	1000	13	2
CSH00124	CSH00125	26¾	679.5	700	9	1
CSH00126	CSH00127	26¾	679.5	750	9	1
CSH00128	CSH00129	26¾	679.5	1000	13	2
CSH00130	CSH00131	29¼	743.0	750	8	1
CSH00132	CSH00133	30½	774.7	750	8	1
CSH00134	CSH00135	30½	774.7	1000	11	2
—	CSH00136	30½	774.7	1250	13	2
CSH00137	CSH00138	33½	850.9	750	7	1
CSH00139	CSH00140	34¾	879.5	1000	9	1
CSH00141	CSH00142	35¾	911.4	1000	9	1
CSH00143	CSH00144	35¾	911.4	1500	13	2
CSH00145	CSH00146	37¼	946.2	1500	13	2
CSH00147	CSH00148	38½	977.9	800	7	1
CSH00149	CSH00150	38½	977.9	1000	8	1
CSH00151	CSH00152	38½	977.9	1500	12	2
CSH00153	CSH00154	42½	1079.5	1250	9	1
CSH00155	CSH00156	42½	1079.5	1500	11	2
—	CSH00157	47¾	1216.2	1350	9	1
—	CSH00158	47¾	1216.2	2250	14	2



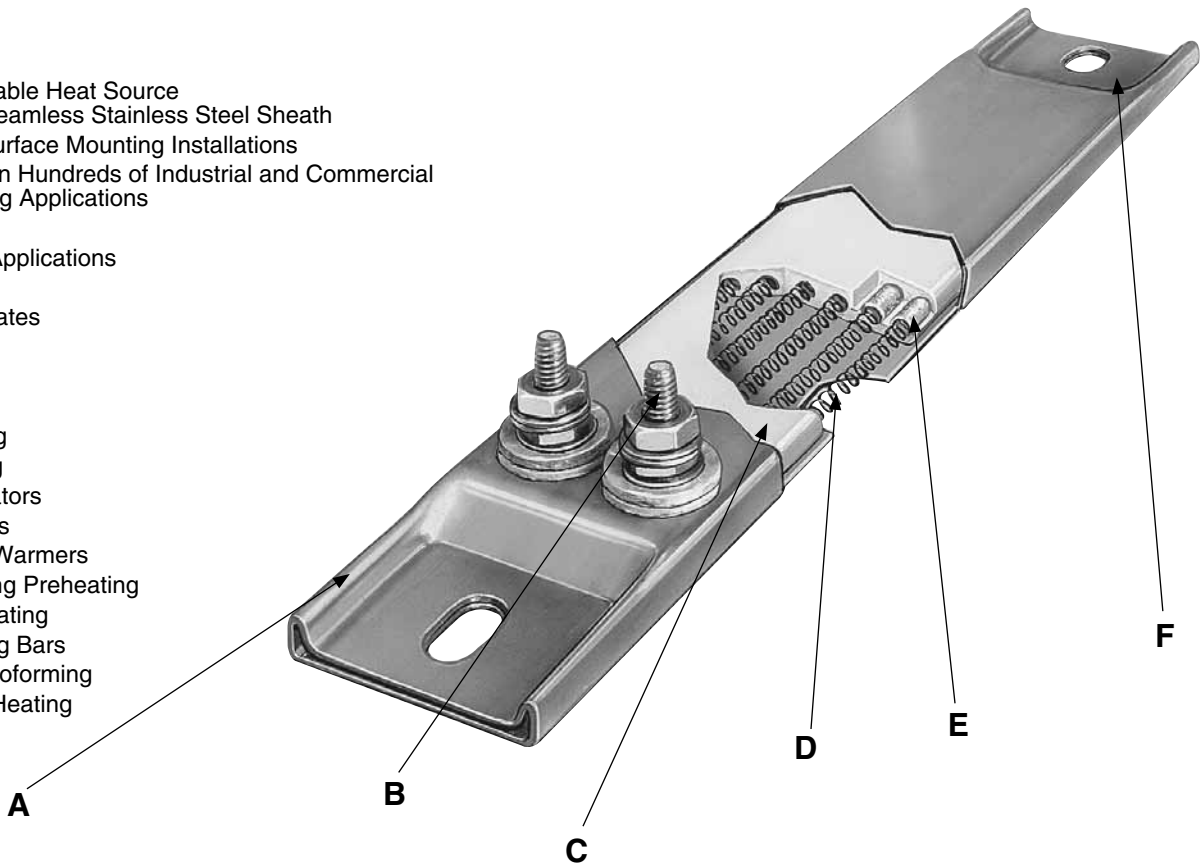


## Channel Strip Heaters Ceramic Insulated

- A Reliable Heat Source with Seamless Stainless Steel Sheath
- Flat Surface Mounting Installations
- Used in Hundreds of Industrial and Commercial Heating Applications

### Typical Applications

- Ovens
- Hot Plates
- Dies
- Molds
- Drying
- Melting
- Baking
- Incubators
- Platens
- Food Warmers
- Welding Preheating
- Air Heating
- Sealing Bars
- Thermoforming
- Tank Heating



**A** Type 304 Stainless Steel sheath provides the best combination of physical strength and resistance to high temperatures and chemical corrosion. Dependable at sheath temperatures of up to 650°C (1200°F).

**B** Stainless Steel 10-32 threaded screws are standard and are securely fastened. Various termination configurations and options are available.

**C** Specially selected and designed ceramic insulator houses the resistance wire coil, insulating it from the outer sheath.

**D** Helically wound resistance wire coil made from nickel-chrome wire is evenly stretched and precisely strung through the ceramic insulator, providing uniform heat. Resistance wire is then mechanically connected to screw terminals or lead wires for a strong positive joint.

**E** A custom mixture of several high purity magnesium oxide grain sizes, chosen to increase thermal conductivity and dielectric strength, are used to fill all remaining space inside and around the ceramic insulator. Voids are densely packed.

**F** Channel strip heaters are available with or without mounting tabs. If without, the ends are silver soldered shut to prevent moisture and contaminants from entering the heater. Tabs are not available on 6.35 thick x 16 mm wide (¼ x ⅝") heaters.





## Channel Strip Heaters Ceramic Insulated

Channel Strip Heaters have proven to be extremely efficient and dependable as a heat source for surface heating in hundreds of industrial and commercial applications. The rectangular tube gives full surface contact when used in a milled slot to provide maximum heat transfer area.

For surface mounting installations, channel strip heaters must be securely clamped along their entire length to a smooth metal surface. When supported by mounting tabs, the terminal end should be secured firmly. Opposite end should be loose to allow for thermal expansion.

### PERFORMANCE RATINGS

**Maximum Sheath Temperature:** 650°C (1200°F)

**Nominal Watt Density:** 20 Watts/in<sup>2</sup> (3.1 Watts/cm<sup>2</sup>)

**Maximum Watt Density:** 45 Watts/in<sup>2</sup> (dependent on design parameters)

### ELECTRICAL SPECIFICATIONS

**Maximum Voltage:** 480 Vac (dependent on design parameters)

**Maximum Recommended Voltage with Leads:** 480V

**Maximum Amperage:**

**Lead Wire Termination:** 10 amp

**Screw Terminations:** 10-32UNF—25 amp

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### PHYSICAL SIZE CONSTRUCTION LIMITATIONS

**Width:**

**16 mm ( $\frac{5}{8}$ " ) Wide Heaters:** +0.000, -0.005"

**25 mm and 38 mm (1 and 1½" ) Wide Heaters:**  
+0.000, -0.010"

**Thickness:**

**6 mm ( $\frac{1}{4}$ " ) Thick Heaters:** +0.000, -0.005"

**8 and 10 mm ( $\frac{5}{16}$  and  $\frac{3}{8}$ " ) Thick Heaters:** +0.000, -0.008"  
[10 mm ( $\frac{3}{8}$ " ) thick heaters have radius corners]

**Length:**

**Up to 24" :**  $\pm\frac{1}{16}$ "

**Over 24" :**  $\pm\frac{1}{8}$ "

**Mounting Slot Size:** Standard 8 x 13 mm ( $\frac{5}{16}$  x  $\frac{1}{2}$ " )

**Special Bushings:** 13 x 16 mm ( $\frac{1}{2}$  x  $\frac{5}{8}$ " )

Standard Specifications and Tolerances of Channel Strip Heaters If tighter tolerances are required, consult OMEGA.

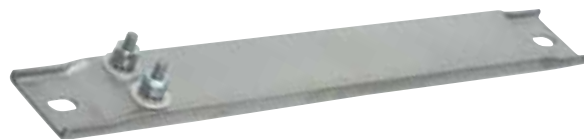
### OMEGA Offers Channel Strip Heaters in Four Rectangular Sizes



16 W x 6 mm thick ( $\frac{5}{8}$ " x  $\frac{1}{4}$ " ).  
Available without mounting tabs only.



25 W x 8 mm thick (1" x  $\frac{5}{16}$ " ).  
Available with or without mounting tabs. When supplied with Type L lead wire termination, mounting tabs are not available.



38 W x 8 mm thick (1½" x  $\frac{5}{16}$ " ).  
Available with or without mounting tabs. When supplied with Type L lead wire termination, mounting tabs are not available.



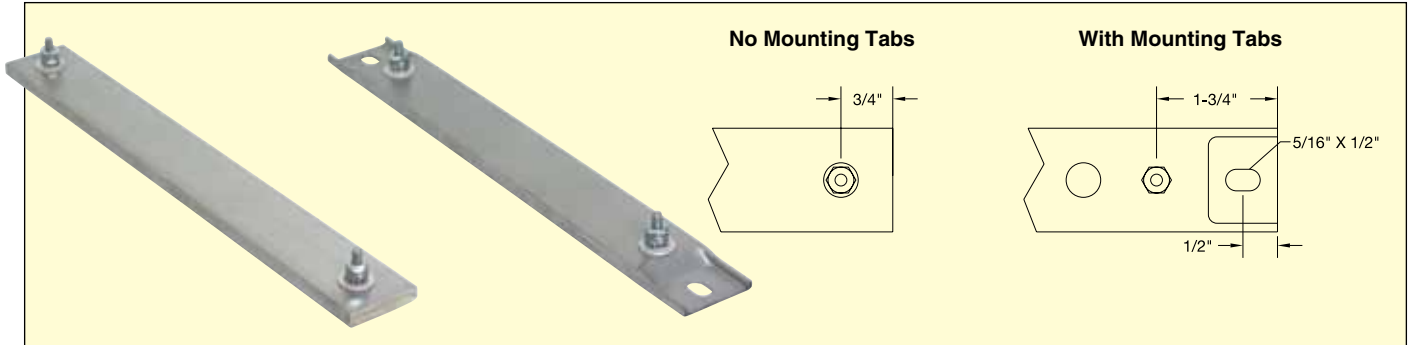
38 W x 10 mm thick (1½" x  $\frac{3}{8}$ " ).  
Available with or without mounting tabs. When supplied with Type L lead wire termination, mounting tabs are not available. [10 mm ( $\frac{3}{8}$ " ) thick heaters have radius corners]



## Channel Strip Heaters Screw Terminal Terminations

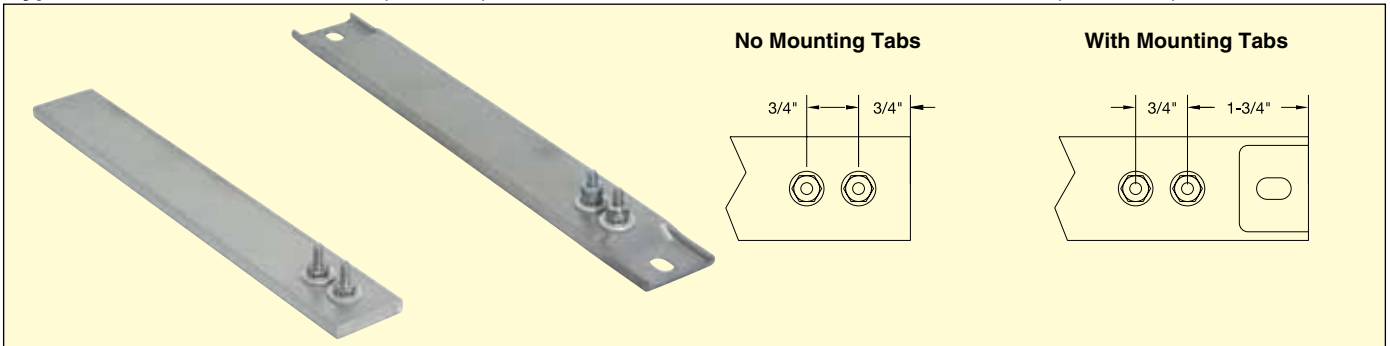
**Type T1** 10-32 Screw Terminals at each end

Available on 25 and 38 mm (1 and 1½") wide heaters



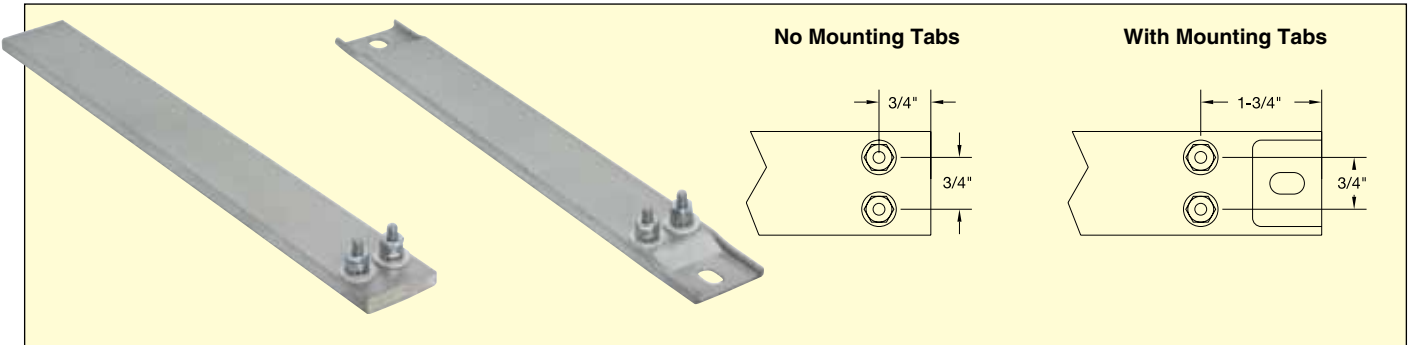
**Type T2** 10-32 Screw Terminals (Tandem) at one end

Available on 25 and 38 mm (1 and 1½") wide heaters



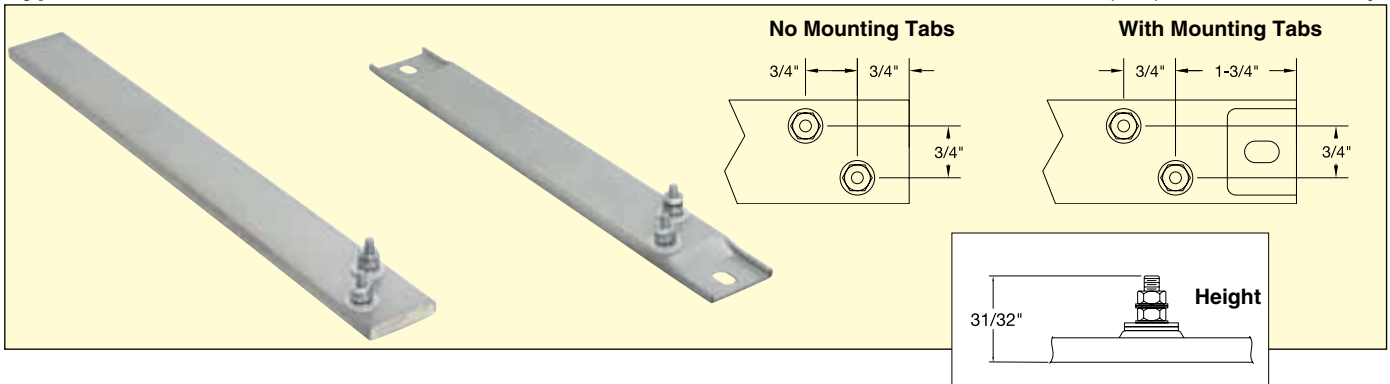
**Type T3** 10-32 Screw Terminals (Parallel) at one end

Available on 38 mm (1½") wide heaters only



**Type T4** 10-32 Terminals offset at one end

Available on 38 mm (1½") wide heaters only



## Channel Strip Heaters Lead Wire Terminations

Type L

### Type L

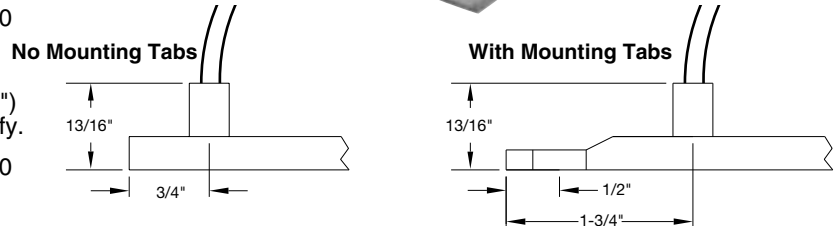
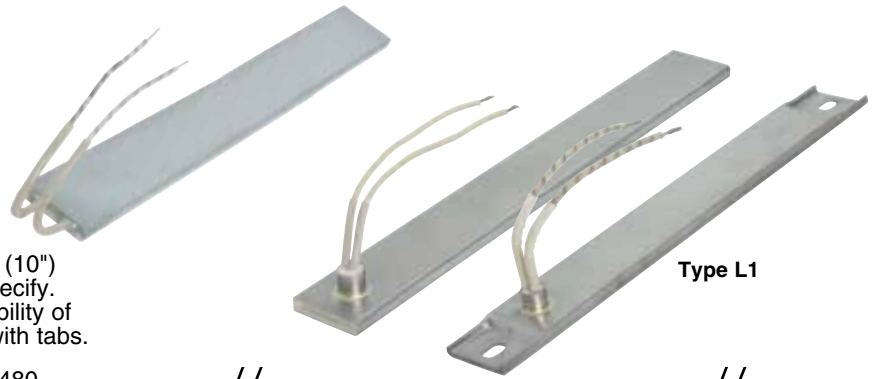
Flexible lead wires exit from end of heater. 254 mm (10") long leads standard; if longer leads are required, specify. Recommended only for tight quarters or where flexibility of the lead wire is required. Not available on heaters with tabs.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

### Type L1

Flexible lead wires exit from top of heater. 254 mm (10") long leads standard; if longer leads are required, specify.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

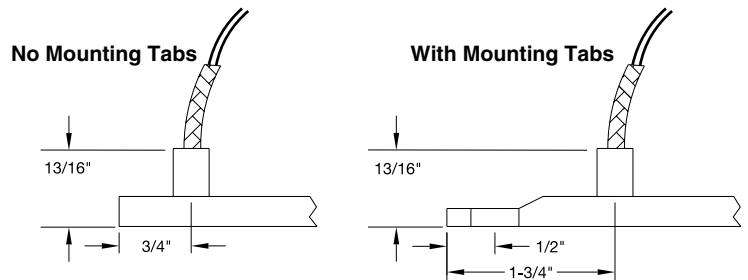


Type W1

### Type W1

Wire braid provides strength and protection to the lead wire insulation, offering sharp bending not possible with armor cable. 254 mm (10") of wire braid over 12" long leads is standard; if longer leads or braid are required, specify.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480



### Type W2

Stainless steel braid over each lead wire offers sharp bending not possible with armor cable, as well as abrasion protection. 254 mm (10") long leads standard; if longer leads are required, specify. Not available on heaters with tabs.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

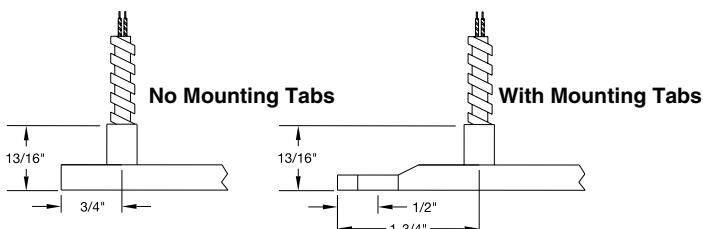
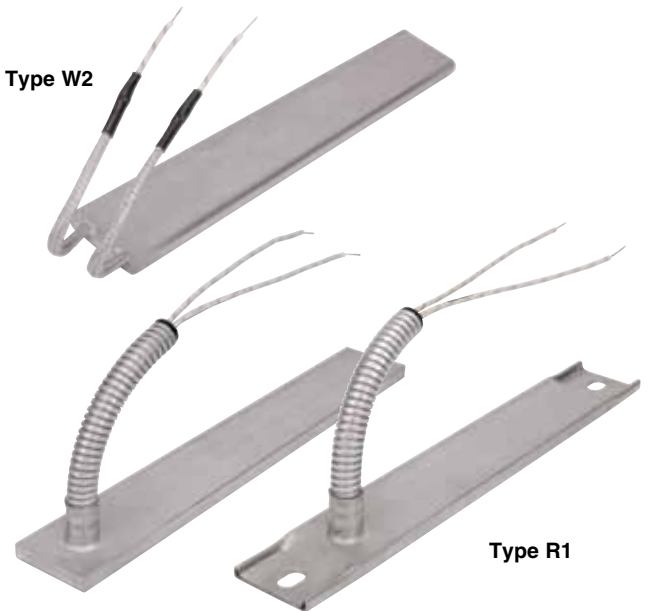
### Type R1

Armor cable provides strength and prevents contamination from getting into the heater. 254 mm (10") of armor over 305 mm (12") long leads are standard; if longer leads or armor are required, please specify.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

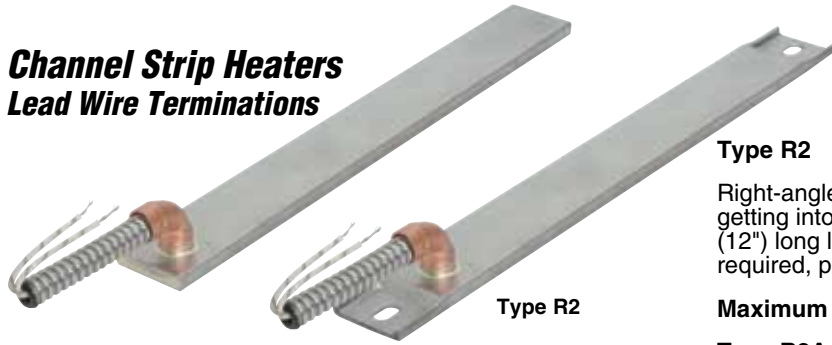
**Type R1A:** Galvanized cable **Type R2A:** Stainless steel cable

Type W2





## Channel Strip Heaters Lead Wire Terminations

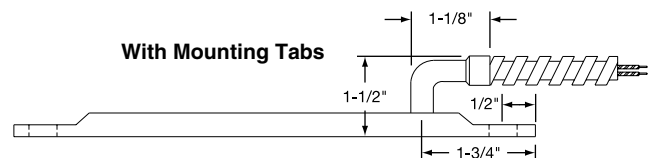
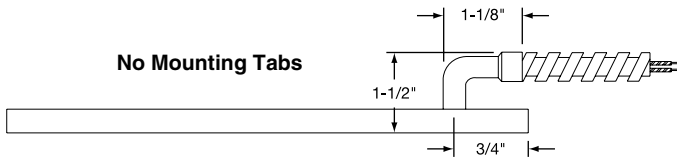


### Type R2

Right-angle armor cable prevents contamination from getting into the heater. 254 mm (10") of armor over 305 mm (12") long leads is standard; if longer leads or armor are required, please specify.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

- Type R2A** Galvanized cable
- Type R2B** Stainless steel cable
- Type R2C** Elbow and leads only (no cable)



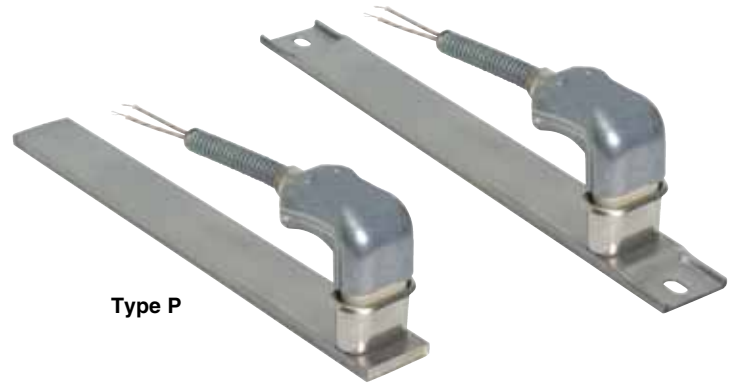
## Terminal Protection

### Type P

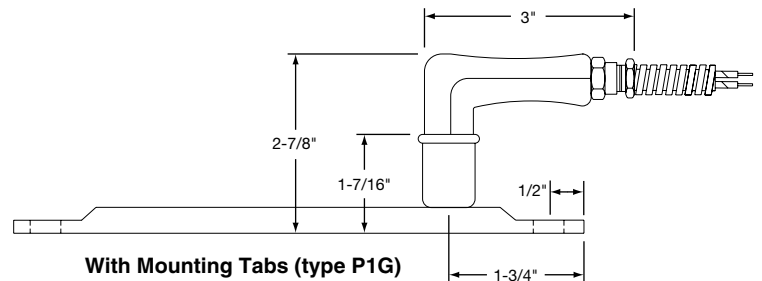
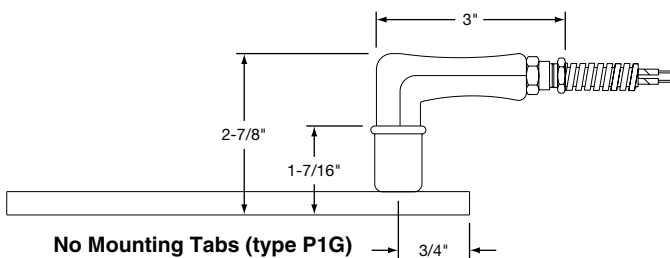
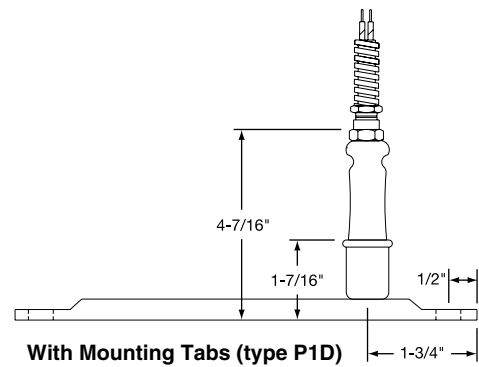
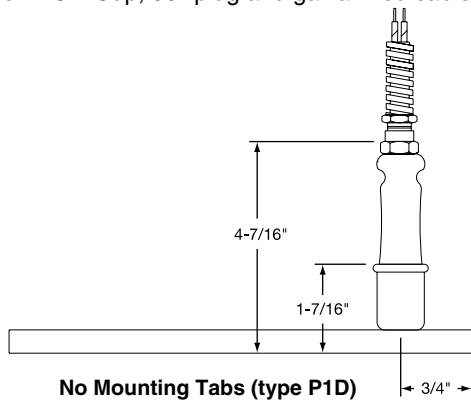
High-Temperature Quick Disconnect Plug. If armor protected lead wires are required, specify armor and lead length. Available on 38 mm (1 1/2") wide heaters only.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 250

- Type P1A** Cup only (UT900)
- Type P1B** Cup and straight plug (H900)
- Type P1C** Cup and 90° plug (HW900)
- Type P1D** Cup, straight plug and galvanized cable
- Type P1G** Cup, 90° plug and galvanized cable



Type P



**Caution:** Exposed electrical wiring on Strip Heaters is a violation of electrical safety codes, including O.S.H.A.

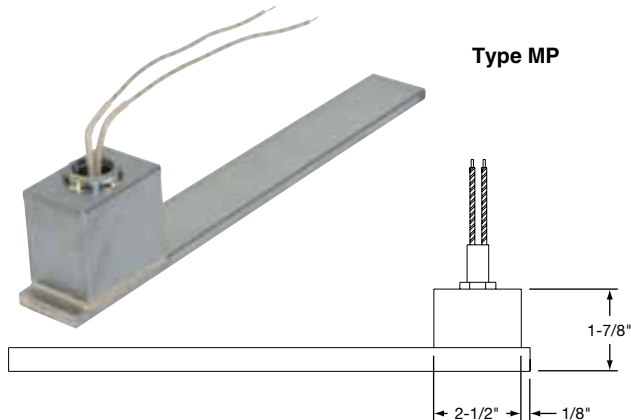
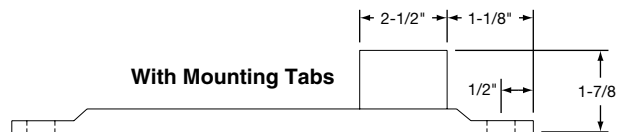


## Channel Strip Heaters Terminal Protection

### Type C

Terminal box has a 13 mm (1/2") trade size knockout (actual diameter 22 mm (7/8")). Box provides excellent protection to exposed terminals. If armor-protected lead wires are required, specify armor and lead length. Available on 25 and 38 mm (1 and 1 1/2") wide heaters.

- Type CA** No cable or braid
- Type CB** Galvanized cable
- Type CC** Stainless steel cable
- Type CD** Wire braid



### Type MP

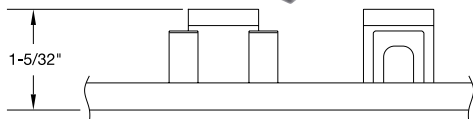
Specially designed box is welded to the Channel Strip Heater and potted with epoxy. The ends of the heater are also welded. Leads exit through a 1/2 NPT nut that can be located at the top or in the front of the box. Armor cable can be supplied with the male fitting, providing a completely sealed channel strip. Available on 38 mm (1 1/2") wide heaters only.

254 mm (10") long leads standard; if longer leads are required, specify.

**Maximum Amps: 25 Maximum Volts: 480**

## Ceramic Covers for Insulating Terminals

Igloo™ Ceramic terminal covers consist of two individual ceramic parts. With a tight-fitting cap and a solid base, an Igloo cover will fully insulate any standard 10-32 terminal lug used for electrical wiring hookups. Igloo covers can be assembled on all Channel Strip heaters with Type 1 and Type 4 screw terminals.



Ceramic Cap



Thread 10-32  
Part Number  
CER-102-101



**Type C6**  
Double Port In-Line  
Part Number: CER-101-104



**Type C7**  
Double Port 90°  
Part Number: CER-101-106

Three different types of Igloo bases are available for your wiring convenience. Double Port In-Line, Double Port 90° and Single Port.

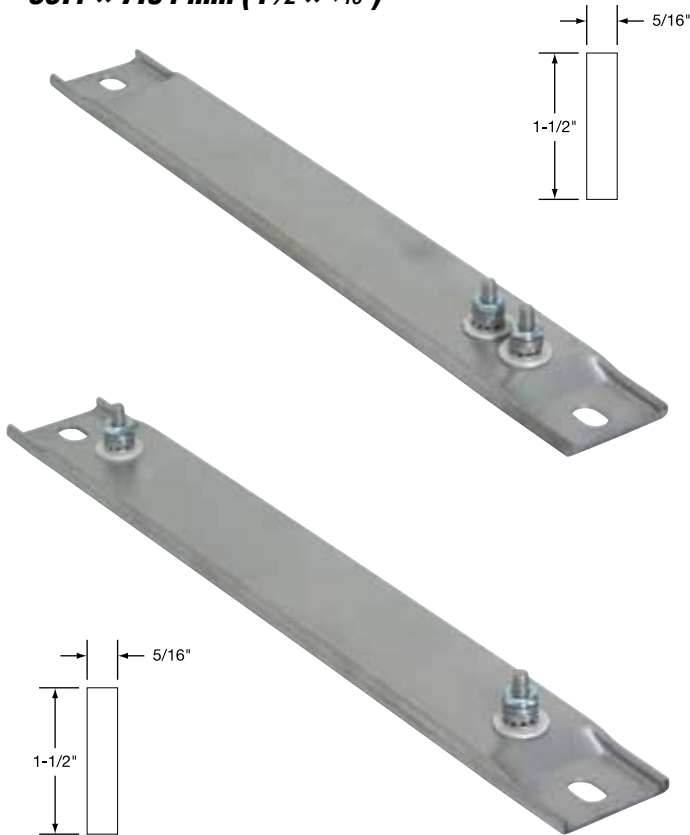
When ordering, specify the type of Igloo.



**Type C8**  
Single Port  
Part Number:  
CER-101-107



**Channel Strip**  
**38.1 x 7.94 mm (1½ x 5/16")**



Part numbers shown are for heaters with T2 Terminals and Mounting Tabs.

**To Order Visit [omega.com/csh4\\_series](http://omega.com/csh4_series) for Pricing and Details**

Model No.		Length		Wattage	Watt Density	
120V	240V	inch	mm		Watt/in <sup>2</sup>	Watt/cm <sup>2</sup>
CSH00317	CSH00320	6	152.4	150	21	3
CSH00189	CSH00190	8	203.2	150	13	2
CSH00342	CSH00343	8	203.2	250	21	3
CSH00322	CSH00325	8	203.2	500	42	7
CSH00191	CSH00192	10½	266.7	250	12	2
CSH00193	CSH00194	12	304.8	350	13	2
CSH00195	CSH00196	14	355.6	500	15	2
CSH00197	CSH00198	17¾	454.2	750	16	2
CSH00327	CSH00331	19½	495.3	1200	23	4
CSH00199	CSH00200	23¾	603.3	750	11	2
—	CSH00201	25½	647.7	500	7	1
CSH00202	CSH00203	29¼	743.0	750	8	1
CSH00204	—	33½	850.9	750	7	1
CSH00205	CSH00206	34½	879.5	1000	9	1
CSH00207	CSH00208	35¾	911.2	1000	9	1
CSH00209	CSH00210	37¼	946.2	1500	13	2
CSH00211	—	38½	977.9	800	7	1
—	CSH00212	53¾	1368.6	1500	8	1
—	CSH00213	53¾	1368.6	2500	14	2
—	CSH00214	63¾	1622.6	1800	8	1
—	CSH00215	63¾	1622.6	3000	14	2
—	CSH00216	71¾	1825.8	2000	8	1
—	CSH00217	71¾	1825.8	3000	12	2

Part numbers shown are for heaters with T1 Terminals and Mounting Tabs.

Model No.		Length		Wattage	Watt Density	
120V	240V	inch	mm		Watt/in <sup>2</sup>	Watt/cm <sup>2</sup>
CSH00316	CSH00583	6	152.4	150	21	3
CSH00218	CSH00219	8	203.2	150	14	2
CSH00220	CSH00221	8	203.2	250	23	4
CSH00222	CSH00223	9½	241.3	200	12	2
CSH00224	CSH00225	9½	241.3	300	18	3
CSH00226	CSH00227	10½	266.7	250	13	2
CSH00228	CSH00229	12	304.8	250	10	2
CSH00230	CSH00231	12	304.8	500	20	3
CSH00345	CSH00528	12	304.8	350	12	2
CSH00232	CSH00233	14	355.6	300	9	1
CSH00234	CSH00235	14	355.6	500	15	2
CSH00236	CSH00237	15¼	387.4	325	9	1
CSH00238	CSH00239	15¼	387.4	500	13	2
CSH00240	CSH00241	17¾	454.2	375	8	1
CSH00242	CSH00243	17¾	454.2	500	11	2
CSH00244	CSH00245	17¾	454.2	750	16	2
CSH00246	CSH00247	17¾	454.2	1000	21	3
CSH00248	CSH00249	19½	495.3	500	10	1
CSH00250	CSH00251	19½	495.3	750	14	2
CSH00252	CSH00253	19½	495.3	1000	19	3
CSH00326	CSH00330	19½	495.3	1200	23	4
CSH00254	CSH00255	21	533.4	500	9	1

Part numbers shown are for heaters with T1 Terminals and Mounting Tabs.

Model No.		Length		Wattage	Watt Density	
120V	240V	inch	mm		Watt/in <sup>2</sup>	Watt/cm <sup>2</sup>
CSH00256	CSH00257	23¾	603.3	250	4	1
CSH00258	CSH00259	23¾	603.3	500	7	1
CSH00260	CSH00261	23¾	603.3	750	11	2
CSH00262	CSH00263	23¾	603.3	1000	15	2
CSH00264	CSH00265	23¾	603.3	1500	22	3
CSH00266	CSH00267	25½	647.7	750	10	2
CSH00268	CSH00269	25½	647.7	1000	13	2
CSH00270	CSH00271	26¾	679.5	700	9	1
CSH00272	CSH00273	26¾	679.5	750	10	1
CSH00347	CSH00348	29¼	742.0	750	8	1
CSH00274	CSH00275	29¾	758.8	750	8	1
CSH00276	CSH00277	30½	774.7	750	8	1
CSH00278	CSH00279	33½	850.9	750	7	1
CSH00280	CSH00281	33½	850.9	1000	10	2
CSH00282	CSH00283	34¾	879.5	1000	9	1
CSH00284	CSH00285	35¾	911.4	1000	9	1
CSH00286	CSH00287	37¼	946.2	1500	13	2
CSH00288	CSH00289	38¾	977.9	1000	8	1
CSH00290	CSH00291	42½	1079.5	1250	9	1
CSH00292	CSH00293	42½	1079.5	1500	11	2

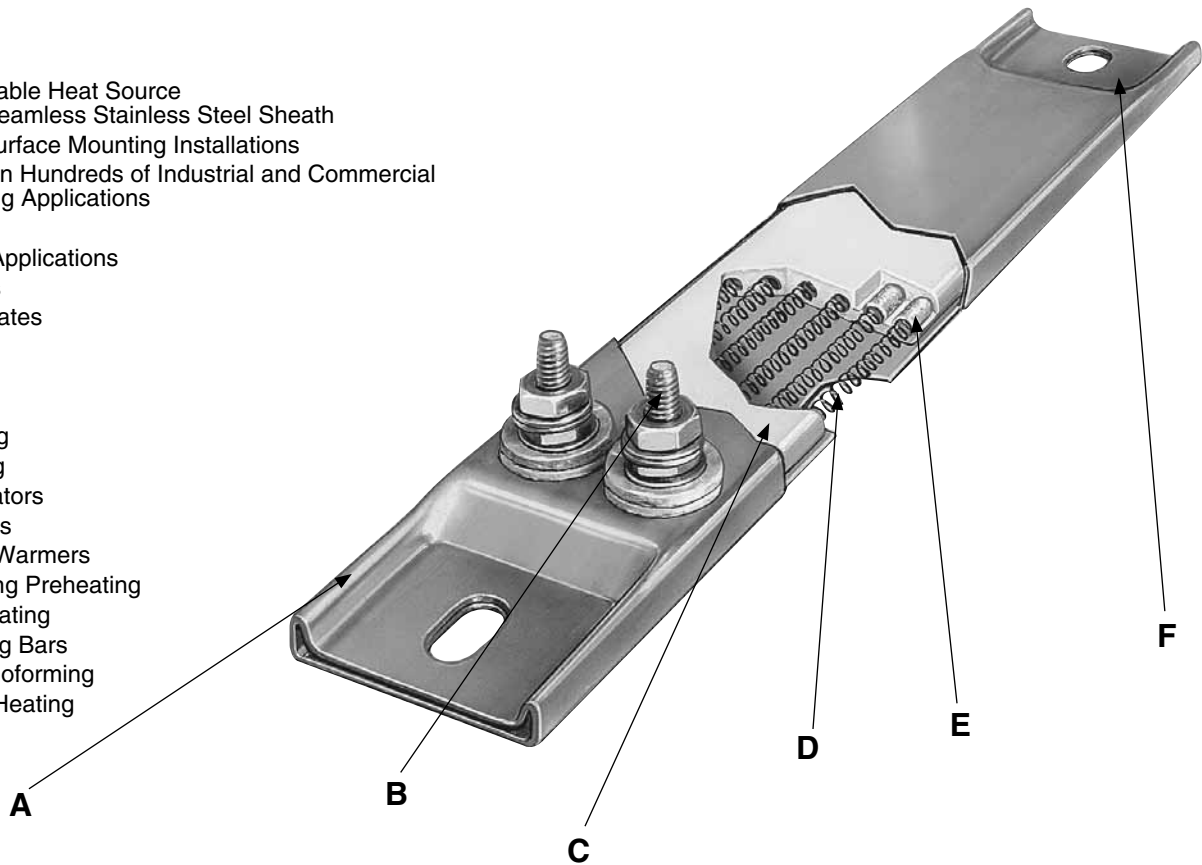


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- Air Heating
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- Thermoforming
- Tank Heating



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**C** Specially selected and designed ceramic insulator houses the resistance wire coil, insulating it from the outer sheath.

**D** Helically wound resistance wire coil made from nickel-chrome wire is evenly stretched and precisely strung through the ceramic insulator, providing uniform heat. Resistance wire is then mechanically connected to screw terminals or lead wires for a strong positive joint.

**E** A custom mixture of several high purity magnesium oxide grain sizes, chosen to increase thermal conductivity and dielectric strength, are used to fill all remaining space inside and around the ceramic insulator. Voids are densely packed.

**F** Channel strip heaters are available with or without mounting tabs. If without, the ends are silver soldered shut to prevent moisture and contaminants from entering the heater. Tabs are not available on 6.35 thick x 16 mm wide (¼ x ⅝") heaters.



## Channel Strip Heaters Ceramic Insulated

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For surface mounting installations, channel strip heaters must be securely clamped along their entire length to a smooth metal surface. When supported by mounting tabs, the terminal end should be secured firmly. Opposite end should be loose to allow for thermal expansion.

### PERFORMANCE RATINGS

**Maximum Sheath Temperature:** 650°C (1200°F)

**Nominal Watt Density:** 20 Watts/in<sup>2</sup> (3.1 Watts/cm<sup>2</sup>)

**Maximum Watt Density:** 45 Watts/in<sup>2</sup> (dependent on design parameters)

### ELECTRICAL SPECIFICATIONS

**Maximum Voltage:** 480 Vac (dependent on design parameters)

**Maximum Recommended Voltage with Leads:** 480V

**Maximum Amperage:**

**Lead Wire Termination:** 10 amp

**Screw Terminations:** 10-32UNF—25 amp

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### PHYSICAL SIZE CONSTRUCTION LIMITATIONS

**Width:**

**16 mm ( $\frac{5}{8}$ " ) Wide Heaters:** +0.000, -0.005"

**25 mm and 38 mm (1 and 1½" ) Wide Heaters:**  
+0.000, -0.010"

**Thickness:**

**6 mm ( $\frac{1}{4}$ " ) Thick Heaters:** +0.000, -0.005"

**8 and 10 mm ( $\frac{5}{16}$  and  $\frac{3}{8}$ " ) Thick Heaters:** +0.000, -0.008"  
[10 mm ( $\frac{3}{8}$ " ) thick heaters have radius corners]

**Length:**

**Up to 24":**  $\pm\frac{1}{16}$ "

**Over 24":**  $\pm\frac{1}{8}$ "

**Mounting Slot Size:** Standard 8 x 13 mm ( $\frac{5}{16}$  x  $\frac{1}{2}$ " )

**Special Bushings:** 13 x 16 mm ( $\frac{1}{2}$  x  $\frac{5}{8}$ " )

Standard Specifications and Tolerances of Channel Strip Heaters If tighter tolerances are required, consult OMEGA.

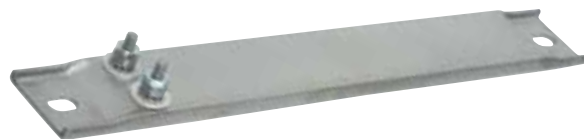
### OMEGA Offers Channel Strip Heaters in Four Rectangular Sizes



16 W x 6 mm thick ( $\frac{5}{8}$ " x  $\frac{1}{4}$ " ).  
Available without mounting tabs only.



25 W x 8 mm thick (1" x  $\frac{5}{16}$ " ).  
Available with or without mounting tabs. When supplied with Type L lead wire termination, mounting tabs are not available.



38 W x 8 mm thick (1½" x  $\frac{5}{16}$ " ).  
Available with or without mounting tabs. When supplied with Type L lead wire termination, mounting tabs are not available.



38 W x 10 mm thick (1½" x  $\frac{3}{8}$ " ).  
Available with or without mounting tabs. When supplied with Type L lead wire termination, mounting tabs are not available. [10 mm ( $\frac{3}{8}$ " ) thick heaters have radius corners]

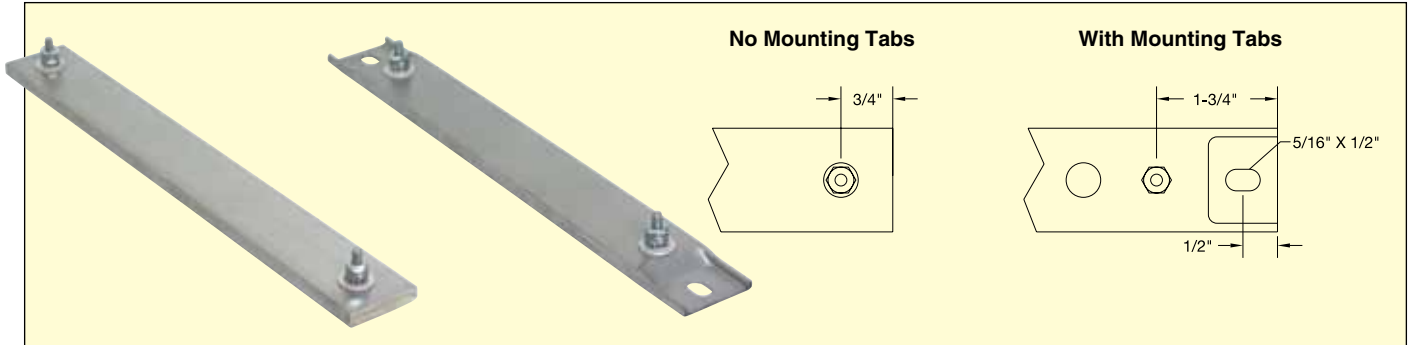




## Channel Strip Heaters Screw Terminal Terminations

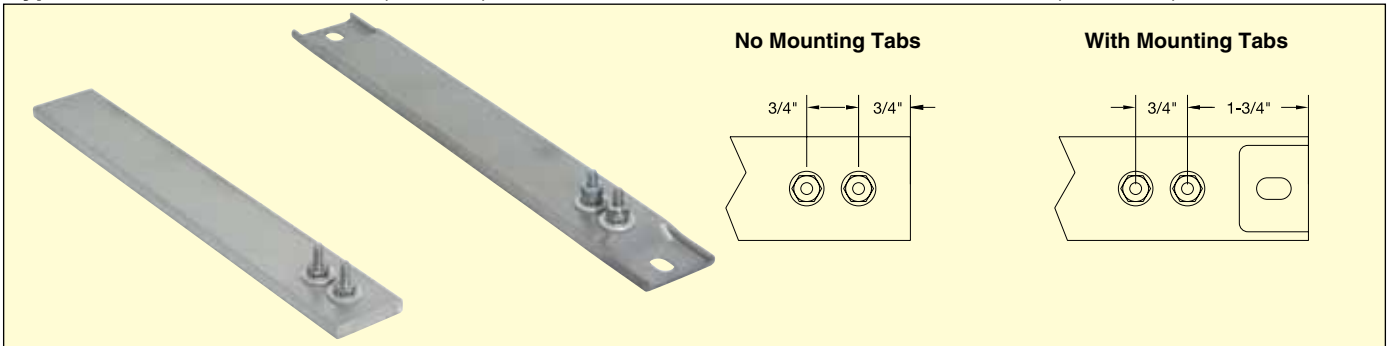
**Type T1** 10-32 Screw Terminals at each end

Available on 25 and 38 mm (1 and 1½") wide heaters



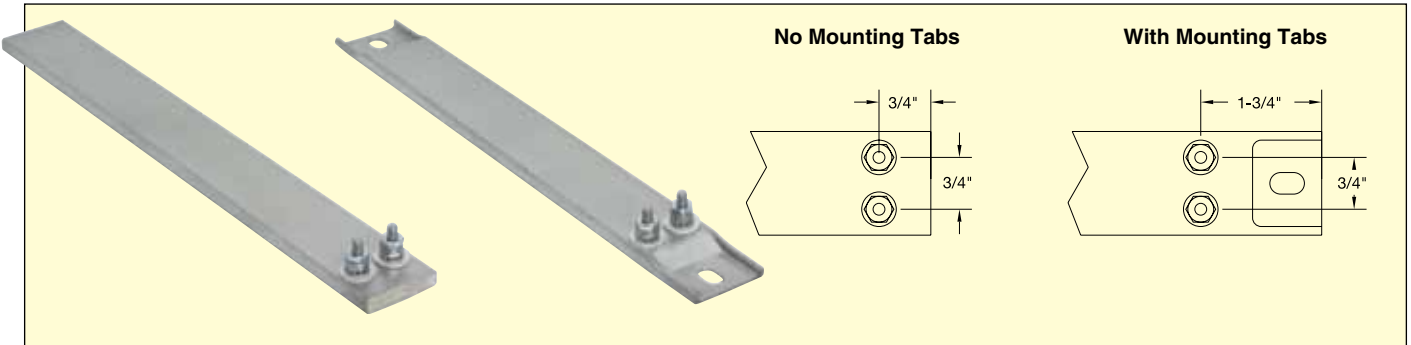
**Type T2** 10-32 Screw Terminals (Tandem) at one end

Available on 25 and 38 mm (1 and 1½") wide heaters



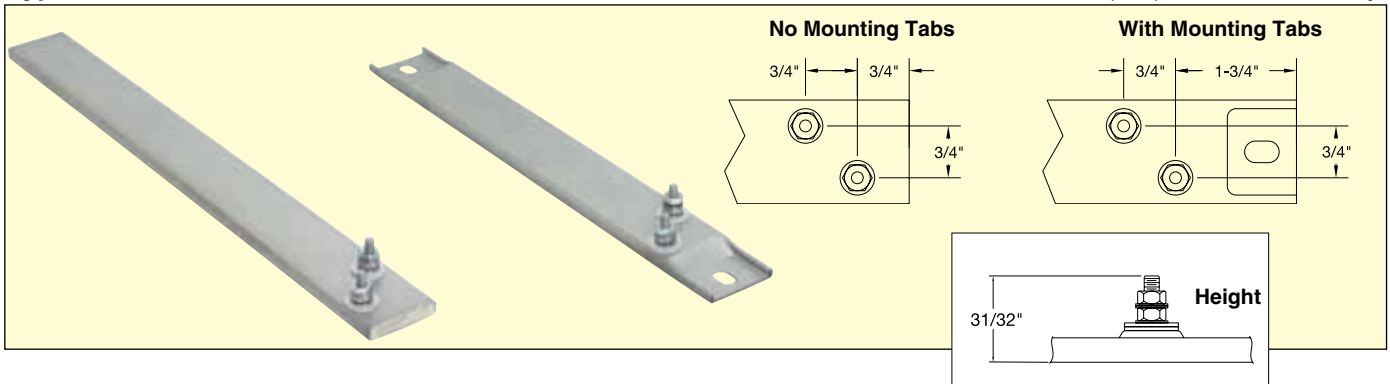
**Type T3** 10-32 Screw Terminals (Parallel) at one end

Available on 38 mm (1½") wide heaters only



**Type T4** 10-32 Terminals offset at one end

Available on 38 mm (1½") wide heaters only



## Channel Strip Heaters Lead Wire Terminations

Type L



### Type L

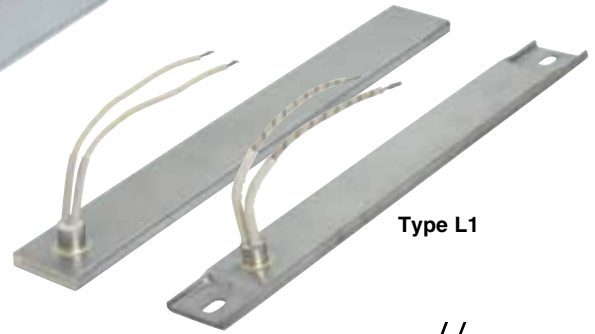
Flexible lead wires exit from end of heater. 254 mm (10") long leads standard; if longer leads are required, specify. Recommended only for tight quarters or where flexibility of the lead wire is required. Not available on heaters with tabs.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

### Type L1

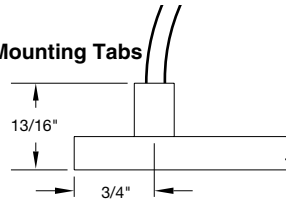
Flexible lead wires exit from top of heater. 254 mm (10") long leads standard; if longer leads are required, specify.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

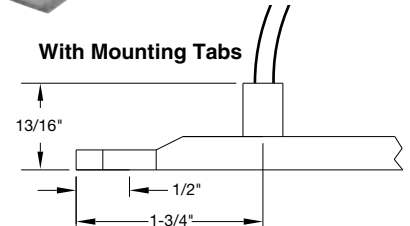


Type L1

No Mounting Tabs



With Mounting Tabs



Type W1

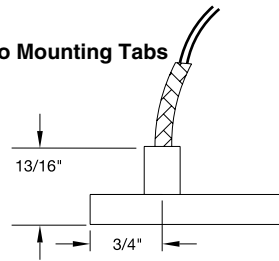


### Type W1

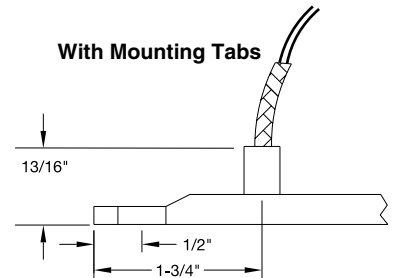
Wire braid provides strength and protection to the lead wire insulation, offering sharp bending not possible with armor cable. 254 mm (10") of wire braid over 12" long leads is standard; if longer leads or braid are required, specify.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

No Mounting Tabs



With Mounting Tabs



### Type W2

Stainless steel braid over each lead wire offers sharp bending not possible with armor cable, as well as abrasion protection. 254 mm (10") long leads standard; if longer leads are required, specify. Not available on heaters with tabs.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

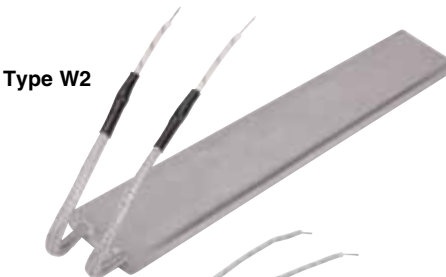
### Type R1

Armor cable provides strength and prevents contamination from getting into the heater. 254 mm (10") of armor over 305 mm (12") long leads are standard; if longer leads or armor are required, please specify.

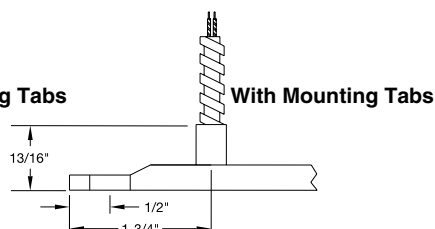
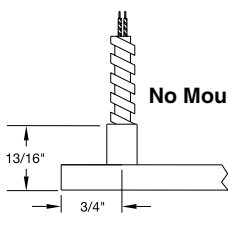
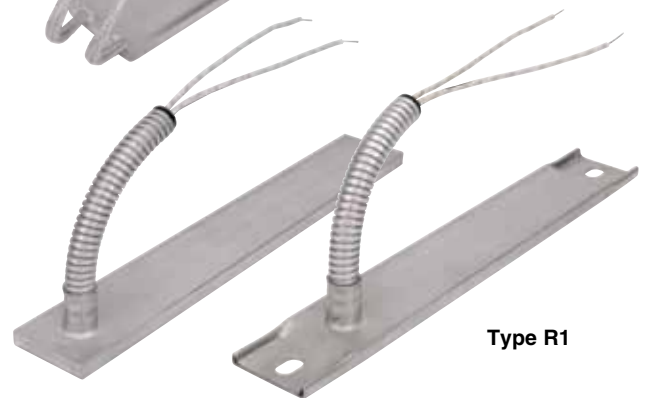
**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

**Type R1A:** Galvanized cable **Type R2A:** Stainless steel cable

Type W2

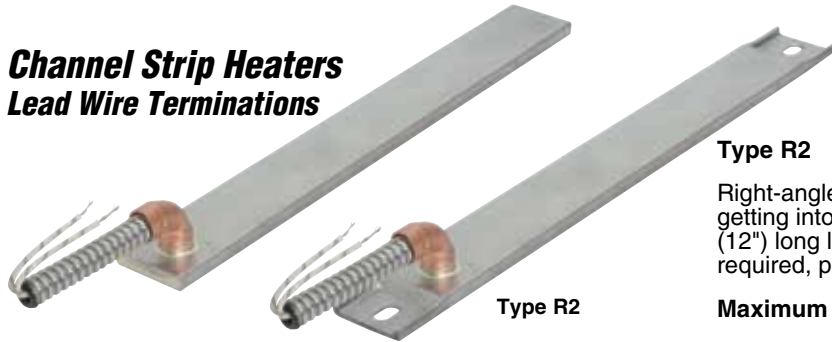


Type R1





## Channel Strip Heaters Lead Wire Terminations

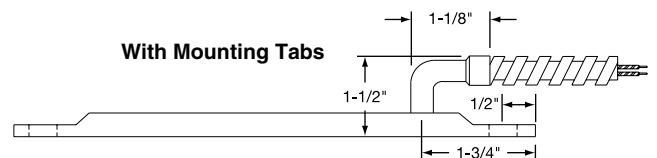
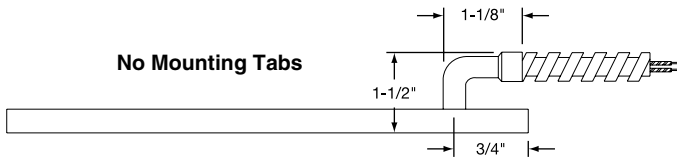


### Type R2

Right-angle armor cable prevents contamination from getting into the heater. 254 mm (10") of armor over 305 mm (12") long leads is standard; if longer leads or armor are required, please specify.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 480

- Type R2A** Galvanized cable
- Type R2B** Stainless steel cable
- Type R2C** Elbow and leads only (no cable)



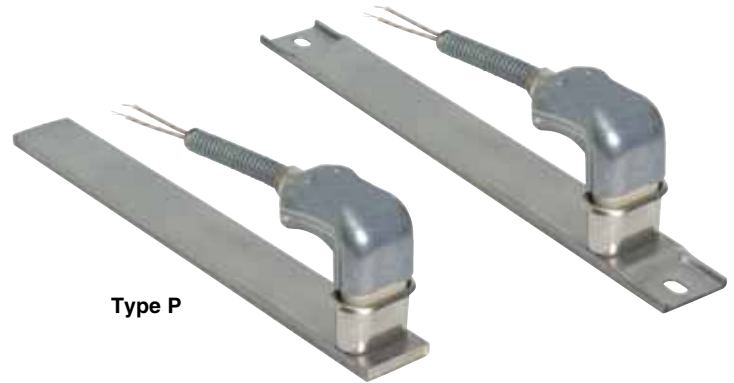
## Terminal Protection

### Type P

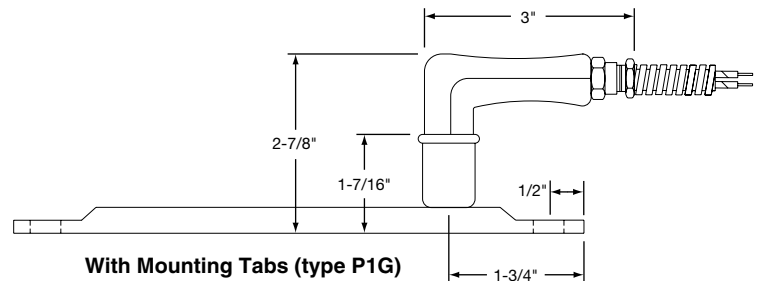
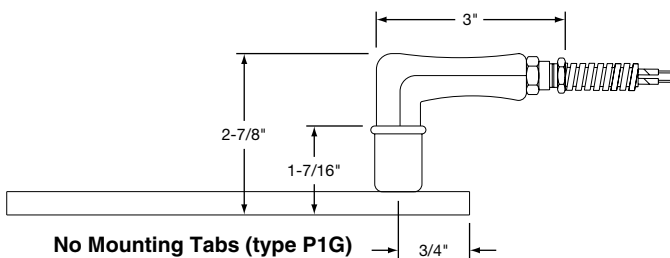
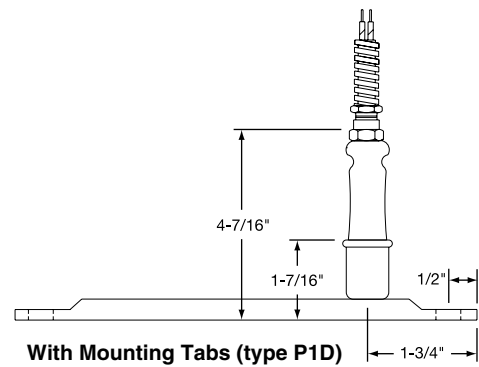
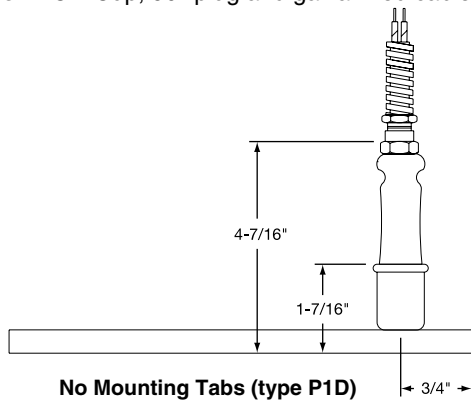
High-Temperature Quick Disconnect Plug. If armor protected lead wires are required, specify armor and lead length. Available on 38 mm (1 1/2") wide heaters only.

**Maximum Amps:** 10 at 240 Vac **Maximum Volts:** 250

- Type P1A** Cup only (UT900)
- Type P1B** Cup and straight plug (H900)
- Type P1C** Cup and 90° plug (HW900)
- Type P1D** Cup, straight plug and galvanized cable
- Type P1G** Cup, 90° plug and galvanized cable



Type P



**Caution:** Exposed electrical wiring on Strip Heaters is a violation of electrical safety codes, including O.S.H.A.

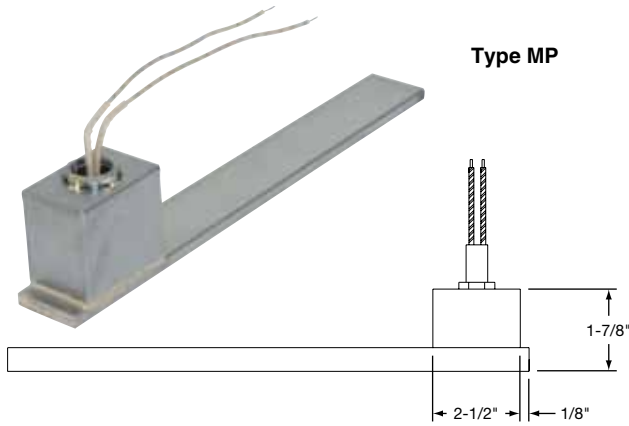
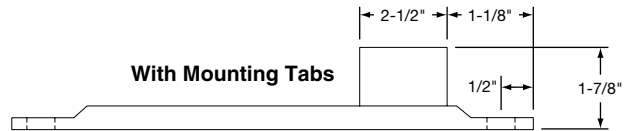
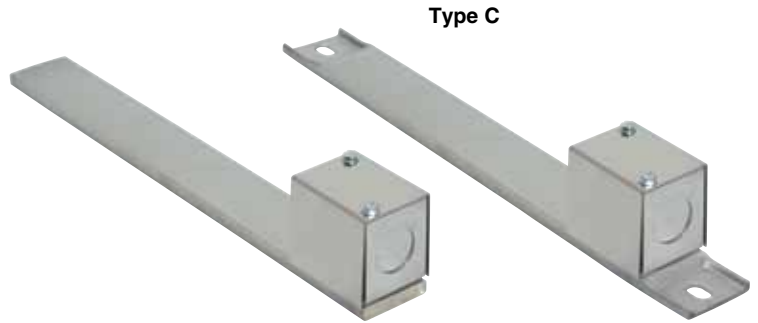


## Channel Strip Heaters Terminal Protection

### Type C

Terminal box has a 13 mm (1/2") trade size knockout (actual diameter 22 mm (7/8")). Box provides excellent protection to exposed terminals. If armor-protected lead wires are required, specify armor and lead length. Available on 25 and 38 mm (1 and 1 1/2") wide heaters.

- Type CA** No cable or braid
- Type CB** Galvanized cable
- Type CC** Stainless steel cable
- Type CD** Wire braid



### Type MP

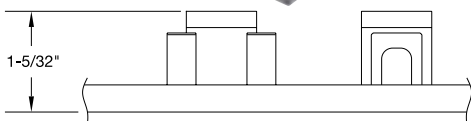
Specially designed box is welded to the Channel Strip Heater and potted with epoxy. The ends of the heater are also welded. Leads exit through a 1/2 NPT nut that can be located at the top or in the front of the box. Armor cable can be supplied with the male fitting, providing a completely sealed channel strip. Available on 38 mm (1 1/2") wide heaters only.

254 mm (10") long leads standard; if longer leads are required, specify.

**Maximum Amps: 25 Maximum Volts: 480**

## Ceramic Covers for Insulating Terminals

Igloo™ Ceramic terminal covers consist of two individual ceramic parts. With a tight-fitting cap and a solid base, an Igloo cover will fully insulate any standard 10-32 terminal lug used for electrical wiring hookups. Igloo covers can be assembled on all Channel Strip heaters with Type 1 and Type 4 screw terminals.



Ceramic Cap



Thread 10-32  
Part Number  
CER-102-101



**Type C6**  
Double Port In-Line  
Part Number: CER-101-104



**Type C7**  
Double Port 90°  
Part Number: CER-101-106

Three different types of Igloo bases are available for your wiring convenience. Double Port In-Line, Double Port 90° and Single Port.

When ordering, specify the type of Igloo.



**Type C8**  
Single Port  
Part Number:  
CER-101-107



**Channel Strip**  
**38.1 x 9.53 mm (1½ x ⅜")**

Part numbers shown are for heaters with T4 Terminals and Mounting Tabs.



**To Order Visit [omega.com/csh5\\_series](http://omega.com/csh5_series) for Pricing and Details**

Model No.		Length		Wattage	Watt Density	
120V	240V	inch	mm		Watt/in <sup>2</sup>	Watt/cm <sup>2</sup>
—	CSH00294	7½	190.5	200	19	3
—	CSH00295	9	228.6	500	31	5
CSH00296	—	10½	266.7	250	12	2
CSH00297	—	10½	266.7	400	19	3
—	CSH00298	12	304.8	500	18	3
—	CSH00299	15¼	387.4	500	13	2
—	CSH00300	17	431.8	1000	22	3
—	CSH00301	17⅞	454.0	350	7	1
—	CSH00302	17⅞	454.0	500	10	2
—	CSH00303	18	457.2	1000	20	3
—	CSH00304	18½	469.9	500	10	2
—	CSH00305	22½	571.5	1000	15	2
—	CSH00306	24	609.6	1000	14	2
—	CSH00307	25½	647.7	1000	13	2
—	CSH00308	26	660.4	1600	20	3
—	CSH00309	26½	673.1	1500	18	3
—	CSH00310	30½	774.7	750	8	1
—	CSH00311	31½	800.1	800	8	1
—	CSH00312	35⅞	911.2	1000	9	1
—	CSH00313	36	914.4	1000	9	1
—	CSH00314	50	1270.0	1000	6	1
—	CSH00315	62	1574.8	1500	7	1

**Custom Engineered/Manufactured Heaters**

An electric heater can be very application specific, for sizes and ratings not listed, OMEGA® will design and manufacture a channel strip heater to meet your requirements.

**Please Specify the Following:**

- Width and Thickness
- Length
- Wattage
- Voltage
- Termination
- Lead Cable/Braid Length
- Special Features
- Quantity

# STAINLESS STEEL SHEATH CARTRIDGE HEATERS

## Standard and High Watt Density Construction



- ✓ **Stainless Steel Sheath**
- ✓ **CSH Series:**  
Sheath Temperatures to 760°C (1400°F)
- ✓ **CSS Series:**  
Sheath Temperature to 677°C (1250°F)
- ✓ **3.2 to 19 mm (1/8 to 3/4")**  
Diameters
- ✓ **120V and 240V**

### APPLICATIONS

- ✓ Dies
- ✓ Molds
- ✓ Platens
- ✓ Heat Sealing
- ✓ Labeling
- ✓ Packaging
- ✓ Hot Melt Adhesive Machinery

OMEGALUX® CS Series cartridge heaters provide high wattage in limited spaces. They are manufactured with 300 Series stainless steel sheaths to precise dimensions and tolerances to ensure maximum heat transfer for minimum core temperature and faster heating. The CSS Series cartridge heaters feature an economical design of coiled resistance elements and ceramic cores and can be used whenever a high watt density is not required. The CSH Series consists of high watt density cartridge heaters that feature a swaged construction, which allows for longer life at higher temperatures. See next page for the maximum recommended watt density when selecting the high watt density CSH Series cartridge heaters.

CSS and CSH Series cartridge heaters are designed to fit holes drilled and reamed to the nominal

diameter of the heater. The hole should be reamed to the fractional size with a +0.025 mm (0.001") tolerance.

### SPECIFICATIONS

**Lead Length:** 150 mm L (6")

**Lead Insulation:**

**CSH Series:**

Fiberglass, rated to 250°C (482°F)

**CSS Series:**

Heater dia. of 6.4 mm (1/4") and smaller: PFA, rated to 200°C (392°F)

Heater Dia. of 7.9 mm (5/16") and larger: Fiberglass, rated to 250°C (482°F)

**Wattage Tolerance:**

5 to -10% at rated voltage

**Diameter Tolerance:**

From 0.025 to 0.229 mm (0.001 to 0.009") less the nominal diameter in inches

**Length Tolerance:** ±2% or ±1.6 mm (1/16"), whichever is greater

**Camber Tolerance:**

1.7 mm/m (0.020"/ft) of length for units up to 305 mm (12") L

**Sheath Material:**

300 Series stainless steel

**3.18 mm (1/16") Diameter CSS Series Cartridge Heaters (Actual Dia: 0.124 to 0.120")**

<b>To Order</b>				
Length mm (in)	Watts	W/in <sup>2</sup>	Model Number	Weight g (lb)
25 (1.00)	10	35	CSS-01110/120	5 (0.01)
25 (1.00)	15	50	CSS-01115/120	5 (0.01)
38 (1.50)	20	40	CSS-01120/120	14 (0.03)
38 (1.50)	25	50	CSS-01125/120	14 (0.03)
51 (2.00)	35	50	CSS-01235/120	27 (0.06)

**4 mm (5/32") Diameter CSS Series Cartridge Heaters (Actual Dia: 0.155 to 0.152")**

<b>To Order</b>				
Length mm (in)	Watts	W/in <sup>2</sup>	Model Number	Weight g (lb)
25 (1.00)	10	25	CSS-02110/120	23 (0.05)
38 (1.50)	20	35	CSS-02120/120	32 (0.07)
51 (2.00)	35	40	CSS-02235/120	41 (0.09)

**4.76 mm (3/16") Diameter CSS Series Cartridge Heater (Actual Dia: 0.186 to 0.183")**

<b>To Order</b>				
Length mm (in)	Watts	W/in <sup>2</sup>	Model Number	Weight g (lb)
38 (1.50)	30	40	CSS-03130/120	32 (0.07)
51 (2.00)	35	35	CSS-03235/120	41 (0.09)
76 (3.00)	65	40	CSS-03365/120	50 (0.11)
102 (4.00)	90	40	CSS-03490/120	59 (0.13)
102 (4.00)	60	25	CSS-03460/120	59 (0.13)
102 (4.00)	100	45	CSS-034100/120	59 (0.13)

**6.35 mm (1/4") Diameter CSS and CSH Series Cartridge Heaters (Actual Dia: 0.249 to 0.245")**

<b>To Order</b>				
Length mm (in)	Watts	W/in <sup>2</sup>	Model Number	Weight g (lb)
25 (1.00)	20	35	CSS-10120/120	5 (0.01)
25 (1.00)	100	250	CSH-101100/120	9 (0.02)
32 (1.25)	20	25	CSS-101201/120	5 (0.01)
32 (1.25)	100	165	CSH-1011001/120	9 (0.02)
38 (1.50)	30	30	CSS-10130/*	9 (0.02)
38 (1.50)	50	50	CSS-10150/*	9 (0.02)
38 (1.50)	70	85	CSH-10170/120	9 (0.02)
38 (1.50)	120	150	CSH-101120/120	9 (0.02)
51 (2.00)	50	35	CSS-10250/120	14 (0.03)
51 (2.00)	100	85	CSH-102100/120	14 (0.03)
51 (2.00)	150	125	CSH-102150/120	14 (0.03)
64 (2.50)	65	35	CSS-10265/*	18 (0.04)
64 (2.50)	135	85	CSH-102135/120	14 (0.03)
64 (2.50)	185	115	CSH-102185/120	14 (0.03)
76 (3.00)	100	45	CSS-103100/240	23 (0.05)
76 (3.00)	170	90	CSH-103170/120	18 (0.04)
76 (3.00)	220	115	CSH-103220/120	18 (0.04)

More 6.35 mm (1/4") diameter CSS and CSH Series cartridge heaters at top right, this page.

\* Insert "120" or "240" to indicate desired operating voltage.

**6.35 mm (1/4") Diameter CSS and CSH Series Cartridge Heaters (cont.)**

<b>To Order</b>				
Length mm (in)	Watts	W/in <sup>2</sup>	Model Number	Weight g (lb)
89 (3.50)	90	35	CSS-10390/*	27 (0.06)
89 (3.50)	200	85	CSH-103200/*	18 (0.04)
89 (3.50)	260	110	CSH-103260/*	18 (0.04)
102 (4.00)	110	40	CSS-104110/*	32 (0.07)
102 (4.00)	235	85	CSH-104235/*	18 (0.04)
102 (4.00)	300	110	CSH-104300/*	18 (0.04)
102 (4.00)	400	150	CSH-104400/*	18 (0.04)
114 (4.50)	70	21	CSH-10470/120	23 (0.05)
114 (4.50)	110	30	CSS-1041101/*	36 (0.08)
114 (4.50)	270	85	CSH-104270/*	23 (0.05)
114 (4.50)	350	110	CSH-104350/*	23 (0.05)
127 (5.00)	305	85	CSH-105305/*	27 (0.06)
127 (5.00)	400	115	CSH-105400/*	27 (0.06)
178 (7.00)	150	30	CSS-107150/120	54 (0.12)

**9.53 mm (3/8") Diameter CSS and CSH Series Cartridge Heaters (Actual Dia: 0.374 to 0.370")**

<b>To Order</b>				
Length mm (in)	Watts	W/in <sup>2</sup>	Model Number	Weight g (lb)
25 (1.00)	30	40	CSS-20130/120	18 (0.04)
25 (1.00)	100	165	CSH-201100/120	18 (0.04)
32 (1.25)	100	110	CSH-2011001/120	18 (0.04)
32 (1.25)	150	165	CSH-201150/120	18 (0.04)
38 (1.50)	50	40	CSS-20150/*	32 (0.07)
38 (1.50)	150	125	CSH-2015150/120	23 (0.05)
38 (1.50)	200	105	CSH-201200/*	23 (0.05)
51 (2.00)	70	35	CSS-20270/*	41 (0.09)
51 (2.00)	100	50	CSS-202100/120	41 (0.09)
51 (2.00)	150	85	CSH-202150/*	27 (0.06)
51 (2.00)	200	110	CSH-202200/*	27 (0.06)
51 (2.00)	250	135	CSH-202250/*	27 (0.06)
64 (2.50)	100	40	CSS-2021001/*	54 (0.12)
64 (2.50)	200	85	CSH-202200/120	32 (0.07)

More 9.53 mm (3/8") diameter CSS and CSH Series online.

**Ordering Example:** CSS-01120/120, 3.18 mm (1/16") diameter cartridge heater, 120 Vac.

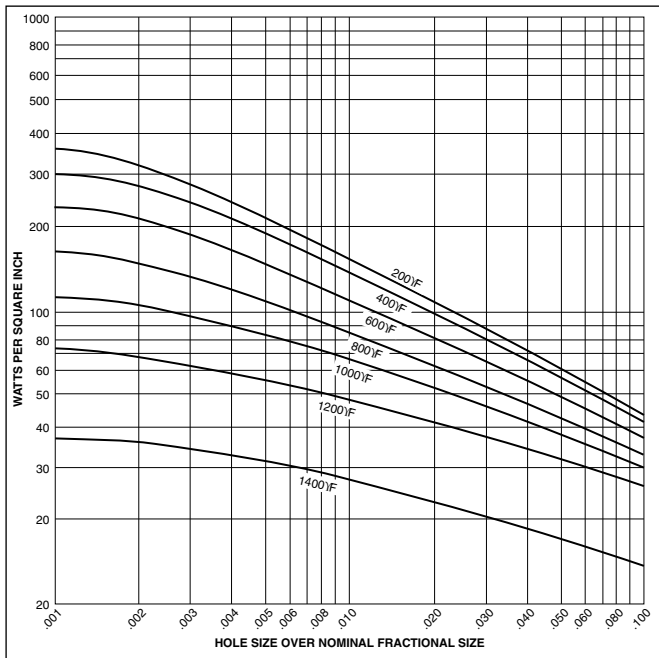
CSH-103220/120, 6.35 mm (1/4") diameter cartridge heater, 120 Vac.



**9.53 mm (3/8") Diameter CSS and CSH Series Cartridge Heaters (continued from page 71)**

<b>To Order</b>				
Length mm (in)	Watts	W/in <sup>2</sup>	Model Number	Weight g (lb)
64 (2.50)	300	125	CSH-202300/*	32 (0.07)
76 (3.00)	75	25	CSS-20375/*	68 (0.15)
76 (3.00)	250	85	CSH-203250/*	36 (0.08)
76 (3.00)	400	135	CSH-203400/*	36 (0.08)
89 (3.50)	150	50	CSS-203150/*	82 (0.18)
89 (3.50)	300	85	CSH-203300/*	41 (0.09)
89 (3.50)	450	130	CSH-203450/120	82 (0.18)
102 (4.00)	75	20	CSS-20475/120	91 (0.20)
102 (4.00)	220	50	CSS-204220/*	91 (0.20)
102 (4.00)	350	85	CSH-204350/*	45 (0.10)
102 (4.00)	500	120	CSH-204500/*	45 (0.10)
114 (4.50)	250	50	CSS-204250/*	104 (0.23)
127 (5.00)	280	50	CSS-205280/*	122 (0.27)
127 (5.00)	500	95	CSH-205500/*	50 (0.11)
140 (5.50)	100	15	CSS-205100/240	141 (0.31)
152 (6.00)	350	50	CSS-206350/*	163 (0.36)
152 (6.00)	600	90	CSH-206600/*	59 (0.13)

\* Insert "120" or "240" to indicate desired operating voltage.



Maximum watts per square inch with various increasing temperatures and hole tolerances

**12.7 mm (1/2") Diameter CSS and CSH Series Cartridge Heaters (Actual Dia: 0.499 to 0.494")**

<b>To Order</b>				
Length mm (in)	Watts	W/in <sup>2</sup>	Model Number	Weight g (lb)
38 (1.50)	75	50	CSS-30175/*	32 (0.07)
38 (1.50)	90	60	CSS-30190/120	32 (0.07)
38 (1.50)	135	85	CSH-301135/*	32 (0.07)
38 (1.50)	335	210	CSH-301335/120	32 (0.07)
51 (2.00)	120	50	CSS-302120/*	50 (0.11)
51 (2.00)	200	85	CSH-302200/*	36 (0.08)
51 (2.00)	400	165	CSH-302400/120	36 (0.08)
64 (2.50)	80	25	CSS-30280/120	64 (0.14)
64 (2.50)	150	50	CSS-302150/*	64 (0.14)
64 (2.50)	270	85	CSH-302270/*	41 (0.09)
64 (2.50)	470	150	CSH-302470/*	41 (0.09)
76 (3.00)	200	50	CSS-303200/*	77 (0.17)
76 (3.00)	335	85	CSH-303335/*	45 (0.10)
76 (3.00)	535	135	CSH-303535/*	45 (0.10)
102 (4.00)	275	50	CSS-304275/*	104 (0.23)
102 (4.00)	470	85	CSH-304470/*	50 (0.11)
127 (5.00)	350	50	CSS-305350/*	122 (0.27)
127 (5.00)	500	70	CSH-305500/*	59 (0.13)
152 (6.00)	425	50	CSS-306425/*	150 (0.33)
152 (6.00)	735	85	CSH-306735/*	68 (0.15)
178 (7.00)	550	55	CSS-307550/*	218 (0.48)
203 (8.00)	650	55	CSS-308650/*	240 (0.53)
203 (8.00)	1000	85	CSH-3081000/*	77 (0.17)
254 (10.00)	850	55	CSS-310850/*	281 (0.62)
254 (10.00)	1200	80	CSH-3101200/240	100 (0.22)
305 (12.00)	1000	55	CSS-3121000/*	313 (0.69)

\* Insert "120" or "240" to indicate desired operating voltage.

Note for CSS and CSH Series heaters: the watt densities are based on a unit installed in mild steel. Different materials affect the above values, i.e., the lower the thermal conductivity of the material, the lower the maximum allowable watts per square inch.

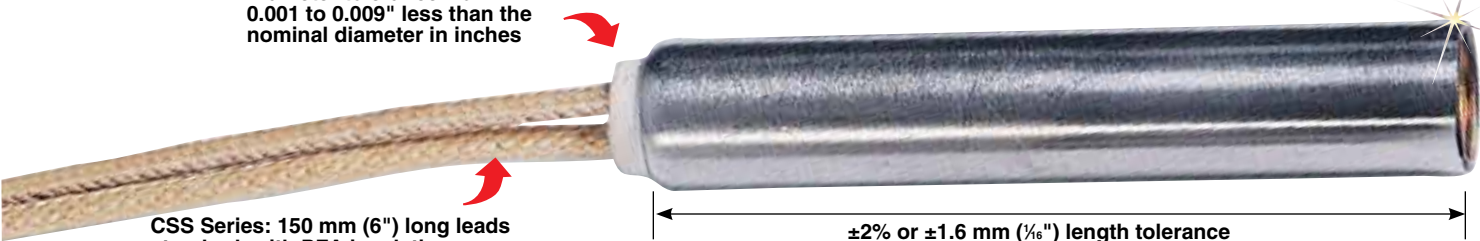
High watt density construction CSH Series





Standard Construction CSS Series

Diameter tolerance from 0.001 to 0.009" less than the nominal diameter in inches



CSS Series: 150 mm (6") long leads standard, with PFA insulation on 6.35 mm (1/4") and smaller models, fiberglass insulation on 7.94 mm (5/16") and larger models  
 CSH Series: fiberglass insulation

±2% or ±1.6 mm (1/16") length tolerance (whichever is greater).

Compact design provides high wattage in small spaces.

15.9 mm (5/8") Diameter CSS and CSH Series Cartridge Heaters (Actual Dia: 0.624 to 0.619")

To Order				
Length mm (in)	Watts	W/in <sup>2</sup>	Model Number	Weight g (lb)
51 (2.00)	250	85	CSH-402250/*	59 (0.13)
64 (2.50)	75	20	CSS-40275/240	68 (0.15)
64 (2.50)	200	50	CSS-402200/*	68 (0.15)
64 (2.50)	335	85	CSH-402335/*	68 (0.15)
76 (3.00)	250	50	CSS-403250/*	95 (0.21)
76 (3.00)	415	85	CSH-403415/*	77 (0.17)
89 (3.50)	300	50	CSS-403300/*	113 (0.25)
89 (3.50)	350	60	CSS-403350/120	113 (0.25)
102 (4.00)	350	50	CSS-404350/*	132 (0.29)
102 (4.00)	585	85	CSH-404585/*	91 (0.20)
127 (5.00)	450	50	CSS-405450/*	159 (0.35)
152 (6.00)	350	30	CSS-406350/120	200 (0.44)
152 (6.00)	400	30	CSS-406400/120	200 (0.44)
152 (6.00)	540	50	CSS-406540/*	200 (0.44)
152 (6.00)	920	85	CSH-406920/*	136 (0.30)
178 (7.00)	635	50	CSS-407635/*	259 (0.57)
203 (8.00)	750	57	CSS-408750/*	249 (0.55)
203 (8.00)	1000	70	CSH-4081000/240	181 (0.40)
203 (8.00)	1500	100	CSH-4081500/240	181 (0.40)
229 (9.00)	950	55	CSS-409950/*	286 (0.63)
254 (10.00)	1000	53	CSS-4101000/*	308 (0.68)
254 (10.00)	1600	85	CSH-4101600/240	318 (0.70)
305 (12.00)	1200	53	CSS-4121200/240	340 (0.75)
305 (12.00)	1750	80	CSH-4121750/240	363 (0.80)

\* Insert "120" or "240" to indicate desired operating voltage.

All cartridge heaters are rated by wattage and watt density (watts per square inch) for either 120 or 240 volt operation. In some applications it may be useful to derate the wattage by operating the cartridge heater at a lower voltage. When operating at lower voltages, the wattage is derated using the following formula:

$$\left(\frac{\text{Operating Voltage}}{\text{Rated Voltage}}\right)^2 \times \text{Wattage at Rated Voltage} = \text{Derated Wattage}$$

19 mm (3/4") Diameter CSS and CSH Series Cartridge Heaters (Actual Dia: 0.749 to 0.741")

To Order				
Length mm (in)	Watts	W/in <sup>2</sup>	Model Number	Weight g (lb)
64 (2.50)	230	50	CSS-502230/*	95 (0.21)
89 (3.50)	350	50	CSS-503350/*	132 (0.29)
127 (5.00)	500	50	CSS-505500/*	195 (0.43)
152 (6.00)	650	50	CSS-506650/*	222 (0.49)
152 (6.00)	1000	80	CSH-5061000/240	200 (0.44)
152 (6.00)	1500	115	CSH-5061500/240	200 (0.44)
178 (7.00)	760	50	CSS-507760/*	259 (0.57)
203 (8.00)	750	40	CSS-508750/120	318 (0.70)
203 (8.00)	885	50	CSS-508885/*	318 (0.70)
203 (8.00)	1500	85	CSH-5081500/240	263 (0.58)
203 (8.00)	2000	110	CSH-5082000/240	263 (0.58)
254 (10.00)	1100	45	CSS-5101100/240	363 (0.80)
254 (10.00)	2000	90	CSH-5102000/240	204 (0.45)
305 (12.00)	1300	45	CSS-5121300/240	417 (0.92)
305 (12.00)	2200	80	CSH-512220/240	454 (1.00)

Ordering Example: CSS-403250/240, 15.9 mm (5/8") diameter, 76 mm (3") long cartridge heater, 240 Vac.

CSH-4081500/240, 15.9 mm (5/8") diameter, 203 mm (8") long cartridge heater, 240 Vac.

CSS-502230/120, 19 mm (3/4") diameter, 64 mm (2.50") long cartridge heater, 120 Vac.

Example: The CSH-5102000/240 cartridge heater is rated at 2000 watts and 90 watts per square inch at 240 volts. To determine the derated wattage when operating on 120 volts:

$$(120 \text{ Volts} / 240 \text{ Volts})^2 \times 2000 \text{ Watts} = 500 \text{ Watts}$$

When operating on 120 volts, the watt density of this heater would also be reduced by a factor of 4 from 90 watts per square inch to approximately 22 watts per square inch.

# BOOSTER HEATER-CORROSION SOLUTION APPLICATIONS

CVCHS Series  
Starts at  
**\$930**

- ✓ Non-Metallic (CPVC) Pipe Body
- ✓ 1.5 to 3 kW
- ✓ 120 and 240V, Single Phase
- ✓ General Purpose Terminal Enclosure
- ✓ INCOLOY Sheath Elements (75 W/in<sup>2</sup>)
- ✓ Integral Thermostat (60 to 190°F)
- ✓ Integral Automatic Cutout (Set at 195°F)

## APPLICATIONS

Used to heat clean and corrosive solutions. Ideal for side-arm heating, in-line circulation and engine pre-heaters.

## FEATURES

**Terminal Enclosure**—E1 General Purpose is standard.

**Elements**—INCOLOY sheath elements rated 75 W/in<sup>2</sup>.

**Flange**—Stainless steel flange for corrosion resistance.

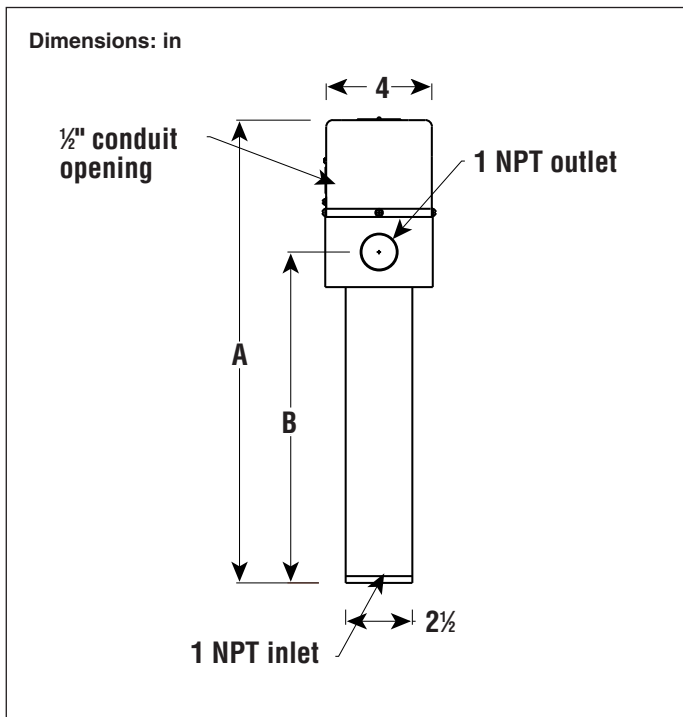
**Vessel**—CPVC pipe body material is resistant to many corrosive solutions and is ideal for water applications. Pipe body material provides good thermal insulation, reducing heat loss.

**Thermostat**—Integral thermostat with 60 to 190°F temperature range, located inside the terminal enclosure.

**High Limit Control**—Integral automatic cutout (overtemperature control) protects against fluid or element overheat (set to open at 195°F).

**Vibration Resistant**—Vibration resistant construction to withstand vibrations typically experienced on many types of operating equipment (i.e., engines).

**Easy to Install**—Minimal size and light weight, no supporting brackets are required.



**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)							
kW	Volts	Ckt & Phase	Dimensions: in		Model No.	Price	Wt. (lb)
			A	B			
<b>150 lb CPVC Plastic Pipe Body—1 INCOLOY Element (75 W/in<sup>2</sup>)</b>							
1.5	120	1-1	17 <sup>5</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>8</sub>	CVCHS-01-01P5-E1-120V	\$930	3
1.5	240	1-1	17 <sup>5</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>8</sub>	CVCHS-01-01P5-E1-240V	1000	3
2	120	1-1	17 <sup>5</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>8</sub>	CVCHS-01-002P-E1-120V	1025	3
2	240	1-1	17 <sup>5</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>8</sub>	CVCHS-01-002P-E1-240V	1025	3
2.5	120	1-1	21 <sup>5</sup> / <sub>16</sub>	16 <sup>3</sup> / <sub>8</sub>	CVCHS-01-02P5-E1-120V	1050	4
2.5	240	1-1	21 <sup>5</sup> / <sub>16</sub>	16 <sup>3</sup> / <sub>8</sub>	CVCHS-01-02P5-E1-240V	1050	4
3	120	1-1	21 <sup>5</sup> / <sub>16</sub>	16 <sup>3</sup> / <sub>8</sub>	CVCHS-01-003P-E1-120V	1100	4
3	240	1-1	21 <sup>5</sup> / <sub>16</sub>	16 <sup>3</sup> / <sub>8</sub>	CVCHS-01-003P-E1-240V	1100	4

Ordering Examples: CVCHS-01-002P-E1-240V, 2 kW, 240V heater, \$1025.  
CVCHS-01-003P-E1-120V, 3 kW, 120V heater, \$1100.

## Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model	Corrosive Solution Booster Heater				
CVCHS	Corrosive Water Solution Circulation Heater				
	Code	Number of Elements			
	01	One			
		Code	kW		
		01P5	1.5	02P5	2.5
		002P	2	003P	3
		Code	Terminal Enclosure		
		E1	General Purpose		
CVCHS	01	01P5	E1	Typical Model Number	



**UNITED STATES**

[www.omega.com](http://www.omega.com)  
1-800-TC-OMEGA  
Stamford, CT.

**CANADA**

[www.omega.ca](http://www.omega.ca)  
Laval(Quebec)  
1-800-TC-OMEGA

**GERMANY**

[www.omega.de](http://www.omega.de)  
Deckenpfronn, Germany  
0800-8266342

**UNITED KINGDOM**

[www.omega.co.uk](http://www.omega.co.uk)  
Manchester, England  
0800-488-488

**FRANCE**

[www.omega.fr](http://www.omega.fr)  
Guyancourt, France  
088-466-342

**CZECH REPUBLIC**

[www.omegaeng.cz](http://www.omegaeng.cz)  
Karviná, Czech Republic  
596-311-899

**BENELUX**

[www.omega.nl](http://www.omega.nl)  
Amstelveen, NL  
0800-099-33-44



**More than 100,000 Products Available!**

• **Temperature**

Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

• **Flow and Level**

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

• **pH and Conductivity**

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

• **Data Acquisition**

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

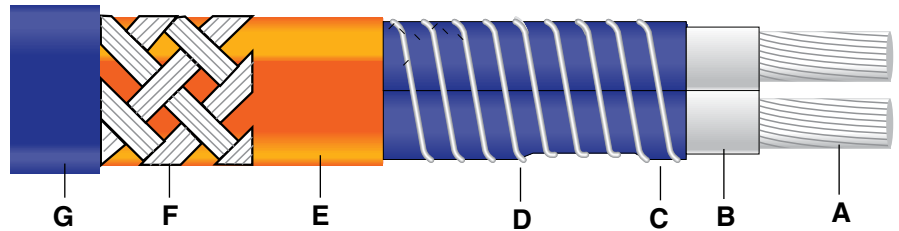
• **Pressure, Strain and Force**

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

• **Heaters**

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# CONSTANT WATTAGE HEAT CABLE



- ✓ Constant Output
- ✓ Cut to Any Length
- ✓ Lower Installation Costs
- ✓ Flexible

OMEGALUX® CWM (constant wattage medium temperature) heating cable is ideal for pipe tracing situations that require higher temperatures for process maintenance as well as freeze protection. No matter what length of cable is needed, the wattage (or heat) produced by each foot of cable remains unchanged.

### Standard Construction

- A. Bus Wires.** Twin 12 AWG copper bus wires provide reliable, consistent electrical current.
- B. Bus Wire Insulation.** 11 mil FEP jacket protects and electrically insulates bus wires.
- C. Inner Sheath.** This insulation jacket holds the 2 bus wires together and provides the wrapping surface for the nichrome heating wire.
- D. Nichrome Wire.** The nichrome resistance heating wire is the heating component of the cable.
- E. Jacket.** Flame-retardant insulation jacket is made from FEP material, which protects heating cable and ensures long service life. This material is also highly corrosion resistant.
- F. Metal Braid.** Plated copper braid covering the jacket provides a positive ground path.
- G. Optional Fluoropolymer Overjacket.** FEP jacket provides protection from most aqueous and chemically corrosive solutions. Add suffix “-CT” to model number.

## SPECIFICATIONS

### Wattage:

4, 8, 10 and 12 W/ft

### Power:

120V, 240V and 480V

### Bus Wires:

12 AWG copper

**Bus Wire Insulation:** Each bus wire is insulated with an 11 mil FEP jacket.

### Approximate Cable Size:

8 x 5 mm (5/16 x 1/8");  
CT only: 26 x 6 mm (1 1/2 x 1/4")

### Minimum Bend Radius:

6 times minor diameter

### Maximum Intermittent Exposure

Temperature/Power-Off: 200/392°C

**Steam Cleaning:** CWM can withstand 200°C (392°F), 150 psig steam purging of process piping when not energized

### Third-Party Approvals:

Visit us online

### Circuit Breaker Selection:

To determine the circuit breaker size required, divide the W/ft (at operating voltage) by the operating voltage; multiply the result times the total installed cable length in feet; multiply this result times 1.2 to get the minimum circuit breaker size



### Caution and Warning!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

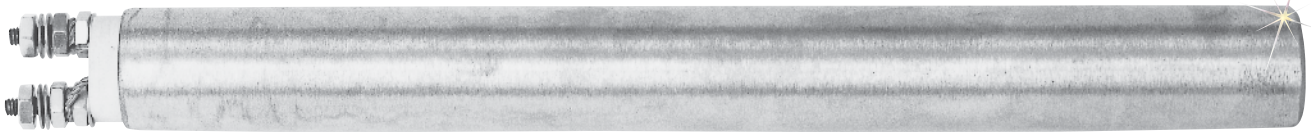
## To Order

Output		Tinned Copper Braid (-C)		FEP Overcoat (-CT) and Tinned Copper Overbraid		Module Length mm (in )	Max Circuit Length m (ft)
Watts/ Foot	Volts	Model Number	Weight kg (lb)/ 1000'	Model Number	Weight kg (lb)/ 1000'		
4	120	<b>CWM4-1C</b>	43.5 (96)	<b>CWM4-1CT</b>	49.9 (110)	457 (18)	106.6 (350)
4	240	<b>CWM4-2C</b>	43.5 (96)	<b>CWM4-2CT</b>	49.9 (110)	762 (30)	213.3 (700)
8	120	<b>CWM8-1C</b>	43.5 (96)	<b>CWM8-1CT</b>	49.9 (110)	457 (18)	74.6 (245)
8	240	<b>CWM8-2C</b>	43.5 (96)	<b>CWM8-2CT</b>	49.9 (110)	610 (24)	144.7 (475)
12	120	<b>CWM12-1C</b>	43.5 (96)	<b>CWM12-1CT</b>	49.9 (110)	305 (12)	60.9 (200)
12	240	<b>CWM12-2C</b>	43.5 (96)	<b>CWM12-2CT</b>	49.9 (110)	610 (24)	121.9 (400)
12	480	<b>CWM12-4C</b>	43.5 (96)	<b>CWM12-4CT</b>	49.9 (110)	762 (30)	243.8 (800)

Minimum length of heating cable is 25 ft. Visit us online for heat cable accessories and controls.

**Ordering Example:** CWM12-1C, 120 Vac heating cable, 12 W/ft, 100-ft length.

# HEAVY DUTY CARTRIDGE HEATERS



## C-HD Series

- ✓ Reliable, Premium Quality
- ✓ CSA Certified
- ✓ Lengths from 2½ to 25"
- ✓ 120 and 240 Vac Models

OMEGALUX® C Series heavy-duty cartridge heaters are especially suited for use in applications involving hot plates, molds, dies, platens and container heating.

### Specifications

**Sheath:** Brass

**Terminations:** 2 bolt terminals #8-32 thread, one end

**Working Temperature:** Up to 315°C (600°F) max

## 1" Diameter

To Order				
Sheath Length	Watts	W/In <sup>2</sup>	Model No.	Wt (lb)
3½"	300	35	C-703/*	0.31
4"	375	28	C-704/*	0.5
6"	600	33	C-705/*	0.63
7"	500	22	C-706/*	0.75
9"	700	26	C-707/*	0.75
10"	750	23	C-708/120	1
10"	750	23	C-708/240	1
12"	800	22	C-709/120	1.13
12"	800	22	C-709/240	1.13
18½"	1250	23	C-713/*	1.75
3"	165	21	C-702/*	0.31
21"	1300	21	C-714/240	2.1
23"	1425	20	C-715/240	2.2
25"	1375	18	C-716/240	2.25

\* C Series Cartridge heaters are available in 120 or 240 Vac. To order, add specified voltage as a suffix.

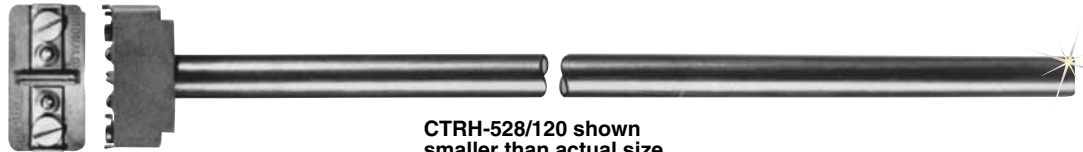
**Ordering Example:** C-702/240, 165 Watt heater, ¾" sheath powered by 240 Vac.

C-704/120 shown smaller than actual size.

## 1 19/64" Diameter

Sheath Length	Watts	W/In <sup>2</sup>	Model	Wt (lb)
3½"	350	33	C-803/*	0.5
4"	600	37	C-806/*	0.75
7"	1000	37	C-830/*	1.25
7"	1200	44	C-810/*	1.25
10½"	1000	26	C-812/*	1.75
4"	300	19	C-804/*	0.75
6¼"	500	23	C-807/*	1
7"	500	18	C-808/*	1.25
9"	650	20	C-811/*	1.5
11½"	750	17	C-813/*	2
14"	1250	22	C-815/*	2.25
16"	1300	21	C-816/*	2.75
17½"	1400	20	C-817/240	3
20¼"	1625	20	C-819/240	3.5
24½"	1780	18	C-822/240	3.75

## CTRH Series

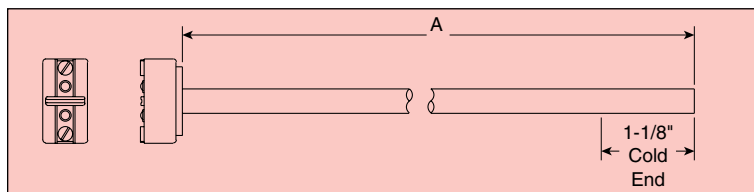


CTRH-528/120 shown smaller than actual size.

- ✓ 0.553 and 0.66" Diameter
- ✓ 1670 to 5130 Watts
- ✓ 120, 208, 240 and 480 Vac
- ✓ 50 and 55 W/in<sup>2</sup>
- ✓ 304 Stainless Steel Sheath

### APPLICATIONS

- ✓ Forming
- ✓ Stress Relieving Metal Parts
- ✓ Dies
- ✓ Platens



To Order					
Dia. (inch)	Sheath Length	Watts	W/In <sup>2</sup>	Model No.	Weight (lb)
0.553	20"	1670	55	CTRH-520/120	1.3
0.553	24	2475	55	CTRH-524/*	1.5
0.553	28	2440	55	CTRH-528/*	1.8
0.553	32	2820	55	CTRH-532/*	2
0.553	36	3200	55	CTRH-536†	2.3
0.553	40	3580	55	CTRH-540†	2.5
0.553	44	3970	55	CTRH-544†	2.8
0.553	48	4350	55	CTRH-548/#	3
0.553	52	4730	55	CTRH-552/#	3.3
0.66	20	1810	50	CTRH-620/120	1.6
0.66	24	2475	50	CTRH-624/*	1.8
0.66	28	2640	50	CTRH-628/*	2.1
0.66	32	3060	50	CTRH-632/*	2.4
0.66	36	3470	50	CTRH-636†	2.7
0.66	40	3880	50	CTRH-640†	3
0.66	44	4300	50	CTRH-644/#	3.3
0.66	48	4610	50	CTRH-648/#	3.6
0.66	52	5130	50	CTRH-652/#	3.9

\* CTRH Cartridge heaters are available in 120, 208 or 240 Vac.

† Heaters available in 208 or 240 Vac. # Heaters available in 208, 240 or 480 Vac. To order, add specified voltage as a suffix.

**Ordering Example:** CTRH-528/240, 2440 Watt heater, 28" sheath powered by 240 Vdc.

### CONSTRUCTION

Type CTRH is an extra high-quality cartridge heater. It is available in 0.553 and 0.663" diameter, sheath lengths up to 4½ feet. and 50 to 55 W/in<sup>2</sup> to heat materials up to 427°C (800°F).

# ONE-PIECE BAND HEATERS

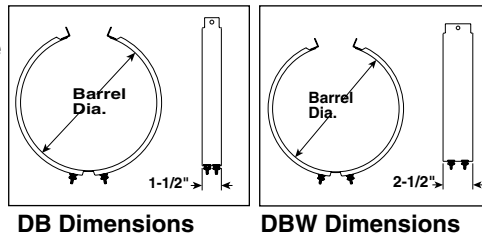
## 4 & 6 cm (1½ & 2½") Wide

### DB/DBW Series

- ✓ Rugged, Reliable, Heavy Duty
- ✓ 13 to 32 cm (5 to 12½") Barrel Diameter
- ✓ Barrel Temperatures Up to 482°C (900°F)

### APPLICATIONS

- ✓ Heating barrels of plastic injection molding machines and extruders
- ✓ Die and die holder heating of plastic extruders and blow molding machines
- ✓ Any application requiring heat applied to a cylindrical surface
- ✓ Burn-out ovens
- ✓ Heated kettles
- ✓ Fluidized beds
- ✓ Heat treating pipes
- ✓ Autoclaves



### FEATURES

**Ten times the life—only slightly higher cost.** This economical long life heavy duty band heater has a 3/8" thick chrome steel (stainless) sheath, which offers ten times the life of a mica band heater at only a slightly higher cost than mica, and considerably lower than ceramic band and aluminum shoe designs.

### Flexible one-piece construction for easy installation and removal.

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

**Heavy duty** – uses a pair of formed 240V OMEGALUX® PT series strip heaters.

**Spring loaded** – for tight fit with Inconel-x spring and nickel-plated clamping bolts and nuts—maintains tightness.

**Uniform high temperature capability.** Highly compacted refractory insulation assures efficient heat transfer, therefore lower resistance wire temperatures.

### SPECIFICATIONS

**Power:** 240/480V\*\*

**Wattage:** 750 to 3250 watts

**Sheath Material:** Chrome Steel

**Maximum Sheath Temperature:** 649°C (1200°F)

To Order				
Watts	W/In <sup>2</sup>	Barrel Dia. cm (in)	Model No.	Wt. kg (lb)
<b>DB- 4 cm (1½"), 240/480 volts**</b>				
770	33	13 (5)	DB-050772	0.7 (1.50)
1000	42	14 (5½)	DB-054102	0.8 (1.75)
750	27	15 (6)	DB-060752	0.9 (2.00)
1000	33	17 (6½)	DB-064102	0.9 (2.00)
1000	30	18 (7)	DB-070102	0.9 (2.00)
1250	35	19 (7½)	DB-074122	0.9 (2.00)
1200	32	20 (8)	DB-080122	0.9 (2.00)
1600	40	22 (8½)	DB-084162	1.1 (2.50)
1500	35	23 (9)	DB-090152	1.1 (2.50)
1700	38	24 (9½)	DB-094172	1.4 (3.00)
1800	38	25 (10)	DB-100182	1.4 (3.00)
1200	24	27 (10½)	DB-104122	1.4 (3.00)
2100	39	29 (11½)	DB-114212	1.4 (3.00)
1500	25	32 (12½)	DB-124152	1.4 (3.00)
<b>DB- 6 cm (2½"), 240/480 volts**</b>				
1525	30	17 (6½)	DBW-064152	1.7 (3.75)
1800	31	19 (7½)	DBW-074182	1.7 (3.75)
2000	35	20 (8)	DBW-080202	1.7 (3.75)
2250	34	22 (8½)	DBW-084222	1.7 (3.75)
2500	35	23 (9)	DBW-090252	1.7 (3.75)
2800	36	25 (10)	DBW-100282	1.7 (3.75)
2950	36	27 (10½)	DBW-104292	1.7 (3.75)
3250	36	29 (11½)	DBW-114322	1.8 (4.00)

\*\* The two 240V strip heating elements must be wired in series for 480V.

Note: Watt densities are based on heated area of contact surface only.





# High Temperature Dual Element Heating Tapes

## DHT Series

- ✔ Dual Element Heating Design Provides Greater Flexibility
- ✔ Connects Easily to Your Choice of Temperature Control—120 Vac Models Include Standard 2-Prong Plug
- ✔ Wide Range of Sizes

### APPLICATIONS

- ✔ Wrap Around and Heat a Wide Range of Laboratory Glassware and Apparatus Including: Graduated Cylinders, Flasks, Beakers, Distillers, and Tubing

The DHT Series is a highly flexible and durable multi-stranded dual heating element that provides even heat across the tape. It is reinforced with high temperature fiberglass for added strength and durability. High temperatures and rapid thermal response with a maximum exposure temperature of 760°C (1400°F).

### Specifications

**Power Density:** 13.1 watts/in<sup>2</sup> (0.020 watts/mm<sup>2</sup>) suitable for electrical conductive surfaces

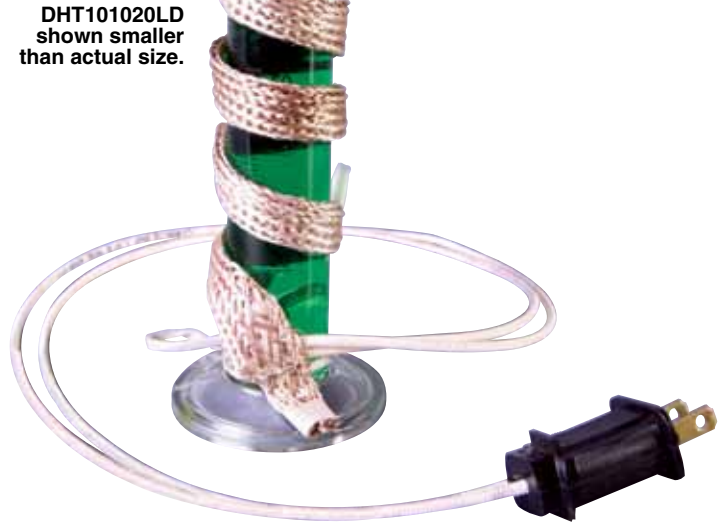
**Power Leads [610 mm (24")]:**

**120 Vac:** Standard 2-prong power plug (NEMA 1 to 15)

**240 Vac:** Bare wire connection

**Temperature Controller Required:**

Includes 230 mm (9") L high temperature tie downs for easy installation



**To Order Visit [omega.com/dht](http://omega.com/dht) for Pricing and Details**

Model No.	Size	Wattage	Volts
DHT051020LD	13 mm x 0.61 m (0.5" x 2')	156	120
DHT051040LD	13 mm x 1.22 m (0.5" x 4')	312	120
DHT051060LD	13 mm x 1.83 m (0.5" x 6')	468	120
DHT051080LD	13 mm x 2.44 m (0.5" x 8')	624	120
DHT051100LD	13 mm x 3.05 m (0.5" x 10')	780	120
DHT052020LD	13 mm x 0.61 m (0.5" x 2')	156	240
DHT052040LD	13 mm x 1.22 m (0.5" x 4')	312	240
DHT052060LD	13 mm x 1.83 m (0.5" x 6')	468	240
DHT052080LD	13 mm x 2.44 m (0.5" x 8')	624	240
DHT052100LD	13 mm x 3.05 m (0.5" x 10')	780	240
DHT052120LD	13 mm x 3.66 m (0.5" x 12')	943	240
DHT101020LD	25.4 mm x 0.61 m (1" x 2')	312	120
DHT101040LD	13 mm x 1.22 m (0.5" x 4')	624	120
DHT101060LD	25.4 mm x 1.83 m (1" x 6')	936	120
DHT101080LD	25.4 mm x 2.44 m (1" x 8')	1248	120
DHT102020LD	25.4 mm x 0.61 m (1" x 2')	312	240
DHT102040LD	25.4 mm x 1.22 m (1" x 4')	624	240
DHT102060LD	25.4 mm x 1.83 m (1" x 6')	936	240
DHT102080LD	25.4 mm x 2.44 m (1" x 8')	1248	240

Comes complete with operator's manual.

**Ordering Examples:** DHT051060LD, high temperature dual element heating tape, 13 mm x 1.83 m (0.5" x 6'), 120V.

DHT101020LD, high temperature dual element heating tape, 25.4 mm x 0.61 m (1" x 2'), 120V.



## Ceramic Insulated Finned Channel Strip Enclosure Heaters

### EHF Series

- 10-32 offset screw terminals (T4 style) standard, other terminations available
- UL recognized component
- Stainless steel sheath and fins
- Easy installation with special enclosure mounting brackets
- Rugged, Durable Construction
- Stainless Steel Sheath
- Nickel-Plated Steel Fins (Stainless Steel Optional)
- Various Terminations
- Trouble-Free Installation
- Various Sizes in Stock

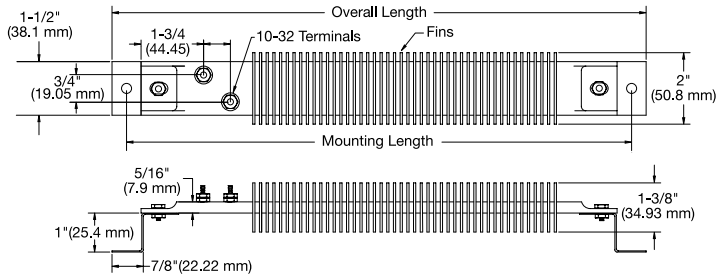


### Typical Applications

- Duct Heating
- Space Heaters
- Drying Ovens
- Food Warmers
- Dehumidifier
- Shrinking Tunnels
- Air Heating
- Heat Curing

OMEGA® finned strip heaters are extremely efficient and dependable as a heat source for hundreds of industrial and commercial applications. They are used for both forced (mounted in a duct) and natural convection air heating (mounted at the bottom of cabinet type ovens).

The finned strip heater's basic design consists of a helically wound resistance coil placed in a specially designed ceramic insulator. The resistance coil is mechanically connected to the screw terminal for positive connection. Stainless steel rectangular tubing is used to house the heater assembly. All remaining voids are filled with high purity magnesium oxide to increase thermal conductivity and dielectric strength.



Nickel-plated steel fins (stainless steel optional) are mounted to the rectangular tubing. The fins have been specially designed to provide maximum surface contact for good heat dissipation into the finned cross sections, thus resulting in rapid heat transfer to the air.

OMEGA finned strip heaters are manufactured in a full line of standard sizes, electrical ratings and terminations, or can be made to your specifications.

## Specifications and Tolerances

If tighter tolerances are required consult OMEGA.

### Performance Ratings

**Maximum Sheath Temperature:** 650°C (1200°F)

**Maximum Watt Density:**

Still Air	Max Watt/cm <sup>2</sup>	Max Watt/in <sup>2</sup>
Up to 149°C (300°F)	3.1	20
149 to 316°C (300 to 600°F)	2.5	16
316 to 427°C (600 to 800°F)	1.6	10
Moving Air	Max Watt/cm <sup>2</sup>	Max Watt/in <sup>2</sup>
At 3 m/sec, up to 93°C (600'/minute, up to 200°F)	6.2	40
At 3 m/sec, up to 204°C (600'/minute, up to 400°F)	4.7	30
At 3 m/sec, up to 316°C (600'/minute, up to 600°F)	3.1	20

### Electrical Specifications

**Maximum Voltage:** 480 Vac (when applicable)

**Maximum Amperage:** 25 A

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### Material Specifications and Physical Sizes

**Sheath:** 304 stainless steel

**Fins:** Nickel plated steel (stainless steel optional)

**Screw Terminals:** Stainless steel 10-32 UNF threads

**Width Including Fins:** 51 mm (2")

**Height Including Fins:** 35 mm (1 3/8")

**Length Tolerance:** Up to 0.61 m (24") ±1/16", over 0.61 m (24") ±1/8"

**Mounting Slot Size:** Standard 8 x 13 mm (5/16 x 1/2")

**Slot Size For Secondary Insulating Bushing:** 13 x 16 mm (1/2 x 5/8") for 300V and above





## Secondary Insulating Bushings

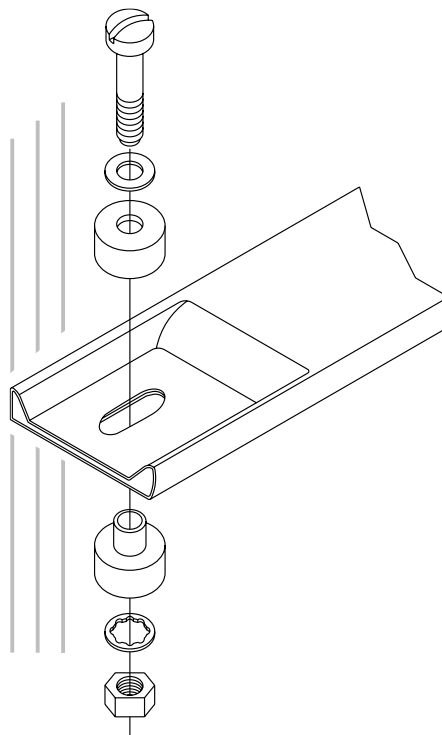
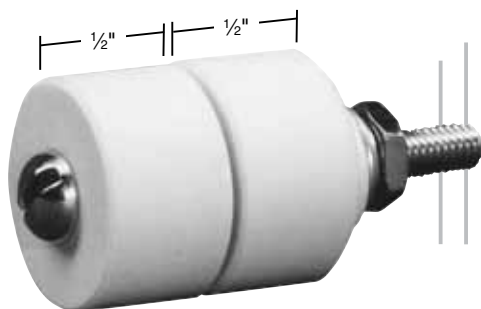
Secondary insulating ceramic bushings increase the effective space between the heater and grounded surface for electrical clearance at high voltages. They must be used on the mounting tabs when the finned heater is connected in series or in direct line voltage above 300V.

When insulating bushings are required, a 13 x 16 (1/2" x 5/8") slot is substituted for the standard slot size 8 x 13 mm (5/16" x 1/2").

### Insulating Bushing Assembly

**Model Number: CERR-1001**

*Note: Two assemblies are required for each heater.*



**CAUTION:** When using secondary insulating bushings, the heater must be guarded to avoid any accidental contact. The guard must be electrically isolated from the heater and must be properly grounded.

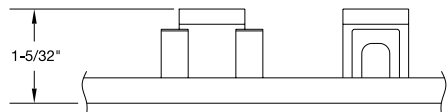
## Ceramic Covers for Insulating Screw Terminals

### Igloo™ Ceramic Covers

Igloo ceramic terminal covers consist of two individual ceramic parts. With a tight-fitting cap and a solid base, an Igloo cover will fully insulate any standard 10-32 terminal lug used for electrical wiring hookups.

Igloo covers can be assembled on all channel strip and finned strip heaters with Type T1 and Type T4 screw terminals. Mica strip heaters with screw terminals that have a minimum center to center distance of 22 mm (7/8") can also be assembled with Igloo covers.

Three different types of Igloo bases are available for your wiring convenience. Double port in-line, double port 90° and single port.



**Type C6**  
Double Port In-Line  
Model Number:  
CER-101-104



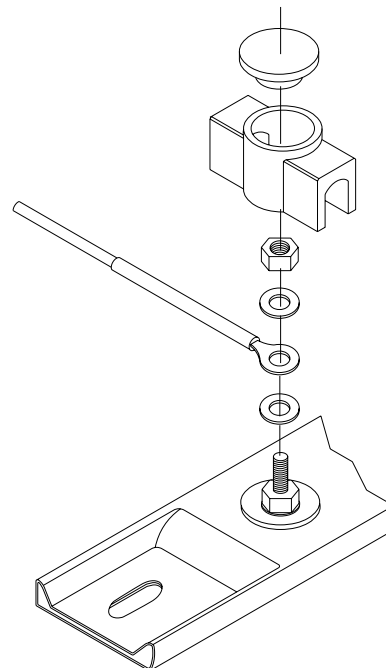
**Type C7**  
Double Port 90°  
Model Number:  
CER-101-106



**Type C8**  
Single Port  
Model Number:  
CER-101-107



**Ceramic Cap**  
Thread 10-32  
Model Number:  
CER-102-101





## Finned Strip Heaters—T3 Termination



To Order Visit <a href="http://omega.com/ehf">omega.com/ehf</a> for Pricing and Details				
Model No.		Overall Length	Mounting Dimension	Watts
120V	240V			
EHF00001	EHF00002	12.125	11.375	200
EHF00003	EHF00004	15.625	14.875	350
EHF00005	EHF00006	19.5	18.75	450
EHF00007	EHF00008	25.375	24.625	700

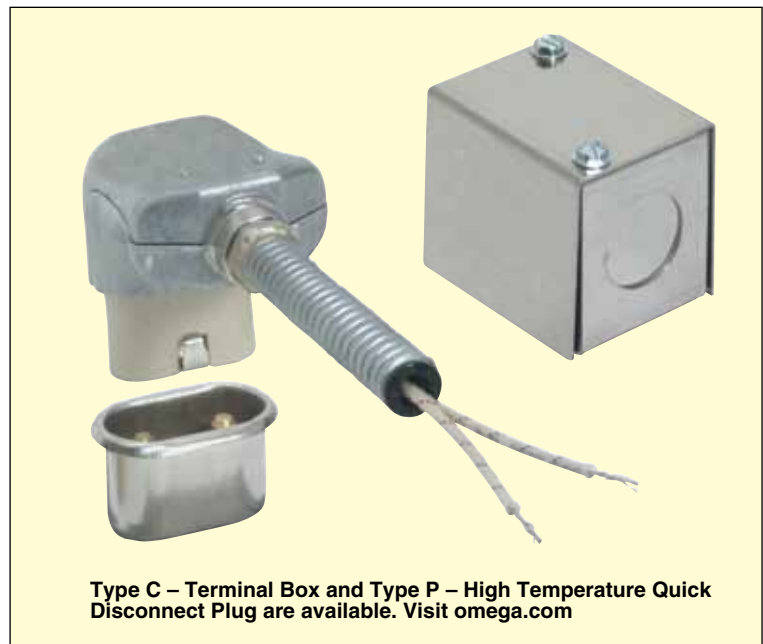
Ordering Example: EHF00001, 200 watt, 120 Vac, finned strip enclosure heater.

### Custom Engineered/Manufactured Heaters

An electric heater can be very application specific; for sizes and ratings not listed, OMEGA will design and manufacture a finned strip heater to meet your requirements.

#### Please Specify the Following:

- Type of Application
- Termination Type
- Length
- Secondary Bushings (see page 2)
- Wattage
- Igloo™ Ceramic Terminal Covers
- Voltage

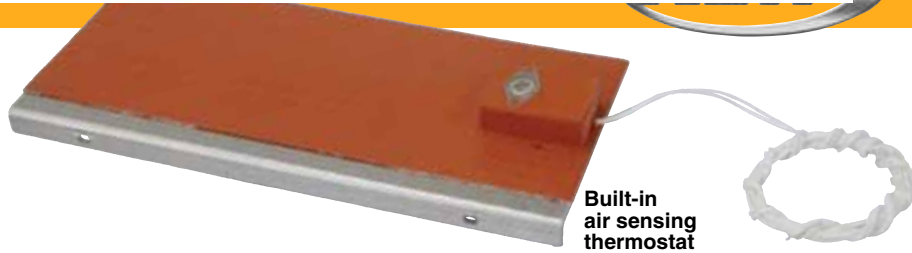


Type C – Terminal Box and Type P – High Temperature Quick Disconnect Plug are available. Visit [omega.com](http://omega.com)



## Silicone Rubber Enclosure Heaters

### EHR Series



Built-in air sensing thermostat

#### Design Features

- Available with or without an Integrated Thermostat (See EHA below for Remote Thermostats)
- Custom Design and Alternate Thermostat Settings Available
- Heater Vulcanized to an Aluminum Mounting Plate for Easy Installation
- 120V Standard; Custom Voltages Available upon Request
- 1.2 m (48") PTFE Leads Standard
- Safe to Operate, No Exposed Electrical Connections
- 13 mm (½") Mounting Flange

EHR Series silicone rubber heaters are designed for easy installation and safe operation. These rectangular shaped wire-wound silicone rubber heaters are vulcanized to an aluminum mounting plate with mounting holes. They provide superior protection for enclosures of all types against condensation, humidity and freezing.

It is recommended that the enclosure heater be used with a thermostat either built in or mounted remotely to limit the maximum temperature reached and conserve energy. The suggested mounting method is at the bottom of the enclosure, mounted vertically. If a remote mounted thermostat is preferred, mount the heater on the bottom of the enclosure and the thermostat in the middle of the enclosure.

#### Determining the Minimum Wattage for Your Application

1. Determine the lowest temperature to which the enclosure is expected to be exposed
2. Determine the operating temperature to which you want the enclosure heated
3. Subtract the ambient temperature from the enclosure temperature to get the temperature change required
4. Calculate the surface area of the enclosure; For a rectangular enclosure use the formula: 2 [(Length x Width) + (Length x Height) + (Width x Height)]
5. Select the correct table below depending upon whether your box is insulated or non-insulated; Read from the table the wattage required depending upon your calculated temperature change and surface area
6. Add an additional 50% of the determined wattage if the enclosure is to be located in windy conditions

#### Selecting the Right Heater for Your Application

1. Determine the wattage of heater(s) that you need. See the instructions on this page to determine your wattage requirements.
2. Determine the type of heater that you need. Depending upon conditions, one heater type might be better than others. Items to take into consideration are space constraints inside the enclosure and wattages required.
3. Determine the number of heaters you need. You can combine multiple heaters to achieve your wattage requirements.
4. Determine how you will control the heaters. Will you use built-in thermostats to monitor the temperature? Or will you use a single temperature control to monitor and control the heaters? OMEGA manufactures a wide range of temperature control devices.

#### Insulated Enclosure Wattage Selection Table

Δ Temperature °C (°F)	Total Surface Area m <sup>2</sup> (ft <sup>2</sup> )													
	0.19 (2)	0.28 (3)	0.37 (4)	0.47 (5)	0.56 (6)	0.70 (7.5)	0.84 (9)	0.93 (10)	1.40 (15)	1.86 (20)	2.33 (25)	2.79 (30)	3.72 (40)	4.65 (50)
11 (20)	10	10	15	20	20	25	30	35	50	65	80	100	130	160
22 (40)	15	20	30	35	40	50	60	65	100	130	160	195	260	320
33 (60)	20	30	45	50	60	75	90	100	145	195	240	290	385	480
44 (80)	30	40	55	65	80	100	115	130	195	260	320	320	515	640
56 (100)	35	50	65	80	100	125	145	160	240	320	400	400	640	800
67 (120)	40	60	80	100	115	150	175	195	290	385	480	480	770	960
78 (140)	45	70	90	115	135	175	205	225	340	450	560	560	900	1120

#### Uninsulated Enclosure Wattage Selection Table

Δ Temperature °C (°F)	Total Surface Area m <sup>2</sup> (ft <sup>2</sup> )													
	0.19 (2)	0.28 (3)	0.37 (4)	0.47 (5)	0.56 (6)	0.70 (7.5)	0.84 (9)	0.93 (10)	1.40 (15)	1.86 (20)	2.33 (25)	2.79 (30)	3.72 (40)	4.65 (50)
11 (20)	30	40	55	70	80	100	120	135	205	270	335	405	540	670
22 (40)	55	80	110	135	160	200	245	270	405	540	670	805	1075	1340
33 (60)	90	120	160	205	245	300	365	405	605	805	1005	1210	1610	2010
44 (80)	110	160	215	270	325	400	485	540	805	1075	1340	1610	2145	2680
56 (100)	135	200	270	335	405	500	605	670	1005	1340	1675	2010	2680	3350
67 (120)	165	240	320	405	485	600	725	805	1210	1610	2010	2415	3220	4020
78 (140)	190	280	375	470	565	700	845	940	1410	1880	2345	2815	3775	4690



## Silicone Rubber Enclosure Heaters (Continued)

To Order Visit [omega.com/ehr\\_eha\\_series](http://omega.com/ehr_eha_series) for Pricing and Details

Model No.	Width mm (inch)	Length mm (inch)	Mounting Center	Watts	Volts	Lead Length m (inch)	Thermostat °C (°F)	
							Opens	Closes
EHR00001	64 (2½)	127 (5)	3	25	120	1.2 (48)	—	—
EHR00002	64 (2½)	127 (5)	3	25	120	1.2 (48)	16 (60)	4 (40)
EHR00003	64 (2½)	127 (5)	3	35	120	1.2 (48)	—	—
EHR00037	64 (2½)	127 (5)	3	50	12	1.2 (48)	16 (60)	4 (40)
EHR00039	64 (2½)	127 (5)	3	50	24	1.2 (48)	—	—
EHR00004	64 (2½)	127 (5)	3	50	120	1.2 (48)	—	—
EHR00005	64 (2½)	127 (5)	3	50	120	1.2 (48)	16 (60)	4 (40)
EHR00048	64 (2½)	152 (6)	4	60	24	1.2 (48)	60 (140)	43 (110)
EHR00006	64 (2½)	152 (6)	4	60	120	1.2 (48)	—	—
EHR00007	64 (2½)	152 (6)	4	60	120	1.2 (48)	16 (60)	4 (40)
EHR00008	64 (2½)	152 (6)	4	60	120	1.2 (48)	60 (140)	43 (110)
EHR00009	64 (2½)	152 (6)	4	60	120	1.2 (48)	82 (180)	66 (150)
EHR00010	64 (2½)	254 (10)	7	70	120	1.2 (48)	—	—
EHR00047	64 (2½)	254 (10)	7	100	12	1.2 (48)	16 (60)	4 (40)
EHR00049	64 (2½)	254 (10)	7	100	12	1.2 (48)	—	—
EHR00035	64 (2½)	254 (10)	7	100	24	1.2 (48)	16 (60)	4 (40)
EHR00011	64 (2½)	254 (10)	7	100	120	1.2 (48)	—	—
EHR00012	64 (2½)	254 (10)	7	100	120	1.2 (48)	16 (60)	4 (40)
EHR00028	64 (2½)	254 (10)	7	100	230	1.2 (48)	16 (60)	4 (40)
EHR00032	64 (2½)	305 (12)	9	80	240	1.2 (48)	16 (60)	4 (40)
EHR00013	64 (2½)	305 (12)	9	120	120	1.2 (48)	—	—
EHR00014	64 (2½)	305 (12)	9	120	120	1.2 (48)	16 (60)	4 (40)
EHR00015	64 (2½)	305 (12)	9	120	120	1.2 (48)	60 (140)	43 (110)
EHR00016	64 (2½)	305 (12)	9	120	120	1.2 (48)	82 (180)	66 (150)
EHR00034	64 (2½)	305 (12)	9	120	240	1.2 (48)	16 (60)	4 (40)
EHR00017	114 (4½)	254 (10)	7	140	120	1.2 (48)	—	—
EHR00018	114 (4½)	254 (10)	7	250	120	1.2 (48)	—	—
EHR00019	114 (4½)	254 (10)	7	250	120	1.2 (48)	16 (60)	4 (40)
EHR00044	114 (4½)	254 (10)	7	250	240	1.2 (48)	60 (140)	43 (110)

Note: Dimensions listed are for heater and bracket; actual heater width is 12.7 mm (½") less.

Note: Mounting slot size is 6 x 4 mm (¼ x 5/32").

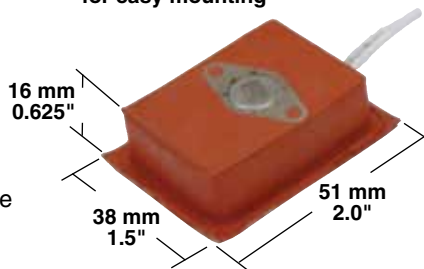
## Remote Thermostats for Enclosure Heaters

### EHA Series

#### Design Features

- Standard PTFE Lead Length: 1.2 m (48")
- Can Easily be Located Anywhere in the Enclosure Using the Pressure Sensitive Adhesive
- Any Standard Thermostat can be Used
- Silicone Rubber Base and Enclosure
- Ratings: 10A/250 Vac, 15A/120 Vac

Pressure Sensitive Adhesive for easy mounting



EHA00005 D-ring and strap mounting thermostat. Can be applied to sense the air around an object or an object directly.



#### Ordering Information

Select a remote thermostat from the list to the right  
Custom engineered/manufactured heaters available consult OMEGA.

Please specify the following:

- Range: Select from the list of thermostats at [omega.com](http://omega.com)
- Lead Length: Specify any special lead length you require

To Order Visit [omega.com/ehr\\_eha\\_series](http://omega.com/ehr_eha_series) for Pricing and Details

Model Number		Opens °F	Closes °F
PSA	D-ring and Strap		
EHA00001	EHA00005	60±5	40±7
EHA00002	—	140±5	110±10
EHA00003	—	180±5	150±10

# SCREW PLUG IMMERSION HEATERS

## EMH Series

EMH-061-120V shown smaller than actual size.



- ✓ 1/2, 3/4, and 1 1/4 NPT Screw Plugs
- ✓ 316 SS Sheath
- ✓ 400 to 1000 W
- ✓ 120 and 240V, 1-Phase
- ✓ Single Thread Pipe Construction

### SPECIFICATIONS

**Power:** 120 and 240V, 1-phase

**Watt Density:**

5/8" Diameter: 37 W/in<sup>2</sup>

3/4" Diameter: 38 W/in<sup>2</sup>

1 1/4" Diameter: 24 W/in<sup>2</sup>

**Termination:**

5/8, 3/4" Diameter: 12" fiberglass leads rated to 250°C (482°F), epoxy potting rated to 130°C (266°F)

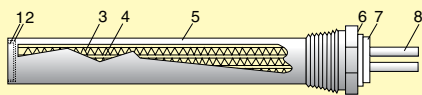
1 1/4" Diameter: 8-32 screw and nut terminals

**Sheath:** 316 SS

**Screw Plug and Threads:** 316 SS

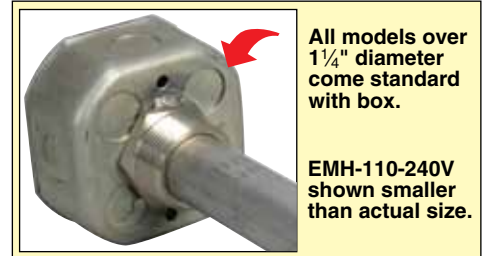
### TOLERANCES

Wattage tolerances are held to 5 to 10% at rated voltage. Length tolerances are ±2% with a ±1/16" minimum



### CONSTRUCTION

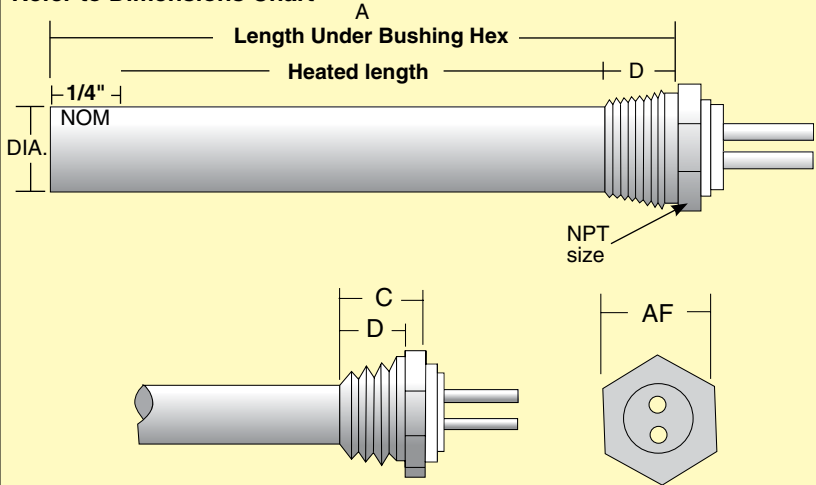
1. Welded end
2. Mica
3. Magnesium oxide packing
4. Element wire situated close to outside surface for maximum heat transfer and minimum internal temperature while preserving good dielectric qualities
5. Series 316 SS sheath
6. Mounting bushing
7. Ceramic cap
8. Flexible, stranded, nickel-alloy insulated leads or rust-resistant post terminals



All models over 1 1/4" diameter come standard with box.

EMH-110-240V shown smaller than actual size.

### Refer to Dimensions Chart



### To Order

Model No.	Description	Watts*	Dimensions (inch)			
			A	C	D	AF
EMH-060-120V	5/8" diameter, 1/2 NPT	400	6	3/4	9/16	7/8
EMH-060-240V	5/8" diameter, 1/2 NPT	400	6	3/4	9/16	7/8
EMH-061-120V	3/4" diameter, 3/4 NPT	500	6	7/8	5/8	1 1/8
EMH-061-240V	3/4" diameter, 3/4 NPT	500	6	7/8	5/8	1 1/8
EMH-110-120V	1 1/4" diameter, 1 1/4 NPT	1000	11	1 1/32	23/32	1 3/4
EMH-110-240V	1 1/4" diameter, 1 1/4 NPT	1000	11	1 1/32	23/32	1 3/4

\* Wattages are based on a unit operating immersed in water. Comes complete with operator's manual.

Ordering Examples: EMH-060-120V, 5/8" dia, 1/2 NPT. EMH-110-120V, 1 1/4" dia, 1 1/4 NPT screw plug immersion heater.

# SCREW PLUG IMMERSION HEATERS CLEAN WATER APPLICATIONS

EMT-3  
Starts at  
**\$191**



- 2 NPT Brass Screw Plug
- Copper Sheath Elements
- High Watt Density (61 to 67 W/in<sup>2</sup>)
- 3 to 12 kW
- Without Thermostat
- 240 and 480V, 3-Phase
- General Purpose or Moisture-Resistant/Explosion-Resistant Terminal Enclosure

The OMEGALUX® EMT-3 Series has a copper sheath and is ideal for clean liquids within the 6 to 8 pH range.

**Please Note:** This immersion heater should be used with an approved temperature control device to ensure safe operation. See Section P for our selection of process controllers.

## SPECIFICATIONS

**Wattage:** 3 to 12 kW  
**Power:** 240 and 480 V, 3-phase  
**Sheath:** 20 cm (2") diameter copper  
**Screw Plug:** 2 NPT brass  
**Watt Density:** 61 to 67 W/in<sup>2</sup>  
**Enclosure:**

General purpose NEMA 1 or optional type E2 moisture-resistant/explosion-resistant enclosure.

**Third-Party Approvals Enclosure:** UL listed with general purpose enclosure.

### CAUTION AND WARNING!

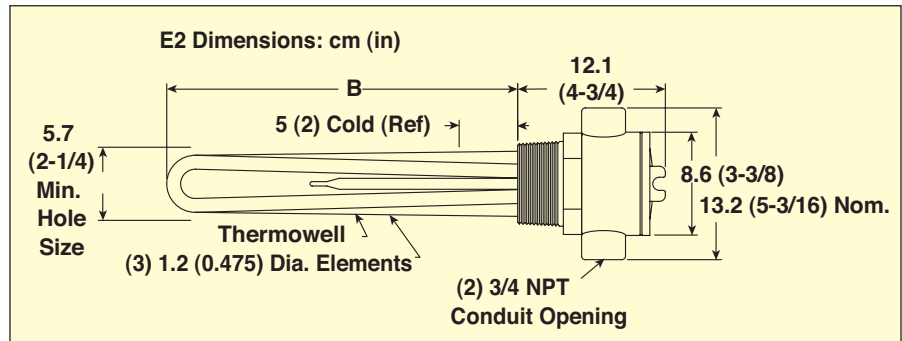
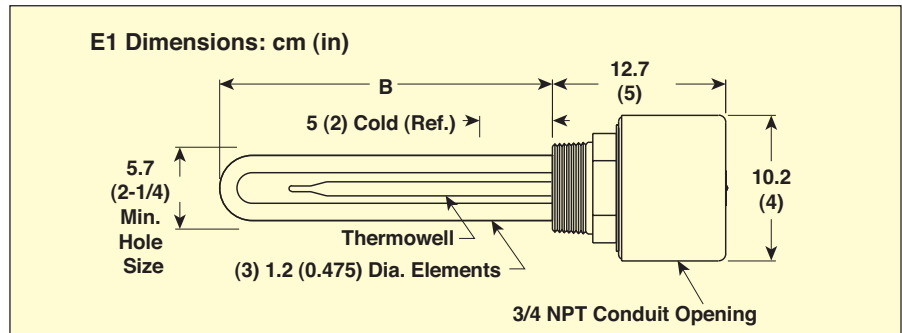
Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.



EMT-303/240, \$191, shown smaller than actual size.



EMT-303E2/240, \$450, shown smaller than actual size.



**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Phase	W/in <sup>2</sup>	No. Elem.	Dim B (in)	E1 General Purpose <sup>1</sup>			E2 Moisture-Resistant/Explosion-Resistant <sup>2</sup>		
					Model No.	Price	Wt. (lb)	Model No.	Price	Wt. (lb)
3	3	67	3	7	EMT-303/*	\$191	5	EMT-303E2/*	\$450	8
6	3	67	3	12	EMT-306/*	305	6	EMT-306E2/*	575	9
9	3	65	3	17½	EMT-309/*	430	7	EMT-309E2/*	700	10
12	3	61	3	24	EMT-312/*	575	8	EMT-312E2/*	850	11

\* Designate voltage: insert "240" for 240 Vac or "480" for 480 Vac.

<sup>1</sup> Heaters with general purpose and moisture-resistant enclosures are UL Listed and CSA certified.

<sup>2</sup> Heaters with explosion-resistant enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.

**Ordering Examples:** EMT-306/480, 480V, 6 kW, 3-phase general purpose heater, \$305.

EMT-312/240, 240V, 9 kW, 3-phase general purpose heater, \$575.



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• **Flow and Level**

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

• **pH and Conductivity**

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

• **Data Acquisition**

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

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Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

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# SCREW PLUG IMMERSION HEATERS SOLUTION WATER APPLICATIONS

EMTI-3 Series  
Starts at

**\$650**



- ✓ 2 NPT Stainless Steel Screw Plug
- ✓ Incoloy Sheath Elements
- ✓ High Watt Density (45 W/in<sup>2</sup>)
- ✓ 3 to 18 kW
- ✓ Without Thermostat
- ✓ 240 and 480V, 3 Phase
- ✓ General Purpose or Moisture-Resistant/  
Explosion-Resistant Terminal Enclosure

## SPECIFICATIONS

**Wattage:** 3 to 18 kW

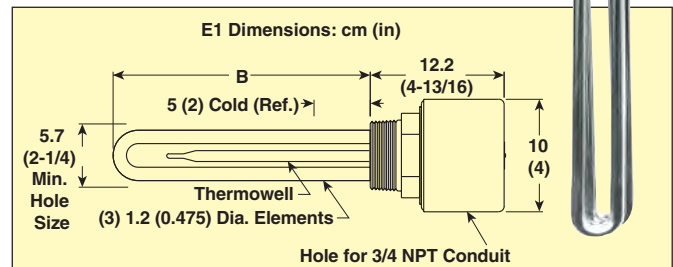
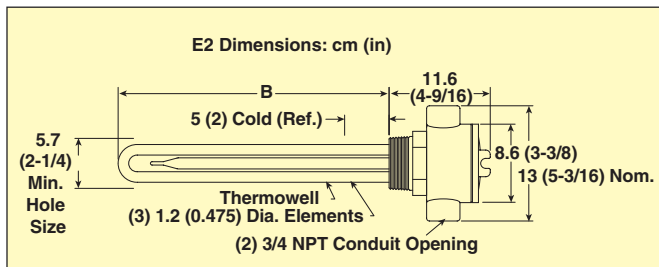
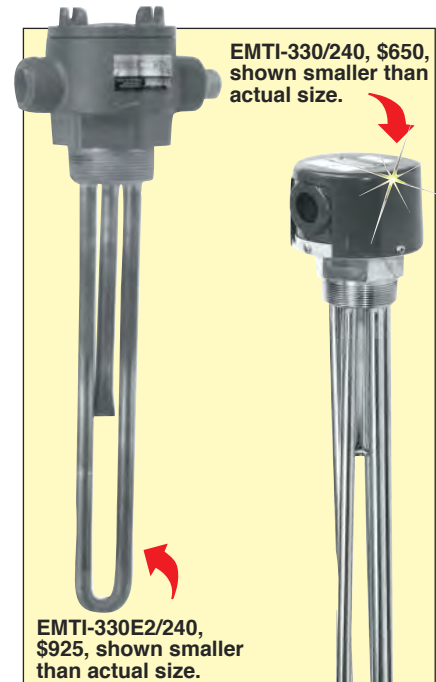
**Power:** 240 to 480V, 3 phase

**Watt Density:** 45 W/in<sup>2</sup>

**Screw Plug:** 2 NPT stainless steel

**Enclosures:** E1 general purpose, NEMA 1 (IP00) rated, or type E2 moisture-resistant/explosion-resistant enclosure.<sup>2</sup>

*Note: This immersion heater should be used with an approved temperature control device to assure safe operation.*



**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Volts	W/in <sup>2</sup>	No. Htg. Elem.	E1 General Purpose Enclosure				E2 Moisture Resis/Explosion Resis. <sup>2</sup>		
				Dim. B cm (in)	Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)
3	240	45	3	19.7 (7 <sup>3</sup> / <sub>4</sub> )	EMTI-330/*	\$650	2.3 (5)	EMTI-330E2/*	\$925	3.6 (8)
3	480	45	3	19.7 (7 <sup>3</sup> / <sub>4</sub> )	EMTI-330/*	650	2.3 (5)	EMTI-330E2/*	925	3.6 (8)
6	240	45	3	45 (17 <sup>3</sup> / <sub>4</sub> )	EMTI-360/*	825	2.7 (6)	EMTI-360E2/*	1100	4.0 (9)
6	480	45	3	45 (17 <sup>3</sup> / <sub>4</sub> )	EMTI-360/*	825	2.7 (6)	EMTI-360E2/*	1100	4.0 (9)
9	240	45	3	63 (24 <sup>7</sup> / <sub>8</sub> )	EMTI-390/*	1000	3.2 (7)	EMTI-390E2/*	1250	4.5 (10)
9	480	45	3	63 (24 <sup>7</sup> / <sub>8</sub> )	EMTI-390/*	1000	3.2 (7)	EMTI-390E2/*	1250	4.5 (10)
12	240	45	3	82 (32 <sup>1</sup> / <sub>8</sub> )	EMTI-3120/*	1150	4.0 (9)	EMTI-3120E2/*	1400	5.4 (12)
12	480	45	3	82 (32 <sup>1</sup> / <sub>8</sub> )	EMTI-3120/*	1150	4.0 (9)	EMTI-3120E2/*	1400	5.4 (12)
15	240	45	3	103 (40 <sup>3</sup> / <sub>8</sub> )	EMTI-3150/*	1350	4.5 (10)	EMTI-3150E2/*	1600	6.0 (13)
15	480	45	3	103 (40 <sup>3</sup> / <sub>8</sub> )	EMTI-3150/*	1350	4.5 (10)	EMTI-3150E2/*	1600	6.0 (13)
18	240	45	3	122 (47 <sup>7</sup> / <sub>8</sub> )	EMTI-3180/*	1500	5.4 (12)	EMTI-3180E2/*	1750	6.8 (15)
18	480	45	3	122 (47 <sup>7</sup> / <sub>8</sub> )	EMTI-3180/*	1500	5.4 (12)	EMTI-3180E2/*	1750	6.8 (15)

\* Designate voltage, i.e., "240" for 240 Vac or "480" for 480 Vac.

<sup>1</sup> Heaters with general purpose enclosures are UL listed and CSA certified.

<sup>2</sup> Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.

Ordering Example: EMTI-330/480, 3 kW heater powered by 480 Vac, \$650.





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# SCREW PLUG IMMERSION HEATERS MEDIUM WEIGHT OIL APPLICATIONS

EMTO-3 Series  
Starts at

**\$525**



- ✓ 2 NPT Stainless Steel Screw Plug
- ✓ Steel Sheath Elements
- ✓ Watt Density: 15 W/in<sup>2</sup>
- ✓ 3 to 9 kW
- ✓ Without Thermostat
- ✓ 240 and 480V, 3 Phase
- ✓ General Purpose or Moisture-Resistant/Explosion-Resistant Terminal Enclosure

*Note: This immersion heater should be used with an approved temperature control device to ensure safe operation. See Section P for our selection of process controllers.*

## SPECIFICATIONS

**Wattage:** 3 to 9 kW

**Power:** 240 to 480V, 3-phase

**Watt Density:** 15 W/in<sup>2</sup>

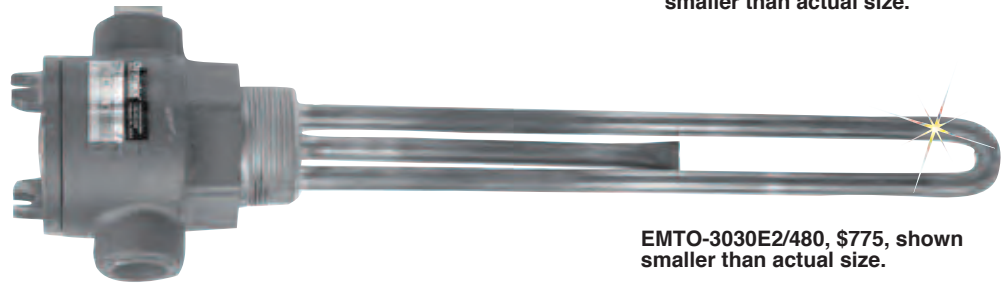
**Screw Plug:**

2 NPT stainless steel

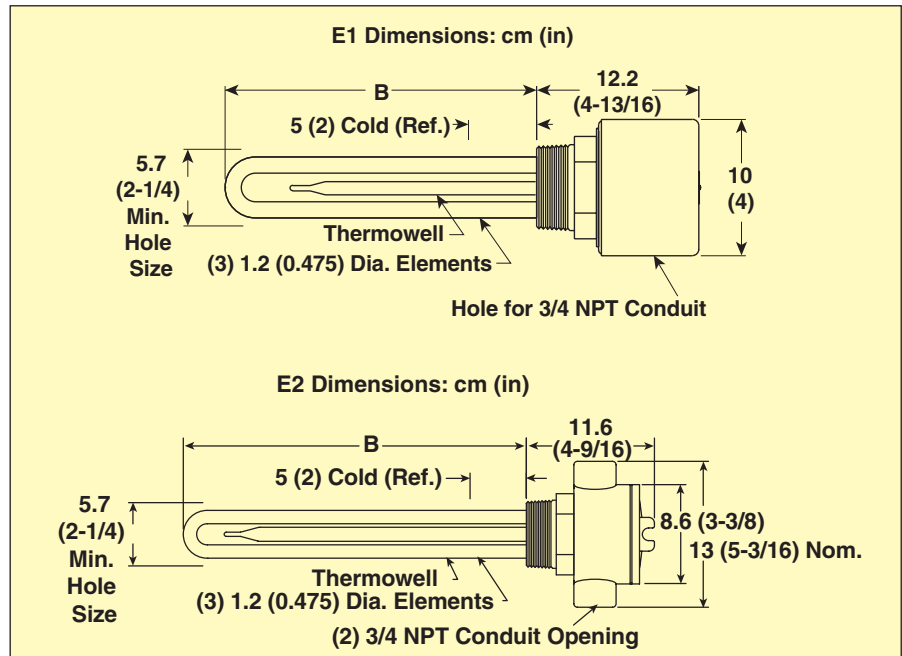
**Enclosures:** E1 general purpose<sup>1</sup>, NEMA 1 (IP00) rated, or type E2 moisture-resistant/explosion-resistant enclosure.<sup>2</sup>



EMTO-3030/480, \$525, shown smaller than actual size.



EMTO-3030E2/480, \$775, shown smaller than actual size.



**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	W/in <sup>2</sup>	No. Htg. Elem.	E1 General Purpose Enclosure <sup>1</sup>				E2 Moisture/Explosion-Resis. Encl. <sup>2</sup>			
			Dim. B cm (in)	Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)	
3	15	3	63 (24 <sup>7</sup> / <sub>8</sub> )	EMTO-3030/*	\$525	3.2 (7)	EMTO-3030E2/*	\$775	4.5 (10)	
4	15	3	82 (32 <sup>7</sup> / <sub>8</sub> )	EMTO-3040/*	675	4.0 (9)	EMTO-3040E2/*	950	5.4 (12)	
5	15	3	103 (40 <sup>3</sup> / <sub>8</sub> )	EMTO-3050/*	850	4.5 (10)	EMTO-3050E2/*	1100	6.0 (13)	
6	15	3	122 (47 <sup>7</sup> / <sub>8</sub> )	EMTO-3060/*	1000	5.4 (12)	EMTO-3060E2/*	1250	6.8 (15)	
9	15	3	172 (67 <sup>3</sup> / <sub>4</sub> )	EMTO-3090/*	1500	6.4 (14)	EMTO-3090E2/*	1750	7.7 (17)	

\* Designate voltage: insert "240" for 240 Vac or "480" for 480 Vac.

<sup>1</sup> Heaters with general purpose enclosures are UL listed and CSA certified.

<sup>2</sup> Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.

**Ordering Examples:** EMTO-3030/480, 3 kW heater powered by 480 Vac, \$525.

EMTO-3060/240, 6 kW immersion heater, \$1000.



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# PROCESS WATER IMMERSION HEATER, 3-ELEMENT DESIGN—2 NPT FITTING

## EMTS-3 Series



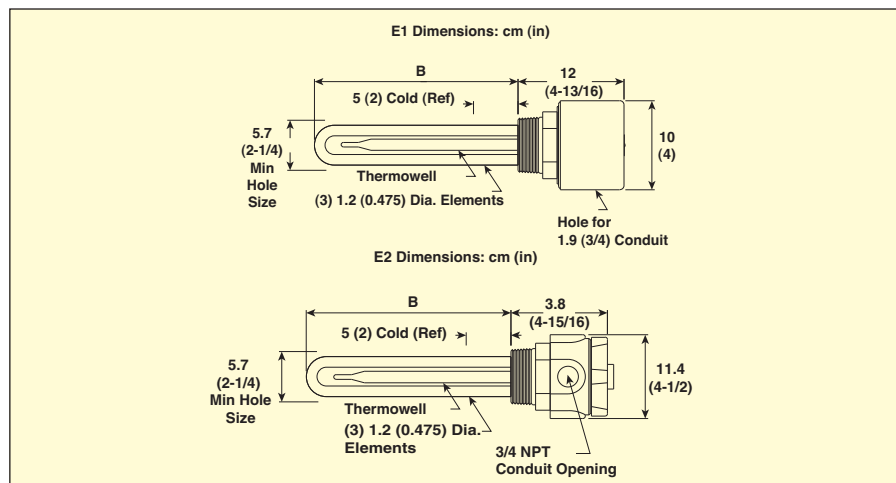
EMTS-330/480V/3P, \$575, shown smaller than actual size.



EMTS-360E2/480V/3P, \$1050, shown smaller than actual size.

- ✓ Compact 0.475" (1.2 cm) Diameter Electropolished Stainless Steel Sheath; 3-Element Design
- ✓ General Purpose; NEMA 1 (IP00) Rated Enclosure or Explosion-Resistant Enclosure Available
- ✓ 2 NPT Electropolished Stainless Steel Screw Plug
- ✓ 3 to 18 kW
- ✓ Rugged, Reliable, Premium OMEGALUX® Quality

The OMEGALUX® EMTS-3 Series includes 3 heating elements all within the compact 2 NPT fitting. The electropolished stainless steel sheath design is well suited for mild corrosive solutions commonly found in industrial applications.



### SPECIFICATIONS

**Wattage:** 3 to 18 kW  
**Power:** 208, 240, 480 Vac, 1 or 3 phase  
**Sheath:** 1.2 cm (0.475") diameter passivated stainless steel

**Screw Plug:** NPT electropolished stainless steel  
**Enclosures:** General purpose, NEMA 1 rated, or E2 moisture-resistant/explosion-resistant enclosure

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

kW	W/in <sup>2</sup>	Dim.B. cm (in)	Wt kg (lb)	E1 General Purpose Enclosure <sup>1</sup>	E2 Moisture Res/Exp. Resis Enc <sup>2</sup>
				Model No.	Model No.
3	47	20 (7¾)	2 (5)	EMTS-330*/**	EMTS-330E2*/**
4.5	44	30 (11¾)	3 (6)	EMTS-345*/**	EMTS-345E2*/**
6	38	45 (17¾)	3 (6)	EMTS-360*/**	EMTS-360E2*/**
7.5	43	50 (19½)	3 (6)	EMTS-375*/**	EMTS-375E2*/**
9	40	63 (24⅞)	3 (7)	EMTS-390*/**	EMTS-390E2*/**
12	40	82 (32⅞)	4 (9)	EMTS-3120*/**	EMTS-3120E2*/**
15	41	82 (40⅞)	5 (10)	EMTS-3150*/**	EMTS-3150E2*/**
18	41	101 (40⅞)	5 (12)	EMTS-3180*/**	EMTS-3180E2*/**
18	41	120 (47⅞)	5 (12)	EMTS-3180*/**	EMTS-3180E2*/**

\* Designate voltage: insert "208V" for 208 Vac, "240V" for 240 Vac or "480V" for 480 Vac.

\*\* Insert the suffix "3P" to the catalog number for 3 phase power.

<sup>1</sup>Heaters with general purpose enclosures are UL listed and CSA certified except models that exceed 48 amps.

<sup>2</sup>Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified except models that exceed 48 amps.

Ordering Example: EMTS-330/208V/3P, 3kW heater powered by 3 phase 208 Vac, \$575.



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# DUAL ZONE DRUM HEATER

## FCDDH-3200-240



- ✓ Easy-to-Use Digital Temperature Controller with Audible/Visual Alarm
- ✓ Large Heater Coverage and High Wattages for Fast Heat-Up
- ✓ High Wattage 3200W (1600W Per Zone)
- ✓ 25 mm (1") Fiberglass Insulation
- ✓ Designed for 55 Gallon Metal Drums

OMEGALUX® full-coverage drum heaters are designed to wrap around a drum and heat the contents while insulating to keep the heat exactly where it needs to be. Full-coverage drum heaters combine the convenience of quick heat-up time and the precision of a digital controller to provide the most practical, efficient means of freeze protection, viscosity control, and maintenance of materials at elevated temperatures. The dual zone drum heater provides a fully heated area with independent temperature control for each zone. It is designed to quickly melt heavy solids like molasses, syrups, etc.

FCDDH-3200-240 shown smaller than actual size.



### SPECIFICATIONS

**Digital On/Off Temperature Controller:** 10 to 232°C (50 to 450°F) for metal drums  
**Heated Area:** Fully heated  
**Wattage:** 3200W (1600W per zone)  
**Max Exposure Temperature:** 260°C (500°F)  
**Outer Sheath:** Silicone-coated fiberglass facing  
**Inner Sheath:** Silicone-coated fiberglass liner  
**Insulation:** 25.4 mm (1") fiberglass  
**Dielectric Strength:** Over 2000V  
**Power Cord:** 1.8 m (6') with stripped lead ends  
**Power:** 240 Vac (grounded heating element meets NEC 427.23)

### To Order

MODEL NO	DESCRIPTION
FCDDH-3200-240	Dual zone drum heater
ACCESSORIES	
FCDG-TOP	Drum top cover
FCDH-STRIP	Expander strip for rolling drums with removable lids

All drum heaters are for 55 gallon size and come with two digital temperature controllers.  
**Ordering Example:** FCDDH-3200-240, dual zone drum heater for 55 gallon size, 240V, 3200W, with a digital temperature controller for each zone and FCDH-TOP insulation cover that fits on the top of a drum to help prevent heat loss.

# DRUM HEATERS

## FCDH Series



- ✓ 55 Gallon Wraparound
- ✓ Easy-to-Use Digital Temperature Controller with Audible/ Visual Alarm
- ✓ Low Watt Density
- ✓ Silicone-Coated Fiberglass Facing
- ✓ 25 mm (1") Fiberglass Insulation
- ✓ Metal and Poly Drum Models

The FCDH Series consists of full-coverage insulated drum heaters that provide a safe and efficient method of temperature and viscosity control. An easy-to-use digital temperature controller prevents temperature runaway. These heaters use a patented grounded heating element and are designed for indoor use when it is desirable to insulate the entire surface of the drum.

### SPECIFICATIONS

#### Digital On/Off Temperature Controllers:

**Metal Drums:** 10 to 232°C (50 to 450°F)

**Poly Drums:** 10 to 71°C (50 to 160°F)

**Max Exposure Temperature:** 260°C (500°F)

**Outer Sheath:** Silicone-coated fiberglass facing

**Inner Sheath:** Silicone-coated fiberglass liner

**Insulation:** 25.4 mm (1") fiberglass

**Dielectric Strength:** Over 2000V

**Power Cord:** 1.8 m (6') with plug on 120V models, stripped lead ends on 240V models

**Power:** 120 or 240 Vac



Display is mounted on top of controller box for increased visibility and user convenience.

FCDH-1600-120 shown smaller than actual size.

### To Order

Model No.	Description	Type	Wattage	Voltage
FCDH-1600-120	Drum heater	Metal	1600	120
FCDH-750-120	Drum heater	Plastic	750	120
FCDH-1600-240	Drum heater	Metal	1600	240
FCDH-750-240	Drum heater	Plastic	750	240
Accessories				
FCDH-TOP	Drum top cover			
FCDH-STRIP	Expander strip for rolling drums with removable lids			

All drum heaters are for 55 gallon size and comes with a digital temperature controller. The 120 Vac models include a 3-prong plug, and the 240 Vac models have stripped leads. FCDH-TOP is an insulation cover that fits on the top of a drum to help prevent heat loss.



**FCH-FGC0 Series**



- ✓ High Power Output (10 to 40W) to Small Size
- ✓ Lightweight
- ✓ Simple Installation
- ✓ Pre-Wired
- ✓ Separate Fan Operation Possible

**Applications**

- ✓ ATM's, Ticket Machines, Parking Ticket Terminals, Access Systems, Fuel Dispensers, Energy Ports, Building-Safety Systems, Building-Management Systems, and Landscaping Systems



FCH-FGC00052R shown actual size.

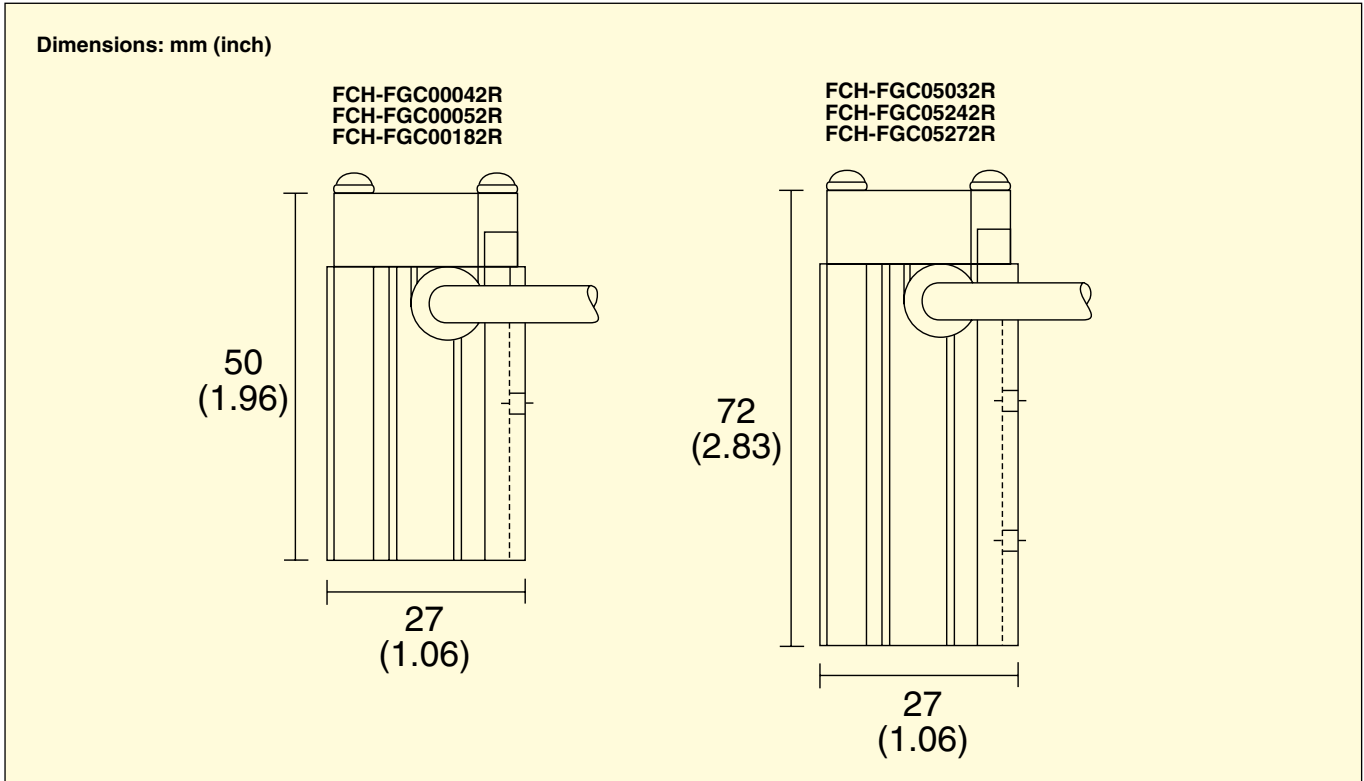
This range of fan heaters uses Positive Temperature Coefficient (PTC) ceramic heating technology to provide the user with a product ideally suited to climate control. The heater can be controlled independently to the fan, allowing a 'fan-only' mode for air circulation. There are nine variants, giving different power and supply voltage capability.

The product has been designed, and approved, for build-in applications. It has a robust construction utilizing two anodized aluminum extrusions, coupled to a 25 mm (1") fan. The heating element is a PTC heater.

**Specifications**

Model No.	FCH-FGC00042R	FCH-FGC00052R, FCH-FGC00182R	FCH-FGC05032R, FCH-FGC05242R, FCH-FGC05272R
Nominal Power at 10°C	10W	20W	40W
Typical Maximum In-Rush Current (A) RMS at 12 Vac	1.5	3	5
Typical Maximum In-Rush Current (A) RMS at 24 Vac	1.3	3	9.5
Typical Maximum In-Rush Current (A) RMS at 115/230 Vac	—	—	1/3.5
Electrical Protection Class	III/SELV		I
Ingress Protection	IP20		
Fan Volumetric Flow (m <sup>3</sup> /Hour)	5.1		
Fan Lifetime—L10 at 40°C (Hours)	120		
Fan Operating Temperature Range	-10 to 70°C (14 to 158°F)		
Nominal Input Voltage Fan (V)	12 DC, 12 AC or 24 AC/DC		
Nominal Input Voltage Heater (V)	12 DC, 12 AC or 24 AC/DC		12 DC, 12 AC or 24 AC/DC or 115/230
Dimensions, Cross Section: mm (inch)	26 x 27 (1 x 1.1)		
Length: mm (inch)	50 (2)		72 (2.8)
Weight: g (oz)	60 (2.1)		90 (3.2)





**To Order Visit [omega.com/fch-fgc0](http://omega.com/fch-fgc0) for Pricing and Details**

Model No.	Description
<b>FCH-FGC00042R</b>	10W, 12V heater, 12 Vdc fan, 600 mm (24") lead with DIN and outlet finger guard
<b>FCH-FGC00052R</b>	20W, 12V heater, 12 Vdc fan, 600 mm (24") lead with DIN and outlet finger guard
<b>FCH-FGC00182R</b>	20W, 24V heater, 24 Vac/dc fan, 600 mm (24") lead with DIN and outlet finger guard
<b>FCH-FGC05032R</b>	40W, 12V heater, 12 Vdc fan, 600 mm (24") lead with DIN and outlet finger guard
<b>FCH-FGC05242R</b>	40W, 24V heater, 24 Vac/dc fan, 600 mm (24") lead with DIN and outlet finger guard
<b>FCH-FGC05272R</b>	40W, 115/230V heater, 24 Vac/dc fan, 600 mm (24") lead with DIN and outlet finger guard

Comes complete with operator's manual.

**Ordering Example:** **FCH-FGC00042R**, compact fan heater, 10W, 12V heater, 12 Vdc fan, 600 mm (24") lead with DIN and outlet finger guard.



**FCH-FGC1 Series**



- ✓ High Power Output (60 to 230W) to Small Size
- ✓ Lightweight
- ✓ Simple Installation
- ✓ Pre-Wired
- ✓ Separate Fan Operation Possible

**Applications**

- ✓ ATM's, Ticket Machines, Parking Ticket Terminals, Access Systems, Fuel Dispensers, Energy Ports, Building-Safety Systems, Building-Management Systems, and Landscaping Systems



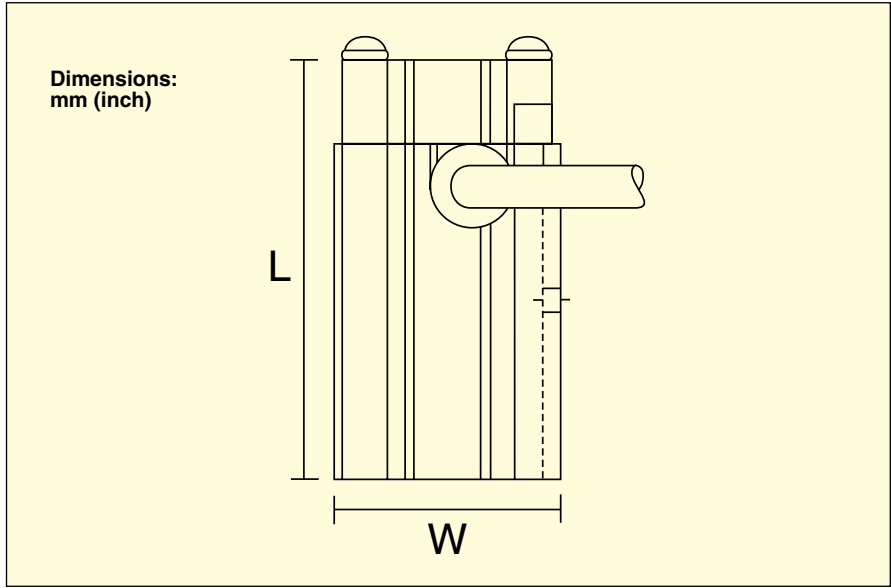
This range of fan heaters uses Positive Temperature Coefficient (PTC) ceramic heating technology to provide the user with a product ideally suited to climate control. The heater can be controlled independently to the fan, allowing a "fan-only" mode for air circulation.

The product has been designed, and approved, for build-in applications. It has a robust construction utilizing two anodized aluminum extrusions, coupled to a 40 mm (1.6") fan. The heating element is a PTC heater.

**Specifications**

Model No.	FCH-FGC10022R, FCH-FGC10262R	FCH-FGC10072R, FCH-FGC10312R	FCH-FGC15012R, FCH-FGC15132R	FCH-FGC15022R, FCH-FGC15142R	FCH-FGC15072R, FCH-FGC15152R
Nominal Power at 10°C	60W	100W	150W	200W	230W
Typical Maximum In-Rush Current (A) RMS at 12 Vac	6.5	—	10	9	9
Typical Maximum In-Rush Current (A) RMS at 24 Vac	7.5	—	—	—	—
Typical Maximum In-Rush Current (A) RMS at 115/230 Vac	1.5/5	1.5/4.5	—	—	—
Fan Volumetric Flow (m³/hour)	13.6	—	12.4	—	17
Fan Lifetime—L10 at 40°C (Hours)	120,000				50,000
Fan Operating Temp Range °C (°F)	-10 to 70 (14 to 158)				-20 to 60 (-4 to 140)
Nominal Input Voltage (Fan)	12 DC, 12 AC or 24 AC/DC				
Nominal Input Voltage (Heater)	12 or 24 AC/DC or 115/230	115/230			
Dimensions (W): mm (inch)—Cross Section	42 x 42 (1.7 x 1.7)				
Length (L): mm (inch)	72/77 (2.8/3)	77 (3)	112 (4.4)	122 (4.8)	122 (4.8)
Weight: g (oz)	175 (6.2)		260 (9.2)	275 (9.7)	275 (9.7)
Finger Guards at Outlet (High Voltage Supply)	Yes				

HT



To Order	
Model No.	Description
FCH-FGC10022R	60W, 12V heater, 12 Vdc fan, 600 mm (24") lead with DIN and outlet finger guard
FCH-FGC10072R	100W, 115/230V heater, 12 Vdc fan, 600 mm (24") lead with DIN and outlet finger guard
FCH-FGC10262R	60W, 24V heater, 24 Vac/Vdc fan, 600 mm (24") lead with DIN and outlet finger guard
FCH-FGC10312R	100W, 115/230V heater, 24 Vac/Vdc fan, 600 mm (24") lead with DIN and outlet finger guard
FCH-FGC15012R	150W, 115/230V heater, 12 Vdc fan, 600 mm (24") lead with DIN and outlet finger guard
FCH-FGC15022R	200W, 115/230V heater, 12 Vdc fan, 600 mm (24") lead with DIN and outlet finger guard
FCH-FGC15072R	230W, 115/230V heater, 24 Vdc fan, 600 mm (24") lead with DIN and outlet finger guard
FCH-FGC15132R	150W, 115/230V heater, 24 Vac/Vdc fan, 600 mm (24") lead with DIN and outlet finger guard
FCH-FGC15142R	200W, 115/230V heater, 24 Vac/Vdc fan, 600 mm (24") lead with DIN and outlet finger guard
FCH-FGC15152R	230W, 115/230V heater, 24 Vac/Vdc fan, 600 mm (24") lead with DIN and outlet finger guard

Comes complete with operator's manual.

Ordering Example: FCH-FGC10072R, compact fan heater, 100W, 115/230V heater, 12 Vdc fan, 600 mm (24") lead with DIN and outlet finger guard.

**FCH-FGC2 Series**



- ✓ High Power Output to Small Size
- ✓ Lightweight
- ✓ Simple Installation
- ✓ Screw Terminals for Easy Wiring

Forced convection heating elements provide the necessary heat and airflow while keeping the footprint to a minimum. These heaters feature a Positive Temperature Coefficient (PTC) core encased by an aluminum heat sink, specifically designed to maximize the heat dissipated into the airflow which is provided by the integrated fan. OMEGA has several series available that are certain to provide the correct combination of size, heat output and airflow for your application.



FCH-FGC20002R shown smaller than actual size.

**Specifications**

Model No.	FCH-FGC20002R, FCH-FGC20022R	FCH-FGC20012R, FCH-FGC20032R
Nominal Power at 10°C (50°F)	300/600W	450/800W
Recommended Fuse at 115V/230V Time Delay Amps	5	6
Typical Maximum In-Rush Current (A) RMS at 230 Vac	10	11
Typical Maximum In-Rush Current (A) RMS at 115 Vac	15	14
Maximum at Body Temperature (°C)	55	80
Electrical Protection Class	I	
Ingress Protection	IP20	
Operating Temperature Range °C (°F)	-40 to 50 (-40 to 122)	
Fan Volumetric Flow (m <sup>3</sup> /hour)	31 to 35	
Fan Life Time—L10 at 40°C (hours)	43,500	
Nominal Input Voltage (Depending on Variant)	115/230 Vac	
Dimensions, Cross Section: mm (inch)	82 x 110 (3.23 x 4.33)	
Length: mm (inch)	150 (5.91)	
Weight: g (oz)	785 (27)	
Finger Guards at Inlet and Outlet	Yes	

**To Order**

Model No.	Description
FCH-FGC20002R	300/600W, 115V, with DIN clip
FCH-FGC20012R	450/800W, 115V, with DIN clip
FCH-FGC20022R	300/600W, 230V, with DIN clip
FCH-FGC20032R	450/800W, 230V, with DIN clip

Comes complete with operator's manual.

Ordering Example: FCH-FGC20002R, compact fan heater, 300/600W, 115V, with DIN clip.



**FCH-FGC3 Series**



- ✓ High Power to Size Ratio
- ✓ Lightweight
- ✓ Easy to Fit
- ✓ Three Power Settings
- ✓ Independent Fan Circuit to Aid Climate Cooling

**Applications**

- ✓ ATM's, Ticket Machines, Parking Ticket Terminals, Access Systems, Fuel Dispensers, Energy Ports, Building-Safety Systems, Building-Management Systems, and Landscaping Systems

This range of fan heaters uses Positive Temperature Coefficient (PTC) ceramic heating technology to provide the user with a product ideally suited to climate control. The heater can be controlled independently to the fan, allowing a 'fan-only' mode for air circulation.

The product has been designed, and approved for many applications. Use of high-quality components guarantees the highest possible operating safety in the respective application. Self-regulation through PTC features.



FCH-FGC3111 shown smaller than actual size.

The heater's proven safety through given temperature limitation have high reliability without additional switching elements. The compact design through high power density provides specific air flow for desired climate.

**Specifications**

Model No.	FCH-FGC3111	FCH-FGC3116
Nominal Power at 10°C (50°F): Watt	200/300/400	
Nominal Input Voltage: V	230 Vac	115 Vac
Nominal Input Frequency: Hz	50	60
Operating Temperature Range: °C (°F)	-10 to 70 (14 to 158)	
Storage Temperature Range: °C (°F)	-40 to 70 (-40 to 158)	
Fan Lifetime [MTTF at 30°C (68°F)]: Hours	329,447	
Fan Volumetric Flow, Approximate m³/h	10 (5.89)	13 (7.65)
Weight, Add 35 g (1.23 oz) for Bracket: g (oz)	275 (9.69)	
Dimensions, Cross Section: mm (inch)	71 x 70 (2.79 x 2.75)	
Length: mm (inch)	96.5 (3.79)	
Harness Length: mm (inch)	240 (9.44)	
Ingress Rating, EN60529	IP20	
Electrical Protection Class	II	

**To Order Visit [omega.com/fch-fgc3](http://omega.com/fch-fgc3) for Pricing and Details**

FCH-FGC3116	200/300/400W, 115V, 240 mm (9.4") lead with DIN clip
FCH-FGC3111	200/300/400W, 230V, 240 mm (9.4") lead with DIN clip

Comes complete with operator's manual.

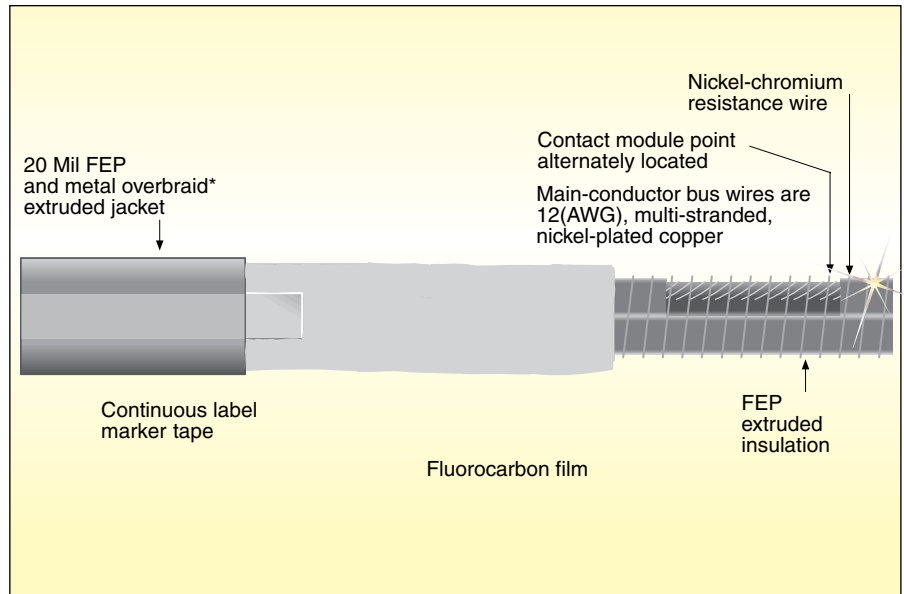
Ordering Example: FCH-FGC3116. 200/300/400W. 115V. 240 mm (9.4") lead with DIN clip.

HT

# MEDIUM TEMPERATURE CONSTANT WATTAGE HEATING CABLE

## FE Series

- ✓ Continuous Exposure Rating up to 204°C (400°F)
- ✓ Low Watt Density
- ✓ Parallel Resistance Heater
- ✓ Cut-to-Length at the Job Site
- ✓ Constant Watt Density
- ✓ Moisture and Chemical Resistance
- ✓ Low Cost
- ✓ Metal Overbraid



## SPECIFICATIONS

**Wattage:** 3, 5, 8, and 12 Watts/ft.  
**Outside Dimension:** Nominal 7.62 x 5.08 mm (0.30 x 0.20")  
**Maximum Short Term Exposure Temperature:** (De-energized) 232°C (450°F)  
**Dielectric Strength:** In excess of 2500V

## APPROVALS

Factory Mutual Class I, Division II, Groups B, C, D; Class II, Division II, Groups E, F, G; and Class III

## APPLICATIONS

OMEGALUX® FE cable is a low-watt density electrical resistance heater. It is designed for freeze protection and midrange process temperature control and maintenance applications in lines periodically purged with 150 psig steam.

The FE cable heating element is tension wrapped and covered with a fluorocarbon film and enclosed in a minimum 20 mil FEP abrasion resistant extruded jacket. This tough outer cover provides moisture and dielectric protection as well as resistance to abrasion.

A tinned copper overbraid provides additional protection and electrical ground return path.

## To Order

Watts/ft.	Volts	Module* Length (ft)	Maximum** Length (ft)	Model No.
3	120	2	360	<b>FE3-120B</b>
3	240	4	720	<b>FE3-240B</b>
5	120	2	275	<b>FE5-120B</b>
5	240	3	550	<b>FE5-240B</b>
8	120	2	220	<b>FE8-120B</b>
8	208	4	381	<b>FE8-208B</b>
8	240	4	440	<b>FE8-240B</b>
8	277	4	508	<b>FE8-277B</b>
8	480	6	880	<b>FE8-480B</b>
12	120	2	180	<b>FE12-120B</b>
12	208	4	312	<b>FE12-208B</b>
12	240	2	360	<b>FE12-240B</b>
12	277	4	416	<b>FE12-277B</b>

\* Cable circuit module length in feet. When ordering please allow a minimum of 1 module length extra for terminations.

\*\* Maximum circuit lengths include end-to-end voltage variation of 10%. Longer runs may be used. Lengths are based on cable operating temperatures of 148°C (300°F).

**NOTE:** Price per foot. When ordering, specify desired length in feet [7.6 m (25') minimum]. To complete your system the following accessories are recommended: (1) Termination kits for FE cable, (2) Control options—a complete selection of controllers and thermostats are available online.

**Ordering Example:** FE8-120B, 100 medium-temperature, constant-wattage heating cables, 8 W/pt., 120 Vac.

# OMEGALUX® ROPE HEATERS

## FGR Series

- ✓ **Operating Temperature Rating to 482°C (900°F)**
- ✓ **Wraps Around Small Diameter Pipes and Tubes**

OMEGALUX® rope heaters apply heat to tubing with diameters as small as 3.2 mm (1/8"). Featuring a maximum allowable operating temperature of 482°C (900°F), the FGR Series rope heaters can be wrapped around either conductive or non-conductive surfaces. Each end terminates with 610 mm (24") long fiberglass-insulated lead wire.

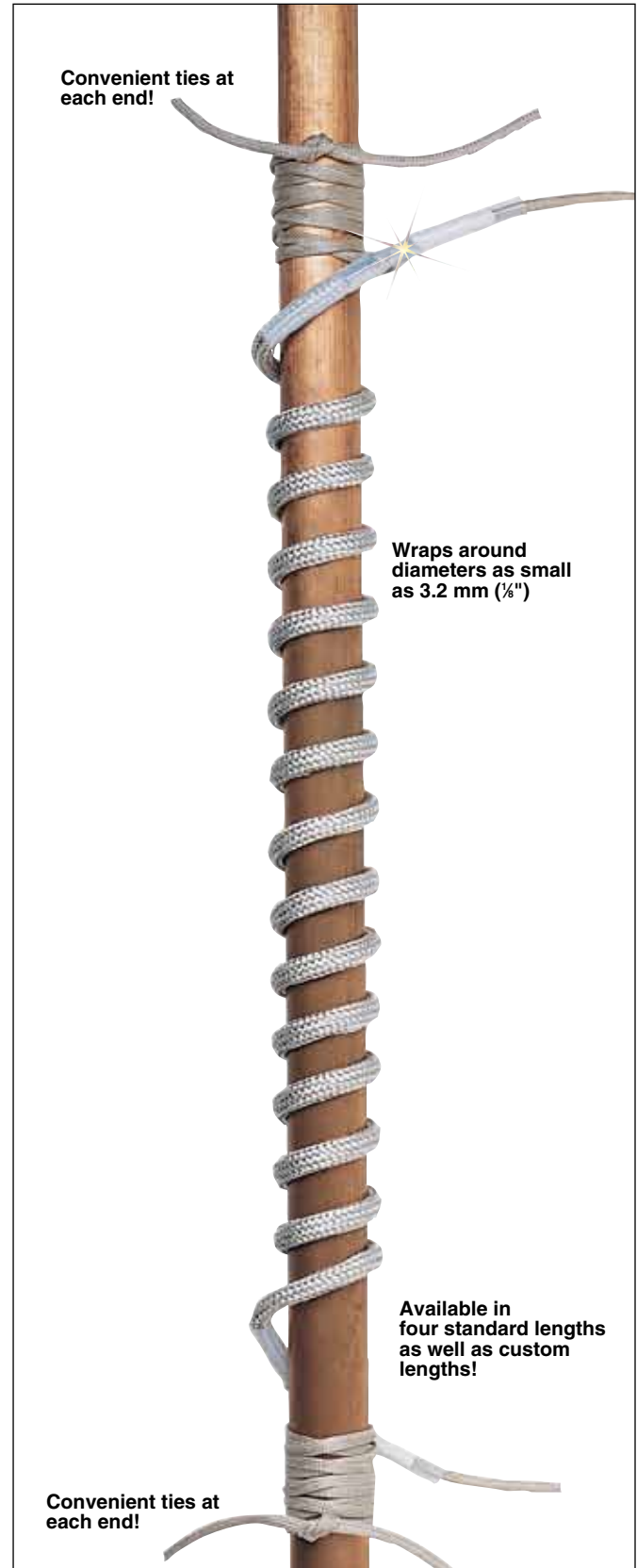
### SPECIFICATIONS

**Maximum Allowable Temperature:** 482°C (900°F)  
**Suitable for Use on Conductive Surface:** Yes  
**Resists Moisture Vapor or Chemicals:** No  
**Standard Diameter:** 5 mm (3/16")  
**Voltage:** 120 Vac or Vdc, 240V optional  
**Linear Wattage:** 4 Watts/inch  
**Heater Length:** 0.9, 1.8, 2.4 or 3.0 m (3, 6, 8 or 10')  
**Lead Length:** 609 mm (24")  
**Termination:** Stripped leads

**To Order** Visit [omega.com/fgr](http://omega.com/fgr) for Pricing and Details

Model Number	Description Length	Wattage	Voltage
<b>FGR-030</b>	0.9 m (3')	125	120
<b>FGR-060</b>	1.8 m (6')	250	120
<b>FGR-080</b>	2.4 m (8')	400	120
<b>FGR-100</b>	3.0 m (10')	500	120

*240 Vac models and other wattages also available.  
 Ordering Example: FGR-060, 1.8 m (6') 120 Vac rope heater.*



# HIGH TEMPERATURE HEATING TAPES

## FGS, FGH, FWH Series

- ✓ Maximum Exposure Temperature up to 480°C (900°F)
- ✓ Reliable
- ✓ Fiberglass Insulated
- ✓ Fast Thermal Response
- ✓ Integral Molded Separable Plug
- ✓ Available with Leads Same End†

### APPLICATIONS

Wide and heavy-duty insulated tapes are good for direct contact on a conductive surface.

Standard tapes are made from fine gage stranded resistance wires that are double insulated with braided fiberglass and knitted into flat tapes for maximum flexibility. A heavy insulated tape is made by taking a standard tape and braiding it between layers of fiberglass yarn. Wide tapes are made from two or more standard tapes that are sewn between two layers of fiberglass cloth.

### SPECIFICATIONS

**Heating Elements:** 36-40 gage resistance wire.

**Lead Wires:** Emerge from opposite ends into separate sides of an integrally molded separable plug

**Heating Element Insulation:** Double-braided fiberglass

**Dielectric Strength:** In excess of 2000 V

† To order heaters with power leads exiting the same end of the tape, add suffix **"LSE"** to model number. To order 240 V version change the "1" in the part no. prior to the "2" to "2" for 240 V. All 240 V versions are not supplied with plugs. Consult Sales for prices.

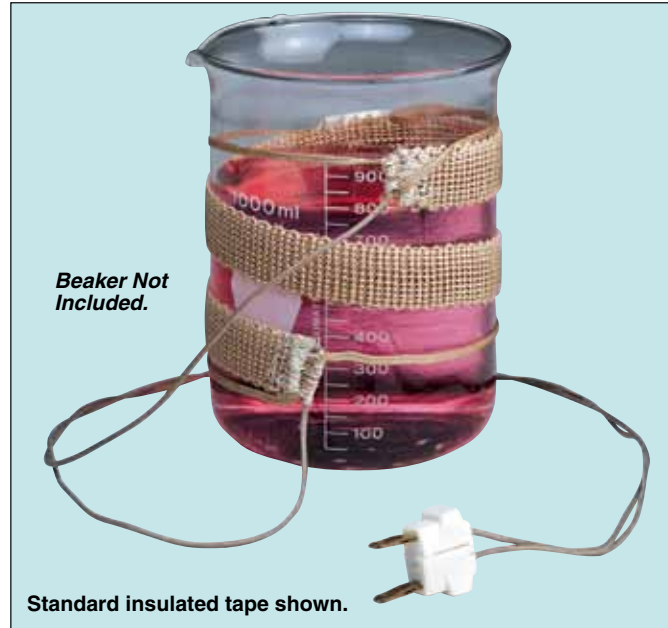
### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

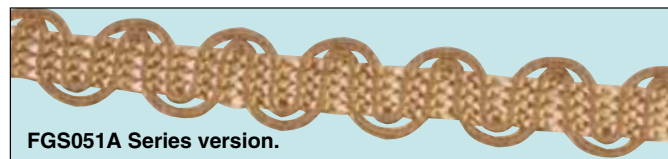
### Wide Heavy Insulated Tapes

To Order				
Watts	W/in <sup>2</sup>	Volts	Size	Model No.
209	4.9	120	1 3/4" x 2'	<b>FWH171-020</b>
418	4.9	120	1 3/4" x 4'	<b>FWH171-040</b>
622	4.9	120	1 3/4" x 6'	<b>FWH171-060</b>
836	4.9	120	1 3/4" x 8'	<b>FWH171-080</b>
1045	4.9	120	1 3/4" x 10'	<b>FWH171-100</b>
313	5.2	120	2 1/2" x 2'	<b>FWH251-020</b>
627	5.2	120	2 1/2" x 4'	<b>FWH251-040</b>
940	5.2	120	2 1/2" x 6'	<b>FWH251-060</b>
1254	5.2	120	2 1/2" x 8'	<b>FWH251-080</b>
1567	5.2	120	2 1/2" x 10'	<b>FWH251-100</b>
418	5.3	120	3 1/4" x 2'	<b>FWH321-020</b>
836	5.3	120	3 1/4" x 4'	<b>FWH321-040</b>
1254	5.3	120	3 1/4" x 6'	<b>FWH321-060</b>
1672	5.3	120	3 1/4" x 8'	<b>FWH321-080*</b>
2090	5.3	120	3 1/4" x 10'	<b>FWH321-100*</b>

\* Does not come with plug. Comes complete with instruction sheet.



Standard insulated tape shown.



FGS051A Series version.

### Standard Insulated Tapes

To Order				
Watts	W/in <sup>2</sup>	Volts	Size	Model No.
46	8.6	120	3/8" x 12"	<b>FGS0031-010</b>
105	8.6	120	1/2" x 2'	<b>FGS051A-020</b>
210	8.6	120	1/2" x 4'	<b>FGS051A-040</b>
310	8.6	120	1/2" x 6'	<b>FGS051A-060</b>
420	8.6	120	1/2" x 8'	<b>FGS051A-080</b>
520	8.6	120	1/2" x 10'	<b>FGS051A-100</b>
210	8.6	120	1" x 2'	<b>FGS101-020</b>
420	8.6	120	1" x 4'	<b>FGS101-040</b>
627	8.6	120	1" x 6'	<b>FGS101-060</b>
830	8.6	120	1" x 8'	<b>FGS101-080</b>
1045	8.6	240	1" x 10'	<b>FGS102-100*</b>

### Heavy Insulated Tapes

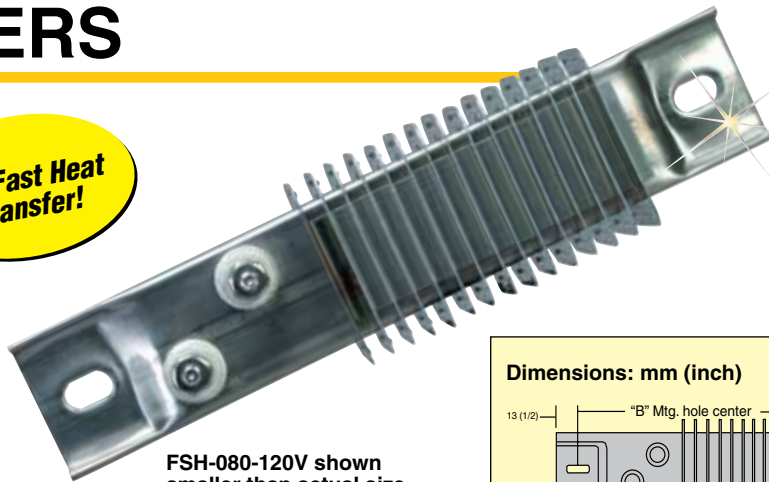
To Order				
Watts	W/in <sup>2</sup>	Volts	Size	Model No.
105	8.6	120	1/2" x 2'	<b>FGH051-020</b>
210	8.6	120	1/2" x 4'	<b>FGH051-040</b>
310	8.6	120	1/2" x 6'	<b>FGH051-060</b>
420	8.6	120	1/2" x 8'	<b>FGH051-080</b>
520	8.6	120	1/2" x 10'	<b>FGH051-100</b>
210	8.6	120	1" x 2'	<b>FGH101-020</b>
420	8.6	120	1" x 4'	<b>FGH101-040</b>
620	8.6	120	1" x 6'	<b>FGH101-060</b>
830	8.6	120	1" x 8'	<b>FGH101-080</b>
1045	8.6	120	1" x 10'	<b>FGH101-100</b>



# CERAMIC-INSULATED FINNED STRIP HEATERS

FSH Series

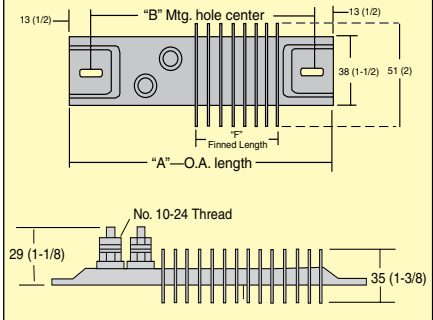
**For Fast Heat Transfer!**



FSH-080-120V shown smaller than actual size.

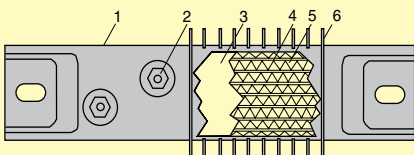
- ✓ Excellent for Use in Air Heating, Air Ovens, and Load Banks
- ✓ Seamless Stainless Steel Sheath
- ✓ Post Terminals
- ✓ Ceramic Element Support
- ✓ Magnesium Oxide Packing

Dimensions: mm (inch)



### Formula for Determination of Watt Density

$$\text{Watts/sq. in.} = \frac{\text{Total unit wattage}}{F \text{ (finned length)} \times 3}$$



### CONSTRUCTION

1. Seamless stainless steel sheath
2. Post terminals
3. Ceramic element support
4. Element wire situated close to outside surface for maximum heat transfer and minimum internal temperature while preserving good dielectric qualities
5. Magnesium oxide packing
6. Aluminum fins offering maximum radiating surface and providing for rapid heat transfer to the surrounding medium. Stainless steel fins are available for corrosive environments. Aluminum fins are standard.

### Tolerances

**Length:** Up to 610 mm (24"), ±1.6 mm (1/16"); 610 mm (24") and over, ±3.2 mm (1/8")

**Wattage:** -10 to 5% at rated voltage

Type of Air	Ft./min.	°C (°F)	Max. Watts/Sq. In.
Still	—	Up to 149 (300)	20
Still	—	149 to 315 (300 to 600)	16
Still	—	315 to 427 (600 to 800)	10
Moving	600	Up to 93 (200)	40
Moving	600	93 to 204 (200 to 400)	30
Moving	600	204 to 315 (400 to 600)	20
Moving	1200	Up to 93 (200)	50
Moving	1200	93 to 204 (200 to 400)	35
Moving	1200	204 to 315 (400 to 600)	25

### To Order

Model No.	Description	Watts	Dimensions: cm (inch)		
			A	B	F
FSH-080-120V	Finned strip heater	400	20 (8)	18 (7)	8 (3)
FSH-080-240V	Finned strip heater	400	20 (8)	18 (7)	8 (3)
FSH-105-120V	Finned strip heater	300	27 (10.5)	24 (10)	15 (6)
FSH-105-240V	Finned strip heater	300	27 (10.5)	24 (10)	15 (6)
FSH-120-120V	Finned strip heater	500	30 (12)	28 (11)	20 (8)
FSH-120-240V	Finned strip heater	500	30 (12)	28 (11)	20 (8)
FSH-121-120V	Finned strip heater	750	30 (12)	28 (11)	20 (8)
FSH-121-240V	Finned strip heater	750	30 (12)	28 (11)	20 (8)
FSH-150-120V	Finned strip heater	500	39 (15)	36 (14)	27 (11)
FSH-150-240V	Finned strip heater	500	39 (15)	36 (14)	27 (11)
FSH-180-120V	Finned strip heater	750	46 (18)	43 (17)	34 (13)
FSH-180-240V	Finned strip heater	750	46 (18)	43 (17)	34 (13)
FSH-181-120V	Finned strip heater	1250	46 (18)	43 (17)	34 (13)
FSH-181-240V	Finned strip heater	1250	46 (18)	43 (17)	34 (13)
FSH-237-120V	Finned strip heater	1000	60 (24)	58 (23)	48 (19)
FSH-237-240V	Finned strip heater	1000	60 (24)	58 (23)	48 (19)
FSH-357-240V	Finned strip heater	2500	91 (36)	58 (23)	48 (19)

Ordering Examples: FSH-105-120V, finned strip heater.  
FSH-181-120V, finned strip heater.

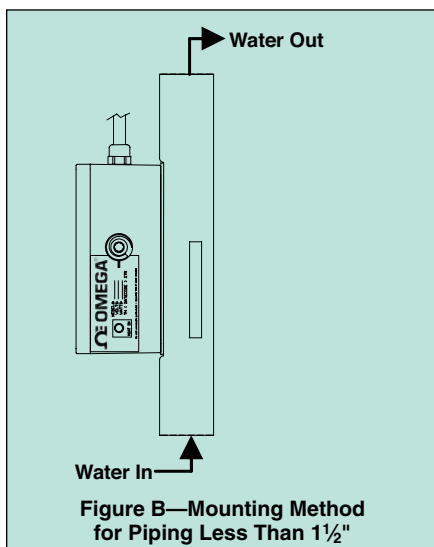
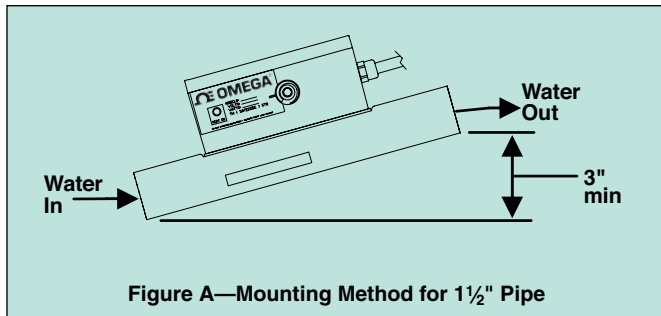
# FTH SERIES HEATERS

FTH Series



FTH-6000-240 shown smaller than actual size.

OMEGA® flow through heaters are designed primarily for providing heat that regulates liquid temperature from 32 to 88°C (90 to 190°F). The heaters have a titanium element that resists corrosion. The flow through tube is 381 mm (15") long and has 1 NPT female pipe connections and is available in 304 SS. The safety high limit trip point for the heater is 99°C (210°F). The 201 x 145 x 89 mm (7.9 x 5.7 x 3.5") enclosure is made of ABS plastic and is water resistant.



## CAUTION AND WARNING!

- Not for use as a spa or hot tub heater
- Read all instructions before installation and operation
- Heater will fail if energized without proper fluid flow—15 GPM min
- Pump must be running and fluid flowing before turning on power to the heater
- Heater must be powered down for one to five minutes before turning off the pump and stopping fluid flow
- Bleed the system of any air before applying power to the heater
- Heaters failures due to insufficient flow or due to dry firing, the heater is not covered under warranty
- Heater should always be mounted so that the water outlet is elevated a minimum of 3" above the water inlet (see figure A)
- When using piping smaller than 1½", the heater is to be mounted in a vertical orientation. Fluid flow is to enter at the bottom and exit out the top (see figure B)
- Minimum connecting pipe diameter is ¾"
- Piping connections are to meet all local plumbing codes
- Electrical connections must be performed in accordance with articles 250 and 680 of the National Electric Code and by a qualified electrician

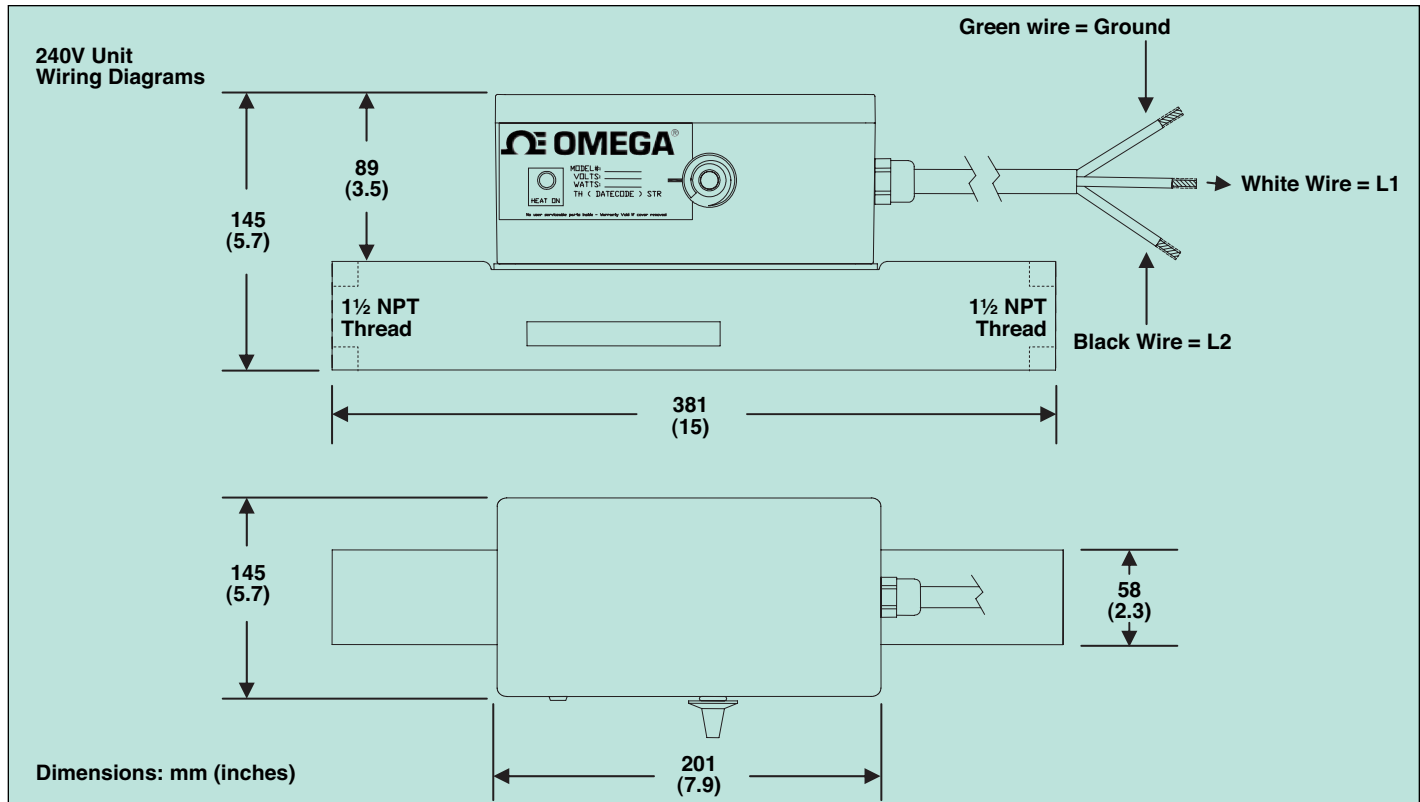
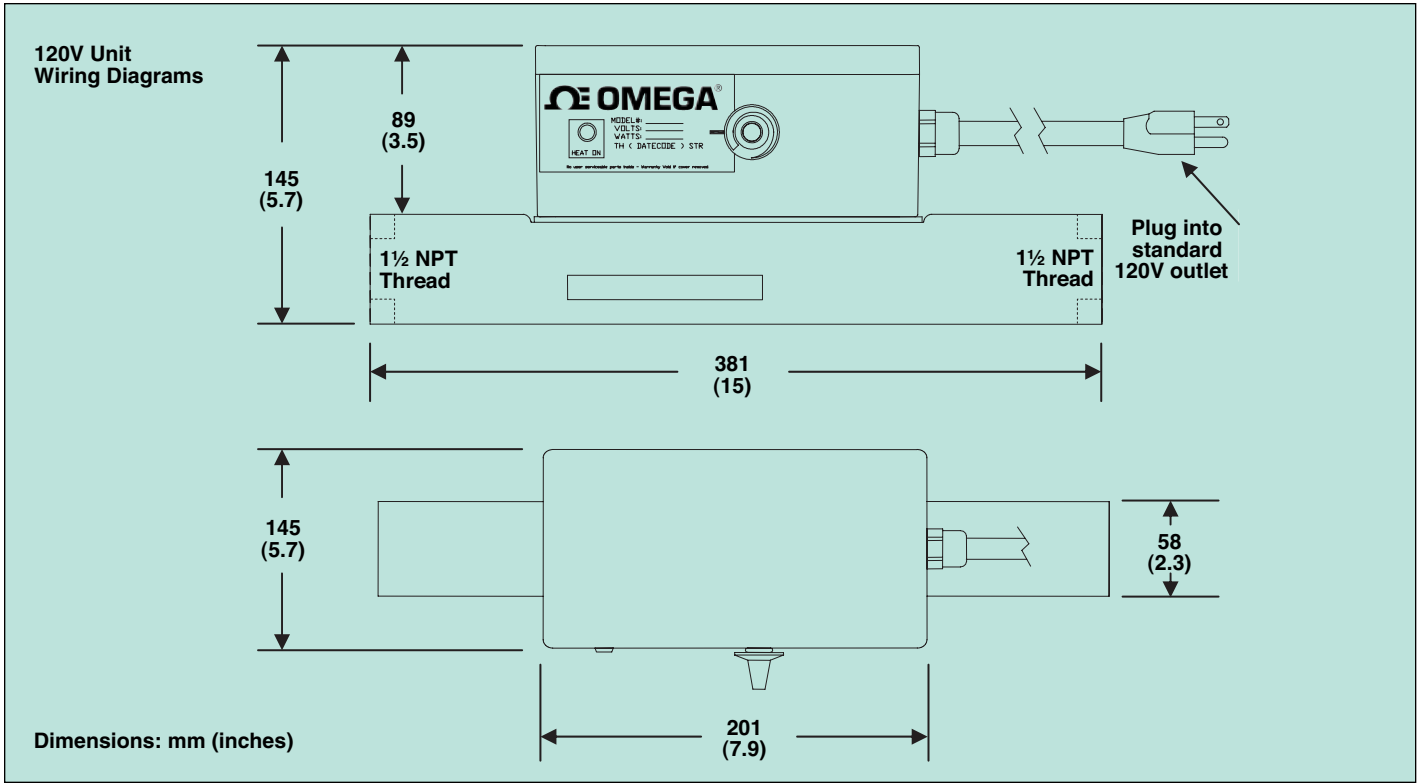
## To Order

Model No.	Wattage	Voltage	Phase	AMP Draw
FTH-1500-120	1500	120	1 Ø	12.5
FTH-2000-240	2000	240	1 Ø	8.3
FTH-3000-240	3000	240	1 Ø	12.5
FTH-4000-240	4000	240	1 Ø	16.7
FTH-5000-240	5000	240	1 Ø	20.8
FTH-6000-240	6000	240	1 Ø	25.0

Comes complete with operator's manual.

Ordering Examples: FTH-1500-120, flow through heater, 1.5 kW.

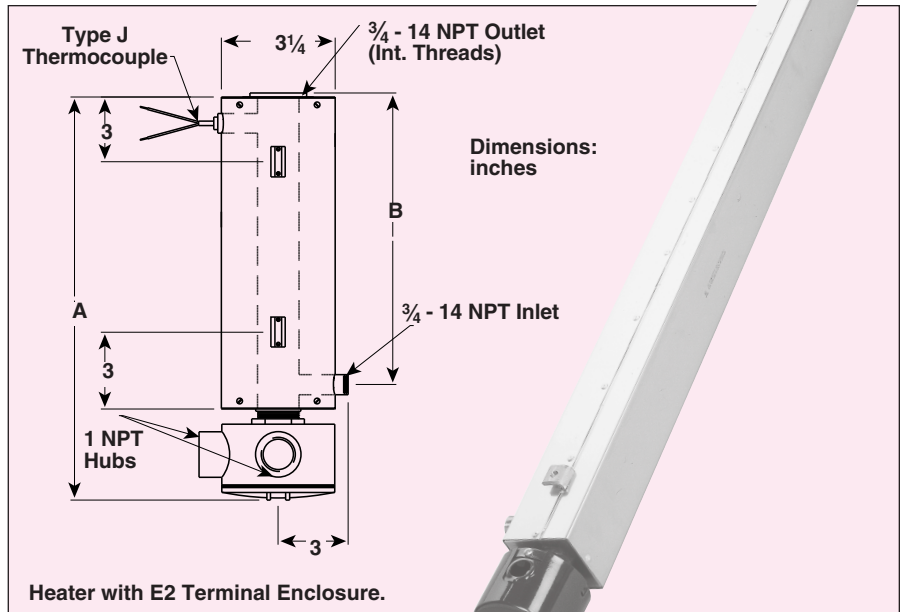
FTH-2000-240, flow through heater, 2 kW.



# SMALL CAPACITY/LOW FLOW GAS APPLICATIONS

GHCIS Series  
Starts at  
**\$2400**

- Cartridge Heater Design
- Stainless Steel Pipe Body
- 0.5 to 3 kW
- 120 and 240V, Single Phase
- INCOLOY® Sheath Elements (37 W/in<sup>2</sup>)
- General Purpose or Moisture Resistant/Explosion Resistant Terminal Enclosure
- Internal Overtemperature Protection (Type K T/C)
- Process Temperature Sensor in Outlet (Type J T/C)



**MOST POPULAR  
ITEMS HIGHLIGHTED**

## APPLICATIONS

**Gas:** Designed to efficiently heat gases, particularly at low-flow rates and relatively high temperatures. (Outlet temperatures to 600°F.)

## FEATURES

**Terminal Enclosure:** Available with E1 General Purpose or E2 Moisture Resistant/Explosion Resistant.

**Cartridge Heater Element:** INCOLOY sheath and spiral wound baffle for efficient heat transfer.

**Vessel:** Stainless Steel (304) construction of all wetted parts.

**Thermal Insulation:** High temperature pipe insulation inside protective outer jacket.

**Process Control:** Accurate process control using a Type J thermocouple located in the heater outlet.

**High Limit Sensor:** Integral overtemperature protection using a Type K thermocouple located inside the cartridge heating element sheath.

**Installation:** Compact rugged design permits easy installation.

## To Order (Specify Model Number)

kW	Volts	Ckt & Phase	Dimensions (In.)		Model No.	Price	Wt. (lb)
			A	B			
1 inch, 304 stainless steel pipe body — 1 INCOLOY cartridge element (37 W/in <sup>2</sup> ) E1 terminal enclosure							
0.5	120	1-1	14	8	GCHCIS-01-0P50-E1/120	\$2750	3
0.5	240	1-1	14	8	GCHCIS-01-0P50-E1/240	2750	3
1	120	1-1	20	14	GCHCIS-01-001P-E1/120	2400	3
1	240	1-1	20	14	GCHCIS-01-001P-E1/240	2400	3
2	120	1-1	32	26	GCHCIS-01-002P-E1/120	3575	4
2	240	1-1	32	26	GCHCIS-01-002P-E1/240	3575	4
3	240	1-1	44	38	GCHCIS-01-003P-E1/240	4250	4

- Order electronic controls separately for remote mounting. Consult controls section for details.
- Special voltage and wattage ratings available.

**Ordering Example:** GCHCIS-01-001P-E1/120, 1 kW, 120V heater, \$2400.

## Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model	Small Capacity/Low Flow Gas			
GCH	Gas Circulation Heater			
C	Cartridge Element			
IS	INCOLOY Sheath — Stainless Steel Vessel			
Code	Number of Elements			
01	One			
Code	Watts			
OP50	500	002P	2,000	
001P	1,000	003P	3,000	
Code	Terminal Enclosure			
E1	General Purpose			
E2	Moisture Resistant/Explosion Resistant			
GCHCIS	01	OP50	E1	Typical Model Number



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Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

### • pH and Conductivity

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

### • Data Acquisition

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# SIDE MOUNT FLUOROPOLYMER COVERED HEATERS

GTF6 and GTF9 Series Starts at

**\$975**



- GTF6—6 Elements**
- ✓ 6 Fluoropolymer Covered Stainless Steel Elements
  - ✓ 10 W/in<sup>2</sup>
  - ✓ 2 to 12 kW
  - ✓ 240 and 480V, 3 Phase
  - ✓ Moisture Resistant Terminal Enclosure

- GTF9—9 Elements**
- ✓ 9 Fluoropolymer Covered Stainless Steel Elements
  - ✓ 10 W/in<sup>2</sup>
  - ✓ 3 to 18 kW
  - ✓ 240 and 480V, 3 Phase
  - ✓ Moisture Resistant Terminal Enclosure

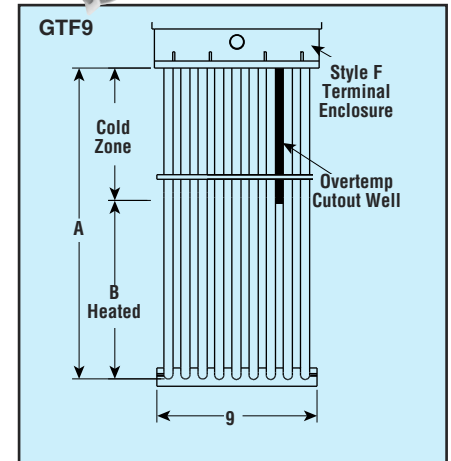
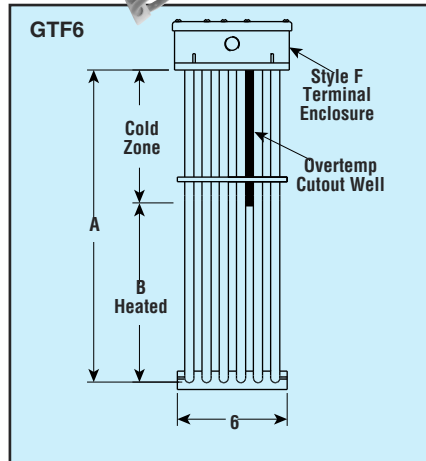
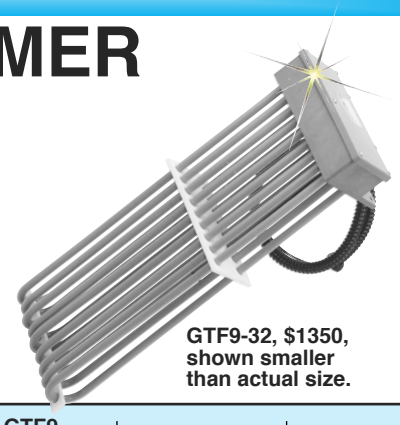
## FEATURES

- ✓ Moisture Resistant Terminal Enclosure
- ✓ Side Mounted Construction with Mounting Flange
- ✓ Overtemperature Protection One Time Use Thermal Fuse (260°F), Field Replaceable
- ✓ Polypropylene Guard, Order Separately
- ✓ Custom Vertical Heights and Other Configurations Available
- ✓ Alternate Voltages and Single Phase Available

GTF6-22, \$975 shown smaller than actual size.



GTF9-32, \$1350, shown smaller than actual size.



**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Volts	W/in <sup>2</sup>	Phase	DIM (in)		Fluoropolymer Model No.	Price	Wt. (lb)	Guard <sup>1</sup> Model No.	Guard <sup>1</sup> Price
				A	B					
<b>GTF6 — 6 Elements</b>										
2	240	10	3	17	9	GTF6-22	\$975	19	GTF6-2G	\$190
2	480	10	3	17	9	GTF6-24	975	19		
3	240	10	3	23	15	GTF6-32	1100	22	GTF6-3G	215
3	480	10	3	23	15	GTF6-34	1100	22		
4	240	10	3	29	21	GTF6-42	1250	24	GTF6-4G	235
4	480	10	3	29	21	GTF6-44	1250	24		
6	240	10	3	35	27	GTF6-62	1500	27	GTF6-6G	260
6	480	10	3	35	27	GTF6-64	1500	27		
8	240	10	3	47	38	GTF6-82	1750	33	GTF6-8G	300
8	480	10	3	47	38	GTF6-84	1750	33		
10	240	10	3	59	47	GTF6-102	2150	40	GTF6-10G	395
10	480	10	3	59	47	GTF6-104	2150	40		
12	240	10	3	68	55	GTF6-122	2300	45	GTF6-12G	445
12	480	10	3	68	55	GTF6-124	2300	45		
<b>GTF9 — 9 Elements</b>										
3	240	10	3	17	9	GTF9-32	\$1350	28	GTF9-3G	\$225
3	480	10	3	17	9	GTF9-34	1350	28		
4.5	240	10	3	23	15	GTF9-452	1500	33	GTF9-45G	255
4.5	480	10	3	23	15	GTF9-454	1500	33		
6	240	10	3	29	21	GTF9-62	1700	36	GTF9-6G	270
6	480	10	3	29	21	GTF9-64	1700	36		
9	240	10	3	35	27	GTF9-92	2050	40	GTF9-9G	305
9	480	10	3	35	27	GTF9-94	2050	40		
12	240	10	3	47	38	GTF9-122	2400	49	GTF9-12G	355
12	480	10	3	47	38	GTF9-124	2400	49		
15	240	10	3	59	47	GTF9-152	2900	60	GTF9-15G	460
15	480	10	3	59	47	GTF9-154	2900	60		
18	240	10	3	68	55	GTF9-182	3150	67	GTF9-18G	525

<sup>1</sup>Guard (not shown). Order separately by Model Number. Guard adds approximately 1/2" to overall heater dimensions.

Ordering Examples: GTF6-62, 240V, 6 kW, 6-element heater, and GTF6-6G, heater guard, \$1500 + 260 = \$1760. GTF9-122, 12 kW heater, \$2400.



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• **Pressure, Strain and Force**

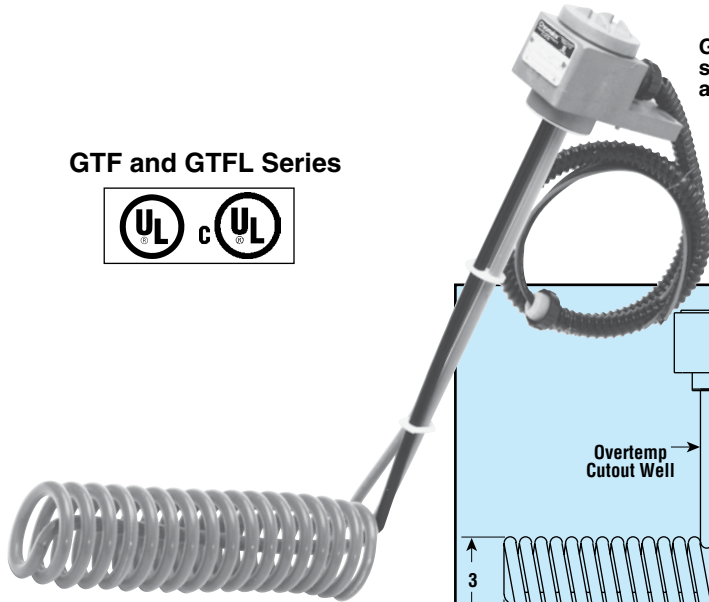
Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

• **Heaters**

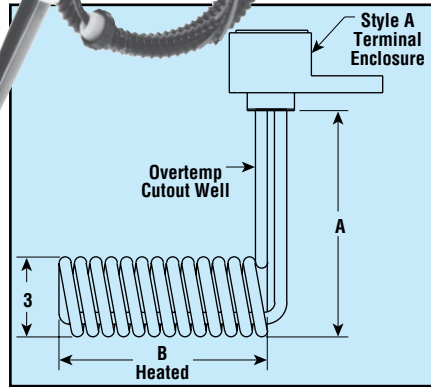
Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# FLUOROPOLYMER COVERED IMMERSION HEATERS

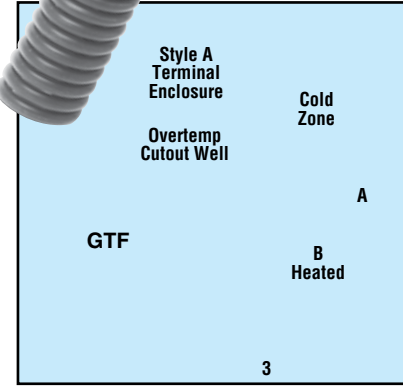
GTF and GTFL Series



GTFL-11 shown smaller than actual size.



GTFL-11 shown smaller than actual size.



- ✓ GTF—Side Mount
- ✓ GTFL—L-Shaped
- ✓ Fluoropolymer Covered Stainless Steel Elements
- ✓ 10 W/in<sup>2</sup>
- ✓ 1 to 6 kW
- ✓ 120, 240 and 480V, 1 Phase
- ✓ Moisture Resistant Terminal Enclosure

## FEATURES

- ✓ Moisture Resistant Terminal Enclosure
- ✓ Side Mounted Vertical Construction with Mounting Bracket (GTF Only)
- ✓ Side Mounted Horizontal Heater L-Shaped (GTFL Only)
- ✓ Overtemperature Protection One Time Use Thermal Fuse (260°F), Field Replaceable
- ✓ Polypropylene Guard, Order Separately
- ✓ Optional Riser Heights Available (GTFL Only)

## To Order

kW	Volts	W/in <sup>2</sup>	Phase	DIM (in)		Fluoropolymer Model No.	(lb)	Guard* Model No.
				A	B			
<b>GTF — Side Mount</b>								
1	120	10	1	11	6	GTF-11	7	GTF-1G
1	240	10	1	11	6	GTF-12	7	
2	240	10	1	17	10	GTF-22	8	GTF-2G
2	480	10	1	17	10	GTF-24	8	
3	240	10	1	23	14	GTF-32	13	GTF-3G
3	480	10	1	23	14	GTF-34	13	
4	240	10	1	29	18	GTF-42	15	GTF-4G
4	480	10	1	29	18	GTF-44	15	
5	240	10	1	35	23	GTF-52	18	GTF-5G
5	480	10	1	35	23	GTF-54	18	
6	240	10	1	40	27	GTF-62	21	GTF-6G
6	480	10	1	40	27	GTF-64	21	
<b>GTFL — L-Shaped</b>								
1	120	10	1	12	9	GTFL-11	8	GTFL-1G
1	240	10	1	12	9	GTFL-12	8	
2	240	10	1	18	13	GTFL-22	9	GTFL-2G
2	480	10	1	18	13	GTFL-24	9	
3	240	10	1	18	17	GTFL-32	13	GTFL-3G
3	480	10	1	18	17	GTFL-34	13	
4	240	10	1	18	21	GTFL-42	16	GTFL-4G
4	480	10	1	18	21	GTFL-44	16	
5	240	10	1	18	25	GTFL-52	18	GTFL-5G
5	480	10	1	18	25	GTFL-54	18	
6	240	10	1	18	29	GTFL-62	21	GTFL-6G
6	480	10	1	18	29	GTFL-64	21	

\* Guard (not shown). Order separately by guard model number. Guard adds approximately 1/2" to overall heater dimensions.

Ordering Examples: GTF-62, 240V, 6 kW, side mount immersion heater, and GTF-6G, heater guard, GTFL-11, 120V, 1 kW, L-shaped immersion heater, and GTFL-1G, heater guard.

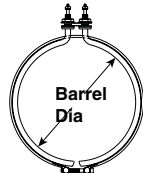




HBA Series



HBT Series



Heated Width



### HBA Series 1 to 6" (3 to 15 cm) Wide One-Piece Nozzle Heaters

- ✓ Nozzle Temps to 1000°F
- ✓ 42" (107 cm) Leads Standard
- ✓ Stainless Steel Clamp Included

Offers Longer Life than mica nozzle heaters.

**Cost less to operate.** Heats up faster and provides more uniform heat distribution. More contact surface than other refractory insulated nozzle heaters.

#### Will not short out from fouling.

The 42" (107 cm) leads are protected by a 36" (91 cm) long closely woven stainless steel sheath. No exposed electrical connections, and element is sealed to prevent entrance of contaminants.

**Easier to install.** Clamp and heater are separate items and may be applied from either side.

**Construction:** A ½ wide x 0.200" thick, Incoloy sheath (max. sheath temperature is 1500°F), magnesium oxide insulated strip heater is tightly spiraled to provide maximum heat transfer to the work. The lead wires are brazed to the heater terminal pins, insulated and covered with heavy duty stainless steel outer braiding to provide mechanical protection.

HBA/HBT Series

### To Order

Watts	Volts	W/In <sup>2</sup>	Barrel Dia. in (cm)	Width	Model No.	Wt. lb (Kg)
275	120	29	1(3)	3 (8)	HBA-103027	0.5 (0.2)
275	120	39	1½(4)	1½(4)	HBA-31427	0.5 (0.2)
350	240	50	1½(4)	1½(4)	HBA-141435	0.5 (0.2)
300	120	32	1½(4)	2 (5)	HBA-32030	0.5 (0.2)
500	240	53	1½(4)	2 (5)	HBA-32050	0.5 (0.2)
200	120	21	1¾(4)	1¾(4)	HBA-161620	0.5 (0.2)
400	120	32	2 (5)	2 (5)	HBA-202040	0.5 (0.2)
200	120	24	2½(5)	1¼(3)	HBA-211220	0.5 (0.2)
400	120	27	2½(5)	2¼(6)	HBA-212240	0.5 (0.2)
800	120	20	2½(5)	6 (15)	HBA-216080	0.5 (0.2)
200	120	22	3¼(8)	7/8(2)	HBA-320820	0.5 (0.2)
200	120	12	3½(9)	1½(4)	HBA-341420	0.5 (0.2)
200	120	16	4 (10)	1(3)	HBA-401020	0.5 (0.2)

### HBT Series 2" (5 cm) Wide Two-Piece Band Heaters

- ✓ Rugged, Premium Quality
- ✓ Stocked for Fast Delivery
- ✓ Barrel Temperature to 900°F
- ✓ Terminal Posts for Power Connection

The HBT series has two matching alloy-sheath (max. sheath temperature is 1200°F) tubular elements and stainless steel matching clamping band, same as the HB series. Elements are flattened for maximum transfer.

Watts	Barrel Dia. in (cm)	Model No.	Wt. lb (kg)
675	3 (8)	HBT-30†	1 (0.5)
925	3¾ (10)	HBT-36†	1 (0.5)
650	4 (10)	HBT-40†	1 (0.5)
750	4½ (11)	HBT-45†	1 (0.5)
1100	4½ (11)	HBT-4411†	1 (0.5)
825	5 (13)	HBT-50†	1.5 (0.7)
950	5½ (14)	HBT-55/*	2 (0.9)
1100	6½ (17)	HBT-65/*	2 (0.9)
1275	7½ (19)	HBT-75/*	2 (0.9)
1425	8½ (22)	HBT-85/*	2 (0.9)
1550	9½ (24)	HBT-95/*	2.5 (1.1)
2000	12 (30)	HBT-120/*	3 (1.4)

† The two 120V elements must be wired in series for 240V.

/\* Specify voltage, insert "120" for 120V or "240" for 240V.

Terminal box, hermetic seals, and flexible leadwire with stainless steel overbraiding are available.

Ordering Example: HBT-55/120 950 watt heater, 120 Vac

# MINERAL INSULATED ONE-PIECE NOZZLE HEATERS

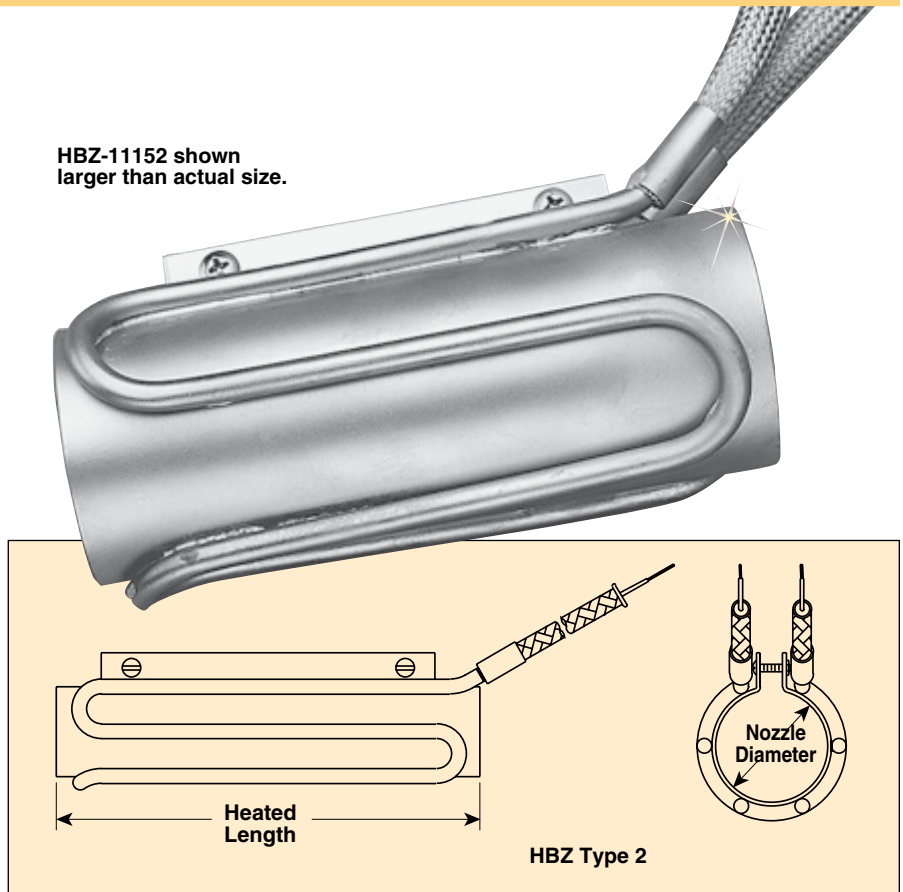
## HBZ Series

HBZ-11152 shown larger than actual size.

- ✓ Reliable, Heavy Duty
- ✓ Stocked for Fast Delivery
- ✓ Sheath Temperatures to 1600°F
- ✓ Nozzle Temperatures to 1000°F
- ✓ 14" (35.5 cm) Leads Standard

## FEATURES

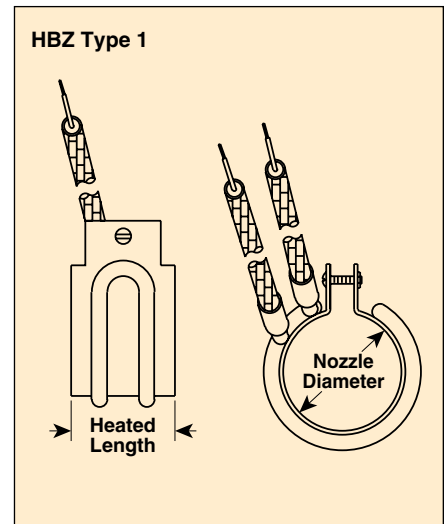
Fast heatup and uniform heat distribution is provided by small-diameter tubular element properly located and silver brazed to stainless-steel band. Heater is slipped over nozzle and integral tabs are drawn tight by stainless steel bolts and nuts. Leads are protected by stainless steel braided cable to prevent contamination by overflow of plastic or other free-flowing materials.



**CAUTION AND WARNING!**  
Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover

To Order						
Watts	Volts	Nozzle Dia. in.(cm)	Length in.(cm)	Model No.		Wt. lb (Kg)
<b>Type 1</b>						
275	120	1½ (4)	1½ (4)	<b>HBZ-11152</b>		0.5 (0.2)
150	120	1¾ (4)	1½ (4)	<b>HBZ-11151</b>		0.5 (0.2)
200	120	1¾ (4)	1¾ (4)	<b>HBZ-11162</b>		0.6 (0.3)
400	120	2 (5)	2 (5)	<b>HBZ-12204</b>		0.7 (0.3)
200	120	2 ⅛ (5)	2¼ (6)	<b>HBZ-2X56</b>		0.7 (0.3)
400	120	2 ⅛ (5)	2¼ (6)	<b>HBZ-12224</b>		0.8 (0.4)
200	120	3½ (9)	1½ (4)	<b>HBZ-3X29</b>		1.0 (0.5)
350	240	1½ (4)	1½ (4)	<b>HBZ-1X70</b>		0.5 (0.2)
200	240	2½ (6)	1 (3)	<b>HBZ-12102</b>		0.5 (0.2)
<b>Type 2</b>						
275	120	1¼ (3)	3 (8)	<b>HBZ-21302</b>		1.0 (0.5)
500	120	1½ (4)	5 (13)	<b>HBZ-2105</b>		1.2 (0.5)
600	120	2 ⅛ (5)	3¾ (10)	<b>HBZ-2X88</b>		1.3 (0.6)
800	120	2 ⅛ (5)	6 (15)	<b>HBZ-2208</b>		1.5 (0.7)
800	120	3¼ (8)	7½ (19)	<b>HBZ-2308</b>		2.0 (0.9)

Thermocouple holes, plugs, and extended leadwire and braid are available.  
Ordering Example: **HBZ-11152**, 275 watts, 120V, one-piece nozzle heater.



# LONG-LIFE BAND HEATERS

## 1½" (4 cm) Wide Two-Piece Band Heaters

- ✓ Premium Quality
- ✓ Rugged Construction
- ✓ Sheath Temperature to 1200°F
- ✓ Barrel Temperature to 800°F
- ✓ Terminal Posts for Power Connection

HB Series band heaters are used to heat the barrels and nozzles of plastic injection molders and extruders. They are also used on autoclaves and for heat treating large diameter piping.

Heater elements are high temperature, tight fitting, and provide uniform heat distribution. These elements are made from a pair of formed OMEGALUX® PT series 240V mineral insulated strip heaters with chrome steel sheath. Complete firm coverage at all times is assured by slip proof, stainless steel clamping bands equipped with heavy threaded socket bolt; this allows the pair of elements to be drawn tight to heated surface. The hotter it gets the tighter it fits. Because clamps cannot loosen or slip off heater, heat transfer is continuously efficient, adding to heater life.

Adjacent HB Series heaters of equal wattage may be wired in series on 480V or connected in multiples of three of 240 or 480V, 3 phase.

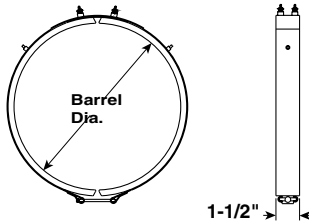
### OPTIONAL ACCESSORIES

**Terminal Cover**—sheet metal box that fully encloses the terminals and guards against spillovers, dripping, grounding, or short circuits. To order, suffix part number with “/ Terminal Cover” for an additional cost.

**Ceramic post terminal insulators, one set**—Use with insulated wire to protect against electrical shock... to wire several heaters where Bx or conduit is not required. Wires can leave heater terminals at any angle. For use with #10-32 thread. To order, part number **H-TP**, for an additional cost.

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.



### To Order

1½" (4 cm) Wide, 240V

Watts	Barrel Dia. In. (cm)	Model No.	Wt. lb (kg)
750	5 (13)	HB-5075	1.5 (0.7)
800	5¼ (13)	HB-5080	1.75 (0.8)
600	5½ (14)	HB-5460	1.75 (0.8)
1500	5½ (14)	HB-5415	1.75 (0.8)
400	6 (15)	HB-6040	2 (0.9)
750	6 (15)	HB-6075	2 (0.9)
1000	6½ (17)	HB-6410	2 (0.9)
1000	7 (18)	HB-7010	2 (0.9)
900	7½ (19)	HB-7490	2.25 (1)
1250	7½ (19)	HB-7412	2.25 (1)
1500	7¾ (20)	HB-7715	2.25 (1)
900	8 (20)	HB-8013	2 (0.9)
1400	8 (20)	HB-8014	2.25 (1)
1565	8½ (22)	HB-8415	2.3 (1)
1100	9 (23)	HB-9015	2.5 (1.1)
1710	9¼ (23)	HB-9217	2.5 (1.1)
1300	9½ (24)	HB-9413	2.75 (1.2)
1600	9½ (24)	HB-9416	2.75 (1.2)
1800	10 (25)	HB-1018	3 (1.4)
2600	10¼ (26)	HB-10226	3 (1.4)
1200	10½ (27)	HB-10415	3 (1.4)
2025	11 (28)	HB-1120	3.25 (1.5)
1200	11½ (29)	HB-11412	3.25 (1.5)
1700	11½ (29)	HB-11417	3.25 (1.5)
1500	12½ (32)	HB-12416	3.5 (1.6)
1800	13½ (34)	HB-13418	3.75 (1.7)
1200	14 (36)	HB-1412	3.9 (1.8)
2500	14 (36)	HB-1425	3.9 (1.8)
2500	15½ (39)	HB-15425	4 (1.8)
2500	17 (43)	HB-1725	4.2 (1.9)
2500	17½ (44)	HB-17425	4.3 (1.9)
3000	20 (51)	HB-2030	4.5 (2)

Mineral insulated band heaters are available in other sizes and ratings. Mica insulated band heaters are also available.

Ordering Example: HB-1120, 2025 watts, 240V band heater.

# CEAMIC INSULATED STRIP HEATERS

## HCS Series



HCS-055-120V  
shown actual size.

### APPLICATIONS

- ✓ Dies
- ✓ Molds
- ✓ Plastic Forming and Sealing
- ✓ Tank and Kettle Heating

(For specific applications, correctly rated elements should be used to prevent overheating and to ensure long life)

### FEATURES

The HCS Series stainless steel strip heaters provide clean, dependable heat with sheath temperatures up to 649°C (1200°F) and watt densities up to 40 W per square inch. Because of the seamless stainless steel sheath, these ceramic-insulated strip heaters are dimensionally stable in milled slots.

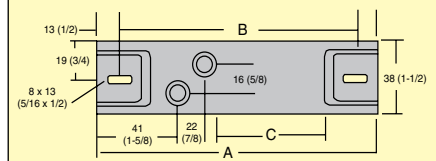
### Formula for Determination of Watt Density

$$\text{Watts/sq. in.} = \frac{\text{Total unit wattage}}{C \text{ (heated length)} \times 3}$$

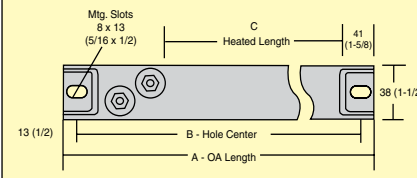
### Standard Termination

Offset at one end

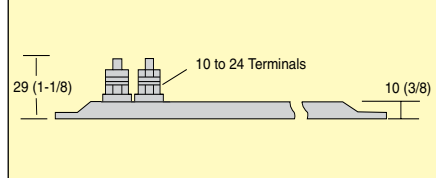
Dimensions: mm (inch)



Dimensions: mm (inch)



Dimensions: mm (inch)



### CONSTRUCTION

1. Seamless stainless steel sheath
2. Post terminals
3. Ceramic element support
4. Element wire situated close to outside surface for maximum heat transfer and minimum internal temperature while preserving good dielectric qualities
5. Magnesium oxide packing

### Tolerances

Width: 1.500" ±0.010"

Length:

Up to 24": ±1/16"

24" and Over: ±1/8"

Thickness: 0.375" ±0.005"

Wattage Tolerances:

-10 to 5% at rated voltage

### To Order

Model No.	Description	Watts	Dimensions: mm (inch)		
			A	B	C
HCS-055-120V	Strip heater	150	140 (5.5)	114 (4.5)	25.4 (1)
HCS-055-240V	Strip heater	150	140 (5.5)	114 (4.5)	25.4 (1)
HCS-080-120V	Strip heater	250	203 (8)	178 (7)	70 (2.75)
HCS-080-240V	Strip heater	250	203 (8)	178 (7)	70 (2.75)
HCS-081-120V	Strip heater	330	203 (8)	178 (7)	70 (2.75)
HCS-081-240V	Strip heater	330	203 (8)	178 (7)	70 (2.75)
HCS-105-120V	Strip heater	300	267 (10.5)	241 (9.5)	133 (5.25)
HCS-105-240V	Strip heater	300	267 (10.5)	241 (9.5)	133 (5.25)
HCS-120-120V	Strip heater	500	305 (12)	279 (11)	184 (7.25)
HCS-120-240V	Strip heater	500	305 (12)	279 (11)	184 (7.25)
HCS-121-120V	Strip heater	750	305 (12)	279 (11)	184 (7.25)
HCS-121-240V	Strip heater	750	305 (12)	279 (11)	184 (7.25)
HCS-152-120V	Strip heater	500	387 (15.25)	362 (14.25)	254 (10)
HCS-152-240V	Strip heater	500	387 (15.25)	362 (14.25)	254 (10)
HCS-180-120V	Strip heater	750	457 (18)	432 (17)	324 (12.75)
HCS-180-240V	Strip heater	750	457 (18)	432 (17)	324 (12.75)
HCS-181-120V	Strip heater	1250	457 (18)	432 (17)	324 (12.75)
HCS-181-240V	Strip heater	1250	457 (18)	432 (17)	324 (12.75)
HCS-237-240V	Strip heater	1000	603 (23.75)	578 (22.75)	470 (18.5)
HCS-300-240V	Strip heater	2000	762 (30)	737 (29)	629 (24.75)
HCS-357-240V	Strip heater	2500	908 (35.75)	883 (34.75)	775 (30.5)

Comes complete with operator's manual.

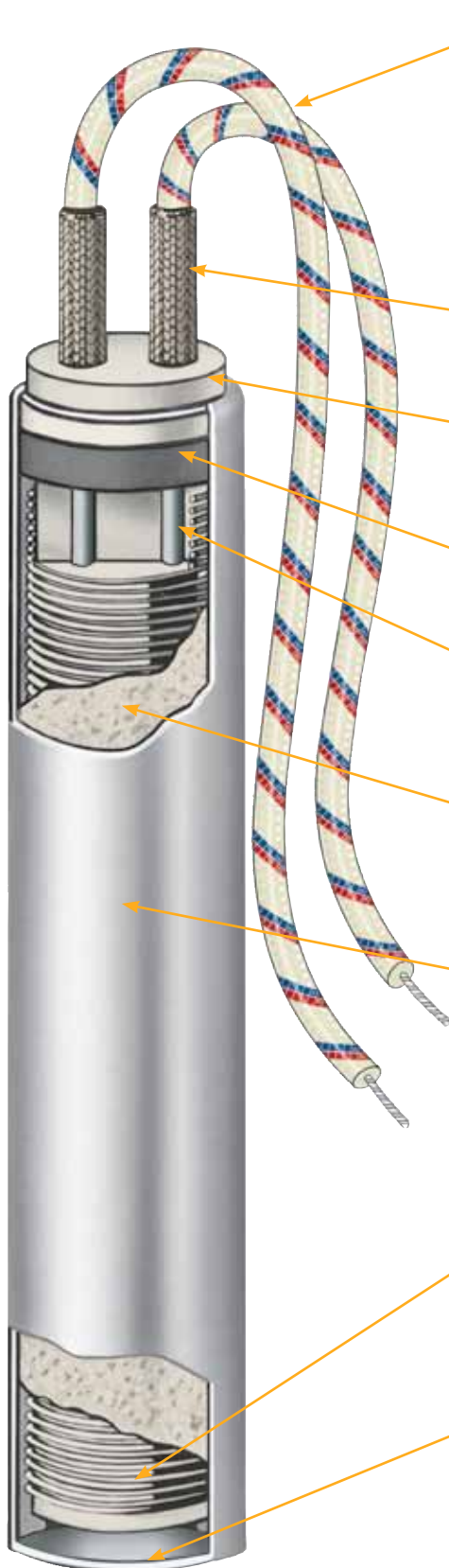
Ordering Examples: HCS-080-120V, strip heater, 250 W.

HCS-180-120V, strip heater, 750 W.



## Hi-Density Cartridge Heaters

### Features



The standard termination for Hi-Density Cartridge Heaters is Type N, 254 mm (10") long nickel conductor lead wires externally connected to 32 mm (1¼") solid conductor terminal pins. The lead wires have fiberglass insulation and are UL approved for temperatures up to 250°C (482°F).



**Note:** To meet the requirements of your application we offer over 40 standard termination styles to select from that will solve many of the most common application problems.

High temperature fiberglass sleeve provides maximum electrical insulation to the crimp connector used to splice the nickel conductors to the flexible leads.

Ceramic end cap prevents nickel conductors from shorting out against sheath when sharp bending of the leads is required. The ceramic cap may be eliminated in some cases to optimize the heater watt density.

Ceramic end cap and swaged-in lava plug protect the internal cartridge from outer contamination. Other types of seals can also be provided.

Solid conductor terminal pins are used to ensure a good electrical connection between the nickel conductor lead wires and the resistance wire. They are sized for the maximum current rating of the heater.

Specially selected grain size high purity Magnesium Oxide (MgO) is used to fill all remaining space inside the sheath. Heater is then swaged, which compacts the magnesium oxide grains into a solid mass, thereby increasing thermal conductivity and dielectric strength.

Standard sheath material is 321 Stainless Steel. It provides high temperature strength up to 650°C (1200°F), good thermal conductivity, and resistance to corrosion and scaling. Alloy 321 is a Nickel-Chromium Stainless Steel modified with the addition of Titanium. For higher operating temperatures up to 760°C (1400°F) or corrosive immersion heating applications, Incoloy® 800 is available. Consult OMEGA for other sheath materials.

Grade "A" Nickel-Chrome resistance wire precisely wound on a high purity magnesium oxide core places the resistance wire as close to the inside of the sheath as possible while maintaining dielectric strength. This provides excellent heat transfer and long heater life with the highest possible watt densities.

Welded end disc made from the same material as the sheath provides a positive seal against moisture and other contaminants.

## **OMEGA Offers the Most Comprehensive and Diverse Selection in Hi-Density Cartridge Heaters**

### **Typical Applications**

- Plastic Extruders
- Hot Runner Molds
- Hot Stamping
- Medical Equipment
- Packaging Equipment
- Molds
- Aerospace
- Sealing Bags
- Semi-Conductor
- Plastic Molding
- Shoe Machinery
- Food Processing
- Heating Gases and Liquids
- Glue Guns
- Laminating Presses
- Platens
- Scientific Equipment
- Food Service Equipment

### **Hi-Density Cartridge Heaters Provide Maximum Processing Temperature Capability**

- Higher watt densities permit smaller heaters to be used without sacrificing life expectancy. This results in up-front as well as long-term cost savings.
- Swaged construction provides maximum support for the resistance wire and excellent heat transfer characteristics, improving the overall life expectancy of the cartridge heater.
- Termination styles and special features allow customization to any application.
- Applications up to 760°C (1400°F)

### **Hi-Density Cartridge Heaters are Classified in Two Distinct Categories**

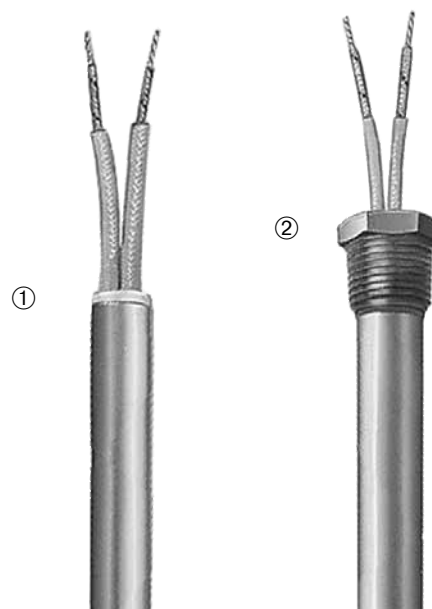
#### **Multi-Purpose Use**

The multi-purpose use cartridge heaters represent OMEGA's commitment to value-added customer service as we maintain in stock over 65,000 semi-finished hi-density cartridge heater substrates, offering a combination of over 1000 sizes in industry standard diameters and lengths ranging from 25.4 mm (1") to 914.4 mm (36") in a complete spectrum of wattages and operating voltages. Multi-purpose use cartridge heaters are the solution for a multitude of original equipment manufacturers (OEMs) or maintenance (MRO) applications.

Available through the terminator program. Complete details are found on page 8.

### **Hi-Density Cartridge Heaters Have Evolved and Today Offer a Multitude of Diverse Product Options:**

1. (HDC) A hi-density cartridge heater in US sizes.
2. (HDL) A hi-density cartridge heater designed with NPT Fittings for Immersion heating.



#### **Highly Engineered Specific Purpose Use**

OMEGA has been at the forefront of addressing the challenges of Original Equipment Manufacturers (OEMs) in a broad segment of diversified industries. As a company we are uniquely qualified and committed to providing value-added expertise in engineering and manufacturing capabilities assisting customers in developing highly engineered specific use cartridge heaters for dependable and reliable performance. Let us provide the optimal solution to your thermal loop system and cartridge heater design challenges.

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



## Hi-Density Cartridge Heater Specifications

### Standard Specifications

#### Performance Ratings

**Maximum Temperature:** 760°C (1400°F)

**Maximum Watt Density:** 15.5 to 46.5 watt/cm<sup>2</sup>  
(100 to 300 Watt/in<sup>2</sup>) depending on heater size and operating temperature

**Note:** The maximum operating temperature and the life expectancy of a cartridge heater is dependent on two main factors:

1. The maximum recommended sheath temperature [648°C (1200°F) for a standard heater]
  2. The maximum ambient temperature for the termination selected.
- Consult OMEGA if you require a recommendation for your application.

#### Length Tolerance for Lead Wires, Wire Braid Leads, and Armor Cable Leads:

**Up to 914 mm (36"):** -12.7, 25.4 mm (-½, 1")

**914 to 1829 mm (36 to 72"):**  
25.4, 50.8 mm (-1, 2")

**Above 72":** 101.6 mm (±4")

### Dimensional Specifications

Nominal Diameter	1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
Actual Diameter	3.10 (0.122)	6.25 (0.246)	7.82 (0.308)	9.42 (0.371)	12.60 (0.496)	15.77 (0.621)	18.95 (0.746)	23.30 (0.996)
Diameter Tolerance	0.051 (±0.002)	0.051 (±0.002)	0.051 (±0.002)	0.051 (±0.002)	0.051 (±0.002)	0.051 (±0.002)	0.076 (±0.003)	0.076 (±0.003)
Minimum Length	31.8 (1.25)	25.40 (1)	25.40 (1)	25.40 (1)	25.40 (1)	25.40 (1)	31.75 (1¼)	44.45 (1¾)
Maximum Length	305 (12)	914 (36)	914 (36)	1219 (48)	1219 (48)	1829 (72)	1829 (72)	1829 (72)
Length Tolerance Heaters up to 127 mm (5") long	2.4 (±3/32)	2.4 (±3/32)	2.4 (±3/32)	2.4 (±3/32)	2.4 (±3/32)	2.4 (±3/32)	3.2 (±1/8)	3.2 (±1/8)
Length Tolerance Heaters over 127 mm (5") long	±2% of sheath length							
Camber Tolerance Heaters to 305 mm (12") long	0.254 mm (0.010") per foot of length							
Camber Tolerance Heaters over 305 mm (12") long	0.508 mm (0.020") per foot of length							

A certain amount of camber is unavoidable. With a slight force, hi-density cartridge heaters will flex enough to fit into a straight reamed hole.

### Electrical Specifications

Nominal Diameter	1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
Maximum Voltage	240	240	240	240	240	480*	480*	480*
Maximum Amperage (see next line for exceptions)	3.0	4.4	4.5	6.7	10.5	23	23	23
†Maximum Amperage for Types C1C, C1D, C2C, C2D, CS, F, M3, R1B, S1, S2, SA, W and W3 Terminations	—	3.0	3.0	5.5	7.6	9.7	9.7	9.7
Minimum Wattage at 120V on a 1" long Heater	—	50	45	45	50	50	—	—
Minimum Wattage at 120V on a 2" long Heater	5	20	20	20	20	20	20	20
Maximum Wattage at 120V	360	525	540	800	1260	2760	2760	2760
Maximum Wattage at 240V	720	1050	1080	1600	2520	5520	5520	5520
Maximum Wattage at 480V	—	—	—	—	—	11,000	11,000	11,000
Wattage Tolerance	+10, -15%		Plus 5%, minus 10%					
Resistance Tolerance	+15, -10%		Plus 10%, minus 5%					

†Current carrying capacities are for ambient temperatures up to 250°C (482°F) with mica insulated lead wires.

\*480V when applicable. Consult OMEGA.

#### Temperature Coefficient of Resistance

The electrical resistance (ohms) of the heater resistance wire increases with temperature rise.

OMEGA standard hi-density cartridge heaters are manufactured with ohms (cold ohms) 3.3% lower than the actual calculated ohms (hot ohms) to compensate for this increase.



**Note:** Specifications detailed on this page are standard. Consult OMEGA if your application requires tighter tolerances or has other special requirements

### Available Electrical Features

Diameter	Dual Volts	3-Phase	Dual Circuits	Multiple Heat Zones (maximum 3 zones)
1/8"	No	No	No	No
1/4"	No	No	No	No
5/16"	No	No	No	No
3/8"	Yes*	No	No	Yes*
1/2"	Yes*	Yes	Yes	Yes*
5/8"	Yes	Yes	Yes	Yes
3/4"	Yes	Yes	Yes	Yes
1"	Yes	Yes	Yes	Yes

Consult factory for maximum wattages and voltages

\*Heaters may require a larger diameter transition area at lead end

## Recommendations for Improving the Life of Hi-Density Cartridge Heaters

Hi-density cartridge heaters have been widely used in many demanding and diverse applications since 1972. The commonly used basic applications are platen, plastic mold and die heating, liquid immersion and air heating.



**Note:** Selection of the wrong termination for a particular application is the primary reason for all heater failures. However, failure to consider other important criteria can also have a negative effect on the life of the heater. To get the best performance and assure long life, it is important to carefully evaluate the following factors.

### Operating Temperature

Operating temperature of a heater is a major factor in determining the life expectancy of a heating element. The heater life depends on the actual temperature of the resistance wire within the heater and not on the process operating temperature. The graph in Figure 1 demonstrates the proper relationship between operating temperature and watt density; the higher the operating temperature, the lower the maximum recommended watt density.

### Heater Watt Density

Cartridge heater watt density is defined as the wattage dissipated per square inch of the heated sheath surface. For a particular application a heater's watt density governs internal resistance wire temperature, which determines the outer sheath temperature. These factors are critical to the proper heating of the application and to the life expectancy of the heater. Special construction features that promote excellent heat transfer permit Hi-Density Cartridge Heaters to operate at higher watt densities while maintaining the lowest possible resistance wire temperatures of any style cartridge heater.

Heater watt density (watts/in<sup>2</sup>) is calculated using the following formula:

$$\text{Watt Density} = \frac{\text{Heater wattage}}{\text{Heated length} \times \text{Heater diameter} \times 3.1416}$$

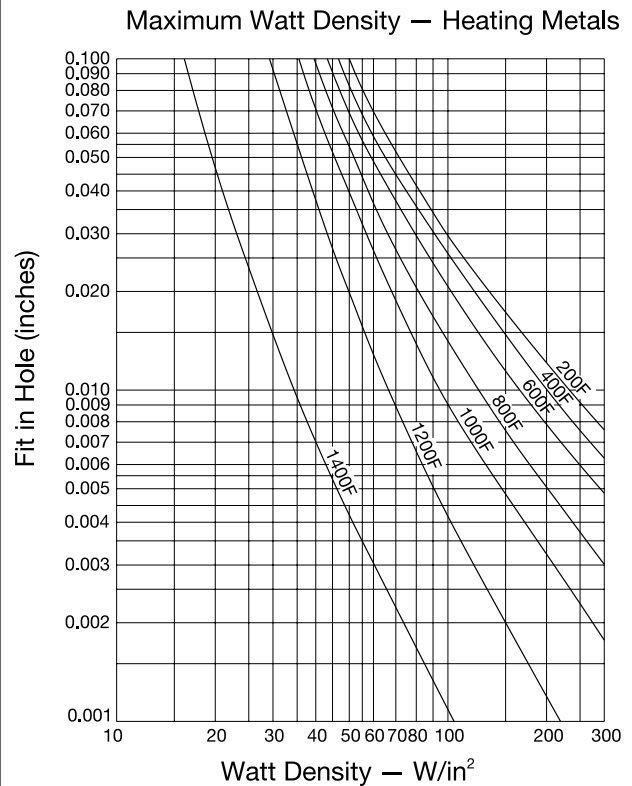
Heated length is the overall length of the heater minus any unheated (cold) sections. Standard Type N, Hi-Density cartridge heaters have 10 mm (3/8") at the lead end and 6 mm (1/4") at the disc end unheated. This would mean a 152 mm (6") long heater would have 265 mm (5 3/8") effective heated length. Unheated sections vary with type of heater termination.

The graph in Figure 1 shows the maximum recommended watt density for hi-density cartridge heaters when used in a steel platen. Watt density limitations for various materials are given in the engineering section of this catalog. For liquid immersion heaters the maximum watt density depends on the type of liquid being heated. The more viscous, or thicker the liquid, the lower the maximum watt density. Higher watt density can cause the liquid to carbonize and accumulate on the heater sheath, which will cause premature heater failure. It is advisable to use heaters that have watt densities below the maximum recommended watt density to get the longest heater life. If the actual heater watt density is close to the maximum recommended watt density, you can correct the problem by:

1. Increasing the number, diameter and length of heaters.
2. Lowering the total wattage; however, this may increase the heat-up time.
3. Obtaining tighter fit (see Figure 2 — Determining Fit).

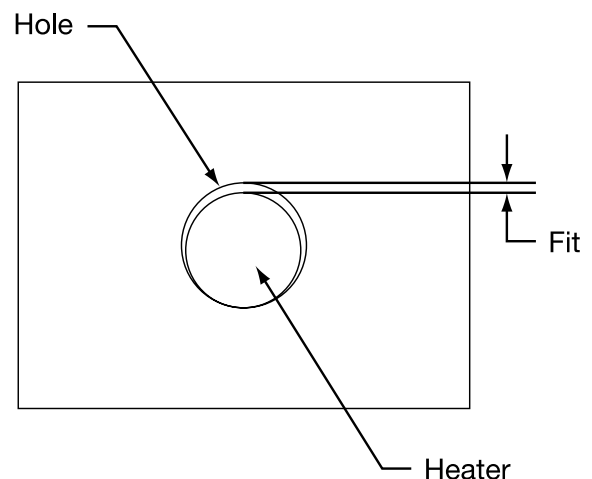
A hi-density cartridge heater designed at the maximum recommended watt density allows the smallest heater to be used to obtain the required wattage with good service life. All things being equal, using a lower watt density heater will typically provide optimized service life.

**Figure 1**  
Recommended Watt Density for Heating Metal Parts



The graph shows the recommended maximum watt density for OMEGA Hi-Density cartridge heaters at different operating temperatures and fit, when the heater is installed in an oxidized mild steel block. The thermocouple is located 13 mm (1/2") from the heater. When heating other materials, the data needs to be extrapolated based on the thermal conductivity of the material. Consult OMEGA with your requirements.

**Figure 2**  
Determining Fit







## Recommendations for Improving the Life of Hi-Density Cartridge Heaters (Continued)

### Determining Fit

When heating a platen, mold, die or hot runner probe with hi-density cartridge heaters inserted into drilled holes, fit is an important factor in determining the life expectancy of the heater. Fit is the difference between the minimum diameter of the cartridge heater and the maximum diameter of the hole. Unheated sections on a hi-density cartridge may be smaller in diameter due to swaging. To determine fit, use the smallest diameter on the heated length only.

**Example:** A 10 mm ( $\frac{3}{8}$ " nominal OD Hi-Density cartridge heater has an actual diameter of 9 mm (0.371")  $\pm 0.002$ , which translates to a minimum diameter of 9 mm (0.369"). If used in a 10 mm (0.376")  $\pm 0.002$  hole, the fit would be 0.23 mm (0.009")  $10 - 9 \text{ mm} = 23 \text{ mm}$  (0.378" - 0.369" = 0.009").

When medium watt density heaters (less than 60 watts per square inch) are used in low temperature applications [less than 315°C (600°F)] general purpose drills are commonly used to drill holes. The typical hole size may be 0.1 to 0.2 mm (0.003 to 0.008") over the drill size. For higher watt density and/or higher temperature applications, we recommend that the holes are drilled and reamed for the tightest possible fit. In applications where precise temperature control and heat transfer properties are required, hi-density cartridge heaters can be centerless ground to  $\pm 0.01 \text{ mm}$  ( $\pm 0.0005$ ").

Although a tighter fit is desirable to efficiently transfer heat and to get long heater life, a looser fit will aid in installing and removing heaters, especially long heaters. We recommend that you apply BNS anti-seize cartridge heater coating as it will improve heat transfer and will make the removal of heaters easier.

The graph in Figure 1 (page 4) shows the effect of fit in determining the maximum recommended watt density on a steel platen. As it is indicated in the graph, the tighter the fit, the higher the maximum recommended watt density.

### Temperature Control and Location of Temperature Sensing Device

In order to better control the heater temperature and hence the resistance wire temperature, use of an appropriate temperature control and the proximity of the heater to the sensor is very important. The graph in Figure 1 (page 4) shows the effect of operating temperature in determining the maximum recommended watt density on a steel platen where the sensor is located 13 mm ( $\frac{1}{2}$ " from the heater. Higher watt density heaters can generate heat faster than the surrounding area's ability to dissipate heat. This creates a thermal lag between the heater and the sensor. The closer the sensor to the heater, the better you can control the heater temperature. By keeping the sensor further from the heater, temperature gradients of several hundred degrees can be observed in many applications, especially during initial start-up and heavy thermal cycling. Although the set operating temperature may be low, the heater may be running at a very high temperature. This is a common cause of heater failure. This can be minimized using time proportional and PID functions of the temperature controllers.

### Power Control

Power control methods affect the life expectancy of heating elements. In general, although economical, on-off controls increase thermal fatigue and oxidation rate on heating elements by causing wide temperature swings of the internal heating element. Silicon controlled rectifiers (scrs), mercury relays and solid state power controls can increase the life expectancy of heating elements by reducing the temperature swings of the internal heating element.

## Common Causes of Cartridge Heater Failures

### Contamination

Contamination is a major cause of heater failure. Moisture, hydraulic oils, and melted plastic are the most common contaminants that are seen on failed heaters. Since the magnesium oxide insulation in a hi-density heater is hygroscopic in nature, moisture is easily absorbed into the heater and typically results in premature heater failure. Moisture absorption during machine washdown or cleanup also is a frequent problem. These contaminants, which are electrically conductive, will short out the heater. Most probably, the failures will be at the lead end of the heater and in some cases can split or blow a hole on the heater sheath. The disc end of a Hi-Density cartridge heater is welded shut with a stainless steel disc.

Generally, contaminants enter the heater through the lead end of the heater. The high temperature lead wires used on Hi-Density heaters have fiberglass or mica insulation. Oil and moisture can wick through the insulation on the lead wire into the heater. OMEGA offers a wide variety of terminations to avoid this problem, including epoxy seals, PTFE seals, convoluted cables, welded end discs, PTFE insulated lead wires and SJO cable. However, there are temperature limitations on many of these terminations.

### Excessive Flexing of Leads

Hi-Density heaters use flexible grade A nickel stranded lead wires with fiberglass or mica insulation. On certain terminations the lead wires are connected externally to solid nickel conductor pins. In applications where there is excessive movement or vibration, the solid pins could break due to fatigue. A simple solution is to give enough slack on the leads to minimize the stress on the solid pins or provide an internal lead wire connection within the heater. OMEGA also offers strain relief brackets and springs to prevent this problem.

Where heater leads can wear out by abrasion due to excessive flexing of the leads, OMEGA offers several abrasion resistant terminations.

### Lack of Heat Sink

Hi-Density heaters are designed with minimum unheated (cold) sections. If the heated sections project from the platen or mold, these sections will get extremely hot due to lack of heat transfer. This will lead to premature heater failure. OMEGA can manufacture heaters with cold sections anywhere along the length of the heater to prevent overheating of the heater sheath.

When a hi-density heater is used as a liquid immersion heater, make sure the heater's sheath length is completely immersed in the liquid. The heater lead end should not be immersed in liquid, since most of the lead end seals are only moisture resistant, not moisture proof.



**Note:** If you should encounter premature cartridge heater failure, consult OMEGA. Our team of professionals will have the solution to your problem.



## Recommendations for Improving the Life of Hi-Density Cartridge Heaters (Continued)

### High Operating Temperature

OMEGA hi-density heaters are designed to operate at sheath temperatures up to 760°C (1400°F). When process temperatures approach the maximum heater sheath temperature, make sure the sheath temperature doesn't exceed its limitations. Location of the thermocouple and the type of temperature and power controls are factors that affect sheath temperature and potential overshoot conditions.

Although the heater is designed to run at temperatures up to 760°C (1400°F), heater lead wires and terminations are rated for much lower temperatures. Care should be taken to make sure that the heater lead end temperatures do not exceed their limitations. Heaters can be made longer with unheated sections at the lead end to bring the lead end out of the high temperature area. OMEGA can also provide you with a high temperature wiring harness, which can withstand temperatures up to 760°C (1400°F).

### Wattage Rating

Heaters with very high wattage ratings can create temperature overshoots, uneven temperature distribution and high heater sheath temperatures, causing premature heater failure.

For liquid immersion heaters, maximum watt density depends on the type of liquid being heated. The heavier or thicker the liquid, the lower the maximum watt density. Higher watt density can cause the liquid to carbonize and accumulate on the heater sheath, which will cause premature heater failure.

### Scale and Sludge Buildup

In liquid immersion applications, periodic cleaning of the heater sheath is necessary to remove any scale buildup on the sheath. Scale can accumulate on the sheath and cause the heater to overheat and fail. When used to heat liquid in a tank, be sure to clean any sludge from the bottom of the tank. A heater sheath covered with sludge will overheat and fail.



**Note:** As explained in the above paragraphs, the single major cause for cartridge heater failure is the selection of the wrong type of heater lead end termination for the specific application. To assist you in selecting the right termination type, see section of detailed descriptions of over 40 terminations designed to solve many of the common application problems. If you need further assistance, consult OMEGA.

### Important Installation Considerations

1. For closest fit and best heat transfer, use reamed holes.
2. When possible, drill holes through the object being heated. This will make heater removal easier.
3. When using an anti-seize coating like BNS spray or paste, do not apply over lead wires or any other current carrying conductors.
4. When using insulated tape or sleeving, check to make sure it is rated for the temperature of the application. Lower temperature rated materials can contain an adhesive or binder that can carbonize and become electrically conductive.
5. When using heaters near their maximum recommended watt density, it is recommended that the temperature sensing probes be at maximum 13 mm (½") from the heater sheath.
6. Lead wires should not be located in the hole containing the cartridge heater during operation. This may cause the lead wires to be exposed to temperatures above their rated temperature.
7. When used in a vacuum application, make sure the lead end of the heater is outside the vacuum. If the lead has to be in the vacuum, consult OMEGA for specific recommendations.
8. Many applications will subject a heater's electrical terminations to one or more of the following potentially damaging conditions:

- Moisture
- Oil and other contaminants
- Flexing
- Abrasion
- High temperature



**Note:** To protect the heater from damage in these harsh environments, OMEGA has a wide selection of terminations and options available.

### BNS Anti-Seize Cartridge Heater Coating

This high temperature, electrically insulating and thermally conductive coating will minimize oxidation and improve heat transfer from heater to the object being heated.

Brush a thin layer of paste or spray lightly over the cartridge heater prior to inserting the heater into a hole.



**CAUTION!** Do not apply over lead wires or other bare current carrying conductors, since the water in the paste and spray can cause an electrical short circuit.



13 oz.  
Aerosol spray can  
Part Number:  
CML00010

- Temperature Range 1562°F (850°C)
- High Heat Transfer



4 oz. Paste with  
brush applicator top  
Part Number: CML00020

- Temperature Range 1562°F (850°C)
- High Heat Transfer



**Note:** Formulated to assist in the removal of cartridge heaters.



## Custom Terminated Multi-Purpose Use Cartridge Heaters from the Terminator Program

OMEGA stocks over 1000 different semi-finished hi-density cartridge heaters in diameters 6, 8, 10, 13, 16, and 19 mm (1/4, 5/16, 3/8, 1/2, 5/8 and 3/4").

These cartridge heaters are semi-finished (substrates), offering you the option to finish them by choosing from 19 program-qualified lead end terminations and options. Cartridge heaters will be ready for shipment within 1 to 3 days, depending on the termination/option selected.

### Ordering Information — Follow These Simple Steps

1. Select an available 6 mm (1/4") through 19 mm (3/4") hi-density cartridge heater. The model numbers in the tables are for heaters with termination type N [254 mm (10") long externally connected lead wires].

2. Refer to the program-qualified lead terminations reference photos to select the cartridge heater termination type best suited for your application.

**NOTE:** Type "N" [254 mm (10") long externally connected plain lead wires] is the most common termination applied in the Terminator program. If a termination other than Type N is selected a new permanent part number will be assigned when your order is placed.

3. Specify your lead requirements in the event that the standard supplied lengths for Plain Leads 254 mm (10"), braid or armor cable [254 mm (10") over 305 mm (12") leads] are not suited for your application.

4. Specify the quantity.

### Terminations

Type N  
Standard Leads



Type B  
Ceramic Bead Insulation



Type BL  
Ceramic Bead and Leads



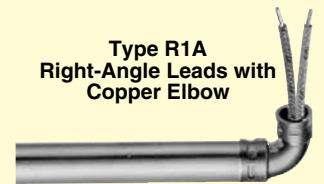
Type C1A & C1B only  
Straight Armor Cable



Type C2A & C2B  
Right-Angle Armor  
Cable with Copper Elbow



Type R1A  
Right-Angle Leads with  
Copper Elbow



Type W  
Straight Wire Braided Leads



Type M2A & M2E  
Potted Lead End Seal  
(Cement Only)



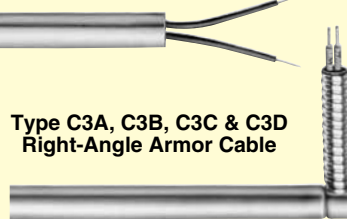
Type CMB & CMP  
Single Threaded Fitting



Type W1A & W1B  
Right-Angle Wire  
Braided Leads



Type C3A, C3B, C3C & C3D  
Right-Angle Armor  
Cable

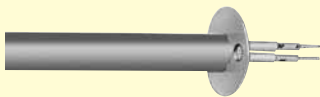


Type R2A & R2B  
Right-Angle Leads



### Options

Type MFR  
Mounting Flange Round



Type LR  
Locating Ring



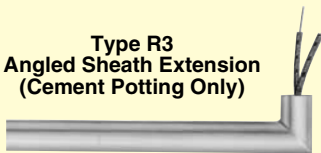
Type PS  
Pull Strap



Type P  
Quick Disconnect Plug



Type R3  
Angled Sheath Extension  
(Cement Potting Only)



Type E1  
General Purpose Box



Type GL  
Ground Lead Sheath



Complete specifications and details on these terminations can be found at [omega.com](http://omega.com).

### Custom Engineered/Manufactured Hi-Density Cartridge Heaters

Because cartridge heaters can be very application specific, consult OMEGA with your special requirements. For sizes, electrical ratings and any other design features required but not listed in the catalog, OMEGA will custom engineer and manufacture to your specifications.

**Consult OMEGA with Your Requirements. We Welcome Your Inquiries.**

## Hi-Density Cartridge Heaters with 321 Stainless Steel Sheath 3/8" (9.525 mm) Nominal Diameter

HDC00125



3/8" Diameter Hi-Density Cartridge Heaters

[See All Models Below](#)

★★★★★

[Be the first to review this product](#)



**QUICK SHIP**

- Watt Densities of 20 W/in<sup>2</sup> to 340 W/in<sup>2</sup> Provide Maximum Process Temperature Flexibility.
- Standard 321 Stainless Steel Sheath Material Provides High Temperature Strength, Good Thermal Conductivity and Resistance to Corrosion and Scaling.
- Swaged Construction Provides Excellent Heat Transfer and High Dielectric Strength.
- U.L. Component Recognized.
- CSA Certified.
- Applications up to 565°C (1050°F) Working Temperature.
- Maximum Sheath Temperature 650°C (1200°F)\*.
- Standard Sheath Lengths 25.4 cm (1") to 610 mm (24")
- 120V and 240V Models
- Over 40 Termination Styles and Special Features.

\*Incoloy® 800 Sheath Material Available on Special Order for Applications up to 760°C (1400°F).

[Cartridge Heaters - View related products](#)

### Description

Hi-Density Multi-Purpose cartridge heaters represent OMEGA's commitment to value-added customer service. OMEGA maintains over 65,000 semi-finished hi-density cartridge heater substrates in stock, offering a combination of over 1000 sizes in industry standard diameters and lengths ranging from 25.4 mm (1") to 914.4 mm (36") in a complete spectrum of wattages and operating voltages.

Multi-purpose cartridge heaters are the solution for a multitude of original equipment manufacturers (OEMs) and maintenance (MRO) applications. Highly engineered standard and special purpose OMEGA cartridge heaters have been at the forefront of addressing the challenges of Original Equipment Manufacturers (OEMs) in a broad segment of diversified industries. As a company OMEGA is uniquely qualified and committed to assist our customers in developing highly engineered specific use cartridge heaters for dependable and reliable performance.

Let OMEGA provide the optimal solution to your thermal loop systems and cartridge heater design challenges. OMEGA will custom manufacture to your specifications. Consult us with your requirements.

### Hi-Density Cartridge Heaters 3/8" Diameter, Actual 0.371" ±0.002" (9.423 mm)

Sheath Length		Model Number		Watts	Watt Density		Sheath Length		Model Number		Watts	Watt Density	
inch	mm	120V	240V		/cm <sup>2</sup>	/in <sup>2</sup>	inch	mm	120V	240V		/cm <sup>2</sup>	/in <sup>2</sup>
1	25.4	HDC00125	—	50	13	85	2	50.8	HDC00186	HDC00187	500	44	283
1	25.4	HDC00127	—	100	26	170	2¼	57.2	HDC00189	—	75	6	36
1	25.4	HDC00128	HDC00129	150	40	255	2¼	57.2	HDC00190	—	100	8	49
1	25.4	—	HDC00130	200	53	340	2¼	57.2	HDC00191	HDC00192	125	9	61
1¼	31.8	HDC00133	—	100	18	113	2¼	57.2	—	HDC00193	150	11	73
1¼	31.8	HDC00135	HDC00136	150	26	170	2¼	57.2	HDC00194	—	175	13	85
1¼	31.8	HDC00137	HDC00138	200	35	226	2¼	57.2	—	HDC00196	200	15	97
1⅝	33.3	HDC00139	HDC00140	100	16	104	2¼	57.2	HDC00197	HDC00200	250	19	125
1⅝	33.3	HDC00141	—	150	24	157	2¼	57.2	HDC00199	—	300	23	146
1¾	34.9	HDC00142	HDC00143	150	23	146	2¼	57.2	HDC00201	HDC00202	350	26	170
1⅞	36.5	HDC00144	—	100	14	91	2¼	57.2	—	HDC00204	400	30	194
1½	38.1	HDC00146	—	30	4	25	2¼	57.2	—	HDC00205	500	38	243
1½	38.1	HDC00147	HDC00148	50	7	42	2⅜	60.3	HDC00206	—	75	5	34
1½	38.1	HDC00149	—	75	10	64	2⅜	60.3	—	HDC00207	165	12	75
1½	38.1	HDC00150	HDC00151	100	13	85	2⅜	60.3	HDC00213	HDC00210	300	21	136
1½	38.1	—	HDC00152	125	17	106	2½	63.5	HDC00215	HDC00214	100	7	42
1½	38.1	HDC00153	HDC00154	150	20	127	2½	63.5	—	—	125	8	53
1½	38.1	HDC00155	HDC00156	200	26	170	2½	63.5	—	HDC00216	150	10	64
1½	38.1	HDC00157	HDC00158	250	33	212	2½	63.5	HDC00217	HDC00218	200	13	85
1¾	44.5	HDC00160	HDC00161	150	16	102	2½	63.5	HDC00219	HDC00220	250	17	106
1¾	44.5	—	HDC00163	200	21	136	2½	63.5	HDC00221	HDC00222	300	20	127
1¾	44.5	HDC00164	HDC00165	250	26	170	2½	63.5	—	HDC00223	350	23	149
1⅞	46	—	HDC00166	150	15	97	2½	63.5	HDC00224	—	400	27	174
1⅞	46	HDC00167	—	200	20	129	2½	63.5	HDC00227	HDC00228	500	33	212
1⅞	47.6	HDC00169	—	250	24	154	2¾	69.9	—	HDC00231	400	23	151
2	50.8	HDC00170	—	50	4	28	2⅜	71.4	—	HDC00235	300	17	110
2	50.8	HDC00171	—	75	7	42	3	76.2	HDC00236	HDC00237	100	5	34
2	50.8	HDC00172	HDC00173	100	9	57	3	76.2	HDC00238	—	125	7	42
2	50.8	HDC00174	—	125	11	71	3	76.2	HDC00239	—	150	8	51
2	50.8	HDC00175	HDC00176	150	13	85	3	76.2	HDC00240	HDC00241	200	11	68
2	50.8	HDC00177	HDC00178	200	18	113	3	76.2	HDC00242	HDC00243	250	13	85
2	50.8	HDC00179	HDC00180	250	22	141	3	76.2	HDC00244	HDC00245	300	16	102
2	50.8	HDC00181	HDC00182	300	26	170	3	76.2	HDC00247	—	375	20	127
2	50.8	—	HDC00183	350	31	198	3	76.2	HDC00249	HDC00250	400	21	136
2	50.8	HDC00184	HDC00185	400	35	226	Ordering Example: HDC00353, 600 W, 120 Vac, ⅜" dia						

Model Numbers listed are cartridge heaters terminated with Type N termination 254 mm (10") long leads.  
 Other Watt Densities and heater lengths up to 48" (1219 mm) may be available on special order.  
 For other terminations and options see Modifications & Options for HDC.  
 Contact OMEGA for part numbers and pricing.

### Hi-Density Cartridge Heaters 3/8" Diameter, Actual 0.371" ±0.002" (9.423 mm)

Sheath Length		Model Number		Watts	Watt Density		Sheath Length		Model Number		Watts	Watt Density	
inch	mm	120V	240V		/cm <sup>2</sup>	/in <sup>2</sup>	inch	mm	120V	240V		/cm <sup>2</sup>	/in <sup>2</sup>
3	76.2	HDC00251	HDC00252	500	26	170	4 <sup>3</sup> / <sub>4</sub>	121	—	HDC00307	300	9	60
3	76.2	—	HDC00253	600	32	204	4 <sup>13</sup> / <sub>16</sub>	122	—	HDC00308	300	9	59
3	76.2	—	HDC00254	750	40	255	4 <sup>13</sup> / <sub>16</sub>	122	—	HDC00309	500	15	98
3 <sup>5</sup> / <sub>16</sub>	84.1	HDC00255	—	500	23	151	5	127	HDC00312	HDC00313	150	4	28
3 <sup>1</sup> / <sub>2</sub>	88.9	HDC00256	—	125	6	35	5	127	HDC00314	HDC00315	200	6	38
3 <sup>1</sup> / <sub>2</sub>	88.9	—	HDC00257	200	9	57	5	127	HDC00316	—	250	7	47
3 <sup>1</sup> / <sub>2</sub>	88.9	—	HDC00258	225	10	64	5	127	HDC00317	HDC00318	300	9	57
3 <sup>1</sup> / <sub>2</sub>	88.9	HDC00259	HDC00260	250	11	71	5	127	—	HDC00319	350	10	66
2 <sup>1</sup> / <sub>4</sub>	57.2	HDC00191	HDC00192	125	9	61	5	127	HDC00320	HDC00321	400	12	75
3 <sup>1</sup> / <sub>2</sub>	88.9	HDC00261	HDC00262	300	13	85	5	127	HDC00323	HDC00324	500	15	94
3 <sup>1</sup> / <sub>2</sub>	88.9	HDC00263	HDC00264	350	15	99	5	127	—	HDC00327	600	18	113
3 <sup>1</sup> / <sub>2</sub>	88.9	—	HDC00265	400	18	113	5	127	—	HDC00328	700	21	132
3 <sup>1</sup> / <sub>2</sub>	88.9	HDC00266	HDC00267	500	22	141	5	127	—	HDC00329	750	22	141
3 <sup>13</sup> / <sub>16</sub>	96.8	HDC00269	—	150	6	38	5	127	—	HDC00330	800	23	151
3 <sup>13</sup> / <sub>16</sub>	96.8	—	HDC00270	500	20	128	5	127	—	HDC00331	1000	29	189
4	101.6	HDC00272	—	100	4	24	5 <sup>1</sup> / <sub>4</sub>	133	—	HDC00332	200	6	36
4	101.6	HDC00273	HDC00274	125	5	30	5 <sup>1</sup> / <sub>2</sub>	140	HDC00334	HDC00335	250	7	42
4	101.6	HDC00275	—	150	6	36	5 <sup>1</sup> / <sub>2</sub>	140	—	HDC00338	550	15	93
4	101.6	HDC00276	—	175	7	42	5 <sup>1</sup> / <sub>2</sub>	140	—	HDC00339	600	16	102
4	101.6	HDC00277	HDC00278	200	8	49	5 <sup>1</sup> / <sub>2</sub>	140	—	HDC00340	1000	26	170
4	101.6	HDC00279	HDC00280	250	9	61	5 <sup>3</sup> / <sub>4</sub>	146	—	HDC00341	400	10	65
4	101.6	HDC00281	HDC00282	300	11	73	5 <sup>3</sup> / <sub>4</sub>	146	HDC00342	HDC00343	600	15	97
4	101.6	HDC00283	HDC00284	350	13	85	6)	152	HDC00344	—	200	5	31
4	101.6	HDC00285	HDC00286	400	15	97	6	152	HDC00345	HDC00346	250	6	39
4	101.6	—	HDC00288	450	17	109	6	152	HDC00347	HDC00348	300	7	46
4	101.6	HDC00289	HDC00290	500	19	121	6	152	HDC00349	HDC00350	400	10	62
4	101.6	—	HDC00292	600	23	146	6	152	HDC00351	HDC00352	500	12	77
4	101.6	—	HDC00293	700	26	170	6	152	HDC00353	HDC00354	600	14	93
4	101.6	—	HDC00294	750	28	182	6	152	—	HDC00355	675	16	104
4 <sup>1</sup> / <sub>4</sub>	108	—	HDC00295	300	11	68	6	152	HDC00356	HDC00357	750	18	116
4 <sup>1</sup> / <sub>4</sub>	108	—	HDC00296	750	26	170	6	152	—	HDC00358	800	19	123
4 <sup>1</sup> / <sub>2</sub>	114.3	—	HDC00297	250	8	53	6	152	—	HDC00359	900	22	139
4 <sup>1</sup> / <sub>2</sub>	114.3	HDC00298	HDC00299	300	10	64	6	152	—	HDC00360	1000	24	154
4 <sup>1</sup> / <sub>2</sub>	114.3	HDC00302	HDC00303	450	15	95	6 <sup>1</sup> / <sub>2</sub>	165	—	HDC00361	600	13	85
4 <sup>1</sup> / <sub>2</sub>	114.3	HDC00304	HDC00305	500	17	106	Ordering Example: HDC00353, 600 W, 120 Vac, 3/8" dia						

Model Numbers listed are cartridge heaters terminated with Type N termination 254 mm (10") long leads.  
 Other Watt Densities and heater lengths up to 48" (1219 mm) may be available on special order.  
 For other terminations and options see Modifications & Options for HDC.  
 Contact OMEGA for part numbers and pricing.

Sheath Length		Model Number		Watts	Watt Density		Sheath Length		Model Number		Watts	Watt Density	
inch	mm	120V	240V		/cm <sup>2</sup>	/in <sup>2</sup>	inch	mm	120V	240V		/cm <sup>2</sup>	/in <sup>2</sup>
6½	165.1	—	HDC00362	1000	22	141	9	229	—	HDC00400	1000	16	100
7	177.8	HDC00365	HDC00366	250	5	33	9½	241	HDC00401	—	200	3	19
7	177.8	—	HDC00367	350	7	46	9½	241	—	HDC00402	600	9	57
7	177.8	HDC00368	—	400	8	52	9½	241	—	HDC00403	1000	15	94
7	177.8	—	HDC00369	500	10	65	10	254	HDC00405	—	400	5	36
7	177.8	HDC00370	HDC00371	600	12	78	10	254	—	HDC00407	500	7	45
7	177.8	—	HDC00373	750	15	98	10	254	HDC00408	HDC00409	600	8	54
7	177.8	—	HDC00374	775	16	101	10	254	—	HDC00410	700	10	63
7	177.8	—	HDC00375	1000	20	131	10	254	—	HDC00411	750	10	67
7½	190.5	—	HDC00377	600	11	73	10	254	—	HDC00413	1000	14	89
7½	190.5	—	HDC00378	725	14	88	10	254	—	HDC00415	1500	21	134
7½	190.5	—	HDC00379	850	16	103	10 <sup>13</sup> / <sub>16</sub>	275	—	HDC00416	375	5	31
7½	190.5	—	HDC00380	1000	19	121	12	305	HDC00417	—	400	5	30
7 <sup>13</sup> / <sub>16</sub>	198.4	—	HDC00381	750	14	87	12	305	—	HDC00418	500	6	37
8	203.2	HDC07944	—	250	5	30	12	305	HDC00419	HDC00420	600	7	44
8	203.2	HDC00382	HDC00383	300	5	34	12	305	—	HDC14222	750	9	57
8	203.2	HDC00384	—	400	7	45	12	305	—	HDC00421	1000	11	74
8	203.2	HDC00385	—	450	8	51	12	305	—	HDC06225	1500	18	113
8	203.2	HDC00386	HDC00387	500	9	57	12 <sup>13</sup> / <sub>16</sub>	325	—	HDC00422	1000	11	69
8	203.2	HDC00388	HDC00389	600	11	68	13	330	—	HDC07200	1000	11	70
8	203.2	—	HDC00390	700	12	79	14	356	—	HDC22941	600	6	39
8	203.2	—	HDC00391	750	13	85	14	356	—	HDC00423	750	7	47
8	203.2	—	HDC00392	900	16	102	16	406	—	HDC22942	600	5	34
8	203.2	—	HDC00393	1000	18	113	16	406	—	HDC00424	1200	10	66
8⅝	219.1	—	HDC00395	500	8	52	18	457	—	HDC22943	1000	9	58
9	228.6	HDC00396	HDC00397	200	3	20	20	508	—	HDC09305	1000	8	53
9	228.6	—	HDC00398	500	8	50	24	610	—	HDC10234	1000	6	38
9	228.6	—	HDC00399	885	14	88	Ordering Example: HDC00353, 600 W, 120 Vac, 3/8" dia						

Model Numbers listed are cartridge heaters terminated with Type N termination 254 mm (10") long leads.

Other Watt Densities and heater lengths up to 48" (1219 mm) may be available on special order.

For other terminations and options see Modifications & Options for HDC.

Contact OMEGA for part numbers and pricing.

## Place Order†

(Specify Model Number)

Show Only Stocked Items

Part Number	Description	Qty
<a href="#">HDC00125</a>	120 volt, 50 watts, 3/8" diameter hi-density cartridge heater	<input type="text" value="0"/>
<a href="#">HDC00130</a>	240 volt, 200 watts, 3/8" diameter hi-density cartridge heater	<input type="text" value="0"/>
<a href="#">HDC00153</a>	120 volt, 150 watts, 3/8" diameter hi-density cartridge heater	<input type="text" value="0"/>

<b>HDC00201</b>	120 volt, 350 watts, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00205</b>	240 volt, 500 watts, 3/8' diameter hi-density cartridge heater	
<b>HDC00266</b>	120 volt, 500 watts, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00270</b>	240 volt, 500 watts, 3/8' diameter hi-density cartridge heater	
<b>HDC00127</b>	120 volt, 100 watts, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00128</b>	120 volt, 150 watts, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00133</b>	120 volt, 100 watts, 1 1/4' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00135</b>	120 volt, 150 watts, 1 1/4' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00137</b>	120 volt, 200 watts, 1 1/4' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00147</b>	120 volt, 50 watts, 1 1/2' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00153</b>	120 volt, 150 watts, 1 1/2' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00155</b>	120 volt, 200 watts, 1 1/2' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00175</b>	120 volt, 150 watts, 2' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00179</b>	120 volt, 250 watts, 2' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00186</b>	120 volt, 500 watts, 2' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00187</b>	2400 volt, 500 watts, 2' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00281</b>	120 volt, 300 watts, 4' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00285</b>	120 volt, 400 watts, 4' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00289</b>	120 volt, 500 watts, 4' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>



<b>HDC00314</b>	120 volt, 200 watts, 5' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00349</b>	120 volt, 400 watts, 6' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00353</b>	120 volt, 600 watts, 6' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00365</b>	120 volt, 250 watts, 7' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00382</b>	120 volt, 300 watts, 8' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>
<b>HDC00405</b>	120 volt, 400 watts, 10' long, 3/8' diameter hi-density cartridge heater	<input type="text" value="0"/>

## Order By Part Number

Part Number	Qty	Part Number	Qty
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

† All amounts shown in USD

**Note:** Ordering Information Order by Model number for stock cartridge heaters with Type N termination. Call OMEGA for model numbers for heaters with other terminator program terminations and options. Custom Engineered/Manufactured Cartridge heaters can be application specific; therefore for sizes, electrical ratings, terminations and any other design features not listed here OMEGA will custom manufacture to your specifications. Consult us with your requirements.

**Ordering Example:** (1) **HDC00153** 3/8" High Density Cartridge Heater, 120V, 150W, **\$32.50**

## Reviews

★★★★★

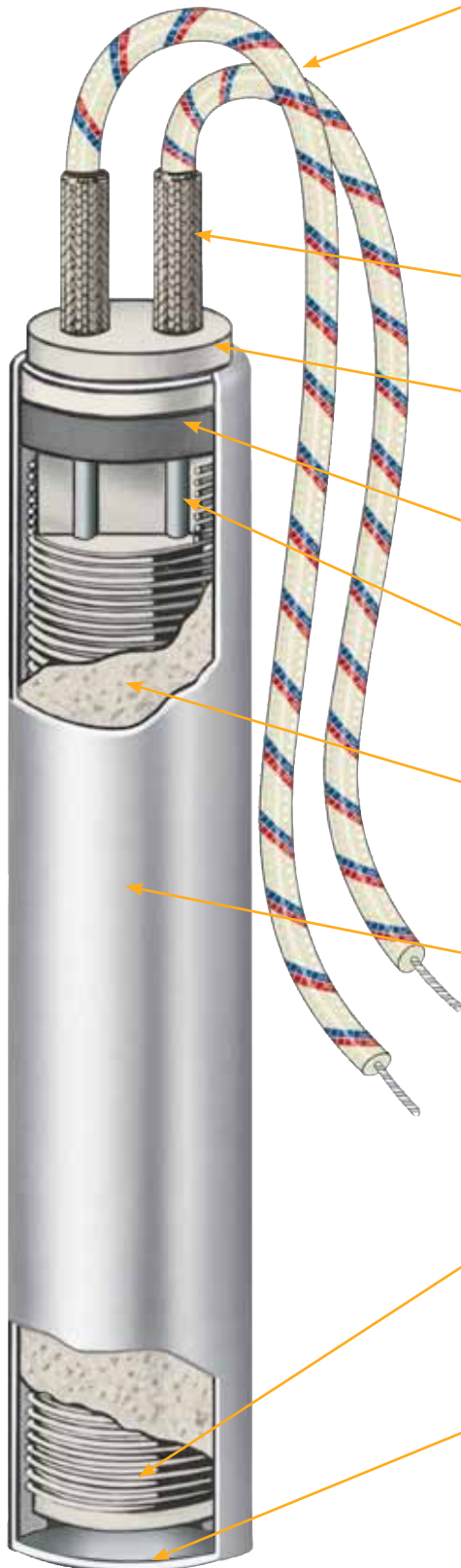
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## Hi-Density Cartridge Heaters



### Features

The standard termination for Hi-Density Cartridge Heaters is Type N, 254 mm (10") long nickel conductor lead wires externally connected to 32 mm (1¼") solid conductor terminal pins. The lead wires have fiberglass insulation and are UL approved for temperatures up to 250°C (482°F). Mica insulated UL approved wires for temperatures up to 450°C (842°F) are optional.



**Note:** To meet the requirements of your application we offer over 40 standard termination styles to select from that will solve many of the most common application problems.

High temperature fiberglass sleeve provides maximum electrical insulation to the crimp connector used to splice the nickel conductors to the flexible leads.

Ceramic end cap prevents nickel conductors from shorting out against sheath when sharp bending of the leads is required. The ceramic cap may be eliminated in some cases to optimize the heater watt density.

Ceramic end cap and swaged-in lava plug protect the internal cartridge from outer contamination. Other types of seals can also be provided.

Solid conductor terminal pins are used to ensure a good electrical connection between the nickel conductor lead wires and the resistance wire. They are sized for the maximum current rating of the heater.

Specially selected grain size high purity Magnesium Oxide (MgO) is used to fill all remaining space inside the sheath. Heater is then swaged, which compacts the magnesium oxide grains into a solid mass, thereby increasing thermal conductivity and dielectric strength.

Standard sheath material is 321 Stainless Steel. It provides high temperature strength up to 650°C (1200°F), good thermal conductivity, and resistance to corrosion and scaling. Alloy 321 is a Nickel-Chromium Stainless Steel modified with the addition of Titanium. For higher operating temperatures up to 760°C (1400°F) or corrosive immersion heating applications, Incoloy® 800 is available. Consult OMEGA for other sheath materials.

Grade "A" Nickel-Chrome resistance wire precisely wound on a high purity magnesium oxide core places the resistance wire as close to the inside of the sheath as possible while maintaining dielectric strength. This provides excellent heat transfer and long heater life with the highest possible watt densities.

Welded end disc made from the same material as the sheath provides a positive seal against moisture and other contaminants.

\* Hi-Density Cartridge Heaters are UL recognized and CSA certified in many design variations under UL File Number E65652 and CSA File Number 043099. If you require UL and/or CSA Agency Approval, please specify when ordering.

## **OMEGA Offers the Most Comprehensive and Diverse Selection in Hi-Density Cartridge Heaters**

### **Typical Applications**

- Plastic Extruders
- Hot Runner Molds
- Hot Stamping
- Medical Equipment
- Packaging Equipment
- Molds
- Aerospace
- Sealing Bags
- Semi-Conductor
- Plastic Molding
- Shoe Machinery
- Food Processing
- Heating Gases and Liquids
- Glue Guns
- Laminating Presses
- Platens
- Scientific Equipment
- Food Service Equipment

### **Hi-Density Cartridge Heaters Provide Maximum Processing Temperature Capability**

- Higher watt densities permit smaller heaters to be used without sacrificing life expectancy. This results in up-front as well as long-term cost savings.
- Swaged construction provides maximum support for the resistance wire and excellent heat transfer characteristics, improving the overall life expectancy of the cartridge heater.
- Termination styles and special features allow customization to any application.
- Applications up to 760°C (1400°F)

### **Hi-Density Cartridge Heaters are Classified in Two Distinct Categories**

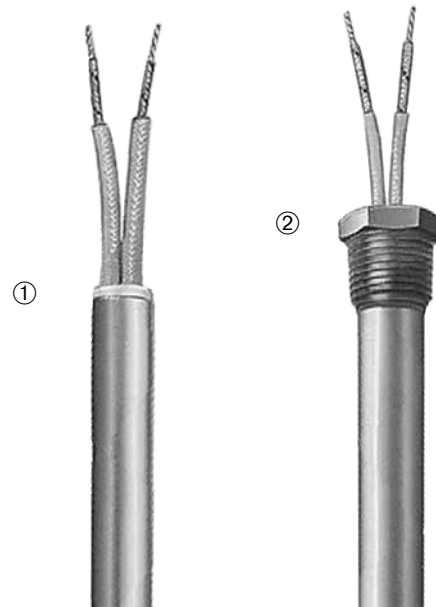
#### **Multi-Purpose Use**

The multi-purpose use cartridge heaters represent OMEGA's commitment to value-added customer service as we maintain in stock over 65,000 semi-finished hi-density cartridge heater substrates, offering a combination of over 1000 sizes in industry standard diameters and lengths ranging from 25.4 mm (1") to 914.4 mm (36") in a complete spectrum of wattages and operating voltages. Multi-purpose use cartridge heaters are the solution for a multitude of original equipment manufacturers (OEMs) or maintenance (MRO) applications.

Available through the terminator program. Complete details are found on page 8.

### **Hi-Density Cartridge Heaters Have Evolved and Today Offer a Multitude of Diverse Product Options:**

1. (HDC) A hi-density cartridge heater in US sizes.
2. (HDL) A hi-density cartridge heater designed with NPT Fittings for Immersion heating.



#### **Highly Engineered Specific Purpose Use**

OMEGA has been at the forefront of addressing the challenges of Original Equipment Manufacturers (OEMs) in a broad segment of diversified industries. As a company we are uniquely qualified and committed to providing value-added expertise in engineering and manufacturing capabilities assisting customers in developing highly engineered specific use cartridge heaters for dependable and reliable performance. Let us provide the optimal solution to your thermal loop system and cartridge heater design challenges.

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



## Hi-Density Cartridge Heater Specifications

### Standard Specifications

#### Performance Ratings

**Maximum Temperature:** 760°C (1400°F)

**Maximum Watt Density:** 15.5 to 46.5 watt/cm<sup>2</sup>  
(100 to 300 Watt/in<sup>2</sup>) depending on heater size and operating temperature

**Note:** The maximum operating temperature and the life expectancy of a cartridge heater is dependent on two main factors:

1. The maximum recommended sheath temperature [648°C (1200°F) for a standard heater]
  2. The maximum ambient temperature for the termination selected.
- Consult OMEGA if you require a recommendation for your application.

#### Length Tolerance for Lead Wires, Wire Braid Leads, and Armor Cable Leads:

**Up to 914 mm (36"):** -12.7, 25.4 mm (-1/2, 1")

**914 to 1829 mm (36 to 72"):**

25.4, 50.8 mm (-1, 2")

**Above 72":** 101.6 mm (±4")

### Dimensional Specifications

Nominal Diameter	1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
<b>Actual Diameter</b>	3.10 (0.122)	6.25 (0.246)	7.82 (0.308)	9.42 (0.371)	12.60 (0.496)	15.77 (0.621)	18.95 (0.746)	23.30 (0.996)
<b>Diameter Tolerance</b>	0.051 (±0.002)	0.051 (±0.002)	0.051 (±0.002)	0.051 (±0.002)	0.051 (±0.002)	0.051 (±0.002)	0.076 (±0.003)	0.076 (±0.003)
<b>Minimum Length</b>	31.8 (1.25)	25.40 (1)	25.40 (1)	25.40 (1)	25.40 (1)	25.40 (1)	31.75 (1¼)	44.45 (1¾)
<b>Maximum Length</b>	305 (12)	914 (36)	914 (36)	1219 (48)	1219 (48)	1829 (72)	1829 (72)	1829 (72)
<b>Length Tolerance Heaters up to 127 mm (5") long</b>	2.4 (±3/32)	2.4 (±3/32)	2.4 (±3/32)	2.4 (±3/32)	2.4 (±3/32)	2.4 (±3/32)	3.2 (±1/8)	3.2 (±1/8)
<b>Length Tolerance Heaters over 127 mm (5") long</b>	±2% of sheath length							
<b>Camber Tolerance Heaters to 305 mm (12") long</b>	0.254 mm (0.010") per foot of length							
<b>Camber Tolerance Heaters over 305 mm (12") long</b>	0.508 mm (0.020") per foot of length							

A certain amount of camber is unavoidable. With a slight force, hi-density cartridge heaters will flex enough to fit into a straight reamed hole.

### Electrical Specifications

Nominal Diameter	1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
<b>Maximum Voltage</b>	240	240	240	240	240	480*	480*	480*
<b>Maximum Amperage (see next line for exceptions)</b>	3.0	4.4	4.5	6.7	10.5	23	23	23
<b>†Maximum Amperage for Types C1C, C1D, C2C, C2D, CS, F, M3, R1B, S1, S2, SA, W and W3 Terminations</b>	—	3.0	3.0	5.5	7.6	9.7	9.7	9.7
<b>Minimum Wattage at 120V on a 1" long Heater</b>	—	50	45	45	50	50	—	—
<b>Minimum Wattage at 120V on a 2" long Heater</b>	5	20	20	20	20	20	20	20
<b>Maximum Wattage at 120V</b>	360	525	540	800	1260	2760	2760	2760
<b>Maximum Wattage at 240V</b>	720	1050	1080	1600	2520	5520	5520	5520
<b>Maximum Wattage at 480V</b>	—	—	—	—	—	11,000	11,000	11,000
<b>Wattage Tolerance</b>	+10, -15%		Plus 5%, minus 10%					
<b>Resistance Tolerance</b>	+15, -10%		Plus 10%, minus 5%					

†Current carrying capacities are for ambient temperatures up to 250°C (482°F) with mica insulated lead wires.

\*480V when applicable. Consult OMEGA.

#### Temperature Coefficient of Resistance

The electrical resistance (ohms) of the heater resistance wire increases with temperature rise.

OMEGA standard hi-density cartridge heaters are manufactured with ohms (cold ohms) 3.3% lower than the actual calculated ohms (hot ohms) to compensate for this increase.



**Note:** Specifications detailed on this page are standard. Consult OMEGA if your application requires tighter tolerances or has other special requirements

### Available Electrical Features

Diameter	Dual Volts	3-Phase	Dual Circuits	Multiple Heat Zones (maximum 3 zones)
1/8"	No	No	No	No
1/4"	No	No	No	No
5/16"	No	No	No	No
3/8"	Yes*	No	No	Yes*
1/2"	Yes*	Yes	Yes	Yes*
5/8"	Yes	Yes	Yes	Yes
3/4"	Yes	Yes	Yes	Yes
1"	Yes	Yes	Yes	Yes

Consult factory for maximum wattages and voltages

\*Heaters may require a larger diameter transition area at lead end.

## Recommendations for Improving the Life of Hi-Density Cartridge Heaters

Hi-density cartridge heaters have been widely used in many demanding and diverse applications since 1972. The commonly used basic applications are platen, plastic mold and die heating, liquid immersion and air heating.



**Note:** Selection of the wrong termination for a particular application is the primary reason for all heater failures. However, failure to consider other important criteria can also have a negative effect on the life of the heater. To get the best performance and assure long life, it is important to carefully evaluate the following factors.

### Operating Temperature

Operating temperature of a heater is a major factor in determining the life expectancy of a heating element. The heater life depends on the actual temperature of the resistance wire within the heater and not on the process operating temperature. The graph in Figure 1 demonstrates the proper relationship between operating temperature and watt density; the higher the operating temperature, the lower the maximum recommended watt density.

### Heater Watt Density

Cartridge heater watt density is defined as the wattage dissipated per square inch of the heated sheath surface. For a particular application a heater's watt density governs internal resistance wire temperature, which determines the outer sheath temperature. These factors are critical to the proper heating of the application and to the life expectancy of the heater. Special construction features that promote excellent heat transfer permit Hi-Density Cartridge Heaters to operate at higher watt densities while maintaining the lowest possible resistance wire temperatures of any style cartridge heater.

Heater watt density (watts/in<sup>2</sup>) is calculated using the following formula:

$$\text{Watt Density} = \frac{\text{Heater wattage}}{\text{Heated length} \times \text{Heater diameter} \times 3.1416}$$

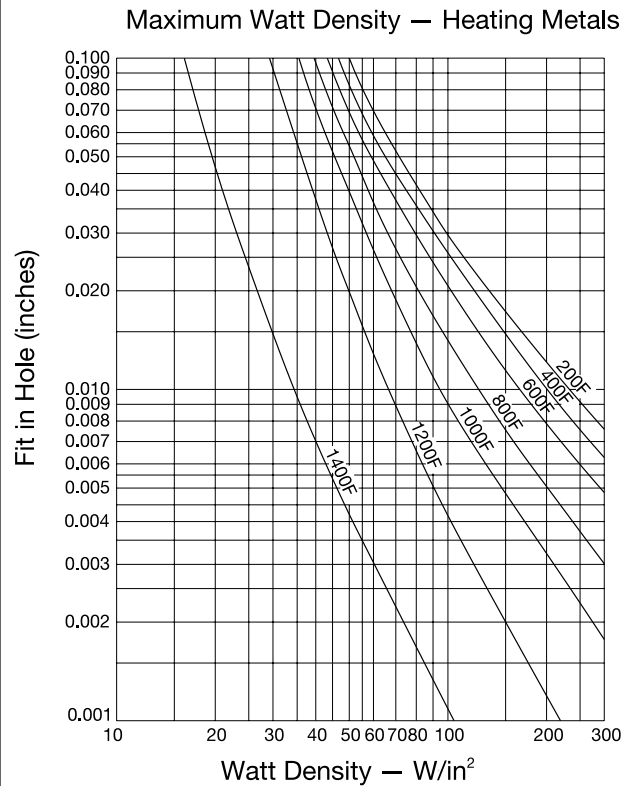
Heated length is the overall length of the heater minus any unheated (cold) sections. Standard Type N, Hi-Density cartridge heaters have 10 mm (3/8") at the lead end and 6 mm (1/4") at the disc end unheated. This would mean a 152 mm (6") long heater would have 265 mm (5 5/8") effective heated length. Unheated sections vary with type of heater termination.

The graph in Figure 1 shows the maximum recommended watt density for hi-density cartridge heaters when used in a steel platen. Watt density limitations for various materials are given in the engineering section of this catalog. For liquid immersion heaters the maximum watt density depends on the type of liquid being heated. The more viscous, or thicker the liquid, the lower the maximum watt density. Higher watt density can cause the liquid to carbonize and accumulate on the heater sheath, which will cause premature heater failure. It is advisable to use heaters that have watt densities below the maximum recommended watt density to get the longest heater life. If the actual heater watt density is close to the maximum recommended watt density, you can correct the problem by:

1. Increasing the number, diameter and length of heaters.
2. Lowering the total wattage; however, this may increase the heat-up time.
3. Obtaining tighter fit (see Figure 2 — Determining Fit).

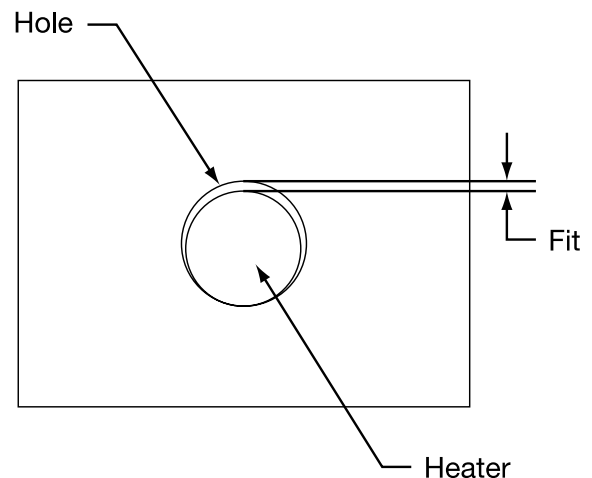
A hi-density cartridge heater designed at the maximum recommended watt density allows the smallest heater to be used to obtain the required wattage with good service life. All things being equal, using a lower watt density heater will typically provide optimized service life.

Figure 1  
Recommended Watt Density for Heating Metal Parts



The graph shows the recommended maximum watt density for OMEGA Hi-Density cartridge heaters at different operating temperatures and fit, when the heater is installed in an oxidized mild steel block. The thermocouple is located 13 mm (1/2") from the heater. When heating other materials, the data needs to be extrapolated based on the thermal conductivity of the material. Consult OMEGA with your requirements.

Figure 2  
Determining Fit





## Recommendations for Improving the Life of Hi-Density Cartridge Heaters (Continued)

### Determining Fit

When heating a platen, mold, die or hot runner probe with hi-density cartridge heaters inserted into drilled holes, fit is an important factor in determining the life expectancy of the heater. Fit is the difference between the minimum diameter of the cartridge heater and the maximum diameter of the hole. Unheated sections on a hi-density cartridge may be smaller in diameter due to swaging. To determine fit, use the smallest diameter on the heated length only.

**Example:** A 10 mm ( $\frac{3}{8}$ " nominal OD Hi-Density cartridge heater has an actual diameter of 9 mm (0.371")  $\pm 0.002$ , which translates to a minimum diameter of 9 mm (0.369"). If used in a 10 mm (0.376")  $\pm 0.002$  hole, the fit would be 0.23 mm (0.009")  $10 - 9 \text{ mm} = 23 \text{ mm}$  (0.378" - 0.369" = 0.009").

When medium watt density heaters (less than 60 watts per square inch) are used in low temperature applications [less than 315°C (600°F)] general purpose drills are commonly used to drill holes. The typical hole size may be 0.1 to 0.2 mm (0.003 to 0.008") over the drill size. For higher watt density and/or higher temperature applications, we recommend that the holes are drilled and reamed for the tightest possible fit. In applications where precise temperature control and heat transfer properties are required, hi-density cartridge heaters can be centerless ground to  $\pm 0.01 \text{ mm}$  ( $\pm 0.0005$ ").

Although a tighter fit is desirable to efficiently transfer heat and to get long heater life, a looser fit will aid in installing and removing heaters, especially long heaters. We recommend that you apply BNS anti-seize cartridge heater coating as it will improve heat transfer and will make the removal of heaters easier.

The graph in Figure 1 (page 4) shows the effect of fit in determining the maximum recommended watt density on a steel platen. As it is indicated in the graph, the tighter the fit, the higher the maximum recommended watt density.

### Temperature Control and Location of Temperature Sensing Device

In order to better control the heater temperature and hence the resistance wire temperature, use of an appropriate temperature control and the proximity of the heater to the sensor is very important. The graph in Figure 1 (page 4) shows the effect of operating temperature in determining the maximum recommended watt density on a steel platen where the sensor is located 13 mm ( $\frac{1}{2}$ ") from the heater. Higher watt density heaters can generate heat faster than the surrounding area's ability to dissipate heat. This creates a thermal lag between the heater and the sensor. The closer the sensor to the heater, the better you can control the heater temperature. By keeping the sensor further from the heater, temperature gradients of several hundred degrees can be observed in many applications, especially during initial start-up and heavy thermal cycling. Although the set operating temperature may be low, the heater may be running at a very high temperature. This is a common cause of heater failure. This can be minimized using time proportional and PID functions of the temperature controllers.

### Power Control

Power control methods affect the life expectancy of heating elements. In general, although economical, on-off controls increase thermal fatigue and oxidation rate on heating elements by causing wide temperature swings of the internal heating element. Silicon controlled rectifiers (scrs), mercury relays and solid state power controls can increase the life expectancy of heating elements by reducing the temperature swings of the internal heating element.

## Common Causes of Cartridge Heater Failures

### Contamination

Contamination is a major cause of heater failure. Moisture, hydraulic oils, and melted plastic are the most common contaminants that are seen on failed heaters. Since the magnesium oxide insulation in a hi-density heater is hygroscopic in nature, moisture is easily absorbed into the heater and typically results in premature heater failure. Moisture absorption during machine washdown or cleanup also is a frequent problem. These contaminants, which are electrically conductive, will short out the heater. Most probably, the failures will be at the lead end of the heater and in some cases can split or blow a hole on the heater sheath. The disc end of a Hi-Density cartridge heater is welded shut with a stainless steel disc.

Generally, contaminants enter the heater through the lead end of the heater. The high temperature lead wires used on Hi-Density heaters have fiberglass or mica insulation. Oil and moisture can wick through the insulation on the lead wire into the heater. OMEGA offers a wide variety of terminations to avoid this problem, including epoxy seals, PTFE seals, convoluted cables, welded end discs, PTFE insulated lead wires and SJO cable. However, there are temperature limitations on many of these terminations.

### Excessive Flexing of Leads

Hi-Density heaters use flexible grade A nickel stranded lead wires with fiberglass or mica insulation. On certain terminations the lead wires are connected externally to solid nickel conductor pins. In applications where there is excessive movement or vibration, the solid pins could break due to fatigue. A simple solution is to give enough slack on the leads to minimize the stress on the solid pins or provide an internal lead wire connection within the heater. OMEGA also offers strain relief brackets and springs to prevent this problem.

Where heater leads can wear out by abrasion due to excessive flexing of the leads, OMEGA offers several abrasion resistant terminations.

### Lack of Heat Sink

Hi-Density heaters are designed with minimum unheated (cold) sections. If the heated sections project from the platen or mold, these sections will get extremely hot due to lack of heat transfer. This will lead to premature heater failure. OMEGA can manufacture heaters with cold sections anywhere along the length of the heater to prevent overheating of the heater sheath.

When a hi-density heater is used as a liquid immersion heater, make sure the heater's sheath length is completely immersed in the liquid. The heater lead end should not be immersed in liquid, since most of the lead end seals are only moisture resistant, not moisture proof.



**Note:** If you should encounter premature cartridge heater failure, consult OMEGA. Our team of professionals will have the solution to your problem.



## Recommendations for Improving the Life of Hi-Density Cartridge Heaters (Continued)

### High Operating Temperature

OMEGA hi-density heaters are designed to operate at sheath temperatures up to 760°C (1400°F). When process temperatures approach the maximum heater sheath temperature, make sure the sheath temperature doesn't exceed its limitations. Location of the thermocouple and the type of temperature and power controls are factors that affect sheath temperature and potential overshoot conditions.

Although the heater is designed to run at temperatures up to 760°C (1400°F), heater lead wires and terminations are rated for much lower temperatures. Care should be taken to make sure that the heater lead end temperatures do not exceed their limitations. Heaters can be made longer with unheated sections at the lead end to bring the lead end out of the high temperature area. OMEGA can also provide you with a high temperature wiring harness, which can withstand temperatures up to 760°C (1400°F).

### Wattage Rating

Heaters with very high wattage ratings can create temperature overshoots, uneven temperature distribution and high heater sheath temperatures, causing premature heater failure.

For liquid immersion heaters, maximum watt density depends on the type of liquid being heated. The heavier or thicker the liquid, the lower the maximum watt density. Higher watt density can cause the liquid to carbonize and accumulate on the heater sheath, which will cause premature heater failure.

### Scale and Sludge Buildup

In liquid immersion applications, periodic cleaning of the heater sheath is necessary to remove any scale buildup on the sheath. Scale can accumulate on the sheath and cause the heater to overheat and fail. When used to heat liquid in a tank, be sure to clean any sludge from the bottom of the tank. A heater sheath covered with sludge will overheat and fail.



**Note:** As explained in the above paragraphs, the single major cause for cartridge heater failure is the selection of the wrong type of heater lead end termination for the specific application. To assist you in selecting the right termination type, see section of detailed descriptions of over 40 terminations designed to solve many of the common application problems. If you need further assistance, consult OMEGA.

### Important Installation Considerations

1. For closest fit and best heat transfer, use reamed holes.
2. When possible, drill holes through the object being heated. This will make heater removal easier.
3. When using an anti-seize coating like BNS spray or paste, do not apply over lead wires or any other current carrying conductors.
4. When using insulated tape or sleeving, check to make sure it is rated for the temperature of the application. Lower temperature rated materials can contain an adhesive or binder that can carbonize and become electrically conductive.
5. When using heaters near their maximum recommended watt density, it is recommended that the temperature sensing probes be at maximum 13 mm (½") from the heater sheath.
6. Lead wires should not be located in the hole containing the cartridge heater during operation. This may cause the lead wires to be exposed to temperatures above their rated temperature.
7. When used in a vacuum application, make sure the lead end of the heater is outside the vacuum. If the lead has to be in the vacuum, consult OMEGA for specific recommendations.
8. Many applications will subject a heater's electrical terminations to one or more of the following potentially damaging conditions:

- Moisture
- Oil and other contaminants
- Flexing
- Abrasion
- High temperature



**Note:** To protect the heater from damage in these harsh environments, OMEGA has a wide selection of terminations and options available.

### BNS Anti-Seize Cartridge Heater Coating

This high temperature, electrically insulating and thermally conductive coating will minimize oxidation and improve heat transfer from heater to the object being heated.

Brush a thin layer of paste or spray lightly over the cartridge heater prior to inserting the heater into a hole.



**CAUTION!** Do not apply over lead wires or other bare current carrying conductors, since the water in the paste and spray can cause an electrical short circuit.



13 oz.  
Aerosol spray can  
Part Number:  
CML00010

- Temperature Range 1562°F (850°C)
- High Heat Transfer



4 oz. Paste with  
brush applicator top  
Part Number: CML00020

- Temperature Range 1562°F (850°C)
- High Heat Transfer



**Note:** Formulated to assist in the removal of cartridge heaters.



## Custom Terminated Multi-Purpose Use Cartridge Heaters from the Terminator Program

OMEGA stocks over 1000 different semi-finished hi-density cartridge heaters in diameters 6, 8, 10, 13, 16, and 19 mm ( $\frac{1}{4}$ ,  $\frac{5}{16}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$  and  $\frac{3}{4}$ ").

These cartridge heaters are semi-finished (substrates), offering you the option to finish them by choosing from 19 program-qualified lead end terminations and options. Cartridge heaters will be ready for shipment within 1 to 3 days, depending on the termination/option selected.

### Ordering Information — Follow These Simple Steps

1. Select an available 6 mm ( $\frac{1}{4}$ " through 19 mm ( $\frac{3}{4}$ ") hi-density cartridge heater. The model numbers in the tables are for heaters with termination type N [254 mm (10") long externally connected lead wires].








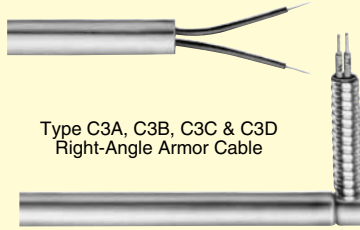


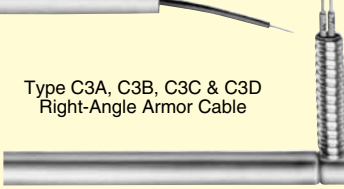

2. Refer to the program-qualified lead terminations reference photos to select the cartridge heater termination type best suited for your application.

**NOTE:** Type "N" [254 mm (10") long externally connected plain lead wires] is the most common termination applied in the Terminator program. If a termination other than Type N is selected a new permanent part number will be assigned when your order is placed.

3. Specify your lead requirements in the event that the standard supplied lengths for Plain Leads 254 mm (10"), braid or armor cable [254 mm (10") over 305 mm (12") leads] are not suited for your application.

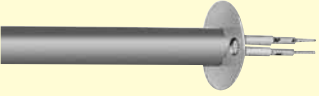
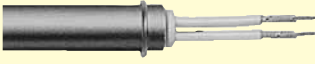


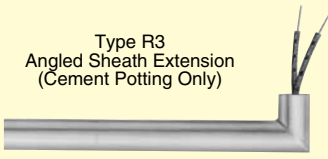


4. Specify the quantity.

### Terminations

<p>Type N Standard Leads</p> 	<p>Type B Ceramic Bead Insulation</p> 	<p>Type BL Ceramic Bead and Leads</p> 
<p>Type C1A &amp; C1B only Straight Armor Cable</p> 	<p>Type C2A &amp; C2B Right-Angle Armor Cable with Copper Elbow</p> 	<p>Type R1A Right-Angle Leads with Copper Elbow</p> 
<p>Type W Straight Wire Braided Leads</p> 	<p>Type M2A &amp; M2E Potted Lead End Seal (Cement Only)</p> 	<p>Type CMB &amp; CMP Single Threaded Fitting</p> 
<p>Type W1A &amp; W1B Right-Angle Wire Braided Leads</p> 	<p>Type C3A, C3B, C3C &amp; C3D Right-Angle Armor Cable</p> 	<p>Type R2A &amp; R2B Right-Angle Leads</p> 

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### Options

<p>Type MFR Mounting Flange Round</p> 	<p>Type LR Locating Ring</p> 	<p>Type PS Pull Strap</p> 	<p>Type P Quick Disconnect Plug</p> 
<p>Type R3 Angled Sheath Extension (Cement Potting Only)</p> 	<p>Type E1 General Purpose Box</p> 	<p>Type GL Ground Lead Sheath</p> 	

Complete specifications and details on these terminations can be found at [omega.com](http://omega.com).

### Custom Engineered/Manufactured Hi-Density Cartridge Heaters

Because cartridge heaters can be very application specific, consult OMEGA with your special requirements. For sizes, electrical ratings and any other design features required but not listed in the catalog, OMEGA will custom engineer and manufacture to your specifications.

**Consult OMEGA with Your Requirements. We Welcome Your Inquiries.**



## Hi-Density Cartridge Heaters

½" Diameter, Actual 12.6 mm (0.496")

Model numbers listed are for cartridge heaters terminated with 254 mm (10") long leads (Type N termination). Other terminator program terminations and options can also be applied to heaters (see ordering information).

**To Order Visit [omega.com/hdc00426\\_series](http://omega.com/hdc00426_series) for Pricing and Details**

Model Number		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watts/cm <sup>2</sup>	Watts/in <sup>2</sup>
HDC00426	—	25.4	1	50	10	64
HDC00427	—	25.4	1	150	30	191
—	HDC00428	25.4	1	200	40	255
HDC00429	—	31.8	1¼	50	7	42
HDC00430	HDC00431	31.8	1¼	125	17	106
—	HDC00432	31.8	1¼	180	24	153
—	HDC00433	31.8	1¼	200	26	170
—	HDC00434	31.8	1¼	250	33	212
HDC00435	—	38.1	1½	50	5	32
HDC00436	HDC00437	38.1	1½	150	15	95
HDC00438	HDC00439	38.1	1½	200	20	127
HDC00440	—	44.5	1¾	100	8	51
—	HDC00441	44.5	1¾	200	16	102
HDC00442	—	44.5	1¾	250	20	127
—	HDC00443	44.5	1¾	400	32	204
HDC00444	—	50.8	2	75	5	32
—	HDC22944	50.8	2	100	8	52
HDC00445	—	50.8	2	150	10	64
HDC00446	—	50.8	2	175	12	74
HDC00447	HDC00448	50.8	2	200	13	85
HDC00449	HDC00450	50.8	2	250	17	106
HDC00451	HDC00452	50.8	2	300	20	127
HDC00453	HDC00454	50.8	2	400	26	170
HDC00455	—	50.8	2	500	33	212
—	HDC00456	50.8	2	600	40	255
—	HDC00457	50.8	2	700	46	297
HDC00458	—	57.2	2¼	75	4	27
HDC00459	—	57.2	2¼	100	6	36
HDC00460	—	57.2	2¼	125	7	45
HDC00461	—	57.2	2¼	150	9	55
HDC00462	HDC00463	57.2	2¼	250	14	91
—	HDC00464	57.2	2¼	300	17	109
HDC00465	HDC00466	57.2	2¼	400	23	146
HDC00467	HDC00468	57.2	2¼	500	28	182
HDC00470	HDC00471	60.3	2⅝	100	5	34
HDC00472	—	60.3	2⅝	125	7	42
HDC00473	HDC00474	60.3	2⅝	250	13	85
—	HDC00475	60.3	2⅝	400	21	136
HDC00476	HDC00477	60.3	2⅝	500	26	170
HDC00478	HDC00479	63.5	2½	100	5	32
HDC00480	—	63.5	2½	125	6	40
—	HDC00481	63.5	2½	150	7	48
HDC00482	HDC00483	63.5	2½	200	10	64
HDC00484	HDC00485	63.5	2½	250	12	80
HDC00486	HDC00487	63.5	2½	300	15	95
HDC00489	HDC00490	63.5	2½	400	20	127
HDC00491	HDC00492	63.5	2½	500	25	159
—	HDC00493	65.1	2⅞	300	14	93
HDC00494	—	65.1	2⅞	350	17	108
HDC00495	—	69.9	2¾	250	11	71
HDC00496	HDC00497	69.9	2¾	400	18	113
HDC00498	HDC00499	76.2	3	125	5	32
HDC00500	HDC00501	76.2	3	150	6	38
—	HDC00502	76.2	3	200	8	51
HDC00503	HDC00504	76.2	3	250	10	64
HDC00505	HDC00506	76.2	3	300	12	76
HDC00507	—	76.2	3	350	14	89
HDC00508	HDC00509	76.2	3	400	16	102



## Hi-Density Cartridge Heaters

½" Diameter, Actual 12.6 mm (0.496")

Model numbers listed are for cartridge heaters terminated with 254 mm (10") long leads (Type N termination). Other terminator program terminations and options can also be applied to heaters (see ordering information).

<b>To Order Visit <a href="http://omega.com/hdc00426_series_series">omega.com/hdc00426_series_series</a> for Pricing and Details</b>						
Model Number		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watts/cm <sup>2</sup>	Watts/in <sup>2</sup>
HDC00510	HDC00511	76.2	3	500	20	127
HDC00512	HDC00513	76.2	3	600	24	153
HDC00514	HDC00515	76.2	3	750	30	191
HDC00516	—	76.2	3	1000	40	255
HDC00517	HDC00518	88.9	3½	250	8	53
—	HDC00519	88.9	3½	300	10	64
—	HDC00520	88.9	3½	350	12	74
—	HDC08472	88.9	3½	400	15	95
HDC00522	HDC00523	88.9	3½	500	17	106
—	HDC00524	88.9	3½	750	25	159
—	HDC00525	88.9	3½	1000	33	212
—	HDC00526	95.3	3¾	500	15	98
—	HDC00527	96.8	3 <sup>13</sup> / <sub>16</sub>	250	8	48
HDC00528	—	96.8	3 <sup>13</sup> / <sub>16</sub>	500	15	96
HDC00529	HDC00530	101.6	4	150	4	27
—	HDC07555	101.6	4	200	6	40
HDC00531	HDC00532	101.6	4	250	7	45
HDC00533	HDC00534	101.6	4	300	9	55
HDC00536	HDC00537	101.6	4	350	10	64
HDC00538	HDC00539	101.6	4	400	11	73
HDC00540	HDC00541	101.6	4	500	14	91
HDC00542	HDC00543	101.6	4	550	16	100
—	HDC00544	101.6	4	600	17	109
HDC00545	HDC00546	101.6	4	750	21	136
—	HDC00547	101.6	4	1000	28	182
—	HDC00548	101.6	4	1200	34	218
HDC00550	—	109.5	4 <sup>9</sup> / <sub>16</sub>	550	14	92
HDC00551	—	114.3	4½	250	6	40
—	HDC00552	114.3	4½	350	9	56
HDC00553	HDC00554	114.3	4½	500	12	80
HDC00555	HDC00556	114.3	4½	650	16	103
HDC00557	HDC00558	114.3	4½	750	19	119
—	HDC00559	114.3	4½	1000	25	159
—	HDC00560	120.7	4¾	200	5	30
HDC00561	—	122.2	4 <sup>13</sup> / <sub>16</sub>	250	6	37
—	HDC00562	122.2	4 <sup>13</sup> / <sub>16</sub>	300	7	44
—	HDC00563	122.2	4 <sup>13</sup> / <sub>16</sub>	1000	23	148
HDC00565	HDC00566	127.0	5	200	4	28
HDC00567	—	127.0	5	250	6	35
—	HDC00568	127.0	5	300	7	42
HDC00569	HDC00570	127.0	5	350	8	50
HDC00571	HDC00572	127.0	5	400	9	57
HDC00573	HDC00574	127.0	5	500	11	71
—	HDC00575	127.0	5	550	12	78
—	HDC00576	127.0	5	600	13	85
—	HDC00577	127.0	5	625	14	88
HDC00578	HDC00579	127.0	5	750	17	106
—	HDC00580	127.0	5	800	18	113
—	HDC00581	127.0	5	1000	22	141
HDC00582	HDC00583	133.4	5¼	250	5	34
—	HDC00584	133.4	5¼	1000	21	134
—	HDC00585	139.7	5½	200	4	25
HDC00586	HDC00587	139.7	5½	500	10	64
—	HDC00588	139.7	5½	650	13	83
HDC00589	HDC00590	139.7	5½	750	15	95
—	HDC00591	146.1	5¾	350	7	42
HDC00592	HDC00593	146.1	5¾	700	13	85
—	HDC00594	147.6	5 <sup>15</sup> / <sub>16</sub>	300	6	36



## Hi-Density Cartridge Heaters

1/2" Diameter, Actual 12.6 mm (0.496")

Model numbers listed are for cartridge heaters terminated with 254 mm (10") long leads (Type N termination). Other terminator program terminations and options can also be applied to heaters (see ordering information).

<b>To Order Visit <a href="http://omega.com/hdc00426_series_series">omega.com/hdc00426_series_series</a> for Pricing and Details</b>						
Model Number		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watts/cm <sup>2</sup>	Watts/in <sup>2</sup>
—	HDC00595	152.4	6	200	4	23
HDC00596	HDC00597	152.4	6	250	5	29
HDC00598	HDC00599	152.4	6	300	5	35
HDC00600	HDC00601	152.4	6	350	6	41
—	HDC00602	152.4	6	450	8	52
HDC00603	HDC00604	152.4	6	500	9	58
—	HDC00605	152.4	6	600	11	69
HDC00606	HDC00607	152.4	6	750	14	87
HDC00609	HDC00610	152.4	6	850	15	98
—	HDC00611	152.4	6	875	16	101
HDC00612	HDC00613	152.4	6	1000	18	116
—	HDC00614	152.4	6	1200	22	139
—	HDC16228	152.4	6	1500	28	183
—	HDC00615	161.9	6 3/8	1000	17	108
HDC00616	HDC00617	165.1	6 1/2	500	8	53
—	HDC00618	165.1	6 1/2	1000	17	106
HDC00619	HDC00620	171.5	6 3/4	500	8	51
HDC00621	—	177.8	7	250	4	24
—	HDC00622	177.8	7	340	5	33
—	HDC00623	177.8	7	400	6	39
HDC00624	HDC00625	177.8	7	500	8	49
HDC00626	HDC00627	177.8	7	600	9	59
—	HDC00628	177.8	7	700	11	69
HDC00629	HDC00630	177.8	7	750	11	73
HDC00631	HDC00632	177.8	7	1000	15	98
—	HDC00633	177.8	7	1500	23	147
HDC00634	HDC00635	190.5	7 1/2	500	7	45
—	HDC00636	190.5	7 1/2	1000	14	91
—	HDC00637	196.9	7 3/4	1000	14	88
—	HDC00639	203.2	8	200	3	17
HDC00640	HDC00641	203.2	8	300	4	25
HDC00642	HDC00643	203.2	8	500	7	42
—	HDC00644	203.2	8	600	8	51
HDC00645	HDC00646	203.2	8	750	10	64
HDC00647	HDC00648	203.2	8	800	11	68
HDC00650	HDC00651	203.2	8	1000	13	85
—	HDC00653	203.2	8	1200	16	102
—	HDC00654	203.2	8	1500	20	127
—	HDC00655	203.2	8	2000	26	170
—	HDC00656	215.9	8 1/2	300	4	24
—	HDC00657	215.9	8 1/2	500	6	40
HDC00658	HDC00659	215.9	8 1/2	1000	12	80
—	HDC00660	222.3	8 3/4	1000	12	77
—	HDC00661	228.6	9	500	6	37
—	HDC00662	228.6	9	750	9	56
HDC00663	HDC00664	228.6	9	1000	12	75



**Hi-Density Cartridge Heaters**  
**1/2" Diameter, Actual 12.6 mm (0.496")**

Model numbers listed are for cartridge heaters terminated with 254 mm (10") long leads (Type N termination). Other terminator program terminations and options can also be applied to heaters (see ordering information).

**To Order Visit [omega.com/hdc00426\\_series\\_series](http://omega.com/hdc00426_series_series) for Pricing and Details**

Model Number		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watts/cm <sup>2</sup>	Watts/in <sup>2</sup>
—	HDC00665	228.6	9	1325	15	99
—	HDC00666	228.6	9	1500	17	112
—	HDC00667	241.3	9½	500	6	35
—	HDC00668	241.3	9½	800	9	57
—	HDC00669	241.3	9½	1000	11	71
HDC00670	HDC00671	254.0	10	500	5	34
—	HDC00672	254.0	10	750	8	50
—	HDC00673	254.0	10	800	8	54
HDC00674	HDC00675	254.0	10	1000	10	67
—	HDC00677	254.0	10	1250	13	84
—	HDC00678	254.0	10	1500	16	101
—	HDC00679	254.0	10	2000	21	134
—	HDC00680	266.7	10½	1500	15	95
HDC00681	—	279.4	11	500	5	30
—	HDC00682	279.4	11	1000	9	61
—	HDC00683	279.4	11	1500	14	91
—	HDC00684	279.4	11	2000	19	121
—	HDC00685	292.1	11½	1525	14	88
HDC00686	HDC00687	304.8	12	500	4	28
HDC00688	HDC00689	304.8	12	600	5	33
HDC00690	HDC00691	304.8	12	1000	9	55
—	HDC00692	304.8	12	1100	9	61
—	HDC00693	304.8	12	1500	13	83
—	HDC00694	304.8	12	2000	17	111
—	HDC00695	317.5	12½	1675	14	89
—	HDC00696	342.9	13½	500	4	24
—	HDC00697	355.6	14	1000	7	47
—	HDC00698	355.6	14	1700	12	80
—	HDC00699	355.6	14	2300	17	108
—	HDC00700	381.0	15	800	5	35
—	HDC00701	381.0	15	1000	7	44
—	HDC00702	381.0	15	1500	10	66
—	HDC00703	381.0	15	2000	14	88
—	HDC00704	406.4	16	800	5	33
—	HDC00705	406.4	16	1000	6	41
—	HDC17207	406.4	16	2000	13	84
—	HDC00706	419.1	16½	2200	14	88
—	HDC00707	431.8	17	1000	6	39
—	HDC00708	457.2	18	750	4	27
—	HDC00709	457.2	18	1000	6	36
—	HDC00710	457.2	18	1500	9	55
—	HDC00711	457.2	18	1700	10	62
—	HDC00712	457.2	18	2000	11	73
—	HDC11652	508.0	20	1000	5	34
—	HDC14867	609.6	24	1000	4	28

**Ordering Information**

Order by model number for cartridge heaters with Type N termination. Call OMEGA for part numbers for heaters with other terminator program terminations and options.

**Custom Engineered/Manufactured**

Cartridge Heaters can be application specific; therefore for sizes, electrical ratings, terminations and any other design features not listed in this section will custom manufacture to your specifications. Consult us with your requirements.



Home » Heaters » Cartridge Heaters » HDC00713

## Hi-Density Cartridge Heaters with 321 Stainless Steel Sheath 5/8" (15.88 mm) Nominal Diameter

HDC00713



5/8" Diameter Hi-Density Cartridge Heaters

**\$36.75** HDC00713

★★★★★

Be the first to review this product



- High Watt Densities of 100 W/in<sup>2</sup> to 300 W/in<sup>2</sup> Provide Maximum Processing Temperature Capability.
- Standard 321 Stainless Steel Sheath Material Provides High Temperature Strength, Good Thermal Conductivity and Resistance to Corrosion and Scaling.
- Swaged Construction Provides Excellent Heat Transfer and High Dielectric Strength.
- U.L. Component Recognized.
- CSA Certified.
- Applications up to 565°C (1050°F) Working Temperature.
- Maximum Sheath Temperature 650°C (1200°F)\*.
- Standard Sheath Lengths 25.4 cm (1") to 1829 mm (72")
- 120V and 240V Models - 480V Capable
- Over 40 Termination Styles and Special Features.

\*Incoloy® 800 Sheath Material Available on Special Order for Applications up to 760°C (1400°F).

[Cartridge Heaters - View related products](#)

### Description

Hi-Density Multi-Purpose cartridge heaters represent OMEGA's commitment to value-added customer service. OMEGA maintains over 65,000 semi-finished hi-density cartridge heater substrates in stock, offering a combination of over 1000 sizes in industry standard diameters and lengths ranging from 25.4 mm (1") here OMEGA will custom manufacture to your specifications. Consult us with your requirements. to 914.4 mm (36") in a complete spectrum of wattages and operating voltages.

Multi-purpose cartridge heaters are the solution for a multitude of original equipment manufacturers (OEMs) and maintenance (MRO) applications. Highly engineered specific purpose OMEGA cartridge heaters have been at the forefront of addressing the challenges of Original Equipment Manufacturers (OEMs) in a broad segment of diversified industries. As a company OMEGA is uniquely qualified and committto assist our customers in developing highly engineered specific use cartridge heaters for dependable and reliable performance.

Let OMEGA provide the optimal solution to your thermal loop systems and cartridge heater design challenges.

**Hi-Density Cartridge Heaters 5/8" Dia., Actual 0.621" ±0.002" ( 15.773 mm)**

Sheath Length		Model Number		Watts	Watt Density		Sheath Length		Model Number		Watts	Watt Density	
inch	mm	120V	240V		/in <sup>2</sup>	/cm <sup>2</sup>	inch	mm	120V	240V		/in <sup>2</sup>	/cm <sup>2</sup>
1¼	31.8	HDC00713	—	50	34	5	4	102	HDC00771	HDC00772	500	73	11
1¼	31.8	HDC00714	HDC00715	200	136	21	4	102	—	HDC00773	550	80	12
1¼	31.8	HDC00716	HDC00717	250	170	26	4	102	—	HDC00774	600	87	14
1½	38.1	HDC00719	HDC00720	250	127	20	4	102	HDC00775	HDC00776	750	109	17
2	50.8	HDC00721	—	100	34	5	4	102	—	HDC00777	1000	146	23
2	50.8	HDC00722	—	125	42	7	4½	114	—	HDC00780	500	64	10
2	50.8	HDC00723	HDC00724	200	68	11	4½	114	HDC00783	HDC00784	750	95	15
2	50.8	HDC00725	HDC00726	250	85	13	4½	114	—	HDC00785	1000	127	20
2	50.8	—	HDC00727	300	102	16	3¾	121	—	HDC00787	750	90	14
2	50.8	—	HDC00728	400	136	21	5	127	HDC00788	HDC00789	250	28	4
2	50.8	—	HDC00729	500	170	26	5	127	—	HDC00790	500	57	9
2	50.8	—	HDC00730	750	255	40	5	127	HDC00791	HDC00792	750	85	13
2¼	57.2	HDC00731	—	100	29	5	5	127	—	HDC00793	875	99	15
2¼	57.2	HDC00732	—	125	36	6	5	127	HDC00794	HDC00795	1000	113	18
2¼	57.2	HDC00733	HDC00734	250	73	11	5⅜	137	HDC00796	HDC00797	800	84	13
2¼	57.2	HDC00735	HDC00736	350	102	16	5½	140	—	HDC00800	800	81	13
2⅜	60.3	HDC00739	HDC00740	280	76	12	5¾	146	—	HDC00801	500	49	8
2½	63.5	HDC00742	—	180	46	7	5¾	146	—	HDC00802	1500	146	23
2½	63.5	HDC00743	HDC00744	275	70	11	6	152	HDC00804	HDC00805	300	28	4
2½	63.5	HDC00745	HDC00746	400	102	16	6	152	HDC00806	HDC00807	500	46	7
2½	63.5	—	HDC00747	720	183	28	6	152	—	HDC00808	750	69	11
3	76.2	HDC00748	—	150	31	5	6	152	HDC00809	HDC00810	1000	93	14
3	76.2	HDC00749	—	180	37	6	6	152	—	HDC00811	1200	111	17
3	76.2	HDC00750	HDC00751	250	51	8	6	152	HDC00812	HDC00813	1500	139	22
3	76.2	HDC00752	HDC00753	350	71	11	6½	165	HDC00814	HDC00815	350	30	5
3	76.2	HDC00754	—	400	81	13	6½	165	HDC00816	HDC00817	500	42	7
3	76.2	HDC00755	HDC00756	500	102	16	6½	165	—	HDC00818	900	76	12
3	76.2	—	HDC00757	600	122	19	6½	165	—	HDC00819	1400	119	18
3	76.2	—	HDC00758	720	147	23	6¾	172	—	HDC00820	500	41	6
3	76.2	—	HDC00759	750	153	24	6¾	172	—	HDC00821	1000	81	13
3¼	82.6	HDC00760	—	200	37	6	7	178	HDC00822	HDC00823	500	39	6
3¼	82.6	—	HDC00761	800	148	23	7	178	—	HDC00824	750	59	9
3½	88.9	—	HDC00762	525	89	14	7	178	HDC00825	HDC00826	1000	78	12
3¾	95.3	HDC00763	HDC00764	525	82	13	7	178	—	HDC00827	1500	118	18
4	102	HDC00766	HDC00767	250	36	6	7½	191	HDC00828	—	325	24	4
4	102	—	HDC00768	300	44	7	7½	191	—	HDC00829	1300	95	15
4	102	HDC00769	—	350	51	8	7¾	197	—	HDC00830	400	28	4
4	102	—	HDC00770	400	58	9	Ordering Example: HDC00713, 50 W, 120 Vac, 5/8" dia						

Model Numbers listed are cartridge heaters terminated with Type N termination 254 mm (10") long leads. For other terminations and options see Modifications & Options for HDC.  
Contact OMEGA for part numbers and pricing.

### Hi-Density Cartridge Heaters 5/8" Dia., Actual 0.621" ±0.002" ( 15.773 mm)

Sheath Length		Model Number		Watts	Watt Density		Sheath Length		Model Number		Watts	Watt Density	
inch	mm	120V	240V		/in <sup>2</sup>	/cm <sup>2</sup>	inch	mm	120V	240V		/in <sup>2</sup>	/cm <sup>2</sup>
7 <sup>3</sup> / <sub>4</sub>	197	—	HDC00831	1000	70	11	12	305	—	HDC00875	2000	89	14
8	203	—	HDC00832	400	27	4	13	330	—	HDC00876	1000	41	6
8	203	HDC00833	HDC00834	500	34	5	13	330	—	HDC00877	1500	61	10
8	203	—	HDC00835	750	51	8	14	356	HDC00878	—	925	35	5
8	203	—	HDC00836	850	58	9	14	356	—	HDC00879	1000	38	6
8	203	HDC00837	HDC00838	1000	68	11	14	356	—	HDC00880	1500	57	9
8	203	HDC00839	HDC00840	1200	81	13	14	356	—	HDC00881	3700	140	22
8	203	HDC00841	HDC00842	1500	102	16	15	381	—	HDC00882	750	26	4
8	203	—	HDC00843	2000	136	21	15	381	—	HDC00883	1000	35	5
8 <sup>3</sup> / <sub>4</sub>	222	HDC00845	—	450	28	4	15	381	—	HDC00884	2400	84	13
8 <sup>3</sup> / <sub>4</sub>	222	—	HDC00846	1800	111	17	15	381	—	HDC00885	4000	140	22
9	229	—	HDC00847	500	30	5	16	406	—	HDC00886	1000	33	5
9	229	—	HDC00848	750	45	7	16	406	—	HDC00887	2500	82	13
9	229	—	HDC00849	1000	60	9	16	406	—	HDC00888	4500	148	23
9	229	—	HDC00850	1500	90	14	17	432	—	HDC00889	1000	31	5
9 <sup>1</sup> / <sub>2</sub>	241	—	HDC00851	975	55	9	18	457	—	HDC00890	900	26	4
10	254	HDC00852	HDC00853	500	27	4	18	457	—	HDC00891	1000	29	5
10	254	HDC00855	—	650	35	5	18	457	—	HDC00892	1500	44	7
10	254	—	HDC00856	750	40	6	18	457	—	HDC00893	3000	87	14
10	254	—	HDC00857	800	43	7	18	457	—	HDC00894	4700	137	21
10	254	HDC00858	HDC00859	1000	54	8	19	483	—	HDC00895	1000	28	4
10	254	HDC00860	HDC00861	1500	80	13	20	508	—	HDC00896	1000	26	4
10	254	—	HDC00862	2000	107	17	20	508	—	HDC00897	1500	39	6
11	279	—	HDC00863	1000	49	8	20	508	—	HDC00898	3500	91	14
11	279	—	HDC00864	1400	68	11	20	508	—	HDC00899	4700	123	19
11	279	—	HDC00865	2000	97	15	24	610	—	HDC00900	1000	22	3
12	305	HDC00866	HDC00867	500	22	3	24	610	—	HDC00901	2000	43	7
12	305	HDC00868	—	600	27	4	24	610	—	HDC00902	4700	102	16
12	305	—	HDC00869	775	34	5	25 <sup>1</sup> / <sub>4</sub>	641	—	HDC00903	1500	31	5
12	305	—	HDC00870	900	40	6	30	762	—	HDC00904	2800	48	8
12	305	HDC00871	HDC00872	1000	44	7	36	914	—	HDC00905	3000	43	7
12	305	HDC00873	HDC00874	1500	66	10	Ordering Example: HDC00713, 50 W, 120 Vac, 5/8" dia						

Model Numbers listed are cartridge heaters terminated with Type N termination 254 mm (10") long leads. For other terminations and options see Modifications & Options for HDC.  
Contact OMEGA for part numbers and pricing.

Show Only Stocked Items

ADD TO CART +

Part Number	Description	Qty
HDC00713 \$36.75 <i>4 In Stock</i>	120 volt, 50 watts, 1 1/4 inches long	<input type="text" value="0"/>
HDC00720 Consult Sales	240 volt, 250 watts, 1 1/4 inches long	
HDC00775 Consult Sales	120 volt, 750 watts, 1 1/4 inches long	
HDC00780 Consult Sales	240 volt, 500 watts, 1 1/4 inches long	
HDC00809 \$62.50 <i>Available In 4 Weeks</i>	120 volt, 1000 watts, 1 1/4 inches long	<input type="text" value="0"/>
HDC00810 Consult Sales	240 volt, 1000 watts, 1 1/4 inches long	
HDC00866 Consult Sales	120 volt, 500 watts, 1 1/4 inches long	
HDC00869 Consult Sales	240 volt, 775 watts, 1 1/4 inches long	
HDC00852 \$81.00 <i>1 In Stock</i>	120 volt, 500 watts, 10 inches long	<input type="text" value="0"/>

## Order By Part Number

Part Number	Qty	Part Number
<input type="text"/>	<input type="text"/>	<input type="text"/>

† All amounts shown in USD

**Note:** Ordering Information Order by Model number for stock cartridge heaters with Type N termination. Call OMEGA for model numbers for heaters with other terminations and options. Custom Engineered/Manufactured heaters can be application specific; therefore for sizes, electrical ratings, terminations and any other design feat here OMEGA will custom manufacture to your specifications. Consult us with your requirements.



## Reviews



Be the first to review this product

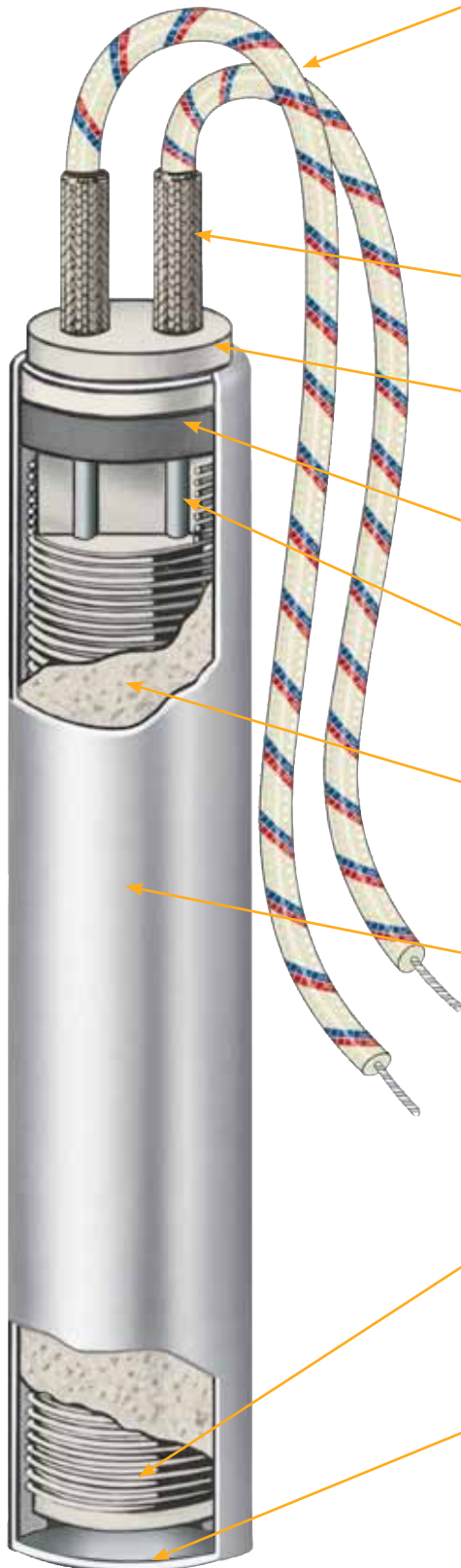
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## Hi-Density Cartridge Heaters



### Features

The standard termination for Hi-Density Cartridge Heaters is Type N, 254 mm (10") long nickel conductor lead wires externally connected to 32 mm (1 1/4") solid conductor terminal pins. The lead wires have fiberglass insulation and are UL approved for temperatures up to 250°C (482°F). Mica insulated UL approved wires for temperatures up to 450°C (842°F) are optional.



**Note:** To meet the requirements of your application we offer over 40 standard termination styles to select from that will solve many of the most common application problems.

High temperature fiberglass sleeve provides maximum electrical insulation to the crimp connector used to splice the nickel conductors to the flexible leads.

Ceramic end cap prevents nickel conductors from shorting out against sheath when sharp bending of the leads is required. The ceramic cap may be eliminated in some cases to optimize the heater watt density.

Ceramic end cap and swaged-in lava plug protect the internal cartridge from outer contamination. Other types of seals can also be provided.

Solid conductor terminal pins are used to ensure a good electrical connection between the nickel conductor lead wires and the resistance wire. They are sized for the maximum current rating of the heater.

Specially selected grain size high purity Magnesium Oxide (MgO) is used to fill all remaining space inside the sheath. Heater is then swaged, which compacts the magnesium oxide grains into a solid mass, thereby increasing thermal conductivity and dielectric strength.

Standard sheath material is 321 Stainless Steel. It provides high temperature strength up to 650°C (1200°F), good thermal conductivity, and resistance to corrosion and scaling. Alloy 321 is a Nickel-Chromium Stainless Steel modified with the addition of Titanium. For higher operating temperatures up to 760°C (1400°F) or corrosive immersion heating applications, Incoloy® 800 is available. Consult OMEGA for other sheath materials.

Grade "A" Nickel-Chrome resistance wire precisely wound on a high purity magnesium oxide core places the resistance wire as close to the inside of the sheath as possible while maintaining dielectric strength. This provides excellent heat transfer and long heater life with the highest possible watt densities.

Welded end disc made from the same material as the sheath provides a positive seal against moisture and other contaminants.

\* Hi-Density Cartridge Heaters are UL recognized and CSA certified in many design variations under UL File Number E65652 and CSA File Number 043099. If you require UL and/or CSA Agency Approval, please specify when ordering.

## OMEGA Offers the Most Comprehensive and Diverse Selection in Hi-Density Cartridge Heaters

### Typical Applications

- Plastic Extruders
- Hot Runner Molds
- Hot Stamping
- Medical Equipment
- Packaging Equipment
- Molds
- Aerospace
- Sealing Bags
- Semi-Conductor
- Plastic Molding
- Shoe Machinery
- Food Processing
- Heating Gases and Liquids
- Glue Guns
- Laminating Presses
- Platens
- Scientific Equipment
- Food Service Equipment

### Hi-Density Cartridge Heaters Provide Maximum Processing Temperature Capability

- Higher watt densities permit smaller heaters to be used without sacrificing life expectancy. This results in up-front as well as long-term cost savings.
- Swaged construction provides maximum support for the resistance wire and excellent heat transfer characteristics, improving the overall life expectancy of the cartridge heater.
- Termination styles and special features allow customization to any application.
- Applications up to 760°C (1400°F)

### Hi-Density Cartridge Heaters are Classified in Two Distinct Categories

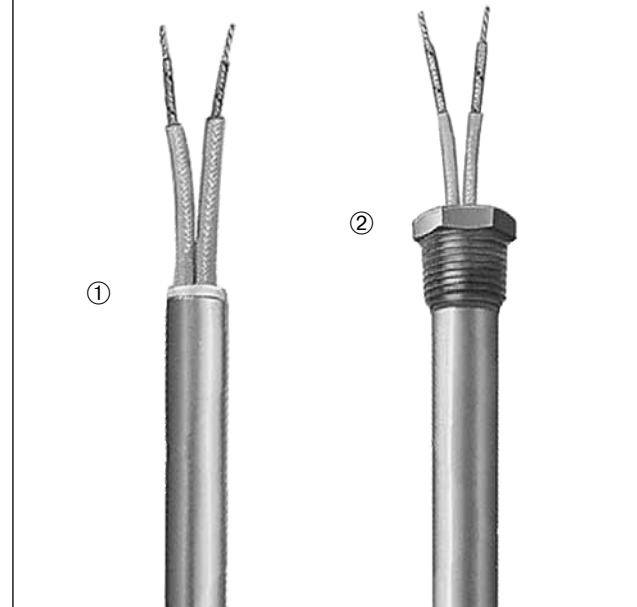
#### Multi-Purpose Use

The multi-purpose use cartridge heaters represent OMEGA's commitment to value-added customer service as we maintain in stock over 65,000 semi-finished hi-density cartridge heater substrates, offering a combination of over 1000 sizes in industry standard diameters and lengths ranging from 25.4 mm (1") to 914.4 mm (36") in a complete spectrum of wattages and operating voltages. Multi-purpose use cartridge heaters are the solution for a multitude of original equipment manufacturers (OEMs) or maintenance (MRO) applications.

Available through the terminator program. Complete details are found on page 8.

### Hi-Density Cartridge Heaters Have Evolved and Today Offer a Multitude of Diverse Product Options:

1. (HDC) A hi-density cartridge heater in US sizes.
2. (HDL) A hi-density cartridge heater designed with NPT Fittings for Immersion heating.



#### Highly Engineered Specific Purpose Use

OMEGA has been at the forefront of addressing the challenges of Original Equipment Manufacturers (OEMs) in a broad segment of diversified industries. As a company we are uniquely qualified and committed to providing value-added expertise in engineering and manufacturing capabilities assisting customers in developing highly engineered specific use cartridge heaters for dependable and reliable performance. Let us provide the optimal solution to your thermal loop system and cartridge heater design challenges.

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



## Hi-Density Cartridge Heater Specifications

### Standard Specifications

#### Performance Ratings

**Maximum Temperature:** 760°C (1400°F)

**Maximum Watt Density:** 15.5 to 46.5 watt/cm<sup>2</sup>  
(100 to 300 Watt/in<sup>2</sup>) depending on heater size and operating temperature

**Note:** The maximum operating temperature and the life expectancy of a cartridge heater is dependent on two main factors:

1. The maximum recommended sheath temperature [648°C (1200°F) for a standard heater]
  2. The maximum ambient temperature for the termination selected.
- Consult OMEGA if you require a recommendation for your application.

#### Length Tolerance for Lead Wires, Wire Braid Leads, and Armor Cable Leads:

**Up to 914 mm (36"):** -12.7, 25.4 mm (-1/2, 1")

**914 to 1829 mm (36 to 72"):**

25.4, 50.8 mm (-1, 2")

**Above 72":** 101.6 mm (±4")

### Dimensional Specifications

Nominal Diameter	1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
<b>Actual Diameter</b>	3.10 (0.122)	6.25 (0.246)	7.82 (0.308)	9.42 (0.371)	12.60 (0.496)	15.77 (0.621)	18.95 (0.746)	23.30 (0.996)
<b>Diameter Tolerance</b>	0.051 (±0.002)	0.051 (±0.002)	0.051 (±0.002)	0.051 (±0.002)	0.051 (±0.002)	0.051 (±0.002)	0.076 (±0.003)	0.076 (±0.003)
<b>Minimum Length</b>	31.8 (1.25)	25.40 (1)	25.40 (1)	25.40 (1)	25.40 (1)	25.40 (1)	31.75 (1¼)	44.45 (1¾)
<b>Maximum Length</b>	305 (12)	914 (36)	914 (36)	1219 (48)	1219 (48)	1829 (72)	1829 (72)	1829 (72)
<b>Length Tolerance Heaters up to 127 mm (5") long</b>	2.4 (±3/32)	2.4 (±3/32)	2.4 (±3/32)	2.4 (±3/32)	2.4 (±3/32)	2.4 (±3/32)	3.2 (±1/8)	3.2 (±1/8)
<b>Length Tolerance Heaters over 127 mm (5") long</b>	±2% of sheath length							
<b>Camber Tolerance Heaters to 305 mm (12") long</b>	0.254 mm (0.010") per foot of length							
<b>Camber Tolerance Heaters over 305 mm (12") long</b>	0.508 mm (0.020") per foot of length							

A certain amount of camber is unavoidable. With a slight force, hi-density cartridge heaters will flex enough to fit into a straight reamed hole.

### Electrical Specifications

Nominal Diameter	1/8"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
<b>Maximum Voltage</b>	240	240	240	240	240	480*	480*	480*
<b>Maximum Amperage (see next line for exceptions)</b>	3.0	4.4	4.5	6.7	10.5	23	23	23
<b>†Maximum Amperage for Types C1C, C1D, C2C, C2D, CS, F, M3, R1B, S1, S2, SA, W and W3 Terminations</b>	—	3.0	3.0	5.5	7.6	9.7	9.7	9.7
<b>Minimum Wattage at 120V on a 1" long Heater</b>	—	50	45	45	50	50	—	—
<b>Minimum Wattage at 120V on a 2" long Heater</b>	5	20	20	20	20	20	20	20
<b>Maximum Wattage at 120V</b>	360	525	540	800	1260	2760	2760	2760
<b>Maximum Wattage at 240V</b>	720	1050	1080	1600	2520	5520	5520	5520
<b>Maximum Wattage at 480V</b>	—	—	—	—	—	11,000	11,000	11,000
<b>Wattage Tolerance</b>	+10, -15%		Plus 5%, minus 10%					
<b>Resistance Tolerance</b>	+15, -10%		Plus 10%, minus 5%					

†Current carrying capacities are for ambient temperatures up to 250°C (482°F) with mica insulated lead wires.

\*480V when applicable. Consult OMEGA.

#### Temperature Coefficient of Resistance

The electrical resistance (ohms) of the heater resistance wire increases with temperature rise.

OMEGA standard hi-density cartridge heaters are manufactured with ohms (cold ohms) 3.3% lower than the actual calculated ohms (hot ohms) to compensate for this increase.



**Note:** Specifications detailed on this page are standard. Consult OMEGA if your application requires tighter tolerances or has other special requirements

### Available Electrical Features

Diameter	Dual Volts	3-Phase	Dual Circuits	Multiple Heat Zones (maximum 3 zones)
1/8"	No	No	No	No
1/4"	No	No	No	No
5/16"	No	No	No	No
3/8"	Yes*	No	No	Yes*
1/2"	Yes*	Yes	Yes	Yes*
5/8"	Yes	Yes	Yes	Yes
3/4"	Yes	Yes	Yes	Yes
1"	Yes	Yes	Yes	Yes

Consult factory for maximum wattages and voltages

\*Heaters may require a larger diameter transition area at lead end.

## Recommendations for Improving the Life of Hi-Density Cartridge Heaters

Hi-density cartridge heaters have been widely used in many demanding and diverse applications since 1972. The commonly used basic applications are platen, plastic mold and die heating, liquid immersion and air heating.



**Note:** Selection of the wrong termination for a particular application is the primary reason for all heater failures. However, failure to consider other important criteria can also have a negative effect on the life of the heater. To get the best performance and assure long life, it is important to carefully evaluate the following factors.

### Operating Temperature

Operating temperature of a heater is a major factor in determining the life expectancy of a heating element. The heater life depends on the actual temperature of the resistance wire within the heater and not on the process operating temperature. The graph in Figure 1 demonstrates the proper relationship between operating temperature and watt density; the higher the operating temperature, the lower the maximum recommended watt density.

### Heater Watt Density

Cartridge heater watt density is defined as the wattage dissipated per square inch of the heated sheath surface. For a particular application a heater's watt density governs internal resistance wire temperature, which determines the outer sheath temperature. These factors are critical to the proper heating of the application and to the life expectancy of the heater. Special construction features that promote excellent heat transfer permit Hi-Density Cartridge Heaters to operate at higher watt densities while maintaining the lowest possible resistance wire temperatures of any style cartridge heater.

Heater watt density (watts/in<sup>2</sup>) is calculated using the following formula:

$$\text{Watt Density} = \frac{\text{Heater wattage}}{\text{Heated length} \times \text{Heater diameter} \times 3.1416}$$

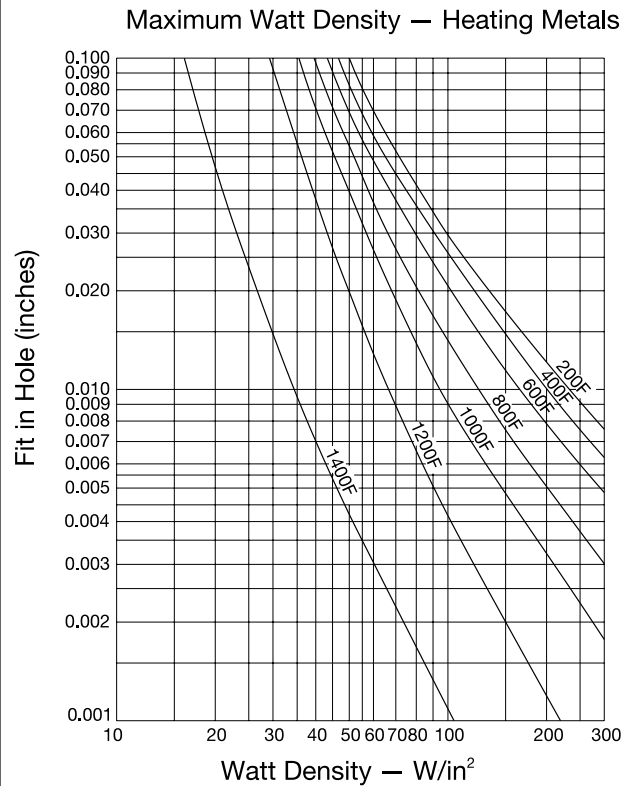
Heated length is the overall length of the heater minus any unheated (cold) sections. Standard Type N, Hi-Density cartridge heaters have 10 mm (3/8") at the lead end and 6 mm (1/4") at the disc end unheated. This would mean a 152 mm (6") long heater would have 265 mm (5 5/8") effective heated length. Unheated sections vary with type of heater termination.

The graph in Figure 1 shows the maximum recommended watt density for hi-density cartridge heaters when used in a steel platen. Watt density limitations for various materials are given in the engineering section of this catalog. For liquid immersion heaters the maximum watt density depends on the type of liquid being heated. The more viscous, or thicker the liquid, the lower the maximum watt density. Higher watt density can cause the liquid to carbonize and accumulate on the heater sheath, which will cause premature heater failure. It is advisable to use heaters that have watt densities below the maximum recommended watt density to get the longest heater life. If the actual heater watt density is close to the maximum recommended watt density, you can correct the problem by:

1. Increasing the number, diameter and length of heaters.
2. Lowering the total wattage; however, this may increase the heat-up time.
3. Obtaining tighter fit (see Figure 2 — Determining Fit).

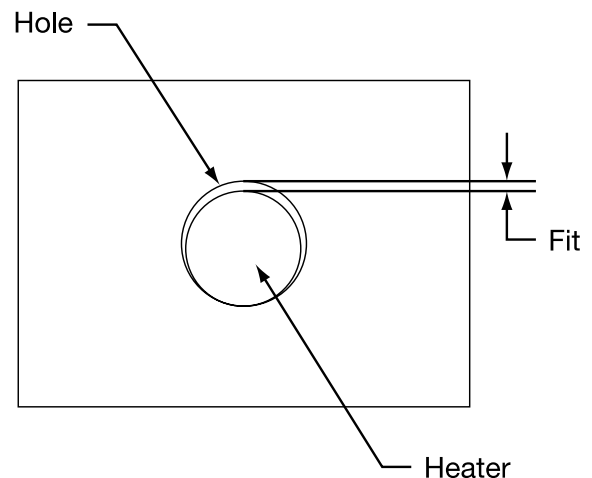
A hi-density cartridge heater designed at the maximum recommended watt density allows the smallest heater to be used to obtain the required wattage with good service life. All things being equal, using a lower watt density heater will typically provide optimized service life.

Figure 1  
Recommended Watt Density for Heating Metal Parts



The graph shows the recommended maximum watt density for OMEGA Hi-Density cartridge heaters at different operating temperatures and fit, when the heater is installed in an oxidized mild steel block. The thermocouple is located 13 mm (1/2") from the heater. When heating other materials, the data needs to be extrapolated based on the thermal conductivity of the material. Consult OMEGA with your requirements.

Figure 2  
Determining Fit





## Recommendations for Improving the Life of Hi-Density Cartridge Heaters (Continued)

### Determining Fit

When heating a platen, mold, die or hot runner probe with hi-density cartridge heaters inserted into drilled holes, fit is an important factor in determining the life expectancy of the heater. Fit is the difference between the minimum diameter of the cartridge heater and the maximum diameter of the hole. Unheated sections on a hi-density cartridge may be smaller in diameter due to swaging. To determine fit, use the smallest diameter on the heated length only.

**Example:** A 10 mm ( $\frac{3}{8}$ " nominal OD Hi-Density cartridge heater has an actual diameter of 9 mm (0.371")  $\pm 0.002$ , which translates to a minimum diameter of 9 mm (0.369"). If used in a 10 mm (0.376")  $\pm 0.002$  hole, the fit would be 0.23 mm (0.009")  $10 - 9 \text{ mm} = 23 \text{ mm}$  (0.378" - 0.369" = 0.009").

When medium watt density heaters (less than 60 watts per square inch) are used in low temperature applications [less than 315°C (600°F)] general purpose drills are commonly used to drill holes. The typical hole size may be 0.1 to 0.2 mm (0.003 to 0.008") over the drill size. For higher watt density and/or higher temperature applications, we recommend that the holes are drilled and reamed for the tightest possible fit. In applications where precise temperature control and heat transfer properties are required, hi-density cartridge heaters can be centerless ground to  $\pm 0.01 \text{ mm}$  ( $\pm 0.0005$ ").

Although a tighter fit is desirable to efficiently transfer heat and to get long heater life, a looser fit will aid in installing and removing heaters, especially long heaters. We recommend that you apply BNS anti-seize cartridge heater coating as it will improve heat transfer and will make the removal of heaters easier.

The graph in Figure 1 (page 4) shows the effect of fit in determining the maximum recommended watt density on a steel platen. As it is indicated in the graph, the tighter the fit, the higher the maximum recommended watt density.

### Temperature Control and Location of Temperature Sensing Device

In order to better control the heater temperature and hence the resistance wire temperature, use of an appropriate temperature control and the proximity of the heater to the sensor is very important. The graph in Figure 1 (page 4) shows the effect of operating temperature in determining the maximum recommended watt density on a steel platen where the sensor is located 13 mm ( $\frac{1}{2}$ ") from the heater. Higher watt density heaters can generate heat faster than the surrounding area's ability to dissipate heat. This creates a thermal lag between the heater and the sensor. The closer the sensor to the heater, the better you can control the heater temperature. By keeping the sensor further from the heater, temperature gradients of several hundred degrees can be observed in many applications, especially during initial start-up and heavy thermal cycling. Although the set operating temperature may be low, the heater may be running at a very high temperature. This is a common cause of heater failure. This can be minimized using time proportional and PID functions of the temperature controllers.

### Power Control

Power control methods affect the life expectancy of heating elements. In general, although economical, on-off controls increase thermal fatigue and oxidation rate on heating elements by causing wide temperature swings of the internal heating element. Silicon controlled rectifiers (scrs), mercury relays and solid state power controls can increase the life expectancy of heating elements by reducing the temperature swings of the internal heating element.

## Common Causes of Cartridge Heater Failures

### Contamination

Contamination is a major cause of heater failure. Moisture, hydraulic oils, and melted plastic are the most common contaminants that are seen on failed heaters. Since the magnesium oxide insulation in a hi-density heater is hygroscopic in nature, moisture is easily absorbed into the heater and typically results in premature heater failure. Moisture absorption during machine washdown or cleanup also is a frequent problem. These contaminants, which are electrically conductive, will short out the heater. Most probably, the failures will be at the lead end of the heater and in some cases can split or blow a hole on the heater sheath. The disc end of a Hi-Density cartridge heater is welded shut with a stainless steel disc.

Generally, contaminants enter the heater through the lead end of the heater. The high temperature lead wires used on Hi-Density heaters have fiberglass or mica insulation. Oil and moisture can wick through the insulation on the lead wire into the heater. OMEGA offers a wide variety of terminations to avoid this problem, including epoxy seals, PTFE seals, convoluted cables, welded end discs, PTFE insulated lead wires and SJO cable. However, there are temperature limitations on many of these terminations.

### Excessive Flexing of Leads

Hi-Density heaters use flexible grade A nickel stranded lead wires with fiberglass or mica insulation. On certain terminations the lead wires are connected externally to solid nickel conductor pins. In applications where there is excessive movement or vibration, the solid pins could break due to fatigue. A simple solution is to give enough slack on the leads to minimize the stress on the solid pins or provide an internal lead wire connection within the heater. OMEGA also offers strain relief brackets and springs to prevent this problem.

Where heater leads can wear out by abrasion due to excessive flexing of the leads, OMEGA offers several abrasion resistant terminations.

### Lack of Heat Sink

Hi-Density heaters are designed with minimum unheated (cold) sections. If the heated sections project from the platen or mold, these sections will get extremely hot due to lack of heat transfer. This will lead to premature heater failure. OMEGA can manufacture heaters with cold sections anywhere along the length of the heater to prevent overheating of the heater sheath.

When a hi-density heater is used as a liquid immersion heater, make sure the heater's sheath length is completely immersed in the liquid. The heater lead end should not be immersed in liquid, since most of the lead end seals are only moisture resistant, not moisture proof.



**Note:** If you should encounter premature cartridge heater failure, consult OMEGA. Our team of professionals will have the solution to your problem.



## Recommendations for Improving the Life of Hi-Density Cartridge Heaters (Continued)

### High Operating Temperature

OMEGA hi-density heaters are designed to operate at sheath temperatures up to 760°C (1400°F). When process temperatures approach the maximum heater sheath temperature, make sure the sheath temperature doesn't exceed its limitations. Location of the thermocouple and the type of temperature and power controls are factors that affect sheath temperature and potential overshoot conditions.

Although the heater is designed to run at temperatures up to 760°C (1400°F), heater lead wires and terminations are rated for much lower temperatures. Care should be taken to make sure that the heater lead end temperatures do not exceed their limitations. Heaters can be made longer with unheated sections at the lead end to bring the lead end out of the high temperature area. OMEGA can also provide you with a high temperature wiring harness, which can withstand temperatures up to 760°C (1400°F).

### Wattage Rating

Heaters with very high wattage ratings can create temperature overshoots, uneven temperature distribution and high heater sheath temperatures, causing premature heater failure.

For liquid immersion heaters, maximum watt density depends on the type of liquid being heated. The heavier or thicker the liquid, the lower the maximum watt density. Higher watt density can cause the liquid to carbonize and accumulate on the heater sheath, which will cause premature heater failure.

### Scale and Sludge Buildup

In liquid immersion applications, periodic cleaning of the heater sheath is necessary to remove any scale buildup on the sheath. Scale can accumulate on the sheath and cause the heater to overheat and fail. When used to heat liquid in a tank, be sure to clean any sludge from the bottom of the tank. A heater sheath covered with sludge will overheat and fail.



**Note:** As explained in the above paragraphs, the single major cause for cartridge heater failure is the selection of the wrong type of heater lead end termination for the specific application. To assist you in selecting the right termination type, see section of detailed descriptions of over 40 terminations designed to solve many of the common application problems. If you need further assistance, consult OMEGA.

### Important Installation Considerations

1. For closest fit and best heat transfer, use reamed holes.
2. When possible, drill holes through the object being heated. This will make heater removal easier.
3. When using an anti-seize coating like BNS spray or paste, do not apply over lead wires or any other current carrying conductors.
4. When using insulated tape or sleeving, check to make sure it is rated for the temperature of the application. Lower temperature rated materials can contain an adhesive or binder that can carbonize and become electrically conductive.
5. When using heaters near their maximum recommended watt density, it is recommended that the temperature sensing probes be at maximum 13 mm (½") from the heater sheath.
6. Lead wires should not be located in the hole containing the cartridge heater during operation. This may cause the lead wires to be exposed to temperatures above their rated temperature.
7. When used in a vacuum application, make sure the lead end of the heater is outside the vacuum. If the lead has to be in the vacuum, consult OMEGA for specific recommendations.
8. Many applications will subject a heater's electrical terminations to one or more of the following potentially damaging conditions:

- Moisture
- Oil and other contaminants
- Flexing
- Abrasion
- High temperature



**Note:** To protect the heater from damage in these harsh environments, OMEGA has a wide selection of terminations and options available.

### BNS Anti-Seize Cartridge Heater Coating

This high temperature, electrically insulating and thermally conductive coating will minimize oxidation and improve heat transfer from heater to the object being heated.

Brush a thin layer of paste or spray lightly over the cartridge heater prior to inserting the heater into a hole.



**CAUTION!** Do not apply over lead wires or other bare current carrying conductors, since the water in the paste and spray can cause an electrical short circuit.



13 oz.  
Aerosol spray can  
Part Number:  
CML00010

- Temperature Range 1562°F (850°C)
- High Heat Transfer



4 oz. Paste with  
brush applicator top  
Part Number: CML00020

- Temperature Range 1562°F (850°C)
- High Heat Transfer



**Note:** Formulated to assist in the removal of cartridge heaters.



## Custom Terminated Multi-Purpose Use Cartridge Heaters from the Terminator Program

OMEGA stocks over 1000 different semi-finished hi-density cartridge heaters in diameters 6, 8, 10, 13, 16, and 19 mm ( $\frac{1}{4}$ ,  $\frac{5}{16}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$  and  $\frac{3}{4}$ ").

These cartridge heaters are semi-finished (substrates), offering you the option to finish them by choosing from 19 program-qualified lead end terminations and options. Cartridge heaters will be ready for shipment within 1 to 3 days, depending on the termination/option selected.

### Ordering Information — Follow These Simple Steps

1. Select an available 6 mm ( $\frac{1}{4}$ " through 19 mm ( $\frac{3}{4}$ ") hi-density cartridge heater. The model numbers in the tables are for heaters with termination type N [254 mm (10") long externally connected lead wires].








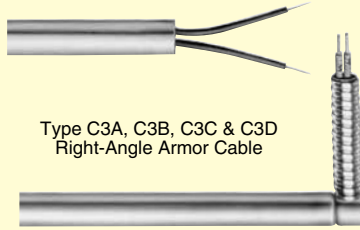


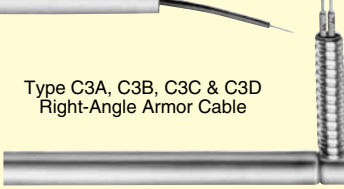

2. Refer to the program-qualified lead terminations reference photos to select the cartridge heater termination type best suited for your application.

**NOTE:** Type "N" [254 mm (10") long externally connected plain lead wires] is the most common termination applied in the Terminator program. If a termination other than Type N is selected a new permanent part number will be assigned when your order is placed.

3. Specify your lead requirements in the event that the standard supplied lengths for Plain Leads 254 mm (10"), braid or armor cable [254 mm (10") over 305 mm (12") leads] are not suited for your application.

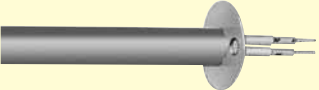
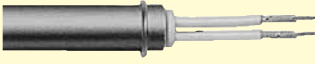


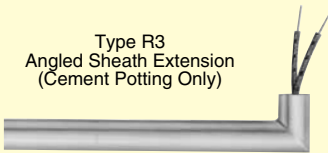


4. Specify the quantity.

### Terminations

<p>Type N Standard Leads</p> 	<p>Type B Ceramic Bead Insulation</p> 	<p>Type BL Ceramic Bead and Leads</p> 
<p>Type C1A &amp; C1B only Straight Armor Cable</p> 	<p>Type C2A &amp; C2B Right-Angle Armor Cable with Copper Elbow</p> 	<p>Type R1A Right-Angle Leads with Copper Elbow</p> 
<p>Type W Straight Wire Braided Leads</p> 	<p>Type M2A &amp; M2E Potted Lead End Seal (Cement Only)</p> 	<p>Type CMB &amp; CMP Single Threaded Fitting</p> 
<p>Type W1A &amp; W1B Right-Angle Wire Braided Leads</p> 	<p>Type C3A, C3B, C3C &amp; C3D Right-Angle Armor Cable</p> 	<p>Type R2A &amp; R2B Right-Angle Leads</p> 

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### Options

<p>Type MFR Mounting Flange Round</p> 	<p>Type LR Locating Ring</p> 	<p>Type PS Pull Strap</p> 	<p>Type P Quick Disconnect Plug</p> 
<p>Type R3 Angled Sheath Extension (Cement Potting Only)</p> 	<p>Type E1 General Purpose Box</p> 	<p>Type GL Ground Lead Sheath</p> 	

Complete specifications and details on these terminations can be found at [omega.com](http://omega.com).

### Custom Engineered/Manufactured Hi-Density Cartridge Heaters

Because cartridge heaters can be very application specific, consult OMEGA with your special requirements. For sizes, electrical ratings and any other design features required but not listed in the catalog, OMEGA will custom engineer and manufacture to your specifications.

**Consult OMEGA with Your Requirements. We Welcome Your Inquiries.**





## Hi-Density Cartridge Heaters

**3/4" Diameter, Actual 18.95 mm (0.746")**

Model numbers listed are for cartridge heaters terminated with 254 mm (10") long leads (Type N termination). Other terminator program terminations and options can also be applied to heaters (see ordering information).

**To Order Visit [omega.com/hdc00906\\_series](http://omega.com/hdc00906_series) for Pricing and Details**

Model Number		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watts/cm <sup>2</sup>	Watts/in <sup>2</sup>
HDC00906	—	50.8	2	200	9	57
—	HDC00907	50.8	2	800	35	226
HDC00908	—	57.2	2¼	200	8	49
—	HDC00909	57.2	2¼	800	30	194
HDC00910	—	76.2	3	250	7	42
HDC00911	HDC00912	76.2	3	500	13	85
HDC00913	HDC00914	76.2	3	600	16	102
—	HDC00915	76.2	3	1000	26	170
HDC00916	HDC00917	88.9	3½	250	6	35
—	HDC00918	88.9	3½	350	8	50
HDC00919	—	88.9	3½	500	11	71
—	HDC00920	88.9	3½	1000	22	141
HDC00921	—	95.3	3¾	250	5	33
—	HDC00922	95.3	3¾	500	10	65
—	HDC00923	95.3	3¾	1000	20	131
HDC00924	—	101.6	4	250	5	30
HDC00926	HDC00927	101.6	4	500	9	61
—	HDC00928	101.6	4	750	14	91
HDC00929	HDC00930	101.6	4	1000	19	121
HDC00931	—	114.3	4½	350	6	37
HDC00932	HDC00933	114.3	4½	875	14	93
—	HDC00934	114.3	4½	1400	23	149
—	HDC00935	120.7	4¾	750	12	75
HDC00936	HDC00937	127.0	5	300	4	28
—	HDC00938	127.0	5	500	7	47
—	HDC00939	127.0	5	750	11	71
HDC00940	HDC00941	127.0	5	1000	15	94
—	HDC00942	127.0	5	1200	18	113
—	HDC00943	146.1	5¾	1000	13	81
HDC00944	HDC00945	152.4	6	500	6	39
—	HDC00946	152.4	6	750	9	58
HDC00947	HDC00948	152.4	6	1000	12	77
—	HDC00949	152.4	6	1200	14	93
—	HDC00950	152.4	6	1500	18	116
—	HDC00951	152.4	6	2000	24	154
HDC00952	HDC00953	177.8	7	500	5	33
HDC00954	HDC00955	177.8	7	1000	10	65
HDC00956	HDC00957	177.8	7	1500	15	98
—	HDC00958	177.8	7	2000	20	131
—	HDC00959	193.7	7⅝	450	4	27
—	HDC00961	203.2	8	350	3	20
HDC00962	HDC00963	203.2	8	500	4	28
—	HDC00964	203.2	8	700	6	40
—	HDC00965	203.2	8	1000	9	57
—	HDC00966	203.2	8	1350	12	76
HDC00967	HDC00968	203.2	8	2000	18	113
—	HDC00969	228.6	9	350	3	17
—	HDC00970	228.6	9	500	4	25

### Ordering Information

Order by Model Number for cartridge heaters with Type N termination. Call OMEGA for part numbers for heaters with other terminator program terminations and options.

### Custom Engineered/Manufactured

Cartridge Heaters can be application specific; therefore for sizes, electrical ratings, terminations and any other design features not listed in this section will custom manufacture to your specifications. Consult us with your requirements.



## Hi-Density Cartridge Heaters

**3/4" Diameter, Actual 18.95 mm (0.746")**

Model numbers listed are for cartridge heaters terminated with 254 mm (10") long leads (Type N termination). Other terminator program terminations and options can also be applied to heaters (see ordering information).

**To Order Visit [omega.com/hdc00906\\_series\\_series](http://omega.com/hdc00906_series_series) for Pricing and Details**

Model Number		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watts/cm <sup>2</sup>	Watts/in <sup>2</sup>
—	HDC22945	228.6	9	1000	8	53
—	HDC00971	228.6	9	1200	9	60
—	HDC00973	228.6	9	1800	14	90
—	HDC00974	247.7	9¾	2000	14	92
—	HDC00975	254.0	10	600	4	27
—	HDC00976	254.0	10	1000	7	45
—	HDC00977	254.0	10	1200	8	54
—	HDC22946	254.0	10	1500	11	70
HDC00978	HDC00979	254.0	10	2000	14	89
—	HDC00980	266.7	10½	550	4	23
—	HDC00981	279.4	11	1000	6	40
—	HDC00983	298.5	11¾	2000	12	75
—	HDC00984	304.8	12	800	5	30
—	HDC00985	304.8	12	1000	6	37
—	HDC00986	304.8	12	1200	7	44
—	HDC00987	304.8	12	1500	9	55
HDC00988	HDC00989	304.8	12	2000	11	74
—	HDC00990	304.8	12	2500	14	92
—	HDC00991	304.8	12	4000	23	148
—	HDC00992	330.2	13	1000	5	34
—	HDC00993	355.6	14	800	4	25
—	HDC00994	355.6	14	1000	5	31
HDC00995	—	355.6	14	1125	6	35
—	HDC00996	355.6	14	1250	6	39
—	HDC00997	355.6	14	1400	7	44
—	HDC00998	355.6	14	2500	12	79
—	HDC00999	355.6	14	4500	22	141
—	HDC01000	374.7	14¾	1500	7	45
—	HDC01001	381.0	15	1000	5	29
—	HDC01002	381.0	15	1500	7	44
—	HDC01003	406.4	16	1000	4	27
HDC01004	—	406.4	16	1175	5	32
—	HDC01005	406.4	16	1500	6	41
—	HDC01006	406.4	16	1800	8	49
—	HDC01007	406.4	16	3000	13	82
—	HDC01008	406.4	16	4700	20	129
—	HDC01009	431.8	17	1000	4	26
—	HDC01010	450.9	17¾	850	3	21
—	HDC01011	457.2	18	1000	4	24
HDC01012	—	457.2	18	1250	5	30
—	HDC01013	457.2	18	1450	6	35
—	HDC01014	457.2	18	2000	8	49
—	HDC01015	457.2	18	3250	12	79
—	HDC01016	457.2	18	5000	19	121
—	HDC01017	482.6	19	1000	4	23
—	HDC01018	508.0	20	1000	4	22
—	HDC01019	508.0	20	1150	4	25
—	HDC01020	508.0	20	2050	7	45
—	HDC01021	508.0	20	2250	8	49
—	HDC01022	508.0	20	5250	18	114
—	HDC01023	609.6	24	1000	3	18
—	HDC01024	609.6	24	1375	4	25
—	HDC01025	609.6	24	2000	6	36
—	HDC01026	609.6	24	2750	8	50
—	HDC01027	609.6	24	5500	15	99
—	HDC01028	914.4	36	2500	5	30

### Ordering Information

Order by Model Number for cartridge heaters with Type N termination. Call OMEGA for part numbers for heaters with other terminator program terminations and options.

### Custom Engineered/Manufactured

Cartridge Heaters can be application specific; therefore for sizes, electrical ratings, terminations and any other design features not listed in this section will custom manufacture to your specifications. Consult us with your requirements.

**HGL Series**



- ✓ **Compact Fan Heater for Increased Heat Output**
- ✓ **Built-In Overheat Protection**
- ✓ **DIN Rail Mountable**
- ✓ **Maintains Minimum Operating Temperatures in Enclosures**
- ✓ **Helps to Prevent Failure of Electronic Components Caused by Condensation and Corrosion**

The HGL Series compact heater is designed for many different applications including electrical and electronic enclosures, display panels, access and parking control systems and personnel booths.

To determine the required heater size follow this equation:

**PH = (A x ΔT x k) - Pv**

- PH** = Required heating power for your application in Watts (W)
- Pv** = Heating power generated by existing components (e.g. a transformer) in Watts (W)
- A** = Exposed enclosure surface area square meters (m<sup>2</sup>)
- ΔT** = Temperature differential between the desired minimum interior temperature and lowest possible external temperature of the enclosure in Kelvin (K), 1.8°F = 1°C = 1K
- k** = Heat transmission coefficient of the enclosure material used:  
 Stainless Steel: 3.7 W/m<sup>2</sup>K  
 Painted Steel: 5.5 W/m<sup>2</sup>K  
 Aluminum: 12 W/m<sup>2</sup>K  
 Polyester/Plastic: 3.5 W/m<sup>2</sup>K

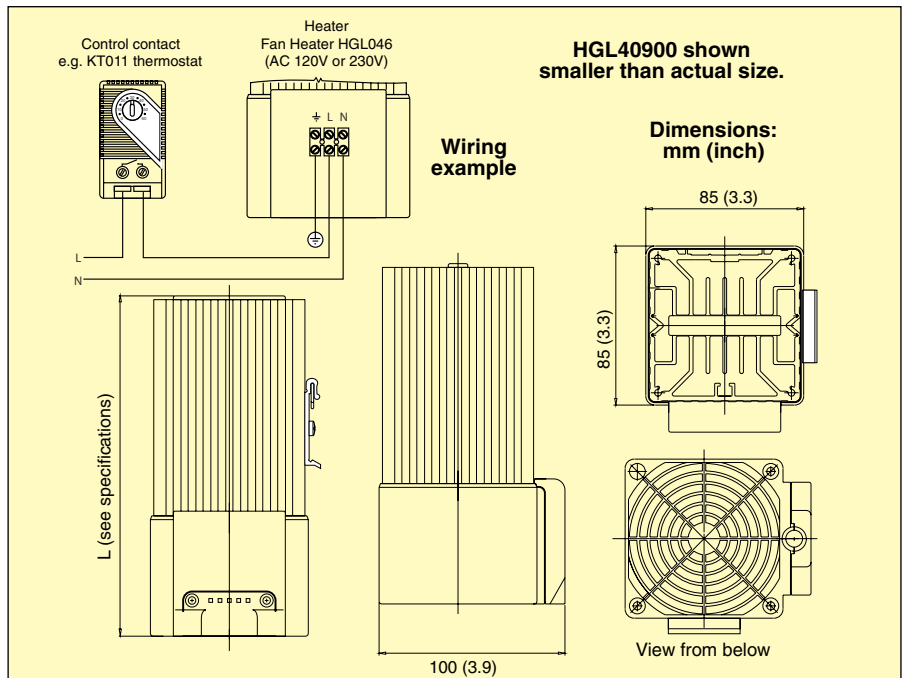
For outdoor applications it is recommended to double the heating power.

**Specifications**

**Operating Voltage:** 110 to 120 Vac, 50/60 Hz  
**Wattage:**  
 HGL40900: 250 W  
 HGL41900: 400 W  
**Heating Element:** Micronite

**Heat Sink:** Extruded aluminum profile, silver anodized  
**Surface Temperature:** Max 75°C (167°F)—400 W heater  
**Overheat Protection:** Built-in temperature limiter  
**Air Exit Temperature:** Approx. 45°C (113°F) 50 mm (2") above heater  
**Axial Fan:** Ball bearing, 50,000 h at 25°C (77°F)  
**Air Flow, Free Blowing, AC:** 26 cfm (45 m<sup>3</sup>/h), 50 Hz; 32 cfm (54 m<sup>3</sup>/h), 60 Hz  
**Connection:** Internal termination AWG 16 max [1.5 mm<sup>2</sup> (0.06 in<sup>2</sup>), with strain relief  
**Mounting:** Clip for 35 mm (1.4") DIN rail (EN 50022)  
**Operating/Storage Temperature:** -45 to 70°C (-49 to 158°F)  
**Protection Class:** I (grounded)  
**Protection Type:** NEMA 2 (IP20)

**Weight:**  
 HGL40900: 1.1 kg (2.4 lb)  
 HGL41900: 1.4 kg (3.1 lb)  
**Length (L) (See Drawing Below):**  
 HGL40900: 182 mm (7.2")  
 HGL41900: 222 mm (8.7")

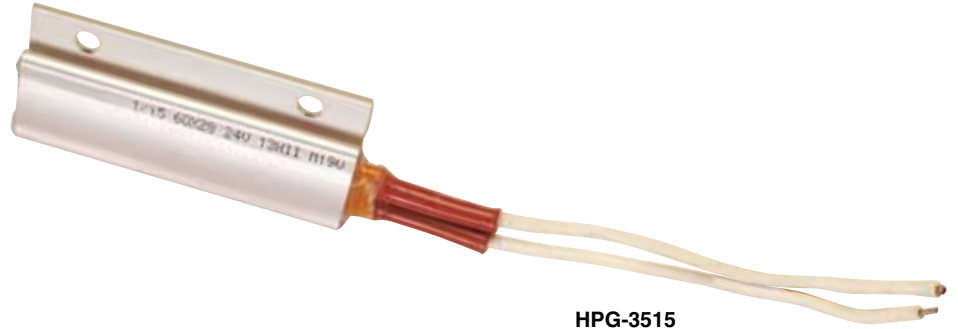


<b>To Order</b>	
<b>Model No.</b>	<b>Description</b>
<b>HGL40900</b>	Fan heater, 250 W, 120 Vac
<b>HGL41900</b>	Fan heater, 400 W, 120 Vac

Comes complete with operator's manual.  
**Ordering Example:** HGL 40900 fan heater 250 watts



HPG Series

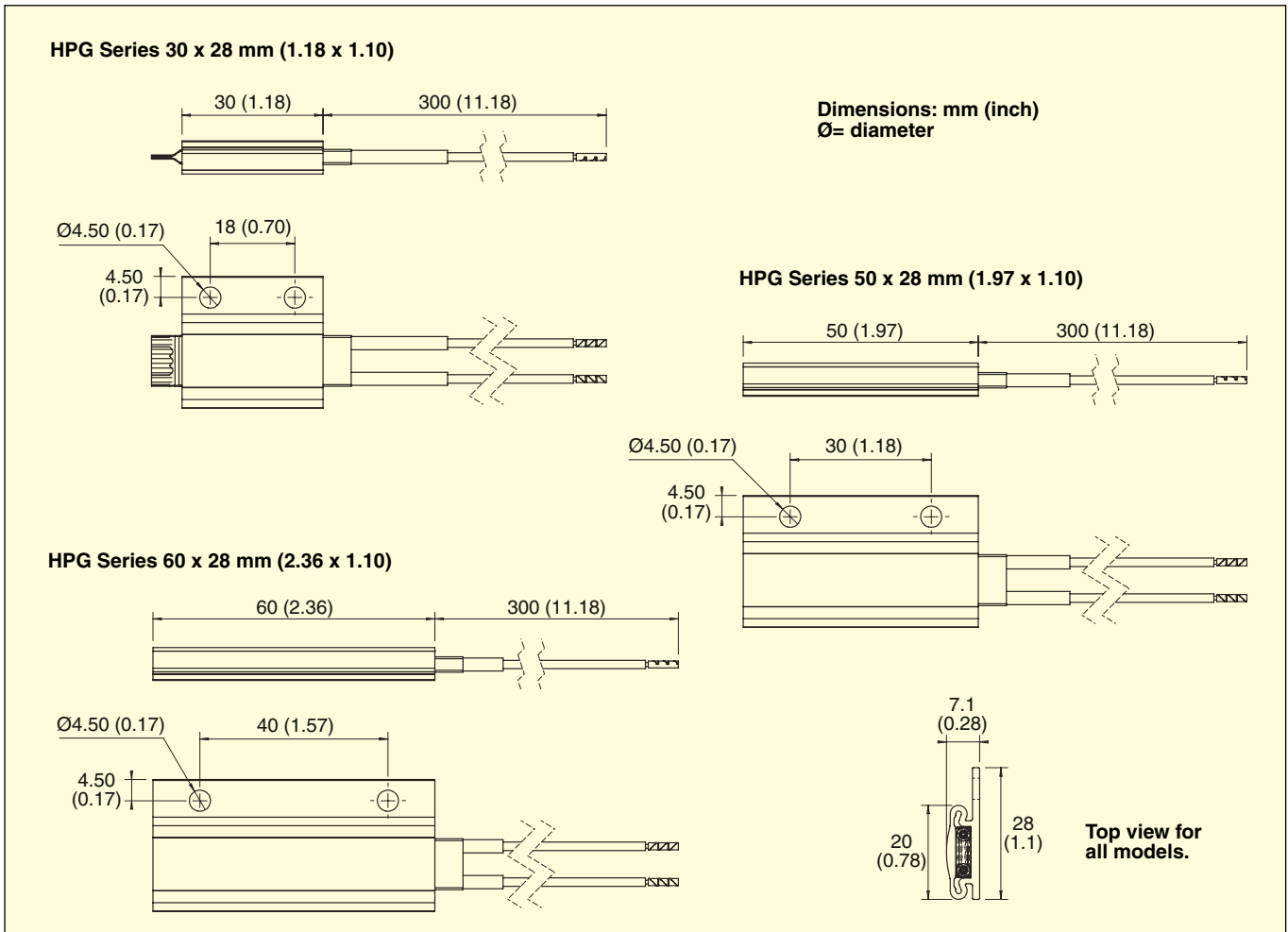


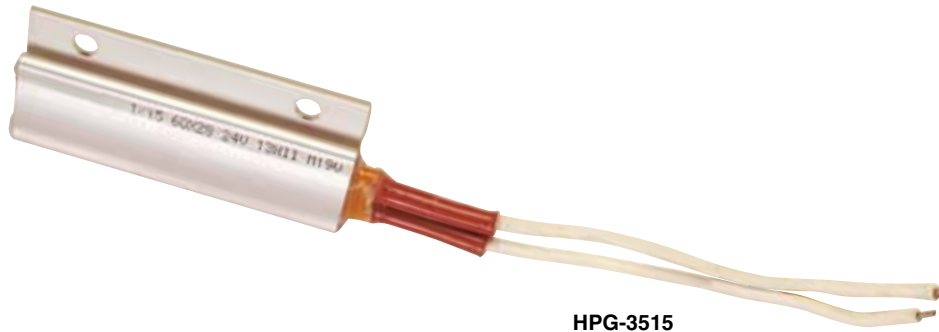
HPG-3515 shown smaller than actual size.

- ✓ Natural Convection Heating Element
- ✓ Compact Design
- ✓ Self Regulating, Highest Power at Low Ambient Temperature
- ✓ Fixing via Flange with 2 Holes for Screw Mounting (Fastener not Provided)
- ✓ Maximum Heater Temperature 170°C (338°F)
- ✓ One Wing

When the heating of a key component is required, the surface and spot heaters provide the right amount of heat where it is needed. The range of applications for these heaters is almost unlimited. Offering many choices in voltage and power output, the

HPG Series promises to be the correct choice for controlled direct heat. A small footprint combined with versatile mounting options further adds to the adaptability of these heaters.





HPG-3515  
shown smaller  
than actual size.

## Specifications

Model No.	HPG-3315/3325/3375	HPG-3415/3425/3475	HPG-3515/3525/3575
Nominal Power Output at 10°C (50°F)	8W	10W	13W
Electrical Protection Class	II		
Ingress Protection (EN60529)	IP20		
Maximum Body Temperature (25°C Ambient)	170°C (338°F)		
Operating Temperature Range	-30 to 70°C (-22 to 158°F)		
Storage Temperature Range	-40 to 70°C (-40 to 158°F)		
Nominal Input Voltage Heating Element	115 Vac/230 Vac/24 Vdc		
Dimensions (Cross-Section), mm (inch)	28 x 7 (1.10 x 0.28)		
Dimensions (Length), mm (inch)	30 (1.18)	50 (1.97)	60 (2.36)
Lead Wire Type	Silicone AWG20		
Lead Wire Length, mm (inch)	300 mm (11.8")		
Wire Termination	Splice crimp 6 mm (0.24")		
Weight: g (oz)	17 (0.60)	21 (0.74)	29 (1.02)

## To Order Visit [omega.com/hpg](http://omega.com/hpg) for Pricing and Details

Model No.	Description
HPG-3315	8 W, 30 x 28 mm (1.18 x 1.10"), 300 mm (11.8") leads, 115V
HPG-3325	8 W, 30 x 28 mm (1.18 x 1.10"), 300 mm (11.8") leads, 230V
HPG-3375	8 W, 30 x 28 mm (1.18 x 1.10"), 300 mm (11.8") leads, 24V
HPG-3415	10 W, 50 x 28 mm (1.97 x 1.10"), 300 mm (11.8") leads, 115V
HPG-3425	10 W, 50 x 28 mm (1.97 x 1.10"), 300 mm (11.8") leads, 230V
HPG-3475	10 W, 50 x 28 mm (1.97 x 1.10"), 300 mm (11.8") leads, 24V
HPG-3515	13 W, 60 x 28 mm (2.36 x 1.10"), 300 mm (11.8") leads, 115V
HPG-3525	13 W, 60 x 28 mm (2.36 x 1.10"), 300 mm (11.8") leads, 230V
HPG-3575	13 W, 60 x 28 mm (2.36 x 1.10"), 300 mm (11.8") leads, 24V

Comes complete with operator's manual.

Ordering Example: HPG-3315, 8 W, 30 x 28 mm (1.18 x 1.10"), 1 wing, 2 holes, 300 mm (11.8") leads, 115V.

# HEATING CORDS

## HTC Series



- ✓ Maximum Exposure Temperature 482°C (900°F)
- ✓ Wraparound Diameters as Small as 3.2 mm (1/8")
- ✓ Knitted and Braided Fiberglass Construction
- ✓ Power Density: 0.003 W/mm<sup>2</sup> (1.8 W/in<sup>2</sup>)
- ✓ Double-Braided Fiberglass Outer Sheath
- ✓ Suitable for Electrically Conductive Surfaces
- ✓ 120 Vac
- ✓ Includes High-Temperature Tie-Downs

OMEGA heating cords are designed for use on small-diameter tubes, vessels, or wherever space is limited. They can be wrapped around tubing as small as 3.2 mm (1/8") diameter. The double-braided fiberglass outer sheath ensures durability for laboratory, production, or maintenance applications.

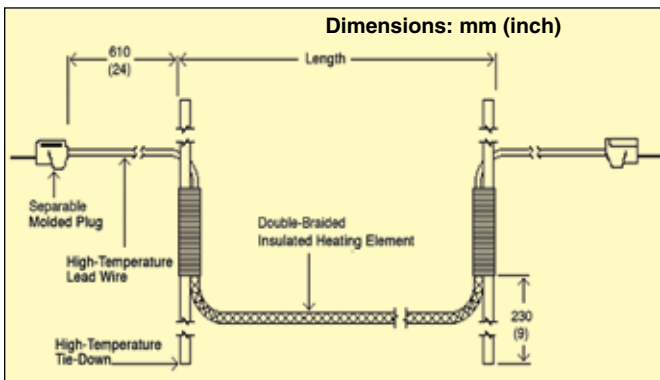
Portable Thermocouple Temperature Controller CN-TOT.

**Must-Have Accessory!**



CN-TOT-175JF-120V shown smaller than actual size.

Dimensions: mm (inch)



HTC-030 shown smaller than actual size.

To Order	
Model No.	Description
HTC-030	Heating cord 0.9 m (3'), 64 W, 120V
HTC-060	Heating cord 1.8 m (6'), 125 W, 120V
HTC-120	Heating cord 3.6 m (12'), 260 W, 120V

# ADJUSTABLE THERMOSTAT

## HTWAT Series



- ✓ Adjustable Thermostat Control Sets Up to 218°C (425°F)
- ✓ No Additional Control Needed
- ✓ Moisture and Chemical Resistant
- ✓ Suitable for Electrically Conductive Surfaces
- ✓ Rapid Heat Up



The HTWAT Series of silicone rubber heating tapes with adjustable thermostat control are designed for process temperature control, freeze protection, and supplemental heat. Applications include valves, pipe lines, bearings, filter housings, actuators, and more. Simply wrap the flexible heating tape around the desired object you want to heat, set the temperature, and it will maintain heat at the set temperature.

## SPECIFICATIONS

**Adjustable Thermostat:**  
10 to 218°C (50 to 425°F)

**Maximum Exposure Temperature:**  
232°C (450°F)

**Nominal Watt Density:**  
6.0 Watts/in V (0.009 Watts/mm V)

**Minimum Bend Radius:**  
12.7 mm (0.5")

**Outer Sheath:**  
Extruded silicone rubber

**Construction:**  
Fiberglass, knitted and braided

**Power Cord:** 1.8 m (6') with plug on 120V models, stripped lead ends on 240V models

**Power:** 120 or 240 Vac

## To Order

120 Vac Power Model No.	240 Vac Power Model No.	Power	Size mm x m (inch x foot)
HTWAT051-002	HTWAT052-002	72 W	12.7 x 0.6 (½ x 2)
HTWAT051-004	HTWAT052-004	144 W	12.7 x 1.2 (½ x 4)
HTWAT051-006	HTWAT052-006	216 W	12.7 x 1.8 (½ x 6)
HTWAT051-008	HTWAT052-008	288 W	12.7 x 2.4 (½ x 8)
HTWAT051-010	HTWAT052-010	360 W	12.7 x 3.0 (½ x 10)
HTWAT101-002	HTWAT102-002	144 W	25.4 x 0.6 (1 x 2)
HTWAT101-004	HTWAT102-004	288 W	25.4 x 1.2 (1 x 4)
HTWAT101-006	HTWAT102-006	432 W	25.4 x 1.8 (1 x 6)
HTWAT101-008	HTWAT102-008	576 W	25.4 x 2.4 (1 x 8)
HTWAT101-010	HTWAT102-010	720 W	25.4 x 3.0 (1 x 10)
HTWAT201-002	HTWAT202-002	288 W	50.8 x 0.6 (2 x 2)
HTWAT201-004	HTWAT202-004	576 W	50.8 x 1.2 (2 x 4)
HTWAT201-006	HTWAT202-006	864 W	50.8 x 1.8 (2 x 6)
HTWAT201-008	HTWAT202-008	1152 W	50.8 x 2.4 (2 x 8)
HTWAT201-010	HTWAT202-010	1440 W	50.8 x 3.0 (2 x 10)
HTWAT301-002	HTWAT302-002	432 W	76.2 x 0.6 (3 x 2)
HTWAT301-004	HTWAT302-004	864 W	76.2 x 1.2 (3 x 4)
HTWAT301-006	HTWAT302-006	1296 W	76.2 x 1.8 (3 x 6)
HTWAT301-008	HTWAT302-008	1440 W	76.2 x 2.4 (3 x 8)
HTWAT301-010	HTWAT302-010	1440 W*	76.2 x 3.0 (3 x 10)

\* 240V version is 1800 W.

Comes complete with user's manual. 240V versions are supplied without plugs.

**Ordering Examples:** HTWAT201-002, heating tape, 2" x 2', 120V, 288 W, with integral adjustable thermostat.

HTWAT051-002, heating tape, ½" x 2'. 120V, 72 W, with integral adjustable thermostat.



**HTWT101-002-60F**



- ✓ **Built-In Thermostat Set at 16°C (60°F)**
- ✓ **Moisture and Chemical Resistant**
- ✓ **Suitable for Electrically Conductive Surfaces**

**SPECIFICATIONS**

**Thermostat Setting:** 16°C (60°F)

**Max Exposure Temperature:** 232°C (450°F)

**Nominal Watts per square mm (inch):** 0.009 (6.0)

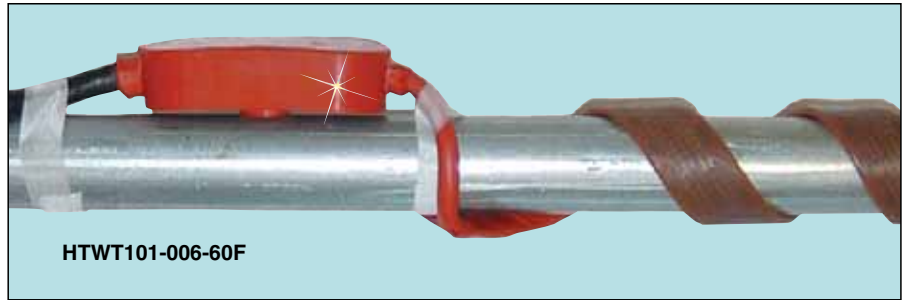
**Outer Sheath:** Extruded silicone rubber

**Construction:** Kapton® wrapped fiberglass, knit and braided

**Width:** 25.4 mm (1")

**Power Cord:** 1.8 m (6') with plug on 120V models, stripped lead ends on 240V models

**Power:** 120 or 240 Vac



**To Order**

Model No.	Length mm (in)	Wattage	Voltage
HTWT101-002-60F	610 (24)	104	120
HTWT101-004-60F	1220 (48)	209	120
HTWT101-006-60F	1829 (72)	313	120
HTWT101-008-60F	2438 (96)	418	120
HTWT101-010-60F	3048 (120)	522	120
HTWT102-004-60F	1220 (48)	209	240
HTWT102-006-60F	1829 (72)	313	240
HTWT102-008-60F	2438 (96)	418	240
HTWT102-010-60F	3048 (120)	522	240

*Comes complete with operator's manual.*

*All heating tapes are 25.4 mm (1") wide and come with a thermostat set at 16°C (60°F).*

**HEATING TAPES WITH PERCENTAGE CONTROLLER**

**HTWC100 Series**

- ✓ **Reliable**
- ✓ **Integral Percentage Controller**
- ✓ **Silicone Rubber Encapsulated Heating Tape**
- ✓ **Maximum Exposure Temperature up to 232°C (450°F)**

The tape consists of a flexible heating strip 1" wide and of varying lengths with a permanently incorporated temperature controller. Standard tapes are available for either 120 or 240V operation and develop 72 watts per lineal foot. These tapes are completely safe when operated according to directions, and with reasonable care, will give long service.

This economical semi-automatically controlled heating tape has been developed for use in small scale heating applications.

**SPECIFICATIONS**

**Power:** 120 or 240V

**Wattage:** 72 watts/lineal foot

**Heating Element:** Fine gage stranded resistance wires insulated with fiberglass yarn and completely enclosed in a silicone rubber extrusion

**Controller:** Rugged and dependable percentage controller. Includes power cord and 2 prong plug



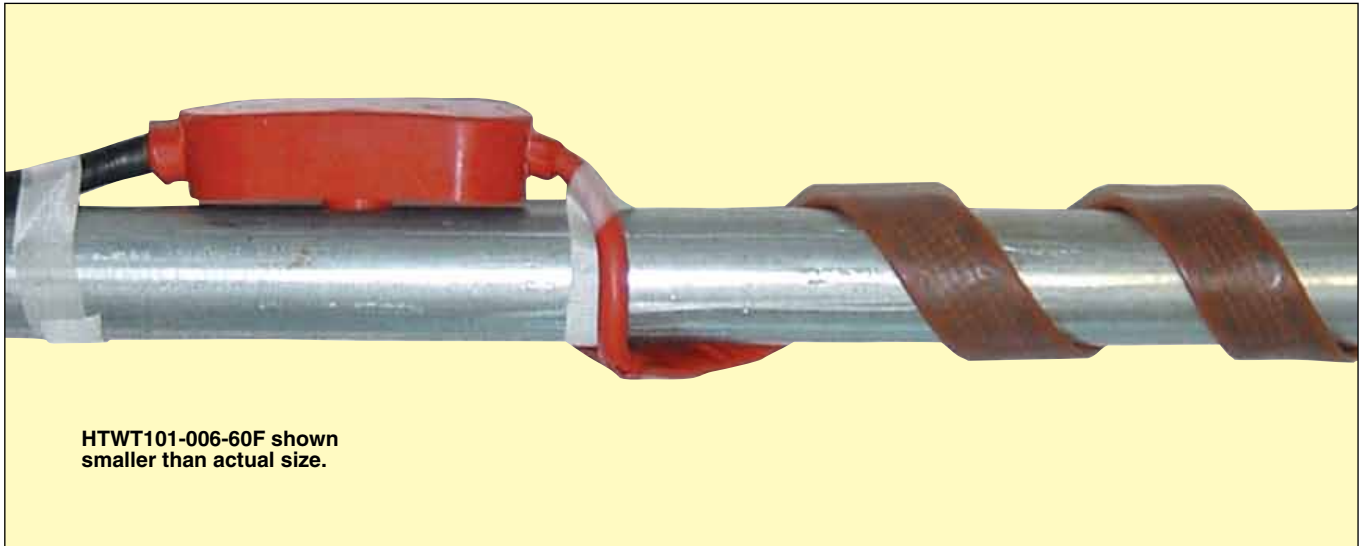
**To Order**

Model Number	Watts	Volts	Size
HTWC101-002	144	120	1" x 2'
HTWC101-004	288	120	1" x 4'
HTWC101-006	432	120	1" x 6'
HTWC101-008	576	120	1" x 8'
HTWC101-010	720	120	1" x 10'
HTWC102-002	144	240	1" x 2'
HTWC102-004	288	240	1" x 4'
HTWC102-006	432	240	1" x 6'
HTWC102-008	576	240	1" x 8'
HTWC102-010	720	240	1" x 10'

*Comes complete with operator's manual.*



# HEATING TAPES WITH BUILT-IN THERMOSTAT



HTWT101-006-60F shown smaller than actual size.

## HTWT100 Series



- ✓ Flexible Silicon Rubber
- ✓ Built-In Thermostat Set at 16°C (60°F)
- ✓ Moisture and Chemical Resistant
- ✓ Suitable for Electrically Conductive Surfaces

HTWT Series consists of flexible silicon rubber heating tapes with a built-in thermostat set at 16°C (60°F). Units are ideal for freeze protection or a low-temperature process control solution. Units are plug-and-play and are suitable for electrically conductive surfaces. They use a patented grounded heating element for safety.

## SPECIFICATIONS

**Thermostat Setting:** 16°C (60°F)  
**Maximum Exposure Temperature:** 230°C (450°F)  
**Nominal Watts per square mm (inch):** 0.009 (6.0)  
**Outer Sheath:** Extruded silicone rubber  
**Construction:** Polyimide film wrapped fiberglass, knit and braided

**Width:** 25.4 mm (1")  
**Power Cord:** 1.8 m (6') with plug on 120V models, stripped lead ends on 240V models  
**Power:** 120 or 240 Vac

*Note: Not for Export to Canada.*

## To Order

Model No.	Description	Length mm (inch)	Wattage	Voltage
HTWT101-002-60F	Heating tapes	610 (24)	104	120
HTWT101-004-60F	Heating tapes	1220 (48)	209	120
HTWT101-006-60F	Heating tapes	1829 (72)	313	120
HTWT101-008-60F	Heating tapes	2438 (96)	418	120
HTWT101-010-60F	Heating tapes	3048 (120)	522	120
HTWT102-004-60F	Heating tapes	1220 (48)	209	240
HTWT102-006-60F	Heating tapes	1829 (72)	313	240
HTWT102-008-60F	Heating tapes	2438 (96)	418	240
HTWT102-010-60F	Heating tapes	3048 (120)	522	240

*Comes complete with operator's manual.*

*All heating tapes are 25.4 mm (1") wide and come with a thermostat set at 16°C (60°F).*

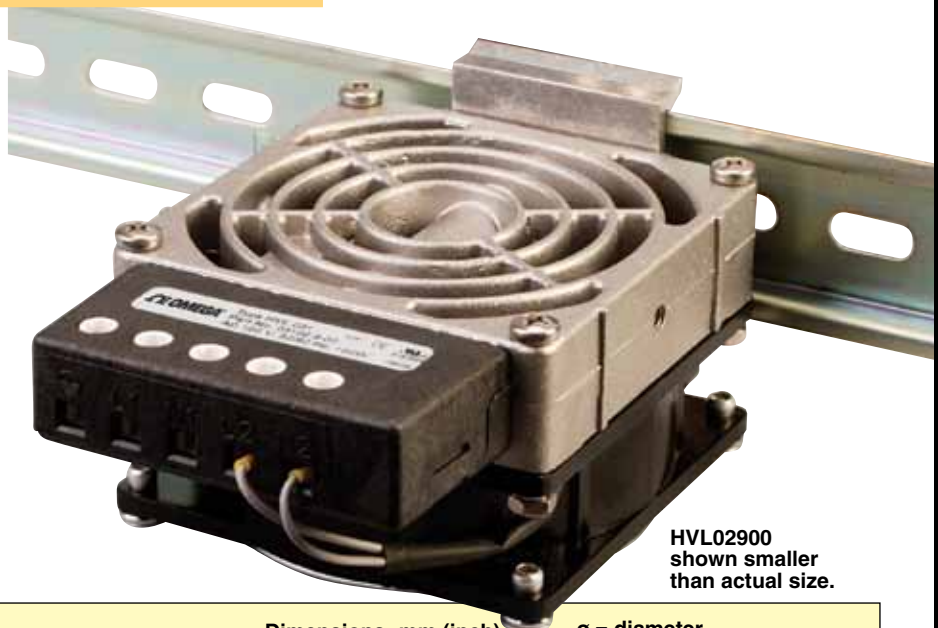
**Ordering Examples:** HTWT101-004-60F, heating tape, 25.4 x 1220 mm (1 x 48"), 120V, 209 W, with a thermostat set at 16°C (60°F).

HTWT101-010-60F, heating tape, 25.4 x 3048 mm (1 x 120"), 120V, 522 W, with a thermostat set at 16°C (60°F).

**HVL Series**



- ✓ **Small, Compact Size Fan Heater**
- ✓ **Built-In Overheat Protection**
- ✓ **DIN Rail Mountable**
- ✓ **Maintains Minimum Operating Temperatures in Enclosures**
- ✓ **Helps to Prevent Failure of Electronic Components Caused by Condensation and Corrosion**



HVL02900 shown smaller than actual size.

This compact heater is designed for many different applications including electrical and electronic enclosures, display panels, access and parking control systems and personnel booths.

To determine the required heater size follow this equation:

$$PH = (A \times \Delta T \times k) - P_v$$

**PH** = Required heating power for your application in Watts (W)

**P<sub>v</sub>** = Heating power generated by existing components (e.g. a transformer) in Watts (W)

**A** = Exposed enclosure surface area square meters (m<sup>2</sup>)

**ΔT** = Temperature differential between the desired minimum interior temperature and lowest possible external temperature of the enclosure in Kelvin (K), 1.8°F = 1°C = 1K

**k** = Heat transmission coefficient of the enclosure material used:  
 Stainless Steel: 3.7 W/m<sup>2</sup>K  
 Painted Steel: 5.5 W/m<sup>2</sup>K  
 Aluminum: 12 W/m<sup>2</sup>K  
 Polyester/Plastic: 3.5 W/m<sup>2</sup>K

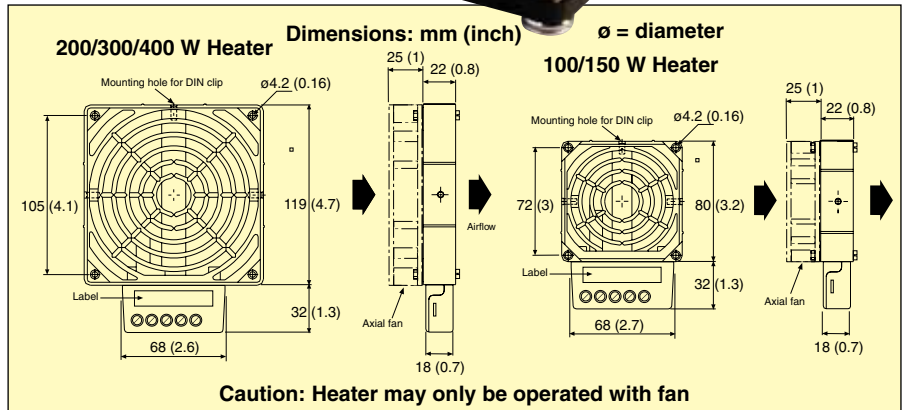
For outdoor applications it is recommended to double the heating power.

**Specifications**

**Operating Voltage:** 120 Vac

**Wattage:**

- HVL02900: 100 W
- HVL03900: 150 W
- HVL13900: 200 W
- HVL14900: 300 W
- HVL15900: 400 W



**Heating Element:** Resistance type cartridge heater

**Heat Sink:** Die-cast aluminum, glass bead finish

**Required Fan Size (Included):**

**100/150 W:** 80 x 80 x 25 mm (3.1 x 3.1 x 0.98")

**Min Air Flow:** 35 m<sup>3</sup>/h (115 ft<sup>3</sup>/h) (20 cfm)

**200/300/400 W:** 120 x 120 x 25 mm (4.7 x 4.7 x 0.98")

**Min Air Flow:** 108 m<sup>3</sup>/h (354 ft<sup>3</sup>/h) (63 cfm)

**Overheat Protection:** Built-in temperature limiter

**Air Exit Temperature:** Approx. 45°C (113°F) 50 mm (2") above heater

**Wiring Compartment:** Plastic UL 94V-O

**Connection (Heater):** 3-pole terminal, AWG 14 max [2.5 mm<sup>2</sup> (0.10 in<sup>2</sup>)]

**Connection (Axial Fan):** 2-pole terminal (L2/N2), AWG 14 max [2.5 mm<sup>2</sup> (0.10 in<sup>2</sup>)]

**Mounting:** Clip for 35 mm (1.4") DIN rail (EN 50022)

**Protection Class:** I (grounded)

**Protection Type:** NEMA 2 (IP20)

**Weight (with Fan):**

**100/150 W:** 600 g (1.3 lb)

**200/300/400 W:** 900 g (2.0 lb)

<b>To Order</b>	
<b>Model No.</b>	<b>Description</b>
HVL02900	Fan heater, 100 W, 120 Vac
HVL03900	Fan heater, 150 W, 120 Vac
HVL13900	Fan heater, 200 W, 120 Vac
HVL14900	Fan heater, 300 W, 120 Vac
HVL15900	Fan heater, 400 W, 120 Vac

Comes complete with operator's manual, mounting kit and axial fan.

**Ordering Examples:** HVL02900, fan heater, 100 W, 120 Vac.

HVL14900, fan heater, 300 W, 120 Vac.

## Cartridge Heater with Incoloy Sheath

Omega's ICH-Series cartridge heaters are constructed of Incoloy material for excellent corrosion resistance with minimal scaling, and excellent performance at high temperatures. This construction also provides uniform heat distribution and good thermal conductivity for fast heating. These heaters are designed to provide maximum wattage in limited spaces. High and low watt densities are available to suit most applications. A variety of cold-end terminations, mounting and threading options are available for maximum versatility. Applications for this cartridge heater include packaging, rubber molding, form fill and sealing, platen heating, HVAC compressors, die casting, hot melt adhesives, hot plate measurements, food manufacturing and extrusion.



### Features

- Incoloy sheath for corrosion resistance and high temperature use
- Operating temperature up to 760°C
- Various watt densities for maximum process flexibility
- Diameters from 0.250 to 1 inch
- Lengths from 1 to 36 inches
- Fiberglass insulated lead wires
- 10 in lead lengths standard
- 16 termination styles offered (others offered on request)

### Specifications

Max sheath temperature	760°C (1400°F)
Operating Voltage	120 VAC or 240 VAC
Sheath Diameter Range	0.25 to 1 inch
Length Range	1 to 36 inches
Wattage Range	10 to 1200 W (other wattages available)
Lead Wire Material	Fiberglass
Standard Lead Length	10 inches (longer lead lengths available)
Termination	Stripped leads; other terminations available

### Model No. Description

<b>ICH-0250-0150-0250-N-10-1</b>	Cartridge heater, 0.250 in diameter, 1.5 in length, 250 Watts, 10-inch lead length (stripped ends), 120 Volts power
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### CARTRIDGE HEATER PART NUMBER BUILDER

**Part Number Breakdown – [Model]-[Diameter]-[Length]-[Wattage]-[Termination]-[Lead Length]-[Voltage]**

**Example: ICH-0250-0150-0250-N-10-1:** Cartridge heater, 0.250 in diameter, 1.5 in length, 250 Watts, 10-inch lead length (stripped ends), 120 Volts power

**Model Description**

ICH	Cartridge Heater with Incoloy Sheath
-----	--------------------------------------

Diameter	Description	Length	Description	Wattage	Description
0250	1/4 in	0100	1 in	0010	10 Watts
0375	3/8 in	0125	1.25 in	Refer to all models table for available standard options, non-standard available on request	
0500	1/2 in	0150	1.5 in		
0625	5/8 in	0200	2 in		
0750	3/4 in	0000	...		
1000	1 in	3300	33 in		
		3400	34 in		
		3500	35 in		
		3600	36 in		

**Termination Description**

N	Stripped leads
B	Ceramic bead insulation
BL	Ceramic bead and leads
C1B	Straight armored cable, stainless steel
C2B	Right-angle armored cable, stainless steel
R1A	Right angle leads, copper elbow
W	Straight wire braided leads
M2A	Potted and sealed, fiberglass wires externally connected
M2E	Potted and sealed, fiberglass wires internally connected
W1A	Right-angle braided leads, cement potting, no lead wire and disc
W1B	Right angle braided leads, cement potting, with lead wire and disc
C3B	Right angle armored cable, cement potting and silicone varnish with lead end disc. Stainless steel cable
R2B	Right angle leads, cement potting, welded lead end disc
R3	Angled sheath extension (cement potting only)
GL	Ground lead sheath
M2C	High temperature epoxy potting, PFA wires internally connected

**Lead Length Description**

10	10 inches standard
[Numeric value in inches]	Please note desired lead length in inches

**Voltage Description**

1	120 Volts AC
2	240 Volts AC

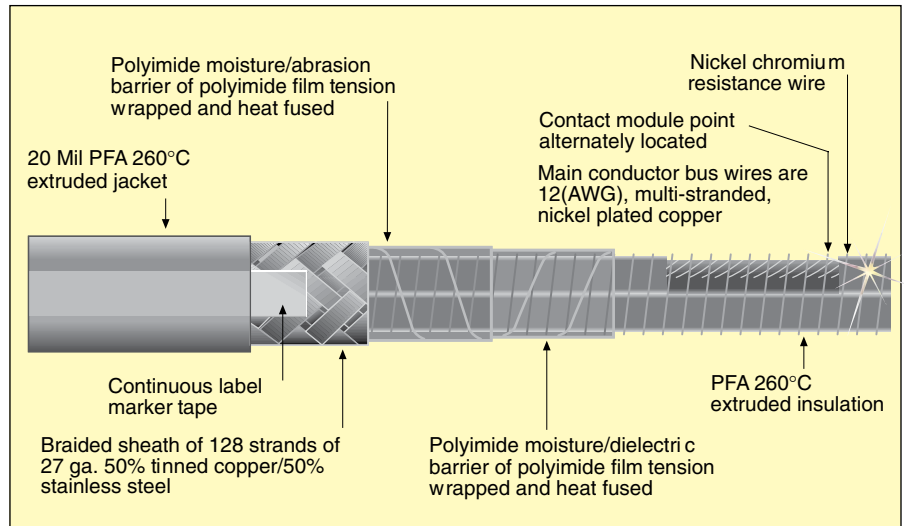
# HIGH TEMPERATURE CONSTANT WATTAGE HEATING CABLE

## KE Series

- Continuous Exposure Rating up to 260°C (500°F)
- Low Watt Density
- Parallel Resistance Heater
- Cut-to-Length at the Job Site
- Constant Watt Density
- All Common Voltages Available
- Moisture and Chemical Resistance
- Continuous Electrical Ground

The KE cable heating element is tension wrapped and covered with two layers of nonflammable polyimide film applied in reverse directions, then heat fused for moisture protection. A stainless steel and tinned copper sheath is then added for additional protection and electrical ground return path. The sheath is enclosed in a minimum 20 mil PFA abrasion and chemical resistant extruded jacket.

OMEGALUX® KE cable is a low Watt density electrical resistance heater. It is designed for freeze protection, viscosity and high temperature process control in Class 1, Groups B, C, and D, Division 2 Classified Areas as well as in corrosive environments. KE is used in asphalt plants, oil refineries, mines, chemical and petrochemical processing areas, other locations where corrosive atmospheres can occur. KE is equally suitable for applications in severe arctic cold.



### APPLICATIONS

- Designed for Freeze Protection and Process Temperature Maintenance

Cable may be overlapped if maximum Process Temperature is less than 154°C (310°F).

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

### SPECIFICATIONS

**Wattage:** 4, 8 and 12 W/ft

**Circuit Module Length:** 1.2 m (4') for all except KE4-480 which is 2.4 m (8') and KE8-480 which is 1.8 m (6')

**Maximum Short Term Exposure Temperature:** 287°C (550°F) (de-energized)

**Outside Dimension:** Nom. 8.38 x 5.72 mm (0.330 x 0.225")

**Dielectric Strength:** In excess of 2500V

### Maximum Circuit Length\*\*--KE Series

Power	120V	208V	240V	277V	480V
4 Watts/ft	349"	606"	699"	806"	1398"
8 Watts/ft	247"	428"	494"	570"	988"
12 Watts/ft	202"	350"	403"	466"	807"

### To Order

4 Watts/ft		8 Watts/ft		12 Watts/ft	
Volts	Model No.*	Volts	Model No.*	Volts	Model No.
120	KE4-120	120	KE8-120	120	KE12-120
208	KE4-208	208	KE8-208	208	KE12-208
240	KE4-240	240	KE8-240	240	KE12-240
277	KE4-277	277	KE8-277	277	KE12-277
480	KE4-480	480	KE8-480	480	KE12-480

\* Price per foot. When ordering specify desired length in feet. 7.6 m (25') minimum.

\*\* Maximum circuit lengths include end-to-end voltage variation of 10%. Longer runs may be used. Lengths are based on cable operating temperatures of 300°F. To complete your system the following accessories are recommended: (1) Termination kits for KE cable (2) control options, visit us online for a complete selection of controllers and thermostats.

**Ordering Example:** KE8-120, quantity of 100, high temperature, constant wattage heating cable. 8 W/foot. 120 Vac.

**KHA-KIT-EFH-15001**



- ✓ Withstand Temperature Extremes from -200 to 200°C (-328 to 392°F)
- ✓ Excellent Tensile Strength, and Tear Resistance
- ✓ Low Out-Gassing
- ✓ Wattage 2.5, 5, or 10 W/in<sup>2</sup>
- ✓ Small, Flexible Radius (0.032" Minimum)
- ✓ Chemical Resistance to Many Solvents and Oils
- ✓ Pressure Sensitive Adhesive
- ✓ 115 or 230 Vac
- ✓ Multiple Heaters with Various Wattages and Profiles



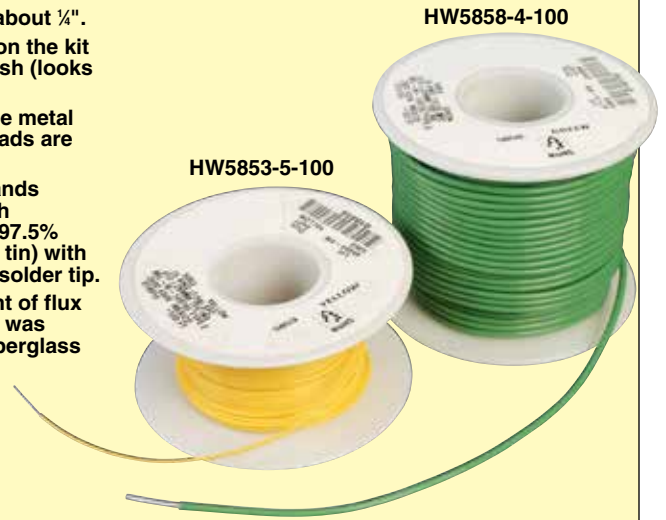
**Typical Applications**

- ✓ Aerospace
- ✓ Analytical Equipment
- ✓ Tooling
- ✓ Commercial Equipment
- ✓ Agriculture
- ✓ Packaging
- ✓ Material Handling

The Polyimide heater kit contains thin and flexible heaters with adhesive backing to conform to practically any flat or curved surface. With 15 different shapes, this kit can suit almost any application. Heater configurations are outlined on a 0.3 x 0.3 m (1x1') sheet, with line markings for easy selection and cutout. When used in combination, these heaters can provide a number of resistances and wattages. Leads can be soldered on or connected with alligator clips.

**Lead wire connection note:**

1. Strip the wire leads about ¼".
2. Scrub the lead area on the kit with a fiberglass brush (looks like a pencil).
3. Flatten or "crush" the metal strands where the leads are stripped.
4. Tin the flattened strands of the leads with high temperature solder (97.5% lead, 1.5% silver, 1% tin) with about 288°C (550°F) solder tip.
5. Apply a small amount of flux on the lead area that was scrubbed with the fiberglass brush and solder.



### Specifications

**Thickness:** 0.203 mm (0.008")

**Maximum Operating**

**Temperature:**

**Polyimide:** 200°C (392°F)

**Adhesive Backing  
(Continuous Use):**

149°C (300°F)

**Adhesive Backing**

**(Short Time Periods):**

Up to 232°C (450°F)

**Dielectric Strength:** 1000 Vac minimum

### Recommended Leads: Current Rating Table

Wire Gage (AWG)	Maximum Current (A)
28	1.25
26	1.25
24	3.16
22	5
20	10
18	15
16	15
14	20

A PTFE-insulated lead wire is recommended for energizing the heater. Use heater wattage chart below along with current rating table to determine the recommended lead-wire gage.

*Note: The chart below shows wattage outputs when heaters are connected to various power supplies. Resistance values are nominal values only. The resistance values have a tolerance of ±10%.*

**CAUTION AND WARNING!**

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel.

### Heater Wattage Chart

Size (inch)	Resistance (Ω)	Watts (12V)	Amps	Watts (28V)	Amps	Watts (115V)	Watts	Watts (230V)	Amps
0.5 x 2.0	8.8	16.4	1.4	89.1	3.2	1502.8	13.1	6011.4	26.1
0.75 x 2.5	23.5	6.1	0.5	33.4	1.2	562.8	4.9	2251.1	9.8
0.75 x 3.25	33.2	4.3	0.4	23.6	0.8	398.3	3.5	1593.4	6.9
1.0 x 1.0	11.0	13.1	1.1	71.3	2.5	1202.3	10.5	4809.1	20.9
1.0 x 3.0	40.0	3.6	0.3	19.6	0.7	330.6	2.9	1322.5	5.8
1.0 x 6.0	105.9	1.4	0.1	7.4	0.3	124.9	1.1	499.5	2.2
1.5 Dia.	32.8	4.4	0.4	23.9	0.9	403.2	3.5	1612.8	7.0
1.5 x 4.5	120.3	1.2	0.1	6.5	0.2	109.9	1.0	439.7	1.9
1.5 x 8.0	252.0	0.6	0.0	3.1	0.1	52.5	0.5	209.9	0.9
2.0 Dia.	56.4	2.6	0.2	13.9	0.5	234.5	2.0	937.9	4.1
2.0 x 3.0	103.7	1.4	0.1	7.6	0.3	127.5	1.1	510.1	2.2
2.5 x 1.25	42.8	3.4	0.3	18.3	0.7	309.0	2.7	1236.0	5.4
2.5 x 2.5	108.6	1.3	0.1	7.2	0.3	121.8	1.1	487.1	2.1
3.0 Dia.	169.0	0.9	0.1	4.6	0.2	78.3	0.7	313.0	1.4
3.0 x 3.0	153.7	0.9	0.1	5.1	0.2	86.0	0.7	344.2	1.5

*Note: All kit heaters require either a temperature or power controller to regulate heater temperature.*

To Order	
Model No.	Description
KHA-KIT-EFH-15001	Polyimide flexible heater sample kit with 15 different shapes

# INSULATED FLEXIBLE HEATERS

## KHRA/KHLVA/KHA Series



- ✓ Rated Up to 150°C (302°F)
- ✓ Etched Foil Design
- ✓ 0.010" Max Thickness
- ✓ 2.5, 5, or 10 Watts/in<sup>2</sup>
- ✓ 115, 230<sup>†</sup> and 28V
- ✓ Optional Pressure-Sensitive Adhesive (PSA)

### Specifications

#### Operating Temperature:

-57 to 150°C (-70 to 302°F) for heaters without pressure sensitive adhesive (PSA). Operating temperature for heaters with sensitive adhesive is -40 to 149°C (-40 to 300°F)

**Maximum Thickness:** 0.010" except at lead wire exit

**Wattage:** 2.5, 5 or 10 W/in<sup>2</sup>

**Leads:** PTFE insulated (UL 1180), 12" (305 mm) long (wire gauge varies with heater). For strain relief, a silicone patch has been added to heaters.

**Dielectric Strength:** 1250 Vac

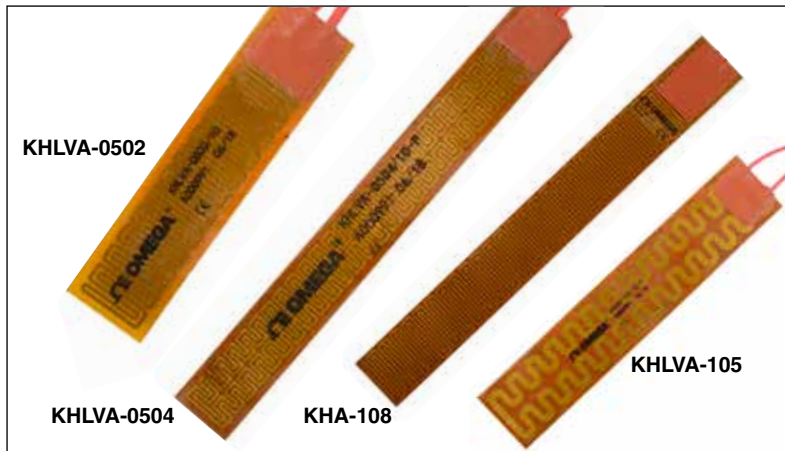
**Minimum Bending Radius:** 0.032"

<sup>†</sup> Most sizes available in 230V.

Consult heaters sales and engineering. If you require custom specifications of a insulated flexible heater, please contact our custom engineering team.

#### KHLVA Series, Rectangular, 28 Volts

Without PSA Model No.	With PSA Model No.	Width, in (cm)	Length, in (cm)	Total Wattage for Watt Density		
				2.5 W/in <sup>2</sup>	5 W/in <sup>2</sup>	10 W/in <sup>2</sup>
KHLVA-0502/(*)	KHLVA-0502/(*)-P	0.5 (1.27)	2 (5.08)	—	5	10
KHLVA-0504/(*)	KHLVA-0504/(*)-P	0.5 (1.27)	4 (10.16)	5	10	20
KHLVA-101/(*)	KHLVA-101/(*)-P	1 (2.54)	1 (2.54)	—	5	10
KHLVA-102/(*)	KHLVA-102/(*)-P	1 (2.54)	2 (5.08)	5	10	20
KHLVA-103/(*)	KHLVA-103/(*)-P	1 (2.54)	3 (7.62)	7.5	15	30
KHLVA-104/(*)	KHLVA-104/(*)-P	1 (2.54)	4 (10.16)	10	20	40
KHLVA-105/(*)	KHLVA-105/(*)-P	1 (2.54)	5 (12.7)	12.5	25	50
KHLVA-202/(*)	KHLVA-202/(*)-P	2 (5.08)	2 (5.08)	10	20	40
KHLVA-203/(*)	KHLVA-203/(*)-P	2 (5.08)	3 (7.62)	15	30	60
KHLVA-204/(*)	KHLVA-204/(*)-P	2 (5.08)	4 (10.16)	20	40	80
KHLVA-205/(*)	KHLVA-205/(*)-P	2 (5.08)	5 (12.7)	25	50	100
KHLVA-303/(*)	KHLVA-303/(*)-P	3 (7.62)	3 (7.628)	22.5	45	90



Smaller than actual size

Polyimide film insulated heaters are available in a variety of shapes, sizes, and wattages. Wattage ratings are 2.5, 5, or 10 W/in<sup>2</sup> at 115, 230<sup>†</sup> or 28V

Polyimide film offers a high degree of resistance to chemicals. Flexible nature can fit into Intrinsic voids & can be applied very Easily.

#### KHRA Series, Round, 115 Volts

### To Order

Without PSA Model No.	With PSA Model No.	Diameter in (cm)	Total Wattage for Watt Density	
			5 W/in <sup>2</sup>	10 W/in <sup>2</sup>
KHRA-2/(*)	KHRA-2/(*)-P	2 (5.08)	—	31.4
KHRA-3/(*)	KHRA-3/(*)-P	3 (7.62)	35.3	70.7
KHRA-4/(*)	KHRA-4/(*)-P	4 (10.16)	62.8	126
KHRA-5/(*)	KHRA-5/(*)-P	5 (12.7)	98.2	196
KHRA-6/(*)	KHRA-6/(*)-P	6 (15.24)	141	283
KHRA-8/(*)	KHRA-8/(*)-P	8 (20.32)	251	503
KHRA-10/(*)	KHRA-10/(*)-P	10 (25.4)	393	785
KHRA-12/(*)	KHRA-12/(*)-P	12 (30.48)	565	1131

Comes complete with operator's manual.

\* Insert watt density: "2" for 2.5 W/in<sup>2</sup>, "5" for 5 W/in<sup>2</sup> or "10" for 10 W/in<sup>2</sup>.

**Note:** Heaters are available in only the watt densities where total wattage is indicated.

**Ordering Example:** KHLVA-104/5-P, 1 x 4" (2.5 x 10 cm), 28V, 5 W/in<sup>2</sup> Polyimide film heater with PSA.



**KHA Series, Rectangular, 115 Volts**

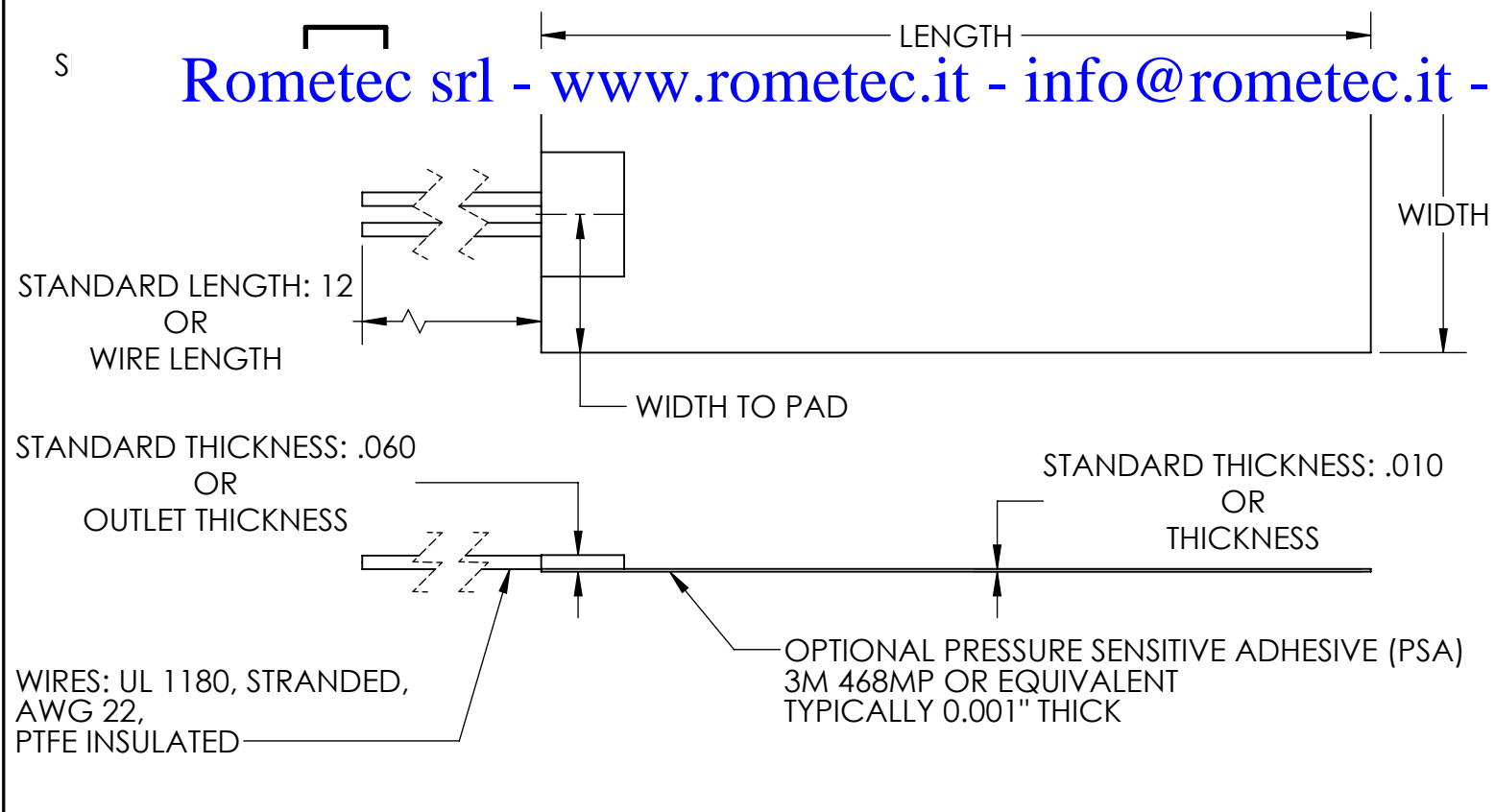
<b>To Order</b>					
Without PSA Model No.	With PSA Model No.	Width, in (cm)	Length, in (cm)	Total Wattage for Watt Density	
				5 W/in <sup>2</sup>	10 W/in <sup>2</sup>
—	KHA-102/(*)-P	1 (2.54)	2 (5.08)	—	30
KHA-103/(*)	KHA-103/(*)-P	1 (2.54)	3 (7.62)	—	30
KHA-104/(*)	KHA-104/(*)-P	1 (2.54)	4 (10.16)	20	40
KHA-105/(*)	KHA-105/(*)-P	1 (2.54)	5 (12.7)	25	50
KHA-106/(*)	KHA-106/(*)-P	1 (2.54)	6 (15.24)	30	60
KHA-108/(*)	KHA-108/(*)-P	1 (2.54)	8 (20.32)	40	80
KHA-110/(*)	KHA-110/(*)-P	1 (2.54)	10 (25.4)	50	100
KHA-112/(*)	KHA-112/(*)-P	1 (2.54)	12 (30.48)	60	120
KHA-202/(*)	KHA-202/(*)-P	2 (5.08)	2 (5.08)	20	40
KHA-203/(*)	KHA-203/(*)-P	2 (5.08)	3 (7.62)	30	60
KHA-204/(*)	KHA-204/(*)-P	2 (5.08)	4 (10.16)	40	80
KHA-205/(*)	KHA-205/(*)-P	2 (5.08)	5 (12.7)	50	100
KHA-206/(*)	KHA-206/(*)-P	2 (5.08)	6 (15.24)	60	120
KHA-208/(*)	KHA-208/(*)-P	2 (5.08)	8 (20.32)	80	160
KHA-210/(*)	KHA-210/(*)-P	2 (5.08)	10 (25.4)	100	200
KHA-212/(*)	KHA-212/(*)-P	2 (5.08)	12 (30.48)	120	240
KHA-303/(*)	KHA-303/(*)-P	3 (7.62)	3 (7.62)	45	90
KHA-304/(*)	KHA-304/(*)-P	3 (7.62)	4 (10.16)	60	120
KHA-305/(*)	KHA-305/(*)-P	3 (7.62)	5 (12.7)	75	150
KHA-306/(*)	KHA-306/(*)-P	3 (7.62)	6 (15.24)	90	180
KHA-308/(*)	KHA-308/(*)-P	3 (7.62)	8 (20.32)	120	240
KHA-310/(*)	KHA-310/(*)-P	3 (7.62)	10 (25.4)	150	300
KHA-312/(*)	KHA-312/(*)-P	3 (7.62)	12 (30.48)	180	360
KHA-404/(*)	KHA-404/(*)-P	4 (10.16)	4 (10.16)	80	160
KHA-405/(*)	KHA-405/(*)-P	4 (10.16)	5 (12.7)	100	200
KHA-406/(*)	KHA-406/(*)-P	4 (10.16)	6 (15.24)	120	240
KHA-408/(*)	KHA-408/(*)-P	4 (10.16)	8 (20.32)	160	320
KHA-410/(*)	KHA-410/(*)-P	4 (10.16)	10 (25.4)	200	400
KHA-412/(*)	KHA-412/(*)-P	4 (10.16)	12 (30.48)	240	480
KHA-505/(*)	KHA-505/(*)-P	5 (12.7)	5 (12.7)	125	250
KHA-506/(*)	KHA-506/(*)-P	5 (12.7)	6 (15.24)	150	300
KHA-508/(*)	KHA-508/(*)-P	5 (12.7)	8 (20.32)	200	400
KHA-510/(*)	KHA-510/(*)-P	5 (12.7)	10 (25.4)	250	500
KHA-512/(*)	KHA-512/(*)-P	5 (12.7)	12 (30.48)	300	600
KHA-606/(*)	KHA-606/(*)-P	6 (15.24)	6 (15.24)	180	360
KHA-608/(*)	KHA-608/(*)-P	6 (15.24)	8 (20.32)	240	480
KHA-610/(*)	KHA-610/(*)-P	6 (15.24)	10 (25.4)	300	600
KHA-612/(*)	KHA-612/(*)-P	6 (15.24)	12 (30.48)	360	720
KHA-808/(*)	KHA-808/(*)-P	8 (20.32)	8 (20.32)	320	640
KHA-810/(*)	KHA-810/(*)-P	8 (20.32)	10 (25.4)	400	800
KHA-812/(*)	KHA-812/(*)-P	8 (20.32)	12 (30.48)	480	960
KHA-1010/(*)	KHA-1010/(*)-P	10 (25.4)	10 (25.4)	500	1000
KHA-1012/(*)	KHA-1012/(*)-P	10 (25.4)	12 (30.48)	600	1200
KHA-1212/(*)	KHA-1212/(*)-P	12 (30.48)	12 (30.48)	720	1440

Comes complete with operator's manual.

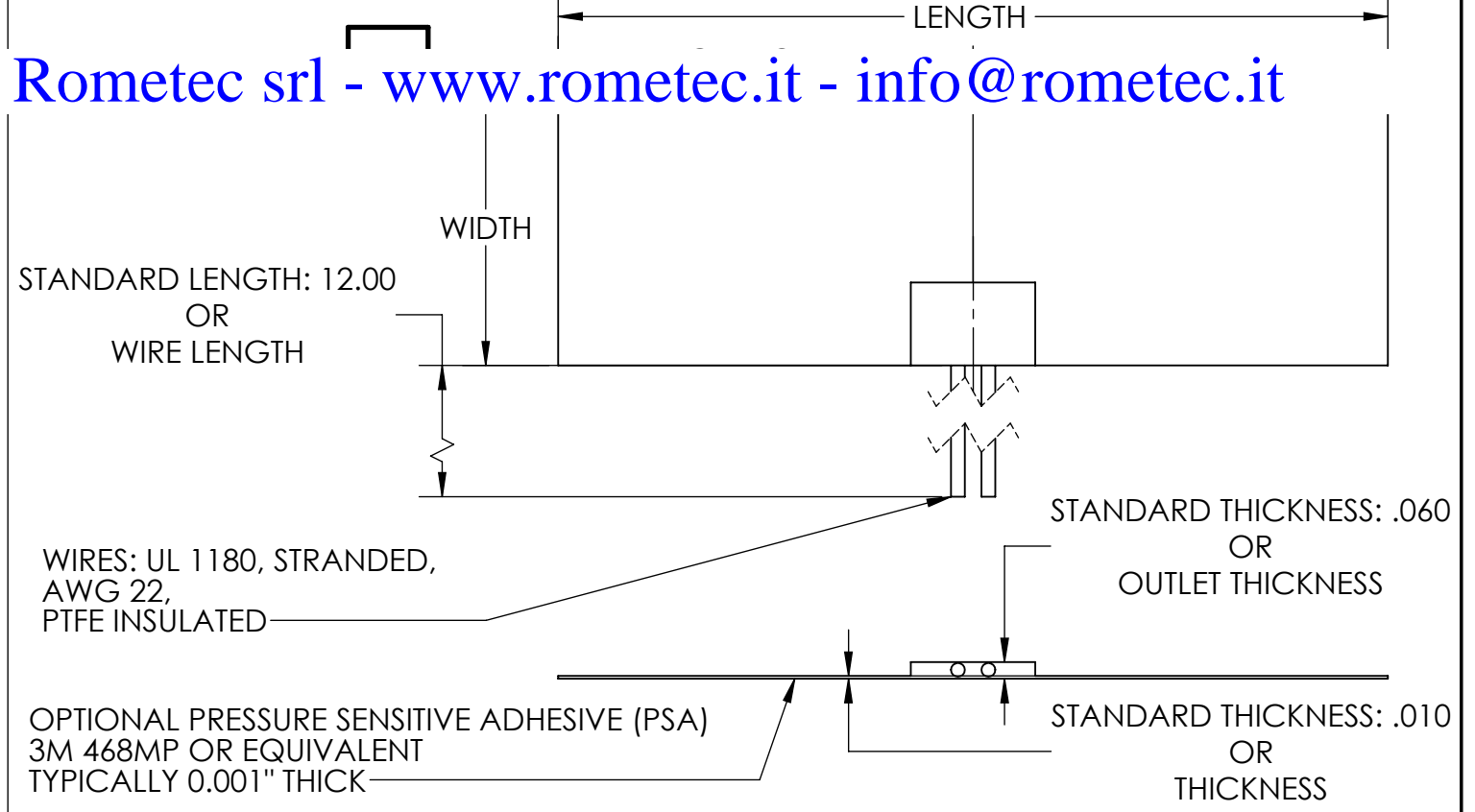
\* Insert watt density: "2" for 2.5 W/in<sup>2</sup>, "5" for 5 W/in<sup>2</sup> or "10" for 10 W/in<sup>2</sup>.

**Note:** Heaters are available in only the watt densities where total wattage is indicated.

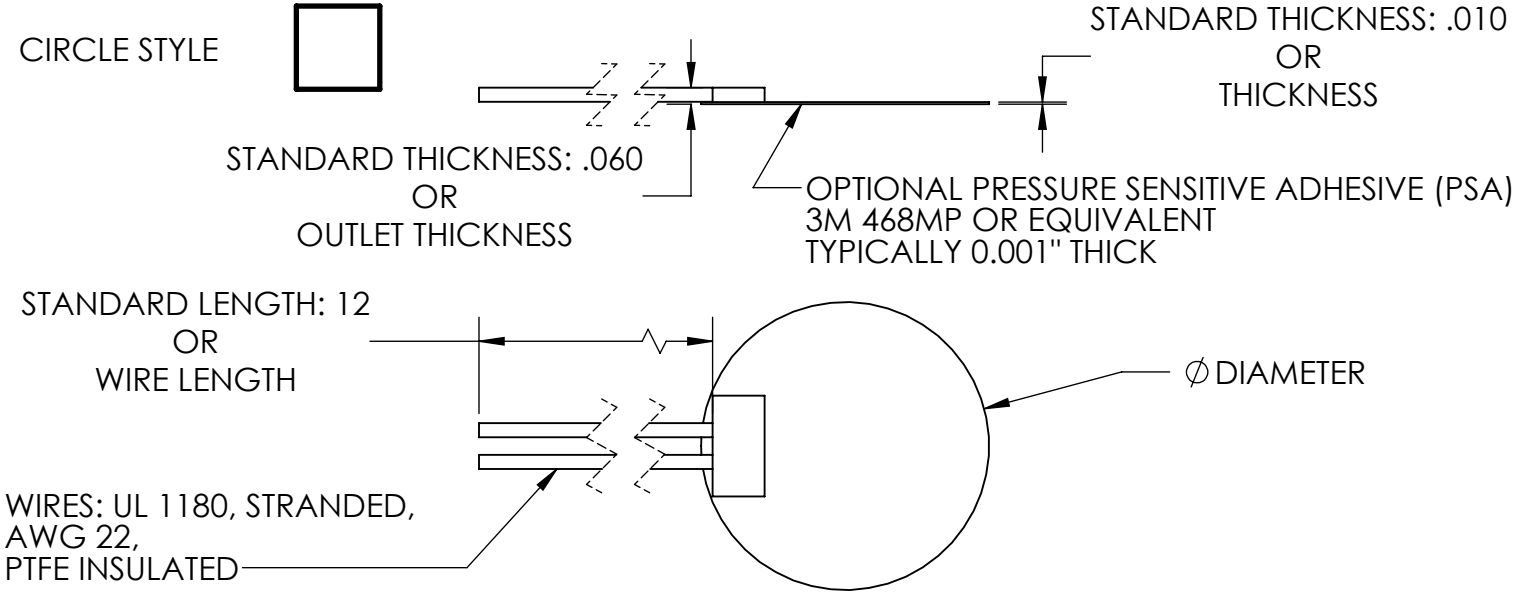
Rometec srl - [www.rometec.it](http://www.rometec.it) - [info@rometec.it](mailto:info@rometec.it) - Rometec srl - [www.rometec.it](http://www.rometec.it) - [info@rometec.it](mailto:info@rometec.it)



WIDTH	LENGTH	WATT DENSITY	VOLTAGE	PSA BACKING	WIDTH TO PAD	WIRE LENGTH	THICKNESS	OUTLET THICKNESS



WIDTH	LENGTH	WATT DENSITY	VOLTAGE	PSA BACKING	LENGTH TO PAD	WIRE LENGTH	THICKNESS	OUTLET THICKNESS



DIAMETER	WATT DENSITY	VOLTAGE	PSA BACKING	WIRE LENGTH	THICKNESS	OUTLET THICKNESS

Rometec srl - [www.rometec.it](http://www.rometec.it) - [info@rometec.it](mailto:info@rometec.it) - Rometec srl - [www.rometec.it](http://www.rometec.it) - [info@rometec.it](mailto:info@rometec.it)

**Fill this form with details required to quote this heater.  
Scan & email this Form to [heaters@omega.com](mailto:heaters@omega.com)**

**If you have specific geometry requirements, you may also create and attach your own drawing.**

**Minimum order of \$1000**

NOTES:

- CONSTRUCTION: POLYIMIDE MATERIAL ENCASING AN INCONEL 600 RESISTIVE FOIL ELEMENT
- OPERATING TEMP (WITHOUT PSA): -57°C TO 150°C
- DIELECTRIC STRENGTH: 1250 VAC FOR 1 SEC
- WATT DENSITY TOLERANCE: ±10%



TITLE:	
SIZE	
TEMPLATE NO.	080-0012
REV	C



## CUSTOM POLYIMIDE HEATER QUOTATION FORM

**Tel: 800-826-6342**

**E-mail: [Heaters@omega.com](mailto:Heaters@omega.com)**

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

State/Province: \_\_\_\_\_ Zip/Postal Code: \_\_\_\_\_

Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_ Fax: \_\_\_\_\_

- 1) What is the application? \_\_\_\_\_
- 2) Material to be heated: \_\_\_\_\_
- 3) Quantity required? \_\_\_\_\_
- 4) Will this be a one-time order or recurring order? \_\_\_\_\_
- 5) Other instrumentation to be quoted: \_\_\_\_\_
- 6) Testing or other required documentation: \_\_\_\_\_
- 7) Lead-time constrained: \_\_\_\_\_

All custom heaters are non-returnable and PO cannot be canceled.

FILL Dimensional sketch from reverse side

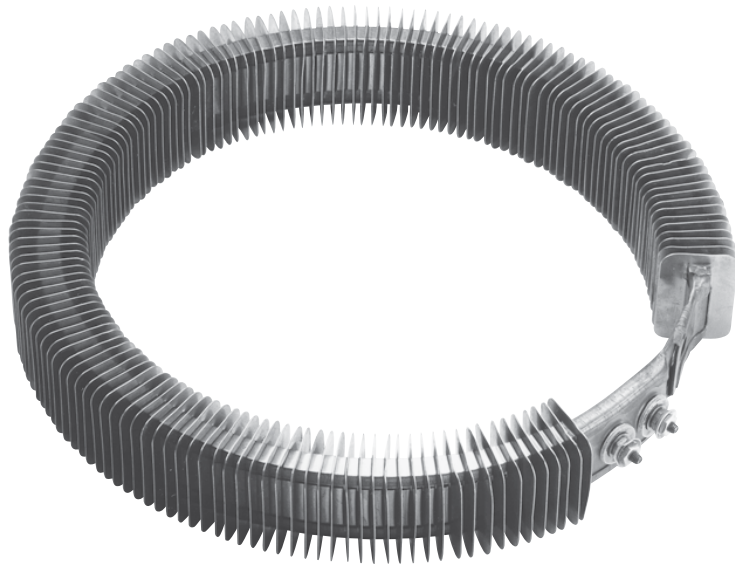
# COILED FINNED ELEMENTS FOR ROUND DUCTWORK

KSEF Series



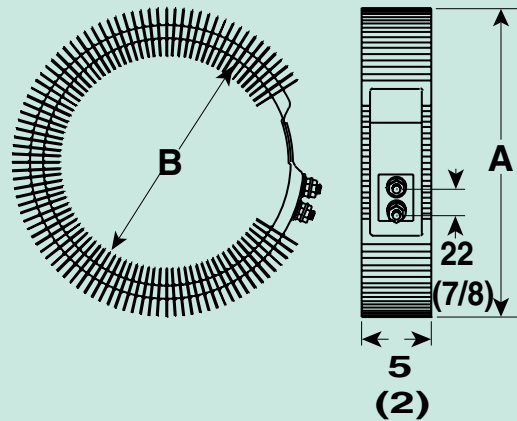
- ✓ Rugged, Reliable, Premium Quality
- ✓ Preformed Circular Finned Strip Units for Round Ducts

- ✓ 1950 to 5000 Watts
- ✓ 120 and 240 Volt Units
- ✓ Excellent Heat Transfer Capabilities



**CAUTION AND WARNING!**  
Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

Dimensions cm (inches)



## FEATURES

**KSEF Series is open construction;** requires mounting brackets to be fabricated by user.

**Elements may be nested** inside of each other, with adequate clearance.

**Controls.** For thermostatic control (AR thermostat) and overheat protection (Type ARC), visit OMEGA online

**Alloy wire or bus bar** should be used for power connections

## APPLICATION

Heating moving air or gas in a round duct

## SPECIFICATIONS

**Sheath Material:** iron or monel

**Fin Material:** iron sheath - aluminized steel; monel sheath - monel

**Power:** 120 or 240 Vac

## Maximum Sheath and Work Temperatures: Free Air

Iron sheath 107°C (225°F)  
Chrome-steel sheath 157°C (315°F)

**Moving Air** – air velocity at 16 fps  
Iron sheath 238°C (460°F)  
Chrome steel sheath 296°C (565°F)

## To Order

Watts	W/in <sup>2</sup>	Dimensions cm (in)		Model Number	Wt. (lb)
		A	B		
<b>Type KSEF — Rust-Resistant Iron Sheath</b>					
1950	27	22.5 (8 <sup>5</sup> / <sub>8</sub> )	15.6 (6 <sup>1</sup> / <sub>8</sub> )	KSEF-24/*	3
2500	26	27.3 (10 <sup>3</sup> / <sub>4</sub> )	20.3 (8)	KSEF-30/*	4
3100	27	31.8 (12 <sup>1</sup> / <sub>2</sub> )	24.4 (9 <sup>3</sup> / <sub>4</sub> )	KSEF-36/240	5
3700	26	57.2 (14 <sup>1</sup> / <sub>2</sub> )	29.8 (11 <sup>3</sup> / <sub>4</sub> )	KSEF-43/240	6
<b>Type KSEF — Monel Sheath</b>					
1950	27	22.5 (8 <sup>5</sup> / <sub>8</sub> )	15.6 (6 <sup>1</sup> / <sub>8</sub> )	KSEF-240M/*	3
2500	26	27.3 (10 <sup>3</sup> / <sub>4</sub> )	20.3 (8)	KSEF-300M/*	4
3100	27	31.8 (12 <sup>1</sup> / <sub>2</sub> )	24.4 (9 <sup>3</sup> / <sub>4</sub> )	KSEF-360M/240	5
3700	26	57.2 (14 <sup>1</sup> / <sub>2</sub> )	29.8 (11 <sup>3</sup> / <sub>4</sub> )	KSEF-430M/240	6
4000	25	41.3 (16 <sup>1</sup> / <sub>4</sub> )	34.3 (13 <sup>1</sup> / <sub>2</sub> )	KSEF-480M/240	7
4500	25	46.4 (18 <sup>1</sup> / <sub>4</sub> )	39.4 (15 <sup>1</sup> / <sub>2</sub> )	KSEF-540M/240	8
5000	23	54.9 (21 <sup>5</sup> / <sub>8</sub> )	47.9 (18 <sup>3</sup> / <sub>4</sub> )	KSEF-640M/240	10

*/\* Specify voltage, insert 120 for 120 Vac or 240 for 240 Vac. Model numbers containing /120 or /240 are only available in that voltage.*

*OMEGALUX can supply other sizes and ratings. Call sales.*



## An Economical and Reliable Cartridge Heater, Used in Applications Requiring Lower Operating Temperatures and Watt Densities

### LDC Series



#### Typical Applications

- Heat Sealing Equipment
- Laminating Equipment
- Packaging Equipment
- Labeling Machines
- Molds and Dies
- Food Processing
- Refrigeration
- Shoe Machinery
- Glue Guns
- Wax Pots
- Heating Liquids
- Heating Gases

Low-density cartridge heaters are an excellent, cost effective choice without compromising quality for Original Equipment Manufacturers (OEMs) consuming large quantities of cartridge heaters for their equipment.

#### Standard Specifications and Tolerances

##### Performance Ratings

**Maximum Temperature:** 650°C (1200°F)

**Maximum Watt Density:** 3.1 to 7.0 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>) depending on heater size and operating temperature

#### Dimensional Specifications

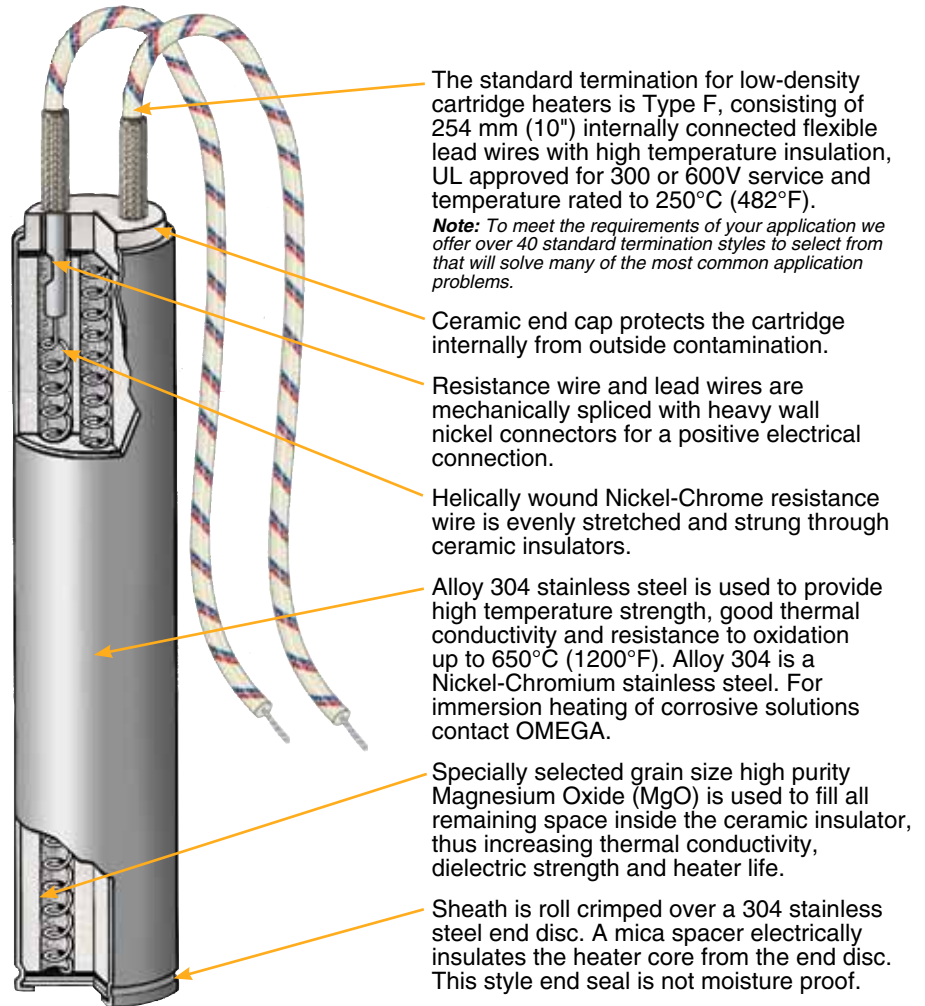
Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Actual Diameter inch	0.185	0.247	0.372	0.496	0.621	0.745	0.870	0.933	0.995	1.250
Actual Diameter mm	4.70	6.27	9.45	12.60	15.77	18.92	22.10	23.70	25.27	31.75
Diameter Tolerance	0.051 mm (±0.002")									0.127 mm (±0.005")
Length Tolerance	1.59 mm (±1/16") up to 152 mm (6") long; 3.18 mm (±1/8") over 152 mm (6") long									
Camber Tolerance	0.254 mm (0.010") per foot of length									

#### Electrical Specifications

Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Maximum Voltage	240	240	240	240	480**	480**	480**	480**	480**	480**
Maximum Amperage	1.5	3.5	6	8	10	15	15	15	25	30
Maximum Wattage	Contact OMEGA									
Wattage Tolerance	Plus 5%, minus 10%									
Resistance Tolerance	Plus 10%, minus 5%									

\* Low density cartridge heaters are UL recognized and CSA certified in many design variations under UL File Number E65652 and CSA File Number 043099. If you require UL and/or CSA Agency Approval, please specify when ordering.

\*\*480V when applicable. Contact OMEGA.





3/16" Diameter, Actual 4.70 mm (0.185")

**To Order Visit [omega.com/ldc1](http://omega.com/ldc1) for Pricing and Details**

Model No.		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
LDC00001	—	25.4	1	15	5.3	34
LDC00002	—	38.1	1½	20	4.7	30
LDC00003	—	50.8	2	30	4.9	31
LDC00004	—	63.5	2½	40	5.0	32
LDC00005	—	76.2	3	45	4.5	29
LDC00006	—	101.6	4	65	4.7	31
LDC00007	—	127.0	5	80	4.6	29
LDC00008	—	152.4	6	100	4.7	30
LDC00009	—	177.8	7	125	5.0	32
LDC00010	—	203.2	8	150	5.2	33
LDC00011	—	254.0	10	170	4.7	30

**Note:** Model numbers above are for low density cartridge heaters terminated with Type F flexible leads, 254 mm (10") long.

**Ordering Example:** LDC00010, 150W, 120 Vac, cartridge heater.

Order by model number from the standard sizes and ratings list on the preceding pages. Note that model numbers shown are for heaters with Type F Termination [254 mm (10") leads].

**Custom Engineered/Manufactured Heaters**

Because an electric heater can be very application specific, for sizes and ratings not listed, OMEGA will design and manufacture a low-density cartridge heater to meet your requirements.

**Please Specify the Following:**

- Diameter
- Length
- Wattage
- Voltage
- Termination Types
- Lead Length
- Cable/Braid Length
- Special Features
- Application Type
- Operating Temperature



## An Economical and Reliable Cartridge Heater, Used in Applications Requiring Lower Operating Temperatures and Watt Densities

LDC Series



### Typical Applications

- Heat Sealing Equipment
- Laminating Equipment
- Packaging Equipment
- Labeling Machines
- Molds and Dies
- Food Processing
- Refrigeration
- Shoe Machinery
- Glue Guns
- Wax Pots
- Heating Liquids
- Heating Gases

Low-density cartridge heaters are an excellent, cost effective choice without compromising quality for Original Equipment Manufacturers (OEMs) consuming large quantities of cartridge heaters for their equipment.

### Standard Specifications and Tolerances

#### Performance Ratings

**Maximum Temperature:** 650°C (1200°F)

**Maximum Watt Density:** 3.1 to 7.0 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>) depending on heater size and operating temperature

#### Dimensional Specifications

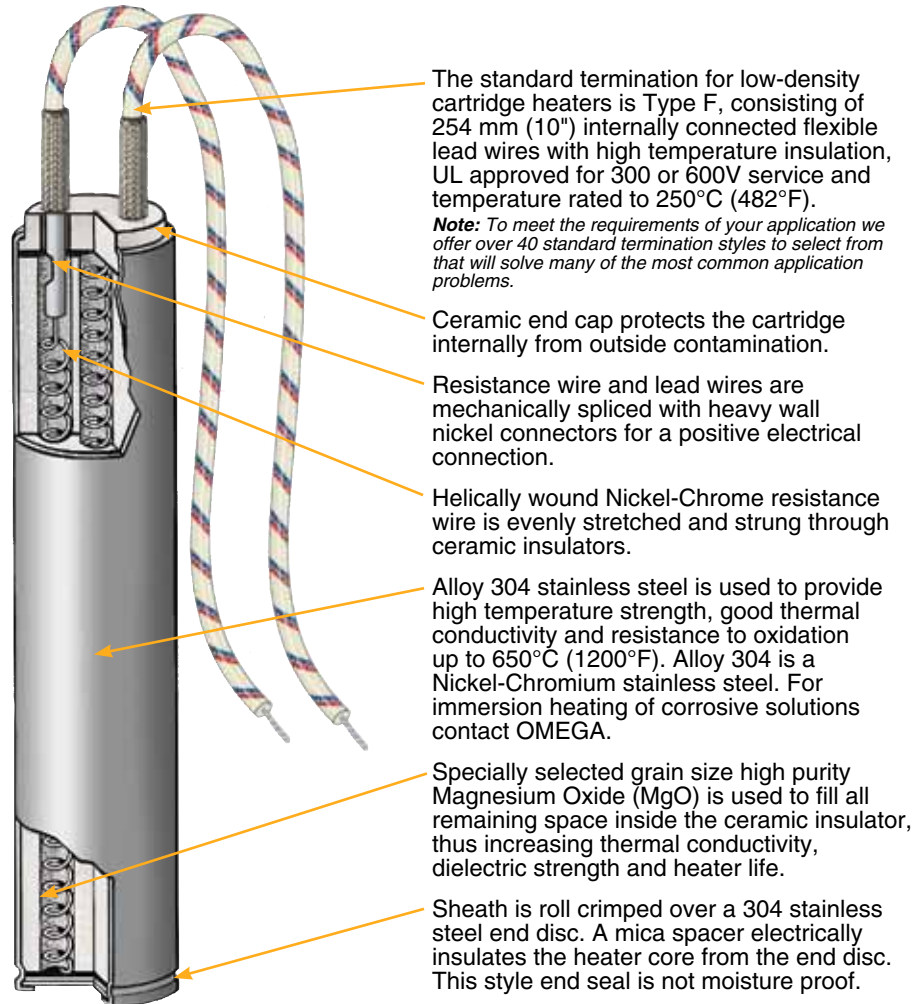
Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Actual Diameter inch	0.185	0.247	0.372	0.496	0.621	0.745	0.870	0.933	0.995	1.250
Actual Diameter mm	4.70	6.27	9.45	12.60	15.77	18.92	22.10	23.70	25.27	31.75
Diameter Tolerance	0.051 mm (±0.002")									0.127 mm (±0.005")
Length Tolerance	1.59 mm (±1/16") up to 152 mm (6") long; 3.18 mm (±1/8") over 152 mm (6") long									
Camber Tolerance	0.254 mm (0.010") per foot of length									

#### Electrical Specifications

Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Maximum Voltage	240	240	240	240	480**	480**	480**	480**	480**	480**
Maximum Amperage	1.5	3.5	6	8	10	15	15	15	25	30
Maximum Wattage	Contact OMEGA									
Wattage Tolerance	Plus 5%, minus 10%									
Resistance Tolerance	Plus 10%, minus 5%									

\* Low density cartridge heaters are UL recognized and CSA certified in many design variations under UL File Number E65652 and CSA File Number 043099. If you require UL and/or CSA Agency Approval, please specify when ordering.

\*\*480V when applicable. Contact OMEGA.





1¼" Diameter, Actual 31.62 mm (1.245")

**To Order Visit [omega.com/ldc10](http://omega.com/ldc10) for Pricing and Details**

Model No.		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
LDC00403	LDC00404	82.6	3¼	400	5.7	37
LDC00405	LDC00406	127.0	5	450	3.9	25
LDC00407	LDC00408	152.4	6	500	3.6	23
LDC00409	LDC00410	152.4	6	800	5.7	37
LDC00411	LDC00412	177.8	7	550	3.3	22
LDC00413	LDC00414	177.8	7	1000	6.1	39
LDC00415	LDC00416	228.6	9	675	3.1	20
LDC00417	LDC00418	254.0	10	1000	4.2	27
LDC00419	LDC00420	304.8	12	1000	3.4	22
—	LDC00421	355.6	14	2000	5.8	38
—	LDC00422	381.0	15	1250	3.4	22
LDC00423	LDC00424	419.1	16½	1000	2.5	16
—	LDC00425	571.5	22½	2200	3.9	25
—	LDC00426	609.6	24	2400	4.0	26

**Note:** Model numbers above are for low density cartridge heaters terminated with Type F flexible leads, 254 mm (10") long.  
**Ordering Example:** LDC00417, 1000 W, 120 Vac cartridge heater.

Order by model number from the standard sizes and ratings list on the preceding pages. Note that model numbers shown are for heaters with Type F Termination [254 mm (10") leads].

**Custom Engineered/Manufactured Heaters**

Because an electric heater can be very application specific, for sizes and ratings not listed, OMEGA will design and manufacture a low-density cartridge heater to meet your requirements.

**Please Specify the Following:**

- Diameter
- Length
- Wattage
- Voltage
- Termination Types
- Lead Length
- Cable/Braid Length
- Special Features
- Application Type
- Operating Temperature





## An Economical and Reliable Cartridge Heater, Used in Applications Requiring Lower Operating Temperatures and Watt Densities

LDC Series



### Typical Applications

- Heat Sealing Equipment
- Laminating Equipment
- Packaging Equipment
- Labeling Machines
- Molds and Dies
- Food Processing
- Refrigeration
- Shoe Machinery
- Glue Guns
- Wax Pots
- Heating Liquids
- Heating Gases

Low-density cartridge heaters are an excellent, cost effective choice without compromising quality for Original Equipment Manufacturers (OEMs) consuming large quantities of cartridge heaters for their equipment.

### Standard Specifications and Tolerances

#### Performance Ratings

**Maximum Temperature:** 650°C (1200°F)

**Maximum Watt Density:** 3.1 to 7.0 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>) depending on heater size and operating temperature

### Dimensional Specifications

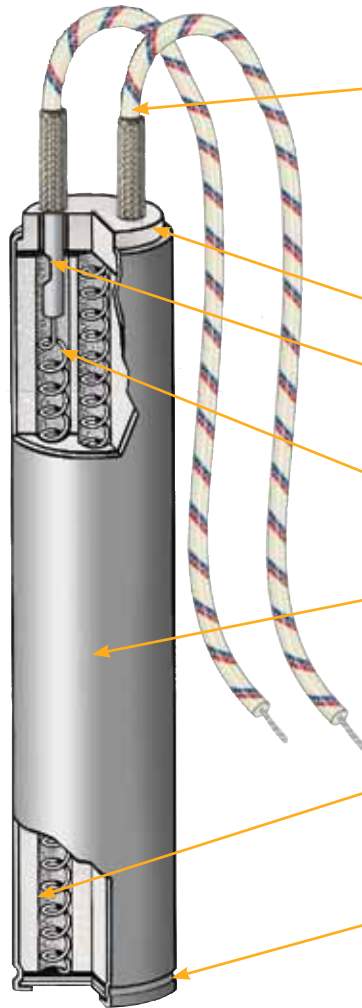
Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Actual Diameter inch	0.185	0.247	0.372	0.496	0.621	0.745	0.870	0.933	0.995	1.250
Actual Diameter mm	4.70	6.27	9.45	12.60	15.77	18.92	22.10	23.70	25.27	31.75
Diameter Tolerance	0.051 mm (±0.002")									0.127 mm (±0.005")
Length Tolerance	1.59 mm (±1/16") up to 152 mm (6") long; 3.18 mm (±1/8") over 152 mm (6") long									
Camber Tolerance	0.254 mm (0.010") per foot of length									

### Electrical Specifications

Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Maximum Voltage	240	240	240	240	480**	480**	480**	480**	480**	480**
Maximum Amperage	1.5	3.5	6	8	10	15	15	15	25	30
Maximum Wattage	Contact OMEGA									
Wattage Tolerance	Plus 5%, minus 10%									
Resistance Tolerance	Plus 10%, minus 5%									

\* Low density cartridge heaters are UL recognized and CSA certified in many design variations under UL File Number E65652 and CSA File Number 043099. If you require UL and/or CSA Agency Approval, please specify when ordering.

\*\*480V when applicable. Contact OMEGA.



The standard termination for low-density cartridge heaters is Type F, consisting of 254 mm (10") internally connected flexible lead wires with high temperature insulation, UL approved for 300 or 600V service and temperature rated to 250°C (482°F).

**Note:** To meet the requirements of your application we offer over 40 standard termination styles to select from that will solve many of the most common application problems.

Ceramic end cap protects the cartridge internally from outside contamination.

Resistance wire and lead wires are mechanically spliced with heavy wall nickel connectors for a positive electrical connection.

Helically wound Nickel-Chrome resistance wire is evenly stretched and strung through ceramic insulators.

Alloy 304 stainless steel is used to provide high temperature strength, good thermal conductivity and resistance to oxidation up to 650°C (1200°F). Alloy 304 is a Nickel-Chromium stainless steel. For immersion heating of corrosive solutions contact OMEGA.

Specially selected grain size high purity Magnesium Oxide (MgO) is used to fill all remaining space inside the ceramic insulator, thus increasing thermal conductivity, dielectric strength and heater life.

Sheath is roll crimped over a 304 stainless steel end disc. A mica spacer electrically insulates the heater core from the end disc. This style end seal is not moisture proof.

¼" Diameter, Actual 6.27 mm (0.247")

**To Order Visit [omega.com/ldc2](http://omega.com/ldc2) for Pricing and Details**

Model No.		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		W/cm <sup>2</sup>	W/in <sup>2</sup>
LDC00012	—	25.4	1	20	5.3	34
LDC00013	—	25.4	1	42	11.1	71
LDC00014	—	38.1	1½	20	3.5	23
LDC00015	—	50.8	2	32	4.2	27
LDC00016	—	50.8	2	40	5.3	34
LDC00017	—	50.8	2	50	6.6	42
LDC00018	—	63.5	2½	30	3.0	19
LDC00019	—	76.2	3	32	2.5	16
LDC00020	—	76.2	3	50	3.9	25
LDC00021	—	88.9	3½	80	5.3	34
LDC00022	LDC00023	101.6	4	100	5.6	36
LDC00024	—	127.0	5	125	5.5	35
LDC00025	LDC00026	152.4	6	150	5.4	35
LDC00027	LDC00028	177.8	7	100	3.0	20
LDC00029	LDC00030	203.2	8	200	5.3	34
LDC00031	LDC00032	254.0	10	250	5.2	34

**Note:** Model numbers above are for low density cartridge heaters terminated with Type F flexible leads, 254 mm (10") long.

**Ordering Example:** LDC00022, 100 W, 120 Vac, cartridge heater.

Order by model number from the standard sizes and ratings list on the preceding pages. Note that model numbers shown are for heaters with Type F Termination [254 mm (10") leads].

**Custom Engineered/Manufactured Heaters**

Because an electric heater can be very application specific, for sizes and ratings not listed, OMEGA will design and manufacture a low-density cartridge heater to meet your requirements.

**Please Specify the Following:**

- Diameter
- Length
- Wattage
- Voltage
- Termination Types
- Lead Length
- Cable/Braid Length
- Special Features
- Application Type
- Operating Temperature



## An Economical and Reliable Cartridge Heater, Used in Applications Requiring Lower Operating Temperatures and Watt Densities

### LDC Series



#### Typical Applications

- Heat Sealing Equipment
- Laminating Equipment
- Packaging Equipment
- Labeling Machines
- Molds and Dies
- Food Processing
- Refrigeration
- Shoe Machinery
- Glue Guns
- Wax Pots
- Heating Liquids
- Heating Gases

Low-density cartridge heaters are an excellent, cost effective choice without compromising quality for Original Equipment Manufacturers (OEMs) consuming large quantities of cartridge heaters for their equipment.

#### Standard Specifications and Tolerances

##### Performance Ratings

**Maximum Temperature:** 650°C (1200°F)

**Maximum Watt Density:** 3.1 to 7.0 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>) depending on heater size and operating temperature

#### Dimensional Specifications

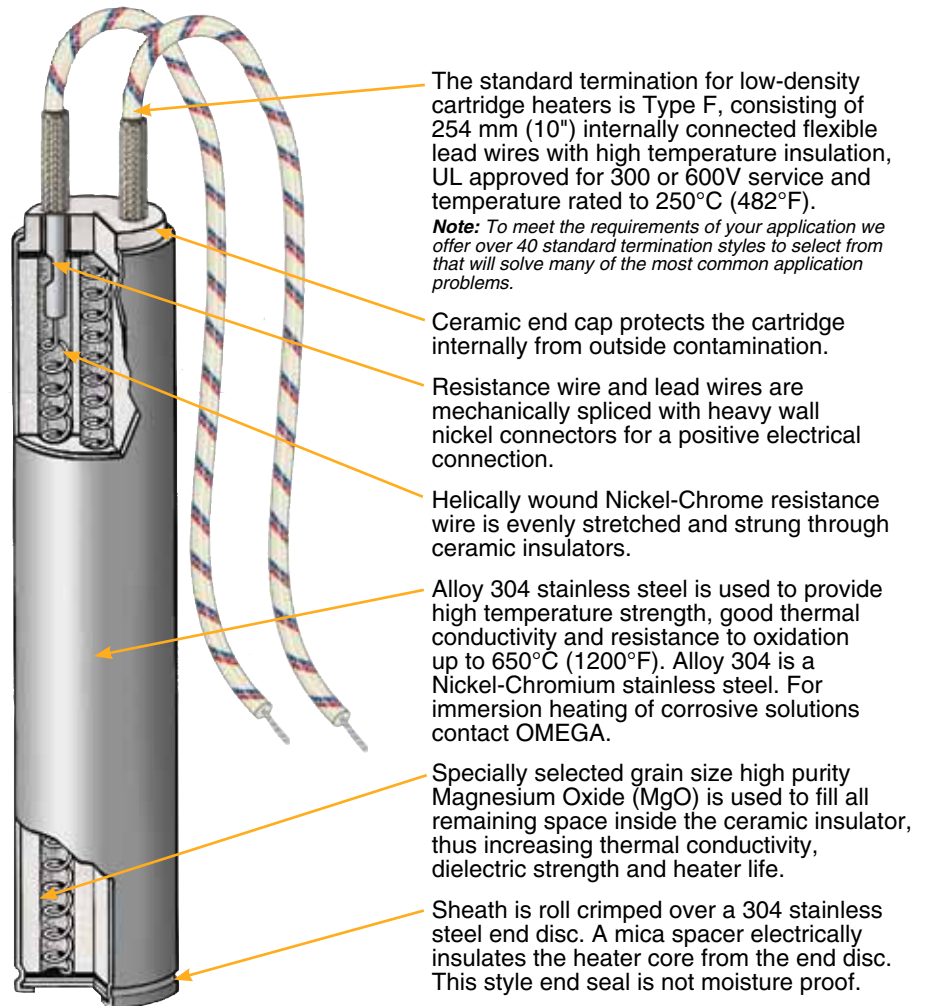
Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Actual Diameter inch	0.185	0.247	0.372	0.496	0.621	0.745	0.870	0.933	0.995	1.250
Actual Diameter mm	4.70	6.27	9.45	12.60	15.77	18.92	22.10	23.70	25.27	31.75
Diameter Tolerance	0.051 mm (±0.002")									0.127 mm (±0.005")
Length Tolerance	1.59 mm (±1/16") up to 152 mm (6") long; 3.18 mm (±1/8") over 152 mm (6") long									
Camber Tolerance	0.254 mm (0.010") per foot of length									

#### Electrical Specifications

Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Maximum Voltage	240	240	240	240	480**	480**	480**	480**	480**	480**
Maximum Amperage	1.5	3.5	6	8	10	15	15	15	25	30
Maximum Wattage	Contact OMEGA									
Wattage Tolerance	Plus 5%, minus 10%									
Resistance Tolerance	Plus 10%, minus 5%									

\* Low density cartridge heaters are UL recognized and CSA certified in many design variations under UL File Number E65652 and CSA File Number 043099. If you require UL and/or CSA Agency Approval, please specify when ordering.

\*\*480V when applicable. Contact OMEGA.



3/8" Diameter, Actual 9.45 mm (0.372")

**To Order Visit [omega.com/ldc3](http://omega.com/ldc3) for Pricing and Details**

Model No.		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
LDC00033	—	38.1	1½	15	2.0	13
LDC00034	—	38.1	1½	40	5.3	34
LDC00035	—	50.8	2	50	4.4	28
LDC00036	—	63.5	2½	75	4.9	32
LDC00037	—	63.5	2½	100	6.6	42
LDC00038	—	76.2	3	100	5.3	34
LDC00039	LDC00040	88.9	3½	120	5.3	34
LDC00041	LDC00042	101.6	4	75	2.8	18
LDC00043	LDC00044	101.6	4	130	4.9	32
LDC00045	LDC00046	101.6	4	150	5.6	36
LDC00047	LDC00048	101.6	4	180	6.8	44
LDC00049	LDC00050	114.3	4½	75	2.5	16
LDC00051	LDC00052	114.3	4½	150	4.9	32
LDC00053	LDC00054	127.0	5	150	4.4	28
LDC00055	LDC00056	127.0	5	200	5.8	38
LDC00057	LDC00058	139.7	5½	200	5.3	34
LDC00059	LDC00060	152.4	6	225	5.4	35
LDC00061	LDC00062	152.4	6	250	6.0	39
LDC00063	LDC00064	177.8	7	200	4.0	26
LDC00065	LDC00066	177.8	7	265	5.4	35
LDC00067	LDC00068	203.2	8	300	5.3	34
LDC00069	LDC00070	228.6	9	350	5.4	35
LDC00071	LDC00072	241.3	9½	300	4.4	28
LDC00073	LDC00074	254.0	10	375	5.2	34
LDC00075	LDC00076	304.8	12	425	4.9	31
LDC00077	LDC00078	304.8	12	450	5.1	33
LDC00079	LDC00080	304.8	12	475	5.4	35
LDC00081	LDC00082	304.8	12	500	5.7	37
LDC00083	LDC00084	355.6	14	500	4.9	31
LDC00085	LDC00086	406.4	16	550	4.7	30
LDC00087	LDC00088	508.0	20	200	1.3	9
LDC00089	LDC00090	508.0	20	650	4.4	28
—	LDC00091	558.8	22	800	4.9	32
—	LDC00092	609.6	24	750	4.2	27

**Note:** Model numbers above are for low density cartridge heaters terminated with Type F flexible leads, 254 mm (10") long.  
**Ordering Example:** LDC00069, 350 W, 120 Vac, cartridge heater.

Order by model number from the standard sizes and ratings list on the preceding pages. Note that model numbers shown are for heaters with Type F Termination [254 mm (10") leads].

**Custom Engineered/Manufactured Heaters**

Because an electric heater can be very application specific, for sizes and ratings not listed, OMEGA will design and manufacture a low-density cartridge heater to meet your requirements.

**Please Specify the Following:**

- Diameter
- Length
- Wattage
- Voltage
- Termination Types
- Lead Length
- Cable/Braid Length
- Special Features
- Application Type
- Operating Temperature



## An Economical and Reliable Cartridge Heater, Used in Applications Requiring Lower Operating Temperatures and Watt Densities

### LDC Series



#### Typical Applications

- Heat Sealing Equipment
- Laminating Equipment
- Packaging Equipment
- Labeling Machines
- Molds and Dies
- Food Processing
- Refrigeration
- Shoe Machinery
- Glue Guns
- Wax Pots
- Heating Liquids
- Heating Gases

Low-density cartridge heaters are an excellent, cost effective choice without compromising quality for Original Equipment Manufacturers (OEMs) consuming large quantities of cartridge heaters for their equipment.

#### Standard Specifications and Tolerances

##### Performance Ratings

**Maximum Temperature:** 650°C (1200°F)

**Maximum Watt Density:** 3.1 to 7.0 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>) depending on heater size and operating temperature

#### Dimensional Specifications

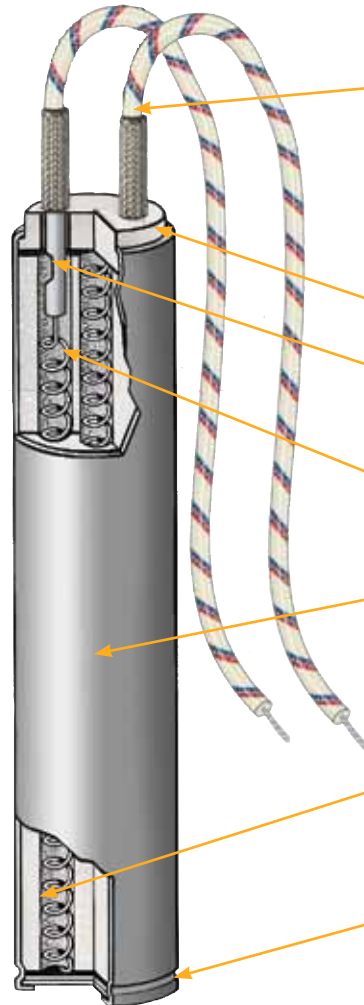
Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Actual Diameter inch	0.185	0.247	0.372	0.496	0.621	0.745	0.870	0.933	0.995	1.250
Actual Diameter mm	4.70	6.27	9.45	12.60	15.77	18.92	22.10	23.70	25.27	31.75
Diameter Tolerance	0.051 mm (±0.002")									0.127 mm (±0.005")
Length Tolerance	1.59 mm (±1/16") up to 152 mm (6") long; 3.18 mm (±1/8") over 152 mm (6") long									
Camber Tolerance	0.254 mm (0.010") per foot of length									

#### Electrical Specifications

Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Maximum Voltage	240	240	240	240	480**	480**	480**	480**	480**	480**
Maximum Amperage	1.5	3.5	6	8	10	15	15	15	25	30
Maximum Wattage	Contact OMEGA									
Wattage Tolerance	Plus 5%, minus 10%									
Resistance Tolerance	Plus 10%, minus 5%									

\* Low density cartridge heaters are UL recognized and CSA certified in many design variations under UL File Number E65652 and CSA File Number 043099. If you require UL and/or CSA Agency Approval, please specify when ordering.

\*\*480V when applicable. Contact OMEGA.



The standard termination for low-density cartridge heaters is Type F, consisting of 254 mm (10") internally connected flexible lead wires with high temperature insulation, UL approved for 300 or 600V service and temperature rated to 250°C (482°F).

**Note:** To meet the requirements of your application we offer over 40 standard termination styles to select from that will solve many of the most common application problems.

Ceramic end cap protects the cartridge internally from outside contamination.

Resistance wire and lead wires are mechanically spliced with heavy wall nickel connectors for a positive electrical connection.

Helically wound Nickel-Chrome resistance wire is evenly stretched and strung through ceramic insulators.

Alloy 304 stainless steel is used to provide high temperature strength, good thermal conductivity and resistance to oxidation up to 650°C (1200°F). Alloy 304 is a Nickel-Chromium stainless steel. For immersion heating of corrosive solutions contact OMEGA.

Specially selected grain size high purity Magnesium Oxide (MgO) is used to fill all remaining space inside the ceramic insulator, thus increasing thermal conductivity, dielectric strength and heater life.

Sheath is roll crimped over a 304 stainless steel end disc. A mica spacer electrically insulates the heater core from the end disc. This style end seal is not moisture proof.

½" Diameter, Actual 12.60 mm (0.496")

**To Order Visit [omega.com/ldc4](http://omega.com/ldc4) for Pricing and Details**

Model No.		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
LDC00093	—	38.1	1½	60	5.9	38
LDC00094	—	50.8	2	75	4.9	32
LDC00095	—	63.5	2½	40	2.0	13
LDC00096	—	63.5	2½	125	6.2	40
LDC00097	LDC00098	76.2	3	150	5.9	38
LDC00099	LDC00100	88.9	3½	150	4.9	32
LDC00101	LDC00102	98.4	3⅞	90	2.6	17
LDC00103	LDC00104	101.6	4	180	5.1	33
LDC00105	—	114.3	4½	200	4.9	32
LDC00106	LDC00107	127.0	5	200	4.4	28
LDC00108	LDC00109	139.7	5½	300	5.9	38
LDC00110	LDC00111	152.4	6	150	2.7	17
LDC00112	LDC00113	152.4	6	250	4.5	29
LDC00114	LDC00115	152.4	6	300	5.4	35
LDC00116	LDC00117	165.1	6½	300	4.9	32
LDC00118	LDC00119	177.8	7	275	4.2	27
LDC00120	LDC00121	177.8	7	350	5.3	34
LDC00122	LDC00123	190.5	7½	350	4.9	32
LDC00124	LDC00125	203.2	8	400	5.3	34
LDC00126	LDC00127	203.2	8	425	5.6	36
LDC00128	LDC00129	215.9	8½	400	4.9	32
LDC00130	LDC00131	228.6	9	450	5.2	34
LDC00132	LDC00133	254.0	10	500	5.2	34
LDC00134	LDC00135	266.7	10½	500	4.9	32
LDC00136	LDC00137	279.4	11	550	5.2	33
LDC00138	LDC00139	304.8	12	500	4.3	28
LDC00140	LDC00141	304.8	12	600	5.1	33
LDC00142	LDC00143	355.6	14	600	4.4	28
LDC00144	LDC00145	381.0	15	650	4.4	29
LDC00146	LDC00147	381.0	15	750	5.1	33
LDC00148	LDC00149	406.4	16	500	3.2	21
LDC00150	LDC00151	406.4	16	675	4.3	28
LDC00152	LDC00153	457.2	18	725	4.1	26
—	LDC00154	457.2	18	800	4.5	29
LDC00155	LDC00156	508.0	20	750	3.8	24
LDC00157	LDC00158	533.4	21	750	3.6	23
LDC00159	LDC00160	609.6	24	500	2.1	14
—	LDC00161	609.6	24	1000	4.2	27
—	LDC00162	635.0	25	1100	4.4	29

**Note:** Model numbers above are for low density cartridge heaters terminated with Type F flexible leads, 254 mm (10") long.

**Ordering Example:** LDC00146, 750 W, 120 Vac, cartridge heater.

Order by model number from the standard sizes and ratings list on the preceding pages. Note that model numbers shown are for heaters with Type F Termination [254 mm (10") leads].

**Custom Engineered/Manufactured Heaters**

Because an electric heater can be very application specific, for sizes and ratings not listed, OMEGA will design and manufacture a low-density cartridge heater to meet your requirements.

**Please Specify the Following:**

- Diameter
- Length
- Wattage
- Voltage
- Termination Types
- Lead Length
- Cable/Braid Length
- Special Features
- Application Type
- Operating Temperature



## An Economical and Reliable Cartridge Heater, Used in Applications Requiring Lower Operating Temperatures and Watt Densities

### LDC Series



#### Typical Applications

- Heat Sealing Equipment
- Laminating Equipment
- Packaging Equipment
- Labeling Machines
- Molds and Dies
- Food Processing
- Refrigeration
- Shoe Machinery
- Glue Guns
- Wax Pots
- Heating Liquids
- Heating Gases

Low-density cartridge heaters are an excellent, cost effective choice without compromising quality for Original Equipment Manufacturers (OEMs) consuming large quantities of cartridge heaters for their equipment.

#### Standard Specifications and Tolerances

##### Performance Ratings

**Maximum Temperature:** 650°C (1200°F)

**Maximum Watt Density:** 3.1 to 7.0 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>) depending on heater size and operating temperature

#### Dimensional Specifications

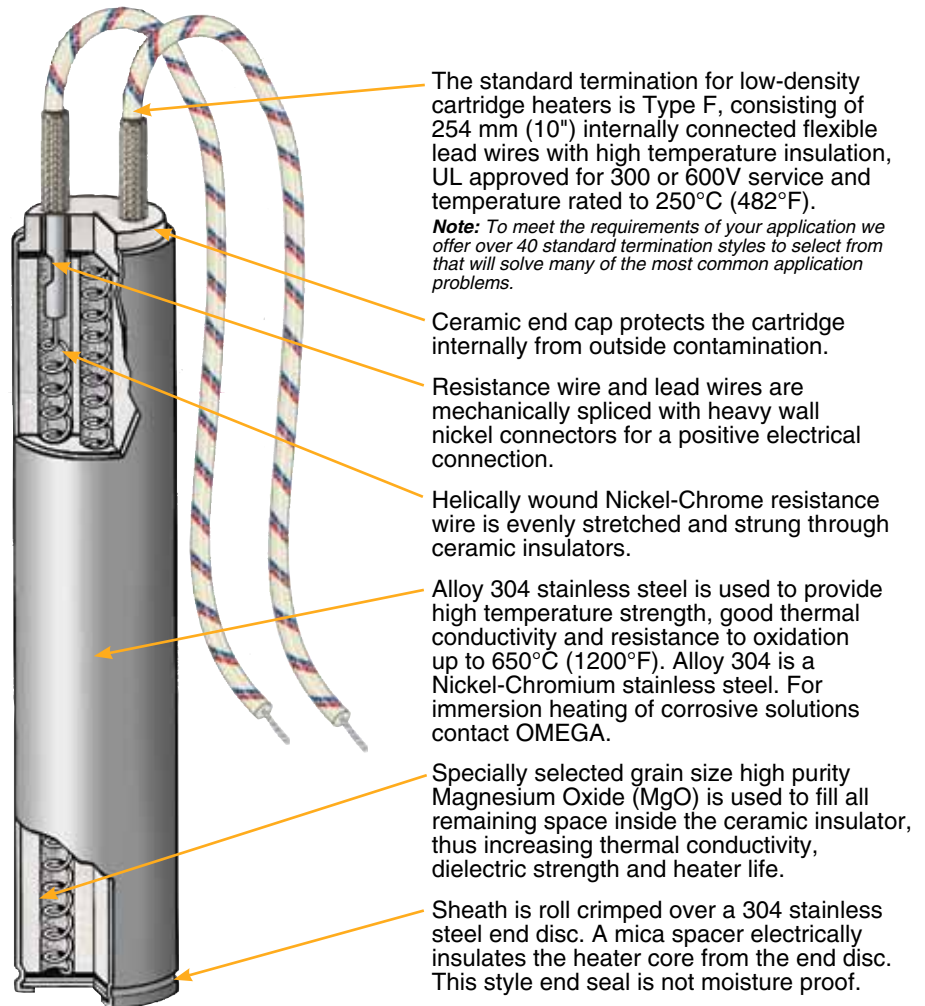
Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Actual Diameter inch	0.185	0.247	0.372	0.496	0.621	0.745	0.870	0.933	0.995	1.250
Actual Diameter mm	4.70	6.27	9.45	12.60	15.77	18.92	22.10	23.70	25.27	31.75
Diameter Tolerance	0.051 mm (±0.002")									0.127 mm (±0.005")
Length Tolerance	1.59 mm (±1/16") up to 152 mm (6") long; 3.18 mm (±1/8") over 152 mm (6") long									
Camber Tolerance	0.254 mm (0.010") per foot of length									

#### Electrical Specifications

Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Maximum Voltage	240	240	240	240	480**	480**	480**	480**	480**	480**
Maximum Amperage	1.5	3.5	6	8	10	15	15	15	25	30
Maximum Wattage	Contact OMEGA									
Wattage Tolerance	Plus 5%, minus 10%									
Resistance Tolerance	Plus 10%, minus 5%									

\* Low density cartridge heaters are UL recognized and CSA certified in many design variations under UL File Number E65652 and CSA File Number 043099. If you require UL and/or CSA Agency Approval, please specify when ordering.

\*\*480V when applicable. Contact OMEGA.





5/8" Diameter, Actual 15.77 mm (0.621")

**To Order Visit [omega.com/ldc5](http://omega.com/ldc5) for Pricing and Details**

Model No.		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
LDC00163	LDC00164	38.1	1½	100	7.9	51
LDC00165	LDC00166	50.8	2	100	5.3	34
LDC00167	LDC00168	63.5	2½	80	3.2	20
LDC00169	LDC00170	63.5	2½	150	5.9	38
LDC00171	LDC00172	76.2	3	175	5.5	36
LDC00173	LDC00174	88.9	3½	190	5.0	32
LDC00175	LDC00176	101.6	4	200	4.5	29
LDC00177	LDC00178	114.3	4½	240	4.7	31
LDC00179	LDC00180	114.3	4½	275	5.4	35
LDC00181	LDC00182	127.0	5	200	3.5	23
LDC00183	LDC00184	127.0	5	250	4.4	28
LDC00185	LDC00186	127.0	5	375	6.6	42
LDC00187	LDC00188	139.7	5½	200	3.2	20
LDC00189	LDC00190	139.7	5½	285	4.5	29
LDC00191	—	139.7	5½	510	8.1	52
LDC00192	LDC00193	149.2	5¾	350	5.1	33
LDC00194	LDC00195	152.4	6	200	2.9	19
LDC00196	LDC00197	152.4	6	300	4.3	28
LDC00198	LDC00199	152.4	6	350	5.0	32
LDC00200	LDC00201	165.1	6½	350	4.6	30
LDC00202	LDC00203	177.8	7	375	4.6	29
LDC00204	LDC00205	203.2	8	400	4.2	27
LDC00206	LDC00207	215.9	8½	425	4.2	27
LDC00208	LDC00209	228.6	9	450	4.2	27
LDC00210	LDC00211	241.3	9½	475	4.2	27
LDC00212	LDC00213	254.0	10	500	4.2	27
LDC00214	LDC00215	279.4	11	550	4.1	27
LDC00216	LDC00217	304.8	12	250	1.7	11
LDC00218	LDC00219	304.8	12	500	3.4	22
LDC00220	LDC00221	304.8	12	600	4.1	27
LDC00222	LDC00223	304.8	12	700	4.8	31
LDC00224	LDC00225	314.3	12¾	450	3.0	19
LDC00226	LDC00227	355.6	14	700	4.1	26
LDC00228	LDC00229	381.0	15	750	4.1	26
LDC00230	LDC00231	406.4	16	800	4.1	26
LDC00232	LDC00233	431.8	17	1000	4.8	31
LDC00234	LDC00235	457.2	18	725	3.3	21
LDC00236	LDC00237	457.2	18	800	3.6	23
LDC00238	LDC00239	508.0	20	900	3.6	24
—	LDC00240	533.4	21	1000	3.9	25
—	LDC00241	558.8	22	2000	7.3	47
—	LDC00242	609.6	24	2000	6.7	43
LDC00243	—	635.0	25	768	2.5	16
—	LDC00244	635.0	25	1100	3.5	23
LDC00245	LDC00246	635.0	25	1500	4.8	31
LDC00247	—	685.8	27	1200	3.6	23
—	LDC00248	711.2	28	2000	5.7	37
—	LDC00249	762.0	30	2000	5.4	35





**5/8" Diameter, Actual 15.77 mm (0.621"), continued**

Model No.		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
—	<b>LDC00250</b>	787.4	31	2000	5.2	33
—	<b>LDC00251</b>	863.6	34	2000	4.7	30
—	<b>LDC00252</b>	914.4	36	2000	4.4	29
—	<b>LDC00253</b>	965.2	38	2000	4.2	27
<b>LDC00254</b>	—	979.5	38 <sup>9/16</sup>	1200	2.5	16

**Note:** Model numbers above are for low density cartridge heaters terminated with Type F flexible leads, 254 mm (10") long.

**Ordering Example:** LDC00241, 2000 W, 240 Vac, cartridge heater.

Order by model number from the standard sizes and ratings list on the preceding pages. Note that model numbers shown are for heaters with Type F Termination [254 mm (10") leads].

**Custom Engineered/Manufactured Heaters**

Because an electric heater can be very application specific, for sizes and ratings not listed, OMEGA will design and manufacture a low-density cartridge heater to meet your requirements.

**Please Specify the Following:**

- Diameter
- Length
- Wattage
- Voltage
- Termination Types
- Lead Length
- Cable/Braid Length
- Special Features
- Application Type
- Operating Temperature



## An Economical and Reliable Cartridge Heater, Used in Applications Requiring Lower Operating Temperatures and Watt Densities

### LDC Series



#### Typical Applications

- Heat Sealing Equipment
- Laminating Equipment
- Packaging Equipment
- Labeling Machines
- Molds and Dies
- Food Processing
- Refrigeration
- Shoe Machinery
- Glue Guns
- Wax Pots
- Heating Liquids
- Heating Gases

Low-density cartridge heaters are an excellent, cost effective choice without compromising quality for Original Equipment Manufacturers (OEMs) consuming large quantities of cartridge heaters for their equipment.

#### Standard Specifications and Tolerances

##### Performance Ratings

**Maximum Temperature:** 650°C (1200°F)

**Maximum Watt Density:** 3.1 to 7.0 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>) depending on heater size and operating temperature

#### Dimensional Specifications

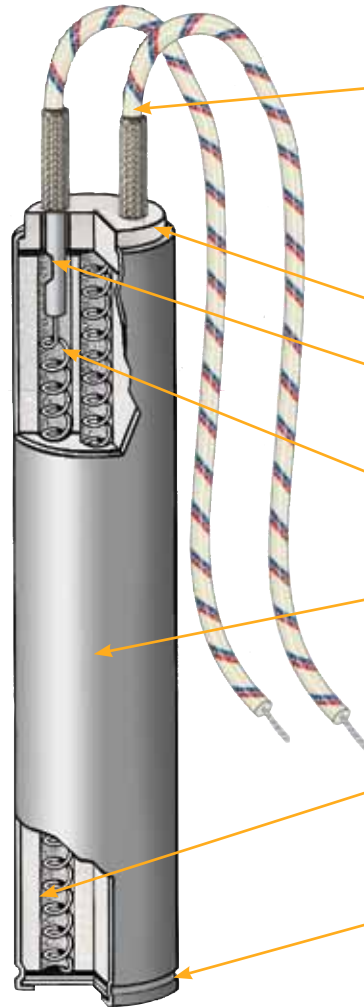
Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Actual Diameter inch	0.185	0.247	0.372	0.496	0.621	0.745	0.870	0.933	0.995	1.250
Actual Diameter mm	4.70	6.27	9.45	12.60	15.77	18.92	22.10	23.70	25.27	31.75
Diameter Tolerance	0.051 mm (±0.002")									0.127 mm (±0.005")
Length Tolerance	1.59 mm (±1/16") up to 152 mm (6") long; 3.18 mm (±1/8") over 152 mm (6") long									
Camber Tolerance	0.254 mm (0.010") per foot of length									

#### Electrical Specifications

Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Maximum Voltage	240	240	240	240	480**	480**	480**	480**	480**	480**
Maximum Amperage	1.5	3.5	6	8	10	15	15	15	25	30
Maximum Wattage	Contact OMEGA									
Wattage Tolerance	Plus 5%, minus 10%									
Resistance Tolerance	Plus 10%, minus 5%									

\* Low density cartridge heaters are UL recognized and CSA certified in many design variations under UL File Number E65652 and CSA File Number 043099. If you require UL and/or CSA Agency Approval, please specify when ordering.

\*\*480V when applicable. Contact OMEGA.



The standard termination for low-density cartridge heaters is Type F, consisting of 254 mm (10") internally connected flexible lead wires with high temperature insulation, UL approved for 300 or 600V service and temperature rated to 250°C (482°F).

**Note:** To meet the requirements of your application we offer over 40 standard termination styles to select from that will solve many of the most common application problems.

Ceramic end cap protects the cartridge internally from outside contamination.

Resistance wire and lead wires are mechanically spliced with heavy wall nickel connectors for a positive electrical connection.

Helically wound Nickel-Chrome resistance wire is evenly stretched and strung through ceramic insulators.

Alloy 304 stainless steel is used to provide high temperature strength, good thermal conductivity and resistance to oxidation up to 650°C (1200°F). Alloy 304 is a Nickel-Chromium stainless steel. For immersion heating of corrosive solutions contact OMEGA.

Specially selected grain size high purity Magnesium Oxide (MgO) is used to fill all remaining space inside the ceramic insulator, thus increasing thermal conductivity, dielectric strength and heater life.

Sheath is roll crimped over a 304 stainless steel end disc. A mica spacer electrically insulates the heater core from the end disc. This style end seal is not moisture proof.



3/4" Diameter, Actual 18.92 mm (0.745")

**To Order Visit [omega.com/ldc6](http://omega.com/ldc6) for Pricing and Details**

Model No.		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
LDC00255	LDC00256	76.2	3	225	5.9	38
LDC00257	LDC00258	88.9	3½	225	4.9	32
LDC00259	LDC00260	88.9	3½	250	5.5	35
LDC00261	LDC00262	101.6	4	300	5.6	36
LDC00263	LDC00264	127.0	5	350	5.1	33
LDC00265	LDC00266	152.4	6	170	2.0	13
LDC00267	LDC00268	152.4	6	350	4.2	27
LDC00269	LDC00270	152.4	6	400	4.8	31
LDC00271	LDC00272	177.8	7	350	3.5	23
LDC00273	LDC00274	177.8	7	450	4.6	29
LDC00275	LDC00276	177.8	7	535	5.4	35
LDC00277	LDC00278	203.2	8	350	3.1	20
LDC00279	LDC00280	203.2	8	500	4.4	28
LDC00281	LDC00282	203.2	8	600	5.3	34
LDC00283	LDC00284	215.9	8½	675	5.6	36
LDC00285	LDC00286	228.6	9	350	2.7	17
LDC00287	LDC00288	228.6	9	550	4.3	27
LDC00289	LDC00290	241.3	9½	575	4.2	27
LDC00291	LDC00292	254.0	10	600	4.2	27
LDC00293	LDC00294	254.0	10	800	5.5	36
LDC00295	LDC00296	279.4	11	675	4.2	27
LDC00297	LDC00298	304.8	12	750	4.3	28
LDC00299	LDC00300	304.8	12	1000	5.7	37
LDC00301	LDC00302	342.9	13½	600	3.0	20
LDC00303	LDC00304	355.6	14	1000	4.9	31
LDC00305	LDC00306	406.4	16	950	4.0	26
LDC00307	LDC00308	457.2	18	950	3.6	23
—	LDC00309	457.2	18	1100	4.1	27
LDC00310	LDC00311	508.0	20	1000	3.4	22
LDC00312	LDC00313	533.4	21	1150	3.7	24
—	LDC00314	762.0	30	1800	4.0	26
—	LDC00315	787.4	31	1800	3.9	25

**Note:** Model numbers above are for low density cartridge heaters terminated with Type F flexible leads, 254 mm (10") long.

**Ordering Example:** LDC00279, 500 W, 120 Vac, cartridge heater.

Order by model number from the standard sizes and ratings list on the preceding pages. Note that model numbers shown are for heaters with Type F Termination [254 mm (10") leads].

**Custom Engineered/Manufactured Heaters**

Because an electric heater can be very application specific, for sizes and ratings not listed, OMEGA will design and manufacture a low-density cartridge heater to meet your requirements.

**Please Specify the Following:**

- Diameter
- Length
- Wattage
- Voltage
- Termination Types
- Lead Length
- Cable/Braid Length
- Special Features
- Application Type
- Operating Temperature



## An Economical and Reliable Cartridge Heater, Used in Applications Requiring Lower Operating Temperatures and Watt Densities

### LDC Series



#### Typical Applications

- Heat Sealing Equipment
- Laminating Equipment
- Packaging Equipment
- Labeling Machines
- Molds and Dies
- Food Processing
- Refrigeration
- Shoe Machinery
- Glue Guns
- Wax Pots
- Heating Liquids
- Heating Gases

Low-density cartridge heaters are an excellent, cost effective choice without compromising quality for Original Equipment Manufacturers (OEMs) consuming large quantities of cartridge heaters for their equipment.

#### Standard Specifications and Tolerances

##### Performance Ratings

**Maximum Temperature:** 650°C (1200°F)

**Maximum Watt Density:** 3.1 to 7.0 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>) depending on heater size and operating temperature

#### Dimensional Specifications

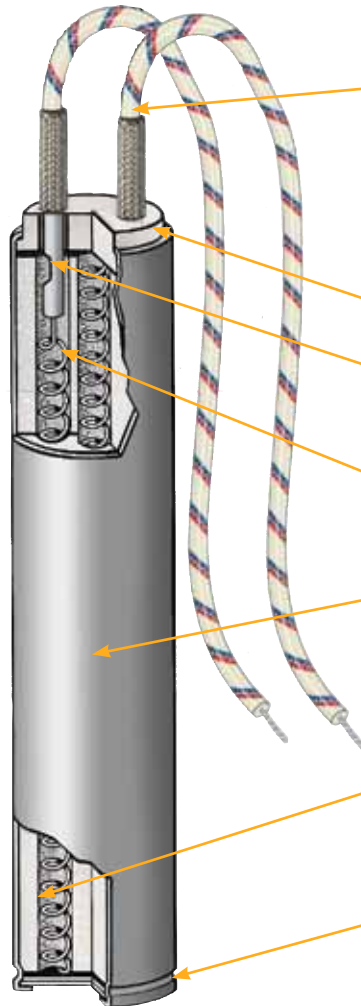
Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Actual Diameter inch	0.185	0.247	0.372	0.496	0.621	0.745	0.870	0.933	0.995	1.250
Actual Diameter mm	4.70	6.27	9.45	12.60	15.77	18.92	22.10	23.70	25.27	31.75
Diameter Tolerance	0.051 mm (±0.002")									0.127 mm (±0.005")
Length Tolerance	1.59 mm (±1/16") up to 152 mm (6") long; 3.18 mm (±1/8") over 152 mm (6") long									
Camber Tolerance	0.254 mm (0.010") per foot of length									

#### Electrical Specifications

Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Maximum Voltage	240	240	240	240	480**	480**	480**	480**	480**	480**
Maximum Amperage	1.5	3.5	6	8	10	15	15	15	25	30
Maximum Wattage	Contact OMEGA									
Wattage Tolerance	Plus 5%, minus 10%									
Resistance Tolerance	Plus 10%, minus 5%									

\* Low density cartridge heaters are UL recognized and CSA certified in many design variations under UL File Number E65652 and CSA File Number 043099. If you require UL and/or CSA Agency Approval, please specify when ordering.

\*\*480V when applicable. Contact OMEGA.



The standard termination for low-density cartridge heaters is Type F, consisting of 254 mm (10") internally connected flexible lead wires with high temperature insulation, UL approved for 300 or 600V service and temperature rated to 250°C (482°F).

**Note:** To meet the requirements of your application we offer over 40 standard termination styles to select from that will solve many of the most common application problems.

Ceramic end cap protects the cartridge internally from outside contamination.

Resistance wire and lead wires are mechanically spliced with heavy wall nickel connectors for a positive electrical connection.

Helically wound Nickel-Chrome resistance wire is evenly stretched and strung through ceramic insulators.

Alloy 304 stainless steel is used to provide high temperature strength, good thermal conductivity and resistance to oxidation up to 650°C (1200°F). Alloy 304 is a Nickel-Chromium stainless steel. For immersion heating of corrosive solutions contact OMEGA.

Specially selected grain size high purity Magnesium Oxide (MgO) is used to fill all remaining space inside the ceramic insulator, thus increasing thermal conductivity, dielectric strength and heater life.

Sheath is roll crimped over a 304 stainless steel end disc. A mica spacer electrically insulates the heater core from the end disc. This style end seal is not moisture proof.

7/8" Diameter, Actual 22.10 mm (0.870")

**To Order Visit [omega.com/ldc7](http://omega.com/ldc7) for Pricing and Details**

Model No.		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
LDC00316	LDC00317	88.9	3½	250	4.7	30
LDC00318	LDC00319	101.6	4	300	4.8	31
LDC00320	LDC00321	127.0	5	400	5.0	32
LDC00322	LDC00323	152.4	6	475	4.9	31
LDC00324	LDC00325	177.8	7	525	4.6	29
LDC00326	LDC00327	203.2	8	550	4.1	27
LDC00328	LDC00329	254.0	10	600	3.6	23
LDC00330	LDC00331	279.4	11	600	3.2	21
LDC00332	LDC00333	279.4	11	700	3.8	24
LDC00334	LDC00335	304.8	12	850	4.2	27
LDC00336	LDC00337	330.2	13	900	4.1	26
LDC00338	LDC00339	381.0	15	950	3.7	24
LDC00340	LDC00341	457.2	18	1000	3.2	21
—	LDC00342	546.1	21½	1000	2.7	17

**Note:** Model numbers above are for low density cartridge heaters terminated with Type F flexible leads, 254 mm (10") long.

**Ordering Example:** LDC00328, 600 W, 120 Vac, cartridge heater.

Order by model number from the standard sizes and ratings list on the preceding pages. Note that model numbers shown are for heaters with Type F Termination [254 mm (10") leads].

**Custom Engineered/Manufactured Heaters**

Because an electric heater can be very application specific, for sizes and ratings not listed, OMEGA will design and manufacture a low-density cartridge heater to meet your requirements.

**Please Specify the Following:**

- Diameter
- Length
- Wattage
- Voltage
- Termination Types
- Lead Length
- Cable/Braid Length
- Special Features
- Application Type
- Operating Temperature



## An Economical and Reliable Cartridge Heater, Used in Applications Requiring Lower Operating Temperatures and Watt Densities

### LDC Series



#### Typical Applications

- Heat Sealing Equipment
- Laminating Equipment
- Packaging Equipment
- Labeling Machines
- Molds and Dies
- Food Processing
- Refrigeration
- Shoe Machinery
- Glue Guns
- Wax Pots
- Heating Liquids
- Heating Gases

Low-density cartridge heaters are an excellent, cost effective choice without compromising quality for Original Equipment Manufacturers (OEMs) consuming large quantities of cartridge heaters for their equipment.

#### Standard Specifications and Tolerances

##### Performance Ratings

**Maximum Temperature:** 650°C (1200°F)

**Maximum Watt Density:** 3.1 to 7.0 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>) depending on heater size and operating temperature

#### Dimensional Specifications

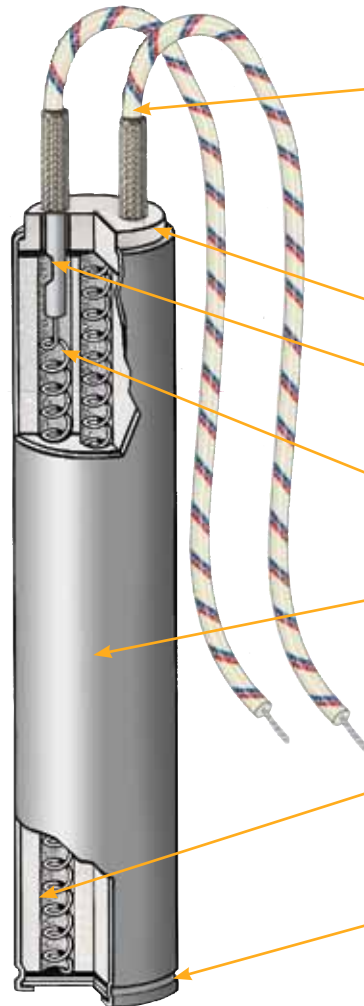
Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Actual Diameter inch	0.185	0.247	0.372	0.496	0.621	0.745	0.870	0.933	0.995	1.250
Actual Diameter mm	4.70	6.27	9.45	12.60	15.77	18.92	22.10	23.70	25.27	31.75
Diameter Tolerance	0.051 mm (±0.002")									0.127 mm (±0.005")
Length Tolerance	1.59 mm (±1/16") up to 152 mm (6") long; 3.18 mm (±1/8") over 152 mm (6") long									
Camber Tolerance	0.254 mm (0.010") per foot of length									

#### Electrical Specifications

Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Maximum Voltage	240	240	240	240	480**	480**	480**	480**	480**	480**
Maximum Amperage	1.5	3.5	6	8	10	15	15	15	25	30
Maximum Wattage	Contact OMEGA									
Wattage Tolerance	Plus 5%, minus 10%									
Resistance Tolerance	Plus 10%, minus 5%									

\* Low density cartridge heaters are UL recognized and CSA certified in many design variations under UL File Number E65652 and CSA File Number 043099. If you require UL and/or CSA Agency Approval, please specify when ordering.

\*\*480V when applicable. Contact OMEGA.



The standard termination for low-density cartridge heaters is Type F, consisting of 254 mm (10") internally connected flexible lead wires with high temperature insulation, UL approved for 300 or 600V service and temperature rated to 250°C (482°F).

**Note:** To meet the requirements of your application we offer over 40 standard termination styles to select from that will solve many of the most common application problems.

Ceramic end cap protects the cartridge internally from outside contamination.

Resistance wire and lead wires are mechanically spliced with heavy wall nickel connectors for a positive electrical connection.

Helically wound Nickel-Chrome resistance wire is evenly stretched and strung through ceramic insulators.

Alloy 304 stainless steel is used to provide high temperature strength, good thermal conductivity and resistance to oxidation up to 650°C (1200°F). Alloy 304 is a Nickel-Chromium stainless steel. For immersion heating of corrosive solutions contact OMEGA.

Specially selected grain size high purity Magnesium Oxide (MgO) is used to fill all remaining space inside the ceramic insulator, thus increasing thermal conductivity, dielectric strength and heater life.

Sheath is roll crimped over a 304 stainless steel end disc. A mica spacer electrically insulates the heater core from the end disc. This style end seal is not moisture proof.



1" Diameter, Actual 25.27 mm (0.995")

<b>To Order Visit <a href="http://omega.com/lcdc8">omega.com/lcdc8</a> for Pricing and Details</b>						
Model No.		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
LDC00373	LDC00374	76.2	3	250	4.9	32
LDC00375	LDC00376	101.6	4	300	4.2	27
LDC00377	LDC00378	127.0	5	375	4.1	27
LDC00379	LDC00380	152.4	6	500	4.5	29
LDC00381	LDC00382	203.2	8	600	3.9	25
LDC00383	LDC00384	228.6	9	700	4.1	26
LDC00385	LDC00386	254.0	10	800	4.2	27
LDC00387	LDC00388	273.1	10¾	600	2.9	19
LDC00389	LDC00390	273.1	10¾	850	4.1	26
LDC00391	LDC00392	304.8	12	1000	4.3	28
LDC00393	LDC00394	355.6	14	1100	4.0	26
LDC00395	LDC00396	457.2	18	1250	3.5	23
LDC00397	LDC00398	565.2	22¼	1000	2.3	15
LDC00399	LDC00400	584.2	23	1000	2.2	14
—	LDC00401	596.9	23½	1500	3.2	21
—	LDC00402	609.6	24	1500	3.1	20

**Note:** Model numbers above are for low density cartridge heaters terminated with Type F flexible leads, 254 mm (10") long.

**Ordering Example:** LDC00392, 1000 W, 240 Vac, cartridge heater.

Order by model number from the standard sizes and ratings list on the preceding pages. Note that model numbers shown are for heaters with Type F Termination [254 mm (10") leads].

**Custom Engineered/Manufactured Heaters**

Because an electric heater can be very application specific, for sizes and ratings not listed, OMEGA will design and manufacture a low-density cartridge heater to meet your requirements.

**Please Specify the Following:**

- Diameter
- Length
- Wattage
- Voltage
- Termination Types
- Lead Length
- Cable/Braid Length
- Special Features
- Application Type
- Operating Temperature



## An Economical and Reliable Cartridge Heater, Used in Applications Requiring Lower Operating Temperatures and Watt Densities

LDC Series



### Typical Applications

- Heat Sealing Equipment
- Laminating Equipment
- Packaging Equipment
- Labeling Machines
- Molds and Dies
- Food Processing
- Refrigeration
- Shoe Machinery
- Glue Guns
- Wax Pots
- Heating Liquids
- Heating Gases

Low-density cartridge heaters are an excellent, cost effective choice without compromising quality for Original Equipment Manufacturers (OEMs) consuming large quantities of cartridge heaters for their equipment.

### Standard Specifications and Tolerances

#### Performance Ratings

**Maximum Temperature:** 650°C (1200°F)

**Maximum Watt Density:**  
3.1 to 7.0 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>)  
depending on heater size and operating temperature

### Dimensional Specifications

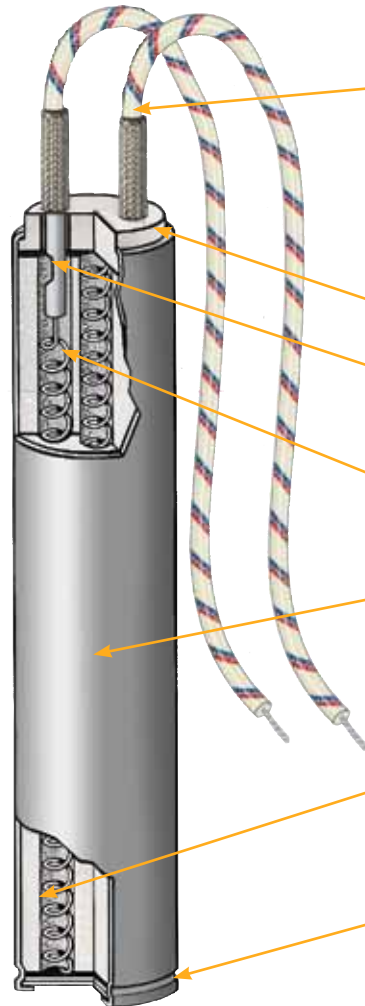
Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Actual Diameter inch	0.185	0.247	0.372	0.496	0.621	0.745	0.870	0.933	0.995	1.250
Actual Diameter mm	4.70	6.27	9.45	12.60	15.77	18.92	22.10	23.70	25.27	31.75
Diameter Tolerance	0.051 mm (±0.002")									0.127 mm (±0.005")
Length Tolerance	1.59 mm (±1/16") up to 152 mm (6") long; 3.18 mm (±1/8") over 152 mm (6") long									
Camber Tolerance	0.254 mm (0.010") per foot of length									

### Electrical Specifications

Nominal Diameter	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/4
Maximum Voltage	240	240	240	240	480**	480**	480**	480**	480**	480**
Maximum Amperage	1.5	3.5	6	8	10	15	15	15	25	30
Maximum Wattage	Contact OMEGA									
Wattage Tolerance	Plus 5%, minus 10%									
Resistance Tolerance	Plus 10%, minus 5%									

\* Low density cartridge heaters are UL recognized and CSA certified in many design variations under UL File Number E65652 and CSA File Number 043099. If you require UL and/or CSA Agency Approval, please specify when ordering.

\*\*480V when applicable. Contact OMEGA.



The standard termination for low-density cartridge heaters is Type F, consisting of 254 mm (10") internally connected flexible lead wires with high temperature insulation, UL approved for 300 or 600V service and temperature rated to 250°C (482°F).

**Note:** To meet the requirements of your application we offer over 40 standard termination styles to select from that will solve many of the most common application problems.

Ceramic end cap protects the cartridge internally from outside contamination.

Resistance wire and lead wires are mechanically spliced with heavy wall nickel connectors for a positive electrical connection.

Helically wound Nickel-Chrome resistance wire is evenly stretched and strung through ceramic insulators.

Alloy 304 stainless steel is used to provide high temperature strength, good thermal conductivity and resistance to oxidation up to 650°C (1200°F). Alloy 304 is a Nickel-Chromium stainless steel. For immersion heating of corrosive solutions contact OMEGA.

Specially selected grain size high purity Magnesium Oxide (MgO) is used to fill all remaining space inside the ceramic insulator, thus increasing thermal conductivity, dielectric strength and heater life.

Sheath is roll crimped over a 304 stainless steel end disc. A mica spacer electrically insulates the heater core from the end disc. This style end seal is not moisture proof.





1<sup>5</sup>/<sub>16</sub>" Diameter, Actual 23.70 mm (0.933")

**To Order Visit [omega.com/lhc9](http://omega.com/lhc9) for Pricing and Details**

Model No.		Sheath Length		Watts	Watt Density	
120V	240V	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
LDC00343	LDC00344	76.2	3	275	5.8	37
LDC00345	LDC00346	101.6	4	325	4.9	32
LDC00347	LDC00348	127.0	5	140	1.6	11
LDC00349	LDC00350	127.0	5	400	4.7	30
LDC00351	LDC00352	152.4	6	450	4.3	28
LDC00353	LDC00354	177.8	7	450	3.6	24
LDC00355	LDC00356	187.3	7 <sup>3</sup> / <sub>8</sub>	270	2.1	13
LDC00357	LDC00358	203.2	8	500	3.5	23
LDC00359	LDC00360	215.9	8 <sup>1</sup> / <sub>2</sub>	500	3.3	21
LDC00361	LDC00362	254.0	10	600	3.3	21
LDC00363	LDC00364	279.4	11	625	3.1	20
LDC00365	LDC00366	304.8	12	700	3.2	21
LDC00367	LDC00368	381.0	15	850	3.1	20
LDC00369	LDC00370	457.2	18	1000	3.0	19
LDC00371	LDC00372	609.6	24	1400	3.1	20

**Note:** Model numbers above are for low density cartridge heaters terminated with Type F flexible leads, 254 mm (10") long.

**Ordering Example:** LDC00357, 500 W, 120 Vac cartridge heater.

Order by model number from the standard sizes and ratings list on the preceding pages. Note that model numbers shown are for heaters with Type F Termination [254 mm (10") leads].

**Custom Engineered/Manufactured Heaters**

Because an electric heater can be very application specific, for sizes and ratings not listed, OMEGA will design and manufacture a low-density cartridge heater to meet your requirements.

**Please Specify the Following:**

- Diameter
- Length
- Wattage
- Voltage
- Termination Types
- Lead Length
- Cable/Braid Length
- Special Features
- Application Type
- Operating Temperature

# ONE-PIECE MICA-INSULATED BAND HEATER



## MB-1 Series

- ✓ 1 to 6 1/8" Nozzle Diameter
- ✓ 100 to 1000 Watts
- ✓ 120 and 240V
- ✓ Up to 482°C (900°F) Max Sheath Temperature
- ✓ Up to 399°C (750°F) Max Barrel Temperature
- ✓ Flexible Strand Terminals (Type A)
- ✓ Heavy-Duty Anti-Torque Post Terminal (Type P)

### APPLICATIONS

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

### FEATURES

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

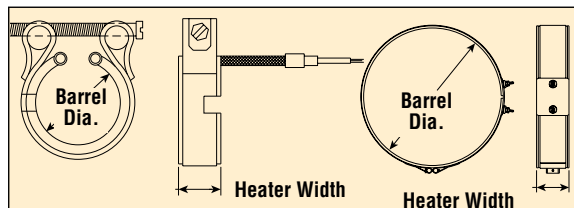
**Long-Term Durability** is ensured by non-hygroscopic mica insulation.

**Uniform Fit to ±1/16"**.

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

**Heavy-Duty Stainless Steel Anti-Torque Post Terminals** come standard at #10 to 32 threads, except for 1" wide units, which have #6 to 32 threads.

**Reliable Performance and Quick Temperature Response One-Piece Construction** provides maximum nozzle coverage in tight spaces.



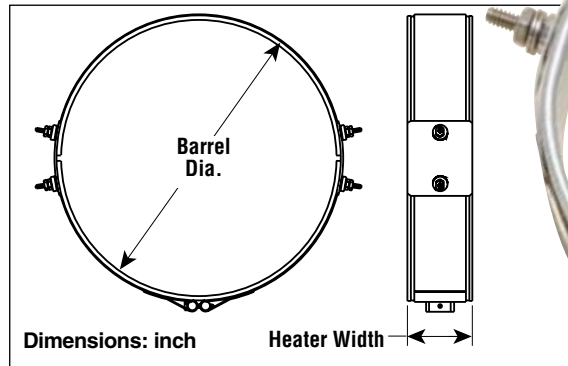
To Order							
Watts	Volts	W/in <sub>2</sub>	Dimensions (inch)		Term.	Model No.	Wt. (lb)
			Barrel Dia.	Heater Width			
175	240	30	15/16	2	A	MBOR2A1A1	0.2
100	120	32	1	1	A	MB1A1A1A1	0.2
100	240	32	1	1	A	MB1A1A1A2	0.2
150	120	48	1	1	A	MB1A1A1A3	0.2
150	120	32	1	1 1/2	A	MB1A1J1A1	0.2
150	240	32	1	1 1/2	A	MB1A1J1A2	0.2
200	120	42	1	1 1/2	A	MB1A1J1A3	0.2
200	240	42	1	1 1/2	A	MB1A1J1A4	0.2
100	120	41	1 1/4	5/8	A	MB1EOL1A1	0.3
150	120	31	1 1/4	1 1/4	A	MB1E1E1A1	0.3
150	240	31	1 1/4	1 1/4	A	MB1E1E1A2	0.3
150	240	19	1 1/4	2	A	MB1E2A1A1	0.3
150	240	35	1 3/8	1	A	MB1G1A1A1	0.3
275	240	42	1 3/8	1 1/2	A	MB1G1J1A1	0.3
300	240	35	1 3/8	2	A	MB1G2A1A1	0.3
150	120	32	1 1/2	1	A	MB1J1A1A1	0.3
150	240	32	1 1/2	1	A	MB1J1A1A2	0.3
200	120	42	1 1/2	1	A	MB1J1A1A3	0.3
200	240	42	1 1/2	1	A	MB1J1A1A4	0.3
225	240	38	1 1/2	1 1/4	A	MB1J1E1A1	0.4
200	120	28	1 1/2	1 1/2	A	MB1J1J1A1	0.4
200	240	28	1 1/2	1 1/2	A	MB1J1J1A2	0.4
250	120	35	1 1/2	1 1/2	A	MB1J1J1A3	0.4
250	240	35	1 1/2	1 1/2	A	MB1J1J1A4	0.4
275	240	39	1 1/2	1 1/2	A	MB1J1J1A6	0.4
275	120	39	1 1/2	1 1/2	P	MB1J1J1P1	0.4
275	240	39	1 1/2	1 1/2	P	MB1J1J1P2	0.4
300	240	32	1 1/2	2	A	MB1J2A1P1	0.4
200	240	31	1 3/8	1 1/4	A	MB1L1E1A1	0.4
200	240	36	1 3/4	1	A	MB1N1A1A1	0.4
200	120	24	1 3/4	1 1/2	A	MB1N1J1A1	0.4
200	240	24	1 3/4	1 1/2	A	MB1N1J1A2	0.4
250	120	30	1 3/4	1 1/2	A	MB1N1J1A3	0.4
250	240	30	1 3/4	1 1/2	A	MB1N1J1A4	0.4
250	240	30	1 3/4	1 1/2	P	MB1N1J1P1	0.4
275	240	33	1 3/4	1 1/2	A	MB1N1J1A5	0.4
300	120	36	1 3/4	1 1/2	A	MB1N1J1A6	0.4
300	240	36	1 3/4	1 1/2	A	MB1N1J1A7	0.4
300	240	36	1 3/4	1 1/2	P	MB1N1J1P2	0.4
200	240	34	1 7/8	1	A	MB1Q1A1A1	0.4
200	120	32	2	1	A	MB2A1A1A1	0.5
200	240	32	2	1	A	MB2A1A1A2	0.5
250	240	27	2	1 1/2	P	MB2A1J1P1	0.5
300	240	32	2	1 1/2	P	MB2A1J1P2	0.5
200	120	30	2 1/8	1	A	MB2C1A1A1	0.5
275	240	41	2 1/8	1	A	MB2C1A1A2	0.5
350	240	35	2 1/8	1 1/2	P	MB2C1J1P1	0.5
250	120	35	2 1/4	1	P	MB2E1A1P1	0.5
250	240	35	2 1/4	1	P	MB2E1A1P2	0.5
200	240	19	2 1/4	1 1/2	P	MB2E1J1P1	0.5
375	240	35	2 1/4	1 1/2	P	MB2E1J1P2	0.5
525	240	37	2 1/4	2	P	MB2E2A1P1	0.5
200	240	27	2 1/2	1	P	MB2G1A1P1	0.5
275	240	35	2 1/2	1	P	MB2J1A1P1	0.6
300	240	25	2 1/2	1 1/2	P	MB2J1J1P1	0.6
350	120	30	2 1/2	1 1/2	P	MB2J1J1P2	0.6
350	240	30	2 1/2	1 1/2	P	MB2J1J1P3	0.6
450	240	29	2 1/2	2	P	MB2J2A1P1	0.6
400	240	31	2 3/4	1 1/2	P	MB2N1J1P1	0.6
300	240	32	3	1	P	MB3A1A1P1	0.7
400	240	42	3	1	P	MB3A1A1P2	0.7
400	240	28	3	1 1/2	P	MB3A1J1P1	0.7
500	240	35	3	1 1/2	P	MB3A1J1P2	0.7
300	240	31	3 1/8	1	P	MB3C1A1P1	0.7
400	240	27	3 1/8	1 1/2	P	MB3C1J1P1	0.7
400	240	27	3 1/4	1 1/2	P	MB3E1J1P1	0.7
500	240	30	3 1/2	1 1/2	P	MB3J1J1P1	0.7
600	240	27	3 1/2	2	P	MB3J2A1P1	0.8
700	240	40	3 3/4	1 1/2	P	MB3N1J1P1	0.8
500	240	27	4	1 1/2	P	MB4A1J1P1	0.8
650	240	31	4 1/2	1 1/2	P	MB4J1J1P1	0.8
600	240	24	5 1/4	1 1/2	P	MB5E1J1P1	0.9
1000	240	35	6 1/8	1 1/2	P	MB6C1J1P1	1

Ordering Example: MB2J1A1P1 375 W, 240V heater

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# 2-PIECE MICA-INSULATED BAND HEATER

MB-2 Series



- ✓ 3½ to 10½" Barrel Dia.
- ✓ 500 to 2000 Watts
- ✓ 240 to 480V
- ✓ 21 to 40 W/in<sup>2</sup>
- ✓ Up to 900°F Max Sheath Temperature
- ✓ Up to 750°F Max Barrel Temperature
- ✓ Heavy Duty Anti-Torque Post Terminals (Type P)

## APPLICATIONS

- ✓ Barrels and Dies of Plastic Molding Machines
- ✓ Extruders
- ✓ Autoclaves
- ✓ Heating Pipe Sections Up to 10½" OD

## FEATURES

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

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

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

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

**Heavy Duty Stainless Steel Post Terminals** complete with hardware, are designed to prevent excess torsion during tightening of connections. Standard #10-32 threads.

**Reliable Performance and Quick Temperature Response**

## To Order

Watts	Volts	W/in <sup>2</sup>	Dimensions (inch)		Model No.	Wt. (lb)
			Barrel Dia.	Heater Width		
500	240/480	30	3½	1½	MB3J1J2P1	0.7
700	240/480	37	4	1½	MB4A1J2P1	0.8
800	240/480	32	4	2	MB4A2A2P1	0.8
750	240/480	35	4½	1½	MB4J1J2P1	0.8
600	240/480	27	4¾	1½	MB4N1J2P1	0.8
900	240/480	39	4⅞	1½	MB4Q1J2P1	0.8
700	240/480	30	5	1½	MB5A1J2P1	0.9
900	240/480	38	5	1½	MB5A1J2P2	0.9
900	240/480	36	5¼	1½	MB5E1J2P1	0.9
800	240/480	31	5½	1½	MB5J1J2P1	0.9
850	240/480	30	6	1½	MB6A1J2P1	1
1000	240/480	35	6	1½	MB6A1J2P2	1
750	240/480	25	6¼	1½	MB6E1J2P1	1
950	240/480	31	6½	1½	MB6J1J2P1	1
1200	240/480	39	6½	1½	MB6J1J2P2	1
1000	240/480	24	6½	2	MB6J2A2P1	1
1000	240/480	31	6¾	1½	MB6N1J2P1	1
1000	240/480	30	7	1½	MB7A1J2P1	1.2
1000	240/480	29	7¼	1½	MB7E1J2P1	1.2
900	240/480	20	7¼	2	MB7E2A2P1	1.3
1200	240/480	35	7⅝	1½	MB7G1J2P1	1.2
1000	240/480	28	7½	1½	MB7J1J2P1	1.2
1200	240/480	34	7½	1½	MB7J1J2P2	1.2
1000	240/480	27	7¾	1½	MB7N1J2P1	1.2
1000	240/480	27	7⅞	1½	MB7Q1J2P1	1.2
1100	240/480	35	8	1¼	MB8A1E2P1	1.4
1000	240/480	27	8	1½	MB8A1J2P1	1.4
1300	240/480	35	8	1½	MB8A1J2P2	1.4
1200	240/480	30	8½	1½	MB8J1J2P1	1.5
1400	240/480	35	8½	1½	MB8J1J2P2	1.5
1600	240/480	30	8½	2	MB8J2A2P1	1.5
1300	240/480	31	9	1½	MB9A1J2P1	1.6
1500	240/480	35	9	1½	MB9A1J2P2	1.6
1800	240/480	30	9½	2	MB9J2A2P1	1.7
2000	240/480	33	9¾	2	MB9N2A2P1	1.8
1000	240/480	21	10	1½	MB10A1J2P1	2.1
1400	240/480	30	10	1½	MB10A1J2P2	2.1
2000	240/480	40	10½	1½	MB10J1J2P1	2.4

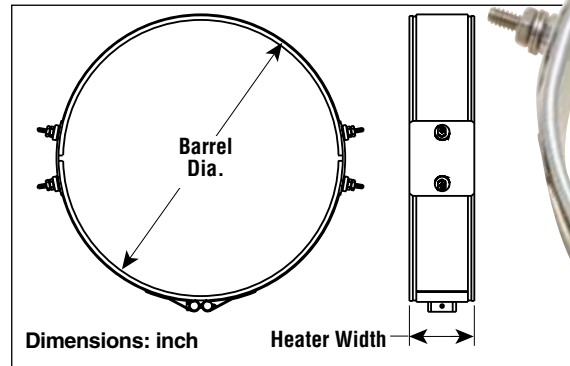
**Note:** Watt densities shown are based on heated area of contact surface only.

**Ordering Example:** MB6J1J2P1, 950 Watt, 240 or 480V Heater.

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# 2-PIECE MICA-INSULATED BAND HEATER

MB-2 Series



- ✓ 3½ to 10½" Barrel Dia.
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- ✓ Up to 900°F Max Sheath Temperature
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- ✓ Heavy Duty Anti-Torque Post Terminals (Type P)

## APPLICATIONS

- ✓ Barrels and Dies of Plastic Molding Machines
- ✓ Extruders
- ✓ Autoclaves
- ✓ Heating Pipe Sections Up to 10½" OD

## FEATURES

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

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

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

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

**Heavy Duty Stainless Steel Post Terminals** complete with hardware, are designed to prevent excess torsion during tightening of connections. Standard #10-32 threads.

**Reliable Performance and Quick Temperature Response**

To Order						
Watts	Volts	W/in <sup>2</sup>	Dimensions (inch)		Model No.	Wt. (lb)
			Barrel Dia.	Heater Width		
500	240/480	30	3½	1½	MB3J1J2P1	0.7
700	240/480	37	4	1½	MB4A1J2P1	0.8
800	240/480	32	4	2	MB4A2A2P1	0.8
750	240/480	35	4½	1½	MB4J1J2P1	0.8
600	240/480	27	4¾	1½	MB4N1J2P1	0.8
900	240/480	39	4⅞	1½	MB4Q1J2P1	0.8
700	240/480	30	5	1½	MB5A1J2P1	0.9
900	240/480	38	5	1½	MB5A1J2P2	0.9
900	240/480	36	5¼	1½	MB5E1J2P1	0.9
800	240/480	31	5½	1½	MB5J1J2P1	0.9
850	240/480	30	6	1½	MB6A1J2P1	1
1000	240/480	35	6	1½	MB6A1J2P2	1
750	240/480	25	6¼	1½	MB6E1J2P1	1
950	240/480	31	6½	1½	MB6J1J2P1	1
1200	240/480	39	6½	1½	MB6J1J2P2	1
1000	240/480	24	6½	2	MB6J2A2P1	1
1000	240/480	31	6¾	1½	MB6N1J2P1	1
1000	240/480	30	7	1½	MB7A1J2P1	1.2
1000	240/480	29	7¼	1½	MB7E1J2P1	1.2
900	240/480	20	7¼	2	MB7E2A2P1	1.3
1200	240/480	35	7⅝	1½	MB7G1J2P1	1.2
1000	240/480	28	7½	1½	MB7J1J2P1	1.2
1200	240/480	34	7½	1½	MB7J1J2P2	1.2
1000	240/480	27	7¾	1½	MB7N1J2P1	1.2
1000	240/480	27	7⅞	1½	MB7Q1J2P1	1.2
1100	240/480	35	8	1¼	MB8A1E2P1	1.4
1000	240/480	27	8	1½	MB8A1J2P1	1.4
1300	240/480	35	8	1½	MB8A1J2P2	1.4
1200	240/480	30	8½	1½	MB8J1J2P1	1.5
1400	240/480	35	8½	1½	MB8J1J2P2	1.5
1600	240/480	30	8½	2	MB8J2A2P1	1.5
1300	240/480	31	9	1½	MB9A1J2P1	1.6
1500	240/480	35	9	1½	MB9A1J2P2	1.6
1800	240/480	30	9½	2	MB9J2A2P1	1.7
2000	240/480	33	9¾	2	MB9N2A2P1	1.8
1000	240/480	21	10	1½	MB10A1J2P1	2.1
1400	240/480	30	10	1½	MB10A1J2P2	2.1
2000	240/480	40	10½	1½	MB10J1J2P1	2.4

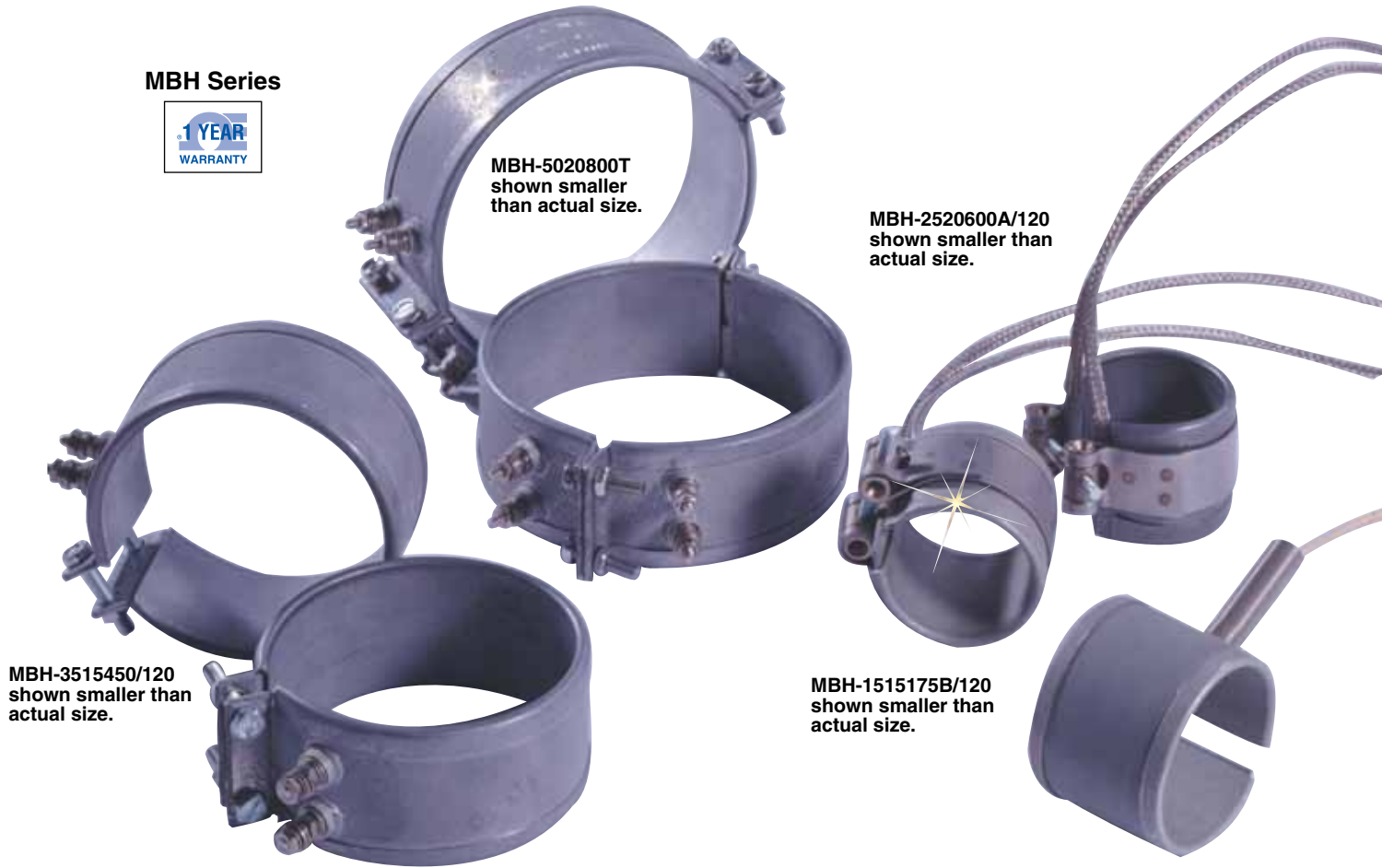
**Note:** Watt densities shown are based on heated area of contact surface only.

**Ordering Example:** MB6J1J2P1, 950 Watt, 240 or 480V Heater.



# MICA-INSULATED BAND HEATERS

## MBH Series



MBH-5020800T  
shown smaller than  
actual size.

MBH-2520600A/120  
shown smaller than  
actual size.

MBH-3515450/120  
shown smaller than  
actual size.

MBH-1515175B/120  
shown smaller than  
actual size.

- ✓ 25 to 292 mm (1 to 11½") ID
- ✓ Up to 482°C (900°F) Barrel Temperature

### APPLICATIONS

- ✓ Cylinders, Dies, Drums, and Holding Tanks
- ✓ Injection and Blow Molding Machines
- ✓ Plastic Extruders

Omegalux® MBH Series mica-insulated band heaters are available in 1- or 2-piece construction and a variety of diameters and widths. One-piece band heaters are manufactured with inside diameters from 25 to 89 mm (1 to 3½"). Two-piece band heaters are available in diameters from 102 to 292 mm (4 to 11½"). Electrical connections are made through post terminals or insulated and stainless steel overbraided leads.

Each half of the 2-piece band heaters is rated 120 V and is wired in parallel for 120 V operation or in series for 240 V operation.

Available options include different dimensions and terminals, special wattage or voltage ratings, flexible conduit, and holes or cutouts. Two or more sections can be manufactured to fit larger diameters. Contact Engineering for more information.

When heating objects to higher temperatures, lower-watt-density heaters should be used to prevent overheating and shortened heater life. Watt density is the total wattage of the heater divided by the heated surface area of the heater. Use the table to the right to select the maximum recommended watt density for the application. Lower watt densities can be achieved by operating 240 V heaters on 120 V.

When operating 240 V heaters on 120 V, the wattage and watt density are derated by a factor of 4.

For example, the MBH-1715300A/240 is a 44 mm (1.75") ID one-piece band heater, rated for 300 W and 36 W per square inch at 240 V. When operating this same heater on 120 V, the wattage and watt density are reduced to 75 W and 9 W per square inch.

### Maximum Operating Temperature

Operating Temperature* °C (°F)	Maximum Recommended Watts per Square Inch
149 (300)	40
204 (400)	30
260 (500)	21
316 (600)	12
371 (700)	10
427 (800)	10
482 (900)	10

**One Piece  
Band Heaters**

MBH-1515175B/120,  
terminal style B,  
shown larger than  
actual size.

style A, shown close  
to actual size.



**One-Piece Construction**

**To Order**

Model Number	ID mm (in)	Width mm (in)	Watts	W/in <sup>2</sup>	Terminal Style	Weight kg (lb)
MBH-101085A/120	25 (1.00)	25 (1.0)	85	27	A	0.11 (0.25)
MBH-101085B/120	25 (1.00)	25 (1.0)	85	27	B	0.11 (0.25)
MBH-1015130A/120	25 (1.00)	38 (1.5)	130	27	A	0.17 (0.37)
MBH-1015130B/120	25 (1.00)	38 (1.5)	130	27	B	0.17 (0.37)
MBH-1210100A/120	32 (1.25)	25 (1.0)	100	25	A	0.17 (0.37)
MBH-1210100B/120	32 (1.25)	25 (1.0)	100	25	B	0.17 (0.37)
MBH-1210150A/120	32 (1.25)	25 (1.0)	150	38	A	0.17 (0.37)
MBH-1210150B/120	32 (1.25)	25 (1.0)	150	38	B	0.17 (0.37)
MBH-1215150A/120	32 (1.25)	38 (1.5)	150	25	A	0.20 (0.43)
MBH-1215150B/120	32 (1.25)	38 (1.5)	150	25	B	0.20 (0.43)
MBH-1215200A/120	32 (1.25)	38 (1.5)	200	34	A	0.20 (0.43)
MBH-1215200B/120	32 (1.25)	38 (1.5)	200	34	B	0.20 (0.43)
MBH-1515175A/*	38 (1.50)	38 (1.5)	175	24	A	0.23 (0.50)
MBH-1515175B/*	38 (1.50)	38 (1.5)	175	24	B	0.23 (0.50)
MBH-1515275A/*	38 (1.50)	38 (1.5)	275	39	A	0.23 (0.50)
MBH-1515275B/*	38 (1.50)	38 (1.5)	275	39	B	0.23 (0.50)
MBH-1715180A/*	44 (1.75)	38 (1.5)	180	22	A	0.25 (0.56)
MBH-1715180B/*	44 (1.75)	38 (1.5)	180	22	B	0.25 (0.56)
MBH-1715300A/*	44 (1.75)	38 (1.5)	300	36	A	0.25 (0.56)
MBH-1715300B/*	44 (1.75)	38 (1.5)	300	36	B	0.25 (0.56)
MBH-2015200A/*	51 (2.00)	38 (1.5)	200	21	A	0.31 (0.68)
MBH-2015200B/*	51 (2.00)	38 (1.5)	200	21	B	0.31 (0.68)
MBH-2015375A/*	51 (2.00)	38 (1.5)	375	40	A	0.31 (0.68)
MBH-2015375B/*	51 (2.00)	38 (1.5)	375	40	B	0.31 (0.68)
MBH-2515300A/*	64 (2.50)	38 (1.5)	300	25	A	0.34 (0.81)
MBH-2515450A/*	64 (2.50)	38 (1.5)	450	38	A	0.34 (0.81)
MBH-2520600A/*	64 (2.50)	51 (2.0)	600	38	A	0.39 (0.87)
MBH-2525750A/*	64 (2.50)	64 (2.5)	750	38	A	0.42 (0.93)
MBH-2530900A/*	64 (2.50)	76 (3.0)	900	38	A	0.48 (1.06)
MBH-3015400/*	76 (3.00)	38 (1.5)	400	28	—	0.25 (0.56)
MBH-3515450/*	89 (3.50)	38 (1.5)	450	27	—	0.31 (0.68)
MBH-3520500/*	89 (3.50)	51 (2.0)	500	23	—	0.39 (0.87)

\* Insert "120" or "240" for 120 Vac or 240 Vac operation.

Ordering Example: MBH-1515175B/120 38 mm (1.5") ID, 38 mm (1.5") width, 175 W, 120 Vac band heater

H

**Two-Piece  
Band Heaters**



**MBH-5515750T,  
Terminal Style T  
shown close  
to actual size.**

**SPECIFICATIONS  
(All Models)**

**Construction:**  
Mica insulation, ribbon  
resistance element, rust  
resistant steel sheath

**Width Tolerance:**  
±1.6 mm (1/16")

**Gap Dimensions:**  
25 to 152 mm (1 to 6")  
I.D.: 8 mm (5/16") nominal;  
152 to 292 mm (6 to 11 1/2")  
I.D.: 10 mm (3/8") nominal

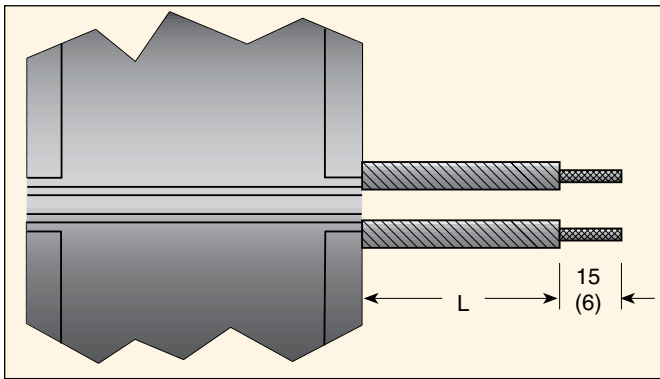
**Thickness:**  
5 mm (3/16") nominal

**Two Piece Construction\*\***

<b>To Order</b>						
<b>Model Number</b>	<b>I.D. mm (")</b>	<b>Width mm (")</b>	<b>Watt</b>	<b>W/in<sup>2</sup></b>	<b>Terminal Style</b>	<b>Weight kg (lb)</b>
MBH-4015550T	102 (4.00)	38 (1.5)	550	30	T	0.23 (0.50)
MBH-4020600T	102 (4.00)	51 (2.0)	600	25	T	0.28 (0.62)
MBH-4515650T	114 (4.50)	38 (1.5)	650	31	T	0.25 (0.56)
MBH-5015750T	127 (5.00)	38 (1.5)	750	31	T	0.31 (0.68)
MBH-5020800T	127 (5.00)	51 (2.0)	800	26	T	0.45 (1.00)
MBH-5515750T	140 (5.50)	38 (1.5)	750	29	T	0.43 (0.95)
MBH-5520900T	140 (5.50)	51 (2.0)	900	26	T	0.45 (1.00)
MBH-6015900T	152 (6.00)	38 (1.5)	900	32	T	0.43 (0.95)
MBH-60201000T	152 (6.00)	51 (2.0)	1000	27	T	0.51 (1.12)
MBH-65151100T	165 (6.50)	38 (1.5)	1100	36	T	0.51 (1.12)
MBH-70151000T	178 (7.00)	38 (1.5)	1000	30	T	0.51 (1.12)
MBH-80151100T	203 (8.00)	38 (1.5)	1100	29	T	0.57 (1.25)
MBH-90151200T	229 (9.00)	38 (1.5)	1200	28	T	0.62 (1.37)
MBH-100151400T	254 (10.00)	38 (1.5)	1400	30	T	0.68 (1.50)
MBH-110201200T	279 (11.00)	51 (2.0)	1200	18	T	0.91 (2.00)
MBH-115151650T	292 (11.50)	38 (1.5)	1650	31	T	0.76 (1.68)

**\*\* Note:** Two piece band heaters can be operated on either 120 or 240 Vac. Each half is rated for 120 V and is wired in parallel for 120 V and in series for 240 V operation.

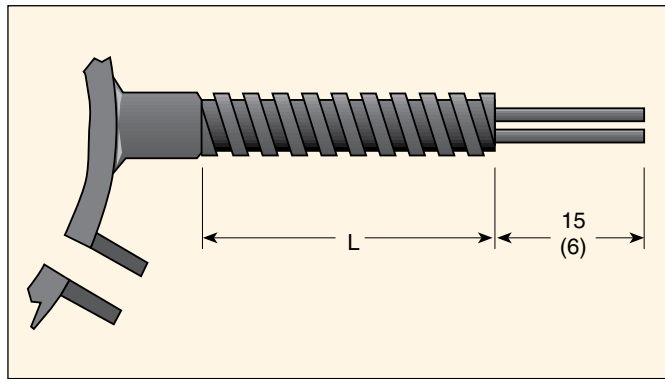
**Dimensions for Terminal Styles A, B and T**



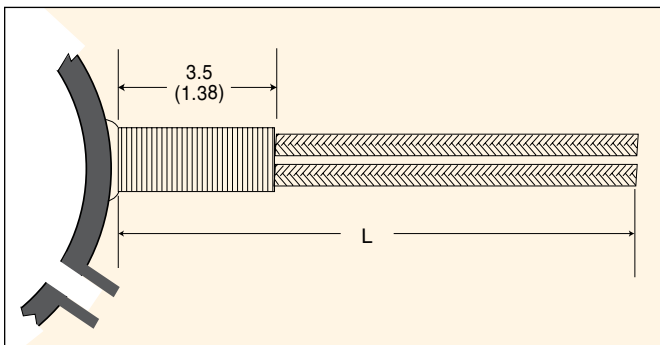
**Terminal Style A**

L = 30 cm (12") for standard heaters  
Longer leads are optional

**Flexible Conduit Options for Terminal Style B**

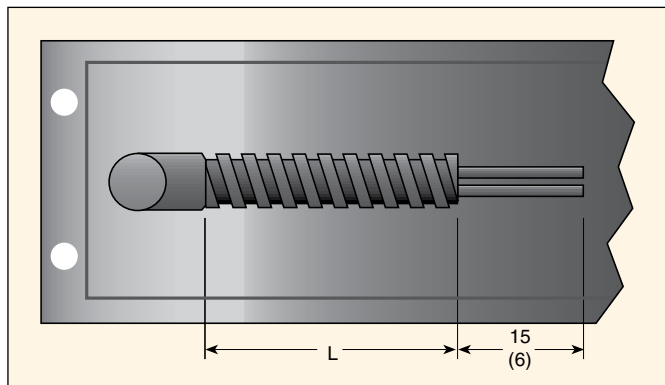


**FC1** Flexible conduit for straight leads

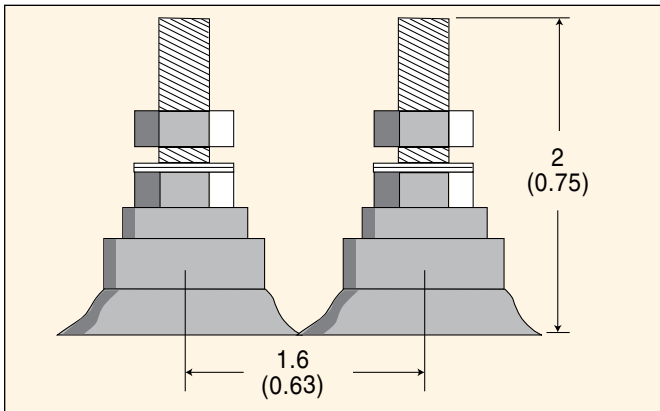


**Terminal Style B**

L = 30 cm (12") for standard heaters  
Longer leads or flexible conduit are optional

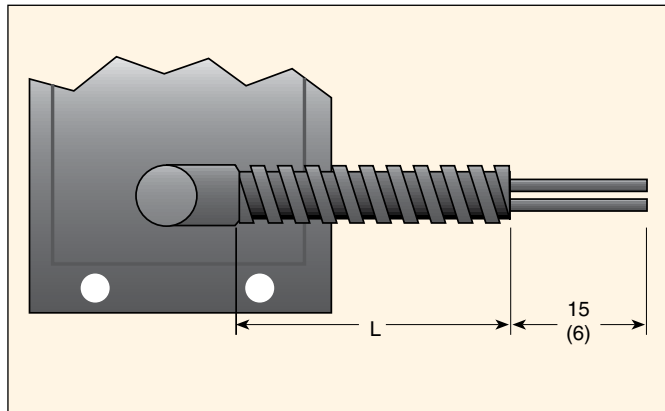


**FC2** Flexible conduit for right angle leads in line with heater



**Terminal Style T**

**Note:** Heater thickness is approx. 5 mm (3/16")  
Total height is approx. 2.5 cm (1")



**FC3** Flexible conduit for right angle leads at 90° to heater

**Terminal Style A Options**

Description	Ordering Suffix
Longer "L" Dimension	/*

**Terminal Style B Options**

Description	Ordering Suffix
Longer "L" Dimension	/*
FC1 Flexible Conduit Option	/FC1/*
FC2 Flexible Conduit Option	/FC2/*
FC3 Flexible Conduit Option	/FC3/*





## DuraBand® with Built-In Strap

General purpose terminal box can be attached on Duraband diameters of 63.5 mm (2½") or larger. It offers excellent protection to exposed terminals. To simplify wiring, the box has a 13 mm (½") trade size knockout [actual diameter 22 mm (7/8")] that will accept standard conduit or flexible armor cable connectors. It can be field assembled on most band heaters with screw terminals having a center distance of 22 mm (7/8").

Flexible armor cable for lead protection is available where abrasion is a problem.

For maximum surface contact, the torque resistant and virtually unbreakable stainless steel screw terminals are securely fastened to a connecting jumper, assuring positive contact with the windings and providing maximum amperage carrying capacity. For other terminal or lead arrangements, see pages 13 through 18.

Specially designed mounting brackets with ¼"-20 socket cap screws are used to draw the built-in strap to a high degree of tension. This tension exerts the great amount of drawing power required to pull the heating element assembly against the cylinder evenly and tightly across its entire width, thus eliminating all air gaps that can cause premature heater failure. The number of bracket assemblies used increases as the width of a Duraband heater increases.

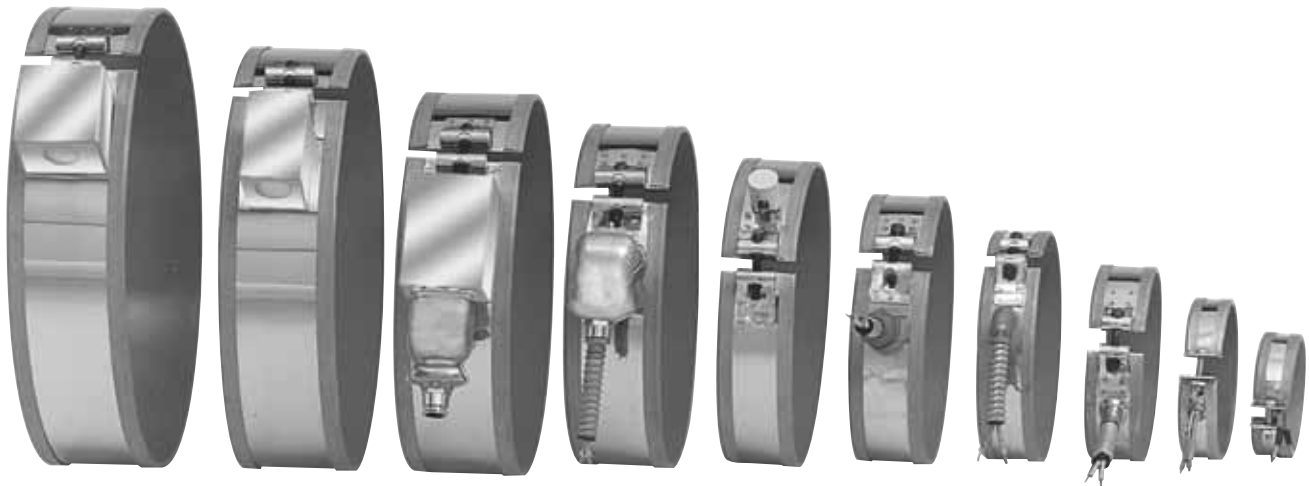
Specially treated rust-resistant steel sheath casing provides the best combination of physical strength, high emissivity and good thermal conductivity to heated cylindrical parts, good for sheath temperatures up to 480°C (900°F).

Specially selected grade and thickness of mica sheet is used to insulate the windings, providing excellent thermal conductivity and dielectric strength.

The gauge of nickel-chrome resistance ribbon wire is selected to achieve the lowest internal element temperatures possible, resulting in maximum heater life. The ribbon wire is wound evenly spaced on a specially selected mica strip, providing even heat distribution and thus eliminating hot spotting that can cause premature heater failure.

Duraband's built-in strap is a unique design feature. A low thermal expansion alloy sheath is used for the outer sheath, covering the entire width of the band heater.





- Built-In Bracket for Superior Clamping
- Unbreakable and Torque-Resistant Screw Terminals
- Temperatures Up to 480°C (900°F)
- Full Width Stainless Steel Built-In Strap
- Flexibility to Incorporate Holes and Cutouts
- Available Two-Piece and Expandable Designs
- Best Mica Insulated Heater on the Market
- Faster Delivery than Any Other Type of Heater Band
- Most Economical Among Various Heater Bands
- Most Versatile and Commonly Used Heater Band

#### Typical Applications

- Plastic Injection Molding Machines
- Plastic Extruders
- Oil Reclamation Equipment
- Food and Candy Extruders
- Drum Heating
- Extrusion Dies
- Holding Tanks
- Blow Molding Machines
- Vending Machines
- Barrels and Heads
- Food Service Warming
- Autoclaves and Sterilizers
- Metallurgical Analyzers
- Fluidized Beds
- Hot Runner Molds
- Pulp and Paper Processing Equipment

#### Designed For Trouble-Free Service

The Duraband heater design is the result of many years of research, development and testing for a reliable mica insulated band heater that can perform at the higher operating temperatures [up to 480°C (900°F)] essential to process high temperature resins, providing long, efficient service necessary for today's high productivity of plastic extruders, injection and blow molding machines.

Duraband is a proven heater design for good life efficiency and dependability. It assures maintaining the lowest winding temperatures possible, keeping a low-mass heating element assembly for fast heat-up and quick thermal response to controls. It incorporates the low thermal expansion built-in strap, a unique design feature.

#### Advantages and Variations

Duraband mica insulated heaters are widely used on operations involving heating of cylindrical surfaces and are manufactured in a full range of standard construction variations, physical dimensions, electrical ratings, and a complete arrangement of screw terminals and lead terminations. (See pages 13 through 18).

However, these standard Duraband heater variations and terminations do not represent the full extent of our capabilities. OMEGA's engineering staff, with many years of experience in heat processing and temperature control applications, can assist you in designing the right Duraband heater for your specific application.



## Standard Specifications and Tolerances

### Performance Ratings

**Maximum Temperature:**

**Standard Sheath:** 482°C (900°F)

**Nominal Watt Density:** 3 to 7 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>)

**Maximum Watt Density:** Dependent on heater size and operating temperature

### Electrical Ratings

**Maximum Voltage:** 480 Vac

**Dual Voltage or 3-Phase:** Available depending on heater design

**Maximum Amperage:**

**Lead Wire Termination:** 10 Amp

**Screw Terminations:** 8-32 UNF—20 Amp;  
10-32 UNF—25 Amp

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### Physical Size Construction Limitations

**Minimum Width:** 19.1 mm (¾")

**Width Tolerance:** 1.59 mm (±1/16")

**Minimum Inside Diameter:** 22.1 mm (7/8")

**Nominal Gap:** 9.5 mm (¾")—if a larger gap is required for probes or thermocouples, specify when ordering

### Built-In Brackets

Heater Width	Number of Brackets
38 to 76 mm (1½ to 3")	1
79 to 127 mm (3⅛ to 5")	2
130 to 145 mm (5⅛ to 6⅞")	3
178 to 254 mm (7 to 10")	4
257 to 381 mm (10⅛ to 15")	5

*If tighter tolerances are required, contact OMEGA.*

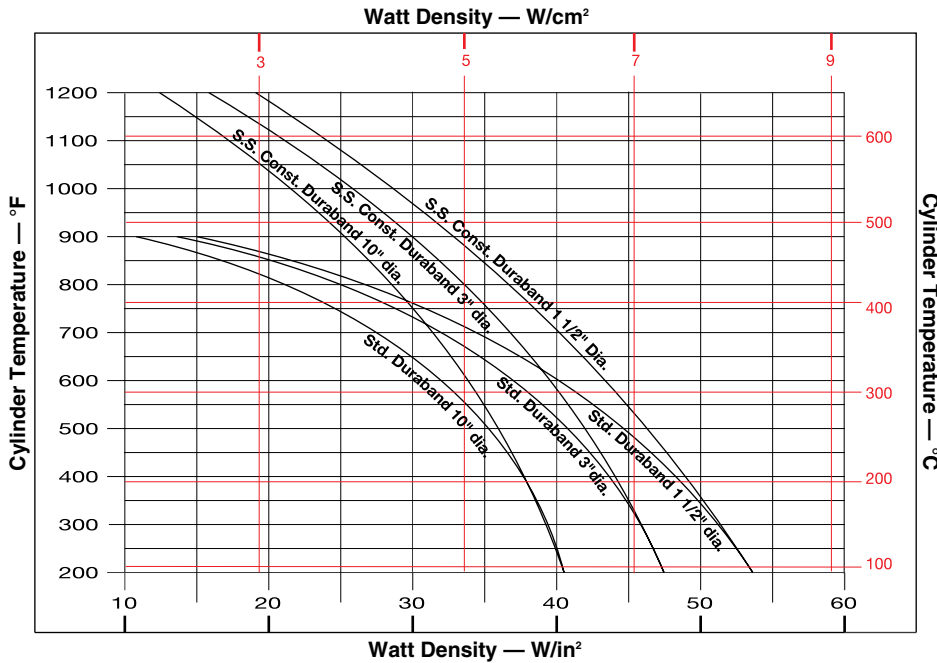
**CAUTION:** Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.

### Minimum ID and Width for Construction/Clamping Styles

Style	Minimum ID		Minimum Width	
	mm	inch	mm	inch
NB	50.8	2	31.8	1¼
NS	76.2	3	31.8	1¼
NE	63.5	2½	31.8	1¼
SB	22.1	7/8	19.1	¾
SS	50.8	2	19.1	¾
SE	63.5	2½	31.8	1¼
FB	25.4	1	19.1	¾
FS	50.8	2	19.1	¾
FE	63.5	2½	31.8	1¼
SL	101.6	4	31.8	1¼
NSL	101.6	4	31.8	1¼
NEL	101.6	4	31.8	1¼
LT	177.8	7	38.1	1½
LS	177.8	7	38.1	1½
LE	177.8	7	38.1	1½
TWL	25.4	1	25.4	1
RNB	134.7	5½	25.4	1
RNS	254	10	25.4	1

**Note:** Refer to individual descriptions for further information. Actual heater minimums will be a combination of termination and construction/strap styles.

## Maximum Watt Densities



### Maximum Allowable Watt Density

The chart displays the maximum Watt Density curves for various diameter heaters. Use this chart when determining the appropriate wattage value for your chosen heater.

Be aware that certain factors will require you to derate the watt density (Watt/in<sup>2</sup>) of your heater selection.

**CAUTION: Failure to adhere to the maximum allowable watt density per heater size will result in poor operating life.**

### Correction Factors

For heaters wider than 76.2 mm (3"), reduce maximum recommended watt density from chart by 20%.

For applications using insulating shroud, reduce maximum recommended watt density from chart by 25%.

### Calculating Maximum Watt Density

#### Factors to be Taken into Consideration:

- A. Type of controls
- B. Voltage variations
- C. Machine cycling rate
- D. Type of resin being processed
- E. Coefficient of thermal expansion and conductivity of the cylinder
- F. Designing a heater that closely matches the wattage requirement will decrease the frequency of cycling and temperature overshoot, thereby increasing the life of the heater.

### Once These Factors have been Established, Proceed with the Following Steps:

1. Determine the maximum operating temperature.
2. Calculate the total wattage required to obtain the maximum operating temperature.
3. Determine the quantity and size of the heater bands to be used. 38 through 76 mm (1½ through 3") wide band heaters have proven to be the most efficient and reliable in most cylindrical heating applications.
4. Determine individual band heater wattage by dividing the total required wattage by the quantity of band heaters selected.
5. Determine the band heater watt density by subtracting unheated areas from the band heater diameter created by screw terminals, gaps, holes, and cutouts (see formula below).
6. Determine if the required watt density previously calculated exceeds the maximum recommended watt density. Note the maximum cylinder temperature required on the left-hand side of the graph, follow the horizontal line until it intersects with the line of the band heater being used, and read directly down to obtain the maximum recommended watt density (Watt/in<sup>2</sup>).
7. If the calculated watt density is higher than the recommended value, it must be corrected or it will cause poor heater life. This can be accomplished by using more band heaters, lowering the heater wattage, or using a different construction type or a different type of band heater.
8. Should you have a problem in selecting the proper band heater or establishing watt density for your application, contact one of the qualified engineers at OMEGA.

Nominal Unheated Areas	
Construction Style	Unheated Area to Subtract
One-piece band	1" x width
Two-piece band	2" x width
Holes and cutouts	Size + ½" x width

### Watt Density Formula

Wattage

$$\text{Watt Density (Watt/in}^2\text{)} = \frac{\text{Wattage}}{[3.14 \times (\text{Band ID}) - \text{Gap-1}\frac{3}{8}] \times \text{Band Width} - \text{Unheated Area (see table)}}$$

Unheated Area (See Table) = Unheated area for construction style + unheated area for any holes or cutouts



## Construction Styles

# 3 Construction Types



Shown with Type NB Built-In Strap

### One-Piece Band

The one-piece construction is available on any screw or lead termination and clamping variation. It can be used where band heaters can be slipped over the end of the cylinder.



Shown with Type NS Built-In Strap

### Two-Piece Band

The two-piece construction is available on any screw or lead and clamping variation. The Duraband two-piece design provides a built-in hinge, making handling and installation easier. It is used on large cylinders or where the heater cannot be slipped over the end of the cylinder. Two-piece band heaters are rated at watts and volts per each half when ordering.

*Note: Multiple segment designs are recommended on larger diameter [typically larger than 381 mm (15")] heaters to improve the clamping force and increase the surface contact between the heater and the barrel for efficient heat transfer.*



Shown with Type NE Built-In Strap

### One-Piece Expandable Band

The one-piece expandable construction is available on any screw or lead and clamping variation. It can be used where a one-piece band heater would have to be expanded to fit over the barrel during installation, rather than slipped over the end of the barrel.

*Note: The one-piece expandable band should not be opened and closed more than twice.*



## Construction/Clamping Variations

### Standard Built-In Strap Clamping (Low Thermal Expansion)

The built-in strap is available with any screw or lead termination and construction variation. The built-in strap eliminates the use of awkward-to-handle separate straps, providing more drawing power than any other type of clamping system. The Duraband with built-in strap is standard on many designs.

#### Type NB—One-Piece Band

Minimum ID: 50.8 mm (2")  
Minimum Width: 31.8 mm (1¼")

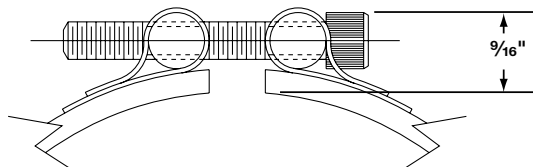
#### Type NS—Two-Piece Band

Minimum ID: 76.2 mm (3")  
Minimum Width: 31.8 mm (1¼")

#### Type NE—One-Piece Expandable Band

Minimum ID: 63.5 mm (2½")  
Minimum Width: 31.8 mm (1¼")

Type NB shown

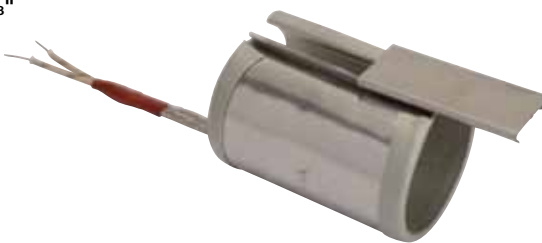
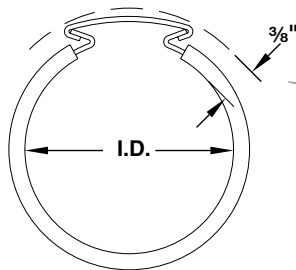


### Wedge Lock

Wedge lock clamping is designed for applications where mounting space is severely limited. It lends itself mainly to small diameter nozzle heaters.

#### Type TWL—One-Piece Band

Minimum ID: 25.4 mm (1")  
Minimum Width: 25.4 mm (1")  
Maximum Width: 88.9 mm (3½")



### Separate Straps

The separate strap clamping is available with any screw or lead termination and construction variation. It is strongly recommended that the Duraband with built-in strap design be used whenever possible because it provides more drawing power than any other type of clamping system.

#### Type SB—One-Piece Band

Minimum ID: 22.2 mm (7/8")  
Minimum Width: 19.1 mm (¾")

#### Type SS—Two-Piece Band

Minimum ID: 50.8 mm (2")  
Minimum Width: 19.1 mm (¾")

Type SB shown

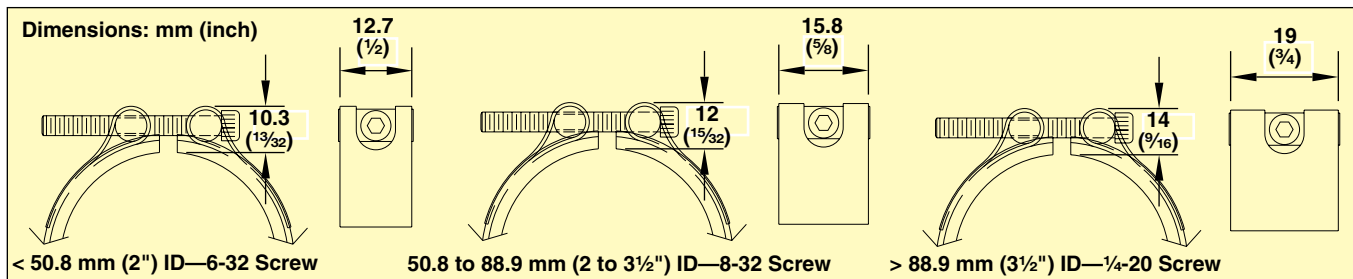


#### Type SE—One-Piece Expandable Band

Minimum ID: 63.5 mm (2½")  
Minimum Width: 31.8 mm (1¼")

### Clearance Dimensions for Separate Strap Clamping

Separate strap clearance dimensions: Dependent on heater inside diameter. The strap dimensions are shown below.





## Construction/Clamping Variations

### Spring Loaded with Built-In Bracket

The heavy duty stainless steel spring with built-in bracket is a variation on the basic Duraband® design. It is available with any screw or lead termination and construction variation. It is recommended for heaters over 305 mm (12") in diameter, and for any diameter heater used in the vertical position, to prevent the heater from slipping off the machine. The springs provide constant tension, therefore maintaining optimum surface contact against the cylinder being heated.

#### Type SL—One-Piece Band

**Minimum ID:** 101.6 mm (4")

**Minimum Width:** 31.8 mm (1¼")

#### Type NSL—Two-Piece Band

**Minimum ID:** 101.6 mm (4")

**Minimum Width:** 31.8 mm (1¼")

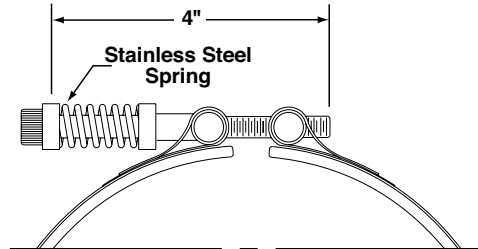
#### Type NEL—One-Piece Expandable Band

**Minimum ID:** 101.6 mm (4")

**Minimum Width:** 31.8 mm (1¼")



Type SL shown



### Latch and Trunion

The latch and trunion clamping system is available with any screw or lead termination and construction variation. It is ideal in absorbing thermal expansion due to the spring loading on the screws. The latch fully opens, facilitating installation on large diameter cylinders. The outer sheath is made from a low thermal expansion alloy.

#### Type LT—One-Piece Band

**Minimum ID:** 177.8 mm (7")

**Minimum Width:** 38.1 mm (1½")

#### Type LS—Two-Piece Band

**Minimum ID:** 177.8 mm (7")

**Minimum Width:** 38.1 mm (1½")

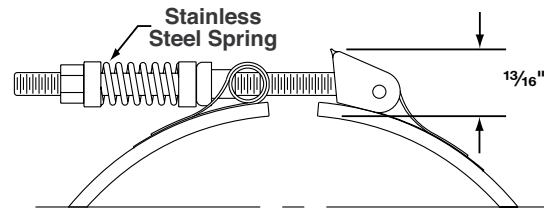
#### Type LE—One-Piece Expandable Band

**Minimum ID:** 177.8 mm (7")

**Minimum Width:** 38.1 mm (1½")



Type LT shown



### Bent-Up Flange (Ears)

The bent-up flange clamping is available with any screw or lead termination and construction variation. The outer sheath is made from a low thermal expansion alloy. The bent-up flange design is best suited for narrow band heaters with small diameters.

#### Type FB—One-Piece Band

**Minimum ID:** 25.4 mm (1")

**Minimum Width:** 19.1 mm (¾")

#### Type FS—Two-Piece Band

**Minimum ID:** 50.8 mm (2")

**Minimum Width:** 19.1 mm (¾")

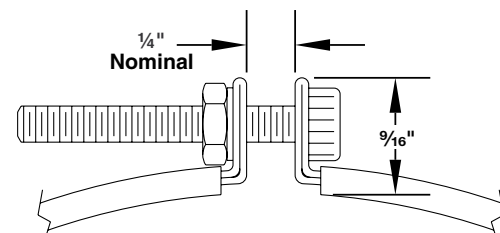
#### Type FE—One-Piece Expandable Band

**Minimum ID:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")



Type FB shown



**Note:** The bent-up flange design should only be used when other clamping methods are not suitable for a specific application. OMEGA recommends built-in strap clamping be used whenever possible, especially on large diameter heaters, because it provides superior clamping power.



### Internal Reverse Bands

#### Type RN—Internal Reverse Band (with Bracket Clamping)

This construction style is used to heat cylindrical surfaces from the inside on heaters 140 mm (5½") diameter and larger.

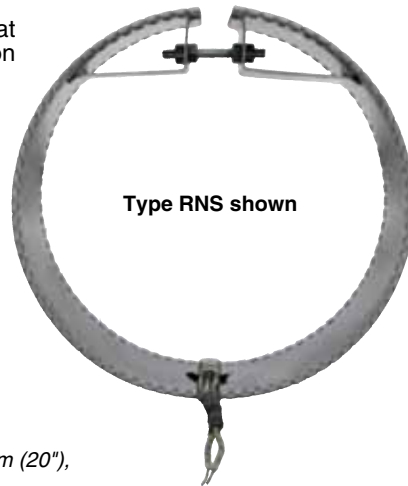
#### Type RNB—Reverse 1-Piece Construction

ID: 139.7 to 2854 mm (5½ to 10")  
Width: 25.4 to 88.9 mm (1" to 3½")  
Maximum Voltage: 240 Vac

#### Type RNS—Reverse 2-Piece Construction

ID: 254 to 508 mm (10 to 20")  
Width: 25.4 to 88.9 mm (1 to 3½")  
Maximum Voltage: 240 Vac

For inside diameters greater than 508 mm (20"), contact OMEGA with your requirements.



#### Type RTWL—Internal Reverse Band (with Wedge Lock Clamping)

This construction style is used to heat cylindrical surfaces from the inside on heaters less than 127 mm (5") outside diameter.

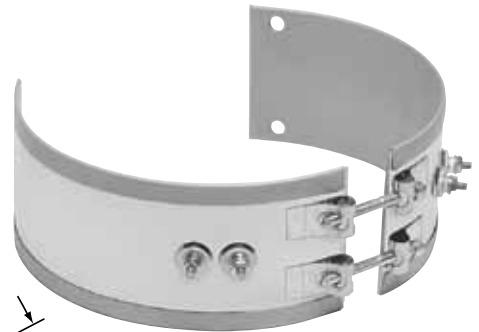
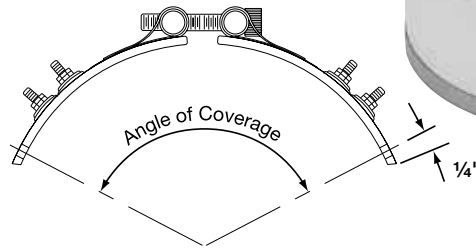


ID: Less than 139.7 mm (5½")  
Width: 25.4 to 88.9 mm (1 to 3½")

### Partial Coverage

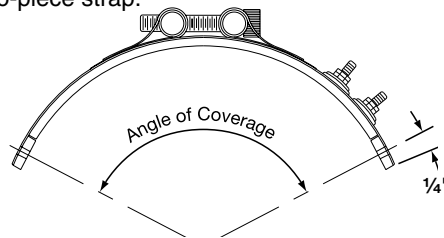
#### Type NS—2-Piece with Built-In Brackets

Partial coverage band heaters are normally required when holes and cutouts will not allow the heater to sufficiently clear the machine obstructions. The preferred method of construction is the two-piece band heater with built-in brackets as illustrated. The heater is screwed down to the cylinder at the ends and the built-in low thermal expansion strap pulls the heater tightly against the cylinder being heated. The standard center of hole to edge of heater dimension is 6.3 mm (¼"). When ordering, please provide the angle of coverage from center to center of the mounting screw holes as shown.



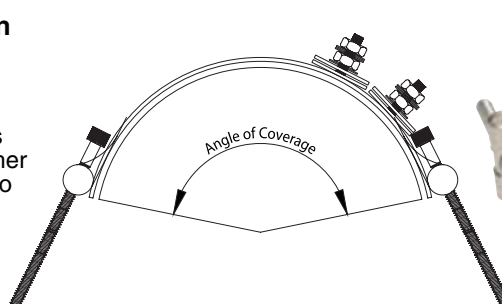
#### Type PS—One-Piece with Two-Piece Separate Strap with Padded Ends

The alternate method of partial coverage construction is the one-piece band heater with a separate two-piece strap. The two-piece strap itself is screwed down at the padded ends, allowing the heater to float between the pads as illustrated. When the strap is tightened, it will pull the heater against the cylinder being heated. The standard center of hole to edge of heater dimension is 6.3 mm (¼"). When ordering, please provide the angle of coverage from center to center of the mounting screw holes as shown.



#### Type NB—One-Piece with Built-In Strap Clamping

Another alternate method of partial coverage construction. The one piece with clamp screws on both sides allows it to be secured to anchor points on either side of a barrel without drilling holes into the barrel.







## Terminations—Stainless Steel Power Terminals: Type T1, Type T2 and Type T3

Available on any clamping or construction variation, the specially designed stainless steel power terminals are internally connected to the heater and are resistant to over-torquing.

The screw terminals are virtually unbreakable. Secure tightening of the electrical connections is essential for safety and long heater life.

### Type T1—Screw Terminals

#### One-Piece Band

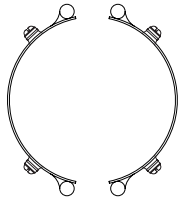
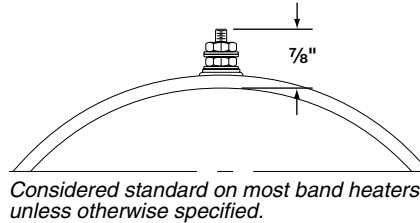
**Standard Termination Location:** Each side of gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 22.2 mm (7/8")

**Post Terminals:** 10-32 standard except 8-32 on <1" wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)



#### Two-Piece Band

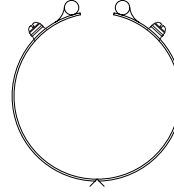
**Standard Termination Location:** Next to gaps on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 22.2 mm (7/8")

**Post Terminals:** 10-32 standard except 8-32 on <1" wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Each side of gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Post Terminals:** 10-32 standard except 8-32 on heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)

### Type T2—Screw Terminals

#### One-Piece Band

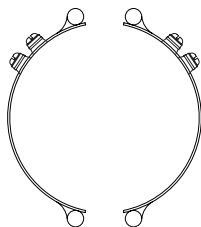
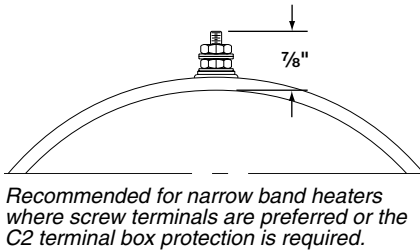
**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 22.2 mm (7/8")

**Post Terminals:** 10-32 standard except 8-32 on <1" wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)



#### Two-Piece Band

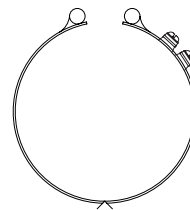
**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 22.2 mm (7/8")

**Post Terminals:** 10-32 standard except 8-32 on <1" wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Post Terminals:** 10-32 standard except 8-32 on heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)

## Terminations

### Type T3-Screw Terminals

#### One-Piece Band

**Standard Termination Location:**

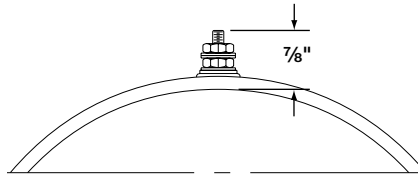
Next to gap; across center of width

**Minimum Inside Diameter:** 50.8 mm (2")

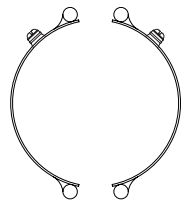
**Minimum Width:** 50.8 mm (2")

**Post Terminals:** 10-32 standard except 8-32 on 50.8 to 63.5 mm (2 to 2½") wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)



The preferred design on band heaters over 76.2 mm (3") wide or when C3 terminal box is required.



#### Two-Piece Band

**Standard Termination Location:**

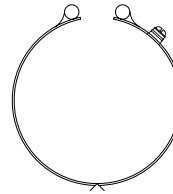
Next to same gap on each half; across center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 50.8 mm (2")

**Post Terminals:** 10-32 standard except 8-32 on 50.8 to 63.5 mm (2 to 2½") wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/ 25 A (10-32) or 20 A (8-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; across center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 50.8 mm (2")

**Post Terminals:** 10-32 standard except 8-32 on 50.8 to 63.5 mm (2 to 2½") wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/ 25A (10-32) or 20 A (8-32)

## Optional Igloo™ Ceramic Covers for Heaters with Screw Terminals

Igloo™ ceramic terminal covers consist of two individual ceramic parts. Unlike conventional ceramic caps, Igloo fully insulates any standard #8 or #10 terminal lugs used for electrical hook-ups.

#### Limitations

To assemble Igloo covers, terminals should be at least 22 mm (7/8") apart

**Minimum ID:** 50.8 mm (2")

**Minimum Width:** 31.7 mm (1¼")

Three types of Igloo™ bases are available:

**Type C6**—Double Port In-Line model number: CER-101-104

**Type C7**—Double Port 90° model number: CER-101-106

**Type C8**—Single Port model number: CER-101-107

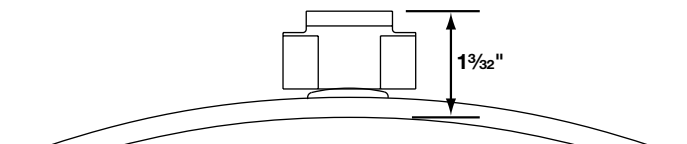
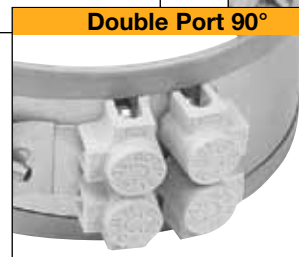
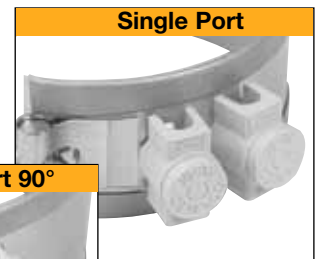
**Igloo™ Caps are Available in the Following Three Screw Terminal Sizes:**

**10-32**—model number: CER-102-101

**10-24**—model number: CER-102-104

**8-32**—model number: CER-102-105

When ordering, specify the type of Igloo and the screw terminal size.



**CAUTION:** Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.



## Terminations—Low-Profile Button Terminals: Type B1, Type B2 and Type B3

Available on any clamping or construction variation, the specially designed stainless steel button terminals are internally connected to the heater and are resistant to

over-torquing while offering a low profile for tight spaces. They are virtually unbreakable. Secure tightening of the electrical connections is essential for safety and long heater life.

### Type B1—Button Terminals

#### One-Piece Band

**Standard Termination Location:** Each side of gap; center of width

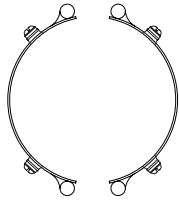
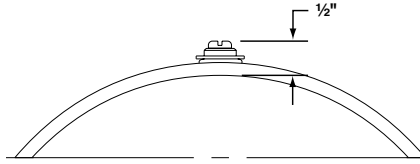
**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts:** 480 Vac

**Maximum Amps:** 25 A (10-32) or 20 A (6-32)



#### Two-Piece Band

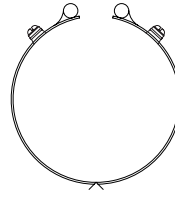
**Standard Termination Location:** Next to gaps on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Each side of gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32)

### Type B2—Button Terminals

#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

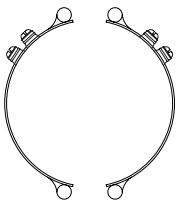
**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts:** 480 Vac

**Maximum Amps:** 25 A (10-32) or 20 A (6-32)



#### Two-Piece Band

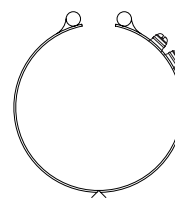
**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 On IDs <5"

**Maximum Volts/Amps:** 480 Vac/ 25 A (10-32) or 20 A (6-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32)



### Type B3-Button Terminals

#### One-Piece Band

**Standard Termination Location:** Next to gap; across center of width

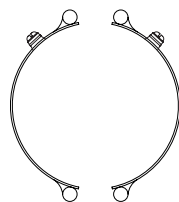
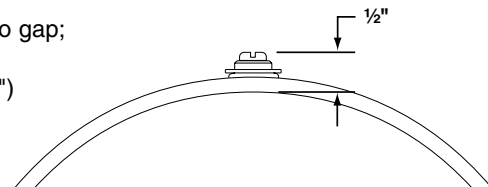
**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 60.3 mm (2 3/8")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts:** 480 Vac

**Maximum Amps:** 25 A (10-32) or 20 A (6-32)



#### Two-Piece Band

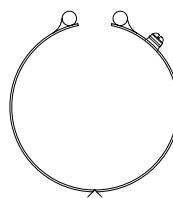
**Standard Termination Location:** Next to same gap on each half; across center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 60.3 mm (2 3/8")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; across center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 60.3 mm (2 3/8")

**Screw Size:** 10-32 standard except 6-32 On IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32)

## Plain Lead Wire Terminations: Type L1, Type L2 and Type L4 Available on Any Clamping or Construction Variation

### Type L1-Straight Lead Wires

The lead wires exit through a brass eyelet. The standard flexible leads are 254 (10") long with 76 (3") of fiberglass sleeving.

**Note:** If longer leads are required, specify when ordering.

#### One-Piece Band

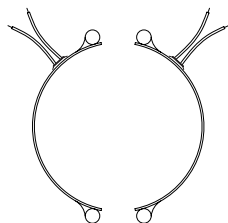
**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

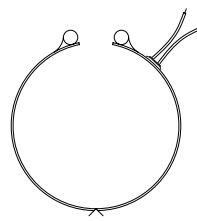
**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480V each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480V

**Maximum Amps:** 10 A



## Terminations

### Type L2—Straight Lead Wires

Type L2 is the preferred termination on all small diameter and small width band heaters. The standard flexible leads are 254 mm (10") long with 76 mm (3") of fiberglass sleeving.

*Note: If longer leads are required, specify when ordering.*



#### One-Piece Band

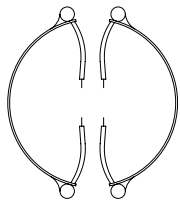
**Standard Termination Location:** Each side of gap; edge of width

**Minimum Inside Diameter:** 22.2 mm ( $\frac{7}{8}$ " )

**Minimum Width:** 19.1 mm ( $\frac{3}{4}$ " )

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

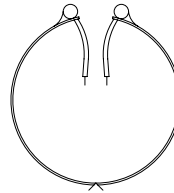
**Standard Termination Location:** Each side of each gap; edge of width

**Minimum Inside Diameter:** 50.8 mm (2" )

**Minimum Width:** 19.1 mm ( $\frac{3}{4}$ " )

**Maximum Volts:** 480V each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Each side of gap; edge of width

**Minimum Inside Diameter:** 63.5 mm ( $2\frac{1}{2}$ " )

**Minimum Width:** 31.8 mm ( $1\frac{1}{4}$ " )

**Maximum Volts:** 480V

**Maximum Amps:** 10 A

### Type L4—Straight Lead Wires

Type L4 is a suitable lead termination for small band heaters. The standard flexible leads are 254 mm (10") long with 76 mm (3") of fiberglass sleeving.

*Note: If longer leads are required, specify when ordering.*

#### One-Piece Band

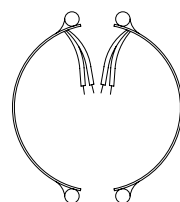
**Standard Termination Location:** Same side of gap; edge of width

**Minimum Inside Diameter:** 22.2 mm ( $\frac{7}{8}$ " )

**Minimum Width:** 25.4 mm (1" )

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

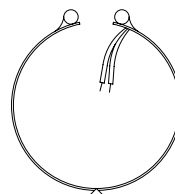
**Standard Termination Location:** Each side of same gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2" )

**Minimum Width:** 25.4 mm (1" )

**Maximum Volts:** 480V each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Same side of gap; edge of width

**Minimum Inside Diameter:** 63.5 mm ( $2\frac{1}{2}$ " )

**Minimum Width:** 31.8 mm ( $1\frac{1}{4}$ " )

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



## Abrasion Resistant Lead Terminations: Type W1, Type W2, Type W2M, Type W3, Type W4 and Type W5M

### Type W1–Straight Wire Braid Leads

Available on any clamping or construction variation. Wire braid leads offer sharp bending not possible with armor cable.

The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads.

**Note:** If longer leads are required, specify when ordering.



#### One-Piece Band

**Standard Termination Location:**

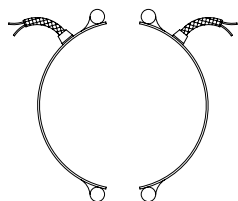
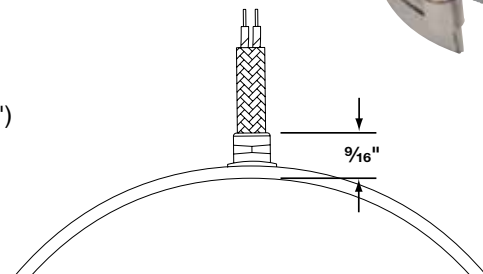
Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

**Standard Termination Location:**

Next to same gap on each half; center of width

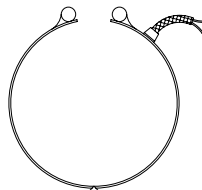
**Minimum Inside Diameter:**

50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:**

Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A

### Type W2–Wire Braid Leads

The W2 wire braid exits at 180° from the gap for special nozzle heating applications. Sleeving is used for additional protection. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads with 76 mm (3") of fiberglass sleeving.

**Note:** If longer leads are required, specify when ordering.

Type W2 is not available on two-piece or one-piece expandable Duraband heaters.

#### One-Piece Band

**Standard Termination Location:**

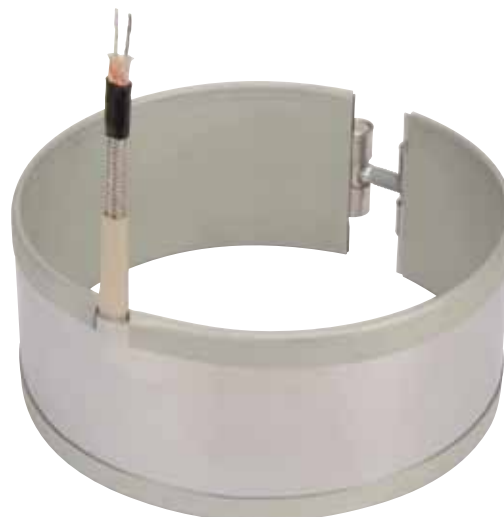
Opposite the gap; edge of width

**Minimum Inside Diameter:** 22.2 mm (7/8")

**Minimum Width:** 28.6 mm (1⅛")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A





## Terminations

### Type W3—Single Wire Braid Leads

Highly recommended for nozzle heating applications. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads with 76 mm (3") of fiber glass sleeving.

**Note:** If longer leads are required, specify when ordering.



#### One-Piece Band

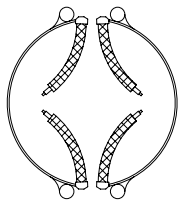
**Standard Termination Location:** Each side of gap; edge of width

**Minimum Inside Diameter:** 19.1 mm (¾")

**Minimum Width:** 22.2 mm (7/8")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

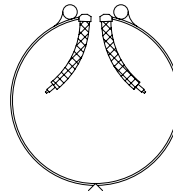
**Standard Termination Location:** Each side of each gap; edge of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 19.1 mm (¾")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Each side of gap; edge of width

**Minimum Inside Diameter:** 19.0 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A

### Type W4—Wire Braid Leads on One Side

A suitable termination for nozzle heating applications. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads.

**Note:** If longer leads are required, specify when ordering.



#### One-Piece Band

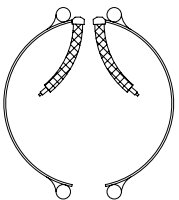
**Standard Termination Location:** Next to gap; edge of width

**Minimum Inside Diameter:** 22.2 mm (7/8")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

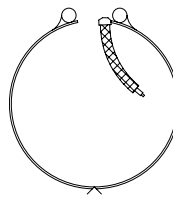
**Standard Termination Location:** Next to same gap on each half; edge of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; edge of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



### Type W2M-Right-Angle Wire Braid Leads, 90° to Heater

Stainless steel wire braid exits perpendicular to the heater centerline through a low profile stainless steel cap. This cap acts as a strain relief which protects against excessive flexing or pulling of the lead wire. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads.

**Note:** If longer leads are required, specify when ordering. Stainless steel construction may be required for widths of 22.2 mm (7/8") to 41.3 mm (1 5/8").



#### One-Piece Band

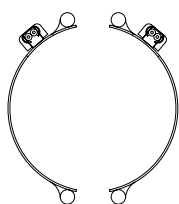
**Standard Termination Location:** Opposite of gap; center of width

**Minimum Inside Diameter:** 38.1 mm (1 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A

### Type W5M-Right-Angle Wire Braid Leads, Parallel to Heater

Stainless steel wire braid exits parallel to the heater centerline through a low profile stainless steel cap. This cap acts as a strain relief which protects against excessive flexing or pulling of the lead wire. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads.

**Note:** If longer leads are required, specify when ordering. Stainless steel construction may be required for widths of 22.2 mm (7/8") to 41.3 mm (1 5/8").



#### One-Piece Band

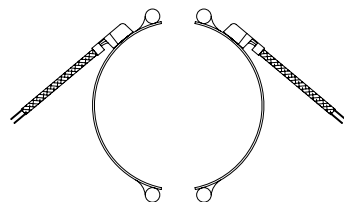
**Standard Termination Location:** Opposite of gap; center of width

**Minimum Inside Diameter:** 38.1 mm (1 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

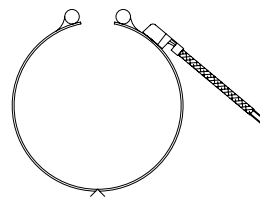
**Standard Termination Location:** Next to same gap on each side; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A





## Terminations—Armor Cable Terminations: Type R1, Type R2 and Type R3

Available on any clamping or construction variation. Armor cable provides far superior protection to lead wires where

abrasion is a constant problem. The standard leads are 254 mm (10") of armor cable over 305 mm (12") of flexible leads.

*Note: If longer leads are required, specify when ordering.*

### Type R1 – Straight Armor Cable

- Type R1A—Galvanized armor cable, crimped
- Type R1B—Stainless Steel armor cable, crimped
- Type R1C—Galvanized armor cable, tack welded

- Type R1D—Stainless Steel armor cable, tack welded
- Type R1E—Galvanized armor cable, full silver brazing
- Type R1F—Stainless Steel armor cable, full silver brazing

#### One-Piece Band

##### Standard Termination Location:

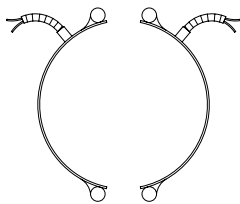
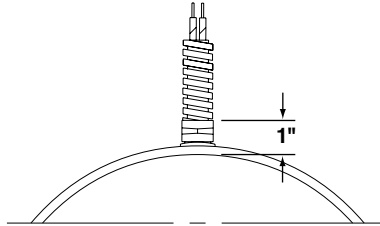
Next to gap; center of width

**Minimum Inside Diameter:** 38.1 mm (1½")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

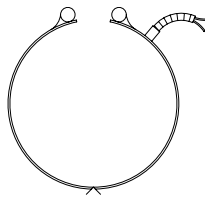
##### Standard Termination Location:

Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/10 A each half



#### One-Piece Expandable Band

##### Standard Termination Location:

Next to gap; center of width

**Minimum Inside Diameter:** 65.3 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A

### Type R2—Right-Angle Armor Cable

- Type R2A—Galvanized armor cable, crimped
- Type R2B—Stainless Steel armor cable, crimped
- Type R2C—Plain leads, no cable

#### One-Piece Band

##### Standard Termination Location:

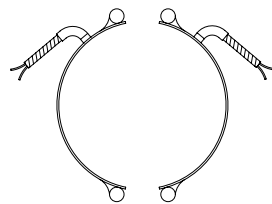
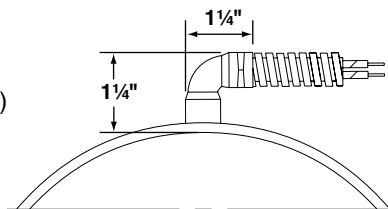
Next to gap; center of width

**Minimum Inside Diameter:** 38.1 mm (1½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

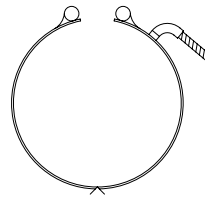
##### Standard Termination Location:

Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A each half



#### One-Piece Expandable Band

##### Standard Termination Location:

Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A



### Type R3-Removable Armor Cable

- Type R3A-Plain leads and female fitting
- Type R3B-Leads, male adaptor and galvanized armor
- Type R3C-Leads, male adaptor and stainless steel armor

Recommended on applications where removable armor is required. The fitting will accept the standard armor cable connector. The standard leads are 254 mm (10") of armor cable over 305 mm (12") of flexible leads.

*Note: If longer leads are required, specify when ordering.*

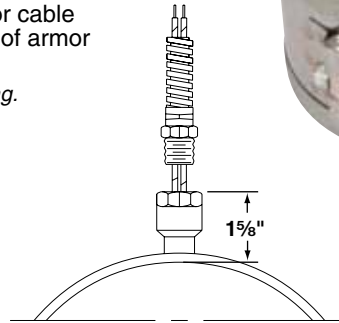
#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

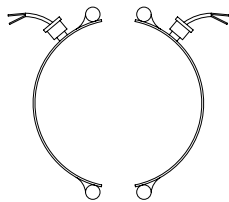
**Minimum Inside Diameter:** 38.1 mm (1½")

**Minimum Width:** 31.7 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A



Type R3B shown



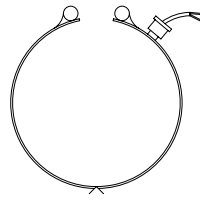
#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.7 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A

### Type S1-Lead Wire Spring Strain Relief

- Type S1A-Plain leads and strain relief spring
- Type S1B-Stainless steel wire braided leads and strain relief spring. 254 mm (10") of braid over 305 mm (12") of flexible leads is standard.

A strain relief spring is attached to the heater at the termination exit to reduce strain on leads subjected to excessive flexing. The spring is 54 mm (2½") long. The flexible standard leads are 254 mm (10") long with 76 mm (3") of fiberglass sleeving.

*Note: If longer leads are required, specify when ordering.*

#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

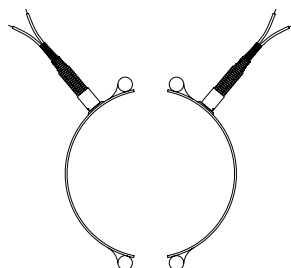
**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



Type S1B shown



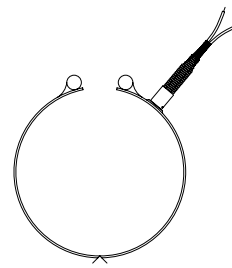
#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.75 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.75 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A



## Terminations—General Purpose Terminal Boxes: Type C2 and Type C5

Available with any construction or clamping variation. They are a simple and economical way to protect employees from electric shock or prevent electric shorts that can result from exposed wiring on band heater electrical installations.

The heavy duty terminal boxes have 13 mm (1/2") knockouts that will accept standard armor cable connectors. They can be field assembled on band heaters that have a center

distance between terminal screws of 22 mm (7/8"). Boxes can be pre-wired with galvanized armor, stainless steel armor, wire braid or plain leads. If a low profile box with cable or leads is required, it is strongly recommended to order it pre-wired by the factory.

The standard leads are 254 mm (10") of cable or wire braid over 305 mm (12") of flexible leads. If longer leads are required, specify when ordering.

### Type C2—Terminal Boxes

#### Type C2—Standard Box

C2A—Box only

C2B—with galvanized armor

C2C—with stainless steel armor

C2D—with wire braid

#### One-Piece Band

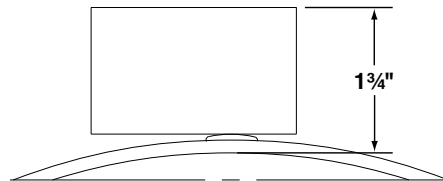
##### Standard Termination Location:

Next to gap; center of width

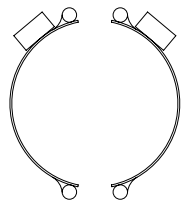
**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A



Type C2 shown



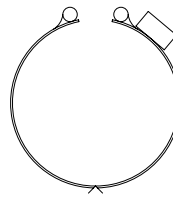
#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A

Heater widths between 25 and 64 mm (1 and 2 1/2") require a minimum ID of 140 mm (5 1/2") or greater.

### Type C5—Terminal Boxes

#### Type C5—Low Profile Box

C5A—Box only

C5B—with galvanized armor

C5C—with stainless steel armor

C5D—with wire braid

C5J—with plain leads

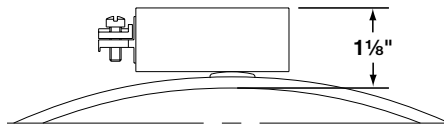
#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

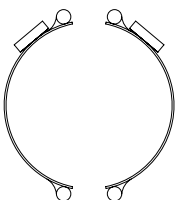
**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A



Type C5 shown



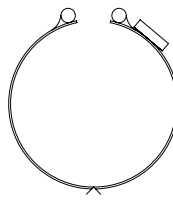
#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A



## Quick Disconnect Plugs: Type P1, Type P2, Type P3 and Type P4

Available on any construction or clamping variation. These plug assemblies are highly recommended and should be used whenever possible. The combination of plug and cup assembly along with armor cable covered leads eliminates all live exposed terminals or wiring that can be a potential hazard to employees or machinery.

Type P1 and P3 assemblies are available with a straight or right-angle plug. Type P2 and P4 plug assemblies have a lower profile and are available with a straight plug only.

To simplify installation, band heaters with these assemblies can be supplied pre-wired, using high temperature lead wires.

The standard leads are 254 mm (10") of armor cable over (12") of flexible leads. If longer leads are required, specify when ordering.

### Type P1—High Temperature Quick Disconnect Plugs

#### Type P1

**P1K**—Cup assembly only

**P1L**—with straight plug

**P1M**—with 90° plug only

**P1N**—with straight plug and galvanized cable

**P1O**—with straight plug and stainless steel cable

**P1P**—with straight plug and wire braid

**P1Q**—with 90° plug and galvanized cable

**P1R**—with 90° plug and stainless steel cable

**P1S**—with 90° plug and wire braid



Type P1Q shown

#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

#### Plug Electrical Ratings

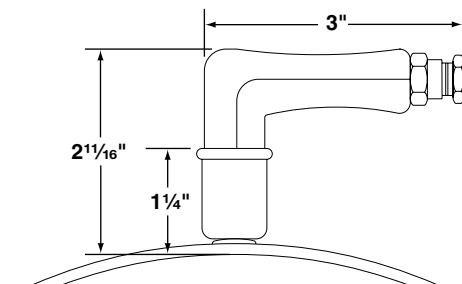
**2-Pole 3-Wire Grounding**

**Maximum Volts:** 250 Vac

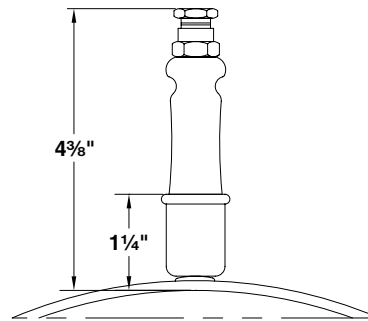
**Maximum Amps:** 16 A

**Maximum Temperature:** 300°C (572°F)

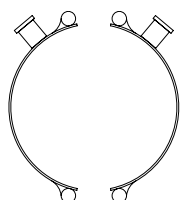
If width is between 38 and 51 mm (1½ and 2"), minimum diameter is 140 mm (5½"). If width is greater than 64 mm (2"), minimum diameter is 64 mm (2")



Type P1M



Type P1L

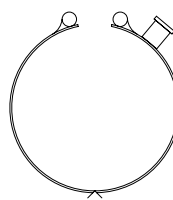


#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 38.1 mm (1½")



## Terminations

### Type P2—High Temperature Quick Disconnect Plugs

**Type P2—Low Profile Assembly**  
**P2F**—Low profile assembly only  
**P2G**—with straight plug only

**P2H**—with straight plug and galvanized cable  
**P2J**—with straight plug and stainless steel cable  
**P2K**—with straight plug and wire braid

#### One-Piece Band

**Standard Termination Location:**  
 Next to gap; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")

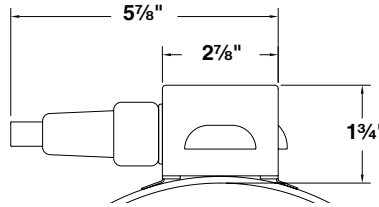
#### Plug Electrical Ratings

**2-Pole 3-Wire Grounding**

**Maximum Volts:** 250 Vac

**Maximum Amps:** 16 A

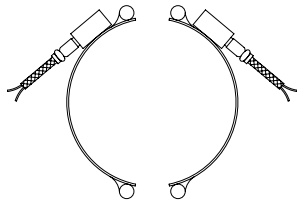
**Maximum Temperature:** 300°C (572°F)



Type P2G shown



Type P2H shown

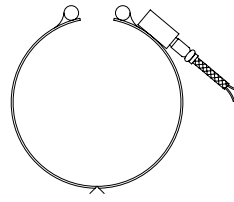


#### Two-Piece Band

**Standard Termination Location:**  
 Next to same gap on each half;  
 center of width

**Minimum Inside Diameter:**  
 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")



#### One-Piece Expandable Band

**Standard Termination Location:**  
 Next to gap; center of width

**Minimum Inside Diameter:**  
 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")

### Type P3—DIN 49458 A/B Quick Disconnect Plugs

**Type P3—Vertical Box Assembly**  
**P3A**—Box assembly only

**P3B**—Box assembly with straight plug  
**P3C**—Box assembly with right-angle plug only

#### One-Piece Band

**Standard Termination Location:** Next to gap;  
 center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 38.1 mm (1½")

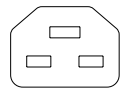
#### Plug Electrical Ratings

**2-Pole 3-Wire Grounding**

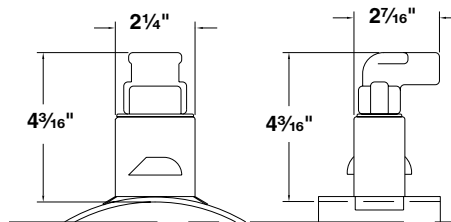
**Maximum Volts:** 250 Vac

**Maximum Amps:** 16 A

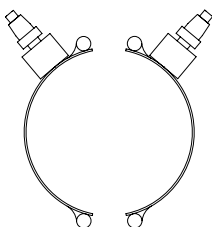
**Maximum Temperature:** 200°C (392°F)



Standard pin orientation



Type P3C shown

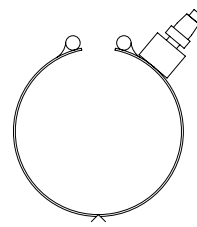


#### Two-Piece Band

**Standard Termination Location:**  
 Next to same gap on each half;  
 center of width

**Minimum Inside Diameter:**  
 76.2 mm (3")

**Minimum Width:** 38.1 mm (1½")



#### One-Piece Expandable Band

**Standard Termination Location:**  
 Next to gap; center of width

**Minimum Inside Diameter:**  
 76.2 mm (3")

**Minimum Width:** 38.1 mm (1½")



### Type P4—DIN 49458 A/B Quick Disconnect Plugs

#### Type P4—Horizontal Box Assembly

P4A—Box assembly only

P4B—Box assembly with straight plug

#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")

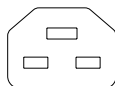
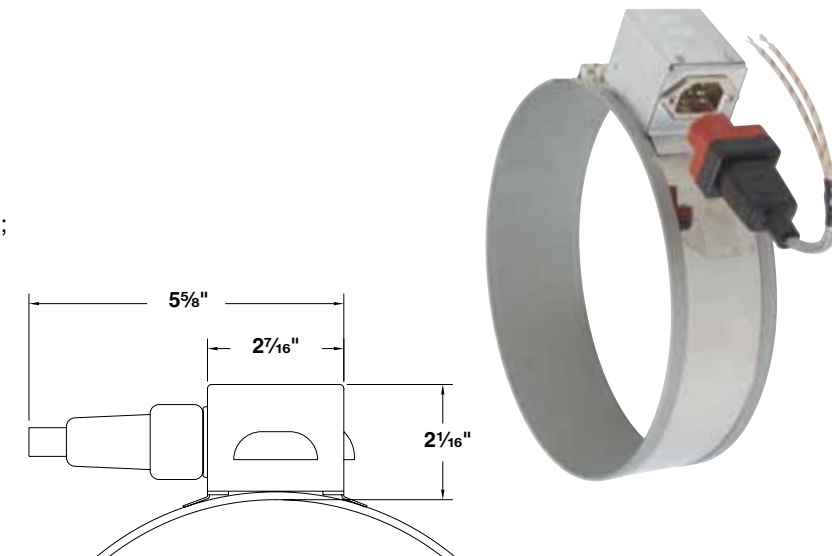
#### Plug Electrical Ratings

**2-Pole 3-Wire Grounding**

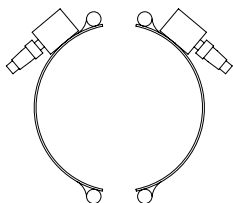
**Maximum Volts:** 250 Vac

**Maximum Amps:** 16 A

**Maximum Temperature:** 200°C (392°F)



Standard pin orientation

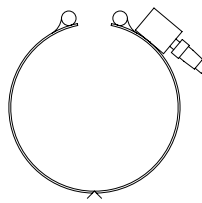


#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

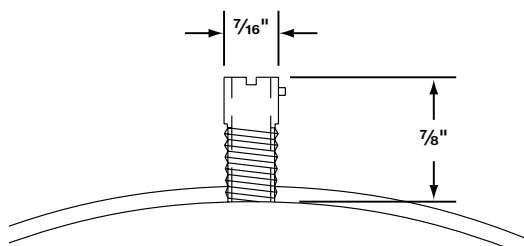
**Minimum Width:** 76.2 mm (3")

## Special Duraband® Construction Options and Variations

### Thermocouple Bayonet Adaptor

A standard bayonet adaptor facilitates the installation of an external thermocouple with a standard bayonet cap. The standard location for the adaptor is 90° from the gap. Specify without through hole for heater sensing or with through hole for load sensing. For heaters less than 25 mm (1") wide order separate strap clamping and utilize the gap for the thermocouple.

Visit [omega.com](http://omega.com) for a complete selection of thermocouples.





## Construction Options and Variations

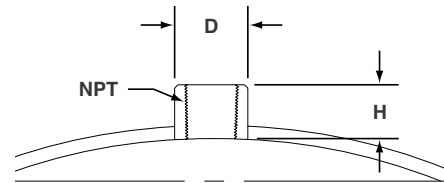
### Thermocouple Coupling

The thermocouple coupling facilitates the installation of an external thermocouple with a threaded fitting to sense the temperature of the band. The standard location for the coupling is 90° from the gap. Specify without through hole for heater sensing or with through hole for load sensing.



#### Available Bushing Sizes

Thread	D, mm (inch)	H, mm (inch)
1/8-27 NPT	14.2 (9/16)	15.8 (5/8)
1/4-20 NPT	19 (3/4)	17.4 (1 1/16)
3/8-18 NPT	22.2 (7/8)	15.8 (5/8)
M12-1.75 mm	19 (3/4)	12.7 (1/2)



### Holes and Cutouts

Holes and cutouts are normally required in band heaters for clearance for thermocouple probes or holding bolts. An oversize gap can in many cases serve the same purpose, saving the expense of the hole.

Using the center of the gap as a starting point, specify the location of the centerpoint of the hole or cutout in terms of degrees and the distance from the edge of the heater. In addition, state the size of the hole or cutout.

For critical hole and cutout locations, a detailed drawing will be required.

**Note:** A minimum of 13 mm (1/2") is required from the hole to the edge of the heater.



### Hinged Two-Piece Band

The hinged two-piece band heater is connected with a continuous hinge for easy installation and removal. This heater can be opened and closed as often as is necessary. The preferred method of clamping is latch and trunnion. It is available with any screw or lead variation. When ordering, specify watts and volts each half.

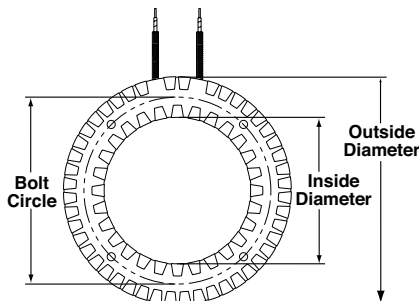
**Minimum Width:** 34.9 mm (1 3/8")



## Special Mica Insulated Heater Construction Variations

### Ring Heaters

When ordering ring heaters, specify inside and outside diameters. If mounting holes are required, specify location and hole size. For critical hole and cutout locations, a detailed drawing will be required.





## Duraband Features

### Additional Duraband® Heater Features

#### Electrical Variations

##### Three-Phase

On very high wattage band heaters it would be advantageous to set up the wiring three-phase to reduce the current load across a single conductor. Three-phase wiring is available on select clamping/construction or termination variation (termination location is subject to engineering approval).

**Minimum ID:** 76.2 mm (3"), **Minimum Width:** 50.8 mm (2")

##### Dual Voltage

Band heaters can be designed using 3-wire series/parallel circuits for dual voltage applications. Whether the heater is run on the higher or lower voltage, the wattage will be the same. Dual Voltage wiring is available on any clamping/construction or termination variation.

##### Ground Terminal or Lead

For those applications requiring a separate ground terminal or lead attached to the heater sheath. A ground terminal or lead is available on any clamping/construction or termination variation.

##### Single Phase/Three Phase Duraband

Heaters can be designed with multiple circuits to operate single or three-phase.

#### Lead Variations

##### Electrical Plugs

Industry standard NEMA Twist-Lock® electrical plugs are available. The plugs can be attached to fiberglass leads, armor cable or wire braid. Electrical plugs can be added to any clamping/construction or termination variation.

#### Built-In Thermocouples

Heaters can be manufactured with a built-in thermocouple to closely control the temperature of the heater.

Type J or K thermocouples are available with fiberglass, wire braid or any other required insulation. Contact OMEGA with your requirements.

#### Construction Variations

##### All Stainless Steel Construction

Mica band heaters can be constructed with the external sheath made entirely from stainless steel. This allows the Duraband to reach the maximum temperature of 650°C (1200°F). All stainless steel construction is available on any clamping/construction or termination variation.

##### Other Sheath Materials

Other sheath materials, such as rust-resistant steel, Monel®, aluminum, or copper are also available for unique applications.

#### Terminal Lugs

Various types of crimp terminals can be attached to the heater leads to make wiring into applications quick and easy. High temperature [649°C (1200°F)] ring terminals and nylon or PVC insulated terminals are available. Spade, ring, and right-angle or straight quick disconnect type terminals can be attached to the leads.



Plug Model No.	Receptacle Model No.	Reference	NEMA P or R	Amps	Volts
EHD-102-113	EHD-103-104	P4 twist lock	L5-15	15	125
EHD-102-121	EHD-103-107	P5 twist lock	L6-15	15	250
EHD-102-104	N/A	P9 twist lock	L2-20	20	250

#### Custom Engineered/Manufactured Heaters

Understanding that an electric heater can be very application specific, for sizes not listed OMEGA® will design and manufacture a Duraband Heater to meet your requirements.

#### Please Specify the Following:

- Inside Diameter
- Width
- Wattage
- Voltage
- Quantity
- Termination (see pages 9 through 22)
- Lead Cable/Braid Length
- Construction style (see pages 5, 22)
- Clamping variation (see pages 6 through 8)
- Special Features





## Installation Recommendations

### Installation Accessories Available

- High Temperature Terminal Lugs
- Igloo™ Ceramic Terminal Covers
- UL Listed Plugs
- High Temperature Lead Wire 450°C (842°F)
- Armor Cable
- Stainless Steel Braid

- High Temperature Sleeving
- Stainless Steel Barrel Covers
- High Temperature Mica Insulated Wiring Harnesses 450°C (842°F)
- Thermocouples
- Temperature Controllers
- High Temperature Fiberglass Tape

1. Disconnect electric power to the machine and/or heaters prior to installing or replacing heaters.
2. Do not install heaters in areas where combustible gases, vapor or dust is present.
3. Use as many narrow band heaters as the application will permit. 38 through 76 mm (1½ through 3") wide heaters are recommended.
4. Using a heater that closely matches the wattage requirements will decrease the frequency of cycling and temperature overshoot, thereby increasing the life of the heater.
5. Make certain that all barrel surfaces are clean and have a smooth finish. Any contaminants or imperfections on the surface can cause premature heater failure.
6. Expandable type Mica Band Heaters may be opened once at the gap to fit on the barrel. Do not open these heaters beyond their specified heater diameter.

**Caution:** Do not open one-piece non-expandable type mica band heaters. Opening of these heaters can damage Mica Insulation and will create electrical short circuits.

7. Position heater bands on the barrel.
8. Securely tighten heater bands around the barrel. Clamping force must be equally distributed on heaters with more than one set of clamping brackets. *Recommended clamping bolt torque is 10 ft./lbs.*
9. For heaters with screw terminals, remove the top nut and flat washers from the power screw terminals. Do not remove or loosen the bottom nut on the power screw terminals. The bottom nut is tightened to 60 in./lbs. at the factory. A loose bottom nut may cause premature heater failure.
10. All electrical wiring of heater bands should be done by a qualified electrician.
  - A. Use only Stainless Steel or other high temperature lugs to prevent material degradation when exposed to high temperatures over a prolonged period of time.

**Caution:** Do not use copper or plated copper lugs.

- B. Use only lead wire with high temperature insulation and proper gauge size.

- C. When connecting power leads to screw terminals make certain that barrels of terminal lugs are not facing down toward the heater case, which will create a short circuit. *Tighten the top nut to 30 in./lbs.*
- D. Make certain power lead wires do not make contact with hot heater surface to avoid degradation of lead wire, as this can cause electrical short circuits.
- E. Make sure the voltage input to the heater bands does not exceed the voltage rating that is stamped on the heater band.
- F. It is recommended that an amperage reading is taken for each heater to verify proper wiring. *(Amps = Watts/Volts)*
11. Insulate all live electrical wires per applicable safety standards.
12. Begin heater band re-tightening procedure. Be sure to wear protective gloves.
  - A. Energize heater bands and allow the heater to reach 149°C (300°F). This usually takes between 3 and 5 minutes.
  - B. Turn off power and immediately re-tighten the heater bands to 10 ft./lbs. Turn power back on.
13. Install shrouds around the machine to meet applicable safety requirements.
14. Once installed, check surroundings to make sure that contaminants won't get on the heater while the unit is in operation. Accumulation of contaminants on heaters can cause premature heater failure.
15. Insulating blanket installations must have band heater re-tightening sequence (#12) completed before blanket installation. Lead wires must exit the insulation blanket as soon as possible; do not entrap lead wires between heater sheath and insulation blanket.

**Caution:** It is imperative that upon start-up of new machines at customer facilities, all of the aforementioned parameters are double checked by qualified field service personnel.

**CAUTION: Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.**



## Barrel Band Heaters

### Standard Mica Insulated Band Heaters for Plastic Injection Molding Machines

#### Design Features

- All Heaters Have 0.61 m (24") High Temperature Leads With 559 mm (22") Stainless Steel Overbraid—Type W1
- Heaters Less Than 38 mm (1½") Wide Have Separate Straps—Type SE
- Designed as One-Piece Expandable Type, Enables You to Open Up the Heater to the Diameter of the Barrel for Easy Installation



To Order Visit <a href="http://omega.com/mbh_barrel">omega.com/mbh_barrel</a> for Pricing and Details									
Model Number		Inside Diameter		Width		Watt	Watt Density		Style
120V	240V	mm	inch	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>	
MBH00098	—	63.5	2½	38.1	1½	300	4.5	29	NE
MBH00099	MBH00108	76.2	3	25.4	1	300	5.6	36	SE
MBH00100	MBH00109	76.2	3	38.1	1½	500	6.2	40	NE
MBH00101	MBH00110	76.2	3	50.8	2	500	4.6	30	NE
—	MBH00111	79.4	3⅛	50.8	2	450	4.0	26	NE
—	MBH00112	82.6	3¼	50.8	2	400	3.4	22	NE
—	MBH00113	88.9	3½	38.1	1½	550	5.7	37	NE
—	MBH00114	88.9	3½	50.8	2	600	4.7	30	NE
—	MBH00115	88.9	3½	76.2	3	300	1.6	10	NE
—	MBH00116	88.9	3½	76.2	3	625	3.2	21	NE
MBH00102	MBH00117	95.3	3¾	38.1	1½	600	5.8	37	NE
MBH00103	MBH00118	95.3	3¾	63.5	2½	850	4.9	32	NE
—	MBH00119	101.6	4	25.4	1	550	7.4	48	SE
—	MBH00120	101.6	4	38.1	1½	550	4.9	32	NE
MBH00104	—	104.8	4⅛	25.4	1	400	5.2	33	SE
—	MBH00121	114.3	4½	25.4	1	550	6.5	42	SE
—	MBH00122	114.3	4½	50.8	2	800	4.7	30	NE
—	MBH00123	120.7	4¾	19.1	¾	150	2.2	14	SE
—	MBH00124	123.8	4⅞	38.1	1½	900	6.5	42	NE
—	MBH00125	127.0	5	38.1	1½	700	4.9	32	NE
—	MBH00126	127.0	5	44.5	1¾	600	3.6	23	NE
—	MBH00127	127.0	5	50.8	2	950	5.0	32	NE
—	MBH00128	127.0	5	63.5	2½	1000	4.2	27	NE
—	MBH00129	139.7	5½	25.4	1	550	5.2	34	SE
—	MBH00130	139.7	5½	38.1	1½	500	3.2	20	NE
—	MBH00131	139.7	5½	38.1	1½	900	5.7	37	NE
—	MBH00132	139.7	5½	50.8	2	500	2.4	15	NE
—	MBH00133	139.7	5½	69.9	2¾	620	2.1	14	NE
—	MBH00134	139.7	5½	76.2	3	1750	5.6	36	NE
MBH00105	—	152.4	6	25.4	1	300	2.6	17	SE
—	MBH00135	152.4	6	38.1	1½	500	2.9	19	NE
—	MBH00136	152.4	6	38.1	1½	850	4.9	32	NE
MBH00106	—	155.6	6⅛	25.4	1	600	5.1	33	SE
—	MBH00137	158.8	6¼	50.8	2	500	2.1	13	NE
—	MBH00138	165.1	6½	38.1	1½	750	4.0	26	NE
—	MBH00139	177.8	7	25.4	1	550	4.1	26	SE
—	MBH00140	190.5	7½	50.8	2	1500	5.6	36	NE
MBH00107	—	206.4	8⅛	50.8	2	1200	5.9	38	NE
—	MBH00141	254.0	10	50.8	2	2000	6.4	41	NE

Ordering Example: MBH00122, 240V, 800 watt, barrel band heater.



## DuraBand® with Built-In Strap

General purpose terminal box can be attached on Duraband diameters of 63.5 mm (2½") or larger. It offers excellent protection to exposed terminals. To simplify wiring, the box has a 13 mm (½") trade size knockout [actual diameter 22 mm (7/8")] that will accept standard conduit or flexible armor cable connectors. It can be field assembled on most band heaters with screw terminals having a center distance of 22 mm (7/8").

Flexible armor cable for lead protection is available where abrasion is a problem.

For maximum surface contact, the torque resistant and virtually unbreakable stainless steel screw terminals are securely fastened to a connecting jumper, assuring positive contact with the windings and providing maximum amperage carrying capacity. For other terminal or lead arrangements, see pages 13 through 18.

Specially designed mounting brackets with ¼"-20 socket cap screws are used to draw the built-in strap to a high degree of tension. This tension exerts the great amount of drawing power required to pull the heating element assembly against the cylinder evenly and tightly across its entire width, thus eliminating all air gaps that can cause premature heater failure. The number of bracket assemblies used increases as the width of a Duraband heater increases.

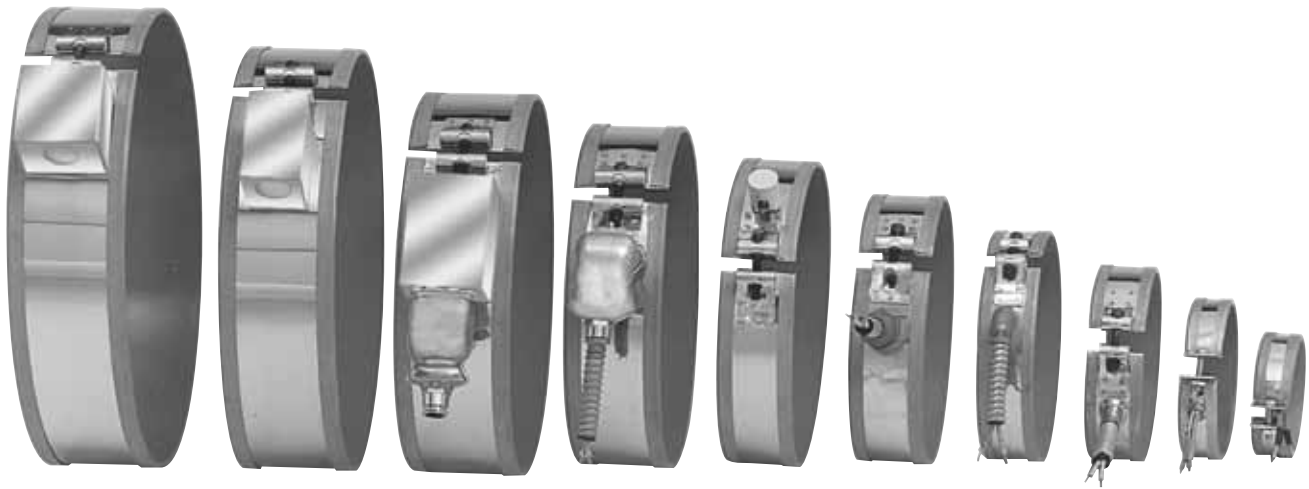
Specially treated rust-resistant steel sheath casing provides the best combination of physical strength, high emissivity and good thermal conductivity to heated cylindrical parts, good for sheath temperatures up to 480°C (900°F).

Specially selected grade and thickness of mica sheet is used to insulate the windings, providing excellent thermal conductivity and dielectric strength.

The gauge of nickel-chrome resistance ribbon wire is selected to achieve the lowest internal element temperatures possible, resulting in maximum heater life. The ribbon wire is wound evenly spaced on a specially selected mica strip, providing even heat distribution and thus eliminating hot spotting that can cause premature heater failure.

Duraband's built-in strap is a unique design feature. A low thermal expansion alloy sheath is used for the outer sheath, covering the entire width of the band heater.





- Built-In Bracket for Superior Clamping
- Unbreakable and Torque-Resistant Screw Terminals
- Temperatures Up to 480°C (900°F)
- Full Width Stainless Steel Built-In Strap
- Flexibility to Incorporate Holes and Cutouts
- Available Two-Piece and Expandable Designs
- Best Mica Insulated Heater on the Market
- Faster Delivery than Any Other Type of Heater Band
- Most Economical Among Various Heater Bands
- Most Versatile and Commonly Used Heater Band

#### Typical Applications

- Plastic Injection Molding Machines
- Plastic Extruders
- Oil Reclamation Equipment
- Food and Candy Extruders
- Drum Heating
- Extrusion Dies
- Holding Tanks
- Blow Molding Machines
- Vending Machines
- Barrels and Heads
- Food Service Warming
- Autoclaves and Sterilizers
- Metallurgical Analyzers
- Fluidized Beds
- Hot Runner Molds
- Pulp and Paper Processing Equipment

#### Designed For Trouble-Free Service

The Duraband heater design is the result of many years of research, development and testing for a reliable mica insulated band heater that can perform at the higher operating temperatures [up to 480°C (900°F)] essential to process high temperature resins, providing long, efficient service necessary for today's high productivity of plastic extruders, injection and blow molding machines.

Duraband is a proven heater design for good life efficiency and dependability. It assures maintaining the lowest winding temperatures possible, keeping a low-mass heating element assembly for fast heat-up and quick thermal response to controls. It incorporates the low thermal expansion built-in strap, a unique design feature.

#### Advantages and Variations

Duraband mica insulated heaters are widely used on operations involving heating of cylindrical surfaces and are manufactured in a full range of standard construction variations, physical dimensions, electrical ratings, and a complete arrangement of screw terminals and lead terminations. (See pages 13 through 18).

However, these standard Duraband heater variations and terminations do not represent the full extent of our capabilities. OMEGA's engineering staff, with many years of experience in heat processing and temperature control applications, can assist you in designing the right Duraband heater for your specific application.



## Standard Specifications and Tolerances

### Performance Ratings

**Maximum Temperature:**

**Standard Sheath:** 482°C (900°F)

**Nominal Watt Density:** 3 to 7 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>)

**Maximum Watt Density:** Dependent on heater size and operating temperature

### Electrical Ratings

**Maximum Voltage:** 480 Vac

**Dual Voltage or 3-Phase:** Available depending on heater design

**Maximum Amperage:**

**Lead Wire Termination:** 10 Amp

**Screw Terminations:** 8-32 UNF—20 Amp;  
10-32 UNF—25 Amp

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### Physical Size Construction Limitations

**Minimum Width:** 19.1 mm (¾")

**Width Tolerance:** 1.59 mm (±1/16")

**Minimum Inside Diameter:** 22.1 mm (7/8")

**Nominal Gap:** 9.5 mm (¾")—if a larger gap is required for probes or thermocouples, specify when ordering

### Built-In Brackets

Heater Width	Number of Brackets
38 to 76 mm (1½ to 3")	1
79 to 127 mm (3⅛ to 5")	2
130 to 145 mm (5⅛ to 6⅞")	3
178 to 254 mm (7 to 10")	4
257 to 381 mm (10⅛ to 15")	5

*If tighter tolerances are required, contact OMEGA.*

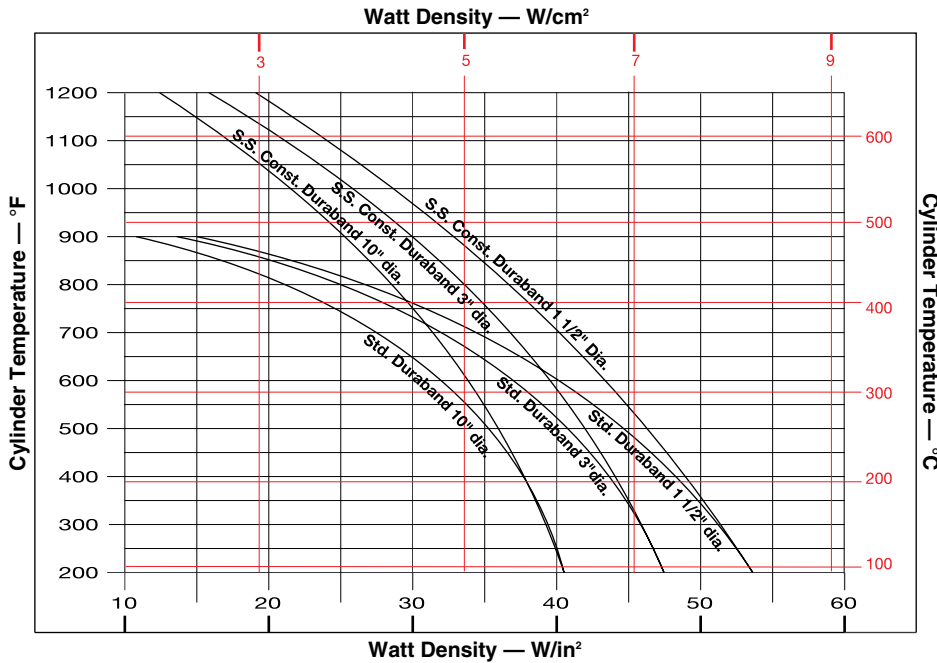
**CAUTION:** Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.

### Minimum ID and Width for Construction/Clamping Styles

Style	Minimum ID		Minimum Width	
	mm	inch	mm	inch
NB	50.8	2	31.8	1¼
NS	76.2	3	31.8	1¼
NE	63.5	2½	31.8	1¼
SB	22.1	7/8	19.1	¾
SS	50.8	2	19.1	¾
SE	63.5	2½	31.8	1¼
FB	25.4	1	19.1	¾
FS	50.8	2	19.1	¾
FE	63.5	2½	31.8	1¼
SL	101.6	4	31.8	1¼
NSL	101.6	4	31.8	1¼
NEL	101.6	4	31.8	1¼
LT	177.8	7	38.1	1½
LS	177.8	7	38.1	1½
LE	177.8	7	38.1	1½
TWL	25.4	1	25.4	1
RNB	134.7	5½	25.4	1
RNS	254	10	25.4	1

**Note:** Refer to individual descriptions for further information. Actual heater minimums will be a combination of termination and construction/strap styles.

## Maximum Watt Densities



### Maximum Allowable Watt Density

The chart displays the maximum Watt Density curves for various diameter heaters. Use this chart when determining the appropriate wattage value for your chosen heater.

Be aware that certain factors will require you to derate the watt density (Watt/in<sup>2</sup>) of your heater selection.

**CAUTION: Failure to adhere to the maximum allowable watt density per heater size will result in poor operating life.**

### Correction Factors

For heaters wider than 76.2 mm (3"), reduce maximum recommended watt density from chart by 20%.

For applications using insulating shroud, reduce maximum recommended watt density from chart by 25%.

### Calculating Maximum Watt Density

#### Factors to be Taken into Consideration:

- A. Type of controls
- B. Voltage variations
- C. Machine cycling rate
- D. Type of resin being processed
- E. Coefficient of thermal expansion and conductivity of the cylinder
- F. Designing a heater that closely matches the wattage requirement will decrease the frequency of cycling and temperature overshoot, thereby increasing the life of the heater.

### Once These Factors have been Established, Proceed with the Following Steps:

1. Determine the maximum operating temperature.
2. Calculate the total wattage required to obtain the maximum operating temperature.
3. Determine the quantity and size of the heater bands to be used. 38 through 76 mm (1½ through 3") wide band heaters have proven to be the most efficient and reliable in most cylindrical heating applications.
4. Determine individual band heater wattage by dividing the total required wattage by the quantity of band heaters selected.
5. Determine the band heater watt density by subtracting unheated areas from the band heater diameter created by screw terminals, gaps, holes, and cutouts (see formula below).
6. Determine if the required watt density previously calculated exceeds the maximum recommended watt density. Note the maximum cylinder temperature required on the left-hand side of the graph, follow the horizontal line until it intersects with the line of the band heater being used, and read directly down to obtain the maximum recommended watt density (Watt/in<sup>2</sup>).
7. If the calculated watt density is higher than the recommended value, it must be corrected or it will cause poor heater life. This can be accomplished by using more band heaters, lowering the heater wattage, or using a different construction type or a different type of band heater.
8. Should you have a problem in selecting the proper band heater or establishing watt density for your application, contact one of the qualified engineers at OMEGA.

Nominal Unheated Areas	
Construction Style	Unheated Area to Subtract
One-piece band	1" x width
Two-piece band	2" x width
Holes and cutouts	Size + ½" x width

### Watt Density Formula

Wattage

$$\text{Watt Density (Watt/in}^2\text{)} = \frac{\text{Wattage}}{[3.14 \times (\text{Band ID}) - \text{Gap-1}\frac{3}{8}] \times \text{Band Width} - \text{Unheated Area (see table)}}$$

Unheated Area (See Table) = Unheated area for construction style + unheated area for any holes or cutouts



## Construction Styles

# 3 Construction Types



Shown with Type NB Built-In Strap

### One-Piece Band

The one-piece construction is available on any screw or lead termination and clamping variation. It can be used where band heaters can be slipped over the end of the cylinder.



Shown with Type NS Built-In Strap

### Two-Piece Band

The two-piece construction is available on any screw or lead and clamping variation. The Duraband two-piece design provides a built-in hinge, making handling and installation easier. It is used on large cylinders or where the heater cannot be slipped over the end of the cylinder. Two-piece band heaters are rated at watts and volts per each half when ordering.

**Note:** Multiple segment designs are recommended on larger diameter [typically larger than 381 mm (15")] heaters to improve the clamping force and increase the surface contact between the heater and the barrel for efficient heat transfer.



Shown with Type NE Built-In Strap

### One-Piece Expandable Band

The one-piece expandable construction is available on any screw or lead and clamping variation. It can be used where a one-piece band heater would have to be expanded to fit over the barrel during installation, rather than slipped over the end of the barrel.

**Note:** The one-piece expandable band should not be opened and closed more than twice.



## Construction/Clamping Variations

### Standard Built-In Strap Clamping (Low Thermal Expansion)

The built-in strap is available with any screw or lead termination and construction variation. The built-in strap eliminates the use of awkward-to-handle separate straps, providing more drawing power than any other type of clamping system. The Duraband with built-in strap is standard on many designs.

#### Type NB—One-Piece Band

**Minimum ID:** 50.8 mm (2")  
**Minimum Width:** 31.8 mm (1¼")

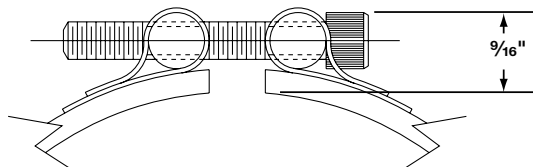
#### Type NS—Two-Piece Band

**Minimum ID:** 76.2 mm (3")  
**Minimum Width:** 31.8 mm (1¼")

#### Type NE—One-Piece Expandable Band

**Minimum ID:** 63.5 mm (2½")  
**Minimum Width:** 31.8 mm (1¼")

Type NB shown

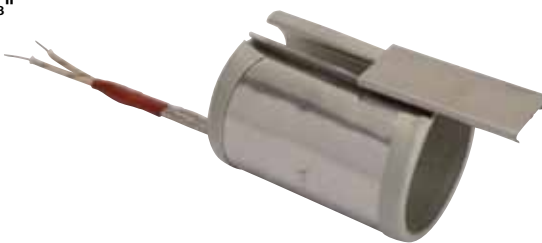
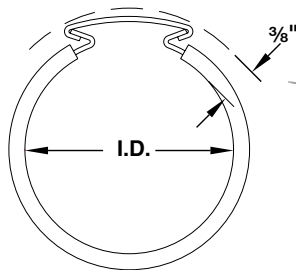


### Wedge Lock

Wedge lock clamping is designed for applications where mounting space is severely limited. It lends itself mainly to small diameter nozzle heaters.

#### Type TWL—One-Piece Band

**Minimum ID:** 25.4 mm (1")  
**Minimum Width:** 25.4 mm (1")  
**Maximum Width:** 88.9 mm (3½")



### Separate Straps

The separate strap clamping is available with any screw or lead termination and construction variation. It is strongly recommended that the Duraband with built-in strap design be used whenever possible because it provides more drawing power than any other type of clamping system.

#### Type SB—One-Piece Band

**Minimum ID:** 22.2 mm (7/8")  
**Minimum Width:** 19.1 mm (¾")

#### Type SS—Two-Piece Band

**Minimum ID:** 50.8 mm (2")  
**Minimum Width:** 19.1 mm (¾")

Type SB shown

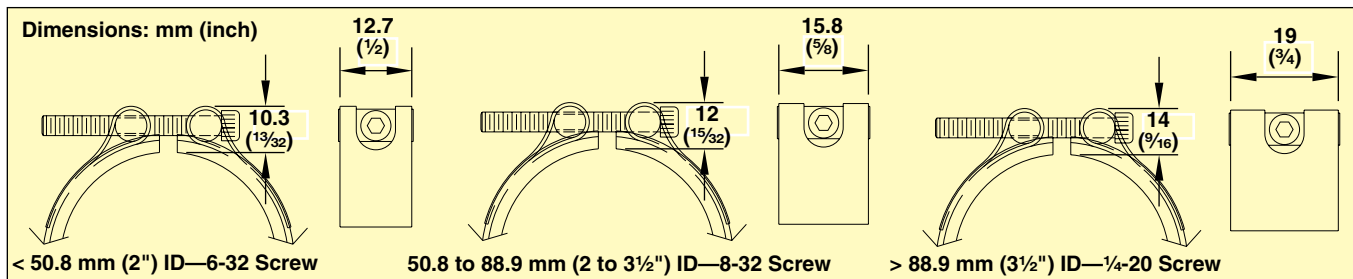


#### Type SE—One-Piece Expandable Band

**Minimum ID:** 63.5 mm (2½")  
**Minimum Width:** 31.8 mm (1¼")

### Clearance Dimensions for Separate Strap Clamping

Separate strap clearance dimensions: Dependent on heater inside diameter. The strap dimensions are shown below.







## Construction/Clamping Variations

### Spring Loaded with Built-In Bracket

The heavy duty stainless steel spring with built-in bracket is a variation on the basic Duraband® design. It is available with any screw or lead termination and construction variation. It is recommended for heaters over 305 mm (12") in diameter, and for any diameter heater used in the vertical position, to prevent the heater from slipping off the machine. The springs provide constant tension, therefore maintaining optimum surface contact against the cylinder being heated.

#### Type SL—One-Piece Band

**Minimum ID:** 101.6 mm (4")

**Minimum Width:** 31.8 mm (1¼")

#### Type NSL—Two-Piece Band

**Minimum ID:** 101.6 mm (4")

**Minimum Width:** 31.8 mm (1¼")

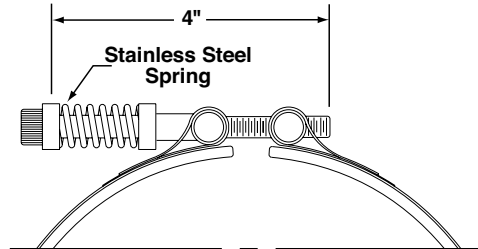
#### Type NEL—One-Piece Expandable Band

**Minimum ID:** 101.6 mm (4")

**Minimum Width:** 31.8 mm (1¼")



Type SL shown



### Latch and Trunion

The latch and trunion clamping system is available with any screw or lead termination and construction variation. It is ideal in absorbing thermal expansion due to the spring loading on the screws. The latch fully opens, facilitating installation on large diameter cylinders. The outer sheath is made from a low thermal expansion alloy.

#### Type LT—One-Piece Band

**Minimum ID:** 177.8 mm (7")

**Minimum Width:** 38.1 mm (1½")

#### Type LS—Two-Piece Band

**Minimum ID:** 177.8 mm (7")

**Minimum Width:** 38.1 mm (1½")

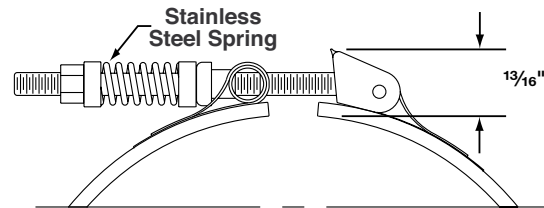
#### Type LE—One-Piece Expandable Band

**Minimum ID:** 177.8 mm (7")

**Minimum Width:** 38.1 mm (1½")



Type LT shown



### Bent-Up Flange (Ears)

The bent-up flange clamping is available with any screw or lead termination and construction variation. The outer sheath is made from a low thermal expansion alloy. The bent-up flange design is best suited for narrow band heaters with small diameters.

#### Type FB—One-Piece Band

**Minimum ID:** 25.4 mm (1")

**Minimum Width:** 19.1 mm (¾")

#### Type FS—Two-Piece Band

**Minimum ID:** 50.8 mm (2")

**Minimum Width:** 19.1 mm (¾")

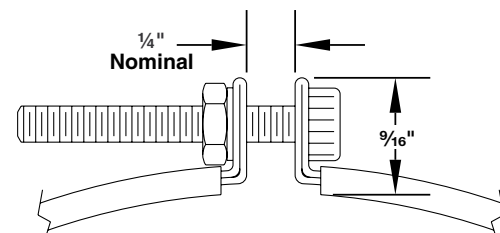
#### Type FE—One-Piece Expandable Band

**Minimum ID:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")



Type FB shown



**Note:** The bent-up flange design should only be used when other clamping methods are not suitable for a specific application. OMEGA recommends built-in strap clamping be used whenever possible, especially on large diameter heaters, because it provides superior clamping power.



### Internal Reverse Bands

#### Type RN—Internal Reverse Band (with Bracket Clamping)

This construction style is used to heat cylindrical surfaces from the inside on heaters 140 mm (5½") diameter and larger.

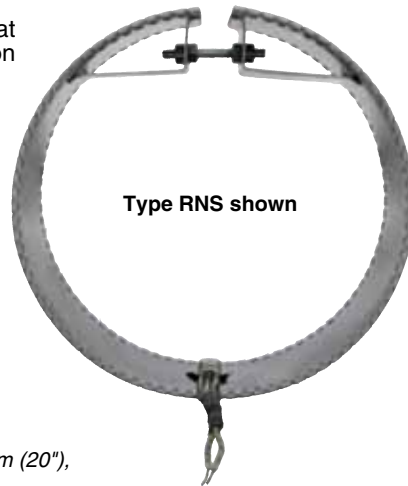
#### Type RNB—Reverse 1-Piece Construction

ID: 139.7 to 2854 mm (5½ to 10")  
Width: 25.4 to 88.9 mm (1" to 3½")  
Maximum Voltage: 240 Vac

#### Type RNS—Reverse 2-Piece Construction

ID: 254 to 508 mm (10 to 20")  
Width: 25.4 to 88.9 mm (1 to 3½")  
Maximum Voltage: 240 Vac

For inside diameters greater than 508 mm (20"), contact OMEGA with your requirements.



#### Type RTWL—Internal Reverse Band (with Wedge Lock Clamping)

This construction style is used to heat cylindrical surfaces from the inside on heaters less than 127 mm (5") outside diameter.

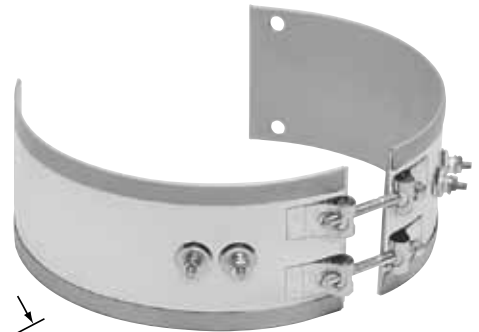
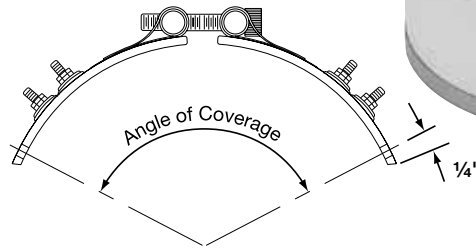


ID: Less than 139.7 mm (5½")  
Width: 25.4 to 88.9 mm (1 to 3½")

### Partial Coverage

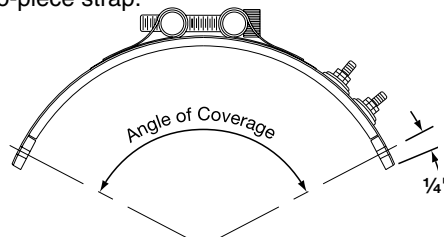
#### Type NS—2-Piece with Built-In Brackets

Partial coverage band heaters are normally required when holes and cutouts will not allow the heater to sufficiently clear the machine obstructions. The preferred method of construction is the two-piece band heater with built-in brackets as illustrated. The heater is screwed down to the cylinder at the ends and the built-in low thermal expansion strap pulls the heater tightly against the cylinder being heated. The standard center of hole to edge of heater dimension is 6.3 mm (¼"). When ordering, please provide the angle of coverage from center to center of the mounting screw holes as shown.



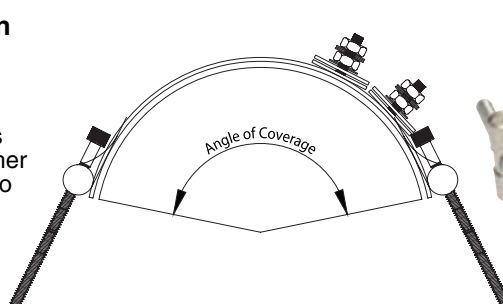
#### Type PS—One-Piece with Two-Piece Separate Strap with Padded Ends

The alternate method of partial coverage construction is the one-piece band heater with a separate two-piece strap. The two-piece strap itself is screwed down at the padded ends, allowing the heater to float between the pads as illustrated. When the strap is tightened, it will pull the heater against the cylinder being heated. The standard center of hole to edge of heater dimension is 6.3 mm (¼"). When ordering, please provide the angle of coverage from center to center of the mounting screw holes as shown.



#### Type NB—One-Piece with Built-In Strap Clamping

Another alternate method of partial coverage construction. The one piece with clamp screws on both sides allows it to be secured to anchor points on either side of a barrel without drilling holes into the barrel.





## Terminations—Stainless Steel Power Terminals: Type T1, Type T2 and Type T3

Available on any clamping or construction variation, the specially designed stainless steel power terminals are internally connected to the heater and are resistant to over-torquing.

The screw terminals are virtually unbreakable. Secure tightening of the electrical connections is essential for safety and long heater life.

### Type T1—Screw Terminals

#### One-Piece Band

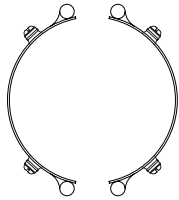
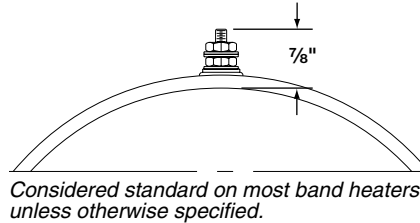
**Standard Termination Location:** Each side of gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 22.2 mm (7/8")

**Post Terminals:** 10-32 standard except 8-32 on <1" wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)



#### Two-Piece Band

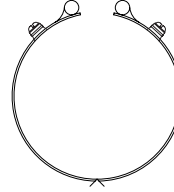
**Standard Termination Location:** Next to gaps on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 22.2 mm (7/8")

**Post Terminals:** 10-32 standard except 8-32 on <1" wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Each side of gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Post Terminals:** 10-32 standard except 8-32 on heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)

### Type T2—Screw Terminals

#### One-Piece Band

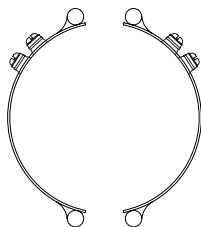
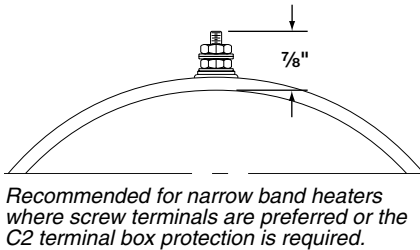
**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 22.2 mm (7/8")

**Post Terminals:** 10-32 standard except 8-32 on <1" wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)



#### Two-Piece Band

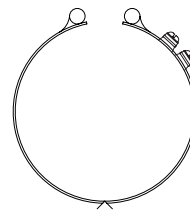
**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 22.2 mm (7/8")

**Post Terminals:** 10-32 standard except 8-32 on <1" wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Post Terminals:** 10-32 standard except 8-32 on heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)

## Terminations

### Type T3-Screw Terminals

#### One-Piece Band

**Standard Termination Location:**

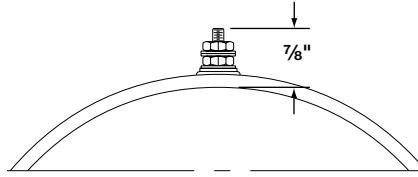
Next to gap; across center of width

**Minimum Inside Diameter:** 50.8 mm (2")

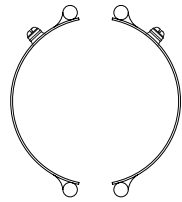
**Minimum Width:** 50.8 mm (2")

**Post Terminals:** 10-32 standard except 8-32 on 50.8 to 63.5 mm (2 to 2½") wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)



The preferred design on band heaters over 76.2 mm (3") wide or when C3 terminal box is required.



#### Two-Piece Band

**Standard Termination Location:**

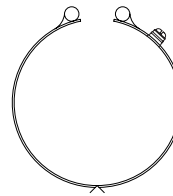
Next to same gap on each half; across center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 50.8 mm (2")

**Post Terminals:** 10-32 standard except 8-32 on 50.8 to 63.5 mm (2 to 2½") wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/ 25 A (10-32) or 20 A (8-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; across center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 50.8 mm (2")

**Post Terminals:** 10-32 standard except 8-32 on 50.8 to 63.5 mm (2 to 2½") wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/ 25A (10-32) or 20 A (8-32)

## Optional Igloo™ Ceramic Covers for Heaters with Screw Terminals

Igloo™ ceramic terminal covers consist of two individual ceramic parts. Unlike conventional ceramic caps, Igloo fully insulates any standard #8 or #10 terminal lugs used for electrical hook-ups.

#### Limitations

To assemble Igloo covers, terminals should be at least 22 mm (7/8") apart

**Minimum ID:** 50.8 mm (2")

**Minimum Width:** 31.7 mm (1¼")

Three types of Igloo™ bases are available:

**Type C6**—Double Port In-Line model number: CER-101-104

**Type C7**—Double Port 90° model number: CER-101-106

**Type C8**—Single Port model number: CER-101-107

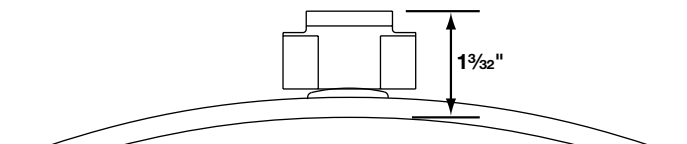
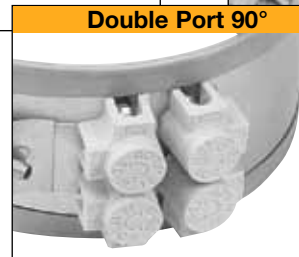
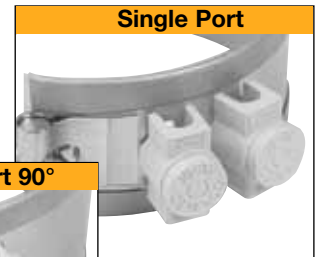
**Igloo™ Caps are Available in the Following Three Screw Terminal Sizes:**

**10-32**—model number: CER-102-101

**10-24**—model number: CER-102-104

**8-32**—model number: CER-102-105

When ordering, specify the type of Igloo and the screw terminal size.



**CAUTION:** Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.



## Terminations—Low-Profile Button Terminals: Type B1, Type B2 and Type B3

Available on any clamping or construction variation, the specially designed stainless steel button terminals are internally connected to the heater and are resistant to

over-torquing while offering a low profile for tight spaces. They are virtually unbreakable. Secure tightening of the electrical connections is essential for safety and long heater life.

### Type B1—Button Terminals

#### One-Piece Band

**Standard Termination Location:** Each side of gap; center of width

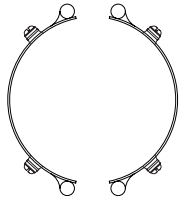
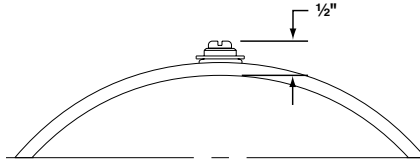
**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts:** 480 Vac

**Maximum Amps:** 25 A (10-32) or 20 A (6-32)



#### Two-Piece Band

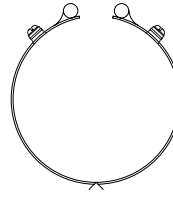
**Standard Termination Location:** Next to gaps on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Each side of gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32)

### Type B2—Button Terminals

#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

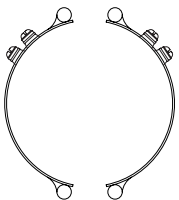
**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts:** 480 Vac

**Maximum Amps:** 25 A (10-32) or 20 A (6-32)



#### Two-Piece Band

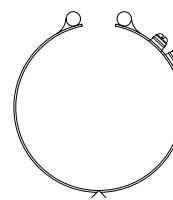
**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 On IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32)



### Type B3-Button Terminals

#### One-Piece Band

**Standard Termination Location:** Next to gap; across center of width

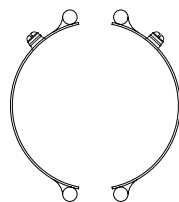
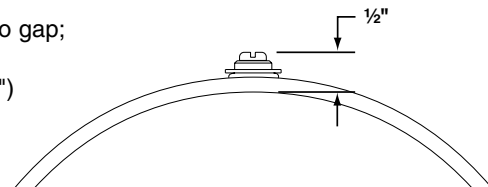
**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 60.3 mm (2 3/8")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts:** 480 Vac

**Maximum Amps:** 25 A (10-32) or 20 A (6-32)



#### Two-Piece Band

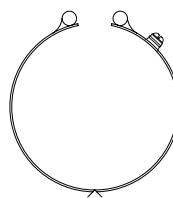
**Standard Termination Location:** Next to same gap on each half; across center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 60.3 mm (2 3/8")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; across center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 60.3 mm (2 3/8")

**Screw Size:** 10-32 standard except 6-32 On IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32)

## Plain Lead Wire Terminations: Type L1, Type L2 and Type L4 Available on Any Clamping or Construction Variation

### Type L1-Straight Lead Wires

The lead wires exit through a brass eyelet. The standard flexible leads are 254 (10") long with 76 (3") of fiberglass sleeving.

**Note:** If longer leads are required, specify when ordering.

#### One-Piece Band

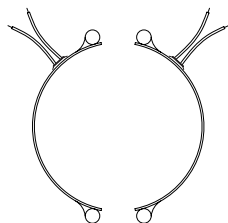
**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

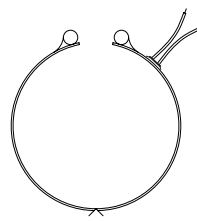
**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480V each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480V

**Maximum Amps:** 10 A



## Terminations

### Type L2—Straight Lead Wires

Type L2 is the preferred termination on all small diameter and small width band heaters. The standard flexible leads are 254 mm (10") long with 76 mm (3") of fiberglass sleeving.

*Note: If longer leads are required, specify when ordering.*



#### One-Piece Band

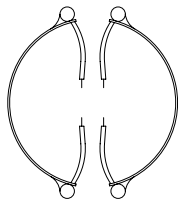
**Standard Termination Location:** Each side of gap; edge of width

**Minimum Inside Diameter:** 22.2 mm ( $\frac{7}{8}$ " )

**Minimum Width:** 19.1 mm ( $\frac{3}{4}$ " )

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

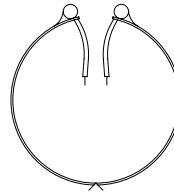
**Standard Termination Location:** Each side of each gap; edge of width

**Minimum Inside Diameter:** 50.8 mm (2" )

**Minimum Width:** 19.1 mm ( $\frac{3}{4}$ " )

**Maximum Volts:** 480V each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Each side of gap; edge of width

**Minimum Inside Diameter:** 63.5 mm ( $2\frac{1}{2}$ " )

**Minimum Width:** 31.8 mm ( $1\frac{1}{4}$ " )

**Maximum Volts:** 480V

**Maximum Amps:** 10 A

### Type L4—Straight Lead Wires

Type L4 is a suitable lead termination for small band heaters. The standard flexible leads are 254 mm (10") long with 76 mm (3") of fiberglass sleeving.

*Note: If longer leads are required, specify when ordering.*

#### One-Piece Band

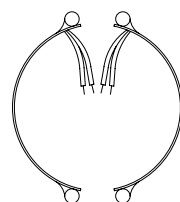
**Standard Termination Location:** Same side of gap; edge of width

**Minimum Inside Diameter:** 22.2 mm ( $\frac{7}{8}$ " )

**Minimum Width:** 25.4 mm (1" )

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

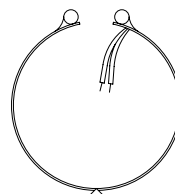
**Standard Termination Location:** Each side of same gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2" )

**Minimum Width:** 25.4 mm (1" )

**Maximum Volts:** 480V each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Same side of gap; edge of width

**Minimum Inside Diameter:** 63.5 mm ( $2\frac{1}{2}$ " )

**Minimum Width:** 31.8 mm ( $1\frac{1}{4}$ " )

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



## Abrasion Resistant Lead Terminations: Type W1, Type W2, Type W2M, Type W3, Type W4 and Type W5M

### Type W1–Straight Wire Braid Leads

Available on any clamping or construction variation. Wire braid leads offer sharp bending not possible with armor cable.

The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads.

**Note:** If longer leads are required, specify when ordering.



#### One-Piece Band

**Standard Termination Location:**

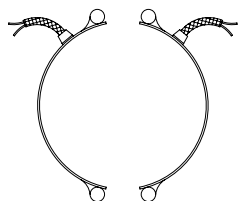
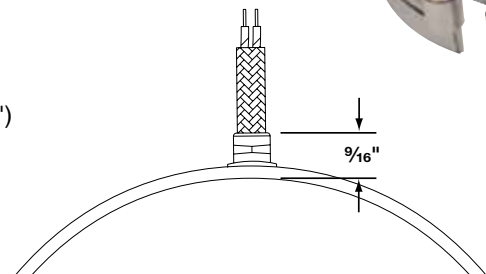
Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

**Standard Termination Location:**

Next to same gap on each half; center of width

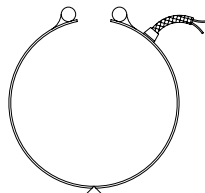
**Minimum Inside Diameter:**

50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:**

Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A

### Type W2–Wire Braid Leads

The W2 wire braid exits at 180° from the gap for special nozzle heating applications. Sleeving is used for additional protection. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads with 76 mm (3") of fiberglass sleeving.

**Note:** If longer leads are required, specify when ordering.

Type W2 is not available on two-piece or one-piece expandable Duraband heaters.

#### One-Piece Band

**Standard Termination Location:**

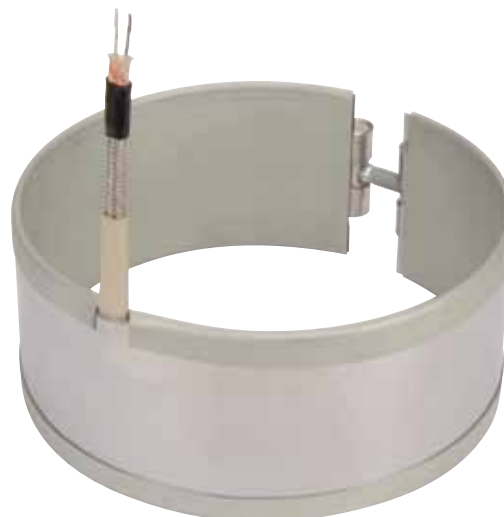
Opposite the gap; edge of width

**Minimum Inside Diameter:** 22.2 mm (7/8")

**Minimum Width:** 28.6 mm (1⅛")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A







## Terminations

### Type W3—Single Wire Braid Leads

Highly recommended for nozzle heating applications. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads with 76 mm (3") of fiber glass sleeving.

**Note:** If longer leads are required, specify when ordering.



#### One-Piece Band

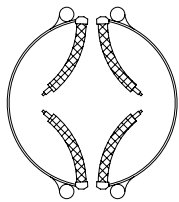
**Standard Termination Location:** Each side of gap; edge of width

**Minimum Inside Diameter:** 19.1 mm (¾")

**Minimum Width:** 22.2 mm (7/8")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

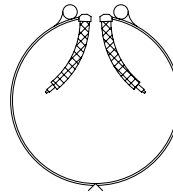
**Standard Termination Location:** Each side of each gap; edge of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 19.1 mm (¾")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Each side of gap; edge of width

**Minimum Inside Diameter:** 19.0 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A

### Type W4—Wire Braid Leads on One Side

A suitable termination for nozzle heating applications. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads.

**Note:** If longer leads are required, specify when ordering.



#### One-Piece Band

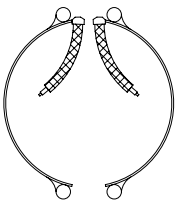
**Standard Termination Location:** Next to gap; edge of width

**Minimum Inside Diameter:** 22.2 mm (7/8")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

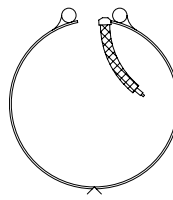
**Standard Termination Location:** Next to same gap on each half; edge of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; edge of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



### Type W2M-Right-Angle Wire Braid Leads, 90° to Heater

Stainless steel wire braid exits perpendicular to the heater centerline through a low profile stainless steel cap. This cap acts as a strain relief which protects against excessive flexing or pulling of the lead wire. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads.

**Note:** If longer leads are required, specify when ordering. Stainless steel construction may be required for widths of 22.2 mm (7/8") to 41.3 mm (1 5/8").



#### One-Piece Band

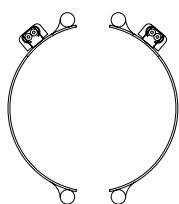
**Standard Termination Location:** Opposite of gap; center of width

**Minimum Inside Diameter:** 38.1 mm (1 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A

### Type W5M-Right-Angle Wire Braid Leads, Parallel to Heater

Stainless steel wire braid exits parallel to the heater centerline through a low profile stainless steel cap. This cap acts as a strain relief which protects against excessive flexing or pulling of the lead wire. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads.

**Note:** If longer leads are required, specify when ordering. Stainless steel construction may be required for widths of 22.2 mm (7/8") to 41.3 mm (1 5/8").



#### One-Piece Band

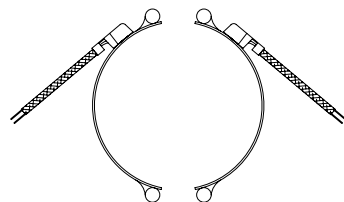
**Standard Termination Location:** Opposite of gap; center of width

**Minimum Inside Diameter:** 38.1 mm (1 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

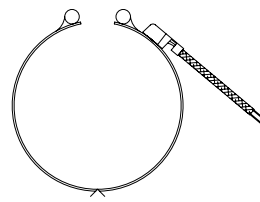
**Standard Termination Location:** Next to same gap on each side; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



## Terminations—Armor Cable Terminations: Type R1, Type R2 and Type R3

Available on any clamping or construction variation. Armor cable provides far superior protection to lead wires where

abrasion is a constant problem. The standard leads are 254 mm (10") of armor cable over 305 mm (12") of flexible leads.

*Note: If longer leads are required, specify when ordering.*

### Type R1 – Straight Armor Cable

- Type R1A—Galvanized armor cable, crimped
- Type R1B—Stainless Steel armor cable, crimped
- Type R1C—Galvanized armor cable, tack welded

- Type R1D—Stainless Steel armor cable, tack welded
- Type R1E—Galvanized armor cable, full silver brazing
- Type R1F—Stainless Steel armor cable, full silver brazing

#### One-Piece Band

##### Standard Termination Location:

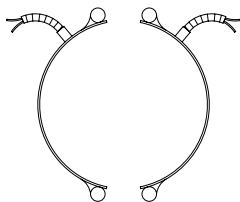
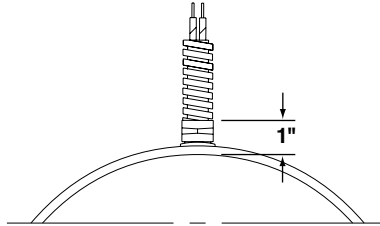
Next to gap; center of width

**Minimum Inside Diameter:** 38.1 mm (1½")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

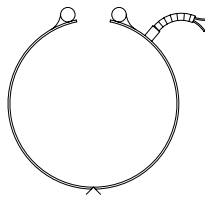
##### Standard Termination Location:

Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/10 A each half



#### One-Piece Expandable Band

##### Standard Termination Location:

Next to gap; center of width

**Minimum Inside Diameter:** 65.3 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A

## Type R2—Right-Angle Armor Cable

- Type R2A—Galvanized armor cable, crimped
- Type R2B—Stainless Steel armor cable, crimped
- Type R2C—Plain leads, no cable

#### One-Piece Band

##### Standard Termination Location:

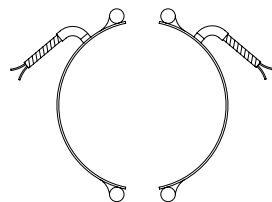
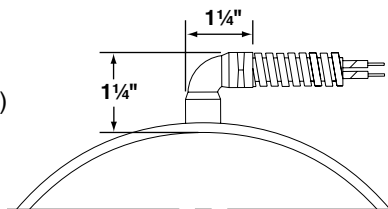
Next to gap; center of width

**Minimum Inside Diameter:** 38.1 mm (1½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

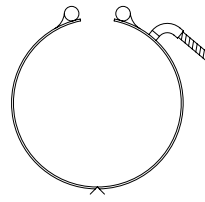
##### Standard Termination Location:

Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A each half



#### One-Piece Expandable Band

##### Standard Termination Location:

Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A



### Type R3-Removable Armor Cable

- Type R3A-Plain leads and female fitting
- Type R3B-Leads, male adaptor and galvanized armor
- Type R3C-Leads, male adaptor and stainless steel armor

Recommended on applications where removable armor is required. The fitting will accept the standard armor cable connector. The standard leads are 254 mm (10") of armor cable over 305 mm (12") of flexible leads.

*Note: If longer leads are required, specify when ordering.*

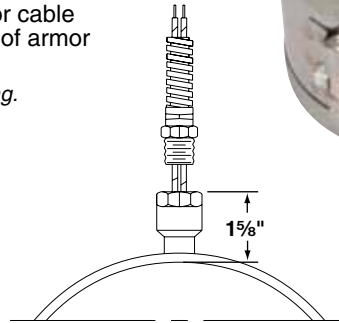
#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

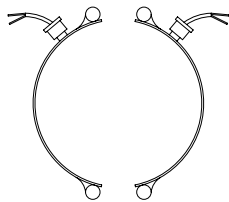
**Minimum Inside Diameter:** 38.1 mm (1½")

**Minimum Width:** 31.7 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A



Type R3B shown



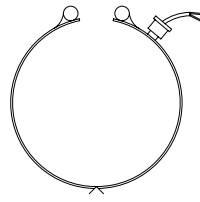
#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.7 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A

### Type S1-Lead Wire Spring Strain Relief

- Type S1A-Plain leads and strain relief spring
- Type S1B-Stainless steel wire braided leads and strain relief spring. 254 mm (10") of braid over 305 mm (12") of flexible leads is standard.

A strain relief spring is attached to the heater at the termination exit to reduce strain on leads subjected to excessive flexing. The spring is 54 mm (2½") long. The flexible standard leads are 254 mm (10") long with 76 mm (3") of fiberglass sleeving.

*Note: If longer leads are required, specify when ordering.*

#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

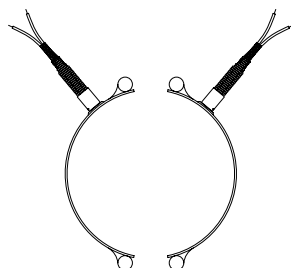
**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



Type S1B shown



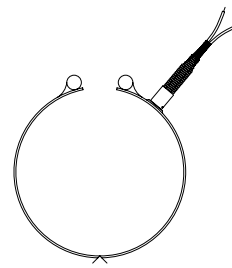
#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.75 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.75 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A



## Terminations—General Purpose Terminal Boxes: Type C2 and Type C5

Available with any construction or clamping variation. They are a simple and economical way to protect employees from electric shock or prevent electric shorts that can result from exposed wiring on band heater electrical installations.

The heavy duty terminal boxes have 13 mm (1/2") knockouts that will accept standard armor cable connectors. They can be field assembled on band heaters that have a center

distance between terminal screws of 22 mm (7/8"). Boxes can be pre-wired with galvanized armor, stainless steel armor, wire braid or plain leads. If a low profile box with cable or leads is required, it is strongly recommended to order it pre-wired by the factory.

The standard leads are 254 mm (10") of cable or wire braid over 305 mm (12") of flexible leads. If longer leads are required, specify when ordering.

### Type C2—Terminal Boxes

#### Type C2—Standard Box

C2A—Box only

C2B—with galvanized armor

C2C—with stainless steel armor

C2D—with wire braid

#### One-Piece Band

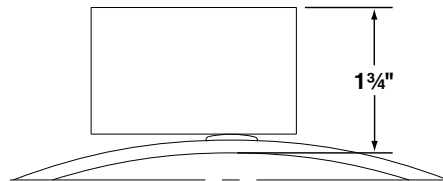
##### Standard Termination Location:

Next to gap; center of width

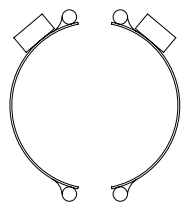
**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A



Type C2 shown



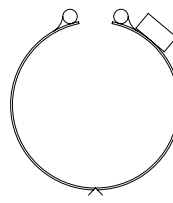
#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A

Heater widths between 25 and 64 mm (1 and 2 1/2") require a minimum ID of 140 mm (5 1/2") or greater.

### Type C5—Terminal Boxes

#### Type C5—Low Profile Box

C5A—Box only

C5B—with galvanized armor

C5C—with stainless steel armor

C5D—with wire braid

C5J—with plain leads

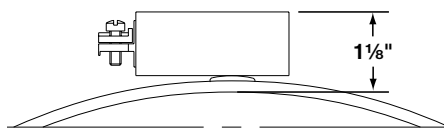
#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

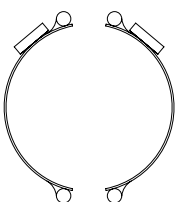
**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A



Type C5 shown



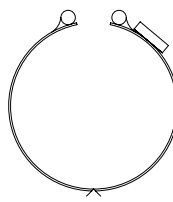
#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A



## Quick Disconnect Plugs: Type P1, Type P2, Type P3 and Type P4

Available on any construction or clamping variation. These plug assemblies are highly recommended and should be used whenever possible. The combination of plug and cup assembly along with armor cable covered leads eliminates all live exposed terminals or wiring that can be a potential hazard to employees or machinery.

Type P1 and P3 assemblies are available with a straight or right-angle plug. Type P2 and P4 plug assemblies have a lower profile and are available with a straight plug only.

To simplify installation, band heaters with these assemblies can be supplied pre-wired, using high temperature lead wires.

The standard leads are 254 mm (10") of armor cable over (12") of flexible leads. If longer leads are required, specify when ordering.

### Type P1—High Temperature Quick Disconnect Plugs

#### Type P1

**P1K**—Cup assembly only

**P1L**—with straight plug

**P1M**—with 90° plug only

**P1N**—with straight plug and galvanized cable

**P1O**—with straight plug and stainless steel cable

**P1P**—with straight plug and wire braid

**P1Q**—with 90° plug and galvanized cable

**P1R**—with 90° plug and stainless steel cable

**P1S**—with 90° plug and wire braid



Type P1Q shown

#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

#### Plug Electrical Ratings

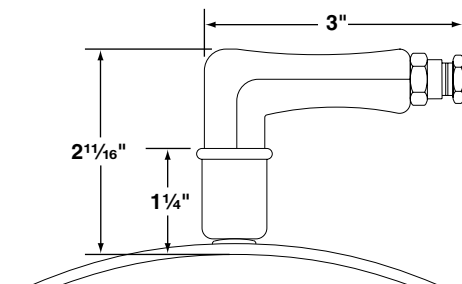
**2-Pole 3-Wire Grounding**

**Maximum Volts:** 250 Vac

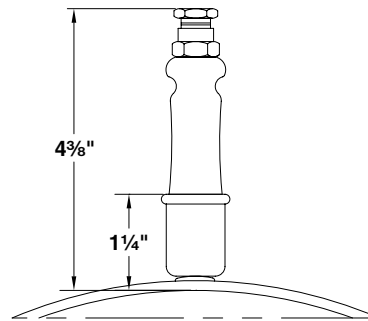
**Maximum Amps:** 16 A

**Maximum Temperature:** 300°C (572°F)

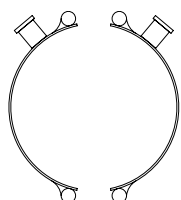
If width is between 38 and 51 mm (1½ and 2"), minimum diameter is 140 mm (5½"). If width is greater than 64 mm (2"), minimum diameter is 64 mm (2")



Type P1M



Type P1L

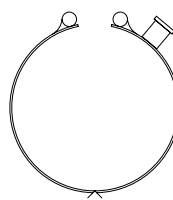


#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 38.1 mm (1½")



## Terminations

### Type P2—High Temperature Quick Disconnect Plugs

**Type P2—Low Profile Assembly**  
**P2F**—Low profile assembly only  
**P2G**—with straight plug only

**P2H**—with straight plug and galvanized cable  
**P2J**—with straight plug and stainless steel cable  
**P2K**—with straight plug and wire braid

#### One-Piece Band

**Standard Termination Location:**  
 Next to gap; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")

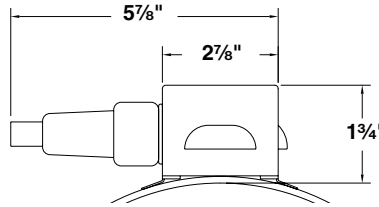
#### Plug Electrical Ratings

**2-Pole 3-Wire Grounding**

**Maximum Volts:** 250 Vac

**Maximum Amps:** 16 A

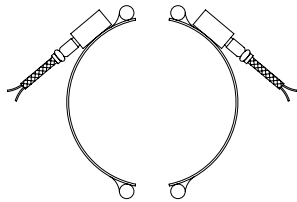
**Maximum Temperature:** 300°C (572°F)



Type P2G shown



Type P2H shown

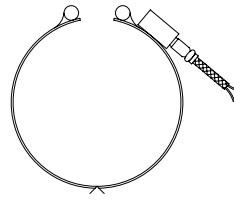


#### Two-Piece Band

**Standard Termination Location:**  
 Next to same gap on each half;  
 center of width

**Minimum Inside Diameter:**  
 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")



#### One-Piece Expandable Band

**Standard Termination Location:**  
 Next to gap; center of width

**Minimum Inside Diameter:**  
 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")

### Type P3—DIN 49458 A/B Quick Disconnect Plugs

**Type P3—Vertical Box Assembly**  
**P3A**—Box assembly only

**P3B**—Box assembly with straight plug  
**P3C**—Box assembly with right-angle plug only

#### One-Piece Band

**Standard Termination Location:** Next to gap;  
 center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 38.1 mm (1½")

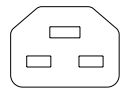
#### Plug Electrical Ratings

**2-Pole 3-Wire Grounding**

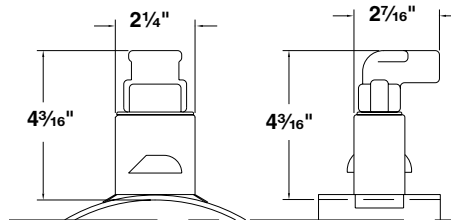
**Maximum Volts:** 250 Vac

**Maximum Amps:** 16 A

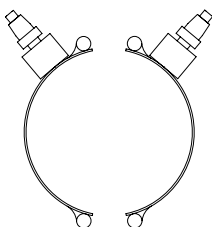
**Maximum Temperature:** 200°C (392°F)



Standard pin orientation



Type P3C shown

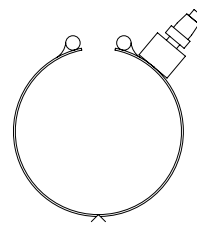


#### Two-Piece Band

**Standard Termination Location:**  
 Next to same gap on each half;  
 center of width

**Minimum Inside Diameter:**  
 76.2 mm (3")

**Minimum Width:** 38.1 mm (1½")



#### One-Piece Expandable Band

**Standard Termination Location:**  
 Next to gap; center of width

**Minimum Inside Diameter:**  
 76.2 mm (3")

**Minimum Width:** 38.1 mm (1½")



### Type P4—DIN 49458 A/B Quick Disconnect Plugs

#### Type P4—Horizontal Box Assembly

P4A—Box assembly only

P4B—Box assembly with straight plug

#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")

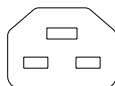
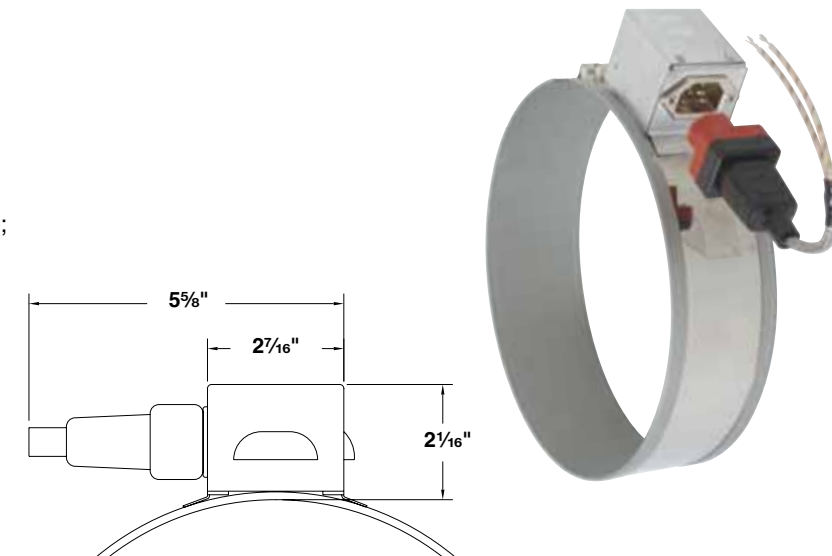
#### Plug Electrical Ratings

**2-Pole 3-Wire Grounding**

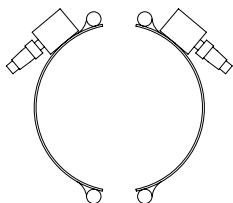
**Maximum Volts:** 250 Vac

**Maximum Amps:** 16 A

**Maximum Temperature:** 200°C (392°F)



Standard pin orientation

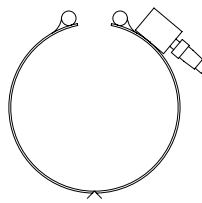


#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

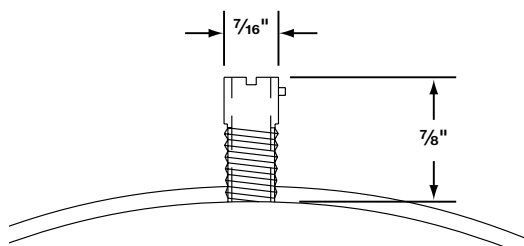
**Minimum Width:** 76.2 mm (3")

## Special Duraband® Construction Options and Variations

### Thermocouple Bayonet Adaptor

A standard bayonet adaptor facilitates the installation of an external thermocouple with a standard bayonet cap. The standard location for the adaptor is 90° from the gap. Specify without through hole for heater sensing or with through hole for load sensing. For heaters less than 25 mm (1" ) wide order separate strap clamping and utilize the gap for the thermocouple.

Visit [omega.com](http://omega.com) for a complete selection of thermocouples.







## Construction Options and Variations

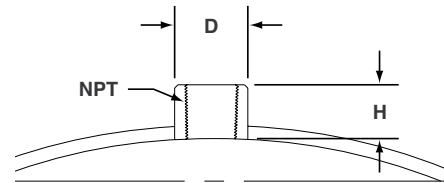
### Thermocouple Coupling

The thermocouple coupling facilitates the installation of an external thermocouple with a threaded fitting to sense the temperature of the band. The standard location for the coupling is 90° from the gap. Specify without through hole for heater sensing or with through hole for load sensing.



#### Available Bushing Sizes

Thread	D, mm (inch)	H, mm (inch)
1/8-27 NPT	14.2 (9/16)	15.8 (5/8)
1/4-20 NPT	19 (3/4)	17.4 (1 1/16)
3/8-18 NPT	22.2 (7/8)	15.8 (5/8)
M12-1.75 mm	19 (3/4)	12.7 (1/2)



### Holes and Cutouts

Holes and cutouts are normally required in band heaters for clearance for thermocouple probes or holding bolts. An oversize gap can in many cases serve the same purpose, saving the expense of the hole.

Using the center of the gap as a starting point, specify the location of the centerpoint of the hole or cutout in terms of degrees and the distance from the edge of the heater. In addition, state the size of the hole or cutout.

For critical hole and cutout locations, a detailed drawing will be required.

**Note:** A minimum of 13 mm (1/2") is required from the hole to the edge of the heater.



### Hinged Two-Piece Band

The hinged two-piece band heater is connected with a continuous hinge for easy installation and removal. This heater can be opened and closed as often as is necessary. The preferred method of clamping is latch and trunnion. It is available with any screw or lead variation. When ordering, specify watts and volts each half.

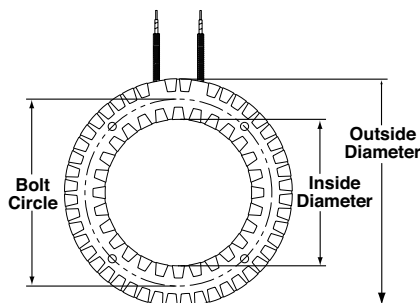
**Minimum Width:** 34.9 mm (1 3/8")



## Special Mica Insulated Heater Construction Variations

### Ring Heaters

When ordering ring heaters, specify inside and outside diameters. If mounting holes are required, specify location and hole size. For critical hole and cutout locations, a detailed drawing will be required.





## Duraband Features

### Additional Duraband® Heater Features

#### Electrical Variations

##### Three-Phase

On very high wattage band heaters it would be advantageous to set up the wiring three-phase to reduce the current load across a single conductor. Three-phase wiring is available on select clamping/construction or termination variation (termination location is subject to engineering approval).

**Minimum ID:** 76.2 mm (3"), **Minimum Width:** 50.8 mm (2")

##### Dual Voltage

Band heaters can be designed using 3-wire series/parallel circuits for dual voltage applications. Whether the heater is run on the higher or lower voltage, the wattage will be the same. Dual Voltage wiring is available on any clamping/construction or termination variation.

##### Ground Terminal or Lead

For those applications requiring a separate ground terminal or lead attached to the heater sheath. A ground terminal or lead is available on any clamping/construction or termination variation.

##### Single Phase/Three Phase Duraband

Heaters can be designed with multiple circuits to operate single or three-phase.

#### Lead Variations

##### Electrical Plugs

Industry standard NEMA Twist-Lock® electrical plugs are available. The plugs can be attached to fiberglass leads, armor cable or wire braid. Electrical plugs can be added to any clamping/construction or termination variation.

#### Built-In Thermocouples

Heaters can be manufactured with a built-in thermocouple to closely control the temperature of the heater.

Type J or K thermocouples are available with fiberglass, wire braid or any other required insulation. Contact OMEGA with your requirements.

#### Construction Variations

##### All Stainless Steel Construction

Mica band heaters can be constructed with the external sheath made entirely from stainless steel. This allows the Duraband to reach the maximum temperature of 650°C (1200°F). All stainless steel construction is available on any clamping/construction or termination variation.

##### Other Sheath Materials

Other sheath materials, such as rust-resistant steel, Monel®, aluminum, or copper are also available for unique applications.

#### Terminal Lugs

Various types of crimp terminals can be attached to the heater leads to make wiring into applications quick and easy. High temperature [649°C (1200°F)] ring terminals and nylon or PVC insulated terminals are available. Spade, ring, and right-angle or straight quick disconnect type terminals can be attached to the leads.



Plug Model No.	Receptacle Model No.	Reference	NEMA P or R	Amps	Volts
EHD-102-113	EHD-103-104	P4 twist lock	L5-15	15	125
EHD-102-121	EHD-103-107	P5 twist lock	L6-15	15	250
EHD-102-104	N/A	P9 twist lock	L2-20	20	250

#### Custom Engineered/Manufactured Heaters

Understanding that an electric heater can be very application specific, for sizes not listed OMEGA® will design and manufacture a Duraband Heater to meet your requirements.

#### Please Specify the Following:

- Inside Diameter
- Width
- Wattage
- Voltage
- Quantity
- Termination (see pages 9 through 22)
- Lead Cable/Braid Length
- Construction style (see pages 5, 22)
- Clamping variation (see pages 6 through 8)
- Special Features



## Installation Recommendations

### Installation Accessories Available

- High Temperature Terminal Lugs
- Igloo™ Ceramic Terminal Covers
- UL Listed Plugs
- High Temperature Lead Wire 450°C (842°F)
- Armor Cable
- Stainless Steel Braid

- High Temperature Sleeving
- Stainless Steel Barrel Covers
- High Temperature Mica Insulated Wiring Harnesses 450°C (842°F)
- Thermocouples
- Temperature Controllers
- High Temperature Fiberglass Tape

1. Disconnect electric power to the machine and/or heaters prior to installing or replacing heaters.
2. Do not install heaters in areas where combustible gases, vapor or dust is present.
3. Use as many narrow band heaters as the application will permit. 38 through 76 mm (1½ through 3") wide heaters are recommended.
4. Using a heater that closely matches the wattage requirements will decrease the frequency of cycling and temperature overshoot, thereby increasing the life of the heater.
5. Make certain that all barrel surfaces are clean and have a smooth finish. Any contaminants or imperfections on the surface can cause premature heater failure.
6. Expandable type Mica Band Heaters may be opened once at the gap to fit on the barrel. Do not open these heaters beyond their specified heater diameter.

**Caution:** Do not open one-piece non-expandable type mica band heaters. Opening of these heaters can damage Mica Insulation and will create electrical short circuits.

7. Position heater bands on the barrel.
8. Securely tighten heater bands around the barrel. Clamping force must be equally distributed on heaters with more than one set of clamping brackets. *Recommended clamping bolt torque is 10 ft./lbs.*
9. For heaters with screw terminals, remove the top nut and flat washers from the power screw terminals. Do not remove or loosen the bottom nut on the power screw terminals. The bottom nut is tightened to 60 in./lbs. at the factory. A loose bottom nut may cause premature heater failure.
10. All electrical wiring of heater bands should be done by a qualified electrician.
  - A. Use only Stainless Steel or other high temperature lugs to prevent material degradation when exposed to high temperatures over a prolonged period of time.

**Caution:** Do not use copper or plated copper lugs.

- B. Use only lead wire with high temperature insulation and proper gauge size.

- C. When connecting power leads to screw terminals make certain that barrels of terminal lugs are not facing down toward the heater case, which will create a short circuit. *Tighten the top nut to 30 in./lbs.*
- D. Make certain power lead wires do not make contact with hot heater surface to avoid degradation of lead wire, as this can cause electrical short circuits.
- E. Make sure the voltage input to the heater bands does not exceed the voltage rating that is stamped on the heater band.
- F. It is recommended that an amperage reading is taken for each heater to verify proper wiring. *(Amps = Watts/Volts)*
11. Insulate all live electrical wires per applicable safety standards.
12. Begin heater band re-tightening procedure. Be sure to wear protective gloves.
  - A. Energize heater bands and allow the heater to reach 149°C (300°F). This usually takes between 3 and 5 minutes.
  - B. Turn off power and immediately re-tighten the heater bands to 10 ft./lbs. Turn power back on.
13. Install shrouds around the machine to meet applicable safety requirements.
14. Once installed, check surroundings to make sure that contaminants won't get on the heater while the unit is in operation. Accumulation of contaminants on heaters can cause premature heater failure.
15. Insulating blanket installations must have band heater re-tightening sequence (#12) completed before blanket installation. Lead wires must exit the insulation blanket as soon as possible; do not entrap lead wires between heater sheath and insulation blanket.

**Caution:** It is imperative that upon start-up of new machines at customer facilities, all of the aforementioned parameters are double checked by qualified field service personnel.

**CAUTION: Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.**



## Standard Mica Insulated Band Heaters for Plastic Injection Molding Machines

### Design Features

- Features Unbreakable 10-32 Screw Terminals
- Larger Heaters [63.5 mm (Dia. 2½" or Greater)] are Designed as One-Piece Expandable Type, Enabling You to Open Up the Heater to the Diameter of the Barrel for Easy Installation
- Heaters Less Than 38 mm (1½") Wide Have Separate Straps—Type SE



Optional Igloo™ ceramic covers can fully insulate any standard #8 or #10 terminal lugs used for electrical hook-ups.



### To Order Visit [omega.com/mbh\\_mica-insulated](http://omega.com/mbh_mica-insulated) for Pricing and Details

Model Number			Inside Diameter		Width		Watt	Watt Density		Style	Term.
120V	240V	480V	mm	inch	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>		
—	MBH00170	—	38.1	1½	25.4	1	150	6.3	40	SB	T2
—	MBH00171	—	38.1	1½	38.1	1½	250	7.0	45	NB	T2
—	MBH00172	—	38.1	1½	50.8	2	300	6.3	40	NB	T2
—	MBH00173	—	44.5	1¾	25.4	1	175	6.0	39	SB	T2
—	MBH00174	—	44.5	1¾	38.1	1½	250	5.7	37	NB	T2
—	MBH00175	—	44.5	1¾	38.1	1½	300	6.9	44	NB	T2
—	MBH00176	—	47.6	1⅞	25.4	1	200	6.3	41	SB	T2
MBH00142	MBH00177	—	50.8	2	38.1	1½	300	5.9	38	NB	T2
MBH00143	MBH00178	—	57.2	2¼	25.4	1	250	6.4	41	SB	T2
—	MBH00179	—	57.2	2¼	50.8	2	525	6.7	43	NB	T2
—	MBH00180	—	60.3	2⅝	25.4	1	100	2.4	15	SB	T2
—	MBH00181	—	60.3	2⅝	25.4	1	250	6.0	39	SB	T2
MBH00144	—	—	60.3	2⅝	63.5	2½	450	4.3	28	NB	T3
—	MBH00182	—	63.5	2½	25.4	1	225	5.1	33	SE	T2
—	MBH00183	—	63.5	2½	25.4	1	250	5.7	36	SE	T2
—	MBH00184	—	63.5	2½	25.4	1	275	6.2	40	SE	T2
MBH00145	MBH00185	—	63.5	2½	38.1	1½	300	4.5	29	NE	T2
MBH00146	MBH00186	—	63.5	2½	38.1	1½	350	5.3	34	NE	T2
—	MBH00187	—	63.5	2½	60.3	2⅝	550	5.2	34	NE	T2
—	MBH00188	—	63.5	2½	73.0	2⅞	650	5.1	33	NE	T3
—	MBH00189	—	63.5	2½	101.6	4	850	4.8	31	NE	T3
MBH00147	MBH00190	—	76.2	3	25.4	1	200	3.7	24	SE	T2
MBH00148	MBH00191	—	76.2	3	25.4	1	250	4.6	30	SE	T2
—	MBH00192	—	76.2	3	25.4	1	300	5.5	36	SE	T2
—	MBH00193	—	76.2	3	25.4	1	350	6.4	42	SE	T2
MBH00149	MBH00194	MBH00348	76.2	3	25.4	1	400	7.4	47	SE	T2
MBH00150	MBH00195	—	76.2	3	38.1	1½	400	4.9	32	NE	T2
—	MBH00196	—	76.2	3	38.1	1½	450	5.5	36	NE	T2
MBH00151	MBH00197	—	76.2	3	38.1	1½	500	6.1	40	NE	T2
—	MBH00198	—	76.2	3	50.8	2	450	4.1	27	NE	T2
—	MBH00199	—	76.2	3	50.8	2	500	4.6	30	NE	T2
—	MBH00200	—	76.2	3	63.5	2½	650	4.8	31	NE	T3
—	MBH00201	—	79.4	3⅞	25.4	1	300	5.3	34	SE	T2
MBH00152	MBH00202	—	79.4	3⅞	25.4	1	400	7.0	45	SE	T2
—	MBH00203	—	79.4	3⅞	38.1	1½	400	4.7	30	NE	T2
MBH00153	MBH00204	—	82.6	3¼	38.1	1½	400	4.5	29	NE	T2
MBH00154	MBH00205	—	88.9	3½	25.4	1	300	4.7	30	SE	T2
—	MBH00206	—	88.9	3½	38.1	1½	325	3.4	22	NE	T2
MBH00155	—	—	88.9	3½	38.1	1½	400	4.1	27	NE	T2
MBH00156	MBH00207	—	88.9	3½	38.1	1½	500	5.2	33	NE	T2



**Standard Mica Insulated Band Heaters for Plastic Injection Molding Machines**

Model Number			Inside Diameter		Width		Watt	Watt Density		Style	Term.
120V	240V	480V	mm	inch	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>		
—	MBH00208	—	88.9	3½	50.8	2	325	2.5	16	NE	T2
MBH00157	—	—	88.9	3½	50.8	2	500	3.9	25	NE	T2
—	MBH00209	—	88.9	3½	50.8	2	650	5.0	33	NE	T2
—	MBH00210	—	88.9	3½	63.5	2½	750	4.7	30	NE	T3
—	MBH00211	—	88.9	3½	76.2	3	1000	5.2	33	NE	T3
—	MBH00212	—	90.5	3¾	60.3	2¾	685	4.4	28	NE	T2
—	MBH00213	—	92.2	3⅝	38.1	1½	625	6.2	40	NE	T2
MBH00158	MBH00214	—	95.3	3¾	25.4	1	350	5.0	32	SE	T2
—	MBH00215	—	95.3	3¾	38.1	1½	500	4.8	31	NE	T2
—	MBH00216	—	95.3	3¾	38.1	1½	700	6.7	43	NE	T2
MBH00159	MBH00217	—	95.3	3¾	63.5	2½	850	4.9	32	NE	T3
—	MBH00218	—	98.4	3⅞	38.1	1½	550	5.1	33	NE	T2
—	MBH00219	—	98.4	3⅞	50.8	2	750	5.2	34	NE	T2
—	MBH00220	—	100.0	3⅝	50.8	2	600	4.1	26	NE	T2
MBH00160	MBH00221	—	101.6	4	25.4	1	400	5.4	35	SE	T2
—	MBH00222	—	101.6	4	38.1	1½	400	3.6	23	NE	T2
—	MBH00223	—	101.6	4	38.1	1½	550	4.9	32	NE	T2
—	MBH00224	MBH00349	101.6	4	38.1	1½	625	5.6	36	NE	T2
—	MBH00225	—	101.6	4	38.1	1½	750	6.7	43	NE	T2
MBH00161	MBH00226	—	101.6	4	50.8	2	550	3.7	24	NE	T2
—	MBH00227	—	101.6	4	50.8	2	800	5.4	35	NE	T2
—	MBH00228	—	101.6	4	57.2	2¼	900	5.4	35	NE	T2
—	MBH00229	—	101.6	4	63.5	2½	1000	5.4	35	NE	T3
—	MBH00230	—	101.6	4	101.6	4	1250	4.2	27	NE	T3
—	MBH00231	—	109.5	4⅝	88.9	3½	1210	4.3	28	NE	T3
MBH00162	MBH00232	—	114.3	4½	25.4	1	350	4.1	27	SE	T2
—	MBH00233	—	114.3	4½	38.1	1½	350	2.8	18	NE	T2
—	MBH00235	—	114.3	4½	38.1	1½	400	3.1	20	NE	T2
—	MBH00236	—	114.3	4½	38.1	1½	650	5.1	33	NE	T2
MBH00163	MBH00237	—	114.3	4½	50.8	2	500	2.9	19	NE	T2
MBH00164	MBH00238	—	114.3	4½	50.8	2	700	4.1	27	NE	T2
MBH00165	MBH00239	—	114.3	4½	63.5	2½	1000	4.7	30	NE	T3
—	MBH00242	MBH00350	120.7	4¾	38.1	1½	600	4.5	29	NE	T2
—	MBH00243	—	120.7	4¾	38.1	1½	650	4.8	31	NE	T2
—	MBH00244	MBH00351	120.7	4¾	76.2	3	1100	4.1	26	NE	T3
—	MBH00245	—	123.8	4⅞	38.1	1½	900	6.5	42	NE	T2
—	MBH00246	—	123.8	4⅞	50.8	2	650	3.5	23	NE	T2
—	MBH00247	MBH00352	123.8	4⅞	50.8	2	760	4.1	27	NE	T2
—	MBH00248	—	123.8	4⅞	76.2	3	900	3.2	21	NE	T3
—	MBH00249	—	125.4	4⅝	76.2	3	1200	4.3	28	NE	T3



### Standard Mica Insulated Band Heaters for Plastic Injection Molding Machines

Model Number			Inside Diameter		Width		Watt	Watt Density		Style	Term.
120V	240V	480V	mm	inch	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>		
—	MBH00250	—	127.0	5	25.4	1	400	4.2	27	SE	T2
—	—	MBH00353	127.0	5	38.1	1½	350	2.5	16	NE	T2
—	MBH00251	—	127.0	5	38.1	1½	700	4.9	32	NE	T2
—	MBH00252	—	127.0	5	38.1	1½	800	5.6	36	NE	T2
—	MBH00253	—	127.0	5	50.8	2	1000	5.3	34	NE	T2
—	MBH00254	—	127.0	5	63.5	2½	1000	4.2	27	NE	T3
—	MBH00255	MBH00354	127.0	5	76.2	3	1200	4.2	27	NE	T3
—	—	MBH00355	127.0	5	82.6	3¼	800	2.6	17	NE	T3
—	MBH00256	—	127.0	5	82.6	32	1250	4.1	26	NE	T3
—	MBH00257	—	127.0	5	101.6	4	1500	4.0	25	NE	T3
—	MBH00258	—	130.2	5⅞	38.1	1½	900	6.2	40	NE	T2
—	MBH00259	—	130.3	5⅞	38.1	1½	600	4.1	26	NE	T2
—	MBH00260	—	133.4	5¼	25.4	1	500	5.0	32	SE	T2
—	MBH00261	MBH00356	133.4	5¼	25.4	1	600	6.0	39	SE	T2
—	MBH00262	MBH00357	133.4	5¼	38.1	1½	600	4.0	26	NE	T2
—	MBH00263	—	133.4	5¼	38.1	1½	1000	6.7	43	NE	T2
—	MBH00264	—	133.4	5¼	50.8	2	1000	5.0	32	NE	T2
—	—	MBH00358	133.4	5¼	57.2	2¼	1300	5.8	37	NE	T2
—	MBH00265	—	133.4	5¼	63.5	2½	1300	5.2	34	NE	T3
—	MBH00266	—	133.4	5¼	76.2	3	1700	5.7	37	NE	T3
—	MBH00267	—	139.7	5½	38.1	1½	800	5.1	33	NE	T2
—	MBH00268	—	146.1	5¾	38.1	1½	600	3.6	23	NE	T2
—	MBH00269	—	149.2	5⅞	76.2	3	1000	3.0	19	NE	T3
—	MBH00270	—	150.8	5⅞	38.1	1½	1000	5.9	38	NE	T2
—	MBH00271	—	152.4	6	25.4	1	500	4.3	28	SE	T2
MBH00166	—	—	152.4	6	34.9	1⅞	950	6.0	39	SE	T2
—	MBH00272	—	152.4	6	38.1	1½	600	3.5	22	NE	T2
MBH00167	MBH00273	—	152.4	6	38.1	1½	850	4.9	32	NE	T2
—	MBH00274	—	152.4	6	38.1	1½	900	5.2	34	NE	T2
—	MBH00275	—	152.4	6	38.1	1½	1000	6.2	40	NE	T2
—	MBH00276	—	152.4	6	50.8	2	1200	5.2	34	NE	T2
—	MBH00277	—	152.4	6	63.5	2½	1450	5.0	32	NE	T3
—	MBH00278	MBH00359	152.4	6	76.2	3	1400	4.1	26	NE	T3
—	MBH00279	—	155.6	6⅞	38.1	1½	1000	5.7	37	NE	T2
—	MBH00280	MBH00360	158.8	6¼	76.2	3	1500	4.2	27	NE	T3
—	MBH00281	MBH00361	160.3	6⅞	76.2	3	1250	3.4	22	NE	T3
—	MBH00282	—	164.3	6⅞	50.8	2	800	3.2	21	NE	T2
—	MBH00283	—	164.3	6⅞	50.8	2	1200	5.1	33	NE	T2



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Model Number			Inside Diameter		Width		Watt	Watt Density		Style	Term.
120V	240V	480V	mm	inch	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>		
—	MBH00284	—	165.1	6½	38.1	1½	750	4.0	26	NE	T2
—	MBH00285	—	165.1	6½	38.1	1½	900	4.8	31	NE	T2
—	MBH00286	—	165.1	6½	38.1	1½	1200	6.4	41	NE	T2
—	MBH00287	—	165.1	6½	50.8	2	1000	4.0	26	NE	T2
—	MBH00288	MBH00362	165.1	6½	63.5	2½	1200	3.8	25	NE	T3
—	MBH00289	—	168.4	6⅝	38.1	1½	815	4.2	27	NE	T2
—	MBH00290	—	168.4	6⅝	38.1	1½	1150	6.0	39	NE	T2
—	MBH00291	—	171.5	6¾	38.1	1½	600	3.1	20	NE	T2
—	MBH00292	—	171.5	6¾	38.1	1½	815	4.2	27	NE	T2
—	MBH00293	—	171.5	6¾	38.1	1½	1000	5.1	33	NE	T2
—	MBH00294	—	171.5	6¾	38.1	1½	1150	5.9	38	NE	T2
—	MBH00295	—	171.5	6¾	50.8	2	1300	5.0	32	NE	T2
—	MBH00296	—	171.5	6¾	101.6	4	2600	5.0	32	NE	T3
—	MBH00297	—	177.8	7	25.4	1	750	5.5	36	SE	T2
—	MBH00298	—	177.8	7	38.1	1½	950	4.7	30	NE	T2
—	MBH00299	—	177.8	7	38.1	1½	1000	4.9	32	NE	T2
—	MBH00300	—	177.8	7	63.5	2½	1000	3.0	19	NE	T3
—	MBH00301	MBH00363	177.8	7	76.2	3	1650	4.1	26	NE	T3
—	MBH00302	MBH00364	180.2	7¾	88.9	3½	1200	2.5	16	NE	T3
—	MBH00303	MBH00365	180.2	7¾	88.9	3½	1650	3.4	22	NE	T3
—	MBH00304	—	181.0	7⅞	38.1	1½	1200	5.8	37	NE	T2
—	MBH00305	—	181.0	7⅞	88.9	3½	1650	3.4	22	NE	T3
—	MBH00306	—	184.2	7¼	50.8	2	900	3.2	21	NE	T2
MBH00168	—	—	190.5	7½	25.4	1	700	4.8	31	SE	T2
—	MBH00307	—	190.5	7½	38.1	1½	800	3.7	24	NE	T2
—	MBH00308	—	190.5	7½	38.1	1½	1000	4.6	30	NE	T2
—	MBH00309	—	190.5	7½	50.8	2	1500	5.2	36	NE	T2
—	MBH00310	MBH00366	190.5	7½	76.2	3	1800	4.1	27	NE	T2
—	MBH00311	—	193.7	7⅞	38.1	1½	1000	4.5	29	NE	T2
—	MBH00312	—	193.7	7⅞	76.2	3	2000	4.5	29	NE	T2
—	MBH00313	—	196.9	7¾	38.1	1½	1000	4.4	29	NE	T2
—	MBH00314	—	200.0	7⅞	38.1	1½	750	3.3	21	NE	T2
—	MBH00315	—	200.0	7⅞	38.1	1½	1000	4.4	28	NE	T2
—	MBH00316	—	200.0	7⅞	76.2	3	2000	4.4	28	NE	T3
—	MBH00317	—	203.2	8	25.4	1	850	5.5	35	SE	T2
—	MBH00318	—	203.2	8	38.1	1½	950	4.1	26	NE	T2
—	MBH00319	MBH00367	203.2	8	38.1	1½	1200	5.1	33	NE	T2
—	MBH00320	—	203.2	8	38.1	1½	1400	6.0	39	NE	T2
—	MBH00321	MBH00368	203.2	8	50.8	2	1500	4.8	31	NE	T2
—	MBH00322	MBH00369	203.2	8	76.2	3	2250	4.8	31	NE	T3



### Standard Mica Insulated Band Heaters for Plastic Injection Molding Machines

Model Number			Inside Diameter		Width		Watt	Watt Density		Style	Term.
120V	240V	480V	mm	inch	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>		
—	MBH00323	MBH00370	209.6	8¼	50.8	2	1800	5.6	36	NE	T2
—	MBH00324	MBH00371	209.6	8¼	101.6	4	3000	4.7	30	NE	T3
—	MBH00325	—	215.9	8½	38.1	1½	1200	4.8	31	NE	T2
—	MBH00326	—	215.9	8½	50.8	2	1600	4.8	31	NE	T2
—	MBH00327	MBH00372	222.3	8¾	76.2	3	2000	3.9	25	NE	T3
—	MBH00328	—	228.6	9	38.1	1½	1300	4.9	32	NE	T2
—	MBH00329	MBH00373	228.6	9	38.1	1½	1500	5.7	37	NE	T2
—	MBH00330	—	228.6	9	50.8	2	1800	5.1	33	NE	T2
—	MBH00331	—	241.3	9½	38.1	1½	1600	5.7	40	NE	T2
—	MBH00332	—	241.3	9½	50.8	2	1800	4.8	31	NE	T2
—	MBH00333	MBH00374	241.3	9½	76.2	3	2000	3.6	23	NE	T3
—	MBH00334	MBH00375	244.5	9⅝	76.2	3	2000	3.5	23	NE	T3
—	MBH00335	MBH00376	244.5	9⅝	76.2	3	3000	5.3	34	NE	T3
—	MBH00336	—	247.7	9¾	50.8	2	2000	5.2	34	NE	T2
—	MBH00337	—	254.0	10	38.1	1½	1400	4.8	31	NE	T2
—	MBH00338	MBH00377	260.4	10¼	76.2	3	2400	4.0	26	NE	T3
—	MBH00339	MBH00378	260.4	10¼	101.6	4	3000	3.7	24	NE	T3
—	MBH00340	—	266.7	10½	38.1	1½	1500	4.8	31	NE	T2
—	MBH00341	MBH00379	266.7	10½	76.2	3	2400	3.9	25	NE	T3
—	MBH00342	—	279.4	11	38.1	1½	1600	4.9	32	NE	T2
—	MBH00343	—	279.4	11	50.8	2	2000	4.6	30	NE	T2
—	MBH00344	—	285.8	11¼	76.2	3	2400	3.6	23	NE	T3
MBH00169	MBH00345	—	292.1	11½	38.1	1½	800	2.4	15	NE	T2
—	MBH00346	—	292.1	11½	38.1	1½	1800	5.3	34	NE	T2
—	MBH00347	—	304.8	12	38.1	1½	2000	5.6	36	NE	T2
—	MBH00308	MBH00380	304.8	12	50.8	2	2300	4.9	31	NE	T2

Ordering Example: MBH00329, 240V, 1500 watt, mica insulated band heater.





## DuraBand® with Built-In Strap

General purpose terminal box can be attached on Duraband diameters of 63.5 mm (2½") or larger. It offers excellent protection to exposed terminals. To simplify wiring, the box has a 13 mm (½") trade size knockout [actual diameter 22 mm (7/8")] that will accept standard conduit or flexible armor cable connectors. It can be field assembled on most band heaters with screw terminals having a center distance of 22 mm (7/8").

Flexible armor cable for lead protection is available where abrasion is a problem.

For maximum surface contact, the torque resistant and virtually unbreakable stainless steel screw terminals are securely fastened to a connecting jumper, assuring positive contact with the windings and providing maximum amperage carrying capacity. For other terminal or lead arrangements, see pages 13 through 18.

Specially designed mounting brackets with ¼"-20 socket cap screws are used to draw the built-in strap to a high degree of tension. This tension exerts the great amount of drawing power required to pull the heating element assembly against the cylinder evenly and tightly across its entire width, thus eliminating all air gaps that can cause premature heater failure. The number of bracket assemblies used increases as the width of a Duraband heater increases.

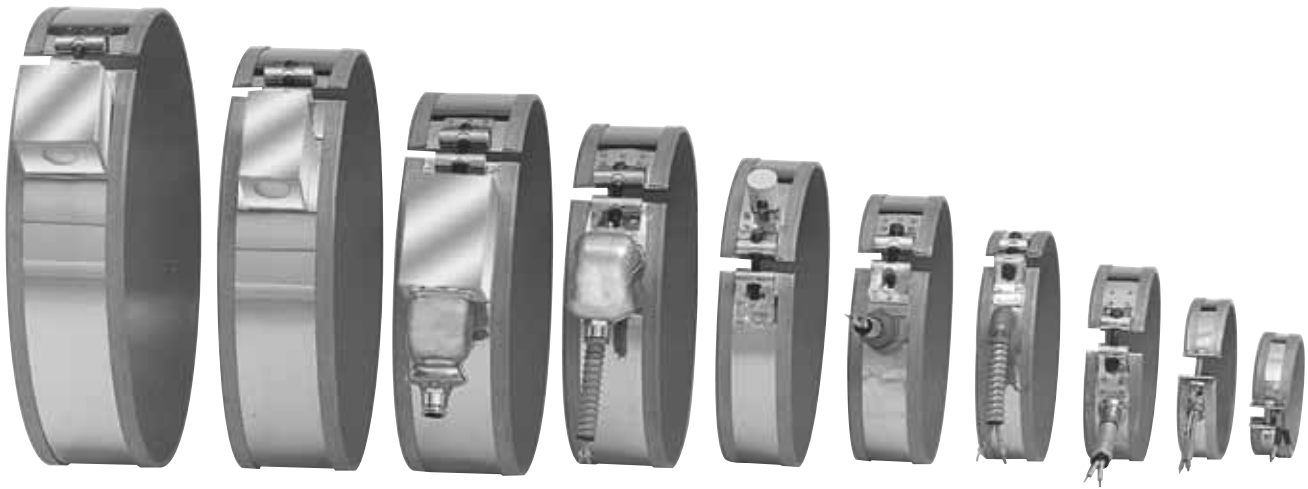
Specially treated rust-resistant steel sheath casing provides the best combination of physical strength, high emissivity and good thermal conductivity to heated cylindrical parts, good for sheath temperatures up to 480°C (900°F).

Specially selected grade and thickness of mica sheet is used to insulate the windings, providing excellent thermal conductivity and dielectric strength.

The gauge of nickel-chrome resistance ribbon wire is selected to achieve the lowest internal element temperatures possible, resulting in maximum heater life. The ribbon wire is wound evenly spaced on a specially selected mica strip, providing even heat distribution and thus eliminating hot spotting that can cause premature heater failure.

Duraband's built-in strap is a unique design feature. A low thermal expansion alloy sheath is used for the outer sheath, covering the entire width of the band heater.





- Built-In Bracket for Superior Clamping
- Unbreakable and Torque-Resistant Screw Terminals
- Temperatures Up to 480°C (900°F)
- Full Width Stainless Steel Built-In Strap
- Flexibility to Incorporate Holes and Cutouts
- Available Two-Piece and Expandable Designs
- Best Mica Insulated Heater on the Market
- Faster Delivery than Any Other Type of Heater Band
- Most Economical Among Various Heater Bands
- Most Versatile and Commonly Used Heater Band

#### Typical Applications

- Plastic Injection Molding Machines
- Plastic Extruders
- Oil Reclamation Equipment
- Food and Candy Extruders
- Drum Heating
- Extrusion Dies
- Holding Tanks
- Blow Molding Machines
- Vending Machines
- Barrels and Heads
- Food Service Warming
- Autoclaves and Sterilizers
- Metallurgical Analyzers
- Fluidized Beds
- Hot Runner Molds
- Pulp and Paper Processing Equipment

#### Designed For Trouble-Free Service

The Duraband heater design is the result of many years of research, development and testing for a reliable mica insulated band heater that can perform at the higher operating temperatures [up to 480°C (900°F)] essential to process high temperature resins, providing long, efficient service necessary for today's high productivity of plastic extruders, injection and blow molding machines.

Duraband is a proven heater design for good life efficiency and dependability. It assures maintaining the lowest winding temperatures possible, keeping a low-mass heating element assembly for fast heat-up and quick thermal response to controls. It incorporates the low thermal expansion built-in strap, a unique design feature.

#### Advantages and Variations

Duraband mica insulated heaters are widely used on operations involving heating of cylindrical surfaces and are manufactured in a full range of standard construction variations, physical dimensions, electrical ratings, and a complete arrangement of screw terminals and lead terminations. (See pages 13 through 18).

However, these standard Duraband heater variations and terminations do not represent the full extent of our capabilities. OMEGA's engineering staff, with many years of experience in heat processing and temperature control applications, can assist you in designing the right Duraband heater for your specific application.



## Standard Specifications and Tolerances

### Performance Ratings

**Maximum Temperature:**

**Standard Sheath:** 482°C (900°F)

**Nominal Watt Density:** 3 to 7 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>)

**Maximum Watt Density:** Dependent on heater size and operating temperature

### Electrical Ratings

**Maximum Voltage:** 480 Vac

**Dual Voltage or 3-Phase:** Available depending on heater design

**Maximum Amperage:**

**Lead Wire Termination:** 10 Amp

**Screw Terminations:** 8-32 UNF—20 Amp;  
10-32 UNF—25 Amp

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### Physical Size Construction Limitations

**Minimum Width:** 19.1 mm (¾")

**Width Tolerance:** 1.59 mm (±1/16")

**Minimum Inside Diameter:** 22.1 mm (7/8")

**Nominal Gap:** 9.5 mm (¾")—if a larger gap is required for probes or thermocouples, specify when ordering

### Built-In Brackets

Heater Width	Number of Brackets
38 to 76 mm (1½ to 3")	1
79 to 127 mm (3⅛ to 5")	2
130 to 145 mm (5⅛ to 6⅞")	3
178 to 254 mm (7 to 10")	4
257 to 381 mm (10⅛ to 15")	5

*If tighter tolerances are required, contact OMEGA.*

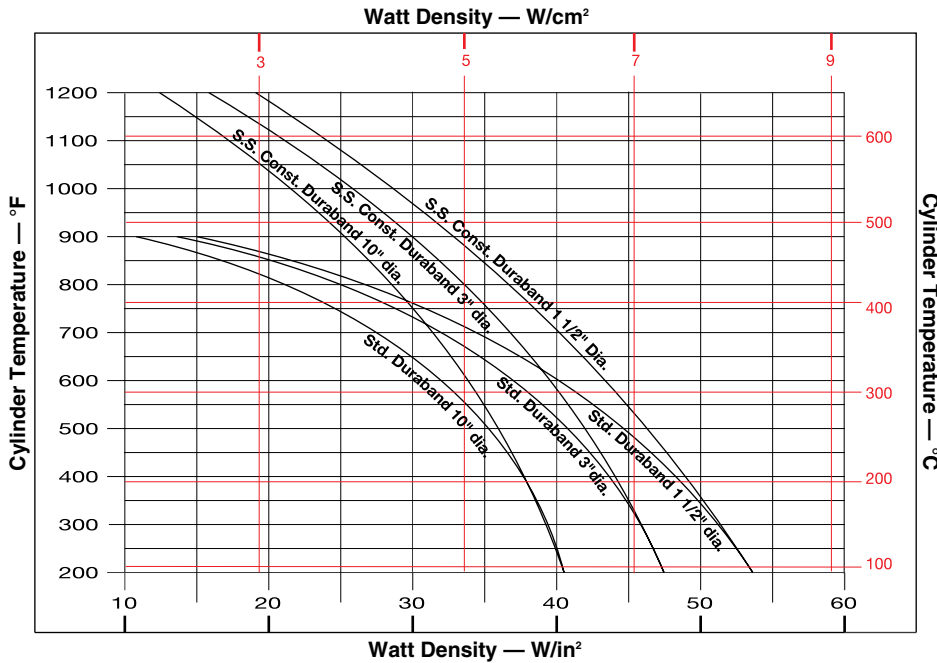
**CAUTION:** Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.

### Minimum ID and Width for Construction/Clamping Styles

Style	Minimum ID		Minimum Width	
	mm	inch	mm	inch
NB	50.8	2	31.8	1¼
NS	76.2	3	31.8	1¼
NE	63.5	2½	31.8	1¼
SB	22.1	7/8	19.1	¾
SS	50.8	2	19.1	¾
SE	63.5	2½	31.8	1¼
FB	25.4	1	19.1	¾
FS	50.8	2	19.1	¾
FE	63.5	2½	31.8	1¼
SL	101.6	4	31.8	1¼
NSL	101.6	4	31.8	1¼
NEL	101.6	4	31.8	1¼
LT	177.8	7	38.1	1½
LS	177.8	7	38.1	1½
LE	177.8	7	38.1	1½
TWL	25.4	1	25.4	1
RNB	134.7	5½	25.4	1
RNS	254	10	25.4	1

**Note:** Refer to individual descriptions for further information. Actual heater minimums will be a combination of termination and construction/strap styles.

## Maximum Watt Densities



### Maximum Allowable Watt Density

The chart displays the maximum Watt Density curves for various diameter heaters. Use this chart when determining the appropriate wattage value for your chosen heater.

Be aware that certain factors will require you to derate the watt density (Watt/in<sup>2</sup>) of your heater selection.

**CAUTION: Failure to adhere to the maximum allowable watt density per heater size will result in poor operating life.**

### Correction Factors

For heaters wider than 76.2 mm (3"), reduce maximum recommended watt density from chart by 20%.

For applications using insulating shroud, reduce maximum recommended watt density from chart by 25%.

### Calculating Maximum Watt Density

#### Factors to be Taken into Consideration:

- A. Type of controls
- B. Voltage variations
- C. Machine cycling rate
- D. Type of resin being processed
- E. Coefficient of thermal expansion and conductivity of the cylinder
- F. Designing a heater that closely matches the wattage requirement will decrease the frequency of cycling and temperature overshoot, thereby increasing the life of the heater.

### Once These Factors have been Established, Proceed with the Following Steps:

1. Determine the maximum operating temperature.
2. Calculate the total wattage required to obtain the maximum operating temperature.
3. Determine the quantity and size of the heater bands to be used. 38 through 76 mm (1½ through 3") wide band heaters have proven to be the most efficient and reliable in most cylindrical heating applications.
4. Determine individual band heater wattage by dividing the total required wattage by the quantity of band heaters selected.
5. Determine the band heater watt density by subtracting unheated areas from the band heater diameter created by screw terminals, gaps, holes, and cutouts (see formula below).
6. Determine if the required watt density previously calculated exceeds the maximum recommended watt density. Note the maximum cylinder temperature required on the left-hand side of the graph, follow the horizontal line until it intersects with the line of the band heater being used, and read directly down to obtain the maximum recommended watt density (Watt/in<sup>2</sup>).
7. If the calculated watt density is higher than the recommended value, it must be corrected or it will cause poor heater life. This can be accomplished by using more band heaters, lowering the heater wattage, or using a different construction type or a different type of band heater.
8. Should you have a problem in selecting the proper band heater or establishing watt density for your application, contact one of the qualified engineers at OMEGA.

Nominal Unheated Areas	
Construction Style	Unheated Area to Subtract
One-piece band	1" x width
Two-piece band	2" x width
Holes and cutouts	Size + ½" x width

### Watt Density Formula

Wattage

$$\text{Watt Density (Watt/in}^2\text{)} = \frac{\text{Wattage}}{[3.14 \times (\text{Band ID}) - \text{Gap-1}\frac{3}{8}] \times \text{Band Width} - \text{Unheated Area (see table)}}$$

Unheated Area (See Table) = Unheated area for construction style + unheated area for any holes or cutouts



## Construction Styles

# 3 Construction Types



Shown with Type NB Built-In Strap

### One-Piece Band

The one-piece construction is available on any screw or lead termination and clamping variation. It can be used where band heaters can be slipped over the end of the cylinder.



Shown with Type NS Built-In Strap

### Two-Piece Band

The two-piece construction is available on any screw or lead and clamping variation. The Duraband two-piece design provides a built-in hinge, making handling and installation easier. It is used on large cylinders or where the heater cannot be slipped over the end of the cylinder. Two-piece band heaters are rated at watts and volts per each half when ordering.

*Note: Multiple segment designs are recommended on larger diameter [typically larger than 381 mm (15")] heaters to improve the clamping force and increase the surface contact between the heater and the barrel for efficient heat transfer.*



Shown with Type NE Built-In Strap

### One-Piece Expandable Band

The one-piece expandable construction is available on any screw or lead and clamping variation. It can be used where a one-piece band heater would have to be expanded to fit over the barrel during installation, rather than slipped over the end of the barrel.

*Note: The one-piece expandable band should not be opened and closed more than twice.*



## Construction/Clamping Variations

### Standard Built-In Strap Clamping (Low Thermal Expansion)

The built-in strap is available with any screw or lead termination and construction variation. The built-in strap eliminates the use of awkward-to-handle separate straps, providing more drawing power than any other type of clamping system. The Duraband with built-in strap is standard on many designs.

#### Type NB—One-Piece Band

**Minimum ID:** 50.8 mm (2")  
**Minimum Width:** 31.8 mm (1¼")

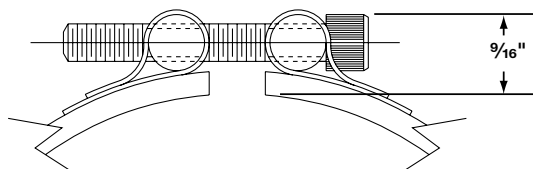
#### Type NS—Two-Piece Band

**Minimum ID:** 76.2 mm (3")  
**Minimum Width:** 31.8 mm (1¼")

#### Type NE—One-Piece Expandable Band

**Minimum ID:** 63.5 mm (2½")  
**Minimum Width:** 31.8 mm (1¼")

Type NB shown

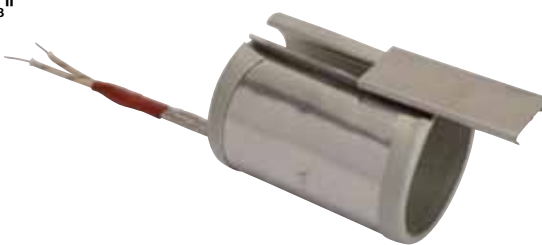
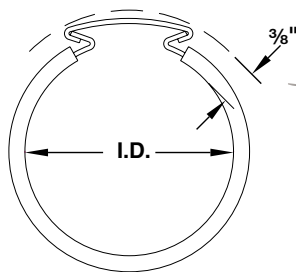


### Wedge Lock

Wedge lock clamping is designed for applications where mounting space is severely limited. It lends itself mainly to small diameter nozzle heaters.

#### Type TWL—One-Piece Band

**Minimum ID:** 25.4 mm (1")  
**Minimum Width:** 25.4 mm (1")  
**Maximum Width:** 88.9 mm (3½")



### Separate Straps

The separate strap clamping is available with any screw or lead termination and construction variation. It is strongly recommended that the Duraband with built-in strap design be used whenever possible because it provides more drawing power than any other type of clamping system.

#### Type SB—One-Piece Band

**Minimum ID:** 22.2 mm (7/8")  
**Minimum Width:** 19.1 mm (¾")

#### Type SS—Two-Piece Band

**Minimum ID:** 50.8 mm (2")  
**Minimum Width:** 19.1 mm (¾")

Type SB shown

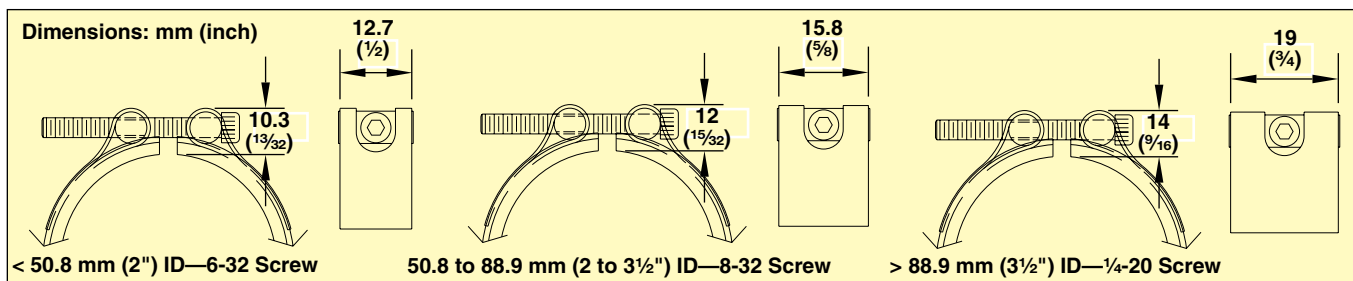


#### Type SE—One-Piece Expandable Band

**Minimum ID:** 63.5 mm (2½")  
**Minimum Width:** 31.8 mm (1¼")

### Clearance Dimensions for Separate Strap Clamping

Separate strap clearance dimensions: Dependent on heater inside diameter. The strap dimensions are shown below.





## Construction/Clamping Variations

### Spring Loaded with Built-In Bracket

The heavy duty stainless steel spring with built-in bracket is a variation on the basic Duraband® design. It is available with any screw or lead termination and construction variation. It is recommended for heaters over 305 mm (12") in diameter, and for any diameter heater used in the vertical position, to prevent the heater from slipping off the machine. The springs provide constant tension, therefore maintaining optimum surface contact against the cylinder being heated.

#### Type SL—One-Piece Band

**Minimum ID:** 101.6 mm (4")

**Minimum Width:** 31.8 mm (1¼")

#### Type NSL—Two-Piece Band

**Minimum ID:** 101.6 mm (4")

**Minimum Width:** 31.8 mm (1¼")

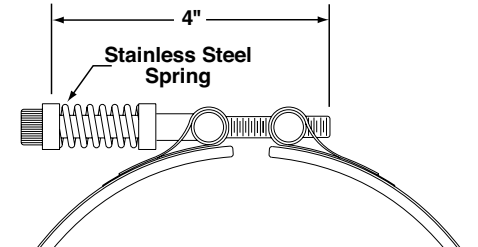
#### Type NEL—One-Piece Expandable Band

**Minimum ID:** 101.6 mm (4")

**Minimum Width:** 31.8 mm (1¼")



Type SL shown



### Latch and Trunion

The latch and trunion clamping system is available with any screw or lead termination and construction variation. It is ideal in absorbing thermal expansion due to the spring loading on the screws. The latch fully opens, facilitating installation on large diameter cylinders. The outer sheath is made from a low thermal expansion alloy.

#### Type LT—One-Piece Band

**Minimum ID:** 177.8 mm (7")

**Minimum Width:** 38.1 mm (1½")

#### Type LS—Two-Piece Band

**Minimum ID:** 177.8 mm (7")

**Minimum Width:** 38.1 mm (1½")

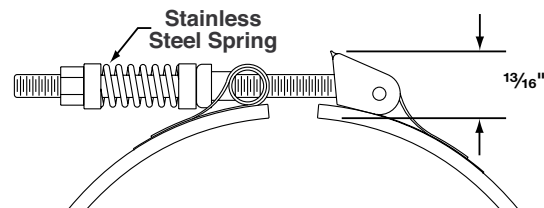
#### Type LE—One-Piece Expandable Band

**Minimum ID:** 177.8 mm (7")

**Minimum Width:** 38.1 mm (1½")



Type LT shown



### Bent-Up Flange (Ears)

The bent-up flange clamping is available with any screw or lead termination and construction variation. The outer sheath is made from a low thermal expansion alloy. The bent-up flange design is best suited for narrow band heaters with small diameters.

#### Type FB—One-Piece Band

**Minimum ID:** 25.4 mm (1")

**Minimum Width:** 19.1 mm (¾")

#### Type FS—Two-Piece Band

**Minimum ID:** 50.8 mm (2")

**Minimum Width:** 19.1 mm (¾")

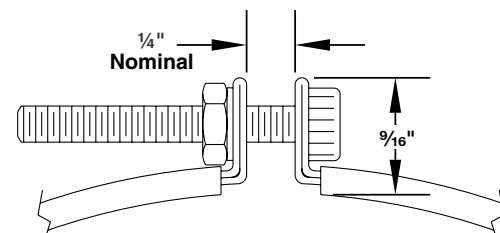
#### Type FE—One-Piece Expandable Band

**Minimum ID:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")



Type FB shown



**Note:** The bent-up flange design should only be used when other clamping methods are not suitable for a specific application. OMEGA recommends built-in strap clamping be used whenever possible, especially on large diameter heaters, because it provides superior clamping power.



### Internal Reverse Bands

#### Type RN—Internal Reverse Band (with Bracket Clamping)

This construction style is used to heat cylindrical surfaces from the inside on heaters 140 mm (5½") diameter and larger.

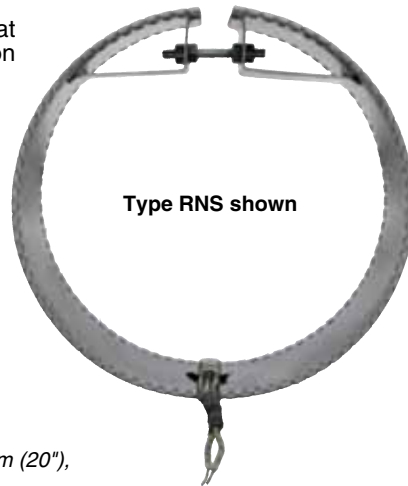
#### Type RNB—Reverse 1-Piece Construction

ID: 139.7 to 2854 mm (5½ to 10")  
Width: 25.4 to 88.9 mm (1" to 3½")  
Maximum Voltage: 240 Vac

#### Type RNS—Reverse 2-Piece Construction

ID: 254 to 508 mm (10 to 20")  
Width: 25.4 to 88.9 mm (1 to 3½")  
Maximum Voltage: 240 Vac

For inside diameters greater than 508 mm (20"), contact OMEGA with your requirements.



#### Type RTWL—Internal Reverse Band (with Wedge Lock Clamping)

This construction style is used to heat cylindrical surfaces from the inside on heaters less than 127 mm (5") outside diameter.

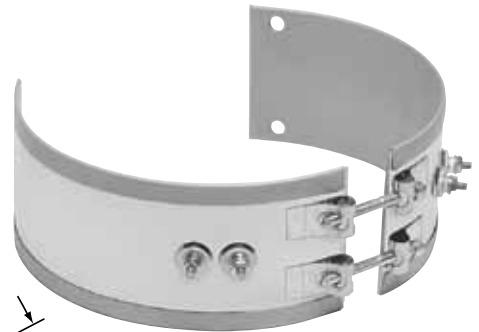
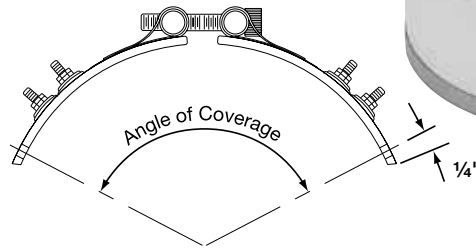


ID: Less than 139.7 mm (5½")  
Width: 25.4 to 88.9 mm (1 to 3½")

### Partial Coverage

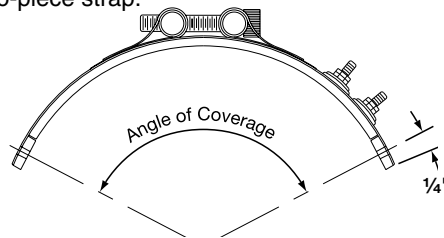
#### Type NS—2-Piece with Built-In Brackets

Partial coverage band heaters are normally required when holes and cutouts will not allow the heater to sufficiently clear the machine obstructions. The preferred method of construction is the two-piece band heater with built-in brackets as illustrated. The heater is screwed down to the cylinder at the ends and the built-in low thermal expansion strap pulls the heater tightly against the cylinder being heated. The standard center of hole to edge of heater dimension is 6.3 mm (¼"). When ordering, please provide the angle of coverage from center to center of the mounting screw holes as shown.



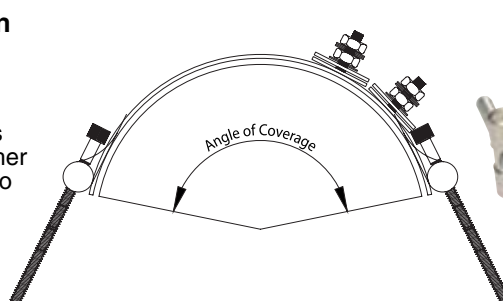
#### Type PS—One-Piece with Two-Piece Separate Strap with Padded Ends

The alternate method of partial coverage construction is the one-piece band heater with a separate two-piece strap. The two-piece strap itself is screwed down at the padded ends, allowing the heater to float between the pads as illustrated. When the strap is tightened, it will pull the heater against the cylinder being heated. The standard center of hole to edge of heater dimension is 6.3 mm (¼"). When ordering, please provide the angle of coverage from center to center of the mounting screw holes as shown.



#### Type NB—One-Piece with Built-In Strap Clamping

Another alternate method of partial coverage construction. The one piece with clamp screws on both sides allows it to be secured to anchor points on either side of a barrel without drilling holes into the barrel.







## Terminations—Stainless Steel Power Terminals: Type T1, Type T2 and Type T3

Available on any clamping or construction variation, the specially designed stainless steel power terminals are internally connected to the heater and are resistant to over-torquing.

The screw terminals are virtually unbreakable. Secure tightening of the electrical connections is essential for safety and long heater life.

### Type T1—Screw Terminals

#### One-Piece Band

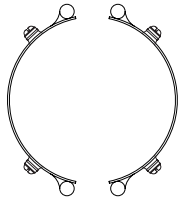
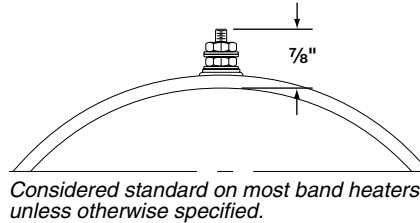
**Standard Termination Location:** Each side of gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 22.2 mm (7/8")

**Post Terminals:** 10-32 standard except 8-32 on <1" wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)



#### Two-Piece Band

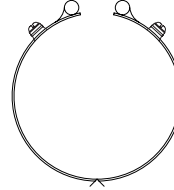
**Standard Termination Location:** Next to gaps on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 22.2 mm (7/8")

**Post Terminals:** 10-32 standard except 8-32 on <1" wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Each side of gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Post Terminals:** 10-32 standard except 8-32 on heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)

### Type T2—Screw Terminals

#### One-Piece Band

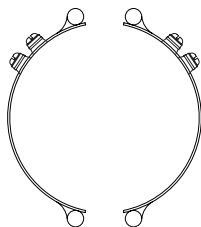
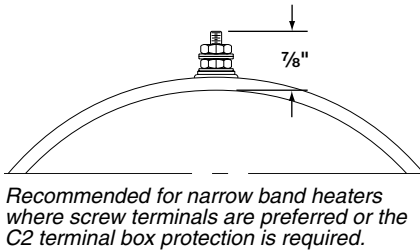
**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 22.2 mm (7/8")

**Post Terminals:** 10-32 standard except 8-32 on <1" wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)



#### Two-Piece Band

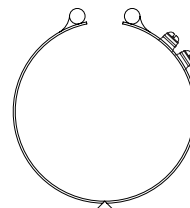
**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 22.2 mm (7/8")

**Post Terminals:** 10-32 standard except 8-32 on <1" wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Post Terminals:** 10-32 standard except 8-32 on heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)

## Terminations

### Type T3-Screw Terminals

#### One-Piece Band

**Standard Termination Location:**

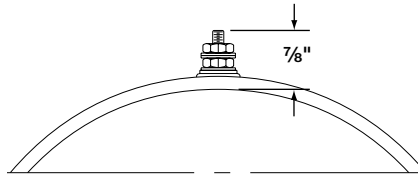
Next to gap; across center of width

**Minimum Inside Diameter:** 50.8 mm (2")

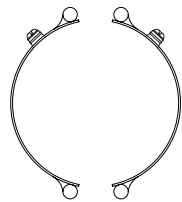
**Minimum Width:** 50.8 mm (2")

**Post Terminals:** 10-32 standard except 8-32 on 50.8 to 63.5 mm (2 to 2½") wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (8-32)



The preferred design on band heaters over 76.2 mm (3") wide or when C3 terminal box is required.



#### Two-Piece Band

**Standard Termination Location:**

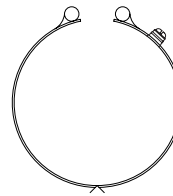
Next to same gap on each half; across center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 50.8 mm (2")

**Post Terminals:** 10-32 standard except 8-32 on 50.8 to 63.5 mm (2 to 2½") wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/ 25 A (10-32) or 20 A (8-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; across center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 50.8 mm (2")

**Post Terminals:** 10-32 standard except 8-32 on 50.8 to 63.5 mm (2 to 2½") wide heaters and heaters with ID <3"

**Maximum Volts/Amps:** 480 Vac/ 25A (10-32) or 20 A (8-32)

## Optional Igloo™ Ceramic Covers for Heaters with Screw Terminals

Igloo™ ceramic terminal covers consist of two individual ceramic parts. Unlike conventional ceramic caps, Igloo fully insulates any standard #8 or #10 terminal lugs used for electrical hook-ups.

#### Limitations

To assemble Igloo covers, terminals should be at least 22 mm (7/8") apart

**Minimum ID:** 50.8 mm (2")

**Minimum Width:** 31.7 mm (1¼")

Three types of Igloo™ bases are available:

**Type C6**—Double Port In-Line model number: CER-101-104

**Type C7**—Double Port 90° model number: CER-101-106

**Type C8**—Single Port model number: CER-101-107

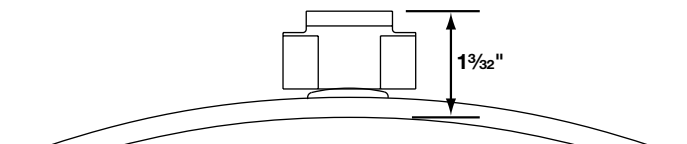
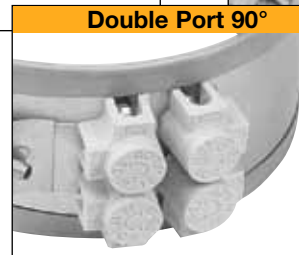
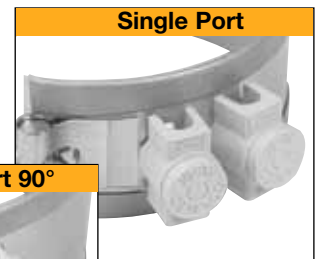
**Igloo™ Caps are Available in the Following Three Screw Terminal Sizes:**

**10-32**—model number: CER-102-101

**10-24**—model number: CER-102-104

**8-32**—model number: CER-102-105

When ordering, specify the type of Igloo and the screw terminal size.



**CAUTION:** Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.



## Terminations—Low-Profile Button Terminals: Type B1, Type B2 and Type B3

Available on any clamping or construction variation, the specially designed stainless steel button terminals are internally connected to the heater and are resistant to

over-torquing while offering a low profile for tight spaces. They are virtually unbreakable. Secure tightening of the electrical connections is essential for safety and long heater life.

### Type B1—Button Terminals

#### One-Piece Band

**Standard Termination Location:** Each side of gap; center of width

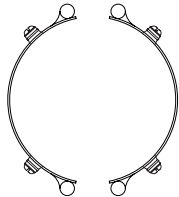
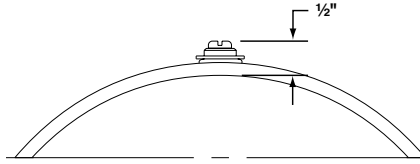
**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts:** 480 Vac

**Maximum Amps:** 25 A (10-32) or 20 A (6-32)



#### Two-Piece Band

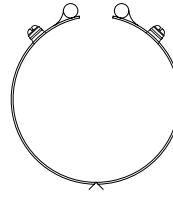
**Standard Termination Location:** Next to gaps on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Each side of gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32)

### Type B2—Button Terminals

#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

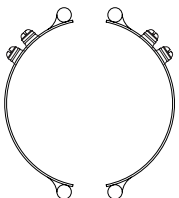
**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts:** 480 Vac

**Maximum Amps:** 25 A (10-32) or 20 A (6-32)



#### Two-Piece Band

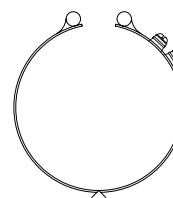
**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 On IDs <5"

**Maximum Volts/Amps:** 480 Vac/ 25 A (10-32) or 20 A (6-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 38.1 mm (1½")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32)



### Type B3-Button Terminals

#### One-Piece Band

**Standard Termination Location:** Next to gap; across center of width

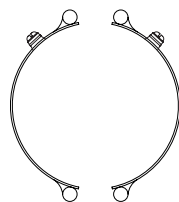
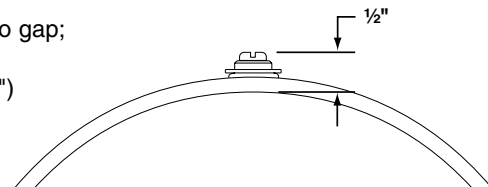
**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 60.3 mm (2 3/8")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts:** 480 Vac

**Maximum Amps:** 25 A (10-32) or 20 A (6-32)



#### Two-Piece Band

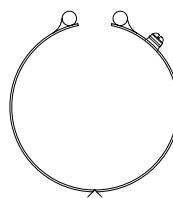
**Standard Termination Location:** Next to same gap on each half; across center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 60.3 mm (2 3/8")

**Screw Size:** 10-32 standard except 6-32 on IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32) each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; across center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 60.3 mm (2 3/8")

**Screw Size:** 10-32 standard except 6-32 On IDs <5"

**Maximum Volts/Amps:** 480 Vac/25 A (10-32) or 20 A (6-32)

## Plain Lead Wire Terminations: Type L1, Type L2 and Type L4 Available on Any Clamping or Construction Variation

### Type L1-Straight Lead Wires

The lead wires exit through a brass eyelet. The standard flexible leads are 254 (10") long with 76 (3") of fiberglass sleeving.

**Note:** If longer leads are required, specify when ordering.

#### One-Piece Band

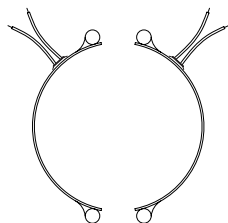
**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

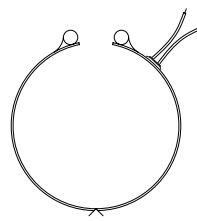
**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480V each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480V

**Maximum Amps:** 10 A



## Terminations

### Type L2—Straight Lead Wires

Type L2 is the preferred termination on all small diameter and small width band heaters. The standard flexible leads are 254 mm (10") long with 76 mm (3") of fiberglass sleeving.

*Note: If longer leads are required, specify when ordering.*



#### One-Piece Band

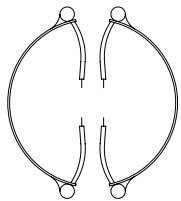
**Standard Termination Location:** Each side of gap; edge of width

**Minimum Inside Diameter:** 22.2 mm ( $\frac{7}{8}$ " )

**Minimum Width:** 19.1 mm ( $\frac{3}{4}$ " )

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

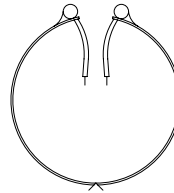
**Standard Termination Location:** Each side of each gap; edge of width

**Minimum Inside Diameter:** 50.8 mm (2" )

**Minimum Width:** 19.1 mm ( $\frac{3}{4}$ " )

**Maximum Volts:** 480V each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Each side of gap; edge of width

**Minimum Inside Diameter:** 63.5 mm ( $2\frac{1}{2}$ " )

**Minimum Width:** 31.8 mm ( $1\frac{1}{4}$ " )

**Maximum Volts:** 480V

**Maximum Amps:** 10 A

### Type L4—Straight Lead Wires

Type L4 is a suitable lead termination for small band heaters. The standard flexible leads are 254 mm (10") long with 76 mm (3") of fiberglass sleeving.

*Note: If longer leads are required, specify when ordering.*

#### One-Piece Band

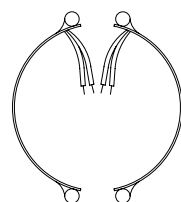
**Standard Termination Location:** Same side of gap; edge of width

**Minimum Inside Diameter:** 22.2 mm ( $\frac{7}{8}$ " )

**Minimum Width:** 25.4 mm (1" )

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

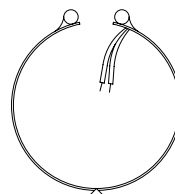
**Standard Termination Location:** Each side of same gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2" )

**Minimum Width:** 25.4 mm (1" )

**Maximum Volts:** 480V each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Same side of gap; edge of width

**Minimum Inside Diameter:** 63.5 mm ( $2\frac{1}{2}$ " )

**Minimum Width:** 31.8 mm ( $1\frac{1}{4}$ " )

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



## Abrasion Resistant Lead Terminations: Type W1, Type W2, Type W2M, Type W3, Type W4 and Type W5M

### Type W1—Straight Wire Braid Leads

Available on any clamping or construction variation. Wire braid leads offer sharp bending not possible with armor cable.

The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads.

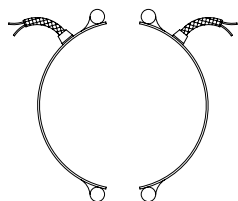
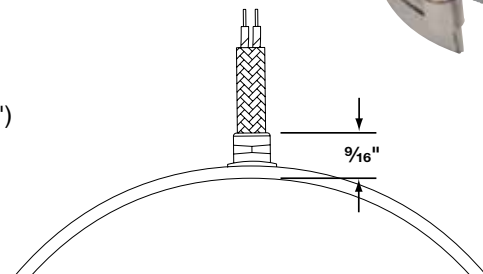
**Note:** If longer leads are required, specify when ordering.



#### One-Piece Band

**Standard Termination Location:**

Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")**Minimum Width:** 25.4 mm (1")**Maximum Volts:** 480 Vac**Maximum Amps:** 10 A

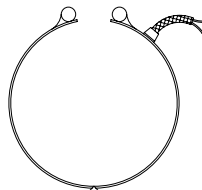
#### Two-Piece Band

**Standard Termination Location:**

Next to same gap on each half; center of width

**Minimum Inside Diameter:**

50.8 mm (2")

**Minimum Width:** 25.4 mm (1")**Maximum Volts:** 480 Vac each half**Maximum Amps:** 10 A each half

#### One-Piece Expandable Band

**Standard Termination Location:**

Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")**Minimum Width:** 31.8 mm (1¼")**Maximum Volts:** 480 Vac**Maximum Amps:** 10 A

### Type W2—Wire Braid Leads

The W2 wire braid exits at 180° from the gap for special nozzle heating applications. Sleeving is used for additional protection. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads with 76 mm (3") of fiberglass sleeving.

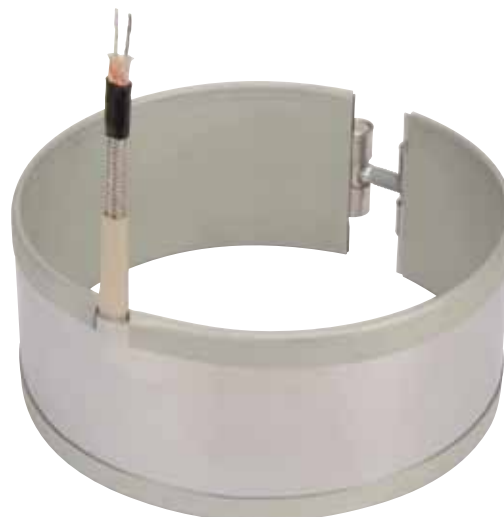
**Note:** If longer leads are required, specify when ordering.

Type W2 is not available on two-piece or one-piece expandable Duraband heaters.

#### One-Piece Band

**Standard Termination Location:**

Opposite the gap; edge of width

**Minimum Inside Diameter:** 22.2 mm (7/8")**Minimum Width:** 28.6 mm (1⅛")**Maximum Volts:** 480 Vac**Maximum Amps:** 10 A



## Terminations

### Type W3—Single Wire Braid Leads

Highly recommended for nozzle heating applications. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads with 76 mm (3") of fiber glass sleeving.

**Note:** If longer leads are required, specify when ordering.



#### One-Piece Band

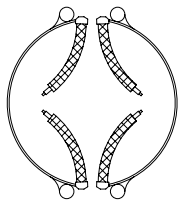
**Standard Termination Location:** Each side of gap; edge of width

**Minimum Inside Diameter:** 19.1 mm (¾")

**Minimum Width:** 22.2 mm (7/8")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

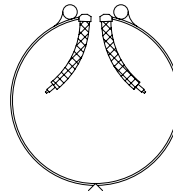
**Standard Termination Location:** Each side of each gap; edge of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 19.1 mm (¾")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Each side of gap; edge of width

**Minimum Inside Diameter:** 19.0 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A

### Type W4—Wire Braid Leads on One Side

A suitable termination for nozzle heating applications. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads.

**Note:** If longer leads are required, specify when ordering.



#### One-Piece Band

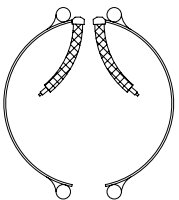
**Standard Termination Location:** Next to gap; edge of width

**Minimum Inside Diameter:** 22.2 mm (7/8")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

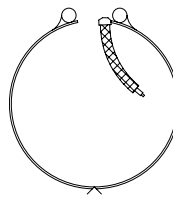
**Standard Termination Location:** Next to same gap on each half; edge of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; edge of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



### Type W2M-Right-Angle Wire Braid Leads, 90° to Heater

Stainless steel wire braid exits perpendicular to the heater centerline through a low profile stainless steel cap. This cap acts as a strain relief which protects against excessive flexing or pulling of the lead wire. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads.

**Note:** If longer leads are required, specify when ordering. Stainless steel construction may be required for widths of 22.2 mm (7/8") to 41.3 mm (1 5/8").



#### One-Piece Band

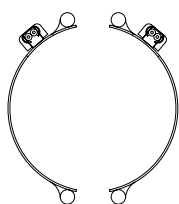
**Standard Termination Location:** Opposite of gap; center of width

**Minimum Inside Diameter:** 38.1 mm (1 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A

### Type W5M-Right-Angle Wire Braid Leads, Parallel to Heater

Stainless steel wire braid exits parallel to the heater centerline through a low profile stainless steel cap. This cap acts as a strain relief which protects against excessive flexing or pulling of the lead wire. The standard leads are 254 mm (10") of wire braid over 305 mm (12") of flexible leads.

**Note:** If longer leads are required, specify when ordering. Stainless steel construction may be required for widths of 22.2 mm (7/8") to 41.3 mm (1 5/8").



#### One-Piece Band

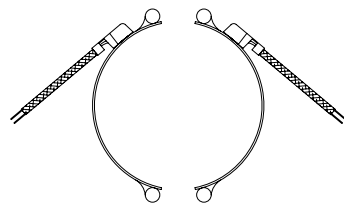
**Standard Termination Location:** Opposite of gap; center of width

**Minimum Inside Diameter:** 38.1 mm (1 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

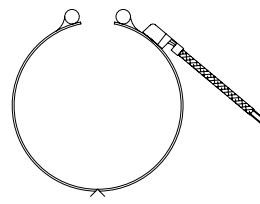
**Standard Termination Location:** Next to same gap on each side; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac each half

**Maximum Amps:** 10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 31.8 mm (1 1/4")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A





## Terminations—Armor Cable Terminations: Type R1, Type R2 and Type R3

Available on any clamping or construction variation. Armor cable provides far superior protection to lead wires where

abrasion is a constant problem. The standard leads are 254 mm (10") of armor cable over 305 mm (12") of flexible leads.

*Note: If longer leads are required, specify when ordering.*

### Type R1 – Straight Armor Cable

- Type R1A—Galvanized armor cable, crimped
- Type R1B—Stainless Steel armor cable, crimped
- Type R1C—Galvanized armor cable, tack welded

- Type R1D—Stainless Steel armor cable, tack welded
- Type R1E—Galvanized armor cable, full silver brazing
- Type R1F—Stainless Steel armor cable, full silver brazing

#### One-Piece Band

##### Standard Termination Location:

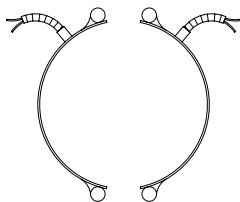
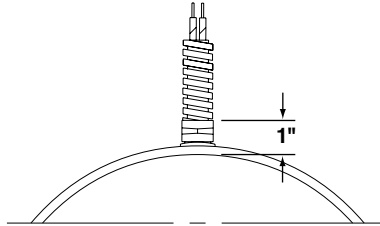
Next to gap; center of width

**Minimum Inside Diameter:** 38.1 mm (1½")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

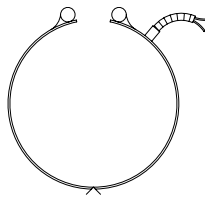
##### Standard Termination Location:

Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/10 A each half



#### One-Piece Expandable Band

##### Standard Termination Location:

Next to gap; center of width

**Minimum Inside Diameter:** 65.3 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A

### Type R2—Right-Angle Armor Cable

- Type R2A—Galvanized armor cable, crimped
- Type R2B—Stainless Steel armor cable, crimped
- Type R2C—Plain leads, no cable

#### One-Piece Band

##### Standard Termination Location:

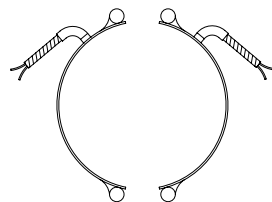
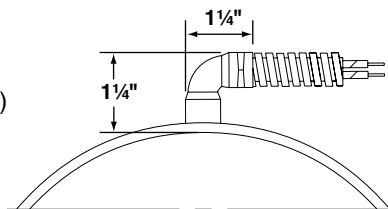
Next to gap; center of width

**Minimum Inside Diameter:** 38.1 mm (1½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



#### Two-Piece Band

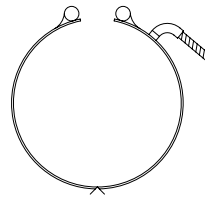
##### Standard Termination Location:

Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A each half



#### One-Piece Expandable Band

##### Standard Termination Location:

Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A



### Type R3-Removable Armor Cable

- Type R3A-Plain leads and female fitting
- Type R3B-Leads, male adaptor and galvanized armor
- Type R3C-Leads, male adaptor and stainless steel armor

Recommended on applications where removable armor is required. The fitting will accept the standard armor cable connector. The standard leads are 254 mm (10") of armor cable over 305 mm (12") of flexible leads.

*Note: If longer leads are required, specify when ordering.*

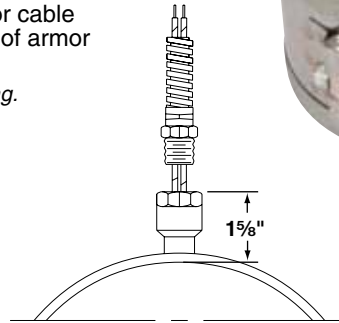
#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

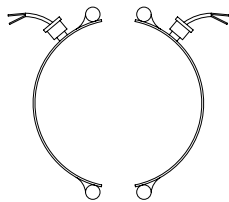
**Minimum Inside Diameter:** 38.1 mm (1½")

**Minimum Width:** 31.7 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A



Type R3B shown



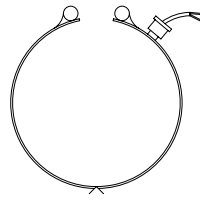
#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.7 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A

### Type S1-Lead Wire Spring Strain Relief

- Type S1A-Plain leads and strain relief spring
- Type S1B-Stainless steel wire braided leads and strain relief spring. 254 mm (10") of braid over 305 mm (12") of flexible leads is standard.

A strain relief spring is attached to the heater at the termination exit to reduce strain on leads subjected to excessive flexing. The spring is 54 mm (2½") long. The flexible standard leads are 254 mm (10") long with 76 mm (3") of fiberglass sleeving.

*Note: If longer leads are required, specify when ordering.*

#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

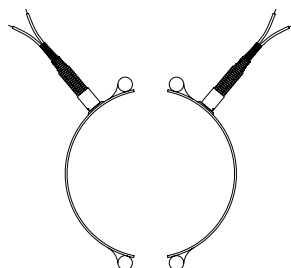
**Minimum Width:** 31.8 mm (1¼")

**Maximum Volts:** 480 Vac

**Maximum Amps:** 10 A



Type S1B shown



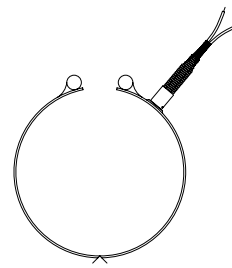
#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 31.75 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 31.75 mm (1¼")

**Maximum Volts/Amps:** 480 Vac/10 A



## Terminations—General Purpose Terminal Boxes: Type C2 and Type C5

Available with any construction or clamping variation. They are a simple and economical way to protect employees from electric shock or prevent electric shorts that can result from exposed wiring on band heater electrical installations.

The heavy duty terminal boxes have 13 mm (1/2") knockouts that will accept standard armor cable connectors. They can be field assembled on band heaters that have a center

distance between terminal screws of 22 mm (7/8"). Boxes can be pre-wired with galvanized armor, stainless steel armor, wire braid or plain leads. If a low profile box with cable or leads is required, it is strongly recommended to order it pre-wired by the factory.

The standard leads are 254 mm (10") of cable or wire braid over 305 mm (12") of flexible leads. If longer leads are required, specify when ordering.

### Type C2—Terminal Boxes

#### Type C2—Standard Box

C2A—Box only

C2B—with galvanized armor

C2C—with stainless steel armor

C2D—with wire braid

#### One-Piece Band

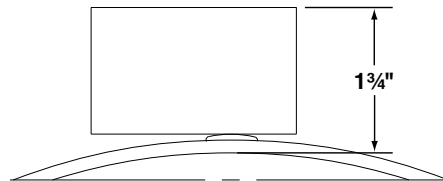
##### Standard Termination Location:

Next to gap; center of width

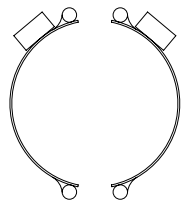
**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A



Type C2 shown



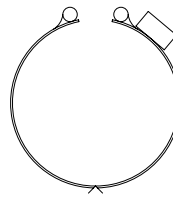
#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A

Heater widths between 25 and 64 mm (1 and 2 1/2") require a minimum ID of 140 mm (5 1/2") or greater.

### Type C5—Terminal Boxes

#### Type C5—Low Profile Box

C5A—Box only

C5B—with galvanized armor

C5C—with stainless steel armor

C5D—with wire braid

C5J—with plain leads

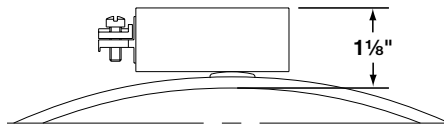
#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

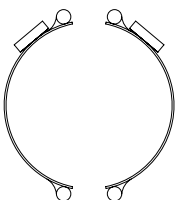
**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A



Type C5 shown



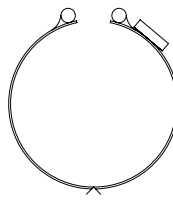
#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A each half



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2 1/2")

**Minimum Width:** 25.4 mm (1")

**Maximum Volts/Amps:** 480 Vac/25 A



## Quick Disconnect Plugs: Type P1, Type P2, Type P3 and Type P4

Available on any construction or clamping variation. These plug assemblies are highly recommended and should be used whenever possible. The combination of plug and cup assembly along with armor cable covered leads eliminates all live exposed terminals or wiring that can be a potential hazard to employees or machinery.

Type P1 and P3 assemblies are available with a straight or right-angle plug. Type P2 and P4 plug assemblies have a lower profile and are available with a straight plug only.

To simplify installation, band heaters with these assemblies can be supplied pre-wired, using high temperature lead wires.

The standard leads are 254 mm (10") of armor cable over (12") of flexible leads. If longer leads are required, specify when ordering.

### Type P1—High Temperature Quick Disconnect Plugs

#### Type P1

**P1K**—Cup assembly only

**P1L**—with straight plug

**P1M**—with 90° plug only

**P1N**—with straight plug and galvanized cable

**P1O**—with straight plug and stainless steel cable

**P1P**—with straight plug and wire braid

**P1Q**—with 90° plug and galvanized cable

**P1R**—with 90° plug and stainless steel cable

**P1S**—with 90° plug and wire braid



Type P1Q shown

#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")

#### Plug Electrical Ratings

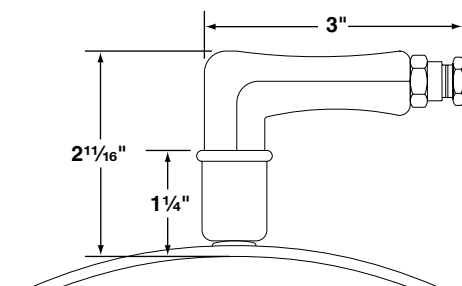
**2-Pole 3-Wire Grounding**

**Maximum Volts:** 250 Vac

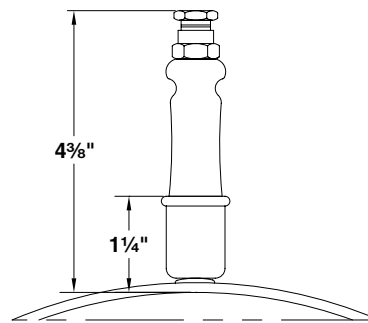
**Maximum Amps:** 16 A

**Maximum Temperature:** 300°C (572°F)

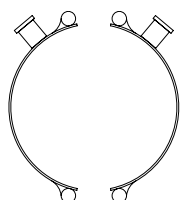
If width is between 38 and 51 mm (1½ and 2"), minimum diameter is 140 mm (5½"). If width is greater than 64 mm (2"), minimum diameter is 64 mm (2")



Type P1M



Type P1L

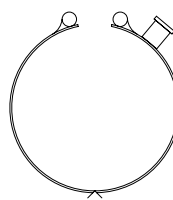


#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 50.8 mm (2")

**Minimum Width:** 38.1 mm (1½")



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

**Minimum Width:** 38.1 mm (1½")



## Terminations

### Type P2—High Temperature Quick Disconnect Plugs

**Type P2—Low Profile Assembly**  
**P2F**—Low profile assembly only  
**P2G**—with straight plug only

**P2H**—with straight plug and galvanized cable  
**P2J**—with straight plug and stainless steel cable  
**P2K**—with straight plug and wire braid

#### One-Piece Band

**Standard Termination Location:**  
 Next to gap; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")

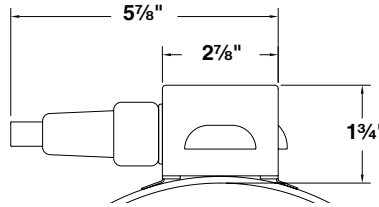
#### Plug Electrical Ratings

**2-Pole 3-Wire Grounding**

**Maximum Volts:** 250 Vac

**Maximum Amps:** 16 A

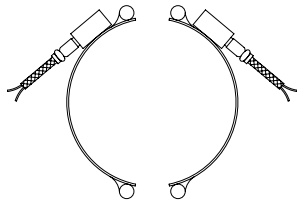
**Maximum Temperature:** 300°C (572°F)



Type P2G shown



Type P2H shown

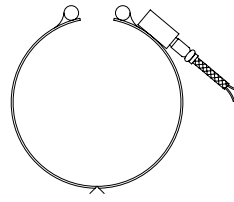


#### Two-Piece Band

**Standard Termination Location:**  
 Next to same gap on each half;  
 center of width

**Minimum Inside Diameter:**  
 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")



#### One-Piece Expandable Band

**Standard Termination Location:**  
 Next to gap; center of width

**Minimum Inside Diameter:**  
 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")

### Type P3—DIN 49458 A/B Quick Disconnect Plugs

**Type P3—Vertical Box Assembly**  
**P3A**—Box assembly only

**P3B**—Box assembly with straight plug  
**P3C**—Box assembly with right-angle plug only

#### One-Piece Band

**Standard Termination Location:** Next to gap;  
 center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 38.1 mm (1½")

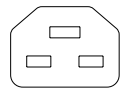
#### Plug Electrical Ratings

**2-Pole 3-Wire Grounding**

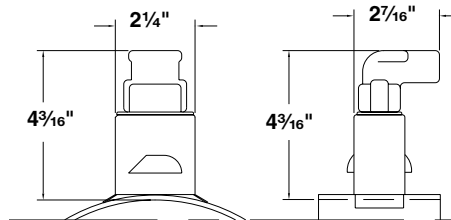
**Maximum Volts:** 250 Vac

**Maximum Amps:** 16 A

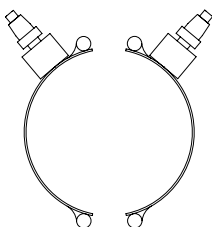
**Maximum Temperature:** 200°C (392°F)



Standard pin orientation



Type P3C shown

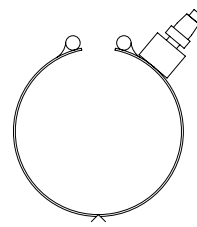


#### Two-Piece Band

**Standard Termination Location:**  
 Next to same gap on each half;  
 center of width

**Minimum Inside Diameter:**  
 76.2 mm (3")

**Minimum Width:** 38.1 mm (1½")



#### One-Piece Expandable Band

**Standard Termination Location:**  
 Next to gap; center of width

**Minimum Inside Diameter:**  
 76.2 mm (3")

**Minimum Width:** 38.1 mm (1½")



### Type P4—DIN 49458 A/B Quick Disconnect Plugs

#### Type P4—Horizontal Box Assembly

P4A—Box assembly only

P4B—Box assembly with straight plug

#### One-Piece Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")

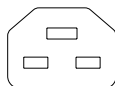
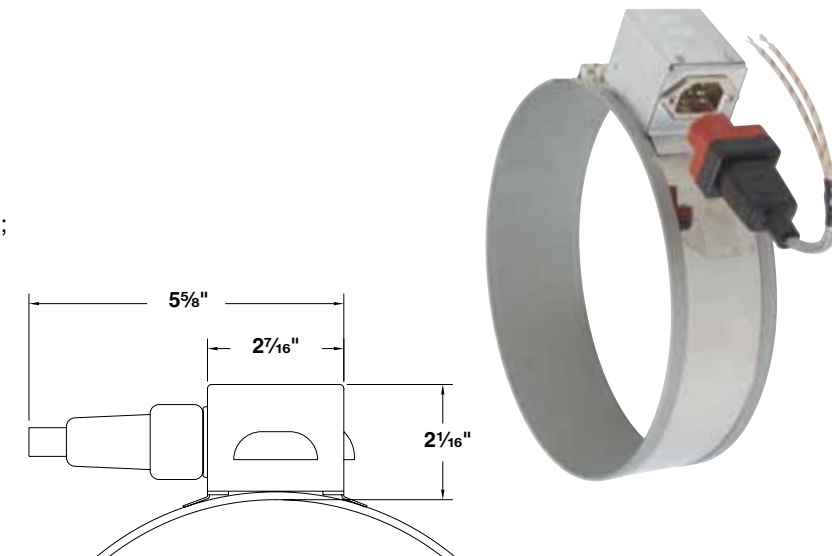
#### Plug Electrical Ratings

**2-Pole 3-Wire Grounding**

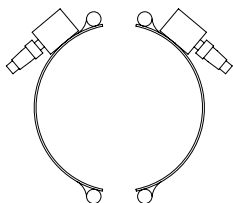
**Maximum Volts:** 250 Vac

**Maximum Amps:** 16 A

**Maximum Temperature:** 200°C (392°F)



Standard pin orientation

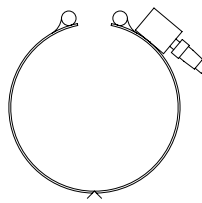


#### Two-Piece Band

**Standard Termination Location:** Next to same gap on each half; center of width

**Minimum Inside Diameter:** 76.2 mm (3")

**Minimum Width:** 63.5 mm (2½")



#### One-Piece Expandable Band

**Standard Termination Location:** Next to gap; center of width

**Minimum Inside Diameter:** 63.5 mm (2½")

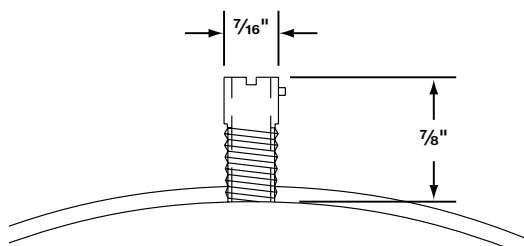
**Minimum Width:** 76.2 mm (3")

## Special Duraband® Construction Options and Variations

### Thermocouple Bayonet Adaptor

A standard bayonet adaptor facilitates the installation of an external thermocouple with a standard bayonet cap. The standard location for the adaptor is 90° from the gap. Specify without through hole for heater sensing or with through hole for load sensing. For heaters less than 25 mm (1" ) wide order separate strap clamping and utilize the gap for the thermocouple.

Visit [omega.com](http://omega.com) for a complete selection of thermocouples.





## Construction Options and Variations

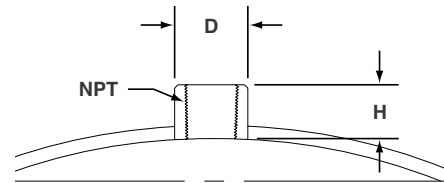
### Thermocouple Coupling

The thermocouple coupling facilitates the installation of an external thermocouple with a threaded fitting to sense the temperature of the band. The standard location for the coupling is 90° from the gap. Specify without through hole for heater sensing or with through hole for load sensing.



#### Available Bushing Sizes

Thread	D, mm (inch)	H, mm (inch)
1/8-27 NPT	14.2 (9/16)	15.8 (5/8)
1/4-20 NPT	19 (3/4)	17.4 (1 1/16)
3/8-18 NPT	22.2 (7/8)	15.8 (5/8)
M12-1.75 mm	19 (3/4)	12.7 (1/2)



### Holes and Cutouts

Holes and cutouts are normally required in band heaters for clearance for thermocouple probes or holding bolts. An oversize gap can in many cases serve the same purpose, saving the expense of the hole.

Using the center of the gap as a starting point, specify the location of the centerpoint of the hole or cutout in terms of degrees and the distance from the edge of the heater. In addition, state the size of the hole or cutout.

For critical hole and cutout locations, a detailed drawing will be required.

**Note:** A minimum of 13 mm (1/2") is required from the hole to the edge of the heater.



### Hinged Two-Piece Band

The hinged two-piece band heater is connected with a continuous hinge for easy installation and removal. This heater can be opened and closed as often as is necessary. The preferred method of clamping is latch and trunnion. It is available with any screw or lead variation. When ordering, specify watts and volts each half.

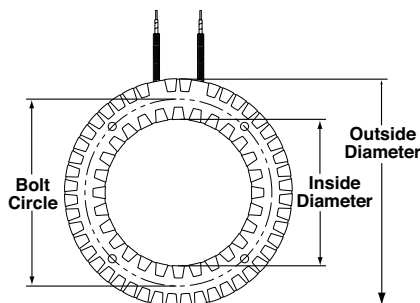
**Minimum Width:** 34.9 mm (1 3/8")



## Special Mica Insulated Heater Construction Variations

### Ring Heaters

When ordering ring heaters, specify inside and outside diameters. If mounting holes are required, specify location and hole size. For critical hole and cutout locations, a detailed drawing will be required.





## Duraband Features

### Additional Duraband® Heater Features

#### Electrical Variations

##### Three-Phase

On very high wattage band heaters it would be advantageous to set up the wiring three-phase to reduce the current load across a single conductor. Three-phase wiring is available on select clamping/construction or termination variation (termination location is subject to engineering approval).

**Minimum ID:** 76.2 mm (3"), **Minimum Width:** 50.8 mm (2")

##### Dual Voltage

Band heaters can be designed using 3-wire series/parallel circuits for dual voltage applications. Whether the heater is run on the higher or lower voltage, the wattage will be the same. Dual Voltage wiring is available on any clamping/construction or termination variation.

##### Ground Terminal or Lead

For those applications requiring a separate ground terminal or lead attached to the heater sheath. A ground terminal or lead is available on any clamping/construction or termination variation.

##### Single Phase/Three Phase Duraband

Heaters can be designed with multiple circuits to operate single or three-phase.

#### Lead Variations

##### Electrical Plugs

Industry standard NEMA Twist-Lock® electrical plugs are available. The plugs can be attached to fiberglass leads, armor cable or wire braid. Electrical plugs can be added to any clamping/construction or termination variation.

#### Built-In Thermocouples

Heaters can be manufactured with a built-in thermocouple to closely control the temperature of the heater.

Type J or K thermocouples are available with fiberglass, wire braid or any other required insulation. Contact OMEGA with your requirements.

#### Construction Variations

##### All Stainless Steel Construction

Mica band heaters can be constructed with the external sheath made entirely from stainless steel. This allows the Duraband to reach the maximum temperature of 650°C (1200°F). All stainless steel construction is available on any clamping/construction or termination variation.

##### Other Sheath Materials

Other sheath materials, such as rust-resistant steel, Monel®, aluminum, or copper are also available for unique applications.

#### Terminal Lugs

Various types of crimp terminals can be attached to the heater leads to make wiring into applications quick and easy. High temperature [649°C (1200°F)] ring terminals and nylon or PVC insulated terminals are available. Spade, ring, and right-angle or straight quick disconnect type terminals can be attached to the leads.



Plug Model No.	Receptacle Model No.	Reference	NEMA P or R	Amps	Volts
EHD-102-113	EHD-103-104	P4 twist lock	L5-15	15	125
EHD-102-121	EHD-103-107	P5 twist lock	L6-15	15	250
EHD-102-104	N/A	P9 twist lock	L2-20	20	250

#### Custom Engineered/Manufactured Heaters

Understanding that an electric heater can be very application specific, for sizes not listed OMEGA® will design and manufacture a Duraband Heater to meet your requirements.

#### Please Specify the Following:

- Inside Diameter
- Width
- Wattage
- Voltage
- Quantity
- Termination (see pages 9 through 22)
- Lead Cable/Braid Length
- Construction style (see pages 5, 22)
- Clamping variation (see pages 6 through 8)
- Special Features





## Installation Recommendations

### Installation Accessories Available

- High Temperature Terminal Lugs
- Igloo™ Ceramic Terminal Covers
- UL Listed Plugs
- High Temperature Lead Wire 450°C (842°F)
- Armor Cable
- Stainless Steel Braid

- High Temperature Sleeving
- Stainless Steel Barrel Covers
- High Temperature Mica Insulated Wiring Harnesses 450°C (842°F)
- Thermocouples
- Temperature Controllers
- High Temperature Fiberglass Tape

1. Disconnect electric power to the machine and/or heaters prior to installing or replacing heaters.
2. Do not install heaters in areas where combustible gases, vapor or dust is present.
3. Use as many narrow band heaters as the application will permit. 38 through 76 mm (1½ through 3") wide heaters are recommended.
4. Using a heater that closely matches the wattage requirements will decrease the frequency of cycling and temperature overshoot, thereby increasing the life of the heater.
5. Make certain that all barrel surfaces are clean and have a smooth finish. Any contaminants or imperfections on the surface can cause premature heater failure.
6. Expandable type Mica Band Heaters may be opened once at the gap to fit on the barrel. Do not open these heaters beyond their specified heater diameter.

**Caution:** Do not open one-piece non-expandable type mica band heaters. Opening of these heaters can damage Mica Insulation and will create electrical short circuits.

7. Position heater bands on the barrel.
8. Securely tighten heater bands around the barrel. Clamping force must be equally distributed on heaters with more than one set of clamping brackets. *Recommended clamping bolt torque is 10 ft./lbs.*
9. For heaters with screw terminals, remove the top nut and flat washers from the power screw terminals. Do not remove or loosen the bottom nut on the power screw terminals. The bottom nut is tightened to 60 in./lbs. at the factory. A loose bottom nut may cause premature heater failure.
10. All electrical wiring of heater bands should be done by a qualified electrician.
  - A. Use only Stainless Steel or other high temperature lugs to prevent material degradation when exposed to high temperatures over a prolonged period of time.

**Caution:** Do not use copper or plated copper lugs.

- B. Use only lead wire with high temperature insulation and proper gauge size.

- C. When connecting power leads to screw terminals make certain that barrels of terminal lugs are not facing down toward the heater case, which will create a short circuit. *Tighten the top nut to 30 in./lbs.*
- D. Make certain power lead wires do not make contact with hot heater surface to avoid degradation of lead wire, as this can cause electrical short circuits.
- E. Make sure the voltage input to the heater bands does not exceed the voltage rating that is stamped on the heater band.
- F. It is recommended that an amperage reading is taken for each heater to verify proper wiring. *(Amps = Watts/Volts)*
11. Insulate all live electrical wires per applicable safety standards.
12. Begin heater band re-tightening procedure. Be sure to wear protective gloves.
  - A. Energize heater bands and allow the heater to reach 149°C (300°F). This usually takes between 3 and 5 minutes.
  - B. Turn off power and immediately re-tighten the heater bands to 10 ft./lbs. Turn power back on.
13. Install shrouds around the machine to meet applicable safety requirements.
14. Once installed, check surroundings to make sure that contaminants won't get on the heater while the unit is in operation. Accumulation of contaminants on heaters can cause premature heater failure.
15. Insulating blanket installations must have band heater re-tightening sequence (#12) completed before blanket installation. Lead wires must exit the insulation blanket as soon as possible; do not entrap lead wires between heater sheath and insulation blanket.

**Caution:** It is imperative that upon start-up of new machines at customer facilities, all of the aforementioned parameters are double checked by qualified field service personnel.

**CAUTION: Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.**



## Nozzle Band Heaters

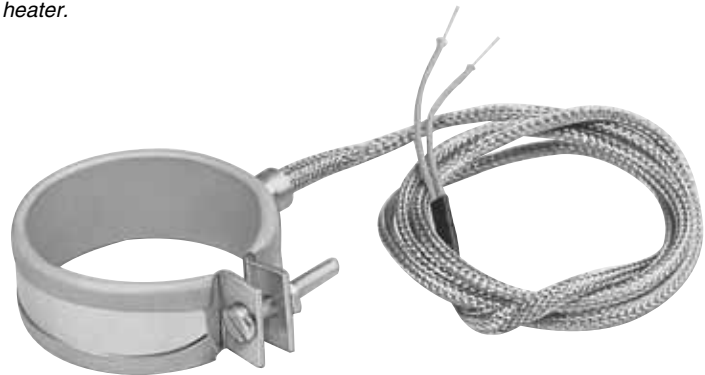
### Standard Replacement Mica Insulated Band Heaters for Plastic Injection Molding Machines



<b>To Order Visit <a href="http://omega.com/mbh_nozzle">omega.com/mbh_nozzle</a> for Pricing and Details</b>						
Model Number		Inside Diameter		Width		Watt
120V	240V	mm	inch	mm	inch	
—	<b>MBH00033</b>	31.8	1¼	30.2	1⅜	125
<b>MBH00031</b>	<b>MBH00035</b>	38.1	1½	25.4	1	150
—	<b>MBH00036*</b>	38.1	1½	25.4	1	150
—	<b>MBH00038</b>	58.7	2⅝	36.5	1⅞	300
—	<b>MBH00039*</b>	58.7	2⅝	36.5	1⅞	300

\* Heaters have built-in Type J thermocouple.

Ordering Example: MBH00031, 120V, 150 watt, nozzle band heater.



<b>To Order Visit <a href="http://omega.com/mbh_nozzle">omega.com/mbh_nozzle</a> for Pricing and Details</b>								
Model Number		Inside Diameter		Width		Watt	Watt Density	
120V	240V	mm	inch	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
<b>MBH00030</b>	<b>MBH00034</b>	38.1	1½	25.4	1	150	6.3	40
<b>MBH00003</b>	<b>MBH00012</b>	44.5	1¾	25.4	1	175	6.0	39
<b>MBH00004</b>	<b>MBH00013</b>	50.8	2	25.4	1	200	5.9	38
<b>MBH00005</b>	—	57.2	2¼	25.4	1	175	4.5	29
—	<b>MBH00037</b>	57.2	2¼	38.1	1½	300	5.1	33
<b>MBH00006</b>	<b>MBH00014</b>	63.5	2½	25.4	1	250	5.7	36
<b>MBH00007</b>	<b>MBH00015</b>	76.2	3	25.4	1	200	3.7	24
<b>MBH00009</b>	<b>MBH00016</b>	88.9	3½	25.4	1	300	4.7	30

Ordering Example: MBH00007, 120V, 200 watt, nozzle band heater.



**Nozzle Band Heaters**  
**Standard Replacement Mica Insulated Band Heaters for Plastic Injection Molding Machines**



**To Order Visit [omega.com/mbh\\_nozzle](http://omega.com/mbh_nozzle) for Pricing and Details**

Model Number	Inside Diameter		Width		Watt	Watt Density		
	240V	mm	inch	mm		inch	Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
MBH00019		38.1	1½	38.1	1½	275	7.7	49
MBH00020		38.1	1½	44.5	1¾	250	6.0	38
MBH00021		38.1	1½	63.5	2½	400	6.7	43
MBH00022		38.1	1½	76.2	3	450	6.3	40
MBH00023		38.1	1½	114.3	4½	600	5.6	36
MBH00024		44.5	1¾	152.4	6	800	4.6	30
MBH00025		54.0	2⅙	23.8	1⅞	215	6.3	40
MBH00026		58.7	2⅝	23.8	1⅞	260	6.9	44
MBH00027		58.7	2⅝	34.9	1⅞	240	4.3	28
MBH00028		69.9	2¾	38.1	1½	260	3.5	23

All heaters have 609 mm (24") high temperature leads with 559 mm (22") stainless steel overbraided.  
**Ordering Example:** MBH00023, 240V, 600 watt, nozzle band heater.

**Design Features**

- All Heaters Have 609 mm (24") High Temperature Leads with 559 mm (22") Stainless Steel Overbraided—Type W3
- Heaters Less Than 38 mm (1½") Wide Have Separate Straps—Type SE
- Designed as One-Piece Expandable Type, Enables You to Open Up the Heater to the Diameter of the Barrel for Easy Installation



**To Order Visit [omega.com/mbh\\_nozzle](http://omega.com/mbh_nozzle) for Pricing and Details**

Model Number			Inside Diameter		Width		Watt	Watt Density		Style
120V	240V	480V	mm	inch	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>	
MBH00040	—	—	69.9	2¾	88.9	3½	600	3.5	22	NE
MBH00041	MBH00054	—	76.2	3	25.4	1	200	3.7	24	SE
MBH00042	MBH00055	—	76.2	3	25.4	1	250	4.7	30	SE
MBH00043	MBH00056	—	76.2	3	25.4	1	300	5.6	36	SE
MBH00044	MBH00057	—	76.2	3	25.4	1	400	7.4	48	SE
MBH00045	MBH00058	—	76.2	3	38.1	1½	500	6.1	40	NE
—	MBH00059	—	76.2	3	63.5	2½	300	2.2	14	NE
MBH00046	MBH00060	—	88.9	3½	15.9	⅝	200	5.0	32	SE
MBH00047	—	—	88.9	3½	25.4	1	200	3.1	20	SE
—	MBH00061	—	88.9	3½	38.1	1½	500	5.2	33	NE
MBH00048	MBH00062	MBH00066	101.6	4	50.8	2	625	4.2	27	NE
MBH00049	—	—	101.6	4	76.2	3	500	2.2	14	NE
MBH00050	MBH00063	MBH00067	101.6	4	101.6	4	1250	4.2	27	NE
MBH00051	—	—	114.3	4½	25.4	1	300	3.5	23	SE
—	MBH00064	MBH00068	114.3	4½	50.8	2	700	4.1	27	NE
MBH00052	—	—	114.3	4½	101.6	4	700	2.1	13	NE
MBH00053	MBH00065	MBH00069	114.3	4½	101.6	4	1400	4.1	27	NE

**Ordering Example:** MBH00049, 120V, 500 watt, nozzle band heater.



## Nozzle Band Heaters

### Standard Replacement Mica Insulated Band Heaters for Plastic Injection Molding Machines



#### Design Features

- All Heaters Have 0.61 m (24") High Temperature Leads—Type L2
- Heaters Less Than 38 mm (1½") Wide Have Separate Straps—Type SE
- Designed as One-Piece Expandable Type, Enables You to Open Up the Heater to the Diameter of the Barrel for Easy Installation

<b>To Order Visit <a href="http://omega.com/mbh_nozzle">omega.com/mbh_nozzle</a> for Pricing and Details</b>										
Model Number			Inside Diameter		Width		Watt	Watt Density		Style
120V	240V	480V	mm	inch	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>	
MBH00070	MBH00078	—	76.2	3	25.4	1	200	3.7	24	SE
MBH00071	MBH00079	—	76.2	3	25.4	1	250	4.6	30	SE
MBH00072	MBH00080	—	76.2	3	25.4	1	300	5.5	36	SE
MBH00073	MBH00081	—	76.2	3	25.4	1	400	7.4	47	SE
MBH00074	MBH00082	—	76.2	3	38.1	1½	400	4.9	32	NE
MBH00075	MBH00083	—	76.2	3	38.1	1½	450	5.5	36	NE
MBH00076	MBH00084	—	76.2	3	38.1	1½	500	6.1	40	NE
MBH00077	MBH00085	—	76.2	3	50.8	2	500	4.6	30	NE
—	MBH00086	—	88.9	3½	25.4	1	400	6.2	40	SE
—	MBH00087	MBH00093	88.9	3½	38.1	1½	250	2.6	17	NE
—	MBH00088	—	88.9	3½	50.8	2	650	5.0	33	NE
—	MBH00089	MBH00094	125.4	4 <sup>15</sup> / <sub>16</sub>	63.5	2½	720	3.1	20	NE
—	MBH00090	MBH00095	139.7	5½	63.5	2½	950	3.6	23	NE
—	MBH00091	MBH00096	149.2	5 <sup>7</sup> / <sub>8</sub>	38.1	1½	675	4.0	26	NE
—	MBH00092	MBH00097	190.5	7½	38.1	1½	1000	4.6	30	NE

Ordering Example: MBH00085, 240V, 500 watt, nozzle band heater.

## Split Sheath Insertion Heaters

- 3/8 - 1 Inch Diameter
- 5 - 60 Inch Lengths (SST)
- 5 - 36 Inch Lengths (QST)
- Sheath Temperatures up to 1600°F (871°C)

### Applications

- Platens
- Presses
- Dies
- Molds

### Description

The SST and QST Split Sheath Insertion Heaters are designed especially for platen, die or mold heating applications where the holes are poorly drilled or worn through age. Independent expansion of each section of the SST and QST when energized, creates intimate contact with the wall of the hole

- Split Sheath design
- Improved conductive heater
- Easily inserted and removed from long holes
- Incoloy® Sheath for long life at extreme temperatures
- Compacted to maximum density for excellent element to sheath heat transfer and dielectric strength

Fig. 001

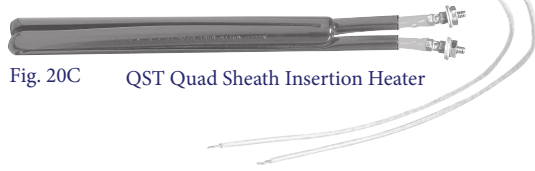


Fig. 20C QST Quad Sheath Insertion Heater

### Terminations

**Flexible Leads** – SST & QST are available with flexible lead wires machine connected to the terminal pins, for temperatures to 850°F (450°C). 12" length is standard. Specify longer length.

**Screw Terminals** – SST and QST are available with standard 8/32 x 1" welded nickel plated steel studs. Easy terminal connections are made using lugs, leads or bus bar. Stainless steel, and other thread sizes or lengths are available. Consult Omega sales.



Unenergized SST



Energized SST



Unenergized QST



Energized QST

Tolerances and Limitations						
Nominal Sheath Diameter	3/8"	1/2"	5/8"	11/16"	3/4"	1"
Actual Sheath Diameter (±.003)	.370"	.495"	.620"	.682"	.745"	.995"
Minimum Sheath Length	5"	5"	5"	5"	5"	5"
Maximum Sheath Length – SST	60"	60"	60"	60"	60"	60"
Maximum Sheath Length – QST	N/A	36"	36"	36"	36"	N/A
Minimum Ohms/inch of EHL*	SST .278	.308	.296	.296	.350	.350
	QST -	.593	.593	.593	.593	-
Maximum Ohms/inch of EHL*	SST 11	21	21	21	26	26
	QST -	38	38	38	38	-
Maximum Standard Voltage		240	240	240	480	480
Maximum Amperage	SST 15	30	40	40	40	40
	QST -	30	30	30	30	-
Wattage						+5% – 10%
Resistance						+10% – 5%
Sheath Length						±3% up to 20"; ±2% over 20"

\*EHL: Effective Heat Length

## SST & QST Split Sheath Insertion Heaters (cont'd.)

Fig. 04C Stainless Steel Armor Cable Lead Protection

Armor Cable is the best protection against abrasion or other damage to lead wires. A straight transition adapter with 12" stainless steel armor cable and 14" lead wires is standard. Specify longer length.

Fig. 15C Right Angle Stainless Steel Armor Cable Lead Protection

Figure 15C Shows an SST Insertion Heater with right angle stainless steel armor cable protect leads. Figure DS is for use where spacing is limited and for wiring convenience. 12" cable and 14" overall lengths are standard. Specify longer length.

Fig. 17C Right Angle Flexible Stainless Steel Braided Leads

Figure 17C right angle flexible stainless steel braid protects lead wires from abrasion and are full length flexible at right angle orientation for installations with limited spacing. 12" stainless steel braid with 14" leads are standard. Specify longer length.

Fig. 10C Mounting Flange

Figure 10Cw is a stop washer or mounting flange. Specify distance from lead end, outside diameter and mounting hole centers, if required.

### Adaptor Dimensions

SST or QST* Diameter	Figures 04C, 15C, 13C & 17C	Cable O.D.*
3/8"	5/8" x 1-1/2"	15/32
1/2"	5/8" x 1-1/2"	
5/8"	3/4" x 1-1/2"	
11/16"	3/4" x 1-1/2"	
3/4"	7/8" x 1-1/2"	
1"	1-1/8" x 1-1/2"	

\* QST (QUAD) N/A in 3/8" Diameter

\*\* Not applicable to Fig. 13C or Fig. 17C



### Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model						
SST Single Split-Sheath Cartridge Heater						
QST Quad Split-Sheath Cartridge Heater						
Code	Nominal Sheath Diameter					
375	3/8" (QST not available)					
500	1/2"					
625	5/8"					
687	11/16"					
750	3/4"					
1000	1"					
Code	Insertion Length (inches of shaft)					
mm	Enter desired shaft insertion length					
Code	Voltage					
120	120 Vac	480	480 Vac			
240	240 Vac	5	Other (Consult Sales)			
380	380 Vac					
Code	Wattage					
XXXX						
Code	Termination Option					
001	12" Leadwire					
10C	Mounting flange/stop washer					
15C	Right angle fitting with flexible stainless steel armor cable (transition 1-1/2" in length)					
40C	Straight Flexible Stainless Steel Armor Cable Fitting (transition 1-1/2" in length)					
17C	Right angle fitting with stainless steel braided lead protection (transition 1-1/2" in length)					
13C	Straight flexible stainless steel braided lead protection (transition 1-1/2" in length)					
20C	Threaded post terminal connection					
SST	375	6	120	1000	15C	Typical Model Number



## Construction Characteristics

The ideal solution for applications that require high watt densities (Watt/in<sup>2</sup>) and/or high operating temperatures.

Band heaters are capable of temperatures up to 760°C (1400°F) and watt densities up to 23.25 Watt/cm<sup>2</sup> (150 Watt/in<sup>2</sup>). The recommended maximum watt density for a specific application will depend on the heater size and its operating temperature.



### Unbreakable Power Screw Terminals

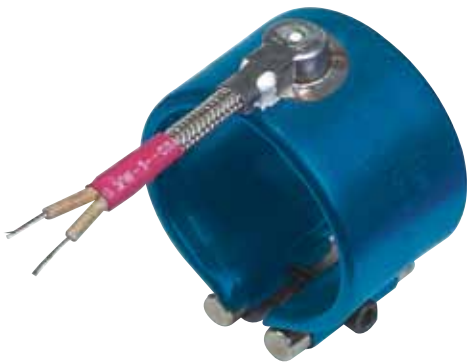
Only these band heaters offer this unique screw terminal design. The stainless steel power screw terminals are resistant to over-torquing.

Specially formulated mineral insulated tape providing excellent thermal conductivity and dielectric strength is used to insulate the nickel chrome resistance wire from the stainless steel sheath. The heater assembly is formed under pressure to a precise diameter with a thin low-mass cross section, assuring fast heat-up rates and reduced cycle times.



### Superior Clamping Mechanism

The clamping brackets are formed from the outer sheath of the heater, providing a unique one-piece built-in construction strap. The clamping power is generated through barrel nuts and socket head screws, which as an integral part of the built-in strap, provide superior clamping force for maximum performance and optimal heater life.



### Innovative Lead Terminations

Smaller size band heaters are powered-up by means of lead wire terminations. To insure a resilient connection that will withstand abrasion, mechanical abuse and keep contaminants out of the transition area, a specially designed stainless steel transition cap with a built-in strain relief was developed. The cap is welded to the sheath and the cavity is filled with insulating cement, sealing the band heater from contaminants.



### Unique Igloo Ceramic Covers

To eliminate exposed wiring/screw terminals on band heater installations, a 90° double port ceramic cap was designed. This unique and exclusive Igloo ceramic terminal insulator fits over the entire terminal and lug, leaving no exposed wiring.

## Specifications & Tolerances

If non-standard widths or tighter tolerances are required, contact OMEGA.

### Performance Ratings

**Maximum Temperature:** 760°C (1400°F)

#### Nominal Watt Density:

**Nozzle Bands, Under 3" Diameter:** 4.7 to 15.5 Watt/cm<sup>2</sup>  
(30 to 100 Watt/in<sup>2</sup>)

**Barrel Bands, 3" and Greater in Diameter:**  
3.1 to 10.9 Watt/cm<sup>2</sup> (20 to 70 Watt/in<sup>2</sup>)

**Maximum Watt Density:** 23 Watt/cm<sup>2</sup> (150 Watt/in<sup>2</sup>)  
dependent on heater size, operating temperature and termination

### Electrical Ratings

**Maximum Voltage:** 480 Vac per termination

**Dual Voltage:** Available depending on heater configuration

#### Maximum Amperage:

**Lead Wire Termination:** 10A

**Screw Terminations:** 8-32UNF—20A, 10-32UNF—25A

**Resistance Tolerance:** +10%, -5%

**Wattage Tolerance:** +5%, -10%

### Physical Size Construction Limitations

#### Nominal Gap—Built-In Bracket:

**Less than 44 mm (1¾") Diameter:** 6 mm (¼")

**44 to 51 mm (1¾ to 2") Diameter:** 8 mm (5/16")

**51 to 127 mm (2 to 5") Diameter:** 10 mm (3/8")

**127 mm to 0.46 m (5 to 18") Diameter:** 13 mm (½")

**Greater than 0.46 m (18") Diameter:** 19 mm (¾")

If a larger gap is required for probes or thermocouples, specify when ordering.

#### Maximum Inside Diameters:

**One-Piece:** 355.6 mm (14")\*

**Expandable:** 355.6 mm (14")\*

**Two-Piece:** 635.0 mm (25")

**Over 635.0 mm (25")** will require multiple segments.  
Contact OMEGA.

\* *Note: OMEGA recommends two-piece construction for heaters 10" ID and greater.*

**Standard Widths:** 25.4 to 203.2 mm (1 to 8")

**Width Tolerance:** 2.4 mm (±3/32")

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

### Diameter/Width Limitations

Width		One-Piece Construction Inside Diameter		Expandable Construction Inside Diameter		Two-Piece Construction Inside Diameter	
in	mm	in	mm	in	mm	in	mm
1	25.4	1 to 10	25.4 to 254.0	N/A	N/A	3 to 25	76.2 to 635.0
1½	38.1	1 to 14	25.4 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
2	50.8	1½ to 14	38.1 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
2½	63.5	1½ to 14	38.1 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
3	76.2	1½ to 14	38.1 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
3½	88.9	1¾ to 14	44.5 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
4	101.6	2 to 14	50.8 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
4½	114.3	2¼ to 14	57.2 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
5	127.0	2½ to 14	63.5 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
5½	139.7	2¾ to 14	69.9 to 355.6	3 to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
6	152.4	3 to 14	76.2 to 355.6	3 to 14	76.2 to 355.6	3 to 25	76.2 to 635.0
6½	165.1	3¼ to 14	82.6 to 355.6	3¼ to 14	82.6 to 355.6	3¼ to 25	82.6 to 635.0
7	177.8	3½ to 14	88.9 to 355.6	3½ to 14	88.9 to 355.6	3½ to 25	88.9 to 635.0
7½	190.5	3¾ to 14	95.3 to 355.6	3¾ to 14	95.3 to 355.6	3¾ to 25	95.3 to 635.0
8	203.2	4 to 14	101.6 to 355.6	4 to 14	101.6 to 355.6	4 to 25	101.6 to 635.0

#### Additional Limitations

- For heaters less than 102 mm (4") in diameter, the maximum width is twice the diameter.
- Heaters with standard brackets are available from 25 to 203 mm (1 to 8" wide, while heaters with low profile brackets are available from 25 to 152 mm (1 to 6") wide.
- 25 mm (1") diameter heaters are only available in 25 to 38 mm (1 and 1½") widths.
- For heaters from 254 mm (10") diameter up to 0.6 m (25") diameter, OMEGA recommends using 2-piece construction for superior clamping. Over 0.6 m (25") diameter, 3 or 4 segments are recommended.
- Combinations of some minimum and maximum variations may not be available. Contact OMEGA with your special requirements.
- Post terminals are only available on heaters greater than 64 mm (2½") in diameter and 38 mm (1½") in width.



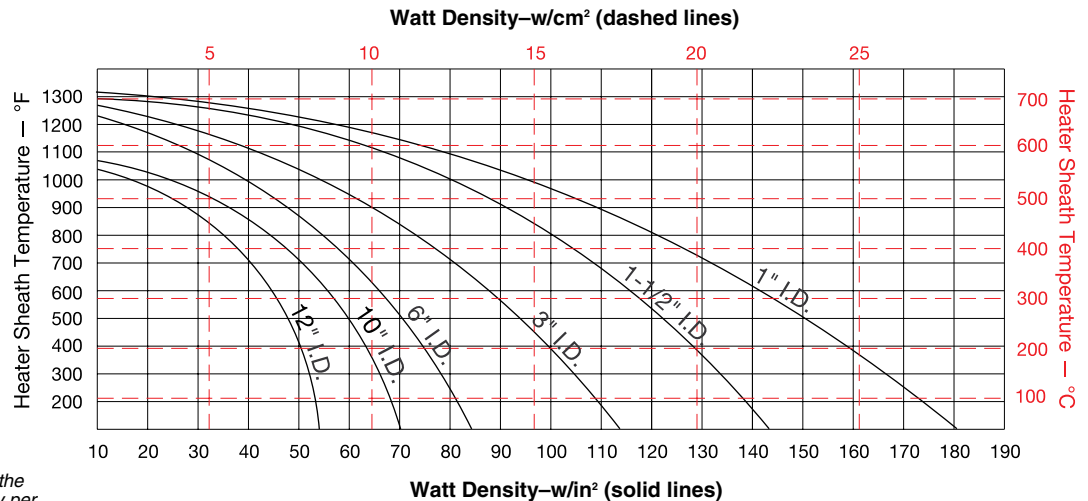
## Maximum Watt Densities

### Maximum Allowable Watt Density

The chart displays the maximum Watt Density curves for various diameter heaters. Use this chart when determining the appropriate wattage value for your chosen heater.

Be aware that certain factors will require you to derate the watt density (Watt/in<sup>2</sup>) of your heater selection.

**CAUTION:** Failure to adhere to the maximum allowable watt density per heater size will result in poor operating life.



## Calculating Maximum Watt Density

### Factors to be taken into consideration:

- A. Type of controls
- B. Voltage variations
- C. Machine cycling rate
- D. Type of resin being processed
- E. Coefficient of thermal expansion and conductivity of the cylinder
- F. Designing a heater that closely matches the wattage requirement will decrease the frequency of cycling and temperature overshoot, thereby increasing the life of the heater

### Once these factors have been established, proceed with the following steps:

1. Determine the maximum operating temperature.
2. Calculate the total wattage required to obtain the maximum operating temperature.
3. Determine the quantity and size of the heater bands to be used. Due to clamping concerns, 51 through 76 mm (2" through 3") wide band heaters have long proven to be the most efficient and reliable in most cylindrical heating applications.
4. Determine individual band heater wattage by dividing the total required wattage by the quantity of band heaters selected.

5. Determine the band heater's heated area by subtracting unheated (cold) areas created by screw terminals, gaps, holes, and cutouts.

### Nominal Unheated Areas

Construction Style	Cold Area to Subtract
One-piece band	1" x width
One-piece expandable band	1½" x width
Two-piece band	2" x width

For each hole or cutout add to the cold area from the Table the (Hole size + ½") x heater width. This is total cold area to use in the following formula to calculate the heater watt density.

### Watt Density Formula

$$\text{Watt Density (Watt/in}^2\text{)} = \frac{\text{Wattage}}{(3.14 \times \text{Band ID} \times \text{Band Width}) - (\text{Cold Area})}$$

6. Check in the above graph that the calculated watt density does not exceed the maximum recommended watt density. Locate the maximum cylinder temperature required on the left-hand side of the graph, follow the horizontal line until it intersects with the line of the band heater being used, and read directly down to obtain the maximum recommended watt density (watt/in<sup>2</sup>).
7. If the calculated watt density is higher than the recommended value, it must be corrected or it will cause poor heater life. This can be accomplished by using more band heaters or lowering the heater wattage.
8. Should you have a problem in selecting the proper band heater or establishing watt density for your application, contact OMEGA.

### Correction Factors

For heaters wider than 76.2 mm (3"), reduce maximum allowable watt density from chart by 20%.

For applications using insulating shroud, reduce maximum allowable watt density from chart by 25%.

Do not use insulating blankets if heater temperatures are above 649°C (1200°F). Failure to adhere will result in premature heater failure.





## Nozzle Band Heaters Available Through the Terminator Program

Model Numbers listed are for heaters with Type W2 termination—right-angle wire braid leads [305 mm (12") leads, 254 mm (10") stainless steel braid]. Other terminator program terminations and options can also be applied to stock heaters (see To Order chart below).

<b>To Order</b>									
Model No.		Inner Dimension		Width		Watt	Watt Density		Clamping/ Construction
120V	240V	mm	inch	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>	
MPP50101	—	25.4	1	25.4	1	150	10.9	70	WB
—	MPP50206	25.4	1	25.4	1	225	16.3	105	WB
MPP50301	MPP50401	25.4	1	38.1	1½	200	9.7	62	WB
—	MPP50601	25.4	1	38.1	1½	250	12.1	78	WB
MPP50701	MPP50801	25.4	1	38.1	1½	300	14.5	93	WB
MPP51101	MPP51202	31.8	1¼	25.4	1	250	13.2	85	WB
—	MPP51401	31.8	1¼	25.4	1	275	14.6	94	WB
MPP51701	—	31.8	1¼	38.1	1½	350	12.4	80	LB
—	MPP51801	31.8	1¼	38.1	1½	350	12.4	80	WB
MPP51901	MPP52001	38.1	1½	25.4	1	200	8.4	54	OB
MPP52301	MPP52402	38.1	1½	25.4	1	300	12.5	81	OB
MPP52501	MPP52602	38.1	1½	38.1	1½	300	8.4	54	LB
—	MPP52903	38.1	1½	38.1	1½	450	12.5	81	LB
—	MPP53001	38.1	1½	50.8	2	300	6.3	40	LB
—	MPP53202	38.1	1½	50.8	2	450	9.4	61	LB
—	MPP53401	38.1	1½	76.2	3	350	4.9	31	LB
—	MPP53501	38.1	1½	76.2	3	500	7.0	45	LB
MPP53801	MPP53901	44.5	1¾	38.1	1½	300	6.9	44	LB
—	MPP54301	44.5	1¾	50.8	2	750	12.9	83	LB
—	MPP54401	44.5	1¾	63.5	2½	550	7.6	49	LB
—	MPP54601	44.5	1¾	76.2	3	1000	11.5	74	LB
MPP54701	MPP54801	50.8	2	25.4	1	350	10.3	66	OB
—	MPP54901	50.8	2	38.1	1½	400	7.8	50	LB
MPP55051	MPP55101	50.8	2	50.8	2	750	11	71	LB
—	MPP55401	57.2	2¼	25.4	1	350	8.9	58	OB
—	MPP55801	57.2	2¼	63.5	2½	1000	10.2	66	LB
MPP55901	MPP56001	63.5	2½	25.4	1	400	9.0	58	OB
—	MPP56101	63.5	2½	38.1	1½	500	7.5	49	LB

Ordering Example: MPP55051, nozzle band heater, 120V, 750 watt, 305 mm (12") leads.

<p><b>Ordering Information</b></p> <p>Order by model number for heaters with Type W2 termination. Call OMEGA for model numbers for heaters with other Terminator Program terminations and options.</p>	<p><b>Custom Engineered/Manufactured</b></p> <p>Heaters can be application specific; therefore for sizes, electrical ratings, terminations and any other design features not listed OMEGA will custom manufacture to your specifications. Consult us with your requirements.</p>
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Model numbers listed are for heaters with screw terminal terminations—Type T2 or T3X.  
Model numbers for heaters with other terminations will be assigned at time of order.

<b>To Order</b>												
Model No.	Inner Dimension		Width		Watt	Voltage	Watt Density		Style	Clamping/ Construction	Terminal	
	mm	inch	mm	inch			Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>				
MPP00230	76.2	3	38.1	1½	500	240	6.3	41	1 pc	NB	T2	
MPP00231	76.2	3	38.1	1½	525	240	6.6	43	1 pc	NB	T2	
MPP00232	82.6	3¼	63.5	2½	1100	120	7.4	48	1 pc	NB	T3X	
MPP00233	82.6	3¼	63.5	2½	1400	240	9.4	61	1 pc	NB	T3X	
MPP00234	88.9	3½	50.8	2	800	240	6.2	40	1 pc	NB	T3X	
MPP00235	92.1	3⅝	38.1	1½	650	240/480	8	52	Exp	NE	T2	
MPP00236	101.6	4	38.1	1½	625	240/480	6.8	44	Exp	NE	T2	
MPP00237	101.6	4	38.1	1½	725	240/480	7.8	51	Exp	NE	T2	
MPP00238	101.6	4	38.1	1½	800	240	7.3	47	1 pc	NB	T2	
MPP00186	114.3	4½	63.5	2½	1250	240	5.9	38	1 pc	NB	T3X	
MPP00239	127	5	38.1	1½	1000	240/480	8.1	52	Exp	NE	T2	
MPP00240	133.4	5¼	38.1	1½	600	240/480	4.6	30	Exp	NE	T2	
MPP00241	133.4	5¼	38.1	1½	1000	240/480	7.7	49	Exp	NE	T2	
MPP00187	133.4	5¼	76.2	3	1700	240/480	6.1	39	Exp	NE	T3X	
MPP00242	133.4	5¼	114.3	4½	2400	240/480	5.7	37	Exp	NE	T3X	
MPP00243	133.4	5¼	114.3	4½	2700	240/480	6.4	41	Exp	NE	T3X	
MPP00244	139.7	5½	38.1	1½	1000	240/480	7.2	47	Exp	NE	T2	
MPP00245	139.7	5½	38.1	1½	1300	240/480	9.4	61	Exp	NE	T2	
MPP00246	152.4	6	38.1	1½	1000	240/480	6.5	42	Exp	NE	T2	
MPP00247	152.4	6	38.1	1½	1400	240/480	9.1	59	Exp	NE	T2	
MPP00248	165.1	6½	38.1	1½	1250	240/480	7.4	48	Exp	NE	T2	
MPP00249	171.5	6¾	38.1	1½	815	240/480	4.6	30	Exp	NE	T2	
MPP00250	171.5	6¾	38.1	1½	1000	240/480	5.7	37	Exp	NE	T2	
MPP00188	171.5	6¾	101.6	4	2600	240/480	5.2	34	Exp	NE	T3X	
MPP00251	171.5	6¾	127	5	3700	240/480	6	39	Exp	NE	T3X	
MPP00189	171.5	6¾	152.4	6	3750	240/480	5	33	Exp	NE	T3X	
MPP00252	177.8	7	38.1	1½	1250	240/480	6.8	44	Exp	NE	T2	
MPP00253	177.8	7	38.1	1½	1500	240/480	8.2	53	Exp	NE	T2	
MPP00254	190.5	7½	38.1	1½	1500	240/480	7.5	49	Exp	NE	T2	
MPP00255	193.7	7⅝	76.2	3	1800	240/480	4.2	27	Exp	NE	T3X	
MPP00190	193.7	7⅝	114.3	4½	3150	240/480	4.9	32	Exp	NE	T3X	
MPP00256	203.2	8	38.1	1½	1250	240/480	5.8	38	Exp	NE	T2	
MPP00257	203.2	8	38.1	1½	1600	240/480	7.5	48	Exp	NE	T2	
MPP00258	228.6	9	38.1	1½	1500	240/480	6.1	40	Exp	NE	T2	
MPP00259	228.6	9	38.1	1½	1750	240/480	7.2	46	Exp	NE	T2	
MPP00191	241.3	9½	76.2	3	3000	240/480	5.6	36	Exp	NE	T3X	
MPP00260	285.8	11¼	76.2	3	2400	240/480	3.7	24	Exp	NE	T3X	
MPP00261	285.8	11¼	127	5	5100	240/480	4.7	31	Exp	NE	T3X	

Ordering Example: MPP00232, nozzle band heater, 120V, 1100 watt, screw terminals.



## Mica Insulated Strip Heaters

MSH Series

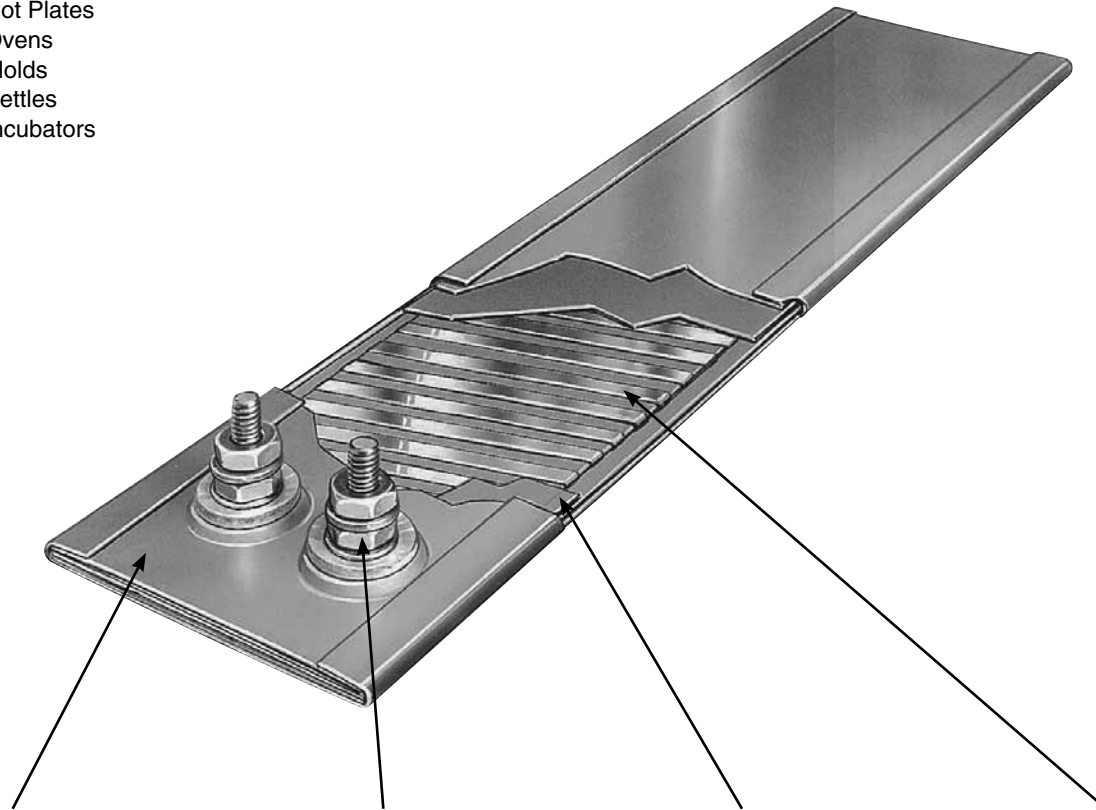


### Typical Applications

- Food Warming Equipment
- Packaging Equipment
- Blow Molding Equipment
- Testing Equipment
- Vulcanizing Presses
- Vending Machines
- Hot Plates
- Ovens
- Molds
- Kettles
- Incubators

An economical, practical and reliable heat source capable of providing uniform heat transfer to flat surfaces.

Mica insulated strip heaters are used in hundreds of industrial and commercial heating applications.



Specially treated rust-resistant steel sheath casing provides the best combination of physical strength, high emissivity and good thermal conductivity for sheath temperatures up to 480°C (900°F). For corrosive atmospheres and/or sheath temperatures up to 650°C (1200°F), stainless steel sheath is available.

For maximum connecting surface, the specially designed stainless steel screw terminals are securely fastened to a connecting jumper, assuring positive contact with the windings, providing maximum current carrying capacity. For other terminal or lead arrangements, see pages 3 and 4.

Specially selected mica grade and thickness is used to insulate the windings, providing excellent thermal conductivity and dielectric strength.

A specific nickel-chrome resistance ribbon wire size is properly engineered to achieve the best combination of wire gauge and spacing between turns, thereby providing the lowest winding temperature possible. The ribbon wire is wound on a specially selected Mica Strip, providing even heat distribution for maximum heater life.

\* Mica Strip heaters are UL recognized and CSA certified in many design variations. Omega's UL file number is E65652 and CSA file number is 043099. If you require UL, CSA, or other NRTL agency approvals, please specify when ordering.

## Specifications and Tolerances

If tighter tolerances are required consult OMEGA. A heater's physical size combined with electrical ratings will determine the actual minimums and maximums.

### Performance Ratings

#### Maximum Sheath Temperature:

**Rust Resistant Steel:** 480°C (900°F)

**Stainless Steel:** 650°C (1200°F)

**Nominal Watt Density:** 5 to 45 Watt/in<sup>2</sup> (0.8 to 7.0 Watt/cm<sup>2</sup>)

**Maximum Watt Density:** Depends on operating temperature and heater size; 38 Watt/in<sup>2</sup> (5.9 Watt/cm<sup>2</sup>)  
Maximum when UL and CSA approval is required

### Electrical Specifications

**Maximum Voltage:** 480V

#### Maximum Amperage:

**Lead Wire Termination:** 10 A

**Screw Terminations:** 8-32UNF—20 A; 10-32UNF—25 A

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

### Formula for Calculating Watt Density

$$\text{Watt Density} = \frac{\text{Heater Wattage}}{(\text{Heater Width} - \frac{3}{8}) \times (\text{Heater Length} - \text{Cold Area}^*)}$$

\* Cold area consists of holes or cutouts.

### Material Specifications and Physical Sizes

**Standard Sheath Material:** Rust resistant steel

**Optional:** Stainless steel or aluminum

**Nominal Thickness:** 4.76 mm ( $\frac{3}{16}$ " )

**Minimum Width:** 15.88 mm ( $\frac{5}{8}$ " ), may vary depending on termination

**Width Tolerance:**  $\pm 0.79$  mm ( $\frac{1}{32}$ " )

**Maximum Length:** 1829 mm (72")

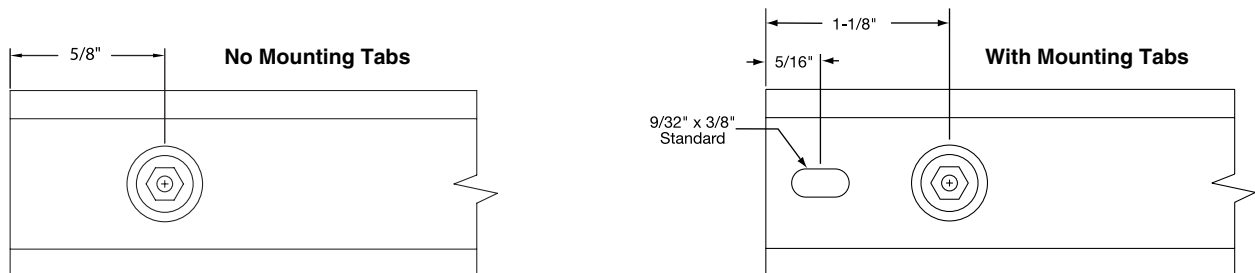
**Length Tolerance:** Up to 610 mm (24")  $\pm 1.59$  mm ( $\frac{1}{16}$ " )  
Over 610 mm (24")  $\pm 3.18$  mm ( $\frac{1}{8}$ " )

#### Screw Terminals:

**25.4 mm (1") Wide Strips:** 8-32 threads

**Over 25.4 mm (1") Wide Strips:** 10-32 threads

### Minimum Termination Distance from Edge of Heater



### Installation Instructions

- Mica insulated strip heaters are available with mounting slots at each end for surface mounting applications or without mounting slots for insertion into milled slots.
- For surface mounting installations, mica strip heaters must be clamped securely along their entire length to a smooth metal surface by using metal clamps 76 to 127 mm (3 to 5") apart.
- Holes along the body of the strip heater for mounting purposes are not recommended and should only be used when there is no other means of clamping the strip heater down. These holes take up valuable winding space, increasing watt density, resulting in poor heater life.
- When supported by mounting slots, the terminal end should be secured firmly. Opposite end should be slightly loosened to allow for linear expansion.
- The surface being heated must be clean and smooth for efficient heat transfer. Small air gaps caused by imperfections can cause hot spots, resulting in heater failure.
- Contaminants such as oil, plastics, and dirt should not be allowed to collect on heaters, as they will find their way into the heater windings, eventually carbonizing and causing electrical shorts.



## Screw Terminal Terminations

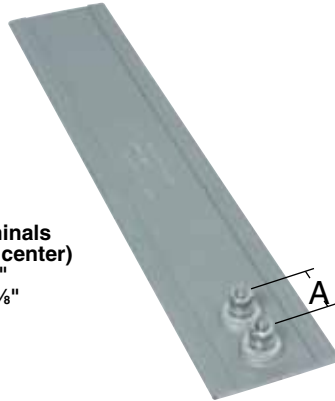
### Type T1

Screw terminals at opposite ends.  
Minimum width required is 22 mm ( $\frac{7}{8}$ ").



### Type T2

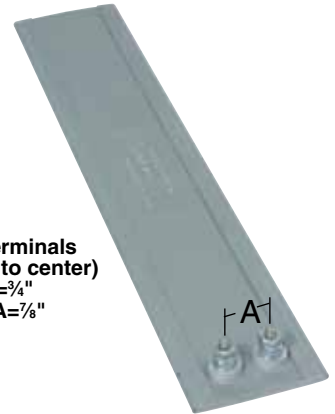
Screw terminals tandem at one end.  
Minimum width required is 22 mm ( $\frac{7}{8}$ ").



**Post Terminals  
(center to center)**  
8-32: A= $\frac{3}{4}$ "  
10-32: A= $\frac{7}{8}$ "

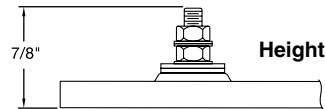
### Type T3

Screw terminals parallel at one end.  
Minimum width required is 51 mm (2").



**Post Terminals  
(center to center)**  
8-32: A= $\frac{3}{4}$ "  
10-32: A= $\frac{7}{8}$ "

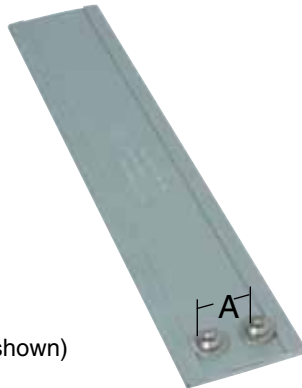
**Note: Typical Termination locations shown (pages 3 and 4). Specify terminal locations when ordering.**



## Terminal Protection

### Type B

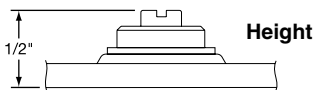
Low-profile 10-32 button terminals with binding head screws. Same location and minimum width requirements as types T1, T2 and T3. 6-32 threads available.



**Type B1** Terminals at opposite ends (see T1)

**Type B2** Terminals same end (see T2)

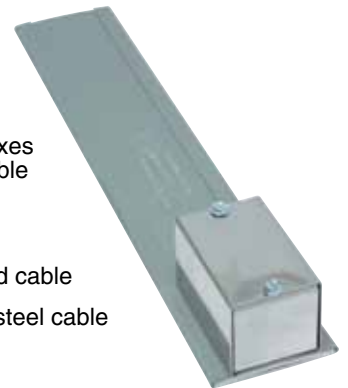
**Type B3** Terminals same end (shown)



**Button Terminals  
(center to center)**  
6-32: A=  $1\frac{1}{8}$ "  
10-32: A=  $\frac{7}{8}$ "

### Type C

Terminal box has one 13 mm ( $\frac{1}{2}$ " trade size knockout [actual diameter 22 mm ( $\frac{7}{8}$ ")] for ease of wiring. It provides excellent protection against exposed terminals. Boxes can be prewired with armor cable or wire braid.



**Type CA** Box only

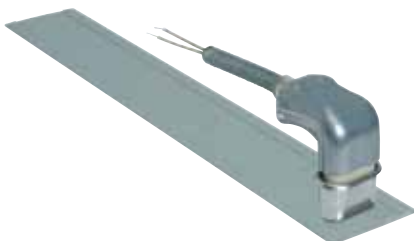
**Type CB** Box with galvanized cable

**Type CC** Box with stainless steel cable

**Type CD** Box with wire braid

### Type P1

High-Temperature quick-disconnect plug. Available on 22 mm ( $\frac{7}{8}$ " widths (depending on termination configuration) and wider with cup and plug assembly or just cup. Type P1Q shown with 90° plug and galvanized armor cable. Other options available. Consult OMEGA.



### Igloo™

Igloo ceramic terminal covers consist of two ceramic parts. With a tight-fitting cap and a solid base, an Igloo cover will fully insulate any standard 8-32 or 10-32 terminal lug used for electrical wiring hookup. Igloo covers can be assembled onto any standard mica strips with 10-32 screw terminals. Igloo covers are available in 3 different styles: single port, double port in-line and double port 90°. For specific model numbers visit [omega.com](http://omega.com). Heater with double port in-line Igloo cover shown here.

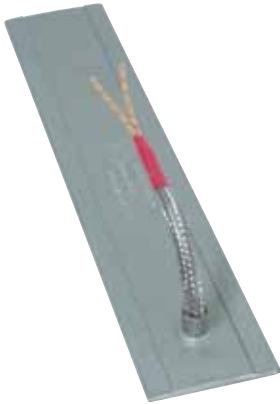




## Lead Wire Terminations

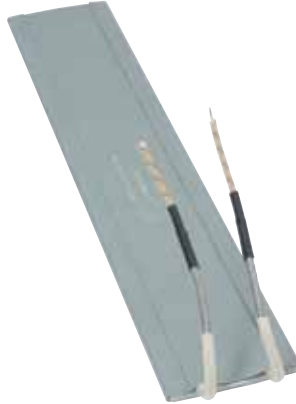
### Type W1

Wire braid leads offer sharp bending not possible with armor cable. 254 mm (10") of wire braid over 305 mm (12") leads is standard. If longer braid or leads are required, specify. Minimum width required is 22 mm (7/8").



### Type W2

Flexible stainless steel braided lead wires exiting at same end. 254 mm (10") stainless steel braid over 305 mm (12") leads is standard. If longer braid or leads are required, specify. Minimum width required is 29 mm (1 1/8").



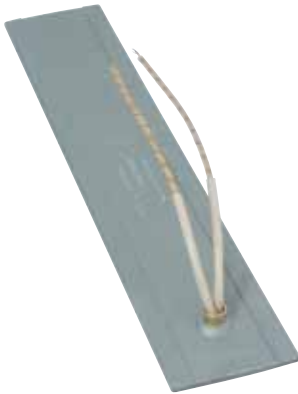
### Type W3

Flexible stainless steel braided lead wires exiting at opposite ends. 254 mm (10") stainless steel braid over 305 mm (12") leads is standard. If longer braid or leads are required, specify. Minimum width required is 19 mm (3/4").



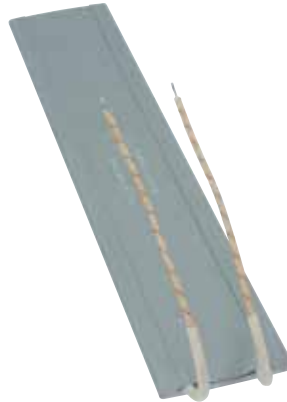
### Type L1

Flexible lead wire exiting from the top through a brass eyelet. 254 mm (10") long leads standard; if longer leads are required, specify. Minimum width required is 22 mm (7/8").



### Type L2

Flexible lead wire exiting same end. 254 mm (10") long leads standard; if longer leads are required, specify. Minimum width required is 29 mm (1 1/8").



### Type L3

Flexible lead wire exiting at opposite ends. 254 mm (10") long leads standard; if longer leads are required, specify. Minimum width required is 19 mm (3/4").

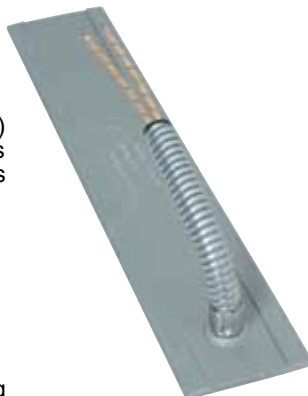


## Abrasion Resistant Terminations

### Type R1

Armor cable provides far superior protection to lead wires where abrasion is a constant problem. Available with 2- or 3-prong plugs. 254 mm (10") of armor cable over 305 mm (12") leads is standard. If longer cable, leads or plugs are required, specify. Minimum width required is 25 mm (1").

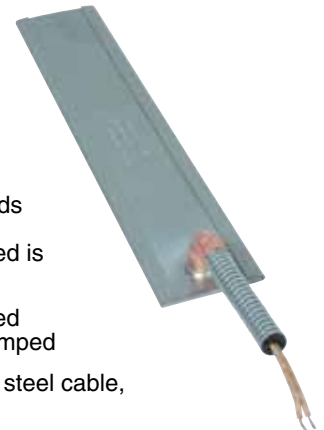
- Type R1A** Galvanized cable, crimped
- Type R1B** Stainless Steel cable, crimped
- Type R1C** Galvanized cable, tack welded
- Type R1D** Stainless Steel cable, tack welded
- Type R1E** Galvanized cable, full silver brazing
- Type R1F** Stainless Steel, full silver brazing



### Type R2

Right-angle armor cable can be positioned in any direction. 254 mm (10") of armor cable over 305 mm (12") leads is standard. If longer leads are required, specify. Minimum width required is 32 mm (1 1/4").

- Type R2A** Galvanized cable, crimped
- Type R2B** Stainless steel cable, crimped
- Type R2C** Plain leads, no cable





## Additional Mica Strip Heater Optional Features



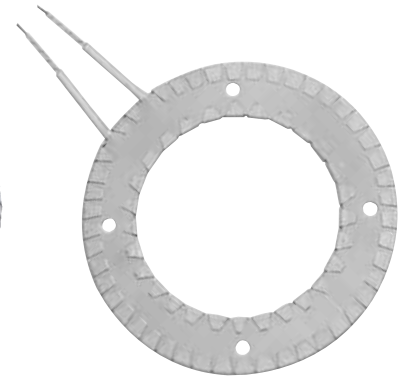
**Disc Heater**

When ordering disc heaters, specify outside diameter, electrical ratings, and termination type. If mounting holes are required, specify location and hole size.

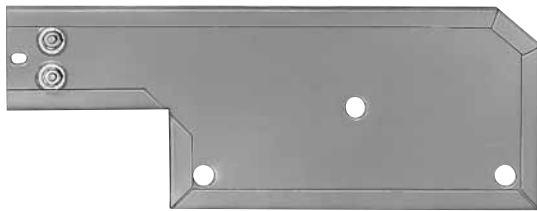


**Ring Heaters**

When ordering ring heaters, specify inside and outside diameters, electrical ratings, and termination type. If mounting holes are required, specify location and hole size.



## Custom Engineered/Manufactured

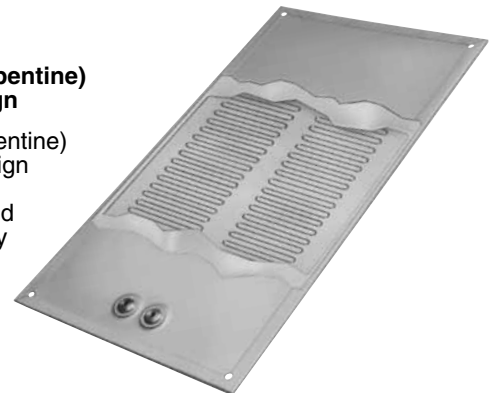


**Irregular Shape**

Mica strip heaters can be made into any practical shape and electrical rating. We welcome your inquiries.

**Sinuated (Serpentine) Element Design**

Sinuated (serpentine) wound coil design is used for low temperature and low watt density applications within the 3 to 10 A range.



## Non-Metal Sheath Custom Mica Heaters



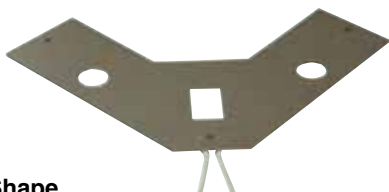
**Open Element**

This economical heater design without the metal case is commonly used in laminating machines. The heater assembly can be suspended or sandwiched between non-metallic machine parts, eliminating the need for additional and expensive metal cases.



**Distributed Wattage**

A mica strip heater can be designed with varying heat profile along the length for uneven heat distribution.



**Irregular Shape**

Non-metal sheath strip heaters can be made into any practical shape and electrical rating. We welcome your inquiries.

Strip Heaters shown on this page are a small representation of the many Custom Engineered and Manufactured designs Omega has produced. If you have a special application and need free technical assistance, consult our team of professionals with your requirements. We welcome your inquiries.

## Sizes and Ratings

Model numbers shown are for heaters without mounting slots. Termination Types L1 and L2 have 254 mm (10") leads. R1 and R2 have 254 mm (10") galvanized armor cable over 305 mm (12") leads. W1 and W2 have 254 mm (10") stainless steel braid over 305 mm (12") leads.

**To Order Visit [omega.com/msh](http://omega.com/msh) for Pricing and Details**

Model No.		Width		Length		Watts	Watt Density		Termination
120V	240V	mm	inch	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>	
MSH00001	MSH00002	25.4	1	152.4	6	100	5	32	L2
—	MSH00003	25.4	1	571.5	22½	525	6	39	W1
—	MSH00004	31.8	1¼	1016.0	40	750	5	31	R2
—	MSH00005	38.1	1½	139.7	5½	225	7	44	L1
—	MSH00006	38.1	1½	139.7	5½	225	7	44	L2
MSH00007	—	38.1	1½	139.7	5½	125	4	25	T2
MSH00008	—	38.1	1½	152.4	6	300	8	53	L2
—	MSH00009	38.1	1½	152.4	6	250	7	44	W1
—	MSH00010	38.1	1½	203.2	8	355	7	45	L2
MSH00011	MSH00012	38.1	1½	203.2	8	400	8	51	L2
MSH00013	—	38.1	1½	203.2	8	400	8	51	T2
—	MSH00014	38.1	1½	241.3	9½	200	3	21	L2
—	MSH00015	38.1	1½	254.0	10	450	7	44	L2
MSH00016	—	38.1	1½	266.7	10½	250	4	23	T2
—	MSH00017	38.1	1½	279.4	11	500	7	44	L1
—	MSH00018	38.1	1½	279.4	11	600	8	53	W1
MSH00019	—	38.1	1½	304.8	12	400	5	32	L2
MSH00020	—	38.1	1½	355.6	14	500	5	34	T2
—	MSH00021	38.1	1½	406.4	16	600	6	36	L2
—	MSH00022	38.1	1½	431.8	17	500	4	28	L1
MSH00023	—	38.1	1½	457.2	18	500	4	26	L2
—	MSH00024	38.1	1½	571.5	22½	775	5	32	W1
—	MSH00025	38.1	1½	609.6	24	1000	6	39	L2
—	MSH00026	38.1	1½	762.0	30	1000	5	31	L2
—	MSH00027	38.1	1½	914.4	36	1000	4	25	L2
MSH00028	—	38.1	1½	914.4	36	1000	4	25	T2
—	MSH00029	50.8	2	76.2	3	100	5	31	T2
MSH00030	—	50.8	2	101.6	4	20	1	4	T2
MSH00031	—	50.8	2	101.6	4	30	1	6	T2
MSH00032	—	50.8	2	101.6	4	40	1	8	T2
MSH00033	—	50.8	2	101.6	4	50	2	10	T2
—	MSH00034	50.8	2	101.6	4	100	3	21	T3
—	MSH00035	50.8	2	101.6	4	100	3	21	W1
—	MSH00036	50.8	2	101.6	4	150	5	31	W1
—	MSH00037	50.8	2	101.6	4	200	6	41	W1
—	MSH00038	50.8	2	203.2	8	275	4	24	L1
—	MSH00039	50.8	2	698.5	27½	1200	4	28	L2
—	MSH00040	50.8	2	1092.2	43	1400	3	21	T2
—	MSH00041	61.9	2⅞	139.7	5½	350	6	38	T3
—	MSH00042	63.5	2½	101.6	4	150	4	24	T1
—	MSH00043	63.5	2½	152.4	6	350	5	33	R1
—	MSH00044	63.5	2½	215.9	8½	350	3	22	T3
MSH00045	MSH00046	63.5	2½	254.0	10	350	3	18	L2
MSH00047	—	63.5	2½	355.6	14	625	4	23	L2
MSH00048	—	73.0	2⅞	152.4	6	300	4	24	T3
—	MSH00049	73.0	2⅞	152.4	6	300	4	24	T3
MSH00050	—	76.2	3	177.8	7	200	2	13	L1
MSH00051	—	76.2	3	177.8	7	500	5	32	L1





Model No.		Width		Length		Watts	Watt Density		Termination
120V	240V	mm	inch	mm	inch		Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>	
MSH00052	—	76.2	3	304.8	12	180	1	6	T1
—	MSH00053	76.2	3	317.5	12½	300	2	10	T3
MSH00054	—	76.2	3	381.0	15	500	2	14	L1
—	MSH00055	76.2	3	660.4	26	600	1	9	R1
—	MSH00056	88.9	3½	101.6	4	100	2	11	W2
—	MSH00057	88.9	3½	114.3	4½	500	7	46	W1
MSH00058	—	88.9	3½	190.5	7½	500	4	25	T3
—	MSH00059	88.9	3½	254.0	10	900	5	32	W2
MSH00060	—	88.9	3½	355.6	14	450	2	11	B3
—	MSH00061	101.6	4	101.6	4	275	4	25	R2
—	MSH00062	101.6	4	203.2	8	425	3	17	T3
—	MSH00063	101.6	4	279.4	11	750	3	21	T3
—	MSH00064	101.6	4	508.0	20	1750	4	25	R1
—	MSH00065	111.1	4¾	179.4	7¼	800	5	33	W2
—	MSH00066	120.7	4¾	139.7	5½	700	6	36	T2
—	MSH00067	120.7	4¾	285.8	11¼	200	1	4	T3
—	MSH00068	123.8	4¾	290.5	11¼	1200	4	26	T3
MSH00069	—	149.2	5¾	279.4	11	425	1	8	R1
—	MSH00070	152.4	6	304.8	12	1200	3	19	T3
—	MSH00071	152.4	6	381.0	15	575	1	7	T3
MSH00072	—	177.8	7	292.1	11½	625	1	9	R1
—	MSH00073	203.2	8	235.0	9¼	450	1	7	T3
—	MSH00074	203.2	8	254.0	10	450	1	7	T3
MSH00075	—	254.0	10	457.2	18	300	0	2	B3

Ordering Example: MSH00052, 76.2 mm (3") wide, 304.8 mm (12") long strip heater, 120V, 180 watts.

**Custom Engineered/Manufactured Heaters**

An electric heater can be very application specific; for sizes and ratings not listed, Omega will design and manufacture a mica insulated heater to meet your requirements.

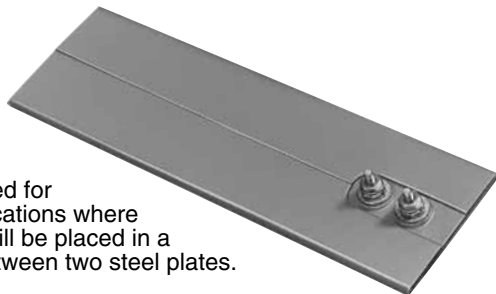
**Please Specify the Following:**

- Width
- Length
- Wattage
- Voltage
- Termination Type
- Lead Length
- Cable/Braid Length
- Optional Features

**Additional Mica Strip Heater Optional Features**

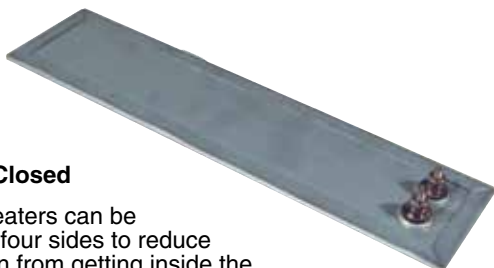
**Butt Case**

Recommended for heating applications where strip heater will be placed in a milled slot between two steel plates.



**Four Sides Closed**

Mica Strip Heaters can be closed on all four sides to reduce contamination from getting inside the heater. Recommended on all strip heaters over 64 mm (2½") in width.



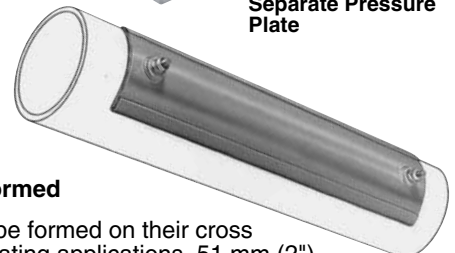
**Pressure Plate**

Strip Heaters can be made with built-in pressure plate to add rigidity and minimize warping of the heater. Standard plate thickness is 3 mm (1/8"). Specify plate thickness and choice of mounting method 1 or mounting method 2.

**Mounting Method 1  
Built-In Pressure Plate**



**Mounting Method 2  
Separate Pressure Plate**



**Cross-Section-Formed**

Strip Heaters can be formed on their cross section for pipe heating applications. 51 mm (2") minimum width required. Specify diameter of pipe on which heaters are to be mounted.

# CLEAN WATER 1- OR 3-PHASE IMMERSION HEATER—2½ NPT FITTING

MT-3 Series Starts at **\$330**



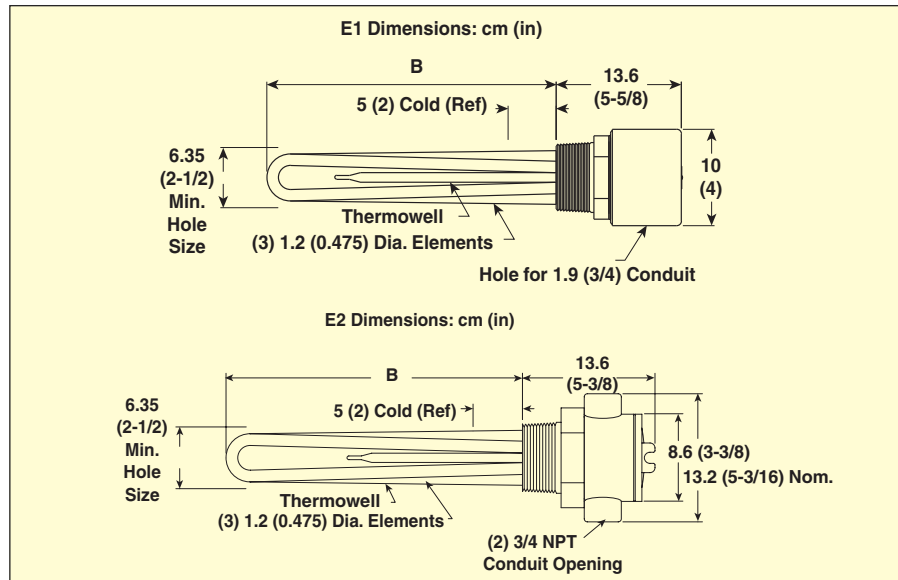
MT-330E2/480V/3P, \$575, shown smaller than actual size.



MT-330A/480V/3P, \$330, shown smaller than actual size.

- ✓ Heavy-Duty Construction
- ✓ Models Available with Explosion-Resistant Enclosure
- ✓ 1.2 cm (0.475") Diameter Copper Sheath, Ideal for 6 to 8 pH Liquids
- ✓ 3 to 18 kW
- ✓ 120, 208, 240, and 480 Vac; 1- and 3-Phase Power

**Note:** This immersion heater should be used with an approved temperature control device to ensure safe operation. See Section P for our selection of process controllers. Not intended for use in hazardous areas. (See previous pages for caution and warnings.)



**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)						E1 General Purpose Enclosure <sup>1</sup>			E2 Explosion/Moisture-Res. Encl. <sup>2</sup>		
kW	Volts	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B cm (in)	Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)	
3	480	51	3	19 (7½)	MT-330A/**†	\$330	3 (5)	MT-330E2/*	\$575	4 (8)	
3.75	240	52	3	21 (8½)	MT-337A/**†	360	3 (6)	MT-337E2/*	600	4 (9)	
4.5	120	48	3	30 (11¾)	MT-345A/**†	400	3 (6)	MT-345E2/*	650	4 (9)	
6	120	48	3	44 (17¼)	MT-360A/**†	470	4 (8)	MT-360E2/*	725	4 (9)	
7.5	208	53	3	49 (19½)	MT-375A/**†	525	4 (8)	MT-375E2/*	775	4 (9)	
9	208	47	3	62 (24½)	MT-390A/**†	600	6 (12)	MT-390E2/*	850	7 (15)	
12	208	46	3	82 (32¾)	MT-3120A/**†³	750	6 (13)	MT-3120E2/*³	1000	6 (16)	
15	208	46	3	101 (39¾)	MT-3150A/**†³	900	7 (14)	MT-3150E2/*³	1150	8 (17)	
18	208	46	3	120 (47¼)	MT-3180A/**†³	1050	7 (15)	MT-3180E2/3P³	1300	8 (18)	

\* Designate voltage: insert "120V" for 120 Vac, "208V" for 208 Vac, "240V" for 240 Vac or "480V" for 480 Vac.

\*\* Designate voltage: insert "208V" for 208 Vac, "240V" for 240 Vac or "480V" for 480 Vac.

† Insert the suffix "3P" after model number for 3-phase power.

<sup>1</sup> Heaters with general purpose enclosures are UL listed and CSA certified.

<sup>2</sup> Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified.

<sup>3</sup> Not UL listed, CSA certified or CSA NRTL/C certified (exceeds 48 amps).

Ordering Examples: MT-330A/240V/3P, 3 kW heater powered by 3-phase 240V, \$330.

MT-337E2/120V/3P, 3 kW heater powered by 3-phase 120V, \$600.



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Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

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# IMMERSION HEATED END CLEAN WATER APPLICATIONS— 1¼ NPT FITTING

MT-1 Series  
Starts at  
**\$134**



- 1¼ NPT Brass Screw Plug
- 120 and 240V, 1-Phase
- General Purpose Models NEMA 1 (IP00) Rated and UL Listed
- Copper Sheath, Ideal for Clean Water Applications

MT-110A/120, \$147, shown smaller than actual size.

General Purpose Enclosure<sup>1</sup>

E1 Dimensions: cm (in)

MT-110E2/120, \$370, shown smaller than actual size.

Explosion-Resistant/  
Moisture-Resistant Enclosure<sup>1</sup>

E2 Dimensions: cm (in)

The MT-1 Series immersion heater is ideally suited for clean water requirements. Models are available with a general purpose terminal enclosure<sup>1</sup> or a rugged moisture-resistant, explosion-resistant terminal enclosure.<sup>2</sup>

**Please Note:** This immersion heater should be used with an approved temperature control device to assure safe operation. See Section P for our complete selection of process controllers.

## SPECIFICATIONS

- Wattage:** 0.6 to 2 kW
- Power:** 120 or 240V, 1 phase
- Sheath:** 0.8 cm (0.315") diameter copper
- Screw Plug:** 1¼ NPT brass
- Watt Density:** 43 to 86 W/in<sup>2</sup>
- Enclosure:** General purpose NEMA 1 (E1) or optional (E2) moisture-resistant/explosion-resistant enclosure<sup>2</sup>

## CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)					E1 General Purpose Encl. <sup>1</sup>			E2 Explos/Moist. Res. Encl. <sup>2</sup>		
kW	Phase	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B cm (in)	Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)
0.6	1	53	1	16 (6¼)	MT-160A/*	\$134	0.4 (1)	MT-160E2/*	\$360	1.8 (4)
0.75	1	65	1	16 (6¼)	MT-175A/*	139	0.4 (1)	MT-175E2/*	365	1.8 (4)
1	1	86	1	16 (6¼)	MT-110A/*	147	0.4 (1)	MT-110E2/*	370	1.8 (4)
1	1	43	2	16 (6¼)	MT-110-3A/*	165	0.9 (2)	MT-110-3E2/*	390	2.3 (5)
1.2	1	53	2	16 (6¼)	MT-112A/*	170	0.9 (2)	MT-112E2/*	395	2.3 (5)
1.5	1	65	2	16 (6¼)	MT-115A/*	181	0.9 (2)	MT-115E2/*	405	2.3 (5)
2	1	86	2	16 (6¼)	MT-120A/*	195	0.9 (2)	MT-120E2/*	420	2.3 (5)

\* Designate voltage: insert "120" for 120V or "240" for 240V. Higher wattages available—contact OMEGALUX®.

<sup>1</sup> Heaters with general purpose and moisture-resistant enclosures are UL listed and CSA certified.

<sup>2</sup> Heaters with explosion-resistant enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.

**Ordering Examples:** MT-110A/120, 1 kW heater powered by 120V with NEMA 1 general purpose enclosure, \$147.

MT-112E2/240, 1.2 kW heater powered by 240V with E2 moisture-resistant, explosion-resistant enclosure, \$395.



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# CLEAN WATER IMMERSION HEATER—2 NPT

MT-2 Series  
Starts at  
**\$145**



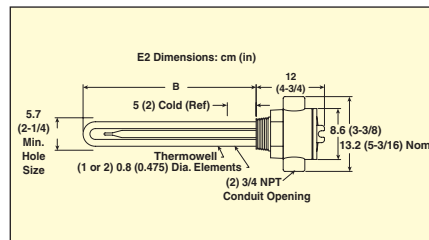
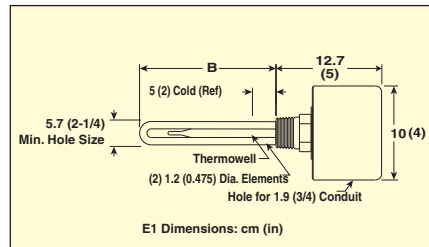
- ✓ Rugged, General Purpose Models—UL Listed and NEMA 1 (IP00) Rated
- ✓ Optional Moisture-Resistant/Explosion-Resistant Enclosure Available
- ✓ Ideal for 6 to 8 pH Clean Liquids
- ✓ 1.5 and 15 kW

The OMEGALUX® MT-2 Series uses a copper sheath that is ideal for clean liquids within the 6 to 8 pH range.

**Please Note:** This immersion heater should be used with an approved temperature control device to ensure safe operation. See Section P for our selection of process controllers.

## SPECIFICATIONS

**Wattage:** 1.5 to 15 kW  
**Power:** 120, 208, 240, 480 V; 1-phase  
**Sheath:** 1.2 cm (0.475") diameter copper  
**Screw Plug:** 2 NPT brass  
**Watt Density:** 46 to 53 W/in<sup>2</sup>  
**Enclosure:** General purpose NEMA 1 (IP00) or optional type E2 moisture-resistant/explosion-resistant enclosure  
**Third-Party Approvals Enclosure:** UL listed with general purpose enclosure



**CAUTION AND WARNING!**  
 Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

MT-215E2/120, \$410, shown smaller than actual size.  
 MT-215A/120, \$160, shown smaller than actual size.



Not intended for use in hazardous areas

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)									
kW	W/in <sup>2</sup>	No. Htg Elem.	Dim. B cm (in)	E1 Gen. Purpose Enclosure <sup>1</sup>			E2 Explosion/Moisture-Res. Encl <sup>2</sup>		
				Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)
1.5	48	1	30 (12)	MT-215A/*	\$160	1 (3)	MT-215E2/*	\$410	3 (6)
2	48	1	46 (18)	MT-220A/*	200	1 (3)	MT-220E2/*	450	3 (6)
2	51	2	20 (8)	MT-220-3A/*	145	1 (3)	MT-220-3E2/*	395	3 (6)
2.5	48	2	24 (9½)	MT-225A/*	175	1 (3)	MT-225E2/*	425	3 (6)
3	48	2	30 (12)	MT-230A/*	200	2 (4)	MT-230E2/*	450	3 (7)
4	48	2	46 (18)	MT-240A/*	260	2 (4)	MT-240E2/*	500	3 (7)
5	53	2	49 (19¾)	MT-250A/*	315	2 (5)	MT-250E2/*	550	4 (8)
6	47	2	64 (25½)	MT-260A/**	370	2 (5)	MT-260E2/**	625	4 (8)
7	49	2	71 (28)	MT-270A/240	420	3 (6)	MT-270E2/240	675	5 (9)
7	49	2	103 (40½)	MT-270A/480	420	3 (6)	MT-270E2/480	675	5 (9)
10	46	2	122 (48)	MT-2100A/**	600	3 (7)	MT-2100E2/**	850	5 (10)
12	46	2	122 (48)	MT-2120A/**†	725	3.6 (8)	MT-2120E2/**†	975	5 (11)
15	50	2	137 (54)	MT-2150A/240†	850	4 (9)	MT-2150E2/240	1100	5.4 (12)
15	50	2	137 (54)	MT-2150A/480†	850	4 (9)	MT-2150E2/480	1100	5.4 (12)

\* To designate voltage: insert "120" for 120V, "208" for 208V, "240" for 240V or 480 for 480V.  
 \*\* To designate voltage: insert "208" for 208V, "240" for 240V or "480" for 480V.  
<sup>1</sup>Heaters with general purpose and moisture-resistant enclosures are UL listed and CSA certified, except models with † (exceed 48 amps).  
<sup>2</sup>Heaters with explosion-resistant enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas, except models with † (exceed 48 amps).  
**Ordering Example:** MT-215A/208. 1.5 kW heater powered by 208 V. \$160.



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# RELIABLE SOLUTION WATER TYPE IMMERSION HEATER—2 NPT FITTING

## MTI-2 Series



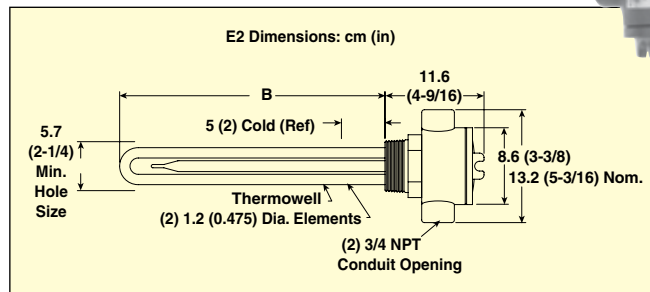
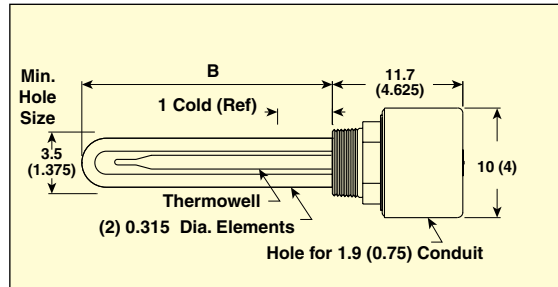
- Durable Incoloy Sheath for Superior Corrosion Protection
- 2 NPT Stainless Steel Screw Plug
- 120, 240, 480 V; 1-Phase Power
- General Purpose UL Listed Enclosure or Moisture-Resistant/Explosion-Resistant Enclosure
- 1.5 to 15 kW

## SPECIFICATIONS

**Wattage:** 1.5 to 15 kW  
**Power:** 120, 240, 480 V; 1-phase  
**Sheath:** 1.2 cm (0.475") diameter Incoloy  
**Screw Plug:** 2 NPT stainless steel  
**Enclosure:** General purpose, NEMA 1 (IP00) rated and UL listed; or E2 moisture-resistant/explosion-resistant enclosure<sup>2</sup>.

Note: This immersion heater should be used with an approved temperature control device to ensure safe operation. Visit us online for our selection of process controllers.

**CAUTION AND WARNING!**  
 Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.



F

To Order								
kW	Phase	W/in <sup>2</sup>	No. of Heating Elements	Dim. B cm (inch)	E1 General Purpose Enclosure <sup>1</sup>		E2 Moisture/Explosion Resistant Enclosure <sup>2</sup>	
					Model No.	Wt. kg (lb)	Model No.	Wt. kg (lb)
1.5	1	48	1	11 <sup>7</sup> / <sub>16</sub> (19)	MTI-215A/*	1 (3)	MTI-215E2/*	3 (6)
2	1	48	1	17 <sup>1</sup> / <sub>2</sub> (44)	MTI-220A/*	2 (4)	MTI-220E2/*	3 (7)
2	1	51	2	7 <sup>7</sup> / <sub>16</sub> (19)	MTI-220A-3A/*	2 (4)	MTI-220-3E2/*	3 (7)
2.5	1	52	2	8 <sup>1</sup> / <sub>2</sub> (22)	MTI-225A/*	2 (4)	MTI-225E2/*	3 (7)
3	1	48	2	11 <sup>7</sup> / <sub>16</sub> (29)	MTI-230A/*	2 (5)	MTI-230E2/*	4 (8)
4	1	48	2	17 <sup>1</sup> / <sub>2</sub> (44)	MTI-240A/*	2 (5)	MTI-240E2/*	4 (8)
5	1	47	2	19 <sup>1</sup> / <sub>4</sub> (48)	MTI-250A/*	2 (5)	MTI-250E2/*	4 (8)
6	1	47	2	24 <sup>19</sup> / <sub>32</sub> (62)	MTI-260A/**	2 (5)	MTI-260E2/**	4 (8)
7	1	49	2	27 <sup>1</sup> / <sub>2</sub> (70)	MTI-270A/**	3 (6)	MTI-270E2/**	4 (9)
10	1	46	2	40 <sup>1</sup> / <sub>32</sub> (102)	MTI-2100A/**	4 (8)	MTI-2100E2/**	5 (11)
12	1	46	2	47 <sup>9</sup> / <sub>16</sub> (121)	†MTI-2120A/**	4 (8)	†MTI-2120E2/**	5 (11)
15	1	50	2	53 <sup>19</sup> / <sub>32</sub> (136)	†MTI-2150A/**	4 (8)	†MTI-2150E2/**	5 (11)

\* Designate voltage: insert "120V" for 120 Vac, "240V" for 240 Vac, "480V" for 480 Vac.

\*\* Designate voltage: insert "240V" for 240 Vac, "480V" for 480 Vac.

<sup>1</sup>Heaters with general purpose enclosures are UL listed and CSA certified except models with † (exceed 48 amps).

<sup>2</sup>Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified, and are not intended for use in hazardous areas, except models with † (exceed 48 amps).

Ordering Example: MTI-215A/480V, 1.5 kW heater equipped by 120 Vac.



# SOLUTION WATER

Rometec srl - [www.rometec.it](http://www.rometec.it) - [info@rometec.it](mailto:info@rometec.it) - Rometec srl - [www.rometec.it](http://www.rometec.it) - [info@rometec.it](mailto:info@rometec.it)

# IMMERSION HEATER—2½ NPT FITTING AND 3-ELEMENT CONSTRUCTION

MTI-3 Series Starts at  
**\$725**



- ✓ NEMA 1 (IP00) Rated, E1 General Purpose Enclosure or Moisture-Resistant/Explosion-Resistant Enclosure<sup>2</sup>
- ✓ Premium-Quality Stainless Steel Screw Plug
- ✓ 240 and 480V, 3-Phase
- ✓ 3 to 18 kW
- ✓ Incoloy Sheath Provides Excellent Corrosion Resistance for Solution Water Applications

The MTI-3 Series screw plug immersion heaters are designed for direct contact heating in solution water applications.

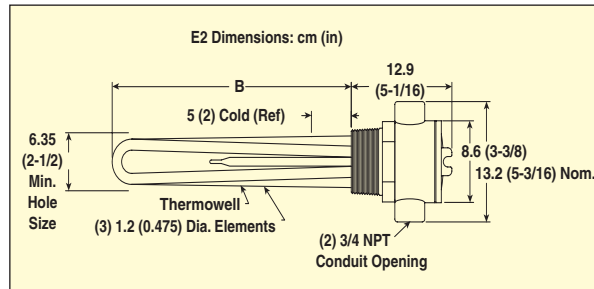
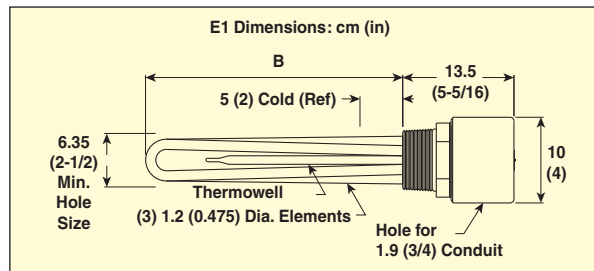
**Please Note:** This immersion heater should be used with an approved temperature control device to ensure safe operation. See Section P for our selection of process controllers.

MTI-330A/240, \$725, shown smaller than actual size.

## SPECIFICATIONS

**Wattage:** 3 to 18 kW  
**Power:** 240 or 480V, 3-phase  
**Watt Density:** 46 to 53 W/in<sup>2</sup>  
**Sheath:** 1.2 cm (0.475") diameter Incoloy  
**Screw Plug:** 2½ NPT stainless steel  
**Enclosures:** E1 general purpose NEMA 1 (IP00) rated or type E2 moisture-resistant/explosion-resistant enclosure.<sup>2</sup>

MTI-330E2/480, \$975, shown smaller than actual size.



  **MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B cm (in)	E1 General Purpose Enclosure <sup>1</sup>			E2 Moisture-/Explosion-Resis. Encl. <sup>2</sup>		
				Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)
3	51	3	17 (6⅝)	MTI-330A/*	\$725	2 (5)	MTI-330E2/*	\$975	3 (8)
4.5	48	3	28 (10⅞)	MTI-345A/*	800	3 (6)	MTI-345E2/*	1050	3 (9)
6	48	3	43 (17⅞)	MTI-360A/*	875	3 (6)	MTI-360E2/*	1100	3 (9)
7.5	53	3	49 (19⅞)	MTI-375A/*	925	3 (6)	MTI-375E2/*	1150	3 (9)
9	47	3	62 (24½)	MTI-390A/*	1000	3 (7)	MTI-390E2/*	1250	4 (10)
12	46	3	83 (32½)	MTI-3120A/*	1150	4 (9)	MTI-3120E2/*	1400	4 (12)
15	46	3	100 (39⅞)	MTI-3150A/*	1300	5 (10)	MTI-3150E2/*	1550	4 (13)
18	51	3	121 (47⅞)	MTI-3180A/*	1400	5 (12)	MTI-3180E2/*	1650	5 (15)

\*Designate voltage: "240" for 240 Vac or "480" for 480 Vac.

<sup>1</sup>Heaters with general purpose enclosures are UL listed and CSA certified.

<sup>2</sup>Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.

Ordering Example: MTI-330A/480, 3 kW heater powered by 480 Vac, \$725.

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## More than 100,000 Products Available!

### • Temperature

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### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# PIPE INSERT HEATERS

MTO-LT Series  
Starts at

**\$625**



- ✓ For Insertion into 2" (5 cm) or Larger Pipe
- ✓ Moisture/Explosion Resistant Enclosure\*
- ✓ 14 to 13 kW
- ✓ 240 and 480V, 1 Phase
- ✓ 2 NPT Steel Screw Plug
- ✓ Lengths to 367"
- ✓ Incoloy Sheath Heating Elements

\*Not intended for use in hazardous areas.

## APPLICATIONS

For use in those applications where process materials can be heated by inserting heater into a 2" (5 cm) or larger pipe. A pipe union will facilitate installation and eliminate the need for twisting the elements inside the pipe. Clearance room should be considered.

## FEATURES

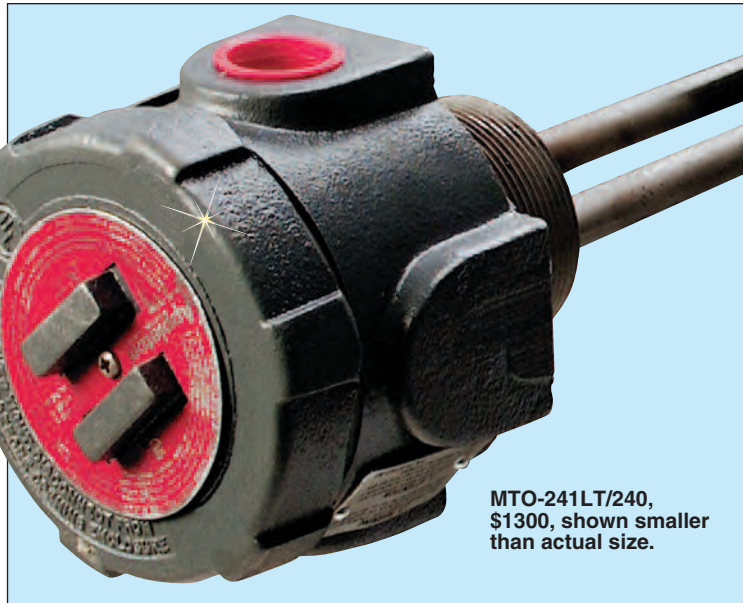
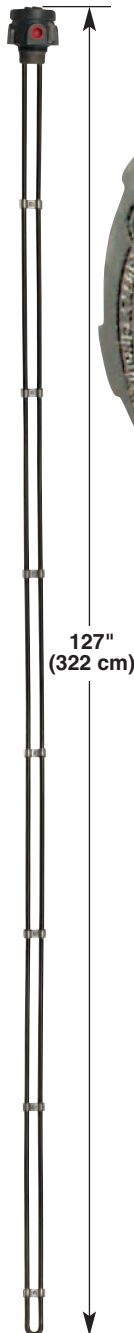
**Choice of materials and surface loadings (W/in<sup>2</sup>)** permit operating in the dead air space of pipes, tubes, or channels.

**Avoids "coking" or charring asphalt or other heat sensitive materials** as the pipe surface functions as a low density heat transfer surface.

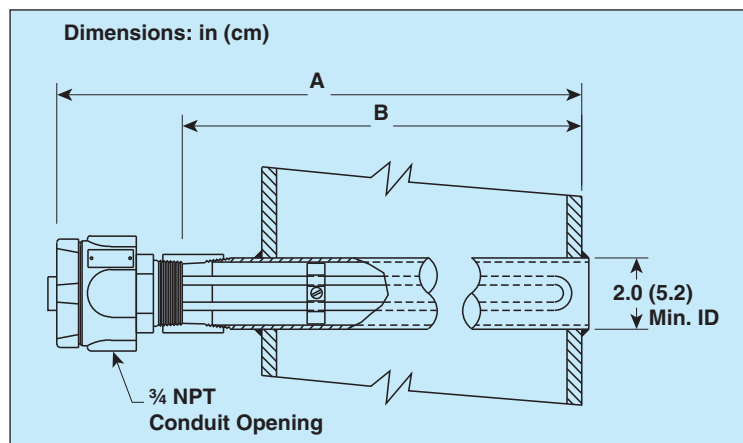
**Corrosion problems alleviated** by lower heat intensity.

**Install or remove** without draining the pipe.

**Liquid-tight terminal housing.**  
**Low watt density.**



MTO-241LT/240, \$1300, shown smaller than actual size.



## CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

**Note:** Controls for use with this heater are not included. This immersion heater should be used with an approved temperature control device to assure safe operation. Visit [omega.com/guides/temperaturecontrollers.html](http://omega.com/guides/temperaturecontrollers.html) for our complete selection of controllers.

**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

Model No.	Price	kW**	Volts	Phase	W/in <sup>2</sup>	Dimensions—in. (cm)		Std. Pipe Thd. in. (cm)	Weight lb (kg)
						A	B		
MTO-241LT/240	\$1300	4	240	1	11.7	127 (322)	120 (305)	2 (5)	12 (5)
MTO-241LT/480	1300	4	480	1	11.7	127 (322)	120 (305)	2 (5)	12 (5)
MTO-251LT/240	625	5	240	1	11.1	163 (414)	156 (396)	2 (5)	16 (7)
MTO-251LT/480	1450	5	480	1	11.1	163 (414)	156 (396)	2 (5)	16 (7)
MTO-275LT/240	2600	7.5	240	1	12.7	211 (536)	204 (518)	2 (5)	22 (10)
MTO-275LT/480	1800	7.5	480	1	12.7	211 (536)	204 (518)	2 (5)	22 (10)
MTO-212LT/480	3900	11.5	480	1	12.9	319 (810)	312 (792)	2 (5)	36 (16)
MTO-213LT/480	4500	13	480	1	12.5	367 (932)	360 (914)	2 (5)	42 (19)

\*\* Higher kW available – consult OMEGALUX®.

Ordering Examples: MTO-241LT/240, 1 phase, 4 kW pipe insert heater, \$1300.



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### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

### • pH and Conductivity

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Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

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### • Heaters

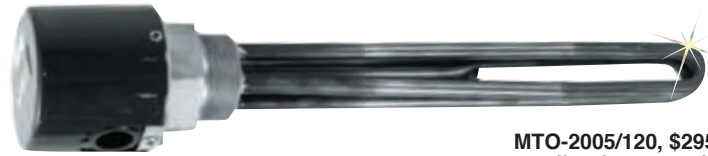
Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# IMMERSION HEATERS FOR HEAVY-WEIGHT OIL APPLICATIONS

MTO-2 and EMTO-3  
Starts at  
**\$295**



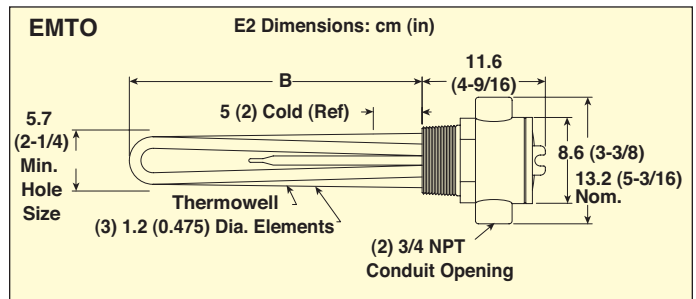
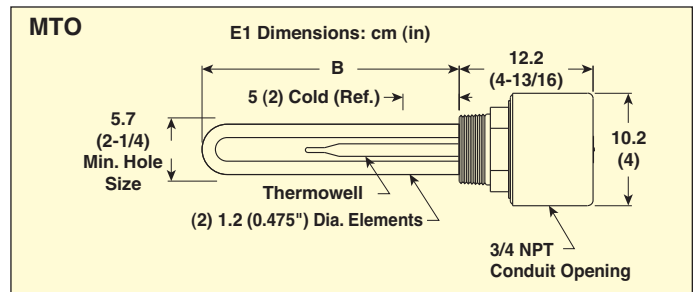
- ✓ 2 NPT Steel Screw Plug
- ✓ Steel Sheath Elements
- ✓ 6 and 8 W/in<sup>2</sup>
- ✓ 0.5 to 3 kW
- ✓ Without Thermostat
- ✓ 120, 208, 240, and 480V; 1 and 3 Phase
- ✓ General Purpose or Moisture-Resistant/Explosion-Resistant Terminal Enclosure



MTO-2005/120, \$295, shown smaller than actual size.



EMTO-301E2/240, \$600, shown smaller than actual size.



## SPECIFICATIONS

**Wattage:** 0.5 to 3 kW  
**Power:** 120, 208, 240 and 480V, 1 and 3 phase  
**Watt Density:** 6 to 8 W/in<sup>2</sup>  
**Sheath:** 1.2 cm (0.475") diameter Incoloy  
**Screw Plug:** 2 NPT stainless steel  
**Enclosures:** E1 general purpose, NEMA 1 (IP00) rated, or type E2 moisture-resistant/explosion-resistant enclosure.<sup>2</sup>

**Please Note:** This immersion heater should be used with an approved temperature control device to assure safe operation. See Temperature Section for our selection of process controllers.

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)					E1 General Purpose <sup>1</sup>			E2 Moisture Resistant/Explosion Resistant <sup>2</sup>		
kW	Phase	No. W/in <sup>2</sup>	Dim B Elem.	cm (in)	Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)
<b>MTO-2</b>										
0.5	1	6	2	45 (17 <sup>3</sup> / <sub>4</sub> )	MTO-2005/*	\$295	1.8 (4)	MTO-2005E2/*	\$550	3.2 (7)
1.1	1	6	2	83 (32 <sup>3</sup> / <sub>4</sub> )	MTO-2011/*	445	2.7 (6)	MTO-2011E2/*	700	4.0 (9)
1.4	1	6	2	102 (40 <sup>1</sup> / <sub>4</sub> )	MTO-2014/*	525	3.2 (7)	MTO-2014E2/*	775	4.5 (10)
<b>EMTO-3</b>										
1	3	8	3	45 (17 <sup>3</sup> / <sub>4</sub> )	EMTO-301/**	\$330	3.2 (7)	EMTO-301E2/**	\$600	4.5 (10)
1.5	3	8	3	63 (24 <sup>7</sup> / <sub>8</sub> )	EMTO-3015/**	485	4 (9)	EMTO-3015E2/**	750	5.4 (12)
2	3	8	3	82 (32 <sup>7</sup> / <sub>16</sub> )	EMTO-302/**	625	4.5 (10)	EMTO-302E2/**	900	5.9 (13)
2.5	3	8	3	103 (40 <sup>3</sup> / <sub>8</sub> )	EMTO-3025/**	800	5.4 (12)	EMTO-3025E2/**	1050	6.8 (15)
3	3	8	3	122 (47 <sup>7</sup> / <sub>8</sub> )	EMTO-303/**	950	6.3 (14)	EMTO-303E2/**	1200	7.7 (17)

\* Designate voltage: insert "120" for 120 Vac, "208" for 208 Vac or "240" for 240 Vac. "480" for 480 Vac.

\*\* Designate voltage: insert "240" for 240 Vac or "480" for 480 Vac.

<sup>1</sup>Heaters with general purpose enclosures are UL listed and CSA certified.

<sup>2</sup>Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified.

Ordering Example: EMTO-301/480, 480V, 1 kW, 3-phase general purpose heater, \$330.

# IMMERSION HEATERS FOR HEAVY WEIGHT OIL APPLICATIONS

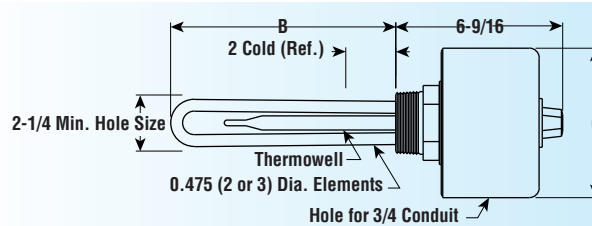


## STYLES ARMTO-2 & AREMTO-3

Basic Unit  
**\$655**

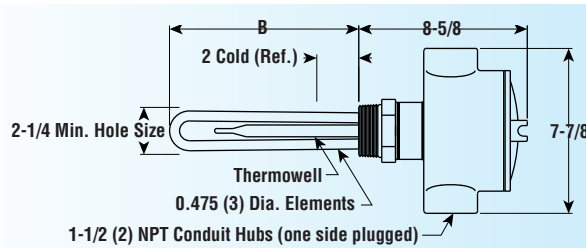


### E1 – Dimensions in (cm)



- ✓ 2" NPT Steel Screw Plug
- ✓ Steel Sheath Elements
- ✓ 6 - 8 W/In<sup>2</sup>
- ✓ 0.5 - 3 kW
- ✓ Integral Thermostat (DPST)
- ✓ 120, 208, 240 and 480 Volt, 1 & 3 Phase
- ✓ General Purpose or Moisture Resistant/Explosion Resistant Terminal Enclosure

### E2 – Dimensions in (cm)



### To Order (Specify Model Number)

							T2 — Temperature (60 - 250°F)	T1 — Temperature (0 - 100°F)		
kW	Volts	Phase	W/In <sup>2</sup>	No. Elem.	DIM B (In.)	Wt. (Lbs.)	Model No.	Price	Model No.	Price
<b>AREMTO-3 — E1 General Purpose<sup>1</sup></b>										
1	240	3	8	3	17-3/4	8	AREMTO-3015T2/240	\$788	AREMTO-3015T1/240	\$788
1	480	3	8	3	17-3/4	8	AREMTO-3015T2/480	788	AREMTO-3015T1/480	788
1.5	240	3	8	3	24-7/8	9	AREMTO-30155T2/240	882	AREMTO-30155T1/240	882
1.5	480	3	8	3	24-7/8	9	AREMTO-30155T2/480	882	AREMTO-30155T1/480	882
2	240	3	8	3	32-7/16	10	AREMTO-3025T2/240	981	AREMTO-3025T1/240	981
2	480	3	8	3	32-7/16	10	AREMTO-3025T2/480	981	AREMTO-3025T1/480	981
2.5	240	3	8	3	40-3/8	11	AREMTO-30255T2/240	1083	AREMTO-30255T1/240	1083
2.5	480	3	8	3	40-3/8	11	AREMTO-30255T2/480	1083	AREMTO-30255T1/480	1083
3	240	3	8	3	47-7/8	12	AREMTO-3025T2/240	1183	AREMTO-3025T1/240	1183
3	480	3	8	3	47-7/8	12	AREMTO-3025T2/480	1183	AREMTO-3025T1/480	1183
<b>AREMTO-3 — E2 Moisture Resistant/Explosion Resistant<sup>2</sup></b>										
1	240	3	8	3	17-3/4	13	AREMTO-3015E2T2/240	\$1083	AREMTO-3015E2T1/240	\$1083
1	480	3	8	3	17-3/4	13	AREMTO-3015E2T2/480	1083	AREMTO-3015E2T1/480	1083
1.5	240	3	8	3	24-7/8	14	AREMTO-30155E2T2/240	1177	AREMTO-30155E2T1/240	1177
1.5	480	3	8	3	24-7/8	14	AREMTO-30155E2T2/480	1177	AREMTO-30155E2T1/480	1177
2	240	3	8	3	32-7/16	15	AREMTO-3025E2T2/240	1275	AREMTO-3025E2T1/240	1275
2	480	3	8	3	32-7/16	15	AREMTO-3025E2T2/480	1275	AREMTO-3025E2T1/480	1275
2.5	240	3	8	3	40-3/8	16	AREMTO-30255E2T2/240	1377	AREMTO-30255E2T1/240	1377
2.5	480	3	8	3	40-3/8	16	AREMTO-30255E2T2/480	1377	AREMTO-30255E2T1/480	1377
3	240	3	8	3	47-7/8	17	AREMTO-3025E2T2/240	1477	AREMTO-3025E2T1/240	1477
3	480	3	8	3	47-7/8	17	AREMTO-3025E2T2/480	1477	AREMTO-3025E2T1/480	1477
<b>ARMTO-2 — E1 General Purpose<sup>1</sup></b>										
0.5	120	1	6	2	17-3/4	7	ARMTO-2005T2/120	\$655	ARMTO-2005T1/120	\$655
0.5	208	1	6	2	17-3/4	7	ARMTO-2005T2/208	655	ARMTO-2005T1/208	655
0.5	240	1	6	2	17-3/4	7	ARMTO-2005T2/240	655	ARMTO-2005T1/240	655
1.1	120	1	6	2	32-3/4	9	ARMTO-2011T2/120	788	ARMTO-2011T1/120	788
1.1	208	1	6	2	32-3/4	9	ARMTO-2011T2/208	788	ARMTO-2011T1/208	788
1.1	240	1	6	2	32-3/4	9	ARMTO-2011T2/240	788	ARMTO-2011T1/240	788
1.4	120	1	6	2	40-1/4	10	ARMTO-2014T2/120	859	ARMTO-2014T1/120	859
1.4	208	1	6	2	40-1/4	10	ARMTO-2014T2/208	859	ARMTO-2014T1/208	859
1.4	240	1	6	2	40-1/4	10	ARMTO-2014T2/240	859	ARMTO-2014T1/240	859

Ordering Example: AREMTO-30155T2/240, is a 240 V, 1.5 kW, 3-Phase, General Purpose Enclosure, with a Temp range of 60-250°F, \$882.

1. Heaters with General Purpose Enclosures are UL Listed and CSA Certified.



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# LIGHT WEIGHT OIL IMMERSION HEATER

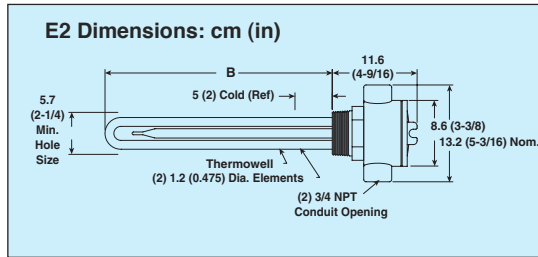
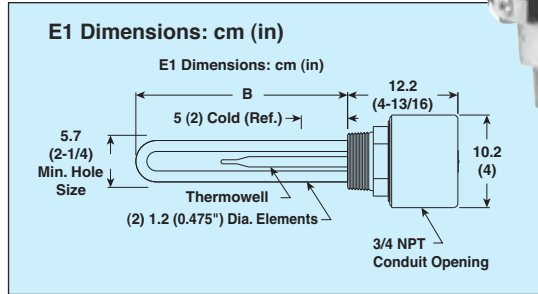
## With 2 Element Design—2 NPT Steel Screw Plug

MTO-2 Series  
Starts at



- Rugged Steel Sheath for Use with Lightweight Oils
- 1.5 to 6 kW
- 120, 208, 240 or 480V; 1 Phase
- General Purpose<sup>1</sup> NEMA-1 Rated and UL Listed Enclosure or Moisture Resistant/<sup>2</sup> Explosion Enclosure<sup>2</sup>

Note: The immersion heater should be used with an approved temperature control device to assure safe operation. See Temperature Section for our selection of process controllers.

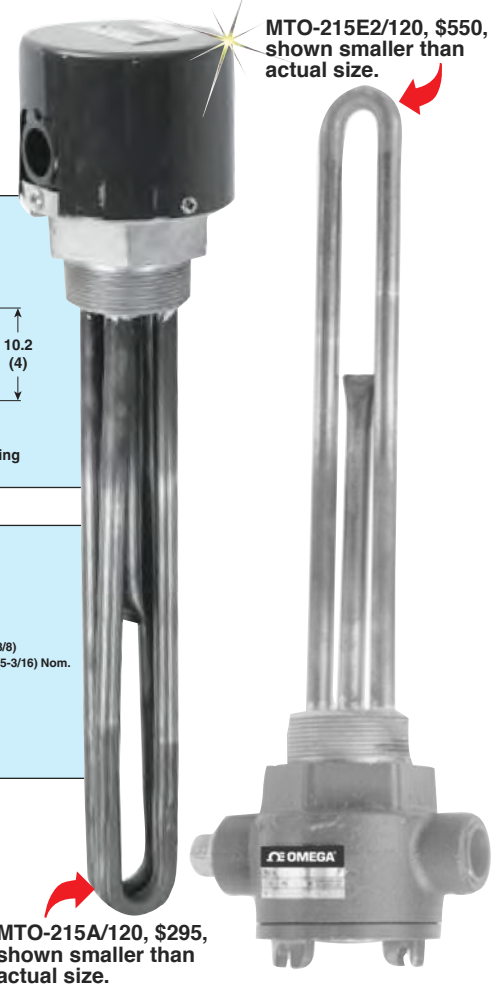


### SPECIFICATIONS

- Wattage:** 1.5 to 6 kW
- Power:** 120, 208, 240 or 480V; 1 phase
- Watt Density:** 23 to 26 W/in<sup>2</sup>
- Sheath:** 1.2 cm (0.475") diameter
- Screw Plug:** 2 NPT steel
- Enclosure:** E1 general purpose<sup>1</sup>, NEMA-1 rated, or type E2 moisture resistant/explosion resistant enclosure.<sup>2</sup>

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.



**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)									
kW	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B cm (in)	E1 General Purpose Enclosure <sup>1</sup>		Wt. kg (lb)	E2 Explos. /Moist Res. Encl. <sup>2</sup>		Wt. kg (lb)
				Model No.	Price		Model No.	Price	
1.5	24	2	30 (11 <sup>3</sup> / <sub>4</sub> )	MTO-215A/*	\$295	1 (3)	MTO-215E2/*	\$550	3 (6)
2	24	2	45 (17 <sup>3</sup> / <sub>4</sub> )	MTO-220A/*	335	2 (4)	MTO-220E2/*	575	3 (7)
2.5	26	2	9 (19 <sup>5</sup> / <sub>8</sub> )	MTO-225A/*	365	2 (4)	MTO-225E2/*	625	3 (7)
3	23	2	63 (24 <sup>7</sup> / <sub>8</sub> )	MTO-230A/*	425	2 (4)	MTO-230E2/*	675	3 (7)
4	23	2	83 (32 <sup>3</sup> / <sub>4</sub> )	MTO-240A/*	500	3 (6)	MTO-240E2/*	750	4 (8)
5	23	2	102 (40 <sup>1</sup> / <sub>4</sub> )	MTO-250A/*	600	3 (7)	MTO-250E2/*	850	4 (8)

\*Designate voltage, i.e., insert "120" for 120 Vac, "208" for 208 Vac, "240" for 240 Vac, or "480" for 480 Vac.

// Designate voltage, i.e., insert "208" for 208 Vac, "240" for 240 Vac, or "480" for 480 Vac.

<sup>1</sup> Heaters with General Purpose Enclosures are UL recognized and CSA Certified.

<sup>2</sup> Heaters with Moisture Resistant/Explosion Resistant Enclosures are CSA NRTL/C Certified.

**Ordering Example:** MTO-215A/240, 1.5 kW heater powered by 240 Vac, \$295.

Caution: Explosion resistant type E2 construction refers to heater design features which provide explosion resisting containment of electrical wiring according to National Electric Code. Abnormal application or use of heaters which in excessive temperatures can create hazardous conditions which can lead to fire







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### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

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### • Heaters

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# MEDIUM-WEIGHT OIL IMMERSION HEATER

MTO-2  
Starts at  
**\$301**



- ✓ 2-Element Design
- ✓ 2 NPT Steel Screw Plug
- ✓ Heavy-Duty Steel Sheath for Use with Medium-Weight Oils
- ✓ Low Watt Density
- ✓ 2 to 6 kW
- ✓ 240 and 480 V, 1 Phase
- ✓ General Purpose NEMA 1 (IP00) Enclosure or Moisture-Resistant/Explosion-Resistant<sup>2†</sup> Enclosure Available<sup>†</sup>

## SPECIFICATIONS

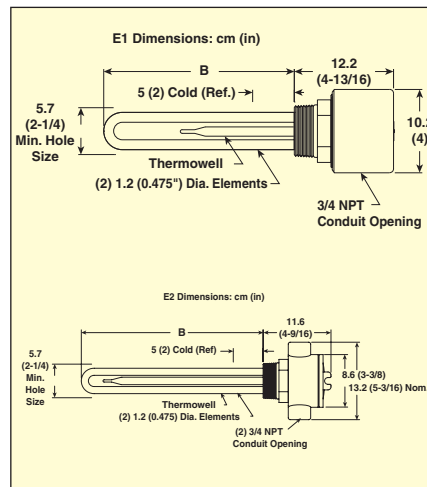
**Wattage:** 2 to 6 kW  
**Power:** 240 and 480 V, 1 phase  
**Watt Density:** 15 W/in<sup>2</sup>  
**Sheath:** 12 mm (0.475") diameter  
**Screw Plug:** 2 NPT steel  
**Enclosure:** E1 general purpose, NEMA 1 (IP00) rated<sup>1</sup>, or E2 moisture-resistant/explosion-resistant enclosure<sup>2</sup>

*Please Note: This immersion heater should be used with an approved temperature control device to ensure safe operation. See the Section P for our selection of process controllers.*



MTO-2020/240, \$377, shown smaller than actual size.

MTO-2060E2/480, \$948, shown smaller than actual size.



**CAUTION AND WARNING!**  
 Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

kW	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B cm (in)	E1 General Purpose Enclosure <sup>1</sup>			E2 Moist-/Explos-Res. Enc. <sup>2†</sup>		
				Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)
2	15	2	63 (24 <sup>3</sup> / <sub>8</sub> )	MTO-2020/*	\$377	7 (4)	MTO-2020E2/*	\$572	3 (7)
2.66	15	2	83 (32 <sup>3</sup> / <sub>4</sub> )	MTO-2026/*	455	3 (6)	MTO-2026E2/*	649	4 (9)
3.33	15	2	102(40 <sup>1</sup> / <sub>4</sub> )	MTO-2033/*	529	3 (7)	MTO-2033E2/*	724	5 (10)
4	15	2	121 (47 <sup>3</sup> / <sub>4</sub> )	MTO-2040/**	606	3 (7)	MTO-2040E2/**	796	5 (10)
5	15	2	146(57 <sup>1</sup> / <sub>2</sub> )	MTO-2050/*	674	4 (8)	MTO-2050E2/*	866	5 (11)
6	15	2	172 (67 <sup>1</sup> / <sub>4</sub> )	MTO-2060/*	759	4 (9)	MTO-2060E2/*	948	5 (12)

\* Designate voltage: insert "240" for 240 Vac or "480" for 480 Vac.

\*\* Designate voltage: insert "208" for 208 Vac, "240" for 240 Vac or "480" for 480 Vac.

<sup>†</sup> **Caution:** Explosion-resistant type E2 construction refers to heater design features that provide explosion-resistant containment of electrical wiring according to National Electric Code. Use of heaters at excessive temperatures can create hazardous conditions that can lead to fire. Not intended for use in hazardous areas.

Consult Section Z for data on allowable watt densities for more viscous materials. Higher kW ratings are available. Contact OMEGALUX®.

<sup>1</sup> Heaters with general purpose enclosures are UL listed and CSA certified.

<sup>2</sup> Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified.

**Ordering Example:** MTO-2020/240, 2 kW heater powered by 240 Vac, \$377.



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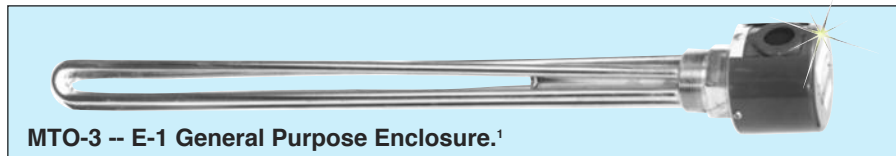
# LIGHT WEIGHT OIL IMMERSION HEATER

## With 3 Element Construction – 2½ NPT Steel Fitting

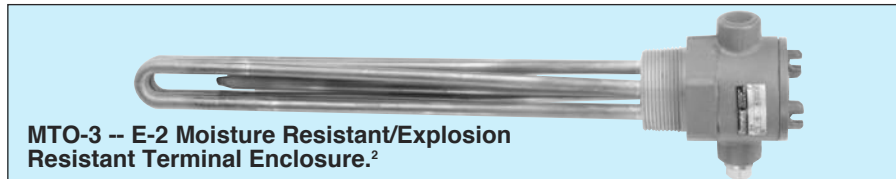
MTO-3 Series  
Starts at  
**\$525**



- ✓ 3 to 9 kW
- ✓ 120, 208, 240 or 480V, 1 & 3 Phase
- ✓ General Purpose NEMA-1 Rated and UL Listed Enclosure<sup>1</sup> or Moisture Resistant/Explosion Resistant Enclosure<sup>2</sup>



MTO-3 -- E-1 General Purpose Enclosure.<sup>1</sup>



MTO-3 -- E-2 Moisture Resistant/Explosion Resistant Terminal Enclosure.<sup>2</sup>

### SPECIFICATIONS

**Wattage:** 3 to 9 kW  
**Power:** 120, 208 or 240 or 480V, 1 & 3 Phase  
**Watt Density:** 23-26 W/in<sup>2</sup>  
**Sheath:** 0.475" diameter

**Screw Plug:** 2½ NPT steel  
**Enclosure:** E1 General Purpose<sup>1</sup>, NEMA-1 rated, and UL listed, or E2 moisture resistant/explosion resistant enclosure<sup>2</sup>

**■ MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

kW	Volts	W/in <sup>2</sup>	No. Htg. Elem.	Element in (cm)	E-1 General Purpose Enclosure <sup>1</sup>			E-2 Moisture Res/Explos. Res.† <sup>2</sup>		
					Model No.	Price	Wt. lb (kg)	Model No.	Price	Wt. lb(kg)
3	120	24	3	17¼ (44)	MTO-330A/120	\$525	6 (3)	MTO-330E2/120	\$775	9 (4)
3	208	24	3	17¼ (44)	MTO-330A/208/*	525	6 (3)	MTO-330E2/208/*	725	9 (4)
3	240	24	3	17¼ (44)	MTO-330A/240/*	525	6 (3)	MTO-330E2/240/*	725	9 (4)
3	480	24	3	17¼ (44)	MTO-330A/480/*	525	6 (3)	MTO-330E2/480/*	725	9 (4)
3.75	120	26	3	19⅞ (48)	MTO-337A/120	550	6 (3)	MTO-337E2/120	800	9 (4)
3.75	208	26	3	19⅞ (48)	MTO-337A/208/*	550	6 (3)	MTO-337E2/208/*	800	9 (4)
3.75	240	26	3	19⅞ (48)	MTO-337A/240/*	550	6 (3)	MTO-337E2/240/*	800	9 (4)
3.75	480	26	3	19⅞ (48)	MTO-337A/480/*	550	6 (3)	MTO-337E2/480/*	800	9 (4)
4.5	120	24	3	24¾ (62)	MTO-345A/120	625	6 (3)	MTO-345E2/120	875	9 (4)
4.5	208	24	3	24¾ (62)	MTO-345A/208/*	625	6 (3)	MTO-345E2/208/*	875	9 (4)
4.5	240	24	3	24¾ (62)	MTO-345A/240/*	625	6 (3)	MTO-345E2/240/*	875	9 (4)
4.5	480	24	3	24¾ (62)	MTO-345A/480/*	625	6 (3)	MTO-345E2/480/*	875	9 (4)
6	120	23	3	32¼ (82)	MTO-360A/120	725	9 (4)	MTO-360E2/120	975	12 (5)
6	208	23	3	32¼ (82)	MTO-360A/208/*	725	9 (4)	MTO-360E2/208/*	975	12 (5)
6	240	23	3	32¼ (82)	MTO-360A/240/*	725	9 (4)	MTO-360E2/240/*	975	12 (5)
6	480	23	3	32¼ (82)	MTO-360A/480/*	725	9 (4)	MTO-360E2/480/*	975	12 (5)
7.5	208	23	3	39¾ (101)	MTO-375A/208/*	825	10 (5)	MTO-375E2/208/*	1050	13 (6)
7.5	240	23	3	39¾ (101)	MTO-375A/240/*	825	10 (5)	MTO-375E2/240/*	1050	13 (6)
7.5	480	23	3	39¾ (101)	MTO-375A/480/*	825	10 (5)	MTO-375E2/480/*	1050	13 (6)
9	208	23	3	47¼ (120)	MTO-390A/208/*	925	11 (5)	MTO-390E2/208/*	1150	14 (6)
9	240	23	3	47¼ (120)	MTO-390A/240/*	925	11 (5)	MTO-390E2/240/*	1150	14 (6)
9	480	23	3	47¼ (120)	MTO-390A/480/*	925	11 (5)	MTO-390E2/480/*	1150	14 (6)

\* Add the suffix "3P" to the model number for 3 phase power. Higher kW ratings are available. Contact OMEGALUX. Consult Section Z for data on allowable watt densities for more viscous materials.

†CAUTION: Explosion resistant type E2 construction refers to heater design features which provide explosion resisting containment of electrical wiring according to National Electric Code. Abnormal application or use of heaters which result in excessive temperatures can create hazardous conditions which can lead to fire. Not intended for use in hazardous areas. **Please Note:** This immersion heater should be used with an approved temperature control device to assure safe operation. See Section P for our selection of process controllers.

**Ordering Example:** MTO-330A/240 3 kW heater powered by 1 phase 240 Vac, \$525.

<sup>1</sup> Heaters with General Purpose Enclosures are UL Listed and CSA Certified.

<sup>2</sup> Heaters with Moisture Resistant/Explosion Resistant Enclosures are CSA NRTL/C Certified.



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Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

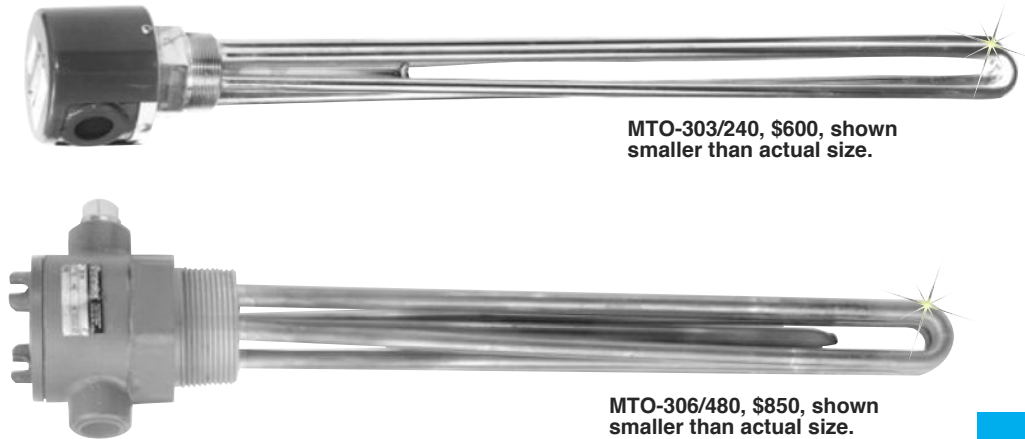
MTO-3 Series  
Starts at  
**\$600**



- ✓ 3-Element Design
- ✓ 240 and 480V, 3-Phase
- ✓ 3 to 9 kW
- ✓ Rugged Steel Sheath
- ✓ Low Watt Density for Heating Medium-Weight Oils
- ✓ 2½ NPT Steel Fitting
- ✓ General Purpose NEMA 1 (IP00) or Moisture-Resistant/Explosion-Resistant Terminal Enclosure

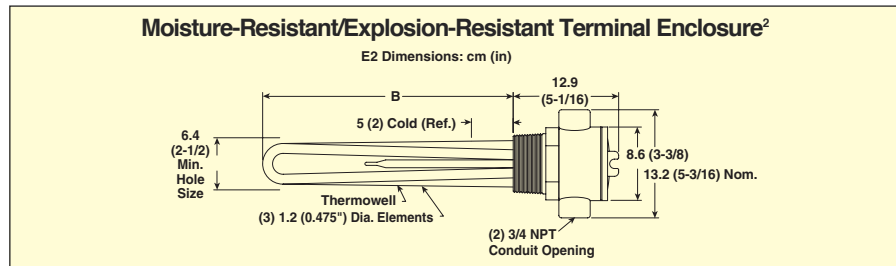
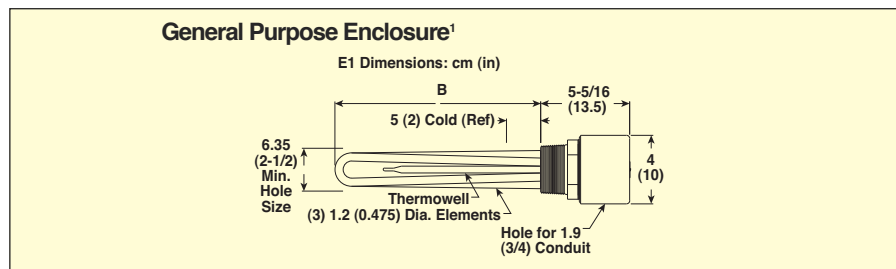
## SPECIFICATIONS

**Wattage:** 3 to 9 kW  
**Power:** 240 and 480V, 3-phase  
**Watt Density:** 15 W/in<sup>2</sup>  
**Sheath:** 1 cm (0.475") diameter steel  
**Screw Plug:** 2½ NPT steel  
**Enclosure:** General purpose, NEMA 1 (IP00) rated, or E2 moisture-resistant/explosion-resistant enclosure.†



MTO-303/240, \$600, shown smaller than actual size.

MTO-306/480, \$850, shown smaller than actual size.



**Note:** This immersion heater should be used with an approved temperature control device to ensure safe operation. See the Temperature Section for our selection of process controllers.

**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Phase	W/in <sup>2</sup>	Htg. Elem.	Dim. B cm (in)	E1 General Purpose Enclosure <sup>1</sup>			E2 Explos/Moist-Resis. Encl. <sup>2†</sup>		
					Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)
3	3	15	3	62 (24¾)	MTO-303/*	\$600	3 (6)	MTO-303E2/*	\$825	3 (9)
4	3	15	3	82 (32¼)	MTO-304/*	675	4 (9)	MTO-304E2/*	925	5 (12)
5	3	15	3	101 (39¾)	MTO-305/*	750	4.5 (10)	MTO-305E2/*	1000	5 (13)
6	3	15	3	120 (47¼)	MTO-306/*	850	5 (11)	MTO-306E2/*	1100	5 (14)
7.5	3	15	3	145 (57)	MTO-307/*	975	6 (14)	MTO-307E2/*	1250	5 (17)
9	3	15	3	171 (67¼)	MTO-309/*	1100	7 (15)	MTO-309E2/*	1350	5 (18)

\* Designate voltage: "240" for 240 Vac, "480" for 480 Vac.

† **Caution:** Explosion-resistant Type E2 construction refers to heater design features that provide explosion-resistant containment of electrical wiring according to National Electric Code. Use of heaters at excessive temperatures can create hazardous conditions that can lead to fire. consult Section Z for data on allowable watt densities for more viscous materials.

<sup>1</sup> Heaters with general purpose enclosures are UL listed and CSA certified.

<sup>2</sup> Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified.

**Ordering Examples:** MTO-303/240, 3 kW, 240 Vac heater, \$600.

MTO-309E2, 9 kW, 240 Vac heater with E2 explosive/moisture-resistive enclosure, \$1350.



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# IMMERSION HEATER FOR LIGHT WEIGHT OIL APPLICATIONS

MTO-1 Series  
Starts at  
**\$220**



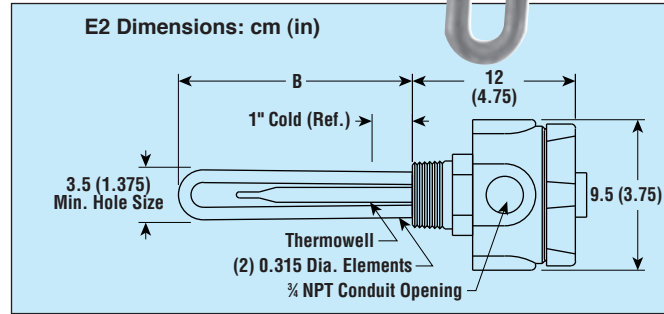
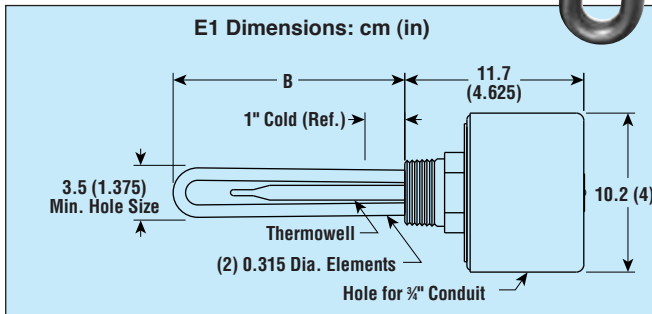
- ✓ 1 1/4 NPT Steel Screw Plug
- ✓ Steel Sheath Elements
- ✓ 10 and 20 W/in<sup>2</sup>
- ✓ 0.5 to 3 kW
- ✓ Without Thermostat
- ✓ 120 and 240V, Single Phase
- ✓ General Purpose or Moisture Resistant/Explosion Resistant Terminal Enclosure



MTO-105/120, \$220, shown smaller than actual size.



MTO-120E2/120, \$500, shown smaller than actual size.



  **MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Volts	Phase	W/in <sup>2</sup>	No. Elem.	Dim. B cm (in)	E1 General Purpose <sup>1</sup>			E2 Moisture Res./Explosion Resistant <sup>2</sup>		
						Model No.	Price	Wt. lb (kg)	Model No.	Price	Wt. lb (kg)
0.5	120	1	10	2	32 (12 1/2)	MTO-105/120	\$220	2 (1)	MTO-105E2/120	\$445	5 (2)
0.5	240	1	10	2	32 (12 1/2)	MTO-105/240	220	2 (1)	MTO-105E2/240	445	5 (2)
1	120	1	20	2	32 (12 1/2)	MTO-110/120	235	2 (1)	MTO-110E2/120	460	5 (2)
1	240	1	20	2	32 (12 1/2)	MTO-110/240	235	2 (1)	MTO-110E2/240	460	5 (2)
2	120	1	20	2	66 (26)	MTO-120/120	275	3 (1)	MTO-120E2/120	500	6 (3)
2	240	1	20	2	66 (26)	MTO-120/240	275	3 (1)	MTO-120E2/240	500	6 (3)
3	120	1	20	2	96 (38)	MTO-130/120	320	3 (1)	MTO-130E2/120	550	6 (3)
3	240	1	20	2	96 (38)	MTO-130/240	320	3 (1)	MTO-130E2/240	550	6 (3)

<sup>1</sup> Heaters with general purpose enclosures are UL recognized and CSA certified.

<sup>2</sup> Heaters with moisture resistant/explosion resistant enclosures are CSA NRTL/C certified.

Ordering Examples: MTO-110/240, 1 kW, 1-phase general purpose heater, \$235. MTO-105E2/120, 0.5 kW, 120 Vac, \$445.

F





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# SCREW PLUG IMMERSION HEATERS PROCESS WATER APPLICATIONS

MTS-1 Series  
Starts at

**\$470**

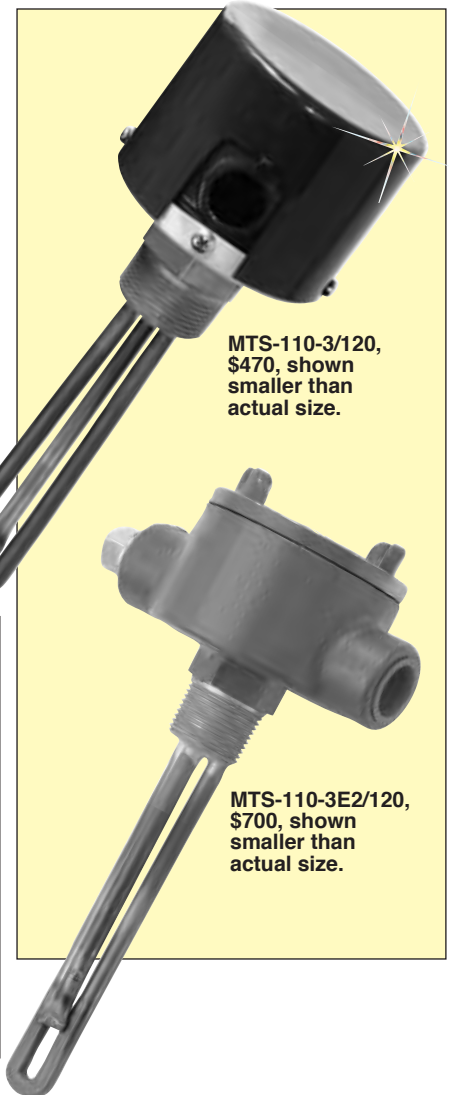
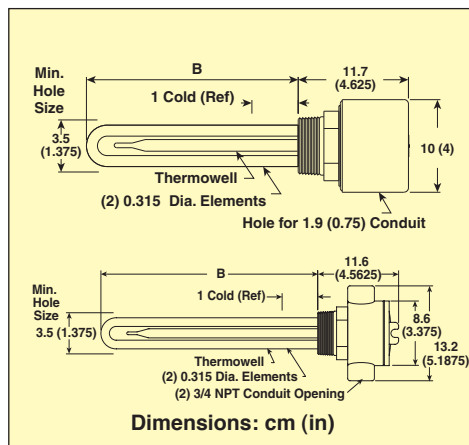


## SPECIFICATIONS

**Wattage:** 1 to 2 kW  
**Power:** 120 and 240V, 1 phase  
**Watt Density:** 43 to 86 W/in<sup>2</sup>  
**Screw Plug:** 1¼ NPT stainless steel passivated screw plug  
**Enclosures:** E1 general purpose, NEMA 1 (IP00) rated, or type E2 moisture resistant/explosion-resistant enclosure.<sup>2</sup>

- ✓ 1¼ NPT Stainless Steel Passivated Screw Plug
- ✓ Stainless Steel Passivated Elements
- ✓ High Watt Density (43 to 86 W/in<sup>2</sup>)
- ✓ 1 to 2 kW
- ✓ Without Thermostat
- ✓ 120 and 240V, 1 Phase
- ✓ General Purpose or Moisture-Resistant/Explosion-Resistant Terminal Enclosure

*Note: This immersion heater should be used with an approved temperature control device to assure safe operation.*



MTS-110-3/120, \$470, shown smaller than actual size.

MTS-110-3E2/120, \$700, shown smaller than actual size.

**MOST POPULAR MODEL HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Volts	W/in <sup>2</sup>	No. Htg. Elem.	E1 General Purpose Enclosure <sup>1</sup>			E2 Moisture Resis/Explosion Resis. <sup>2</sup>			
				Dim. B cm (in)	Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)
1	120	43	2	15.5 (6 1/8)	<b>MTS-110-3</b>	<b>\$470</b>	0.9 (2)	<b>MTS-110-3E2</b>	<b>\$700</b>	2.3 (5)
1	240	43	2	15.5 (6 1/8)	MTS-110-3	470	0.9 (2)	MTS-110-3E2	700	2.3 (5)
1.2	120	53	2	15.5 (6 1/8)	MTS-112	475	0.9 (2)	MTS-112E2	700	2.3 (5)
1.2	240	53	2	15.5 (6 1/8)	MTS-112	475	0.9 (2)	MTS-112E2	700	2.3 (5)
1.5	120	65	2	15.5 (6 1/8)	MTS-115	485	0.9 (2)	MTS-115E2	700	2.3 (5)
1.5	240	65	2	15.5 (6 1/8)	MTS-115	485	0.9 (2)	MTS-115E2	700	2.3 (5)
2	120	86	2	15.5 (6 1/8)	MTS-120	500	0.9 (2)	MTS-120E2	725	2.3 (5)
2	240	86	2	15.5 (6 1/8)	MTS-120	500	0.9 (2)	MTS-120E2	725	2.3 (5)

<sup>1</sup> Heaters with general purpose enclosures are UL Listed and CSA certified.

<sup>2</sup> Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.

Ordering Example: MTS-120/240, 2 kW heater powered by 240 Vac, \$500.



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# HEAVY-DUTY IMMERSION HEATER FOR PROCESS WATER—2 NPT FITTING

MTS-2 Series  
Starts at  
**\$525**



- ✓ NEMA 1 (IP00) Rated, UL Listed General Purpose Enclosure
- ✓ Premium-Quality Passivated Stainless Steel Wetted Parts
- ✓ 1.5 to 15 kW
- ✓ 120, 280, 240, and 480V, 1-Phase

The OMEGALUX® MTS-2 Series process water immersion heater is available for applications with mild acid or alkaline conditions. The passivated stainless steel construction allows complete compatibility.

**Note:** This immersion heater should be used with an approved temperature control device to assure safe operation. See Section P for our selection of process controllers.

## SPECIFICATIONS

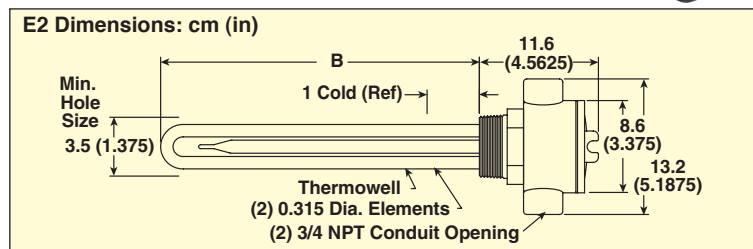
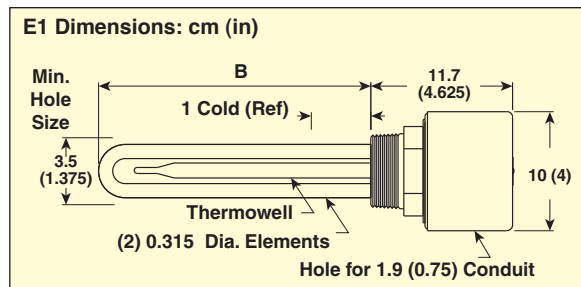
**Wattage:** 1.5 to 15 kW  
**Power:** 120, 208, 240 or 480V; 1-phase  
**Sheath:** 1.2 cm (0.475") diameter passivated stainless steel  
**Enclosure:** General purpose, NEMA 1 rated<sup>1</sup> or E2 moisture-resistant/explosion-resistant enclosure<sup>2</sup>

MTS-240A/240V, \$650, shown smaller than actual size.



MTS-225E2/480V, \$825, shown smaller than actual size.

**CAUTION AND WARNING!**  
 Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.



**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)									
kW	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B cm (in)	E1 General Purpose Enclosure <sup>1</sup>			E2 Moist/Explos-Res Encl <sup>2</sup>		
				Model No.	Price	Wt kg (lb)	Model No.	Price	Wt kg (lb)
1.5	48	1	29 (11 <sup>1</sup> / <sub>16</sub> )	MTS-215A/*	\$550	1 (3)	MTS-215E2/*	\$800	3 (6)
2	48	1	44 (17 <sup>1</sup> / <sub>2</sub> )	MTS-220A/*	600	2 (4)	MTS-220E2/*	850	3 (7)
2	51	2	19 (7 <sup>1</sup> / <sub>2</sub> )	MTS-220-3A/*	525	2 (4)	MTS-220-3E2/*	775	3 (7)
2.5	47	2	23 (9)	MTS-225A/**	575	2 (4)	MTS-225E2/**	825	3 (7)
3	43	2	29 (11 <sup>1</sup> / <sub>2</sub> )	MTS-230A/*	600	2 (5)	MTS-230E2/*	850	4 (8)
4	44	2	44 (17 <sup>1</sup> / <sub>2</sub> )	MTS-240A/*	650	2 (5)	MTS-240E2/*	900	4 (8)
5	45	2	48 (19)	MTS-250A/*	725	2 (5)	MTS-250E2/*	975	4 (8)
6	46	2	62 (24 <sup>1</sup> / <sub>2</sub> )	MTS-260A/***	775	2 (5)	MTS-260E2/***	1000	4 (8)
7	46	2	70 (27 <sup>1</sup> / <sub>2</sub> )	MTS-270A/****	825	3 (6)	MTS-270E2/****	1050	5 (9)
10	46	2	102 (40)	MTS-2100A/***	1000	4 (8)	MTS-2100E2/***	1250	5 (11)
12	50	2	121 (48)	MTS-2120A/***	1100	4 (8)	MTS-2120E2/***	1350	5 (11)
15	50	2	137 (54)	MTS-2150/****	1250	4 (8)	MTS-2150E2/****	1500	5 (11)

\* Designate voltage: insert "120V" for 120 Vac, "208V" for 208 Vac, "240V" for 240 Vac or "480V" for 480 Vac.

\*\* Designate voltage: insert "120V" for 120 Vac, "240V" for 240 Vac or "480V" for 480 Vac.

\*\*\* Designate voltage: insert "208V", "240V" or "480V" for required voltage.

\*\*\*\* Designate voltage: insert "240V" or "480V" for required voltage.

<sup>1</sup> Heaters with general purpose enclosures are UL listed and CSA certified except models that exceed 48 A.

<sup>2</sup> Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified except models that exceed 48 A.

**Ordering Examples:** MTS-240A/240V, 4 kW, 2 NPT immersion heater with general purpose enclosure, \$650.

MTS-230E2/208V, 3 kW, 2 NPT immersion heater with general purpose enclosure. \$850.



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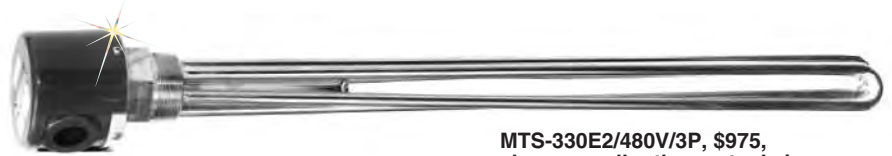
• **Heaters**

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

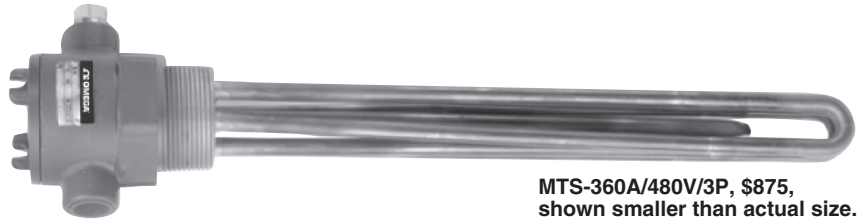
# RIGGED PROCESS WATER IMMERSION HEATER WITH 2½ NPT FITTING

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MTS-3 Series  
Starts at  
**\$725**

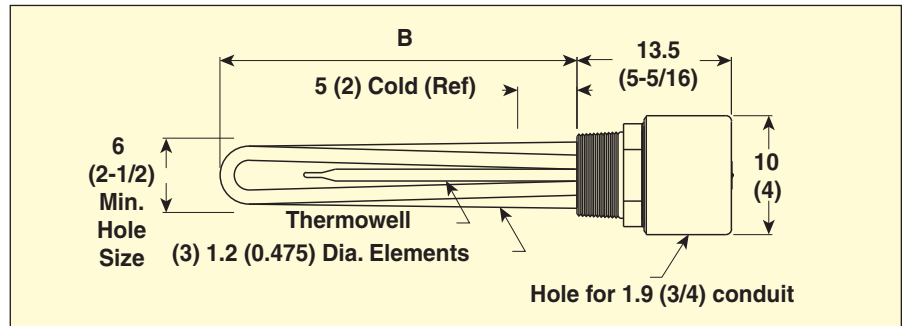


MTS-330E2/480V/3P, \$975, shown smaller than actual size.

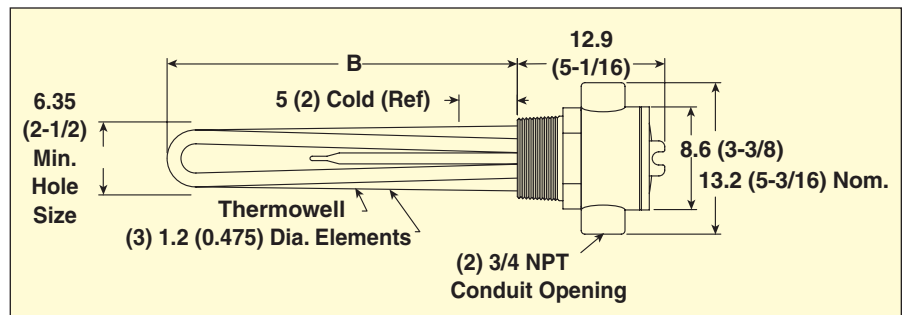


MTS-360A/480V/3P, \$875, shown smaller than actual size.

- ✓ Stainless Steel Wetted Construction
- ✓ 120, 208, 240, 480V; 1 and 3-Phase Power
- ✓ Reliable Heater Design
- ✓ General Purpose Enclosure, NEMA 1 (IP00) Rated and UL Listed



Dimensions: cm (in)



**Please Note:** This immersion heater should be used with an approved temperature control device to ensure safe operation. See Section P for our selection of process controllers.

**CAUTION AND WARNING!**  
Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel.

  **MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)				E1 Gen. Purpose Enclosure <sup>1</sup>			E2 Moist-/Explos-Res. Enc. <sup>2</sup>		
kW	W/in <sup>2</sup>	No. Htg. Elem.	Dim. B cm (in)	Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. lb (kg)
3	51	3	17 (6 <sup>7</sup> / <sub>8</sub> )	MTS-330A/**/***	\$725	2 (5)	MTS-330E2/**/***	\$975	4 (8)
4.5	48	3	28 (10 <sup>7</sup> / <sub>8</sub> )	MTS-345A/**/***	800	3 (6)	MTS-345E2/**/***	1050	4 (9)
6	48	3	43 (16 <sup>7</sup> / <sub>8</sub> )	MTS-360A/**/***	875	3 (6)	MTS-360E2/**/***	1100	4 (9)
7.5	53	3	49 (18 <sup>1</sup> / <sub>16</sub> )	MTS-375A/**/***	925	3 (6)	MTS-375E2/**/***	1159	4 (9)
9	47	3	61 (24)	MTS-390A/208V/**/***	1010	3 (7)	MTS-390E2/**/***	1250	5 (10)
12	46	3	81 (31 <sup>7</sup> / <sub>8</sub> )	†MTS-3120A/208V/**/***	1150	4 (9)	†MTS-3120E2/**/***	1400	5 (12)
15	46	3	101 (39 <sup>3</sup> / <sub>8</sub> )	†MTS-3150A/208V/**/***	1300	5 (10)	†MTS-3150E2/**/***	1550	6 (13)
18	51	3	118 (46 <sup>7</sup> / <sub>8</sub> )	†MTS-3180A/208V/**/***	1400	5 (12)	†MTS-3180E2/**/***	1650	7 (15)

<sup>\*</sup>Designate voltage: insert "120" for 120 Vac, "208" for 208 Vac, "240" for 240 Vac or "480" for 480 Vac.

<sup>\*\*</sup> Designate voltage: insert "208" for 208 Vac, "240" for 240 Vac or "480" for 480 Vac.

<sup>\*\*\*</sup> Add suffix "3P" to the model number for 3-phase power, no extra charge (not available for 120 V models).

<sup>1</sup> Heaters with general purpose enclosures are UL listed and CSA certified except models with † (exceed 48 amps).

<sup>2</sup> Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas, except models with † (exceed 48 amps).

Ordering Example: MTS-330A/480V, 3 kW heater powered by 1-phase 480 Vac, \$725.



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**NEW**

# SCREW PLUG IMMERSION HEATERS PROCESS WATER APPLICATIONS

MTS Series  
Starts at

**\$430**

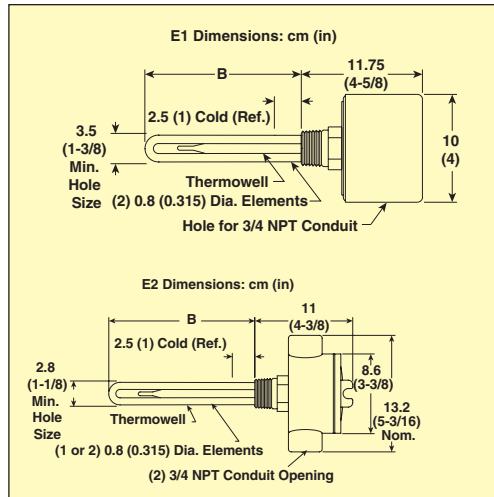


- ✓ 1 NPT Stainless Steel Passivated Screw Plug
- ✓ Stainless Steel Passivated Elements
- ✓ High Watt Density (64 to 86 W/in<sup>2</sup>)
- ✓ 0.75 to 3 kW
- ✓ Without Thermostat
- ✓ 120 and 240V, 1 Phase
- ✓ General Purpose or Moisture-Resistant/Explosion-Resistant Terminal Enclosure

*Note: This immersion heater should be used with an approved temperature control device to assure safe operation.*

## SPECIFICATIONS

**Wattage:** 0.75 to 3 kW  
**Power:** 120 and 240V, 1 phase  
**Watt Density:** 64 to 86 W/in<sup>2</sup>  
**Screw Plug:** 1 NPT stainless steel passivated screw plug  
**Enclosures:** E1 general purpose, NEMA 1 (IP00) rated, or type E2 moisture-resistant/ explosion-resistant enclosure.<sup>2</sup>



**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Volts	W/in <sup>2</sup>	No. Htg. Elem.	E1 General Purpose Enclosure <sup>1</sup>				E2 Moisture Resis/Explosion Resis. <sup>2</sup>			
				Dim. B cm (in)	Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)	
0.75	120	64	1	16 (6 <sup>5</sup> / <sub>16</sub> )	MTS-750/*	\$430	0.9 (2)	MTS-750E2/*	\$650	2.3 (5)	
0.75	240	64	1	16 (6 <sup>5</sup> / <sub>16</sub> )	MTS-750/*	430	0.9 (2)	MTS-750E2/*	650	2.3 (5)	
1	120	85	1	16 (6 <sup>5</sup> / <sub>16</sub> )	MTS-1000/*	435	0.9 (2)	MTS-1000E2/*	650	2.3 (5)	
1	240	85	1	16 (6 <sup>5</sup> / <sub>16</sub> )	MTS-1000/*	435	0.9 (2)	MTS-1000E2/*	650	2.3 (5)	
1.25	120	83	1	20 (8 <sup>1</sup> / <sub>16</sub> )	MTS-1250/*	445	0.9 (2)	MTS-1250E2/*	675	2.3 (5)	
1.25	240	83	1	20 (8 <sup>1</sup> / <sub>16</sub> )	MTS-1250/*	445	0.9 (2)	MTS-1250E2/*	675	2.3 (5)	
1.5	120	86	1	23.5 (9 <sup>3</sup> / <sub>16</sub> )	MTS-1500/*	455	0.9 (2)	MTS-1500E2/*	675	2.3 (5)	
1.5	240	86	1	23.5 (9 <sup>3</sup> / <sub>16</sub> )	MTS-1500/*	455	0.9 (2)	MTS-1500E2/*	675	2.3 (5)	
2	120	83	1	31 (12 <sup>1</sup> / <sub>4</sub> )	MTS-2000/*	475	0.9 (2)	MTS-2000E2/*	700	2.3 (5)	
2	240	83	1	31 (12 <sup>1</sup> / <sub>4</sub> )	MTS-2000/*	475	0.9 (2)	MTS-2000E2/*	700	2.3 (5)	
2.5	120	79	1	41 (16 <sup>1</sup> / <sub>4</sub> )	MTS-2500/*	490	0.9 (2)	MTS-2500E2/*	725	2.3 (5)	
2.5	240	79	1	41 (16 <sup>1</sup> / <sub>4</sub> )	MTS-2500/*	490	0.9 (2)	MTS-2500E2/*	725	2.3 (5)	
3	120	78	1	50 (19 <sup>7</sup> / <sub>16</sub> )	MTS-3000/*	500	1.4 (3)	MTS-3000E2/*	725	2.7 (6)	
3	240	78	1	50 (19 <sup>7</sup> / <sub>16</sub> )	MTS-3000/*	500	1.4 (3)	MTS-3000E2/*	725	2.7 (6)	

\* Designate voltage, i.e., "120" for 120 Vac or "240" for 240 Vac.

<sup>1</sup> Heaters with general purpose enclosures are UL listed and CSA certified.

<sup>2</sup> Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.

Ordering Example: MTS-750/240, 0.75 kW heater powered by 240 Vac, \$430.





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# SCREW PLUG IMMERSION HEATERS CLEAN WATER APPLICATIONS

MT Series  
Starts at  
**\$127**



- ✓ 1 NPT Brass Screw Plug
- ✓ Copper Sheath Element
- ✓ High Watt Density (64 to 86 W/in<sup>2</sup>)
- ✓ 0.75 to 3 kW
- ✓ Without Thermostat
- ✓ 120 and 240V, 1 Phase
- ✓ General Purpose or Moisture-Resistant/Explosion-Resistant Terminal Enclosure

## SPECIFICATIONS

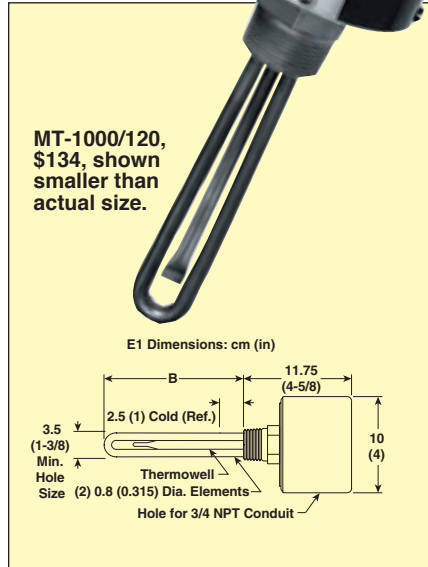
**Wattage:** 0.75 to 3 kW

**Power:** 120 or 240V, 1 phase

**Watt Density:** 64 to 86 W/in<sup>2</sup>

**Screw Plug:** 1 NPT brass screw plug

**Enclosures:** E1 general purpose, NEMA 1 rated, or type E2 moisture-resistant/explosion-resistant enclosure.<sup>2</sup>



**Note:** This immersion heater should be used with an approved temperature control device to assure safe operation.



**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Volts	W/in <sup>2</sup>	No. Htg. Elem.	E1 General Purpose Enclosure <sup>1</sup>				E2 Moisture Resis/Explosion Resis. <sup>2</sup>		
				Dim. B cm (in)	Model No.	Price	Wt. kg (lb)	Model No.	Price	Wt. kg (lb)
0.75	120	64	1	16 (6 <sup>5</sup> / <sub>16</sub> )	MT-750/*	\$127	0.9 (2)	MT-750E2/*	\$355	2.3 (5)
0.75	240	64	1	16 (6 <sup>5</sup> / <sub>16</sub> )	MT-750/*	127	0.9 (2)	MT-750E2/*	355	2.3 (5)
1	120	85	1	16 (6 <sup>5</sup> / <sub>16</sub> )	MT-1000/*	134	0.9 (2)	MT-1000E2/*	360	2.3 (5)
1	240	85	1	16 (6 <sup>5</sup> / <sub>16</sub> )	MT-1000/*	134	0.9 (2)	MT-1000E2/*	360	2.3 (5)
1.25	120	83	1	20 (8 <sup>1</sup> / <sub>16</sub> )	MT-1250/*	145	0.9 (2)	MT-1250E2/*	370	2.3 (5)
1.25	240	83	1	20 (8 <sup>1</sup> / <sub>16</sub> )	MT-1250/*	145	0.9 (2)	MT-1250E2/*	370	2.3 (5)
1.5	120	86	1	23.5 (9 <sup>1</sup> / <sub>4</sub> )	MT-1500/*	153	0.9 (2)	MT-1500E2/*	375	2.3 (5)
1.5	240	86	1	23.5 (9 <sup>1</sup> / <sub>4</sub> )	MT-1500/*	153	0.9 (2)	MT-1500E2/*	375	2.3 (5)
2	120	83	1	31 (12 <sup>1</sup> / <sub>4</sub> )	MT-2000/*	171	0.9 (2)	MT-2000E2/*	395	2.3 (5)
2	240	83	1	31 (12 <sup>1</sup> / <sub>4</sub> )	MT-2000/*	171	0.9 (2)	MT-2000E2/*	395	2.3 (5)
2.5	120	79	1	41 (16 <sup>1</sup> / <sub>4</sub> )	MT-2500/*	190	0.9 (2)	MT-2500E2/*	415	2.3 (5)
2.5	240	79	1	41 (16 <sup>1</sup> / <sub>4</sub> )	MT-2500/*	190	0.9 (2)	MT-2500E2/*	415	2.3 (5)
3	120	78	1	50 (19 <sup>3</sup> / <sub>8</sub> )	MT-3000/*	210	1.4 (3)	MT-3000E2/*	435	2.7 (6)
3	240	78	1	50 (19 <sup>3</sup> / <sub>8</sub> )	MT-3000/*	210	1.4 (3)	MT-3000E2/*	435	2.7 (6)

\* Designate voltage, i.e., "120" for 120 Vac or "240" for 240 Vac.

<sup>1</sup> Heaters with general purpose enclosures are UL Listed and CSA certified.

<sup>2</sup> Heaters with moisture-resistant/explosion-resistant enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.

Ordering Example: MT-750/240, 0.75 kW heater powered by 240 Vac, \$127.



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## Natural Convection

### NCH-11000 Series



- ✓ Dual Voltage 100 to 240 Vac
- ✓ UL94V-0 High Temperature Plastic Housing
- ✓ Touch Safe Heater; Does Not Exceed 74°C (165°F) for Low Temperature Version/ 105°C (221°F) for High Temperature Version
- ✓ Optimized for Low Inrush Current
- ✓ Self Regulating, Highest Power at Low Ambient Temperature
- ✓ Easy Connection, Finger Guard with Integrated Terminal Block
- ✓ Fixing 35 mm DIN Rail Mount
- ✓ RoHS Compliant (EU Directive 2002/95/EC)

The NCH-11000 Series range of natural convection heaters consists of a ceramic type heating element, with electrically insulated and corrosion resistant (anodized) heat-sink fins. A UL94V-0 heater guard in high temperature plastic is provided to protect from accidental contact with the element.

Elements are self-regulating giving the highest power at a low ambient temperature. There are four primary variants giving different powers. Additionally heaters



Both models shown smaller than actual size.

NCH-11000

are built as low and high temperature versions. Heaters NCH-11000 and NCH-11100 are low temperature versions; the plastic heater guard does not exceed 74°C (165°F). Heaters NCH-11200 and NCH-11300 are hotter allowing higher power output; however the plastic heater guard does not exceed a safe 105°C (221°F).

The heating element conforms to IP20. For ease of installation the product is supplied with a factory fitted stainless steel 35 mm DIN-rail mounting clip. Electrical connection is via a terminal block which is integrated with the heater guard. All elements are optimized for low inrush current across the permissible voltage range.

### Specifications

Model No.	NCH-11000	NCH-11100	NCH-11200	NCH-11300
Nominal Power Output at 10°C (50°F)	20W	30W	40W	65W
Typical Peak Inrush Current (Arms) 230V/115V	0.6/0.8	1.8/2.2	1.6/2.0	5.5/5.5
Maximum Body Temperature (30°C Ambient)	74°C (165°F)		105°C (221°F)	
Electrical Protection Class	II			
Ingress Protection (EN60529)	IP20			
Operating Temperature Range	-30 to 70°C (-22 to 158°F)			
Storage Temperature Range	-40 to 70°C (-40 to 158°F)			
Nominal Input Voltage	100 to 240 Vac			
Nominal Input Frequency, Hz	50 to 60			
Dimensions (Cross Section), mm (inch)	35.5 x 57 (1.4 x 2.24)			
Dimensions (Length), mm (inch)	97.5 (3.84)	157.5 (6.2)	97.5 (3.84)	157.5 (6.2)
Connector Block (AWG)	12 to 24			
Weight: g (oz)	100 (3.53)	160 (5.64)	100 (3.53)	160 (5.64)

Note: All data are for unit operated in vertical orientation.

### To Order Visit [omega.com/nch-11000](http://omega.com/nch-11000) for Pricing and Details

Model No.	Description
NCH-11000	Low temperature version 74°C (165°F) maximum, 20 W, 100 to 240V
NCH-11100	Low temperature version 74°C (165°F) maximum, 30 W, 100 to 240V
NCH-11200	Higher temperature version 105°C (221°F) maximum, 40 W, 100 to 240V
NCH-11300	Higher temperature version 105°C (221°F) maximum, 65 W, 100 to 240V

Comes complete with 35 mm DIN rail mounting clip and operator's manual.

Ordering Example: NCH-11000 natural convection heater, 20 W, 100 to 240 Vac



**NCH-37000 Series**



- ✓ Rugged Aluminium Extrusion Profile
- ✓ High Power Density Compact Design
- ✓ Self-Regulating Technology
- ✓ Safety by Temperature Limitations
- ✓ Fixing Clip can be Mounted Either at the Wide Side or at the Narrow Side

**Applications**

- ✓ Cash Points, Ticket Machines, Parking Ticket Terminals, Access Systems, Fuel Dispensers, and Portals of Energy, Building-Safety Systems, Building-Management Systems, and Landscaping Systems

These convection heaters and contact heating elements are based on PTC (Positive Temperature Coefficients) technology. A wide range of types with different designs and performances for various applications are available.

This product line is distinguished by design characteristics: limited temperature of external profile through thermal decoupling. Optimized convective heat transfer through chimney effect. Self-regulation through PTC technology. Approved safety on the basis of given temperature limitation. High reliability. No switching components.



**NCH-37017801**  
shown actual size.

**Specifications**

Model No.	NCH-37017701	NCH-37017801	NCH-37018001	NCH-37018201	NCH-37018401
Rated Power at 10°C (50°F): Watt	30	50	60	75	100
External Profile Temperature (Approximate): °C (°F)	130 (266)	205 (401)	205 (401)	190 (374)	200 (392)
Voltage Range	110 to 240 Vac/Vdc				
Protection Class	II				
System of Protection	IP20				
Connection Cable 2 x 0.5 mm <sup>2</sup> (0.08 x 0.02 in <sup>2</sup> ), Silicone	500 mm (19.7") long				
Dimensions: L x W x H, mm (inch)	65 x 70.7 x 24 (2.6 x 2.8 x 0.9)	95 x 70.7 x 24 (3.7 x 2.8 x 0.9)	125 x 70.7 x 24 (4.9 x 2.8 x 0.9)	175 x 70.7 x 24 (6.9 x 2.8 x 0.9)	
Weight: kg (lb)	0.13 (0.29)	0.14 (0.31)	0.19 (0.42)	0.24 (0.53)	0.34 (0.75)
Recommended Fuse (Time-Delay) 240V/110V	4 A/2 A	6.3 A/4 A	6.3 A/4 A	6.3 A/4 A	6.3 A/6.3 A

<b>To Order</b>	
Model No.	Description
NCH-37017701	30W, 110 to 240 Vac/Vdc, 500 mm (19.7") lead
NCH-37017801	50W, 110 to 240 Vac/Vdc, 500 mm (19.7") lead
NCH-37018001	60W, 110 to 240 Vac/Vdc, 500 mm (19.7") lead
NCH-37018201	75W, 110 to 240 Vac/Vdc, 500 mm (19.7") lead
NCH-37018401	100W, 110 to 240 Vac/Vdc, 500 mm (19.7") lead

Comes complete with operator's manual.

Ordering Example: NCH-37017701. 30W 110 to 240 Vac/Vdc natural convection heater

# Resistance Heating

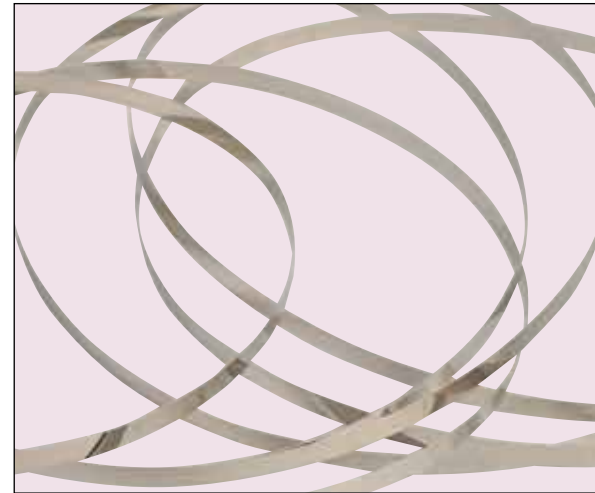
## Ribbon Wire

### Nickel-Chromium Alloy 80% Nickel/20% Chromium

**NCCR Series**  
30 m (100') Spool

- ✓ Uniformity of Resistance
- ✓ Mechanical Stability
- ✓ Fine Surface Finish

✓ Nickel-Chromium Wire (80Ni-20Cr) is Proven to Deliver Outstanding Performance Over Extended Periods of Time and is the Same Wire OMEGA Uses in Our Own Electrical Heating Elements



100' spool of NCCR-15-100 shown smaller than actual size.

#### Resistance Wire—Current vs. Temperature

Current Carrying Capacity of Straight Nickel Chromium Wire

Approximate amperes to heat a straight, oxidized wire in quiet air to given temperature

		°F	400	600	800	1000	1200	1400
		°C	205	315	427	538	649	760
AWG or B & S	Inches Diameter	Amperes						
15	0.057	7.2	10.0	12.8	16.1	20.0	24.5	
16	0.051	6.4	8.7	10.9	13.7	17.0	20.9	
17	0.045	5.5	7.5	9.5	11.7	14.5	17.6	
18	0.040	4.8	6.5	8.2	10.1	12.2	14.8	
19	0.036	4.3	5.8	7.2	8.7	10.6	12.7	
20	0.032	3.8	5.1	6.3	7.6	9.1	11.0	
21	0.0285	3.3	4.3	5.3	6.5	7.8	9.4	
22	0.0253	2.9	3.7	4.5	5.6	6.8	8.2	
23	0.0226	2.58	3.3	4.0	4.9	5.9	7.0	
24	0.0201	2.21	2.9	3.4	4.2	5.1	6.0	
25	0.0179	1.92	2.52	3.0	3.6	4.3	5.2	
26	0.0159	1.67	2.14	2.60	3.2	3.8	4.5	
27	0.0142	1.44	1.84	2.25	2.73	3.3	3.9	
28	0.0126	1.24	1.61	1.95	2.38	2.85	3.4	
29	0.0113	1.08	1.41	1.73	2.10	2.51	2.95	
30	0.0100	0.92	1.19	1.47	1.78	2.14	2.52	
31	0.0089	0.77	1.03	1.28	1.54	1.84	2.17	
32	0.0080	0.68	0.90	1.13	1.36	1.62	1.89	
33	0.0071	0.59	0.79	0.97	1.17	1.40	1.62	
34	0.0063	0.50	0.68	0.83	1.00	1.20	1.41	
35	0.0056	0.43	0.57	0.72	0.87	1.03	1.21	
36	0.0050	0.38	0.52	0.63	0.77	0.89	1.04	
37	0.0045	0.35	0.46	0.57	0.68	0.78	0.90	
38	0.0040	0.30	0.41	0.50	0.59	0.68	0.78	
39	0.0035	0.27	0.36	0.42	0.49	0.58	0.66	
40	0.0031	0.24	0.31	0.36	0.43	0.50	0.57	

### Current Carrying Capacity of Ribbon Nickel Chromium Wire

At 648°C (1200°F) Approximate

Thickness in Inches	Width-Inches					
	1/64	1/32	1/16	3/32	1/8	3/16
	Amps					
0.0063	1.56	2.89	5.5	8.2	10.1	16.6
0.0056	1.45	2.69	5.2	7.2	9.5	15.6
0.0050	1.35	2.52	4.9	6.8	9.0	14.7
0.0045	1.26	2.38	4.6	6.4	8.5	14.0
0.0040	1.18	2.23	4.1	6.0	8.0	13.1
0.0035	1.09	2.07	3.8	5.6	7.5	12.3
0.0031	1.01	1.94	3.6	5.3	7.0	11.5
0.0020	—	—	—	—	—	—
0.0015	4	—	—	—	—	—

The current values above are based on actual tests of single strands of oxidized wire mounted in quiet air and operated at 648°C (1200°F). The tables are calculated for wire having a resistivity at 648°C (1200°F) and a total surface watts-density of 28 W per square inch.

### To Order

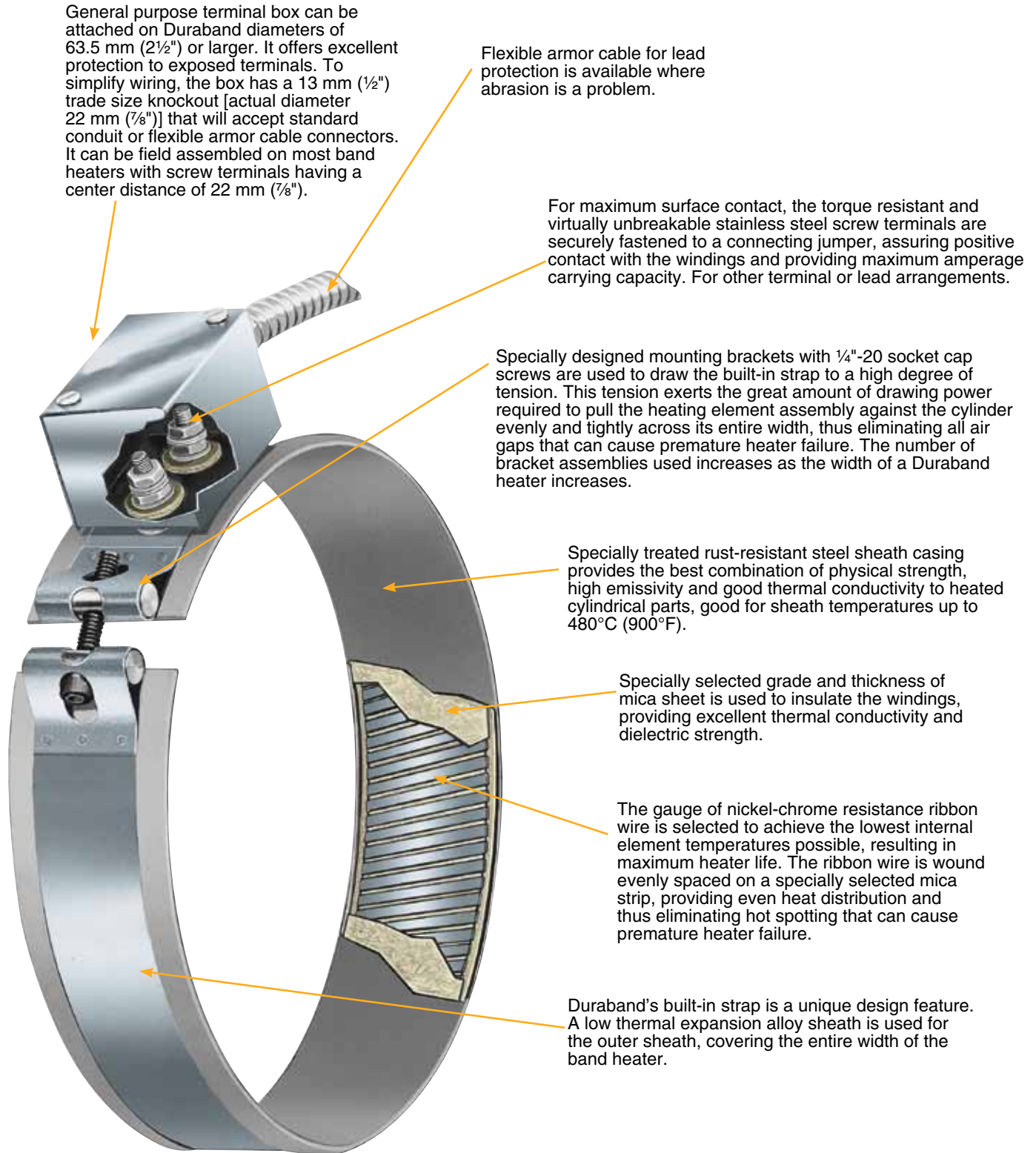
Model No.	Thickness	Width	Ω/ft*
NCRR-1-100	0.0015"	1/64"	22.75
NCRR-2-100	0.002"	1/64"	17.36
NCRR-3-100	0.0031"	1/64"	11.20
NCRR-4-100	0.0035"	1/64"	9.99
NCRR-5-100	0.004"	1/64"	8.68
NCRR-6-100	0.0045"	1/64"	7.12
NCRR-7-100	0.005"	1/64"	6.95
NCRR-8-100	0.0056"	1/64"	6.20
NCRR-9-100	0.0063"	1/64"	5.51
NCRR-10-100	0.002"	1/32"	9.83
NCRR-11-100	0.0031"	1/32"	5.60
NCRR-12-100	0.0035"	1/32"	4.96
NCRR-13-100	0.004"	1/32"	4.34
NCRR-14-100	0.0045"	1/32"	3.86
NCRR-15-100	0.005"	1/32"	3.47
NCRR-16-100	0.0063"	1/32"	2.76
NCRR-17-100	0.0031"	1/16"	3.17
NCRR-18-100	0.0035"	1/16"	2.81
NCRR-19-100	0.004"	1/16"	2.46
NCRR-20-100	0.0045"	1/16"	1.93
NCRR-21-100	0.005"	1/16"	1.74
NCRR-22-100	0.0056"	1/16"	1.55
NCRR-23-100	0.0063"	1/16"	1.38
NCRR-25-100	0.0031"	3/32"	2.11
NCRR-26-100	0.0035"	3/32"	1.87
NCRR-27-100	0.0045"	3/32"	1.46
NCRR-28-100	0.0063"	3/32"	0.91
NCRR-29-100	0.0031"	1/8"	1.59
NCRR-30-100	0.0035"	1/8"	1.40
NCRR-31-100	0.004"	1/8"	1.23
NCRR-32-100	0.0045"	1/8"	1.09
NCRR-33-100	0.005"	1/8"	0.98
NCRR-34-100	0.0056"	1/8"	0.88
NCRR-35-100	0.0031"	3/16"	0.88
NCRR-36-100	0.0035"	3/16"	0.78
NCRR-37-100	0.004"	3/16"	0.68
NCRR-38-100	0.0045"	3/16"	0.60
NCRR-39-100	0.005"	3/16"	0.54

\* Resistance tolerance: ±5%

Ordering Example: NCRR-15-100, 100' spool of 0.0035" thickness of heating ribbon wire.



## Replacement Band Heaters for Plastic Injection Molding Machines



General purpose terminal box can be attached on Duraband diameters of 63.5 mm (2½") or larger. It offers excellent protection to exposed terminals. To simplify wiring, the box has a 13 mm (½") trade size knockout [actual diameter 22 mm (7/8")] that will accept standard conduit or flexible armor cable connectors. It can be field assembled on most band heaters with screw terminals having a center distance of 22 mm (7/8").

Flexible armor cable for lead protection is available where abrasion is a problem.

For maximum surface contact, the torque resistant and virtually unbreakable stainless steel screw terminals are securely fastened to a connecting jumper, assuring positive contact with the windings and providing maximum amperage carrying capacity. For other terminal or lead arrangements.

Specially designed mounting brackets with ¼"-20 socket cap screws are used to draw the built-in strap to a high degree of tension. This tension exerts the great amount of drawing power required to pull the heating element assembly against the cylinder evenly and tightly across its entire width, thus eliminating all air gaps that can cause premature heater failure. The number of bracket assemblies used increases as the width of a Duraband heater increases.

Specially treated rust-resistant steel sheath casing provides the best combination of physical strength, high emissivity and good thermal conductivity to heated cylindrical parts, good for sheath temperatures up to 480°C (900°F).

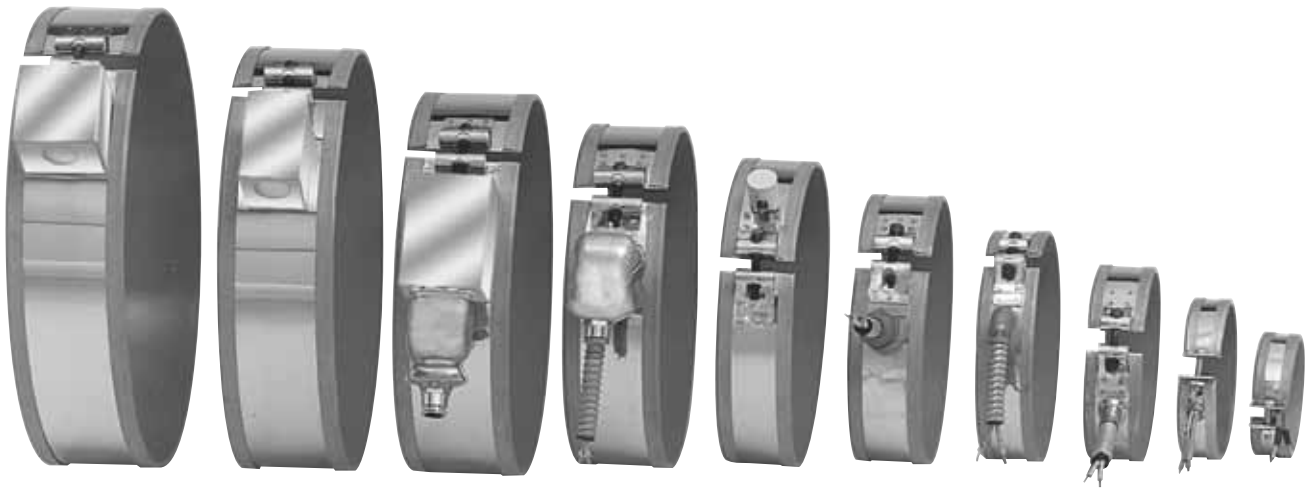
Specially selected grade and thickness of mica sheet is used to insulate the windings, providing excellent thermal conductivity and dielectric strength.

The gauge of nickel-chrome resistance ribbon wire is selected to achieve the lowest internal element temperatures possible, resulting in maximum heater life. The ribbon wire is wound evenly spaced on a specially selected mica strip, providing even heat distribution and thus eliminating hot spotting that can cause premature heater failure.

Duraband's built-in strap is a unique design feature. A low thermal expansion alloy sheath is used for the outer sheath, covering the entire width of the band heater.



## **Replacement Band Heaters for Plastic Injection Molding Machines**



- Built-In Bracket for Superior Clamping
- Unbreakable and Torque-Resistant Screw Terminals
- Temperatures Up to 480°C (900°F)
- Full Width Stainless Steel Built-In Strap
- Flexibility to Incorporate Holes and Cutouts
- Available Two-Piece and Expandable Designs
- Most Economical Among Various Heater Bands
- Most Versatile and Commonly Used Heater Band

### **Typical Applications**

- Plastic Injection Molding Machines
- Plastic Extruders
- Oil Reclamation Equipment
- Food and Candy Extruders
- Drum Heating
- Extrusion Dies
- Holding Tanks
- Blow Molding Machines
- Vending Machines
- Barrels and Heads
- Food Service Warming
- Autoclaves and Sterilizers
- Metallurgical Analyzers
- Fluidized Beds
- Hot Runner Molds
- Pulp and Paper Processing Equipment

### **Designed For Trouble-Free Service**

The Duraband heater design is the result of many years of research, development and testing for a reliable mica insulated band heater that can perform at the higher operating temperatures [up to 480°C (900°F)] essential to process high temperature resins, providing long, efficient service necessary for today's high productivity of plastic extruders, injection and blow molding machines.

Duraband is a proven heater design for good life efficiency and dependability. It assures maintaining the lowest winding temperatures possible, keeping a low-mass heating element assembly for fast heat-up and quick thermal response to controls. It incorporates the low thermal expansion built-in strap, a unique design feature.

### **Advantages and Variations**

Duraband mica insulated heaters are widely used on operations involving heating of cylindrical surfaces and are manufactured in a full range of standard construction variations, physical dimensions, electrical ratings, and a complete arrangement of screw terminals and lead terminations.

However, these standard Duraband heater variations and terminations do not represent the full extent of our capabilities. OMEGA's engineering staff, with many years of experience in heat processing and temperature control applications, can assist you in designing the right Duraband heater for your specific application.



## Replacement Band Heaters for Plastic Injection Molding Machines

### Standard Specifications and Tolerances

#### Performance Ratings

**Maximum Temperature:**

**Standard Sheath:** 482°C (900°F)

**Nominal Watt Density:** 3 to 7 Watt/cm<sup>2</sup> (20 to 45 Watt/in<sup>2</sup>)

**Maximum Watt Density:** Dependent on heater size and operating temperature

#### Electrical Ratings

**Maximum Voltage:** 480 Vac

**Dual Voltage or 3-Phase:** Available depending on heater design

**Maximum Amperage:**

**Lead Wire Termination:** 10 Amp

**Screw Terminations:** 8-32 UNF—20 Amp;  
10-32 UNF—25 Amp

**Resistance Tolerance:** 10%, -5%

**Wattage Tolerance:** 5%, -10%

#### Physical Size Construction Limitations

**Minimum Width:** 19.1 mm (¾")

**Width Tolerance:** 1.59 mm (±1/16")

**Minimum Inside Diameter:** 22.1 mm (7/8")

**Nominal Gap:** 9.5 mm (¾")—if a larger gap is required for probes or thermocouples, specify when ordering

#### Built-In Brackets

Heater Width	Number of Brackets
38 to 76 mm (1½ to 3")	1
79 to 127 mm (3⅛ to 5")	2
130 to 145 mm (5⅛ to 6⅞")	3
178 to 254 mm (7 to 10")	4
257 to 381 mm (10⅛ to 15")	5

*If tighter tolerances are required, contact OMEGA.*

**CAUTION:** Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.

#### Minimum ID and Width for Construction/Clamping Styles

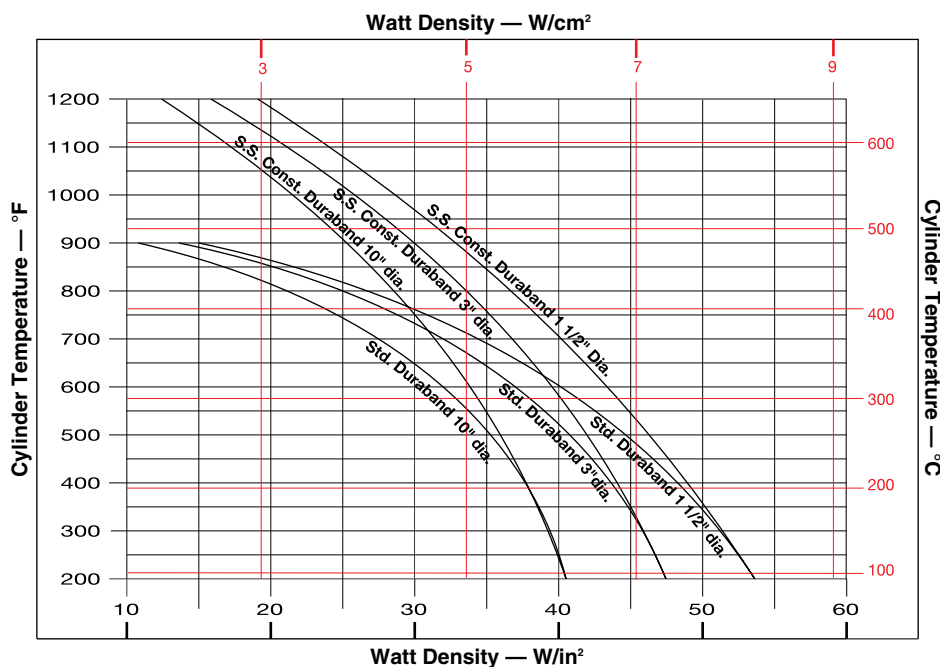
Style	Minimum ID		Minimum Width	
	mm	inch	mm	inch
NB	50.8	2	31.8	1¼
NS	76.2	3	31.8	1¼
NE	63.5	2½	31.8	1¼
SB	22.1	7/8	19.1	¾
SS	50.8	2	19.1	¾
SE	63.5	2½	31.8	1¼
FB	25.4	1	19.1	¾
FS	50.8	2	19.1	¾
FE	63.5	2½	31.8	1¼
SL	101.6	4	31.8	1¼
NSL	101.6	4	31.8	1¼
NEL	101.6	4	31.8	1¼
LT	177.8	7	38.1	1½
LS	177.8	7	38.1	1½
LE	177.8	7	38.1	1½
TWL	25.4	1	25.4	1
RNB	134.7	5½	25.4	1
RNS	254	10	25.4	1

**Note:** Refer to individual descriptions for further information. Actual heater minimums will be a combination of termination and construction/strap styles.



## Replacement Band Heaters for Plastic Injection Molding Machines

### Maximum Watt Densities



#### Maximum Allowable Watt Density

The chart displays the maximum Watt Density curves for various diameter heaters. Use this chart when determining the appropriate wattage value for your chosen heater.

Be aware that certain factors will require you to derate the watt density (Watt/in<sup>2</sup>) of your heater selection.

**CAUTION: Failure to adhere to the maximum allowable watt density per heater size will result in poor operating life.**

#### Correction Factors

For heaters wider than 76.2 mm (3"), reduce maximum recommended watt density from chart by 20%.

For applications using insulating shroud, reduce maximum recommended watt density from chart by 25%.

#### Calculating Maximum Watt Density

##### Factors to be Taken into Consideration:

- A. Type of controls
- B. Voltage variations
- C. Machine cycling rate
- D. Type of resin being processed
- E. Coefficient of thermal expansion and conductivity of the cylinder
- F. Designing a heater that closely matches the wattage requirement will decrease the frequency of cycling and temperature overshoot, thereby increasing the life of the heater.

#### Once These Factors have been Established, Proceed with the Following Steps:

1. Determine the maximum operating temperature.
2. Calculate the total wattage required to obtain the maximum operating temperature.
3. Determine the quantity and size of the heater bands to be used. 38 through 76 mm (1½ through 3") wide band heaters have proven to be the most efficient and reliable in most cylindrical heating applications.
4. Determine individual band heater wattage by dividing the total required wattage by the quantity of band heaters selected.
5. Determine the band heater watt density by subtracting unheated areas from the band heater diameter created by screw terminals, gaps, holes, and cutouts (see formula below).
6. Determine if the required watt density previously calculated exceeds the maximum recommended watt density. Note the maximum cylinder temperature required on the left-hand side of the graph, follow the horizontal line until it intersects with the line of the band heater being used, and read directly down to obtain the maximum recommended watt density (Watt/in<sup>2</sup>).
7. If the calculated watt density is higher than the recommended value, it must be corrected or it will cause poor heater life. This can be accomplished by using more band heaters, lowering the heater wattage, or using a different construction type or a different type of band heater.
8. Should you have a problem in selecting the proper band heater or establishing watt density for your application, contact one of the qualified engineers at OMEGA.

Nominal Unheated Areas	
Construction Style	Unheated Area to Subtract
One-piece band	1" x width
Two-piece band	2" x width
Holes and cutouts	Size + ½" x width

#### Watt Density Formula

Wattage

$$\text{Watt Density (Watt/in}^2\text{)} = \frac{\text{Wattage}}{[3.14 \times (\text{Band ID}) - \text{Gap-1}\frac{3}{8}] \times \text{Band Width} - \text{Unheated Area (see table)}}$$

Unheated Area (See Table) = Unheated area for construction style + unheated area for any holes or cutouts



## Replacement Band Heaters for Plastic Injection Molding Machines NHL Series

- Economically Priced
- 12" Leads and 2" of Protective Sleeving
- Supplied with Low Profile Clamping Strap



### Mica Insulated Nozzle Heater

To Order							
Model No.		Inside Diameter		Width		Watts	Watt Density W/in <sup>2</sup>
120V	240V	mm	inch	mm	Inch		
NHL00130	NHL00131	22.2	7/8	25	1	85	49
NHL00100	NHL00101	25	1	25	1	100	47
NHL00132	NHL00133	25	1	25	1	125	58
NHL00102	NHL00103	25	1	38.1	1½	150	47
NHL00104	NHL00105	25	1	38.1	1½	200	62
NHL00106	NHL00107	25	1	51	2	250	58
NHL00154	NHL00155	31.7	1¼	15.8	5/8	100	55
NHL00108	NHL00109	31.7	1¼	25	1	175	60
NHL00156	NHL00157	31.7	1¼	31.7	1¼	125	34
NHL00158	NHL00159	31.7	1¼	31.7	1¼	250	68
NHL00110	NHL00111	31.7	1¼	38.1	1½	250	57
NHL00160	NHL00161	38.1	1½	22.2	7/8	100	31
NHL00162	NHL00163	38.1	1½	25	1	100	27
NHL00112	NHL00113	38.1	1½	25	1	150	40
NHL00114	NHL00115	38.1	1½	25	1	200	54
NHL00164	NHL00165	38.1	1½	31.7	1¼	250	54
NHL00134	NHL00135	38.1	1½	38.1	1½	150	27
NHL00116	NHL00117	38.1	1½	38.1	1½	200	36
NHL00136	NHL00137	38.1	1½	38.1	1½	250	45
NHL00118	NHL00119	38.1	1½	38.1	1½	275	49
NHL00138	NHL00139	38.1	1½	38.1	1½	300	54
NHL00120	NHL00121	38.1	1½	51	2	300	40
NHL00122	NHL00123	38.1	1½	63.5	2½	350	38
NHL00166	NHL00167	38.1	1½	63.5	2½	400	43
NHL00168	NHL00169	38.1	1½	76.2	3	350	31
NHL00124	NHL00125	38.1	1½	76.2	3	400	36
NHL00170	NHL00171	38.1	1½	76.2	3	500	45
NHL00172	NHL00173	44.4	1¾	25	1	175	39
NHL00174	NHL00175	44.4	1¾	38.1	1½	200	30
NHL00140	NHL00141	44.4	1¾	38.1	1½	225	33
NHL00176	NHL00177	44.4	1¾	38.1	1½	250	37
NHL00178	NHL00179	44.4	1¾	38.1	1½	300	44
NHL00180	NHL00181	44.4	1¾	76.2	3	500	37
NHL00182	NHL00183	51	2	25	1	200	38
NHL00142	NHL00143	51	2	38.1	1½	300	38
NHL00144	NHL00145	51	2	51	2	400	38



## Replacement Band Heaters for Plastic Injection Molding Machines NHL Series (continued)

Mica Insulated Nozzle Heater

Model No.		Inside Diameter		Width		Watts	Watt Density W/in <sup>2</sup>
120V	240V	mm	inch	mm	Inch		
NHL00126	NHL00127	54	2 <sup>1</sup> / <sub>8</sub>	25	1	100	18
NHL00128	NHL00129	54	2 <sup>1</sup> / <sub>8</sub>	51	2	200	18
NHL00146	NHL00147	57.1	2 <sup>1</sup> / <sub>4</sub>	25	1	225	37
NHL00148	NHL00149	60.3	2 <sup>3</sup> / <sub>8</sub>	25	1	250	39
NHL00150	NHL00151	63.5	2 <sup>1</sup> / <sub>2</sub>	25	1	300	44
NHL00152	NHL00153	63.5	2 <sup>1</sup> / <sub>2</sub>	38.1	1 <sup>1</sup> / <sub>2</sub>	200	19
NHL00186	NHL00187	63.5	2 <sup>1</sup> / <sub>2</sub>	38.1	1 <sup>1</sup> / <sub>2</sub>	350	34

Note: For normal plastic processing OMEGA recommends watt densities under 55 W/in<sup>2</sup>.

### NHW Series

- Economically Priced
- 12" Leads and 10' Stainless Steel Wire Braid
- Supplied with Low Profile Clamping Strap



Mica Insulated Nozzle Heater

To Order							
Model No.		Inside Diameter		Width		Watts	Watt Density W/in <sup>2</sup>
120V	240V	mm	inch	mm	Inch		
NHW00130	NHW00131	22.2	7/8	25	1	85	49
NHW00100	NHW00101	25	1	25	1	100	47
NHW00132	NHW00133	25	1	25	1	125	58
NHW00102	NHW00103	25	1	38.1	1 <sup>1</sup> / <sub>2</sub>	150	47
NHW00104	NHW00105	25	1	38.1	1 <sup>1</sup> / <sub>2</sub>	200	62
NHW00106	NHW00107	25	1	51	2	250	58
NHW00108	NHW00109	31.7	1 <sup>1</sup> / <sub>4</sub>	25	1	175	60
NHW00156	NHW00157	31.7	1 <sup>1</sup> / <sub>4</sub>	31.7	1 <sup>1</sup> / <sub>4</sub>	125	34
NHW00158	NHW00159	31.7	1 <sup>1</sup> / <sub>4</sub>	31.7	1 <sup>1</sup> / <sub>4</sub>	250	68
NHW00110	NHW00111	31.7	1 <sup>1</sup> / <sub>4</sub>	38.1	1 <sup>1</sup> / <sub>2</sub>	250	57
NHW00160	NHW00161	38.1	1 <sup>1</sup> / <sub>2</sub>	22.2	7/8	100	31
NHW00162	NHW00163	38.1	1 <sup>1</sup> / <sub>2</sub>	25	1	100	27
NHW00112	NHW00113	38.1	1 <sup>1</sup> / <sub>2</sub>	25	1	150	40
NHW00114	NHW00115	38.1	1 <sup>1</sup> / <sub>2</sub>	25	1	200	54
NHW00164	NHW00165	38.1	1 <sup>1</sup> / <sub>2</sub>	31.7	1 <sup>1</sup> / <sub>4</sub>	250	54
NHW00134	NHW00135	38.1	1 <sup>1</sup> / <sub>2</sub>	38.1	1 <sup>1</sup> / <sub>2</sub>	150	27
NHW00116	NHW00117	38.1	1 <sup>1</sup> / <sub>2</sub>	38.1	1 <sup>1</sup> / <sub>2</sub>	200	36
NHW00136	NHW00137	38.1	1 <sup>1</sup> / <sub>2</sub>	38.1	1 <sup>1</sup> / <sub>2</sub>	250	45
NHW00118	NHW00119	38.1	1 <sup>1</sup> / <sub>2</sub>	38.1	1 <sup>1</sup> / <sub>2</sub>	275	49
NHW00138	NHW00139	38.1	1 <sup>1</sup> / <sub>2</sub>	38.1	1 <sup>1</sup> / <sub>2</sub>	300	54
NHW00120	NHW00121	38.1	1 <sup>1</sup> / <sub>2</sub>	51	2	300	40
NHW00122	NHW00123	38.1	1 <sup>1</sup> / <sub>2</sub>	63.5	2 <sup>1</sup> / <sub>2</sub>	350	38
NHW00166	NHW00167	38.1	1 <sup>1</sup> / <sub>2</sub>	63.5	2 <sup>1</sup> / <sub>2</sub>	400	43
NHW00124	NHW00125	38.1	1 <sup>1</sup> / <sub>2</sub>	76.2	3	400	36



**Replacement Band Heaters for Plastic Injection Molding Machines  
NHW Series (continued)**

**Mica Insulated Nozzle Heater**

Model No.		Inside Diameter		Width		Watts	Watt Density W/in <sup>2</sup>
120V	240V	mm	inch	mm	Inch		
NHW00170	NHW00171	38.1	1½	76.2	3	500	45
NHW00174	NHW00175	44.4	1¾	38.1	1½	200	30
NHW00140	NHW00141	44.4	1¾	38.1	1½	225	33
NHW00176	NHW00177	44.4	1¾	38.1	1½	250	37
NHW00178	NHW00179	44.4	1¾	38.1	1½	300	44
NHW00142	NHW00143	51	2	38.1	1½	300	38
NHW00144	NHW00145	51	2	51	2	400	38
NHW00126	NHW00127	54	2⅛	25	1	100	18
NHW00184	NHW00185	54	2⅛	25	1	200	35
NHW00128	NHW00129	54	2⅛	51	2	200	18
NHW00146	NHW00147	57	2¼	25	1	225	37
NHW00148	NHW00149	60.3	2⅝	25	1	250	39
NHW00150	NHW00151	63.5	2½	25	1	300	44
NHW00152	NHW00153	63.5	2½	38.1	1½	200	19
NHW00186	NHW00187	63.5	2½	38.1	1½	350	34
NHW00188	NHW00189	69.8	2¾	38.1	1½	400	35

*Note: For normal plastic processing OMEGA recommends watt densities under 55 W/in<sup>2</sup>.*

# Resistance Heating Wire

## Nickel-Chromium Alloy

### 60% Nickel/16% Chromium (Balance Iron)

- ✓ Used to Make Straight or Helical Coil Resistance Heaters
- ✓ Quick Heating, Long Life
- ✓ High Temperature, 1000°C (1850°F)
- ✓ Corrosion Resistant
- ✓ Convenient 15 m (50') and 60 m (200') Spools



Nickel-Chrome 60 is the world's standard of comparison in the electrical trade for metallic resistance wire. It is an alloy of 60% nickel and 16% chromium, and is the accepted material for heating devices operating up to 1000°C (1850°F). This encompasses most pluggable power cord domestic heating appliances and those heating units of medium temperatures which do not require the unsurpassed quality of NI/CR-80/20, the 80-20 alloy.

In addition to being commonly used in electrical heating, Nickel-Chrome 60 is used extensively in industrial

applications for rheostats and resistance units. It makes for compact units capable of withstanding severe overloads and short circuits without damage or circuit impairment.

The excellent corrosion resistance of Nickel-Chrome 60 makes it very useful for purposes other than electrical heating. Acid dipping baskets, cyanide hardening and pickling containers, filter cloth, wire mesh, bolts and nuts are a few representative uses.

#### Specifications

**Composition:** 60% Ni, 16% Cr, balance Fe

**Specific Resistance:** 675 Ω per circular mil-foot at 68°F (20°C); see table below for multiplication factors to obtain resistance at other temperatures

**Specific Gravity:** 8.25

**Density:** 0.298 lb/in<sup>3</sup>

**Melting Point:** Approx 1350°C (2450°F)

**Nominal Coefficient of**

**Linear Expansion:** 0.000017 (20 to 1000°C)

**Tensile Strength (lb/in<sup>2</sup>) at 20°C (68°F):**

**Soft Annealed:** 95,000

**Nominal Temperature Coefficient of Resistance:**

0.00015 Ω/Ω/°C (20 to 500°C)

**Factor by Which Resistance at Room Temperature Is to Be Multiplied to Obtain Resistance at Indicated Temperatures**  
(These figures are given as a basis for engineering calculations and represent average material as supplied.)

Temp °C	20	93	204	315	427	538	649	760	871°C
Temp °F	68	200	400	600	800	1000	1200	1400	1600°F
Factor	1.000	1.019	1.044	1.070	1.092	1.108	1.112	1.118	1.13

#### To Order

AWG	Dia. mm (inch)	Ω per ft @ 20°C (68°F)	Current Temperature Characteristics* °C (°F)						Model No.
			425 (800)	550 (1000)	650 (1200)	750 (1400)	875 (1600)	1100 (2000)	
18	1.0 (0.040)	0.4219	7.90	9.75	11.96	14.51	17.37	23.08	NI60-040-(t)
20	0.81 (0.032)	0.6592	5.92	7.25	8.86	10.69	12.72	16.87	NI60-032-(t)
22	0.64 (0.0253)	1.055	4.44	5.40	6.56	7.87	11.63	12.33	NI60-025-(t)
24	0.51 (0.0201)	1.671	3.32	4.01	4.86	5.80	6.82	9.01	NI60-020-(t)
26	0.40 (0.0159)	2.670	2.52	3.00	3.61	4.31	5.06	6.63	NI60-015-(t)
28	0.32 (0.0126)	4.252	1.90	2.28	2.73	3.23	3.77	4.88	NI60-012-(t)
30	0.25 (0.010)	6.750	1.43	1.74	2.06	2.43	2.81	3.59	NI60-010-(t)

\* Showing approximate amperes necessary to produce a given temperature, applying only to a straight wire stretched horizontally in free air.

† Specify desired length in feet: "50" or "200". **Note:** This wire is **not** intended for use in making thermocouple elements.

**Ordering Example:** NI60-010-200 is a 60 m (200') spool of 30 gage bare 60% nickel/16% chromium alloy heating wire.

**Note:** Published prices are based on market value at time of printing and are subject to change due to Nickel surcharges, Chromium and precious-metal market fluctuations.

# Resistance Heating Wire



## Nickel-Chromium Alloy

### 80% Nickel/20% Chromium

- ✓ Withstands High Temperatures up to 1150°C (2100°F)
- ✓ Quick Heating, Long Life
- ✓ Corrosion Resistant
- ✓ Used to Make Straight or Helical Coil Resistance Heaters
- ✓ Convenient 15 m (50') and 60 m (200') Spools Available

OMEGA™ NIC80 wire is a resistance heating wire comprised of 80% Nickel and 20% Chromium. NIC80 wire is commonly used as a resistor at elevated temperatures. NI/CR-80/20 is essential for resistor elements in high temperature applications such as electric furnaces, electric ranges and radiant heaters operating at temperatures up to 1150°C (2100°F).

In addition to these qualities and standard uses, it has found wide application in technical applications due to its combination of high electrical resistance and its temperature coefficient of resistance much less than that of Nickel-Chrome 60.



#### Specifications

**Composition:** 80% Ni, 20% Cr

**Specific Resistance:**

650 Ω per circular mil-foot at 20°C (68°F). See table below for multiplication factors to obtain resistance at other temperatures.

**Specific Gravity:** 8.41

**Density:** 0.304 lb/in<sup>3</sup>

**Melting Point:** Approx 1400°C (2550°F)

**Nominal Coefficient of Linear Expansion:** 0.000017 (10 to 1000°C)

**Tensile Strength (lb/in<sup>2</sup>) at 20°C (68°F):**

**Soft Annealed:** 100,000

**Nominal Temperature**

**Coefficient of Resistance:** 0.00011 Ω/Ω/°C (20 to 500°C)

**Factor by Which Resistance at Room Temperature Is to Be Multiplied to Obtain Resistance at Indicated Temperatures**  
(These figures are given as a basis for engineering calculations and represent average material as supplied.)

Temp °C	20	93	204	315	427	538	649	760	871	982	1093°C
Temp °F	68	200	400	600	800	1000	1200	1400	1600	1800	2000°F
Factor	1.000	1.016	1.037	1.054	1.066	1.070	1.064	1.062	1.066	1.072	1.078

#### To Order

AWG	Dia. mm (1")	Ω per ft @ 20°C (68°F)	Current Temperature Characteristics* °C (°F)						Model No.
			425 (800)	550 (1000)	650 (1200)	750 (1400)	875 (1600)	1100 (2000)	
18	1.0 (0.040)	0.4062	8.32	10.17	12.48	15.11	18.06	24.03	N180-040-(†)
20	0.81 (0.032)	0.6348	6.17	7.56	9.24	11.13	13.23	17.57	N180-032-(†)
22	0.64 (0.0253)	1.015	4.62	5.62	6.85	8.20	9.69	12.85	N180-025-(†)
24	0.51 (0.0201)	1.609	3.46	4.18	5.06	6.04	7.10	9.40	N180-020-(†)
26	0.40 (0.0159)	2.571	2.62	3.12	3.76	4.49	5.27	6.90	N180-015-(†)
28	0.32 (0.0126)	4.094	1.98	2.38	2.84	3.37	3.93	5.09	N180-012-(†)
30	0.25 (0.010)	6.50	1.50	1.81	2.14	2.53	2.93	3.75	N180-010-(†)

\* Showing approximate amperes necessary to produce a given temperature, applying only to a straight wire stretched horizontally in free air.

† Specify desired length in feet: "50" or "200". **Note:** This wire is **not** intended for use in making thermocouple elements.

**Ordering Example:** N180-032-50 is a 15 m (50') spool of 20 gage bare wire.

**Note:** Published prices are based on market value at time of printing and are subject to change due to Nickel surcharges, Chromium and precious-metal market fluctuations.



# Alloy Resistance Wire

**Continuous Lengths to 3500 Meters (10,000 Feet)**  
 80% Nickel/20% Chromium and 60% Nickel/16% Chromium (Balance Iron)

**An Exclusive  
 OMEGA  
 Manufactured  
 Innovation**

**NIC80 and NIC60**  
 7.5 m (25')  
 (spooled length)

- ✓ **Most Popular Sizes and Gages Supplied Off-the-Shelf!**
- ✓ **Available in English Sizes**
- ✓ **Consult Factory for Your Special Requirements or OEM Needs**

Our nickel-chromium alloy resistance heating wire is now available coiled for ready use. Coiled heating wire is used in many high-temperature applications, including electric furnaces, radiant heating, and air heating.

NIC80 is an alloy of 80% nickel and 20% chromium and represents the highest standard in materials for use in elevated temperature environments. It is useable at temperatures up to 1150°C (2100°F).

NIC60 contains 60% nickel and 16% chromium, with the balance iron, and can be used up to 1000°C (1850°F). It is the benchmark material, most widely accepted and employed in electrical heating.

Both of these alloys also provide excellent corrosion resistance.

Coils using 18 to 30 AWG wire with 25 to 100 turns per inch are standard. Custom coil dimensions are also available.



Available in a range of wire gages and coil diameters.

Shown smaller than actual size.

## Specifications

### NIC80

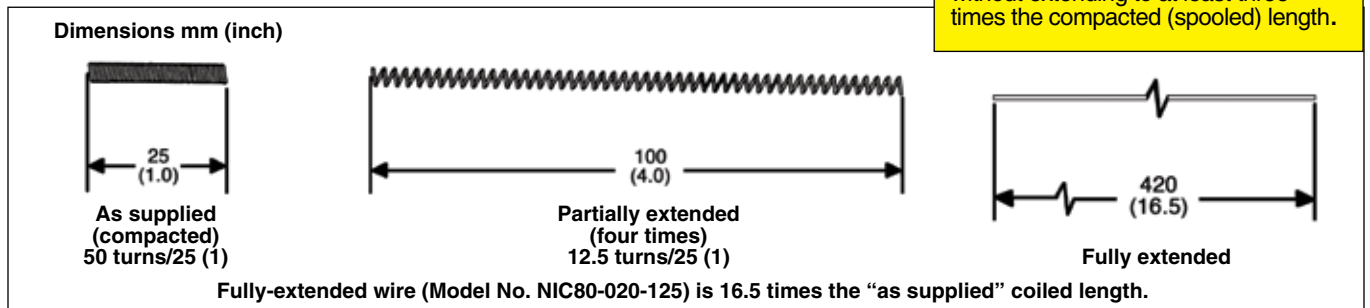
**Composition:** 80% Ni, 20% Cr  
**Specific Resistance:** 650 Ω per circular mil-foot at 20°C (68°F); see table for straight nickel-chromium wire multiplication factors to obtain resistance at other temperatures  
**Specific Gravity:** 8.41  
**Density:** 0.304 lb/in<sup>3</sup>  
**Melting Point:** ≈1400°C (2550°F)  
**Nominal Coefficient of Linear Expansion:** 0.000017 (10 to 1000°C)  
**Nominal Temperature Coefficient of Resistance:** 0.00011 Ω/Ω/°C (20 to 500°C)  
**Tensile Strength (lb/in<sup>2</sup>) @ 20°C (68°F):**  
 Hard Drawn: 200,000  
 Soft Annealed: 100,000

### NIC60

**Composition:** 60% Ni, 16% Cr, 24% Fe  
**Specific Resistance:** 675 Ω per circular mil-foot at 20°C (68°F); see table for straight nickel-chromium wire multiplication factors to obtain resistance at other temperatures  
**Specific Gravity:** 8.25  
**Density:** 0.298 lb/in<sup>3</sup>  
**Melting Point:** ≈1350°C (2450°F)  
**Nominal Coefficient of Linear Expansion:** 0.000017 (20 to 1000°C)  
**Nominal Temperature Coefficient of Resistance:** 0.00015 Ω/Ω/°C (20 to 500°C)  
**Tensile Strength (lb/in<sup>2</sup>) @ 20°C (68°F):**  
 Hard Drawn: 200,000  
 Soft Annealed: 95,000

### CAUTION AND WARNING!

Spools of wire are supplied tightly compacted. Never use precoiled wire without extending to at least three times the compacted (spooled) length.



An Exclusive  
manufactured  
Innovation

NIC80: 80% NICKEL, 20% CHROMIUM

To Order						
Model Number	AWG	Wire Dia. mm (inch)	OD of Compacted Coil mm (") ±10%	Turns/ inch	25 mm (1") Fully Extended Length mm (inch)	Ω per inch of Coil @ 20°C (68°F)
NIC80-040-250	18	1.0 (0.040)	6.4 (0.250)	25	418 (16.5)	0.558
NIC80-032-250	20	0.81 (0.032)	6.4 (0.250)	31	538 (21.2)	1.132
NIC80-032-188	20	0.81 (0.032)	4.8 (0.188)	31	389 (15.3)	0.810
NIC80-025-250	22	0.64 (0.253)	6.4 (0.250)	40	119 (28.3)	2.450
NIC80-025-188	22	0.64 (0.253)	4.8 (0.188)	40	521 (20.5)	1.775
NIC80-020-156	24	0.51 (0.0201)	4.0 (0.156)	50	541 (21.3)	3.000
NIC80-020-188	24	0.51 (0.0201)	4.8 (0.188)	50	671 (26.4)	3.574
NIC80-020-125	24	0.51 (0.0201)	3.2 (0.125)	50	419 (16.5)	2.233
NIC80-015-125	26	0.40 (0.0159)	3.2 (0.125)	66	579 (22.8)	5.546
NIC80-012-125	28	0.32 (0.0126)	3.2 (0.125)	83	749 (29.5)	11.128
NIC80-010-125	30	0.25 (0.010)	3.2 (0.125)	100	917 (36.1)	19.570
NIC80-010-093	30	0.25 (0.010)	2.4 (0.093)	100	663 (26.1)	14.138
NIC80-010-062	30	0.25 (0.010)	1.6 (0.062)	100	414 (16.3)	8.849

Consult Sales Department for quantity discount over 200'.

Ordering Example: NIC80-010-125-200 is 30-gage 80% nickel/20% chromium alloy resistance cable, precoiled in 0.125" OD coils, 200' (spooled length).

**NIC60: 60% Nickel, 16% Chromium**

Model Number	AWG	Wire Dia. mm (inch)	OD of Compacted Coil mm (") ±10%	Turns/ inch	25 mm (1") Fully Extended Length mm (inch)	Ω per inch of Coil @ 20°C (68°F)
NIC60-040-250	18	1.0 (0.040)	6.4 (0.250)	25	419 (16.5)	0.580
NIC60-032-250	20	0.81 (0.032)	6.4 (0.250)	31	538 (21.2)	1.176
NIC60-032-188	20	0.81 (0.032)	4.8 (0.188)	31	389 (15.3)	0.841
NIC60-025-250	22	0.64 (0.253)	6.4 (0.250)	40	119 (28.3)	2.545
NIC60-025-188	22	0.64 (0.253)	4.8 (0.188)	40	521 (20.5)	1.843
NIC60-020-188	24	0.51 (0.0201)	4.8 (0.188)	50	671 (26.4)	3.711
NIC60-020-156	24	0.51 (0.0201)	4.0 (0.156)	50	541 (21.3)	2.966
NIC60-020-125	24	0.51 (0.0201)	3.2 (0.125)	50	419 (16.5)	2.319
NIC60-015-125	26	0.40 (0.0159)	3.2 (0.125)	66	579 (22.8)	5.760
NIC60-012-125	28	0.32 (0.0126)	3.2 (0.125)	83	749 (29.5)	11.556
NIC60-010-125	30	0.25 (0.010)	3.2 (0.125)	100	917 (36.1)	20.322
NIC80-010-093	30	0.25 (0.010)	2.4 (0.093)	100	663 (26.1)	14.681
NIC60-010-062	30	0.25 (0.010)	1.6 (0.062)	100	414 (16.3)	9.189

Consult Sales Department for quantity discount over 200'.

Ordering Example: NIC60-010-125-50 is 18-gage 60% nickel/16% chromium alloy resistance cable, precoiled in 0.125" OD coils, 50' (spooled length).

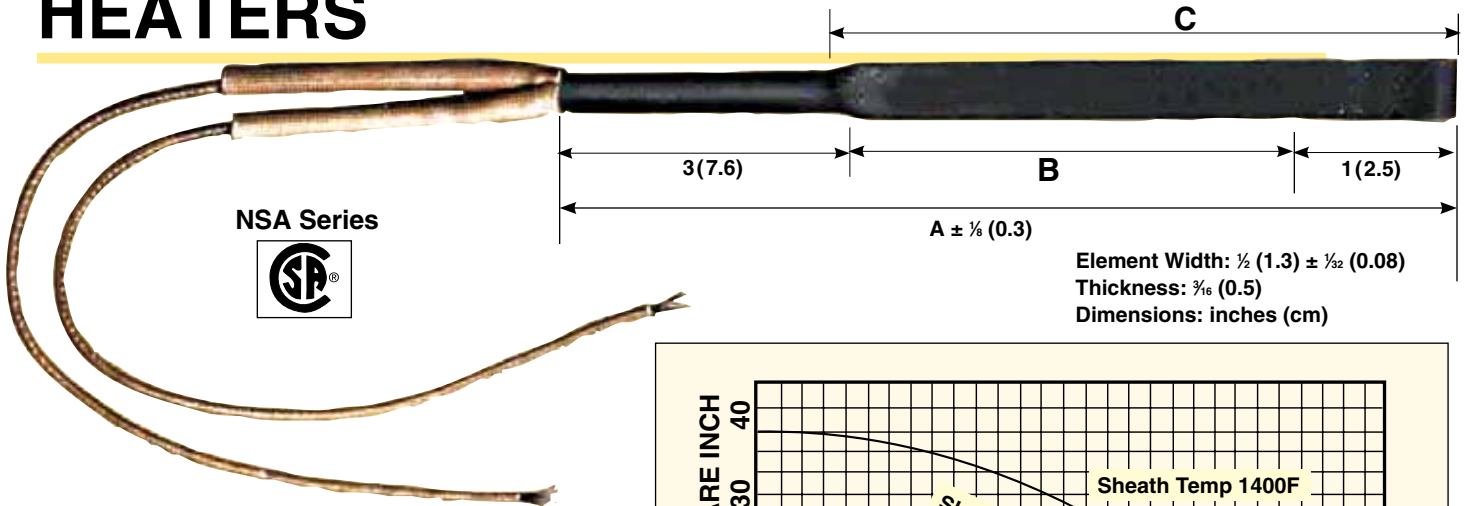
**Current Temperature Characteristics\***

		NIC80 Coiled Wire Current Characteristics (Amps)						NIC60 Coiled Wire Current Characteristics (Amps)					
AWG	Wire Dia. mm (")	425°C (800°F)	540°C (1000°F)	650°C (1200°F)	760°C (1400°F)	875°C (1600°F)	1100°C (2000°F)	425°C (800°F)	540°C (1000°F)	650°C (1200°F)	760°C (1400°F)	875°C (1600°F)	1100°C (2000°F)
18	1.0 (0.040)	5.41	6.93	8.48	10.41	12.48	16.70	5.20	6.65	8.14	10.00	11.92	16.03
20	0.81 (0.032)	3.72	4.84	6.01	7.44	8.96	12.20	3.56	4.64	5.77	7.15	8.60	11.71
22	0.64 (0.0253)	2.48	3.15	3.84	4.93	6.13	8.81	2.39	3.03	3.69	4.74	5.89	8.46
24	0.51 (0.0201)	2.05	2.59	3.13	3.82	4.55	6.07	1.96	2.47	3.00	3.67	4.36	5.83
26	0.40 (0.0159)	1.50	1.93	2.37	2.87	3.39	4.47	1.44	1.86	2.28	2.76	3.26	4.29
28	0.32 (0.0126)	0.93	1.22	1.51	1.87	2.26	3.09	0.89	1.18	1.45	1.80	2.17	2.97
30	0.25 (0.010)	0.63	0.82	1.02	1.32	1.64	2.38	0.62	0.79	0.98	1.26	1.58	2.28

\* Showing approximate current in amperes necessary to raise a coil of arbor size of 1/8" diameter, to a given temperature, when stretched twice the close-wound length in open air.

Note: Published prices are based on market value at time of printing and are subject to change due to Nickel surcharges, Chromium and precious metal market fluctuations.

# HIGH TEMPERATURE STRIP HEATERS



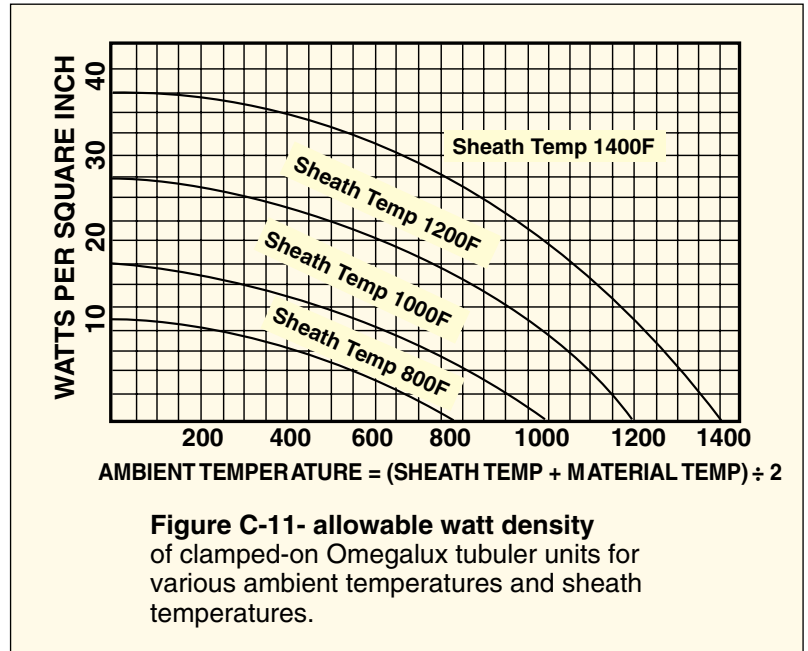
NSA Series



Element Width:  $\frac{1}{2}$  (1.3)  $\pm$   $\frac{1}{32}$  (0.08)  
 Thickness:  $\frac{3}{16}$  (0.5)  
 Dimensions: inches (cm)

- ✓ Rugged, Reliable, Premium Quality
- ✓ 125 to 400 Watts
- ✓ Seamless Construction
- ✓  $\frac{1}{2}$ " (1.27 cm) Slim Design for Space Restricted Applications

Dimension A = Total Length  
 Dimension B = Heated Length  
 Dimension C = Flattened Length



The NSA series high temperature strip heater features a slim  $\frac{1}{2}$ " (1.27 cm) wide mini-size construction similar to NS type. The heater design, materials and construction give long life for given power densities. The Incoloy sheath encloses nickel-chromium resistance wire embedded in a densely compacted refractory material selected for dielectric insulation value and good heat conduction to the sheath. The small cross-section is often an advantage where space is a factor.

## FEATURES

$\frac{3}{16}$ " (0.5 cm) thick x  $\frac{1}{2}$ " (1.27 cm) wide mini-size construction similar to NS type. The heater design, materials and construction give long life for given power densities. The Incoloy sheath encloses nickel-chromium resistance wire embedded in a densely compacted refractory material selected for dielectric insulation value and good heat conduction to the sheath. The small cross-section is often an advantage where space is a factor.

## SPECIFICATIONS

**Sheath Material:** Incoloy  
**Max. Sheath Temp.:** 815°C (1500°F)  
**Power:** 120 or 240 Vac

### CAUTION AND WARNING

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

## To Order

Dimension: inch (cm)								
Heated Length			Watts	W/In <sup>2†</sup>	Volts	Model No.	Wt. lb (kg)	
A	B	C						
7 $\frac{1}{8}$ (18)	3 $\frac{1}{8}$ (8)	5 $\frac{5}{8}$ (13)	125	32	120	NSA-711	0.20 (0.09)	
10 $\frac{1}{16}$ (27)	6 $\frac{1}{16}$ (17)	8 $\frac{5}{8}$ (21)	300	20	120	NSA-1013	0.28 (0.12)	
11 $\frac{1}{8}$ (28)	7 $\frac{1}{8}$ (18)	9 $\frac{3}{4}$ (24)	350	22	240	NSA-1123	0.38 (0.17)	
13 $\frac{3}{4}$ (35)	9 $\frac{3}{4}$ (24)	12 (30)	200	11	240	NSA-1422	0.47 (0.21)	
14 $\frac{3}{16}$ (36)	10 $\frac{3}{16}$ (26)	12 $\frac{3}{16}$ (32)	200	7	120	NSA-1412	0.49 (0.45)	
16 $\frac{1}{4}$ (41)	12 $\frac{1}{4}$ (31)	14 $\frac{1}{2}$ (37)	400	19	240	NSA-1624	0.56 (0.25)	

<sup>†</sup> To determine maximum allowable watt density, see Figures online.

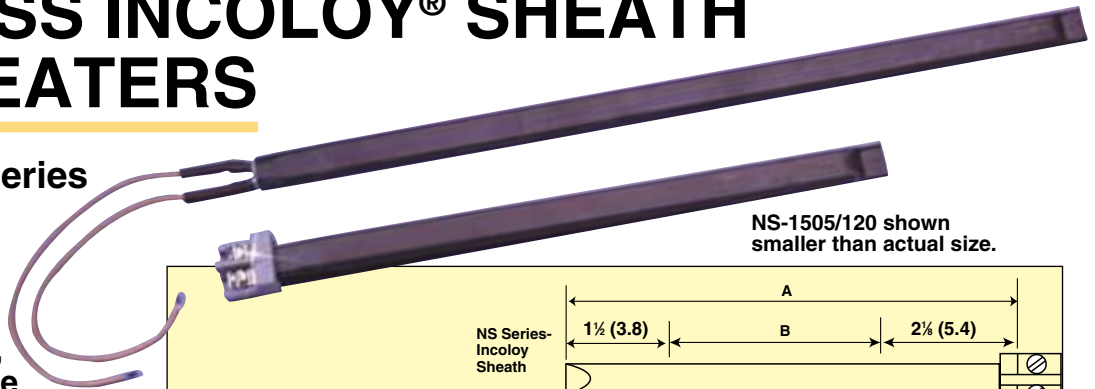
**Ordering Examples:** NSA-711, high temperature strip heater, 120 Vac.  
 NSA-1624, high temperature strip heater, 240V.

# SEAMLESS INCOLOY® SHEATH STRIP HEATERS

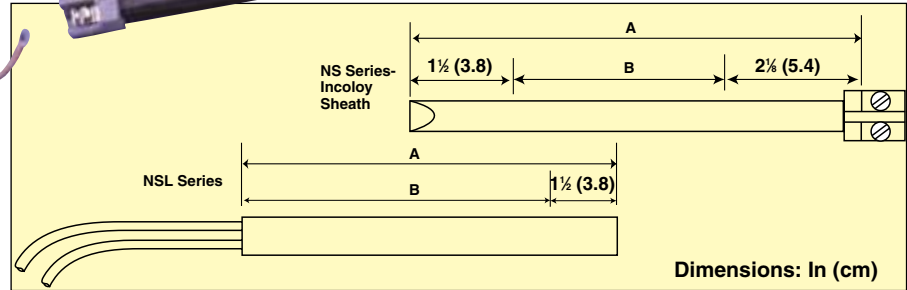
## NS and NSL Series



- 1.9 cm (3/4") Wide, High Temperature
- Rugged, Reliable, Premium Quality
- 500 to 3000 Watt
- 2 Terminals at One End Seamless Construction



NS-1505/120 shown smaller than actual size.



## FEATURES

Strip-heater advantages for higher-temperature applications are offered by NS series. The heater design, materials and construction give long life for given power densities. The Incoloy sheath encloses nickel-chromium resistance wire embedded in a densely compacted refractory material selected for dielectric insulation value and good heat conduction to the sheath. The small cross-section is often an advantage where space is a factor.

### Clamp-on Temperatures to 1200°F

Maximum work temperature depends on the watt density of the heater. (Above right) gives a few examples of work temperatures at different watt densities.

### Mounting

The flat top and bottom surfaces may be flush mounted or sandwiched between two heat-conducting metal parts. Straight heaters can be mounted on surfaces curved to 15 cm (6") inside radius or larger. The heater may be field bent to minimum 8 cm (3") inside radius. Standard strip heater clamps and clamping bands may be used for mounting.

### In Free or Forced Air, Sheath Temperature to 1500°F

Maximum work temperature depends on the watt density of

the heater. Table 1 (below) gives a few examples of work temperatures at different watt densities.

### Optional Features Available

Terminal end bend of 15°—for clearing terminal block when mounted on a flat surface, Add suffix “-TERMINAL BEND” to model number.

**Seal welding end opposite terminals.**

Max Work Temperature °F			
Application	30 W/in <sup>2</sup>	20 W/in <sup>2</sup>	10 W/in <sup>2</sup>
Clamp-on	300	750	950
Convection			
Air Heating	950	1200	1350

## SPECIFICATIONS

**Sheath Material:** Incoloy  
**Max Sheath Temp:** 399°C (1500°F)  
**Power:** 120, 240 or 480 Vac  
**Minimum Inside Bend Radius:** 76 mm (3")

## To Order

Dimension: Inches (cm)		NS Series—Incoloy Sheath			NSL Series—10" Wire Type Leads	
A	B	Watts	W/In <sup>2†</sup>	Model No.	Model No.	Wt. (lb) kg
12½ (32)	8¾ (23)	500	32	NS-1205/**	NSL-1205/**	0.63 (0.28)
13¾ (35)	10¼ (26)	500	28	NS-1405/**	NSL-1405/**	0.68 (0.30)
15⅞ (39)	11⅞ (30)	500	24	NS-1505/**	NSL-1505/**	0.73 (0.33)
17⅞ (45)	14⅞ (36)	750	30	NS-1807/**	NSL-1807/**	0.90 (0.40)
18½ (47)	14⅞ (38)	1000	38	NS-1801/**	NSL-1801/*	0.93 (0.42)
19¾ (49)	15¾ (40)	1000	36	NS-1901/*	NSL-1901/*	1.0 (0.45)
21⅞ (54)	17⅞ (45)	1100	35	NS-2001/**	NSL-2001/*	1.1 (0.49)
23¾ (60)	20¾ (51)	1200	34	NS-2401/*	NSL-2401/*	1.2 (0.54)
25¼ (64)	21¾ (55)	1300	34	NS-2501/*	NSL-2501/*	1.25 (0.56)
26⅞ (68)	23¾ (59)	1400	34	NS-2601/**	NSL-2601/*	1.30 (0.59)
30⅞ (77)	26⅞ (67)	1500	32	NS-3015/*	NSL-3015/*	1.52 (0.68)
33⅞ (86)	30⅞ (77)	1500	28	NS-3301/**	NSL-3301/*	1.68 (0.76)
36¾ (92)	32¾ (83)	1850	32	NS-3601/*	NSL-3601/*	1.85 (0.83)
39 (99)	35¾ (90)	2000	32	NS-3802/*	NSL-3802/*	2.00 (0.90)
40¾ (104)	37¾ (94)	2100	32	NS-4302/*	NSL-4302/*	2.13 (0.96)
51¾ (130)	47¾ (121)	2700	32	NS-4827/**	NSL-4827/*	2.7 (0.12)
54 (138)	50¾ (128)	3000	34	NS-5403/**	NSL-5403/**	2.75 (0.12)

\* Designate voltage, i.e.; insert “120” for 120 or “240” or “480” voltage required.

\*\* 120 or 240 Vac only. \*\*\* 240 or 480 Vac only.

† To determine maximum allowable watt density, see Figures C-8 to C-10.

Ordering Examples: NS-2601/240, seamless Incoloy sheath.

NSL-1205/120, seamless 10" wire type leads.

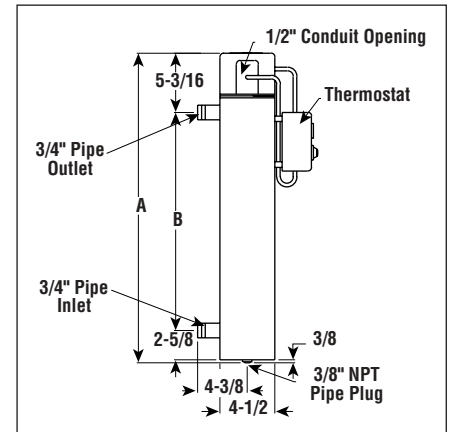
# CLEAN WATER APPLICATIONS

## NWHA Series

- ✓ **Oval Flange Design**
- ✓ **2" Galvanized Carbon Steel Pipe Body, 150 Lb Construction**
- ✓ **3 - 5 kW**
- ✓ **120, 240 and 480V, Single Phase**
- ✓ **General Purpose Terminal Enclosure**
- ✓ **Two 0.475" Dia. Copper Sheath Elements (50 W/In<sup>2</sup>)**
- ✓ **Side Mounted AR Thermostat (60 - 250°F)**
- ✓ **UL, CSA and Other Third Party Approval, Listing or Certification Available**



Dimensions (Inches)



### APPLICATIONS

**Clean Water Heating:** Low-cost solution to booster water heating in remote applications.

### FEATURES

**Terminal Enclosure :** E1 General Purpose is standard.

**Elements:**

Two copper sheath elements.

**Flange:**

Oval (manifold) heater flange.

**Vessel:** Pipe body and nozzles are galvanized ASTM A53B carbon steel pipe. The end disk is galvanized ASTM A516 Grade 70 carbon steel plate.

Provided with thermal insulation and painted sheet metal jacket.

**Wiring:**

Convenient field wiring terminals are provided for easy installation.

**Controls:** Stock and assembly stock heaters come equipped with side mounted mechanical AR thermostat.

### To Order (Specify Model Number)

**MOST POPULAR  
ITEMS HIGHLIGHTED**

kW	Volts	Phase	Dimensions (In.)			Model No.	Price	Wt. (Lbs.)
			A	B	C			
3	120	1-1	23 <sup>3</sup> / <sub>16</sub>	15	—	NWHA-02-003P-E1/120	\$829	20
3	240	1-1	23 <sup>3</sup> / <sub>16</sub>	15	—	NWHA-02-003P-E1/240	829	20
3	480	1-1	23 <sup>3</sup> / <sub>16</sub>	15	—	NWHA-02-003P-E1/480	829	20
4	240	1-1	31 <sup>3</sup> / <sub>16</sub>	23	—	NWHA-02-004P-E1/240	885	27
4	480	1-1	31 <sup>3</sup> / <sub>16</sub>	23	—	NWHA-02-004P-E1/480	885	27
5	240	1-1	31 <sup>3</sup> / <sub>16</sub>	23	—	NWHA-02-005P-E1/240	1000	27
5	480	1-1	31 <sup>3</sup> / <sub>16</sub>	23	—	NWHA-02-005P-E1/480	1000	27

**Ordering Example:**  
NWHA-02-004P-E1/240 is a 4 kW, 240 Volt Heater, \$885.

### Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model	Clean Water
NWHA	Water Circulation Heater with Oval Flange
	<b>Code</b> <b>Number of Elements</b>
	02              Two
	<b>Code</b> <b>kW</b>
	003P          3
	004P          4
	005P          5
	<b>Code</b> <b>Terminal Enclosure</b>
	E1              General Purpose
NWHA	02      003P      E1      Typical Model Number



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1-800-TC-OMEGA  
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Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

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Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

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Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

• **Pressure, Strain and Force**

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

• **Heaters**

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# PURE WATER, CORROSIVE SOLUTION AND HIGH TEMPERATURE GAS APPLICATIONS

## NWHMTSS, NWHIS and NWHOIS Series

- ✓ Screw Plug or Flanged Heater Design
- ✓ 3 - 14" Type 304 Stainless Steel Pipe Body, 150 Lb Construction
- ✓ 2 - 200 kW
- ✓ 120, 240 and 480V, 1 & 3 Phase
- ✓ General Purpose, Moisture Resistant/Explosion Resistant, Explosion Resistant or Moisture Resistant Terminal Enclosure
- ✓ 0.475" Dia. Stainless Steel or INCOLOY Sheath Elements (15 - 50 W/In<sup>2</sup>)
- ✓ With & Without Thermostat
- ✓ UL, CSA and Other Third Party Approval, Listing or Certification Available on Many Models

### APPLICATIONS

#### Pure Water:

Heating of demineralized or de-ionized water that is highly aggressive to mild steel.

#### Mildly Corrosive Solutions:

Heat mildly corrosive solutions (pH5 to pH9) using stainless elements and a passivated stainless pipe body.

#### Highly Corrosive Solutions and Oils:

Low watt density INCOLOY sheath elements coupled with a passivated Stainless Steel pipe body provides long service life when heating highly corrosive solutions and sulfur laden oils.

**Steam Superheating:** Increase the enthalpy and quality of steam. Smaller units can be used to make up line losses in steam generating and distribution systems.

#### High Temperature Gas:

INCOLOY elements and a Stainless Steel vessel enhance safe operation to nearly 1400°F outlet gas temperature in air, gas or steam superheating applications.

### FEATURES

**Terminal Enclosures:** Standard stock heater terminal enclosure E1 General Purpose. Moisture Resistant/Explosion Resistant E2, Explosion Resistant E3 or Moisture Resistant E4 Enclosures are available as assembly stock.

**Elements:** Sturdy 0.475" Dia. Stainless Steel or INCOLOY sheath elements provide superior strength and rigidity. OMEGALUX elements utilize high quality resistance wire for coil construction. The coil is surrounded with high purity magnesium oxide which is compacted to a dense solid to ensure high thermal conductivity and dielectric strength.

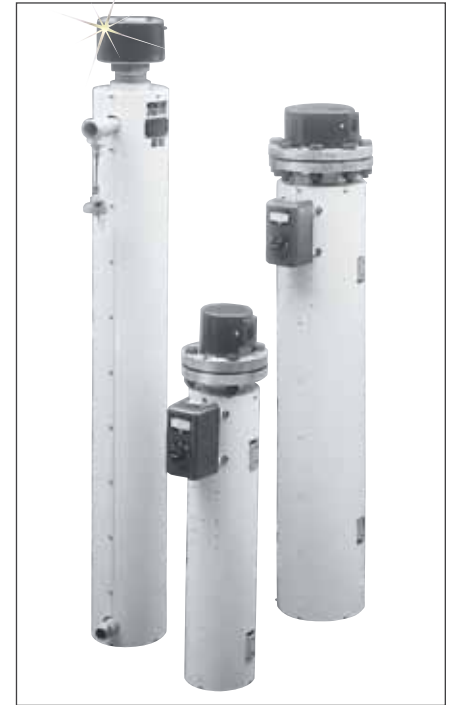
**Corrosion Resistance:** NWHMTSS, NWHIS and NWHOIS pipe bodies and all Stainless Steel heating elements are passivated to provide additional resistance to corrosion.

**Flanges:** Type 304 Stainless Steel flanges are standard on 3" and larger circulation heaters. Flange dimensions conform to ANSI B16.5 standards. Series NWHMTSS heaters utilize a Stainless Steel screw plug.

**Vessels:** Pipe body and nozzles are type 304 ASTM A312 ERW Stainless Steel pipe. The end disks are type 304 ASTM A240 Stainless Steel plate. Provided with thermal insulation and painted sheet metal jacket.

**Baffle Assemblies:** Internal baffle assemblies are provided for model GCHISB-18 heaters to increase the velocity of the air, gas or steam as it passes through the vessel. Increasing the velocity of the gas helps reduce the temperature of the element sheaths and the vessel walls in critical applications.

**Wiring:** Wiring terminals are spaced to provide proper arcing and creepage clearances per the NEC. Termination insulators provide electrical isolation between the terminals and the grounded metal sheath to enhance personnel safety and equipment service life. Heavy duty jumper straps and other terminal parts assure tight connections and an extra margin of current carrying capacity.



**Controls:** All stock and assembly stock heaters, Series MTSS, 03 and 06, come equipped with mechanical AR thermostats. These thermostats are suitable for most applications. Explosion-resistant and liquid-tight thermostats are provided on E2/E3 and E4 units, respectively. Individual product pages list other types of thermostats and controls available for each heater. For heaters listed without controls, refer to the Overview on Mechanical and Electrical Control Options in this section.

**Precision Temperature Control and Control Panels:** For larger kW heaters and precise control of gas temperatures in high temperature applications, OMEGALUX recommends the use of thermocouple sensors, electronic PID temperature controls and SCR power panels for circulation heater applications. The use of electronic and SCR controls will minimize overshoot and reduce the possibility of heater damage from overtemperature operation. Integral or remote mounted control panels with electronic controls and solid state (SCR) or contactor power controllers can be provided using virtually any combination of control devices. Consult the Controls section for

# PURE WATER & MILDLY CORROSIVE SOLUTION APPLICATIONS

## NWHMTSS Series

- 2½ NPT Stainless Steel Screw Plug Design
- 2½" Passivated Stainless Steel Pipe Body, 150 Lb Construction
- 3 - 18 kW
- 120, 240 and 480V, 1 & 3 Phase
- General Purpose, Moisture Resistant/Explosion Resistant Terminal Enclosure
- Three 0.475" Dia. Stainless Steel Sheath Elements (50 W/in<sup>2</sup>)
- Integral Thermostat (60 - 250°F)
- UL, CSA and Other Third Party Approval, Listing or Certification Available on Many Models

### APPLICATIONS

Remote and Booster Heating of demineralized or de-ionized water and mildly corrosive solutions (pH5 to pH9).

### FEATURES

#### Terminal Enclosure:

E1 General Purpose is standard. E2 enclosure available.

#### Elements:

Three Type 304 passivated Stainless Steel sheath elements.

**Screw Plug:** 2½" Type 304 Stainless Steel screw plug with ½" thermowell for thermostat bulb.

**Vessel:** Pipe body and nozzles are type 304 ASTM A312 ERW Stainless Steel pipe. The end disks are type 304 ASTM A240 or A479 Stainless Steel plate. Provided with thermal insulation and 20 gauge painted sheet metal jacket.

#### Wiring:

Convenient field wiring terminals are provided for easy installation.

**Controls:** Stock and assembly stock heaters come equipped with integral thermostat.

kW	Volts	Ckt & Phase	Dimensions: in			Model No.	Wt. (lb)
			A	B	C		
3	120	1-1	21%	9%	—	NWHMTSS-03-003P-E1/120	15
3	240	1-1	21%	9%	—	NWHMTSS-03-003P-E1/240	15
3	240	1-3	21%	9%	—	NWHMTSS-03-003P-E1/240/3P	15
3	480	1-1	21%	9%	—	NWHMTSS-03-003P-E1/480	15
3	480	1-3	21%	9%	—	NWHMTSS-03-003P-E1/480/3P	15
4.5	240	1-1	21%	9%	—	NWHMTSS-03-04P5-E1/240	15
4.5	240	1-3	21%	9%	—	NWHMTSS-03-04P5-E1/240/3P	15
4.5	480	1-1	21%	9%	—	NWHMTSS-03-04P5-E1/480	15
4.5	480	1-3	21%	9%	—	NWHMTSS-03-04P5-E1/480/3P	15
6	240	1-1	34%	22½	16½	NWHMTSS-03-006P-E1/240	22
6	240	1-3	34%	22½	16½	NWHMTSS-03-006P-E1/240/3P	22
6	480	1-1	34%	22½	16½	NWHMTSS-03-006P-E1/480	22
6	480	1-3	34%	22½	16½	NWHMTSS-03-006P-E1/480/3P	22
9	240	1-1	34%	22½	16½	NWHMTSS-03-009P-E1/240	22
9	240	1-3	34%	22½	16½	NWHMTSS-03-009P-E1/240/3P	22
9	480	1-1	34%	22½	16½	NWHMTSS-03-009P-E1/480	22
9	480	1-3	34%	22½	16½	NWHMTSS-03-009P-E1/480/3P	22
12	240	1-1	57%	45%	39%	NWHMTSS-03-012P-E1/240	40
12	240	1-3	57%	45%	39%	NWHMTSS-03-012P-E1/240/3P	40
12	480	1-1	57%	45%	39%	NWHMTSS-03-012P-E1/480	40
12	480	1-3	57%	45%	39%	NWHMTSS-03-012P-E1/480/3P	40
15	240	1-1	57%	45%	39%	NWHMTSS-03-015P-E1/240	40
15	240	1-3	57%	45%	39%	NWHMTSS-03-015P-E1/240/3P	40
15	480	1-1	57%	45%	39%	NWHMTSS-03-015P-E1/480	40
15	480	1-3	57%	45%	39%	NWHMTSS-03-015P-E1/480/3P	40
18	240	1-1	57%	45%	39%	NWHMTSS-03-018P-E1/240	40
18	240	1-3	57%	45%	39%	NWHMTSS-03-018P-E1/240/3P	40
18	480	1-1	57%	45%	39%	NWHMTSS-03-018P-E1/480	40
18	480	1-3	57%	45%	39%	NWHMTSS-03-018P-E1/480/3P	40

#### Ordering Example:

**NWHMTSS-03-009P-E1/480,**  
9 kW, 1 phase,  
480V heater.

#### Ordering Information

To Order: Complete the Model Number using the Matrix provided.

**Model**  
NWHMTSS

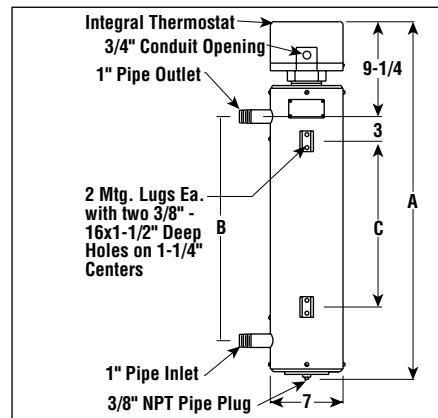
**Pure Water and Mildly Corrosive Solution**

Water Circulation Heater with Screw Plug  
Stainless Steel Sheath — Stainless Steel Vessel

#### Code Number of Elements

03	Three
Code	kW
003P	3
04P5	4.5
006P	6
009P	9
012P	12
015P	15
018P	18

Dimensions: inches  
NWHMTSS-03



Note: Add 2" to A dimension for E2 Enclosure.

NWHMTSS 03 003P E1 Typical Model Number

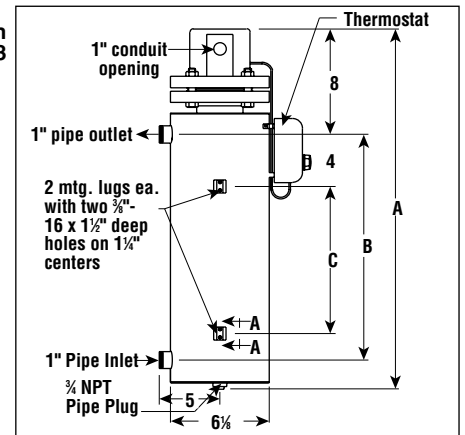


# PURE WATER AND MILDLY CORROSIVE SOLUTION APPLICATIONS

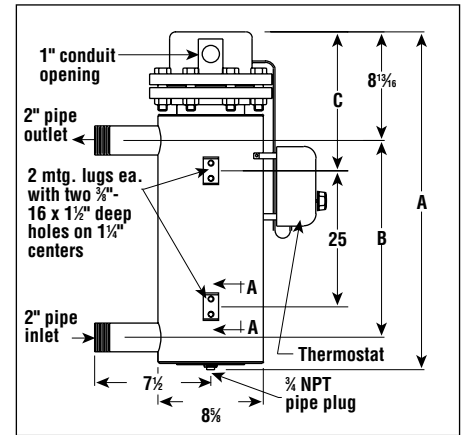
## NWHIS Series

Dimensions: in  
NWHIS-03

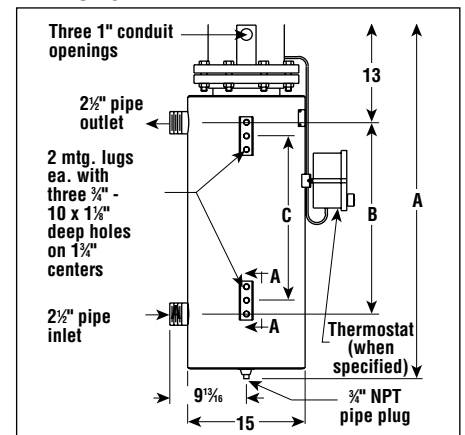
To Order							
kW	Volts	Ckt & Phase	Dimensions: in			Model No.	Wt. (lb)
			A	B	C		
<b>Series 03—3", 150 lb, 304 Passivated Stainless Steel Vessel, 3 INCOLOY Elements (45 W/in<sup>2</sup>) with Side Mounted Thermostat (60 to 250°F)—1 NPT Pipe Inlet and Outlet</b>							
6	240	1-3	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHIS-03-006P-E1/240	70
6	480	1-3	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHIS-03-006P-E1/480	70
12	240	1-3	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHIS-03-012P-E1/240	80
12	480	1-3	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHIS-03-012P-E1/480	80
18	240	1-3	55 <sup>7</sup> / <sub>16</sub>	45	39	NWHIS-03-018P-E1/240	98
18	480	1-3	55 <sup>7</sup> / <sub>16</sub>	45	39	NWHIS-03-018P-E1/480	98
<b>Series 06—5", 150 lb, 304 Passivated Stainless Steel Vessel, 6 INCOLOY Elements (45 W/in<sup>2</sup>) with Side Mounted Thermostat (60 to 250°F)—2 NPT Pipe Inlet and Outlet</b>							
24	240	2-3	41 <sup>3</sup> / <sub>4</sub>	30	11 <sup>3</sup> / <sub>4</sub>	NWHIS-06-024P-E1/240	140
24	480	1-3	41 <sup>3</sup> / <sub>4</sub>	30	11 <sup>3</sup> / <sub>4</sub>	NWHIS-06-024P-E1/480	140
30	240	2-3	48 <sup>3</sup> / <sub>4</sub>	37	14 <sup>3</sup> / <sub>4</sub>	NWHIS-06-030P-E1/240	155
30	480	1-3	48 <sup>3</sup> / <sub>4</sub>	37	14 <sup>3</sup> / <sub>4</sub>	NWHIS-06-030P-E1/480	155
40	240	2-3	60 <sup>3</sup> / <sub>4</sub>	48 <sup>1</sup> / <sub>2</sub>	20 <sup>3</sup> / <sub>4</sub>	NWHIS-06-040P-E1/240	176
40	480	2-3	60 <sup>3</sup> / <sub>4</sub>	48 <sup>1</sup> / <sub>2</sub>	20 <sup>3</sup> / <sub>4</sub>	NWHIS-06-040P-E1/480	176
50	480	2-3	73 <sup>3</sup> / <sub>4</sub>	61 <sup>1</sup> / <sub>2</sub>	27 <sup>3</sup> / <sub>4</sub>	NWHIS-06-050P-E1/240	210
<b>Series 18—8", 150 lb, 304 Passivated Stainless Steel Vessel, 18 INCOLOY Elements (45 W/in<sup>2</sup>)—2 1/2" NPT Pipe Inlet and Outlet</b>							
50	240	3-3	45 <sup>1</sup> / <sub>2</sub>	24 <sup>1</sup> / <sub>16</sub>	27 <sup>3</sup> / <sub>16</sub>	NWHIS-18-050P-E1/240	396
50	480	3-3	45 <sup>1</sup> / <sub>2</sub>	24 <sup>1</sup> / <sub>16</sub>	27 <sup>3</sup> / <sub>16</sub>	NWHIS-18-050P-E1/480	396
75	240	3-3	53 <sup>1</sup> / <sub>2</sub>	32 <sup>1</sup> / <sub>16</sub>	29 <sup>3</sup> / <sub>16</sub>	NWHIS-18-075P-E1/240	414
75	480	3-3	53 <sup>1</sup> / <sub>2</sub>	32 <sup>1</sup> / <sub>16</sub>	29 <sup>3</sup> / <sub>16</sub>	NWHIS-18-075P-E1/480	414
100	240	3-3	60 <sup>1</sup> / <sub>2</sub>	39 <sup>1</sup> / <sub>16</sub>	36 <sup>3</sup> / <sub>16</sub>	NWHIS-18-100P-E1/240	425
100	480	3-3	60 <sup>1</sup> / <sub>2</sub>	39 <sup>1</sup> / <sub>16</sub>	36 <sup>3</sup> / <sub>16</sub>	NWHIS-18-100P-E1/480	425
125	240	3-3	67 <sup>1</sup> / <sub>2</sub>	47 <sup>1</sup> / <sub>16</sub>	43 <sup>3</sup> / <sub>16</sub>	NWHIS-18-125P-E1/240	470
125	480	3-3	67 <sup>1</sup> / <sub>2</sub>	47 <sup>1</sup> / <sub>16</sub>	43 <sup>3</sup> / <sub>16</sub>	NWHIS-18-125P-E1/480	470
150	240	3-3	77 <sup>1</sup> / <sub>2</sub>	56 <sup>1</sup> / <sub>16</sub>	53 <sup>3</sup> / <sub>16</sub>	NWHIS-18-150P-E1/240	535
150	480	3-3	77 <sup>1</sup> / <sub>2</sub>	56 <sup>1</sup> / <sub>16</sub>	53 <sup>3</sup> / <sub>16</sub>	NWHIS-18-150P-E1/480	535
175	240	3-3	86 <sup>1</sup> / <sub>2</sub>	65 <sup>1</sup> / <sub>16</sub>	62 <sup>3</sup> / <sub>16</sub>	NWHIS-18-175P-E1/240	625
175	480	3-3	86 <sup>1</sup> / <sub>2</sub>	65 <sup>1</sup> / <sub>16</sub>	62 <sup>3</sup> / <sub>16</sub>	NWHIS-18-175P-E1/480	625
200	240	3-3	96 <sup>1</sup> / <sub>2</sub>	75 <sup>1</sup> / <sub>16</sub>	72 <sup>3</sup> / <sub>16</sub>	NWHIS-18-200P-E1/240	705
200	480	3-3	96 <sup>1</sup> / <sub>2</sub>	75 <sup>1</sup> / <sub>16</sub>	72 <sup>3</sup> / <sub>16</sub>	NWHIS-18-200P-E1/480	705



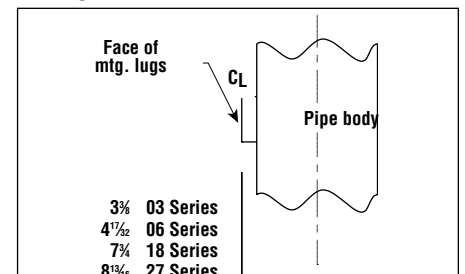
NWHIS-06



NWHIS-18



NWHIS-AA



Model	Pure Water and Mildly Corrosive Solution			
NWH IS	Water Circulation Heater			
	INCOLOY Elements — Stainless Steel Vessel			
	Code	Number of Elements		
	03	Three		
	06	Six		
	18	Eighteen		
	Code	kW		
	006P	6	040P 40	
	012P	12	050P 50	
	018P	18	075P 75	
	024P	24	150P 150	
	030P	30	175P 175	
			200P 200	
	Code	Terminal Enclosure		
	E1	General Purpose		
	E2	Moisture Resistant/Explosion Resistant		
	E3	Explosion Resistant		
	E4	Moisture Resistant		
NWH	03	006P	E1	Typical Model Number

**Ordering Example:**  
NWHIS-18-050P-E1/240,  
50 kW, 240V heater.

**Note:** Refer to the Controls section online for side mounted controls or control panels.

### Ordering Information

To Order—Complete the Model Number using the Matrix provided.

# CORROSIVE OIL & HIGHLY CORROSIVE SOLUTION APPLICATIONS

## NWHOIS Series

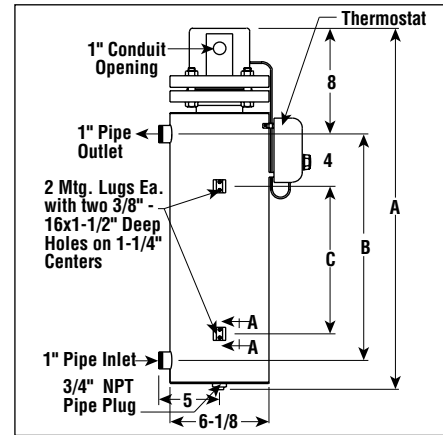
kW	Volts	Ckt & Phase	Dimensions: in			Model No.	Wt. (lb)
			A	B	C		
<b>Series 03 — 3 inch, 150 lb 304 passivated stainless steel vessel, 3 INCOLOY elements (15 W/In<sup>2</sup>) with side mounted thermostat (60 to 250°F) — 1" NPT pipe inlet and outlet</b>							
2	240	1-3	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHOIS-03-002P-E1/240	70
2	480	1-3	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHOIS-03-002P-E1/480	70
4	240	1-3	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHOIS-03-004P-E1/240	80
4	480	1-3	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHOIS-03-004P-E1/480	80
6	240	1-3	55 <sup>5</sup> / <sub>16</sub>	45	39	NWHOIS-03-006P-E1/240	98
6	480	1-3	55 <sup>5</sup> / <sub>16</sub>	45	39	NWHOIS-03-006P-E1/480	98
<b>Series 06 — 5 inch, 150 lb 304 passivated stainless steel vessel, 6 INCOLOY elements (15 W/In<sup>2</sup>) with side mounted thermostat (60 to 250°F) — 2" NPT pipe inlet and outlet</b>							
8	240	1-3	4 <sup>1</sup> / <sub>4</sub>	30	11 <sup>1</sup> / <sub>2</sub>	NWHOISR-06-008P-E1/240	140
8	480	1-3	4 <sup>1</sup> / <sub>4</sub>	30	11 <sup>1</sup> / <sub>2</sub>	NWHOISR-06-008P-E1/480	140
12	240	1-3	60 <sup>1</sup> / <sub>4</sub>	48 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub>	NWHOISR-06-012P-E1/240	176
12	480	1-3	60 <sup>1</sup> / <sub>4</sub>	48 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub>	NWHOISR-06-012P-E1/480	176
<b>Series 06 — 5 inch, 150 lb 304 passivated stainless steel vessel, 6 INCOLOY elements (23 W/In<sup>2</sup>) with side mounted thermostat (60 to 250°F) — 2" NPT pipe inlet and outlet</b>							
25	240	2-3	73 <sup>3</sup> / <sub>8</sub>	61 <sup>1</sup> / <sub>2</sub>	27 <sup>3</sup> / <sub>8</sub>	NWHOIS-06-025P-E1/240	176
25	480	1-3	73 <sup>3</sup> / <sub>8</sub>	61 <sup>1</sup> / <sub>2</sub>	27 <sup>3</sup> / <sub>8</sub>	NWHOIS-06-025P-E1/480	176
30	240	2-3	86 <sup>3</sup> / <sub>8</sub>	74 <sup>3</sup> / <sub>8</sub>	33 <sup>3</sup> / <sub>8</sub>	NWHOIS-06-030P-E1/240	240
30	480	1-3	86 <sup>3</sup> / <sub>8</sub>	74 <sup>3</sup> / <sub>8</sub>	33 <sup>3</sup> / <sub>8</sub>	NWHOIS-06-030P-E1/480	240

**Ordering Example:** NWHOISR-06-008P-E1/480, 8 kW, 480V heater.  
**Note:** Refer to the Controls section online for side mounted controls or control panels.

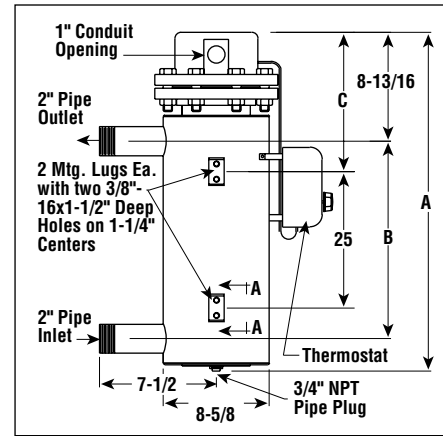
**Ordering Information**  
 To Order — Complete the Model Number using the Matrix provided.

Model	Corrosive Oil and Highly Corrosive Solution	
NWHO	Oil Circulation Heater	
IS	INCOLOY Elements — Stainless Steel Vessel	
R	Reduced Watt Density	
Code	Number of Elements	
03	Three	
06	Six	
Code	kW	
002P	2	008P 8      030P 30
004P	4	012P 12
006P	6	025P 25
Code	Terminal Enclosure	
E1	General Purpose	
E2	Moisture Resistant/Explosion Resistant	
E3	Explosion Resistant	
E4	Moisture Resistant	
NWHOIS 03	002P E1	Typical Model Number

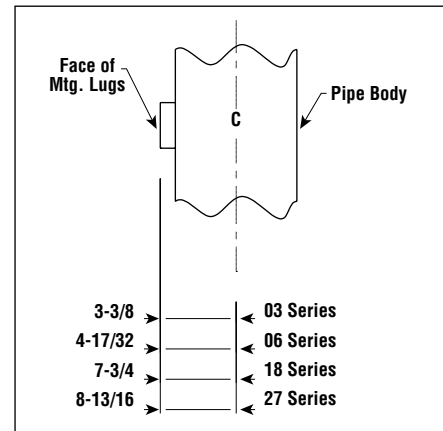
Dimensions (Inches)  
 NWHOIS-03



NWHOIS-06



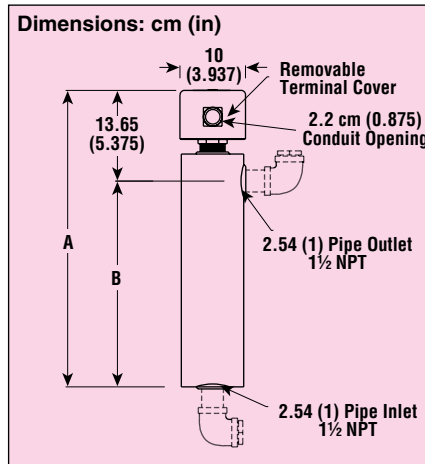
NWHOIS-AA



# BOOSTER HEATER- WATER APPLICATIONS

## NWHJR Series

- ✓ Heavy Wall Carbon Steel or Brass Pipe Body
- ✓ 1.5 to 3 kW
- ✓ 120 and 240V, Single Phase
- ✓ 0.315" Dia. Copper Sheath Elements (80 W/in<sup>2</sup>)
- ✓ General Purpose or Moisture Resistant Terminal Enclosure
- ✓ Integral Thermostat (60 to 180°F)



NWHJRG-01-01P5-E1/120 shown smaller than actual size.



### APPLICATIONS

Type NWHJR (Junior) can be used to supply hot water or boost water temperature anywhere in a water distribution system.

### FEATURES

#### Terminal Enclosure:

E1 General Purpose is standard.  
E4 Moisture Resistant available.

#### Elements:

Seamless 0.315" diameter copper sheath heating element brazed to a 1" brass screw plug.

**Vessel:** Available with galvanized steel or solid brass pipe body.

#### Thermostat:

Integral thermostat with 60 to 180°F temperature range located inside the terminal enclosure.

**Mounting:** Easy to install; minimal size and weight, no supporting brackets are required.

**Third Party:** UL Listed - CSA Certification available (except NWHJRG-01-003P-E1 120V).

### To Order

kW	Volts	Ckt & Phase	Dimensions: in		Model No.	Wt. (lb)
			A	B		
<b>150 lb Carbon Steel Pipe Body—1 Copper Element (80 W/in<sup>2</sup>)</b>						
1.5	120	1-1	18	12%	NWHJRG-01-01P5-E1/120	14
1.5	240	1-1	18	12%	NWHJRG-01-01P5-E1/240	14
2	120	1-1	18	12%	NWHJRG-01-002P-E1/120	14
2	240	1-1	18	12%	NWHJRG-01-002P-E1/240	14
2.5	120	1-1	22	16%	NWHJRG-01-02P5-E1/120	16
2.5	240	1-1	22	16%	NWHJRG-01-02P5-E1/240	16
3	120	1-1	22	16%	NWHJRG-01-003P-E1/120	16
3	240	1-1	22	16%	NWHJRG-01-003P-E1/240	16
<b>150 lb Brass Pipe Body—1 Copper Element (80 W/in<sup>2</sup>)</b>						
1.5	120	1-1	18	12%	NWHJRB-01-01P5-E1/120	14
1.5	240	1-1	18	12%	NWHJRB-01-01P5-E1/240	14
2	120	1-1	18	12%	NWHJRB-01-002P-E1/120	14
2	240	1-1	18	12%	NWHJRB-01-002P-E1/240	14
2.5	240	1-1	22	16%	NWHJRB-01-02P5-E1/240	16
3	240	1-1	22	16%	NWHJRB-01-003P-E1/240	16

**Ordering Examples:** NWHJRG-01-02P5-E1/120, 2.5 kW, 120V heater.

NWHJRB-01-01P5-E1/120, 1.5 kW heater.

Ordering Information	Model	Water Booster Heater			
		Code	Number of Elements		
To order — complete the model number using the matrix provided.	NWH JRG JRB	Water Circulation Heater			
		Galvanized Tank			
		Brass Tank			
		01	One		
		Code	kW		
		01P5	1.5	02P5	2.5
		002P	2	003P	3
		Code	Terminal Enclosure		
		E1	General Purpose		
		E4	Moisture Resistant		
NWHJRG 01 003P E1		Typical Model Number			

# MEDIUM & HEAVY WEIGHT OIL APPLICATIONS

## NWHMTOR Series

- 2½ NPT Steel Screw Plug Design
- 2½" Carbon Steel Pipe Body, 150 lb Construction
- 1 to 9 kW
- 120, 240 and 480V, 1 & 3 Phase
- General Purpose, Moisture Resistant/Explosion Resistant or Moisture Resistant Terminal Enclosure
- Three 0.475" Dia. Steel Sheath Low Watt Density Elements (15 W/in<sup>2</sup>)
- Integral Thermostat (60 to 250°F)
- UL, CSA and Other Third Party Approval, Listing or Certification Available

## APPLICATIONS

**Medium and Heavy Weight Oil:** Low watt density elements reduce the risk of damaging highly viscous fluids.

## FEATURES

### Terminal Enclosure:

E1 General Purpose is standard. E2 Moisture Resistant/Explosion Resistant or E4 Moisture Resistant Enclosures available.

### Elements:

Three steel sheath elements.

**Screw Plug:** 2½ NPT Steel screw plug with ½" thermowell for thermostat bulb.

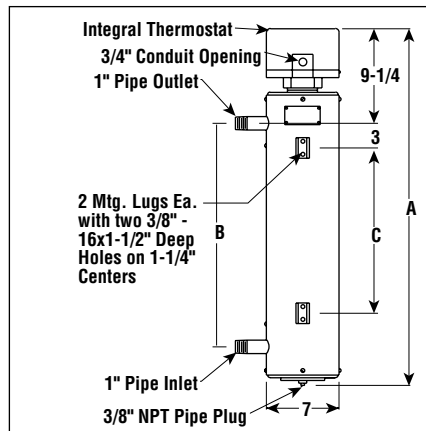
**Vessel:** Pipe body and nozzles are ASTM A53B carbon steel pipe. The end disk is ASTM A516 Grade 70 carbon steel plate. Provided with thermal insulation and painted sheet metal jacket.

### Wiring:

Convenient field wiring terminals are provided for easy installation.

**Controls:** Stock and assembly stock heaters come equipped with integral thermostat.

### Dimensions: inches



Note — Add 2" to A dimension for E2 Enclosure.



NWHMTOR-03-001P-E1/120 shown smaller than actual size.

## To Order

		Dimensions: in					
kW	Volts	Ckt & Phase	A	B	C	Model No.	Wt. (lb)
1	120	1-1	21½	9½	—	NWHMTOR-03-001P-E1/120	10
1	240	1-1	21½	9½	—	NWHMTOR-03-001P-E1/240	10
1	240	1-3	21½	9½	—	NWHMTOR-03-001P-E1/240/3P	10
1	480	1-3	21½	9½	—	NWHMTOR-03-001P-E1/480/3P	10
3	240	1-1	34½	22½	16½	NWHMTOR-03-003P-E1/240	22
3	240	1-3	34½	22½	16½	NWHMTOR-03-003P-E1/240/3P	22
3	480	1-1	34½	22½	16½	NWHMTOR-03-003P-E1/480	22
3	480	1-3	34½	22½	16½	NWHMTOR-03-003P-E1/480/3P	22
5	240	1-1	57½	45¼	39¼	NWHMTOR-03-005P-E1/240	40
5	240	1-3	57½	45¼	39¼	NWHMTOR-03-005P-E1/240/3P	40
5	480	1-1	57½	45¼	39¼	NWHMTOR-03-005P-E1/480	40
5	480	1-3	57½	45¼	39¼	NWHMTOR-03-005P-E1/480/3P	40
7.5	240	1-1	68½	56	50	NWHMTOR-03-07P5-E1/240	48
7.5	240	1-3	68½	56	50	NWHMTOR-03-07P5-E1/240/3P	48
7.5	480	1-1	68½	56	50	NWHMTOR-03-07P5-E1/480	48
7.5	480	1-3	68½	56	50	NWHMTOR-03-07P5-E1/480/3P	48
9	240	1-1	79½	67	61	NWHMTOR-03-009P-E1/240	54
9	240	1-3	79½	67	61	NWHMTOR-03-009P-E1/240/3P	54
9	480	1-1	79½	67	61	NWHMTOR-03-009P-E1/480	54
9	480	1-3	79½	67	61	NWHMTOR-03-009P-E1/480/3P	54

Ordering Example: NWHMTOR-03-005P-E1/240, 5 kW, 1 phase, 240V heater.

## Ordering Information

To Order — Complete the Model Number using the Matrix provided.

Model	Medium and Heavy Weight Oil			
NWHMTOR	Oil Circulation Heater with Screw Plug			
	Low Watt Density Elements			
R	Code Number of Elements			
	03	Three		
	Code kW			
	003P	3	07P5	7.5
	04P5	4.5	009P	9
	006P	6		
	Code Terminal Enclosure			
	E1	General Purpose		
	E2	Moisture Resistant/Explosion Resistant		
	E4	Moisture Resistant		
NWHMTOR 03	003P	E1	Typical Model Number	

# LIGHT & MEDIUM WEIGHT OIL APPLICATIONS

## NWHMTO Series

- 2½ NPT Steel Screw Plug Design
- 2½" Carbon Steel Pipe Body, 150 Lb Construction
- 3 to 9 kW
- 120, 240 and 480V, 1 & 3 Phase
- General Purpose, Moisture Resistant/Explosion Resistant or Moisture Resistant Terminal Enclosure
- Three 0.475" Dia. Steel Sheath Elements (23 W/in<sup>2</sup>)
- Integral Thermostat (200 to 550°F)
- UL, CSA and Other Third Party Approval, Listing or Certification Available

## APPLICATIONS

**Light and Medium Weight Oil:**  
Low-cost solution to heating lubricating and cutting oils in remote applications.

## FEATURES

### Terminal Enclosure:

E1 General Purpose is standard. E2 Moisture Resistant/Explosion Resistant and E4 Moisture Resistant Enclosures available.

### Elements:

Three steel sheath elements.

### Screw Plug:

2½ NPT Steel screw plug with ½" thermowell for thermostat bulb.

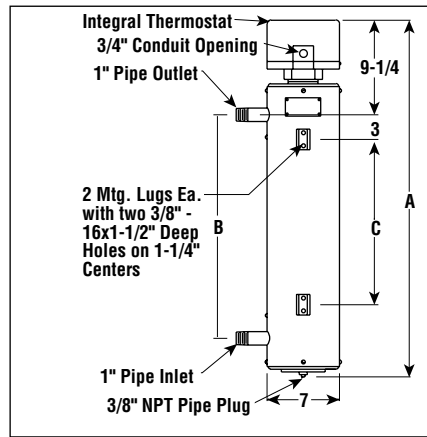
**Vessel:** Pipe body and nozzles are ASTM A53B carbon steel pipe. The end disk is ASTM A516 Grade 70 carbon steel plate. Provided with thermal insulation and painted sheet metal jacket.

### Wiring:

Convenient field wiring terminals are provided for easy installation.

**Controls:** Stock and assembly stock heaters come equipped with integral thermostat.

Dimensions: inches



Note — Add 2" to A dimension for E2 Enclosure.



NWHMTO-03-003P-E1/240 shown smaller than actual size.

To Order							
kW	Volts	Ckt & Phase	Dimensions: in			Model No.	Wt. (lb)
			A	B	C		
3	240	1-1	34¾	22½	16½	NWHMTO-03-003P-E1/240	22
3	240	1-3	34¾	22½	16½	NWHMTO-03-003P-E1/240/3P	22
3	480	1-1	34¾	22½	16½	NWHMTO-03-003P-E1/480	22
3	480	1-3	34¾	22½	16½	NWHMTO-03-003P-E1/480/3P	22
4.5	240	1-1	34¾	22½	16½	NWHMTO-03-04P5-E1/240	22
4.5	240	1-3	34¾	22½	16½	NWHMTO-03-04P5-E1/240/3P	22
4.5	480	1-1	34¾	22½	16½	NWHMTO-03-04P5-E1/480	22
4.5	480	1-3	34¾	22½	16½	NWHMTO-03-04P5-E1/480/3P	22
6	240	1-1	57½	45¼	39¼	NWHMTO-03-006P-E1/240	40
6	240	1-3	57½	45¼	39¼	NWHMTO-03-006P-E1/240/3P	40
6	480	1-1	57½	45¼	39¼	NWHMTO-03-006P-E1/480	40
6	480	1-3	57½	45¼	39¼	NWHMTO-03-006P-E1/480/3P	40
7.5	240	1-1	57½	45¼	39¼	NWHMTO-03-07P5-E1/240	40
7.5	240	1-3	57½	45¼	39¼	NWHMTO-03-07P5-E1/240/3P	40
7.5	480	1-1	57½	45¼	39¼	NWHMTO-03-07P5-E1/480	40
7.5	480	1-3	57½	45¼	39¼	NWHMTO-03-07P5-E1/480/3P	40
9	240	1-1	57½	45¼	39¼	NWHMTO-03-009P-E1/240	40
9	240	1-3	57½	45¼	39¼	NWHMTO-03-009P-E1/240/3P	40
9	480	1-1	57½	45¼	39¼	NWHMTO-03-009P-E1/480	40
9	480	1-3	57½	45¼	39¼	NWHMTO-03-009P-E1/480/3P	40

Ordering Example: NWHMTO-03-07P5-E1/240/3P, 7.5 kW, 3 phase, 240V heater,

Model	Light and Medium Weight Oil			
NWHMTO	Oil Circulation Heater with Screw Plug			
	Code	Number of Elements		
	03	Three		
	Code	kW		
	003P	3	07P5	7.5
	04P5	4.5	009P	9
	006P	6		
	Code	Terminal Enclosure		
	E1	General Purpose		
	E2	Moisture Resistant/Explosion Resistant		
	E4	Moisture Resistant		

## Ordering Information

To Order — Complete the Model Number using the Matrix provided.

NWHMTO 03 003P E1 Typical Model Number

# CLEAN WATER APPLICATIONS



## NWHMT Series **DISCONTINUED**

- 2½" NPT Screw Plug Design
- 2½" Galvanized Carbon Steel Pipe Body, 150 Lb Construction
- 3 - 18 kW
- 120, 240 and 480V, 1 & 3 Phase
- General Purpose, Moisture Resistant/Explosion Resistant Terminal Enclosure
- Three 0.475" Dia. Copper Sheath Elements (50 W/In<sup>2</sup>)
- Integral Thermostat (60 - 250°F)
- UL, CSA and Other Third Party Approval, Listing or Certification Available

### APPLICATIONS

Clean Water Heating — Low-cost solution to booster water heating in remote applications.

### FEATURES

**Terminal Enclosure:**  
E1 General Purpose is standard. E2 Moisture Resistant/Explosion Resistant Enclosures available.

**Elements:**  
Three copper sheath elements.

**Screw Plug:**  
2½" NPT brass screw plug with ½" thermowell for thermostat bulb.

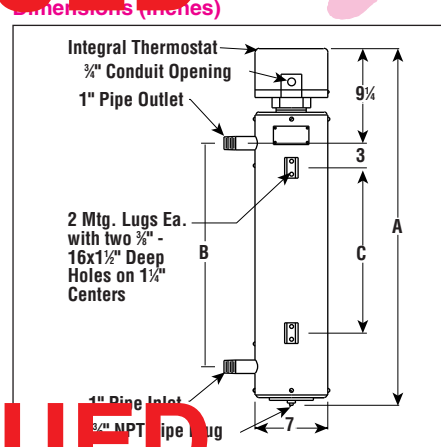
**Vessel:** Pipe body and nozzles are galvanized ASTM A53B carbon steel pipe. The end disk is galvanized ASTM A516 Grade 70 carbon steel plate. Provided with thermal insulation and painted sheet metal jacket.

**Wiring:**  
Convenient field wiring terminals are provided for easy installation.

**Controls:** Stock and assembly stock heaters come equipped with integral thermostat.



**Note —**  
Add 2" to A dimension for E2 Enclosure.



## **DISCONTINUED**

To Order (Specify Model Number)

**MOST POPULAR ITEMS HIGHLIGHTED**

kW	Volts	Ckt & Phase	Dimensions (In.)			Model No.	Price	Wt. (Lbs.)
			A	B	C			
3	120	1-1	21%	9%	—	NWHMT-03-003P-E1/120	\$951	15
3	240	1-1	21%	9%	—	NWHMT-03-003P-E1/240	951	15
3	240	1-3	21%	9%	—	NWHMT-03-003P-E1/240/3P	951	15
3	480	1-1	21%	9%	—	NWHMT-03-003P-E1/480	951	15
3	480	1-3	21%	9%	—	NWHMT-03-003P-E1/480/3P	951	15
4.5	240	1-1	21%	9%	—	NWHMT-03-04P5-E1/240	973	15
4.5	240	1-3	21%	9%	—	NWHMT-03-04P5-E1/240/3P	973	15
4.5	480	1-1	21%	9%	—	NWHMT-03-04P5-E1/480	973	15
4.5	480	1-3	21%	9%	—	NWHMT-03-04P5-E1/480/3P	973	15
6	240	1-1	34%	22½	16½	NWHMT-03-006P-E1/240	1021	22
6	240	1-3	34%	22½	16½	NWHMT-03-006P-E1/240/3P	1021	22
6	480	1-1	34%	22½	16½	NWHMT-03-006P-E1/480	1021	22
6	480	1-3	34%	22½	16½	NWHMT-03-006P-E1/480/3P	1021	22
9	240	1-1	34%	22½	16½	NWHMT-03-009P-E1/240	1161	22
9	240	1-3	34%	22½	16½	NWHMT-03-009P-E1/240/3P	1161	22
9	480	1-1	34%	22½	16½	NWHMT-03-009P-E1/480	1161	22
9	480	1-3	34%	22½	16½	NWHMT-03-009P-E1/480/3P	1161	22
12	240	1-1	57%	45%	39%	NWHMT-03-012P-E1/240	1332	40
12	240	1-3	57%	45%	39%	NWHMT-03-012P-E1/240/3P	1332	40
12	480	1-1	57%	45%	39%	NWHMT-03-012P-E1/480	1332	40
12	480	1-3	57%	45%	39%	NWHMT-03-012P-E1/480/3P	1332	40
15	240	1-1	57%	45%	39%	NWHMT-03-015P-E1/240	1453	40
15	240	1-3	57%	45%	39%	NWHMT-03-015P-E1/240/3P	1453	40
15	480	1-1	57%	45%	39%	NWHMT-03-015P-E1/480	1453	40
15	480	1-3	57%	45%	39%	NWHMT-03-015P-E1/480/3P	1453	40
18	240	1-1	57%	45%	39%	NWHMT-03-018P-E1/240	1579	40
18	240	1-3	57%	45%	39%	NWHMT-03-018P-E1/240/3P	1579	40
18	480	1-1	57%	45%	39%	NWHMT-03-018P-E1/480	1579	40
18	480	1-3	57%	45%	39%	NWHMT-03-018P-E1/480/3P	1579	40

**Ordering Example:**  
NWHMT-03-009P-E1/240/3P is a 9 kW, 3 Phase, 240 Volt Heater, \$1161.

**Ordering Information**  
To Order — Complete the Model Number using the Matrix provided.

Model	Clean Water
NWHMT	Water Circulation Heater with Screw Plug
<b>Code</b>	<b>Number of Elements</b>
03	Three
<b>Code</b>	<b>kW</b>
003P	3
004P5	4.5
006P	6
009P	9
<b>Code</b>	<b>Terminal Enclosure</b>
E1	General Purpose
E2	Moisture Resistant/Explosion Resistant
NWHMT 03	003P E1
Typical Model Number	

## **DISCONTINUED**





**UNITED STATES**

[www.omega.com](http://www.omega.com)  
1-800-TC-OMEGA  
Stamford, CT.

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Laval(Quebec)  
1-800-TC-OMEGA

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[www.omegaeng.cz](http://www.omegaeng.cz)  
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Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# PURE WATER, CORROSIVE SOLUTION AND HIGH TEMPERATURE GAS APPLICATIONS

## NWHMTSS, NWHIS and NWHOIS Series

- ✓ Screw Plug or Flanged Heater Design
- ✓ 3 - 14" Type 304 Stainless Steel Pipe Body, 150 Lb Construction
- ✓ 2 - 200 kW
- ✓ 120, 240 and 480V, 1 & 3 Phase
- ✓ General Purpose, Moisture Resistant/Explosion Resistant, Explosion Resistant or Moisture Resistant Terminal Enclosure
- ✓ 0.475" Dia. Stainless Steel or INCOLOY Sheath Elements (15 - 50 W/in<sup>2</sup>)
- ✓ With & Without Thermostat
- ✓ UL, CSA and Other Third Party Approval, Listing or Certification Available on Many Models

### APPLICATIONS

#### Pure Water:

Heating of demineralized or de-ionized water that is highly aggressive to mild steel.

#### Mildly Corrosive Solutions:

Heat mildly corrosive solutions (pH5 to pH9) using stainless elements and a passivated stainless pipe body.

#### Highly Corrosive Solutions and Oils:

Low watt density INCOLOY sheath elements coupled with a passivated Stainless Steel pipe body provides long service life when heating highly corrosive solutions and sulfur laden oils.

**Steam Superheating:** Increase the enthalpy and quality of steam. Smaller units can be used to make up line losses in steam generating and distribution systems.

#### High Temperature Gas:

INCOLOY elements and a Stainless Steel vessel enhance safe operation to nearly 1400°F outlet gas temperature in air, gas or steam superheating applications.

### FEATURES

**Terminal Enclosures:** Standard stock heater terminal enclosure E1 General Purpose. Moisture Resistant/Explosion Resistant E2, Explosion Resistant E3 or Moisture Resistant E4 Enclosures are available as assembly stock.

**Elements:** Sturdy 0.475" Dia. Stainless Steel or INCOLOY sheath elements provide superior strength and rigidity. OMEGALUX elements utilize high quality resistance wire for coil construction. The coil is surrounded with high purity magnesium oxide which is compacted to a dense solid to ensure high thermal conductivity and dielectric strength.

**Corrosion Resistance:** NWHMTSS, NWHIS and NWHOIS pipe bodies and all Stainless Steel heating elements are passivated to provide additional resistance to corrosion.

**Flanges:** Type 304 Stainless Steel flanges are standard on 3" and larger circulation heaters. Flange dimensions conform to ANSI B16.5 standards. Series NWHMTSS heaters utilize a Stainless Steel screw plug.

**Vessels:** Pipe body and nozzles are type 304 ASTM A312 ERW Stainless Steel pipe. The end disks are type 304 ASTM A240 Stainless Steel plate. Provided with thermal insulation and painted sheet metal jacket.

**Baffle Assemblies:** Internal baffle assemblies are provided for model GCHISB-18 heaters to increase the velocity of the air, gas or steam as it passes through the vessel. Increasing the velocity of the gas helps reduce the temperature of the element sheaths and the vessel walls in critical applications.

**Wiring:** Wiring terminals are spaced to provide proper arcing and creepage clearances per the NEC. Termination insulators provide electrical isolation between the terminals and the grounded metal sheath to enhance personnel safety and equipment service life. Heavy duty jumper straps and other terminal parts assure tight connections and an extra margin of current carrying capacity.



**Controls:** All stock and assembly stock heaters, Series MTSS, 03 and 06, come equipped with mechanical AR thermostats. These thermostats are suitable for most applications. Explosion-resistant and liquid-tight thermostats are provided on E2/E3 and E4 units, respectively. Individual product pages list other types of thermostats and controls available for each heater. For heaters listed without controls, refer to the Overview on Mechanical and Electrical Control Options in this section.

**Precision Temperature Control and Control Panels:** For larger kW heaters and precise control of gas temperatures in high temperature applications, OMEGALUX recommends the use of thermocouple sensors, electronic PID temperature controls and SCR power panels for circulation heater applications. The use of electronic and SCR controls will minimize overshoot and reduce the possibility of heater damage from overtemperature operation. Integral or remote mounted control panels with electronic controls and solid state (SCR) or contactor power controllers can be provided using virtually any combination of control devices. Consult the Controls section for details.



# PURE WATER & MILDLY CORROSIVE SOLUTION APPLICATIONS



## NWHMTSS Series

- 2½" NPT Stainless Steel Screw Plug Design
- 2½" Passivated Stainless Steel Pipe Body, 150 Lb Construction
- 3 - 18 kW
- 120, 240 and 480V, 1 & 3 Phase
- General Purpose, Moisture Resistant/Explosion Resistant Terminal Enclosure
- Three 0.475" Dia. Stainless Steel Sheath Elements (50 W/In<sup>2</sup>)
- Integral Thermostat (60 - 250°F)
- UL, CSA and Other Third Party Approval, Listing or Certification Available on Many Models

### APPLICATIONS

Remote and Booster Heating of demineralized or de-ionized water and mildly corrosive solutions (pH5 to pH9).

### FEATURES

#### Terminal Enclosure:

E1 General Purpose is standard. E2 enclosure available.

#### Elements:

Three Type 304 passivated Stainless Steel sheath elements.

#### Screw Plug:

2½" Type 304 Stainless Steel screw plug with ½" thermowell for thermostat bulb.

**Vessel:** Pipe body and nozzles are type 304 ASTM A312 ERW Stainless Steel pipe. The end disks are type 304 ASTM A240 or A479 Stainless Steel plate. Provided with thermal insulation and 20 gauge painted sheet metal jacket.

#### Wiring:

Convenient field wiring terminals are provided for easy installation.

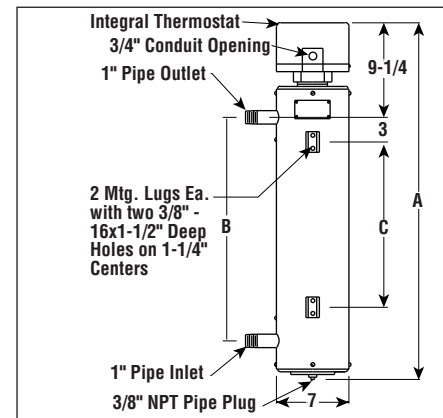
**Controls:** Stock and assembly stock heaters come equipped with integral thermostat.

**MOST POPULAR ITEMS HIGHLIGHTED**

**To Order (Specify Model Number)**



Dimensions (Inches)  
NWHMTSS-03



Note - Add 2" to A dimension for E2 Enclosure.

kW	Volts	Ckt & Phase	Dimensions (In.)			Model No.	Price	Wt. (Lbs.)
			A	B	C			
3	120	1-1	21%	9%	—	NWHMTSS-03-003P-E1/120	\$2237	15
3	240	1-1	21%	9%	—	NWHMTSS-03-003P-E1/240	2237	15
3	240	1-3	21%	9%	—	NWHMTSS-03-003P-E1/240/3P	2237	15
3	480	1-1	21%	9%	—	NWHMTSS-03-003P-E1/480	2237	15
3	480	1-3	21%	9%	—	NWHMTSS-03-003P-E1/480/3P	2237	15
4.5	240	1-1	21%	9%	—	NWHMTSS-03-04P5-E1/240	2286	15
4.5	240	1-3	21%	9%	—	NWHMTSS-03-04P5-E1/240/3P	2286	15
4.5	480	1-1	21%	9%	—	NWHMTSS-03-04P5-E1/480	2286	15
4.5	480	1-3	21%	9%	—	NWHMTSS-03-04P5-E1/480/3P	2286	15
6	240	1-1	34%	22½	16½	NWHMTSS-03-006P-E1/240	2401	22
6	240	1-3	34%	22½	16½	NWHMTSS-03-006P-E1/240/3P	2401	22
6	480	1-1	34%	22½	16½	NWHMTSS-03-006P-E1/480	2401	22
6	480	1-3	34%	22½	16½	NWHMTSS-03-006P-E1/480/3P	2401	22
9	240	1-1	34%	22½	16½	NWHMTSS-03-009P-E1/240	2471	22
9	240	1-3	34%	22½	16½	NWHMTSS-03-009P-E1/240/3P	2471	22
9	480	1-1	34%	22½	16½	NWHMTSS-03-009P-E1/480	2471	22
9	480	1-3	34%	22½	16½	NWHMTSS-03-009P-E1/480/3P	2471	22
12	240	1-1	57%	45%	39%	NWHMTSS-03-012P-E1/240	2543	40
12	240	1-3	57%	45%	39%	NWHMTSS-03-012P-E1/240/3P	2543	40
12	480	1-1	57%	45%	39%	NWHMTSS-03-012P-E1/480	2543	40
12	480	1-3	57%	45%	39%	NWHMTSS-03-012P-E1/480/3P	2543	40
15	240	1-1	57%	45%	39%	NWHMTSS-03-015P-E1/240	2654	40
15	240	1-3	57%	45%	39%	NWHMTSS-03-015P-E1/240/3P	2654	40
15	480	1-1	57%	45%	39%	NWHMTSS-03-015P-E1/480	2654	40
15	480	1-3	57%	45%	39%	NWHMTSS-03-015P-E1/480/3P	2654	40
18	240	1-1	57%	45%	39%	NWHMTSS-03-018P-E1/240	2772	40
18	240	1-3	57%	45%	39%	NWHMTSS-03-018P-E1/240/3P	2772	40
18	480	1-1	57%	45%	39%	NWHMTSS-03-018P-E1/480	2772	40
18	480	1-3	57%	45%	39%	NWHMTSS-03-018P-E1/480/3P	2772	40

### Model Pure Water and Mildly Corrosive Solution

NWHMT SS Water Circulation Heater with Screw Plug  
Stainless Steel Sheath — Stainless Steel Vessel

#### Code Number of Elements

03	Three
Code	kW
003P	3
004P5	4.5
006P	6
009P	9
012P	12
015P	15
018P	18

#### Code Terminal Enclosure

E1	General Purpose
E2	Moisture Resistant/Explosion Resistant

NWHMTSS 03 003P E1 Typical Model Number

#### Ordering Example:

**NWHMTSS-03-009P-E1/480** is a 9 kW, 1 Phase, 480 Volt Heater, \$2471.

#### Ordering Information

To Order: Complete the Model Number using the Matrix provided.



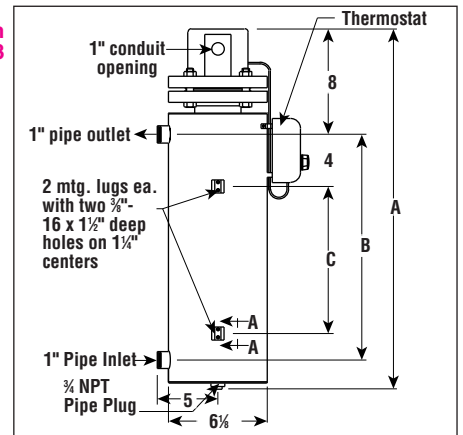
# PURE WATER AND MILDLY CORROSIVE SOLUTION APPLICATIONS

## NWHIS Series

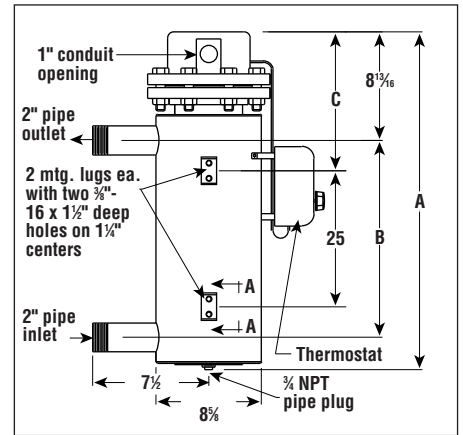
Dimensions: in  
NWHIS-03

**MOST POPULAR MODELS HIGHLIGHTED!**

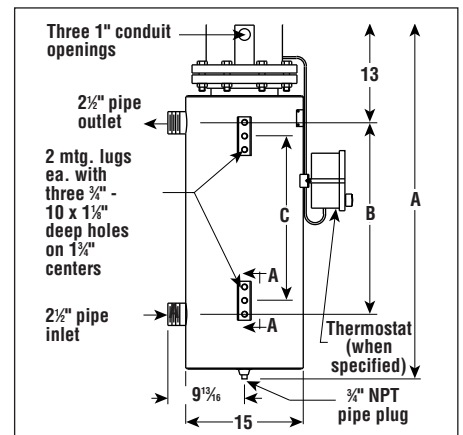
To Order (Specify Model Number)								
kW	Volts	Ckt & Phase	Dimensions: in			Model No.	Price	Wt. (lb)
			A	B	C			
<b>Series 03—3", 150 lb, 304 Passivated Stainless Steel Vessel, 3 INCOLOY Elements (45 W/in<sup>2</sup>) with Side Mounted Thermostat (60 to 250°F)—1 NPT Pipe Inlet and Outlet</b>								
6	240	1-3	32 <sup>1</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHIS-03-006P-E1/240	\$5800	70
6	480	1-3	32 <sup>1</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHIS-03-006P-E1/480	5800	70
12	240	1-3	42 <sup>1</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHIS-03-012P-E1/240	6200	80
12	480	1-3	42 <sup>1</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHIS-03-012P-E1/480	6200	80
18	240	1-3	55 <sup>1</sup> / <sub>16</sub>	45	39	NWHIS-03-018P-E1/240	6700	98
18	480	1-3	55 <sup>1</sup> / <sub>16</sub>	45	39	NWHIS-03-018P-E1/480	6700	98
<b>Series 06—5", 150 lb, 304 Passivated Stainless Steel Vessel, 6 INCOLOY Elements (45 W/in<sup>2</sup>) with Side Mounted Thermostat (60 to 250°F)—2 NPT Pipe Inlet and Outlet</b>								
24	240	2-3	41 <sup>1</sup> / <sub>4</sub>	30	11 <sup>1</sup> / <sub>2</sub>	NWHIS-06-024P-E1/240	\$10,750	140
24	480	1-3	41 <sup>1</sup> / <sub>4</sub>	30	11 <sup>1</sup> / <sub>2</sub>	NWHIS-06-024P-E1/480	10,750	140
30	240	2-3	48 <sup>1</sup> / <sub>4</sub>	37	14 <sup>1</sup> / <sub>4</sub>	NWHIS-06-030P-E1/240	11,700	155
30	480	1-3	48 <sup>1</sup> / <sub>4</sub>	37	14 <sup>1</sup> / <sub>4</sub>	NWHIS-06-030P-E1/480	11,700	155
40	240	2-3	60 <sup>1</sup> / <sub>4</sub>	48 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub>	NWHIS-06-040P-E1/240	13,200	176
40	480	2-3	60 <sup>1</sup> / <sub>4</sub>	48 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub>	NWHIS-06-040P-E1/480	13,200	176
50	480	2-3	73 <sup>1</sup> / <sub>2</sub>	61 <sup>1</sup> / <sub>2</sub>	27 <sup>1</sup> / <sub>2</sub>	NWHIS-06-050P-E1/240	14,950	210
<b>Series 18—8", 150 lb, 304 Passivated Stainless Steel Vessel, 18 INCOLOY Elements (45 W/in<sup>2</sup>)—2 1/2 NPT Pipe Inlet and Outlet</b>								
50	240	3-3	45 <sup>1</sup> / <sub>4</sub>	24 <sup>1</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>16</sub>	NWHIS-18-050P-E1/240	\$20,050	396
50	480	3-3	45 <sup>1</sup> / <sub>4</sub>	24 <sup>1</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>16</sub>	NWHIS-18-050P-E1/480	20,050	396
75	240	3-3	53 <sup>1</sup> / <sub>4</sub>	32 <sup>1</sup> / <sub>16</sub>	29 <sup>1</sup> / <sub>16</sub>	NWHIS-18-075P-E1/240	21,700	414
75	480	3-3	53 <sup>1</sup> / <sub>4</sub>	32 <sup>1</sup> / <sub>16</sub>	29 <sup>1</sup> / <sub>16</sub>	NWHIS-18-075P-E1/480	21,700	414
100	240	3-3	60 <sup>1</sup> / <sub>4</sub>	39 <sup>1</sup> / <sub>16</sub>	36 <sup>1</sup> / <sub>16</sub>	NWHIS-18-100P-E1/240	21,800	425
100	480	3-3	60 <sup>1</sup> / <sub>4</sub>	39 <sup>1</sup> / <sub>16</sub>	36 <sup>1</sup> / <sub>16</sub>	NWHIS-18-100P-E1/480	21,800	425
125	240	3-3	67 <sup>1</sup> / <sub>4</sub>	47 <sup>1</sup> / <sub>16</sub>	43 <sup>1</sup> / <sub>16</sub>	NWHIS-18-125P-E1/240	26,000	470
125	480	3-3	67 <sup>1</sup> / <sub>4</sub>	47 <sup>1</sup> / <sub>16</sub>	43 <sup>1</sup> / <sub>16</sub>	NWHIS-18-125P-E1/480	26,000	470
150	240	3-3	77 <sup>1</sup> / <sub>4</sub>	56 <sup>1</sup> / <sub>16</sub>	53 <sup>1</sup> / <sub>16</sub>	NWHIS-18-150P-E1/240	28,850	535
150	480	3-3	77 <sup>1</sup> / <sub>4</sub>	56 <sup>1</sup> / <sub>16</sub>	53 <sup>1</sup> / <sub>16</sub>	NWHIS-18-150P-E1/480	28,850	535
175	240	3-3	86 <sup>1</sup> / <sub>4</sub>	65 <sup>1</sup> / <sub>16</sub>	62 <sup>1</sup> / <sub>16</sub>	NWHIS-18-175P-E1/240	31,650	625
175	480	3-3	86 <sup>1</sup> / <sub>4</sub>	65 <sup>1</sup> / <sub>16</sub>	62 <sup>1</sup> / <sub>16</sub>	NWHIS-18-175P-E1/480	31,650	625
200	240	3-3	96 <sup>1</sup> / <sub>4</sub>	75 <sup>1</sup> / <sub>16</sub>	72 <sup>1</sup> / <sub>16</sub>	NWHIS-18-200P-E1/240	34,950	705
200	480	3-3	96 <sup>1</sup> / <sub>4</sub>	75 <sup>1</sup> / <sub>16</sub>	72 <sup>1</sup> / <sub>16</sub>	NWHIS-18-200P-E1/480	34,950	705



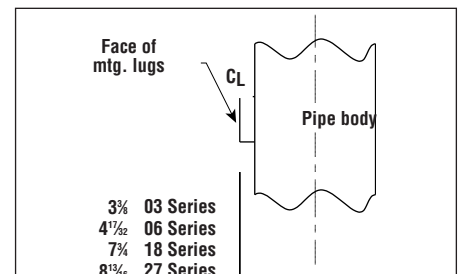
NWHIS-06



NWHIS-18



NWHIS-AA



Model	Pure Water and Mildly Corrosive Solution			
NWH IS	Water Circulation Heater			
	INCOLOY Elements — Stainless Steel Vessel			
	Code	Number of Elements		
	03	Three		
	06	Six		
	18	Eighteen		
	Code	kW		
	006P	6		
	012P	12		
	018P	18		
	024P	24		
	030P	30		
	040P	40		
	050P	50		
	075P	75		
	100P	100		
	125P	125		
	Code	Terminal Enclosure		
	E1	General Purpose		
	E2	Moisture Resistant/Explosion Resistant		
	E3	Explosion Resistant		
	E4	Moisture Resistant		
NWH	03	006P	E1	Typical Model Number

**Ordering Example:**  
NWHIS-18-050P-E1/240,  
50 kW, 240V heater,  
\$20,050.

**Note:** Refer to the Controls section for side mounted controls or control panels.

### Ordering Information

To Order— Complete the Model Number using the Matrix provided.



# CORROSIVE OIL & HIGHLY CORROSIVE SOLUTION APPLICATIONS

## NWHOIS Series

To Order (Specify Model Number)

**MOST POPULAR  
ITEMS HIGHLIGHTED**

kW	Volts	Ckt & Phase	Dimensions (In.)			Model No.	Price	Wt. (Lbs.)
			A	B	C			
<b>Series 03 — 3 inch, 150 lb 304 passivated stainless steel vessel, 3 INCOLOY elements (15 W/in<sup>2</sup>) with side mounted thermostat (60 to 250°F) — 1" NPT pipe inlet and outlet</b>								
2	240	1-3	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHOIS-03-002P-E1/240	\$3279	70
2	480	1-3	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHOIS-03-002P-E1/480	3279	70
4	240	1-3	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHOIS-03-004P-E1/240	3495	80
4	480	1-3	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHOIS-03-004P-E1/480	3495	80
6	240	1-3	55 <sup>5</sup> / <sub>16</sub>	45	39	NWHOIS-03-006P-E1/240	3784	98
6	480	1-3	55 <sup>5</sup> / <sub>16</sub>	45	39	NWHOIS-03-006P-E1/480	3784	98
<b>Series 06 — 5 inch, 150 lb 304 passivated stainless steel vessel, 6 INCOLOY elements (15 W/in<sup>2</sup>) with side mounted thermostat (60 to 250°F) — 2" NPT pipe inlet and outlet</b>								
8	240	1-3	4 <sup>1</sup> / <sub>4</sub>	30	11 <sup>1</sup> / <sub>2</sub>	NWHOISR-06-008P-E1/240	6069	140
8	480	1-3	4 <sup>1</sup> / <sub>4</sub>	30	11 <sup>1</sup> / <sub>2</sub>	NWHOISR-06-008P-E1/480	6069	140
12	240	1-3	60 <sup>1</sup> / <sub>4</sub>	48 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub>	NWHOISR-06-012P-E1/240	7445	176
12	480	1-3	60 <sup>1</sup> / <sub>4</sub>	48 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub>	NWHOISR-06-012P-E1/480	7445	176
<b>Series 06 — 5 inch, 150 lb 304 passivated stainless steel vessel, 6 INCOLOY elements (23 W/in<sup>2</sup>) with side mounted thermostat (60 to 250°F) — 2" NPT pipe inlet and outlet</b>								
25	240	2-3	73 <sup>3</sup> / <sub>8</sub>	61 <sup>1</sup> / <sub>2</sub>	27 <sup>3</sup> / <sub>8</sub>	NWHOIS-06-025P-E1/240	8402	176
25	480	1-3	73 <sup>3</sup> / <sub>8</sub>	61 <sup>1</sup> / <sub>2</sub>	27 <sup>3</sup> / <sub>8</sub>	NWHOIS-06-025P-E1/480	8402	176
30	240	2-3	86 <sup>3</sup> / <sub>8</sub>	74 <sup>3</sup> / <sub>8</sub>	33 <sup>3</sup> / <sub>8</sub>	NWHOIS-06-030P-E1/240	9407	240
30	480	1-3	86 <sup>3</sup> / <sub>8</sub>	74 <sup>3</sup> / <sub>8</sub>	33 <sup>3</sup> / <sub>8</sub>	NWHOIS-06-030P-E1/480	9407	240

Ordering Example: NWHOISR-06-008P-E1/480 is a 8 kW, 480 Volt Heater, \$6069.

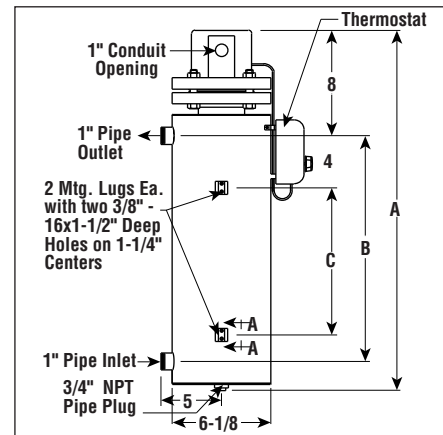
Note — Refer to the Controls section for side mounted controls or control panels.

### Ordering Information

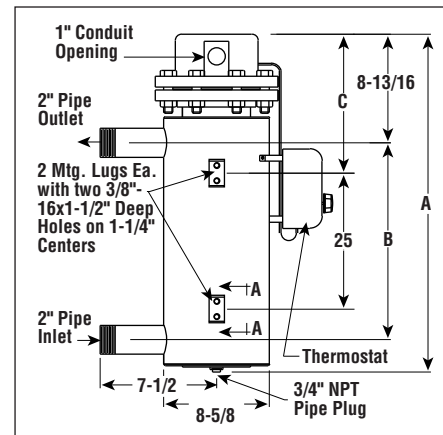
To Order — Complete the Model Number using the Matrix provided.

Model	Corrosive Oil and Highly Corrosive Solution	
NWHO	Oil Circulation Heater	
IS	INCOLOY Elements — Stainless Steel Vessel	
R	Reduced Watt Density	
Code	Number of Elements	
03	Three	
06	Six	
Code	kW	
002P	2	008P 8      030P 30
004P	4	012P 12
006P	6	025P 25
Code	Terminal Enclosure	
E1	General Purpose	
E2	Moisture Resistant/Explosion Resistant	
E3	Explosion Resistant	
E4	Moisture Resistant	
NWHOIS 03	002P E1	Typical Model Number

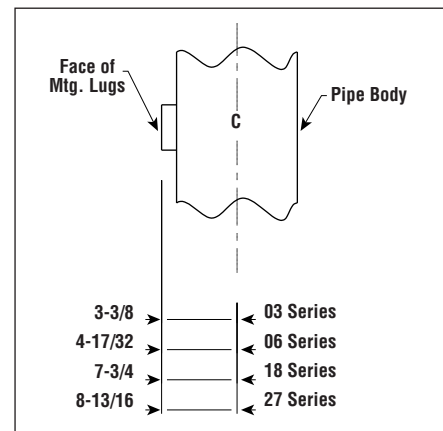
Dimensions (Inches)  
NWHOIS-03



NWHOIS-06



NWHOIS-AA





**UNITED STATES**

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1-800-TC-OMEGA  
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088-466-342

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Karviná, Czech Republic  
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Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

### • pH and Conductivity

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

### • Data Acquisition

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# MEDIUM, HEAVY & FUEL OIL APPLICATIONS

## NWHOR & NWHORB Series



NWHOR-03-003P-E1/240 shown smaller than actual size.

- ✓ 3 to 14" ANSI Blind Flange Design
- ✓ 3 to 14" Carbon Steel Pipe Body, 150 lb Construction
- ✓ 3 to 120 kW
- ✓ 240 and 480V, 1 & 3 Phase
- ✓ General Purpose, Moisture Resistant/Explosion Resistant, Explosion Resistant or Moisture Resistant Terminal Enclosure
- ✓ 0.475" Dia. Steel Sheath Low Watt Density Elements (12 to 15 W/In<sup>2</sup>)
- ✓ With & Without Side Mounted AR Thermostat (60 to 250°F)
- ✓ UL, CSA and Other Third Party Approval, Listing or Certification Available

### FEATURES

**Terminal Enclosure:** E1 General Purpose is standard. E2 Moisture Resistant/Explosion Resistant, E3 Explosion Resistant or E4 Moisture Resistant Enclosures available.

**Elements:** 0.475" diameter steel sheath elements.

**Flange:** 3 to 14" ANSI B-16.5 Blind flange with 1/2" thermowell for thermostat bulb and a 1/8" NPT threaded opening for a thermocouple or RTD.

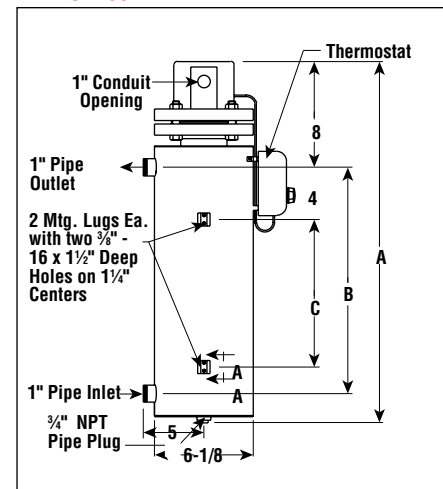
**Vessel:** Pipe body and nozzles are ASTM A53B carbon steel pipe. The end disk is ASTM A516 Grade 70 carbon steel plate. Provided with thermal insulation and painted sheet metal jacket.

**Wiring:** Convenient field wiring terminals are provided for easy installation.

**Controls:** Series 03 and 06 stock and assembly stock heaters come equipped with side mounted thermostat. Series 18, 27 and 45 are furnished without thermostat.

**WARNING:** Hazard of Fire. These devices function as temperature controls only. Because they do not fail-safe, an approved temperature and/or pressure safety control must be used for safe operation. Consult Controls online.

Dimensions: inches  
NWHOR-03



Note: Add 2" to A dimension for E2 enclosure.

### APPLICATIONS

**Medium and Heavy Weight Oil:** Low watt density reduces the risk of damaging highly viscous fluids. Improve flow ability of fuel oils.

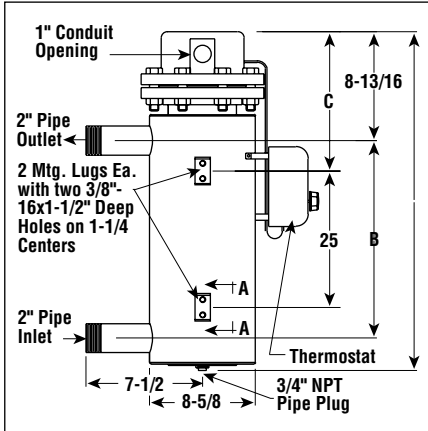
To Order							
kW	Volts	Circuit & Phase	Dimensions (in)			Model No.	Wt. (lb)
			A	B	C		
Series 03 — 3" 150 lb carbon steel vessel — 3 steel elements (15 W/In <sup>2</sup> ) with side mounted thermostat — 1 NPT pipe inlet and outlet							
3	240	1-1	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHOR-03-003P-E1/240	70
3	240	1-3	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHOR-03-003P-E1/240/3P	70
3	480	1-1	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHOR-03-003P-E1/480	70
3	480	1-3	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHOR-03-003P-E1/480/3P	70
4	240	1-1	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHOR-03-004P-E1/240	80
4	240	1-3	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHOR-03-004P-E1/240/3P	80
4	480	1-1	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHOR-03-004P-E1/480	80
4	480	1-3	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHOR-03-004P-E1/480/3P	80
6	240	1-1	55 <sup>7</sup> / <sub>16</sub>	45	39	NWHOR-03-006P-E1/240	94
6	240	1-3	55 <sup>7</sup> / <sub>16</sub>	45	39	NWHOR-03-006P-E1/240/3P	94
6	480	1-1	55 <sup>7</sup> / <sub>16</sub>	45	39	NWHOR-03-006P-E1/480	94
6	480	1-3	55 <sup>7</sup> / <sub>16</sub>	45	39	NWHOR-03-006P-E1/480/3P	94

Ordering Examples: NWHOR-03-004P-E1/240, 4 kW, 1 phase, 240V heater.  
NWHOR-03-006P-E1/480/3P, 6 kW (1 to 3) phase, 480V heater.

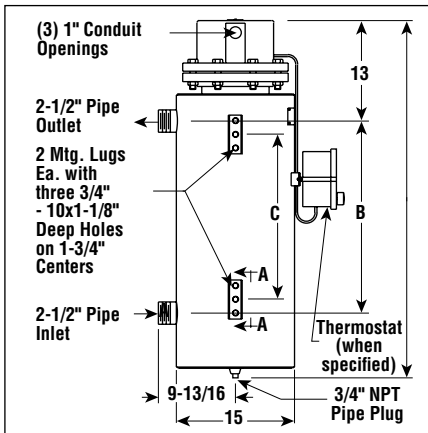
# MEDIUM, HEAVY AND FUEL OIL APPLICATIONS

## NWHOR & NWHORB Series

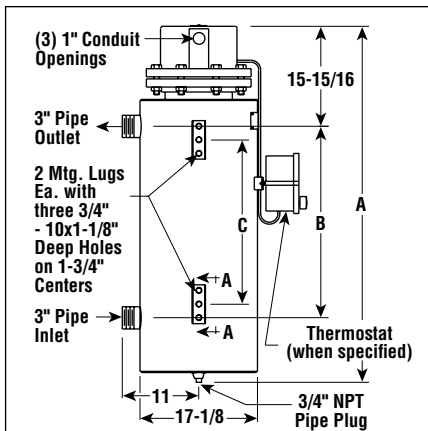
Dimensions (Inches)  
NWHO-06



NWHOR-18



NWHOR-27



**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)								
kW	Volts	Ckt & Phase	Dimensions (in)			Model No.	Wt. (Lbs.)	
			A	B	C			
<b>Series 06 — 5", 150 lb carbon steel vessel — 6 steel elements (15 W/in<sup>2</sup>) with side mounted thermostat — 2 NPT pipe inlet and outlet</b>								
8	240	1-3	41 <sup>3</sup> / <sub>4</sub>	30	11 <sup>3</sup> / <sub>16</sub>	NWHOR-06-012P-E1/240	140	
8	480	1-3	41 <sup>3</sup> / <sub>4</sub>	30	11 <sup>3</sup> / <sub>16</sub>	NWHOR-06-012P-E1/480	140	
10	240	1-3	48 <sup>3</sup> / <sub>4</sub>	37	14 <sup>3</sup> / <sub>16</sub>	NWHOR-06-015P-E1/240	155	
10	480	1-3	48 <sup>3</sup> / <sub>4</sub>	37	14 <sup>3</sup> / <sub>16</sub>	NWHOR-06-015P-E1/480	155	
<b>Series 18 — 8", 150 lb carbon steel vessel — 18 steel elements (12 W/in<sup>2</sup>) — 2 1/2" NPT pipe inlet and outlet</b>								
20	240	3-3	53 <sup>3</sup> / <sub>4</sub>	32 <sup>1</sup> / <sub>16</sub>	29 <sup>3</sup> / <sub>16</sub>	NWHOR-18-020P-E1/240	450	
20	480	3-3	53 <sup>3</sup> / <sub>4</sub>	32 <sup>1</sup> / <sub>16</sub>	29 <sup>3</sup> / <sub>16</sub>	NWHOR-18-020P-E1/480	450	
25	240	3-3	60 <sup>3</sup> / <sub>4</sub>	39 <sup>1</sup> / <sub>16</sub>	36 <sup>3</sup> / <sub>16</sub>	NWHOR-18-025P-E1/240	500	
25	480	3-3	60 <sup>3</sup> / <sub>4</sub>	39 <sup>1</sup> / <sub>16</sub>	36 <sup>3</sup> / <sub>16</sub>	NWHOR-18-025P-E1/480	500	
30	240	3-3	67 <sup>7</sup> / <sub>16</sub>	47 <sup>7</sup> / <sub>16</sub>	43 <sup>7</sup> / <sub>16</sub>	NWHOR-18-030P-E1/240	565	
30	480	3-3	67 <sup>7</sup> / <sub>16</sub>	47 <sup>7</sup> / <sub>16</sub>	43 <sup>7</sup> / <sub>16</sub>	NWHOR-18-030P-E1/480	565	
35	240	3-3	77 <sup>7</sup> / <sub>16</sub>	56 <sup>1</sup> / <sub>16</sub>	53 <sup>3</sup> / <sub>16</sub>	NWHOR-18-035P-E1/240	650	
35	480	3-3	77 <sup>7</sup> / <sub>16</sub>	56 <sup>1</sup> / <sub>16</sub>	53 <sup>3</sup> / <sub>16</sub>	NWHOR-18-035P-E1/480	650	
40	240	3-3	86 <sup>3</sup> / <sub>16</sub>	65 <sup>1</sup> / <sub>16</sub>	62 <sup>3</sup> / <sub>16</sub>	NWHOR-18-040P-E1/240	725	
40	480	3-3	86 <sup>3</sup> / <sub>16</sub>	65 <sup>1</sup> / <sub>16</sub>	62 <sup>3</sup> / <sub>16</sub>	NWHOR-18-040P-E1/480	725	
45	240	3-3	96 <sup>3</sup> / <sub>16</sub>	75 <sup>1</sup> / <sub>16</sub>	72 <sup>3</sup> / <sub>16</sub>	NWHOR-18-045P-E1/240	815	
45	480	3-3	96 <sup>3</sup> / <sub>16</sub>	75 <sup>1</sup> / <sub>16</sub>	72 <sup>3</sup> / <sub>16</sub>	NWHOR-18-045P-E1/480	815	
<b>Series 27 — 10", 150 lb carbon steel vessel — 27 steel elements (12 W/in<sup>2</sup>) — 3 NPT pipe inlet and outlet</b>								
50	240	3-3	77 <sup>9</sup> / <sub>16</sub>	52	48 <sup>1</sup> / <sub>2</sub>	NWHOR-27-050P-E1/240	730	
50	480	3-3	77 <sup>9</sup> / <sub>16</sub>	52	48 <sup>1</sup> / <sub>2</sub>	NWHOR-27-050P-E1/480	730	
60	240	3-3	87 <sup>9</sup> / <sub>16</sub>	62	58 <sup>1</sup> / <sub>2</sub>	NWHOR-27-060P-E1/240	750	
60	480	3-3	87 <sup>9</sup> / <sub>16</sub>	62	58 <sup>1</sup> / <sub>2</sub>	NWHOR-27-060P-E1/480	750	
70	240	3-3	97 <sup>9</sup> / <sub>16</sub>	72	68 <sup>1</sup> / <sub>2</sub>	NWHOR-27-070P-E1/240	770	
70	480	3-3	97 <sup>9</sup> / <sub>16</sub>	72	68 <sup>1</sup> / <sub>2</sub>	NWHOR-27-070P-E1/480	770	
<b>Series 45 — 14", 150 lb carbon steel vessel — 45 steel elements (15 W/in<sup>2</sup>) — 6" flanged pipe inlet and outlet</b>								
90	480	3-3	76	57 <sup>3</sup> / <sub>16</sub>	66 <sup>1</sup> / <sub>16</sub>	NWHOR-45-090P-E1/480	830	
125	480	3-3	91	72 <sup>3</sup> / <sub>16</sub>	81 <sup>1</sup> / <sub>16</sub>	NWHOR-45-125P-E1/480	960	
150	480	3-3	106	87 <sup>3</sup> / <sub>16</sub>	96 <sup>1</sup> / <sub>16</sub>	NWHOR-45-150P-E1/480	1080	
175	480	3-3	121	102 <sup>3</sup> / <sub>16</sub>	111 <sup>1</sup> / <sub>16</sub>	NWHOR-45-175P-E1/480	1200	
200	480	3-3	128 <sup>1</sup> / <sub>2</sub>	109 <sup>1</sup> / <sub>16</sub>	119 <sup>1</sup> / <sub>16</sub>	NWHOR-45-200P-E1/480	1320	

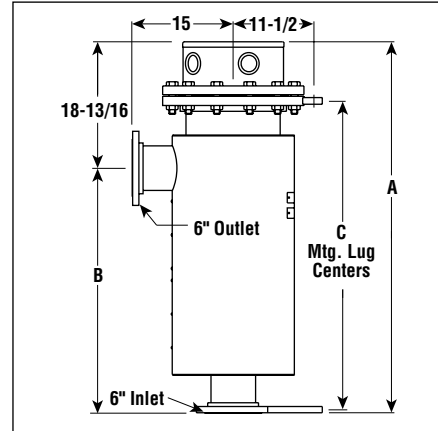
Ordering Example: NWHOR-18-030P-E1/240 is a 30 kW, 240 Volt Heater.

Note — Refer to the Controls section for side mounted controls or control panels.

# HEAVY & FUEL OIL APPLICATIONS (BAFFLED)

## NWHOR & NWHORB Series

Dimensions (Inches)  
NWHOR-45

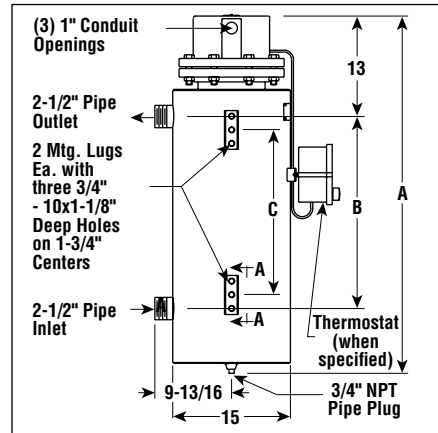


**To Order (Specify Model Number)** **MOST POPULAR ITEMS HIGHLIGHTED**

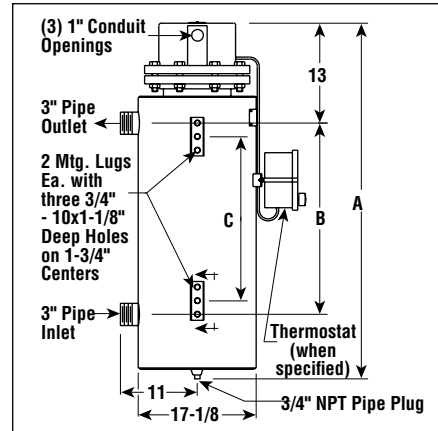
kW	Volts	Ckt & Phase	Dimensions (In.)			Model No.	Wt. (Lbs.)
			A	B	C		
<b>Series 18 — 8 inch 150 lb carbon steel vessel — 18 baffled steel elements (12 W/In<sup>2</sup>) — 2 1/2" NPT pipe inlet and outlet</b>							
20	240	3-3	53 3/4	32 1/16	29 3/16	NWHORB-18-020P-E1/240	456
20	480	3-3	53 3/4	32 1/16	29 3/16	NWHORB-18-020P-E1/480	456
25	240	3-3	60 3/4	39 1/16	36 3/16	NWHORB-18-025P-E1/240	506
25	480	3-3	60 3/4	39 1/16	36 3/16	NWHORB-18-025P-E1/480	506
30	240	3-3	67 3/8	47 3/16	43 1/16	NWHORB-18-030P-E1/240	571
30	480	3-3	67 3/8	47 3/16	43 1/16	NWHORB-18-030P-E1/480	571
35	240	3-3	77 3/8	56 19/16	53 3/16	NWHORB-18-035P-E1/240	656
35	480	3-3	77 3/8	56 19/16	53 3/16	NWHORB-18-035P-E1/480	656
40	240	3-3	86 3/8	65 3/16	62 3/16	NWHORB-18-040P-E1/240	731
40	480	3-3	86 3/8	65 3/16	62 3/16	NWHORB-18-040P-E1/480	731
45	240	3-3	96 3/8	75 3/16	72 3/16	NWHORB-18-045P-E1/240	821
45	480	3-3	96 3/8	75 3/16	72 3/16	NWHORB-18-045P-E1/480	821
<b>Series 27 — 10 inch, 150 lb carbon steel vessel — 27 baffled steel elements (12 W/In<sup>2</sup>) — 3" NPT pipe inlet and outlet</b>							
50	240	3-3	77 3/16	52	48 1/2	NWHORB-27-080P-E1/240	736
50	480	3-3	77 3/16	52	48 1/2	NWHORB-27-080P-E1/480	736
60	240	3-3	87 3/16	62	58 1/2	NWHORB-27-090P-E1/240	756
60	480	3-3	87 3/16	62	58 1/2	NWHORB-27-090P-E1/480	756
70	240	3-3	97 3/16	72	68 1/2	NWHORB-27-100P-E1/240	776
70	480	3-3	97 3/16	72	68 1/2	NWHORB-27-100P-E1/480	776

Ordering Example: NWHORB-18-035P-E1/240 is a 35 kW, 240 Volt Heater.  
Note — Refer to the Controls section for side mounted controls or control panels.

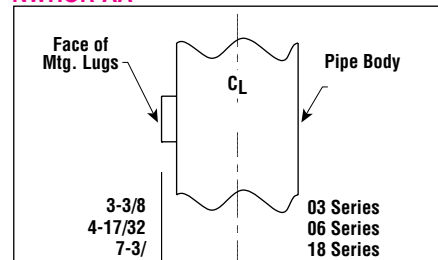
NWHORB-18



NWHORB-27



NWHOR-AA



**Ordering Information**  
To Order — Complete the Model Number using the Matrix provided.

Model	Medium, Heavy and Fuel Oil
NWHOR	Oil Circulation Heater
	Low Watt Density Elements
RB	Internal Baffles
Code	Number of Elements
03	Three
06	Six
18	Eighteen
Code	kW
003P	3
004P	4
006P	6
008P	8
010P	10
012P	12
020P	20
025P	25
030P	30
035P	35
040P	40
045P	45
050P	50
060P	60
070P	70
090P	90
125P	125
150P	150
175P	175
200P	200
018P	18
Code	Terminal Enclosure
E1	General Purpose
E2	Moisture Resistant/Explosion Resistant
E3	Explosion Resistant
E4	Moisture Resistant
NWHORB 18	030P E1
Typical Model Number	

# LIGHT AND MEDIUM WEIGHT OIL APPLICATIONS

## NWHO/NWHOB Series

- ✓ 3 to 10" ANSI Blind Flange Design
- ✓ 3 to 10" Carbon Steel Pipe Body, 150 Lb Construction
- ✓ 3 to 120 kW
- ✓ 240 and 480V, 1 and 3 Phase
- ✓ General Purpose, Moisture Resistant/Explosion Resistant, Explosion Resistant or Moisture Resistant Terminal Enclosure
- ✓ 0.475" Dia. Steel Sheath Elements (20 to 23 W/in<sup>2</sup>)
- ✓ With and Without Side Mounted AR Thermostat (200 to 550°F)
- ✓ UL, CSA and Other Third Party Approval, Listing or Certification Available

## APPLICATIONS

**Light and Medium Weight Oil:** Temperature maintenance and heating of heat transfer oils. Improve flow ability of medium weight oils.

## FEATURES

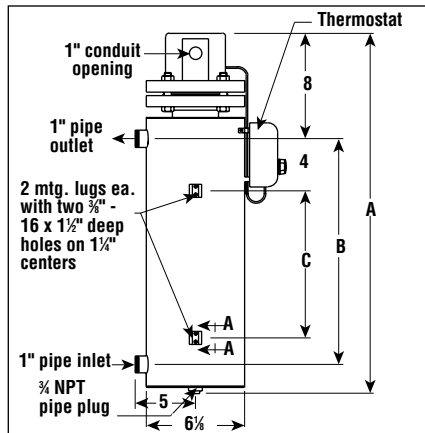
### Terminal Enclosure:

E1 General Purpose is standard. E2 Moisture Resistant/Explosion Resistant, E3 Explosion Resistant or E4 Moisture Resistant Enclosures available.

**Elements:** 0.475" diameter steel sheath elements.

**Flange:** 3 to 10" ANSI B-16.5 Blind flange with 1/2" thermowell for thermostat bulb and a 1/2 NPT threaded opening for a thermocouple or RTD.

Dimensions: in  
NWHO-03



Note: Add 2" to A dimension for E2 enclosure.

**Vessel:** Pipe body and nozzles are ASTM A53B carbon steel pipe. The end disk is ASTM A516 Grade 70 carbon steel plate. Provided with thermal insulation and painted sheet metal jacket.

**Wiring:** Convenient field wiring terminals are provided for easy installation.

**Controls:** Series 3 and 6 stock and assembly stock heaters come equipped with side mounted thermostat. Series 18 and 27 are furnished without thermostat.



NWHO-03-003P-E1/240 shown smaller than actual size.

**WARNING:** Hazard of Fire. These devices function as temperature controls only. Because they do not fail-safe, an approved temperature and/or pressure safety control must be used for safe operation. Consult Controls online.

To Order							
kW	Volts	Ckt & Phase	Dimensions: in			Model No.	Wt. lb
			A	B	C		
<b>Series 03—3", 150 lb Carbon Steel Vessel—3 Steel Elements (23 W/in<sup>2</sup>) with Side Mounted Thermostat—1 NPT Pipe Inlet and Outlet</b>							
3	240	1-1	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHO-03-003P-E1/240	70
3	240	1-3	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHO-03-003P-E1/240/3P	70
3	480	1-1	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHO-03-003P-E1/480	70
3	480	1-3	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHO-03-003P-E1/480/3P	70
4.5	240	1-1	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHO-03-04P5-E1/240	70
4.5	240	1-3	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHO-03-04P5-E1/240/3P	70
4.5	480	1-1	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHO-03-04P5-E1/480	70
4.5	480	1-3	32 <sup>15</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWHO-03-04P5-E1/480/3P	70
6	240	1-1	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHO-03-006P-E1/240	80
6	240	1-3	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHO-03-006P-E1/240/3P	80
6	480	1-1	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHO-03-006P-E1/480	80
6	480	1-3	42 <sup>15</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWHO-03-006P-E1/480/3P	80
7.5	480	1-1	55 <sup>7</sup> / <sub>16</sub>	45	39	NWHO-03-07P5-E1/480	94
7.5	480	1-3	55 <sup>7</sup> / <sub>16</sub>	45	39	NWHO-03-07P5-E1/480/3P	94
9	240	1-1	55 <sup>7</sup> / <sub>16</sub>	45	39	NWHO-03-009P-E1/240	94
9	240	1-3	55 <sup>7</sup> / <sub>16</sub>	45	39	NWHO-03-009P-E1/240/3P	94
9	480	1-1	55 <sup>7</sup> / <sub>16</sub>	45	39	NWHO-03-009P-E1/480	94
9	480	1-3	55 <sup>7</sup> / <sub>16</sub>	45	39	NWHO-03-009P-E1/480/3P	94

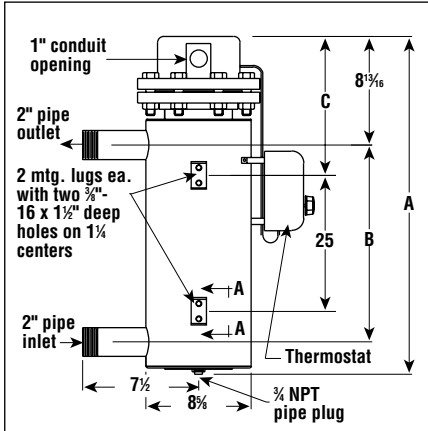
Ordering Examples: NWHO-03-04P5-E1/480/3P, 4.5 kWt, 3-phase 480V heater. NWHO-03-009P-E1/480, 9 kW, 1-phase 480V heater.



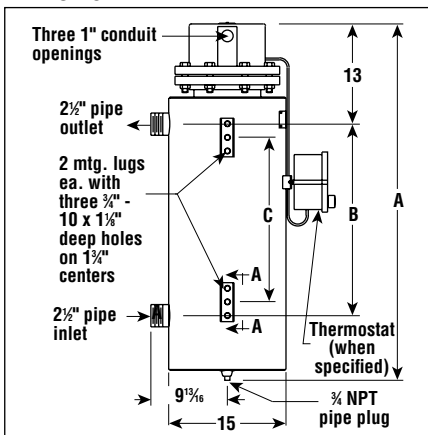
# LIGHT AND MEDIUM WEIGHT OIL APPLICATIONS

## NWHO/NWHOB Series

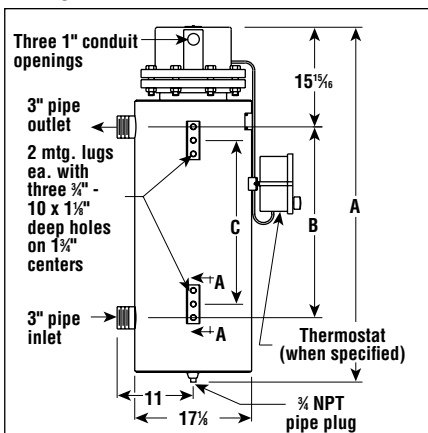
Dimensions: in, NWHO-06



NWHO-18



NWHO-27



NWHO-18-030P-E1/240 shown smaller than actual size.

## To Order

kW	Volts	Ckt & Phase	Dimensions: in			Model No.	Wt. lb
			A	B	C		
<b>Series 06—5", 150 lb Carbon Steel Vessel—6 Steel Elements (23 W/in<sup>2</sup>) with Side Mounted Thermostat—2 NPT Pipe Inlet and Outlet</b>							
12	240	1-3	41 3/4	30	11 1/8	NWHO-06-012P-E1/240	140
12	480	1-3	41 3/4	30	11 1/8	NWHO-06-012P-E1/480	140
15	240	1-3	48 3/4	37	14 1/8	NWHO-06-015P-E1/240	155
15	480	1-3	48 3/4	37	14 1/8	NWHO-06-015P-E1/480	155
20	240	2-3	60 1/4	48 1/2	20 3/8	NWHO-06-020P-E1/240/2C	176
20	480	1-3	60 1/4	48 1/2	20 3/8	NWHO-06-020P-E1/480	176
25	480	2-3	73 3/8	61 1/8	27 1/8	NWHO-06-025P-E1/480/2C	212
25	480	1-3	73 3/8	61 1/8	27 1/8	NWHO-06-025P-E1/480	212
30	480	2-3	86 3/8	74 3/8	33 1/8	NWHO-06-030P-E1/480/2C	240
30	480	1-3	86 3/8	74 3/8	33 1/8	NWHO-06-030P-E1/480	240
<b>Series 18—8", 150 lb Carbon Steel Vessel—18 Steel Elements (20 W/in<sup>2</sup>)—2 1/2" NPT Pipe Inlet and Outlet</b>							
30	240	3-3	53 1/4	32 1/16	29 3/16	NWHO-18-030P-E1/240	360
30	480	3-3	53 1/4	32 1/16	29 3/16	NWHO-18-030P-E1/480	360
40	240	3-3	60 1/4	39 1/16	36 3/16	NWHO-18-040P-E1/240	436
40	480	3-3	60 1/4	39 1/16	36 3/16	NWHO-18-040P-E1/480	436
50	240	3-3	67 1/8	47 1/16	43 13/16	NWHO-18-050P-E1/240	500
50	480	3-3	67 1/8	47 1/16	43 13/16	NWHO-18-050P-E1/480	500
60	240	3-3	77 3/8	56 13/16	53 5/16	NWHO-18-060P-E1/240	600
60	480	3-3	77 3/8	56 13/16	53 5/16	NWHO-18-060P-E1/480	600
70	240	3-3	86 3/8	65 13/16	62 3/16	NWHO-18-070P-E1/240	660
70	480	3-3	86 3/8	65 13/16	62 3/16	NWHO-18-070P-E1/480	660
80	240	3-3	96 3/8	75 13/16	72 3/16	NWHO-18-080P-E1/240	750
80	480	3-3	96 3/8	75 13/16	72 3/16	NWHO-18-080P-E1/480	750
<b>Series 27—10", 150 lb Carbon Steel Vessel—27 Steel Elements (20 W/in<sup>2</sup>)—3 NPT Pipe Inlet and Outlet</b>							
80	240	3-3	77 3/16	52	48 1/2	NWHO-27-080P-E1/240	720
80	480	3-3	77 3/16	52	48 1/2	NWHO-27-080P-E1/480	720
90	240	3-3	81 3/16	56	52 1/2	NWHO-27-090P-E1/240	735
90	480	3-3	81 3/16	56	52 1/2	NWHO-27-090P-E1/480	735
100	480	3-3	87 3/16	62	58 1/2	NWHO-27-100P-E1/480	750
120	480	3-3	97 3/16	72	68 1/2	NWHO-27-120P-E1/480	765

Note: Refer to the controls section for side mounted controls or control panels.

Ordering Examples: NWHO-18-060P-E1/240, 60 kW, 240V heater.

NWHO-06-012P-E1/240, 12 kW, 240V heater.

# LIGHT AND MEDIUM WEIGHT OIL APPLICATIONS

## NWHO/NWHOB Series

To Order							
kW	Volts	Ckt & Phase	Dimensions: in			Model No.	Wt. lb
			A	B	C		
<b>Series 18—8", 150 lb Carbon Steel Vessel—18 Baffled Steel Elements (20 W/in<sup>2</sup>)—2 1/2" NPT Pipe Inlet and Outlet</b>							
30	240	3-3	53 3/4	32 11/16	29 13/16	NWHOB-18-030P-E1/240	366
30	480	3-3	53 3/4	32 11/16	29 13/16	NWHOB-18-030P-E1/480	368
40	240	3-3	60 1/4	39 11/16	36 13/16	NWHOB-18-040P-E1/240	442
40	480	3-3	60 1/4	39 11/16	36 13/16	NWHOB-18-040P-E1/480	442
50	240	3-3	67 7/8	47 7/16	43 31/16	NWHOB-18-050P-E1/240	506
50	480	3-3	67 7/8	47 7/16	43 31/16	NWHOB-18-050P-E1/480	506
60	240	3-3	77 3/8	56 13/16	53 3/16	NWHOB-18-060P-E1/240	606
60	480	3-3	77 3/8	56 13/16	53 3/16	NWHOB-18-060P-E1/480	606
70	240	3-3	86 3/8	65 13/16	62 21/16	NWHOB-18-070P-E1/240	666
70	480	3-3	86 3/8	65 13/16	62 21/16	NWHOB-18-070P-E1/480	666
80	240	3-3	96 3/8	75 13/16	72 21/16	NWHOB-18-080P-E1/240	756
80	480	3-3	96 3/8	75 13/16	72 21/16	NWHOB-18-080P-E1/480	756
<b>Series 27—10", 150 lb Carbon Steel Vessel—27 Baffled Steel Elements (20 W/in<sup>2</sup>)—3 NPT Pipe Inlet and Outlet</b>							
80	240	3-3	77 7/16	52	48 1/2	NWHOB-27-080P-E1/240	726
80	480	3-3	77 7/16	52	48 1/2	NWHOB-27-080P-E1/480	726
90	240	3-3	81 1/16	56	52 1/2	NWHOB-27-090P-E1/240	741
90	480	3-3	81 1/16	56	52 1/2	NWHOB-27-090P-E1/480	741
100	480	3-3	87 7/16	62	58 1/2	NWHOB-27-100P-E1/480	756
120	480	3-3	97 7/16	72	68 1/2	NWHOB-27-120P-E1/480	771

**Note:** Refer to the controls section for side mounted controls or control panels.  
**Ordering Example:** NWHOB-18-060P-E1/240, 60 kW, 240V heater.

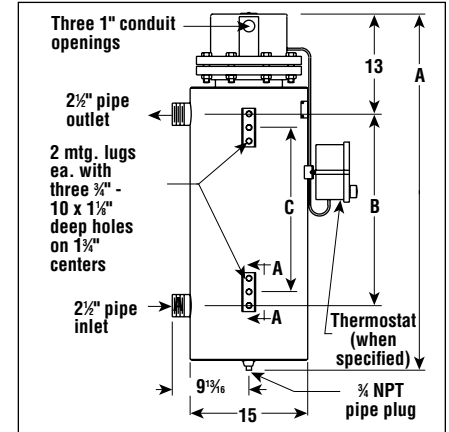
### Ordering Information:

To Order—  
 Complete the Model Number using the Matrix provided.

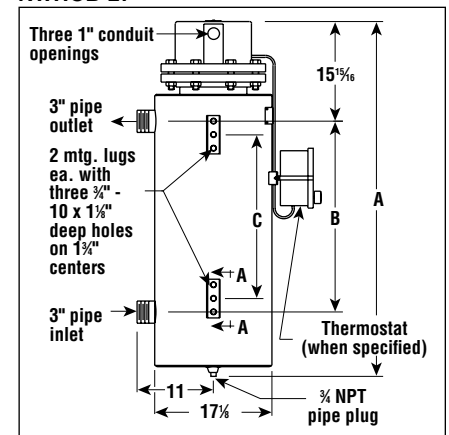
Model	Light and Medium Weight Oil
NWHO	Oil Circulation Heater
B	Internal Baffles
Code	Number of Elements
03	Three
06	Six
18	Eighteen
27	Twenty Seven
Code	kW
003P	3
04P5	4.5
006P	6
07P5	7.5
009P	9
012P	12
015P	15
020P	20
025P	25
030P	30
040P	40
050P	50
060P	60
070P	70
080P	80
090P	90
100P	100
120P	120
Code	Terminal Enclosure
E1	General Purpose
E2	Moisture Resistant/Explosion Resistant
E3	Explosion Resistant
E4	Moisture Resistant

NWHOB 18 030P E1 Typical Model Number

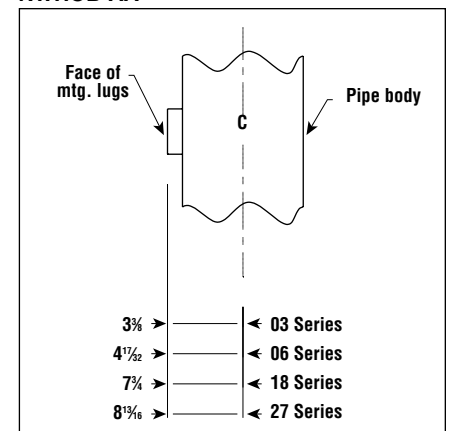
Dimensions: in  
 NWHOB-18



NWHOB-27



NWHOB-AA





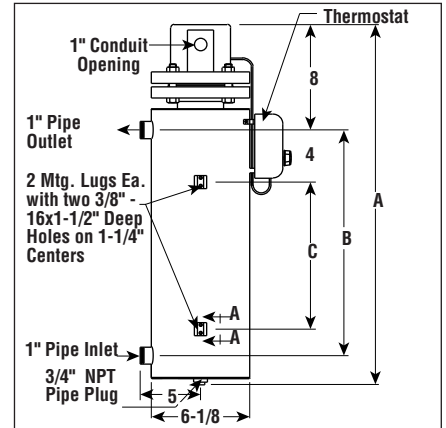
# CLEAN WATER APPLICATIONS

## NWH Series **DISCONTINUED**

- ✓ 3 - 14" ANSI Blind Flange Design
- ✓ 3 - 14" Galvanized Carbon Steel Pipe Body, 150 Lb Construction
- ✓ 6 - 500 kW
- ✓ 240 and 480V, 1 & 3 Phase
- ✓ General Purpose, Moisture Resistant/Explosion Resistant, Explosion Resistant or Moisture Resistant Terminal Enclosure
- ✓ 0.475" Dia. Copper Sheath Elements (45 - 50 W/In<sup>2</sup>)
- ✓ With & Without Side Mounted AR Thermostat (60 - 250°F)
- ✓ UL, CSA and Other Third Party Approval, Listing or Certification Available



Dimensions (Inches)



Note — Add 2" to A dimension for E2 enclosure.

# DISCONTINUED

### APPLICATIONS

**Clean Water Heating:** Higher kilowatt ratings and larger capacity tanks for industrial and commercial water heating applications.

### To Order (Specify Model Number)

### MOST POPULAR ITEMS HIGHLIGHTED

kW	Volts	Ckt & Phase	Dimensions (In.)			Model No.	Price	Wt. (Lbs.)
			A	B	C			
<b>Series 3 — 3 inch, 150 lb carbon steel vessel — 3 copper elements (45 W/In<sup>2</sup>) with side mounted thermostat — 1" NPT pipe inlet and outlet</b>								
6	240	1-1	32 <sup>1</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWH-03-006P-E1/240	\$1173	70
6	240	1-3	32 <sup>1</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWH-03-006P-E1/240/3P	1173	70
6	480	1-1	32 <sup>1</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWH-03-006P-E1/480	1173	70
6	480	1-3	32 <sup>1</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWH-03-006P-E1/480/3P	1173	70
9	240	1-1	32 <sup>1</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWH-03-009P-E1/240	1350	70
9	240	1-3	32 <sup>1</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWH-03-009P-E1/240/3P	1350	70
9	480	1-1	32 <sup>1</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWH-03-009P-E1/480	1350	70
9	480	1-3	32 <sup>1</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>2</sub>	16 <sup>1</sup> / <sub>2</sub>	NWH-03-009P-E1/480/3P	1350	70
12	240	1-1	42 <sup>1</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWH-03-012P-E1/240	1536	80
12	240	1-3	42 <sup>1</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWH-03-012P-E1/240/3P	1536	80
12	480	1-1	42 <sup>1</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWH-03-012P-E1/480	1536	80
12	480	1-3	42 <sup>1</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	NWH-03-012P-E1/480/3P	1536	80
15	240	1-1	55 <sup>1</sup> / <sub>16</sub>	45	39	NWH-03-015P-E1/240	1665	94
15	240	1-3	55 <sup>1</sup> / <sub>16</sub>	45	39	NWH-03-015P-E1/240/3P	1665	94
15	480	1-1	55 <sup>1</sup> / <sub>16</sub>	45	39	NWH-03-015P-E1/480	1665	94
15	480	1-3	55 <sup>1</sup> / <sub>16</sub>	45	39	NWH-03-015P-E1/480/3P	1665	94
18	240	1-1	55 <sup>1</sup> / <sub>16</sub>	45	39	NWH-03-018P-E1/240	1810	94
18	240	1-3	55 <sup>1</sup> / <sub>16</sub>	45	39	NWH-03-018P-E1/240/3P	1810	94
18	480	1-1	55 <sup>1</sup> / <sub>16</sub>	45	39	NWH-03-018P-E1/480	1810	94
18	480	1-3	55 <sup>1</sup> / <sub>16</sub>	45	39	NWH-03-018P-E1/480/3P	1810	94
<b>Series 6 — 5 inch, 150 lb carbon steel vessel — 6 copper elements (45 W/In<sup>2</sup>) with side mounted thermostat — 2" NPT pipe inlet and outlet</b>								
24	240	2-3	41 <sup>1</sup> / <sub>4</sub>	30	11 <sup>1</sup> / <sub>2</sub>	NWH-06-024P-E1/240	2888	140
24	480	1-3	41 <sup>1</sup> / <sub>4</sub>	30	11 <sup>1</sup> / <sub>2</sub>	NWH-06-024P-E1/480	2888	140
30	240	2-3	48 <sup>3</sup> / <sub>8</sub>	37	14 <sup>1</sup> / <sub>2</sub>	NWH-06-030P-E1/240	3177	155
30	480	1-3	48 <sup>3</sup> / <sub>8</sub>	37	14 <sup>1</sup> / <sub>2</sub>	NWH-06-030P-E1/480	3177	155
40	240	2-3	60 <sup>3</sup> / <sub>8</sub>	48 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub>	NWH-06-040P-E1/240	3723	176
40	480	2-3	60 <sup>3</sup> / <sub>8</sub>	48 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub>	NWH-06-040P-E1/480	3723	176
50	480	2-3	73 <sup>3</sup> / <sub>8</sub>	61 <sup>1</sup> / <sub>2</sub>	27 <sup>1</sup> / <sub>2</sub>	NWH-06-050P-E1/480	4632	210
60	480	2-3	86 <sup>3</sup> / <sub>8</sub>	74 <sup>1</sup> / <sub>2</sub>	33 <sup>1</sup> / <sub>2</sub>	NWH-06-060P-E1/480	4632	240

Ordering Example: NWH-03-015P-E1/240/3P is a 15 kW, 3 Phase, 240 Volt Heater, \$1665.

# CLEAN WATER APPLICATIONS

## NWH Series

To Order (Specify Model Number)

**MOST POPULAR  
ITEMS HIGHLIGHTED**

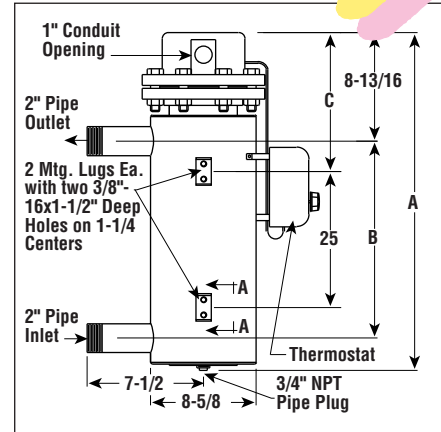
kW	Volts	Ckt & Phase	Dimensions (In.)			Model No.	Price	Wt. (Lbs.)
			A	B	C			
<b>Series 18 — 8 inch, 150 lb carbon steel vessel — 18 copper elements (50 W/in<sup>2</sup>) — 2 1/2" NPT pipe inlet and outlet</b>								
50	240	3-3	45 3/4	24 1/16	27 3/16	NWH-18-050P-E1/240	\$7548	396
50	480	3-3	45 3/4	24 1/16	27 3/16	NWH-18-050P-E1/480	7548	396
75	240	3-3	53 3/4	32 1/16	29 3/16	NWH-18-075P-E1/240	7852	414
75	480	3-3	53 3/4	32 1/16	29 3/16	NWH-18-075P-E1/480	7852	414
100	240	3-3	60 3/4	39 1/16	36 3/16	NWH-18-100P-E1/240	8246	425
100	480	3-3	60 3/4	39 1/16	36 3/16	NWH-18-100P-E1/480	8246	425
125	240	3-3	67 3/4	47 3/16	43 3/16	NWH-18-125P-E1/240	9167	470
125	480	3-3	67 3/4	47 3/16	43 3/16	NWH-18-125P-E1/480	9167	470
150	240	3-3	77 3/4	56 3/16	53 3/16	NWH-18-150P-E1/240	10,470	535
150	480	3-3	77 3/4	56 3/16	53 3/16	NWH-18-150P-E1/480	10,470	535
175	240	3-3	86 3/4	65 3/16	62 3/16	NWH-18-175P-E1/240	11,609	625
175	480	3-3	86 3/4	65 3/16	62 3/16	NWH-18-175P-E1/480	11,609	625
200	240	3-3	96 3/4	75 3/16	72 3/16	NWH-18-200P-E1/240	12,696	705
200	480	3-3	96 3/4	75 3/16	72 3/16	NWH-18-200P-E1/480	12,696	705
<b>Series 45 — 14 inch, 150 lb carbon steel vessel — 45 copper elements (50 W/in<sup>2</sup>) — 6" flanged pipe inlet and outlet</b>								
250	480	3-3	68 1/2	49 1/16	59 3/16	NWH-45-250P-E1/480	16,853	830
300	480	3-3	76	57 3/16	66 1/16	NWH-45-300P-E1/480	17,133	960
350	480	3-3	83 1/2	64 1/16	74 3/16	NWH-45-350P-E1/480	17,494	1,090
400	480	3-3	91	72 3/16	81 1/16	NWH-45-400P-E1/480	17,920	1,220
450	480	3-3	98 1/2	79 3/16	89 3/16	NWH-45-450P-E1/480	18,356	1,350
500	480	3-3	106	87 3/16	96 1/16	NWH-45-500P-E1/480	18,781	1,480

Ordering Example: NWH-18-175P-E1/240 is a 175 kW, 240 Volt Heater, \$11,609.  
 Note — Refer to the Controls section for side mounted controls or control panels.

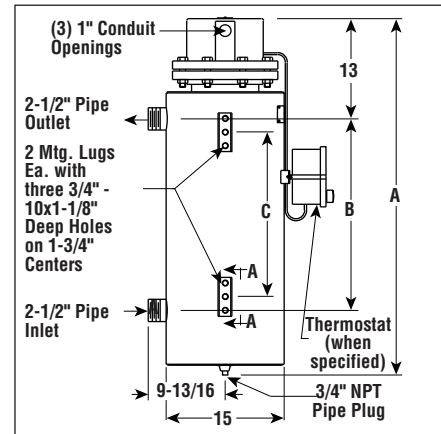
**Ordering Information**  
 To Order — Complete the Model Number using the Matrix provided.

Model	Clean Water
NWH	Water Circulation Heater
	<b>Code</b> <b>Number of Elements</b>
	03    Three
	06    Six
	18    Eighteen
	45    Forty Five
	<b>Code</b> <b>kW</b>
	024P    24      075P    75      300P    300
	030P    30      100P    100     350P    350
	040P    40      125P    125     400P    400
	050P    50      200P    200     450P    450
	060P    60      250P    250     500P    500
	<b>Code</b> <b>Terminal Enclosure</b>
	E1    General Purpose
	E2    Moisture Resistant/Explosion Resistant
	E3    Explosion Resistant
	E4    Moisture Resistant
NWH	06    024P    E1    Typical Model Number

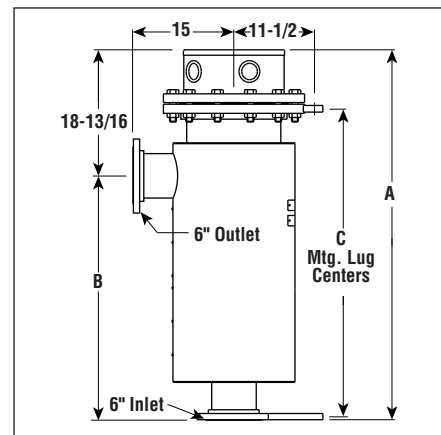
Dimensions (Inches)  
NWH-6



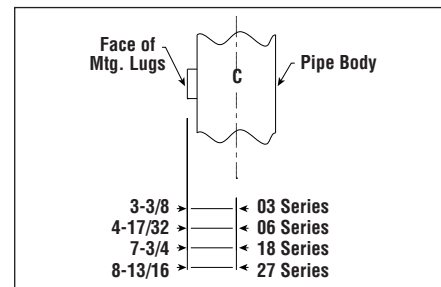
NWH-18



NWH-45



NWH-AA





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### • Temperature

Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

### • pH and Conductivity

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

### • Data Acquisition

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# FINNED STRIP HEATERS

## For Fast Heat Transfer

### OTF Series



- ✓ Rugged, Reliable, Premium Quality
- ✓ 250 to 4150 W
- ✓ 1½" (3.8 cm) Strip [with Fins 2" (5 cm) Wide]
- ✓ Maximum Work Temperature from 225 to 565°F
- ✓ Available with Either Rust-Resisting Iron or Chrome Steel Sheath

### FEATURES

**Durability** is assured by rugged OMEGALUX® strip heater with lock-on aluminized steel fins

**Fast heat transfer** to air from large finned area.

**Large selection** of lengths, wattage and watt densities.

### UL Component Recognized

Finned elements (exclusive construction). High-quality, coiled nickel-chrome resistor wire is uniformly spaced over the width and length of the finned strip element, then embedded in high-grade refractory material which both insulates the wire and transfers heat rapidly. The refractory is then compressed to rock hardness and maximum density under tremendous hydraulic pressure to improve heat transfer from coil to sheath. Elements are oven baked at high temperatures to semi-vitrify and mature the refractory. Sheath material is either rust-resisting iron or chrome steel. Fins of aluminized steel are provided to improve that transfer to the air. Elements are individually replaceable.



### APPLICATION

- ✓ For mounting across air stream within forced air ducts
- ✓ For use in dryers, ovens and other process air heating equipment
- ✓ For comfort heating applications, principally ducts, load banks and humidity controls
- ✓ A wide range of air blast and convection requirements can be accommodated by the wide range of lengths, wattages and watt densities available

OTF-106/120 shown smaller than actual size.

### To Order

Rust-Resisting Iron Sheath for Sheath Temperatures to 750°F Maximum

Watts	W/ln2†	Dimension: Inches (cm)			Model No.	Weight lb (kg)
		A	B	F		
250	10	10½ (27)	9½ (24)	6 (15)	OTF-102/*	2 (0.9)
350	15	10½ (27)	9½ (24)	6 (15)	OTF-103/*	2 (0.9)
600	25	10½ (27)	9½ (24)	6 (15)	OTF-106/*	2 (0.9)
500	17	12 (30)	11 (28)	7½ (19)	OTF-125/*	2 (0.9)
750	25	12 (30)	11 (28)	7½ (19)	OTF-127/*	2 (0.9)
250	8	12 (30)	11 (28)	7½ (19)	OTF-122/240	2 (0.9)
900	25	14 (36)	13 (33)	9½ (24)	OTF-149/*	2 (0.9)
500	15	14 (36)	13 (33)	9½ (24)	OTF-145/240	2 (0.9)
325	8	15¼ (39)	14¼ (36)	10¾ (27)	OTF-153/120	3 (1.4)
1000	25	15¼ (39)	14¼ (36)	10¾ (27)	OTF-151/*	3 (1.4)
500	10	17⅞ (46)	16⅞ (43)	13¾ (34)	OTF-185/*	3 (1.4)
1000	19	17⅞ (46)	16⅞ (43)	13¾ (34)	OTF-181/*	3 (1.4)
1300	25	17⅞ (46)	16⅞ (43)	13¾ (34)	OTF-182/*	3 (1.4)
1000	18	19½ (50)	18½ (47)	15 (38)	OTF-191/240	3 (1.4)
1500	25	19½ (50)	18½ (47)	15 (38)	OTF-192/*	3 (1.4)
1000	16	21 (53)	20 (51)	16½ (42)	OTF-211/240	3 (1.4)
1550	25	21 (53)	20 (51)	16½ (42)	OTF-212/240	3 (1.4)
750	10	23¾ (60)	22¾ (58)	19¼ (49)	OTF-247/240	4 (1.8)
1000	14	23¾ (60)	22¾ (58)	19¼ (49)	OTF-241/240	4 (1.8)
1800	25	23¾ (60)	22¾ (58)	19¼ (49)	OTF-242/240	4 (1.8)
1250	16	25½ (65)	24½ (62)	21 (53)	OTF-251/240	4 (1.8)
2000	26	25½ (65)	24½ (62)	21 (53)	OTF-252/240	4 (1.8)
700	9	26¾ (68)	25¾ (65)	22¼ (57)	OTF-267/*	4 (1.8)
1350	17	26¾ (68)	25¾ (65)	22¼ (57)	OTF-261/240	4 (1.8)
2000	24	26¾ (68)	25¾ (65)	22¼ (57)	OTF-262/240	4 (1.8)
1500	17	30½ (77)	29⅞ (75)	25 (64)	OTF-301/240	4 (1.8)
2350	26	30½ (77)	29⅞ (75)	25 (64)	OTF-302/240	4 (1.8)
1000	9	35⅞ (91)	34⅞ (89)	30⅞ (77)	OTF-361/240	5 (2.3)
1800	16	35⅞ (91)	34⅞ (89)	30⅞ (77)	OTF-363/240	5 (2.3)
2850	26	35⅞ (91)	34⅞ (89)	30⅞ (77)	OTF-362/240	5 (2.3)
2000	17	38½ (98)	37⅞ (89)	33 (84)	OTF-382/240	5 (2.3)
3100	26	38½ (98)	37⅞ (89)	33 (84)	OTF-383/*	5 (2.3)
3400	26	42½ (108)	41⅞ (106)	37 (94)	OTF-43/240	6 (2.7)

\* Specify voltage, insert "120" for 120 Vac or 240 for "240" Vac. Model numbers containing /120 or /240 are only available in that voltage.

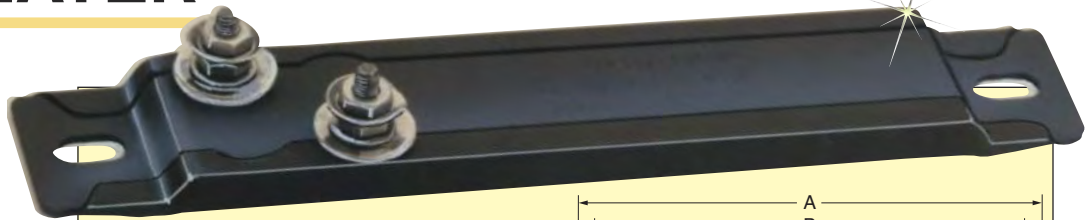
† To determine maximum allowable watt density.

Ordering Examples: OTF-127/120, finned strip heater 120 Vac.

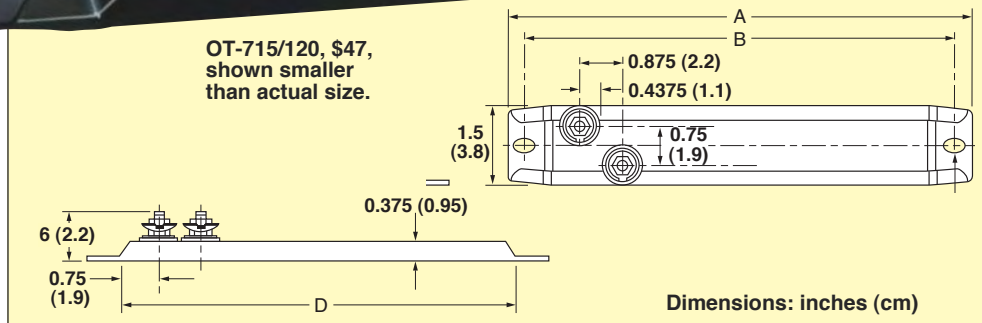
OTF-102/240, finned strip heater 240 Vac.

# STRIP HEATER

OT Series  
Starts at  
**\$47**



OT-715/120, \$47, shown smaller than actual size.



- ✓ 1½" (3.8 cm) Wide
- ✓ 2 Offset Bolt Terminals at One End
- ✓ Rugged, Reliable, Premium Quality
- ✓ UL Component Recognized and CSA Certified

**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

Dimensions: In (cm)		Rust-Resisting Iron Sheath					Chrome Steel Sheath				
A	B	D	Watts	W/in <sup>2</sup>	Model No.	Price	Watts	W/in <sup>2</sup>	Model No.	Price	Wt. lb (kg)
7½ (19)	6½ (17)	6 (15)	150	11	OT-715/*	\$47	200	15	OT-702/*	\$61	0.5 (.2)
8 (20)	7 (18)	6½ (17)	150	10	OT-815/*	49	250	17	OT-802/*	63	0.56 (.25)
8 (20)	7 (18)	6½ (17)	175	12	OT-817/*	49	400	27	OT-804/*	63	0.56 (.25)
10½ (27)	9½ (24)	9 (23)	250	10	OT-1025/*	50	350	15	OT-1003/*	67	0.75 (.34)
10½ (27)	9½ (24)	9 (23)	—	—	—	—	400	17	OT-1004/*	67	0.88 (.40)
12 (30)	11 (28)	10½ (27)	250	8	OT-1225/*	50	250	8	OT-1202/*	68	0.88 (.40)
12 (30)	11 (28)	10½ (27)	—	—	—	—	350	14	OT-1203/*	68	0.88 (.40)
12 (30)	11 (28)	10½ (27)	—	—	—	—	500	17	OT-1205/*	68	0.88 (.40)
14 (36)	13 (33)	12½ (32)	300	8	OT-1430/*	54	500	14	OT-1405/*	72	1.0 (.45)
15½ (39)	14¼ (36)	13¼ (35)	325	8	OT-1532/*	56	500	12	OT-1505/*	73	1.13 (.51)
17¼ (45)	16¼ (43)	16¼ (42)	350	6.5	OT-1835/*	56	500	10	OT-1805/*	78	1.38 (.63)
17¼ (45)	16¼ (43)	16¼ (42)	375	7	OT-1837/*	56	750	15	OT-1807/*	78	1.38 (.63)
17¼ (45)	16¼ (43)	16¼ (42)	500	10	OT-1850/*	56	1000	19	OT-1801/*	78	1.38 (.63)
19½ (50)	18½ (47)	18 (46)	350	6	OT-1935/*	56	500	9	OT-1905/*	82	1.5 (.68)
19½ (50)	18½ (47)	18 (46)	500	8	OT-1950/*	56	750	13.5	OT-1907/*	82	1.5 (.68)
19½ (50)	18½ (47)	18 (46)	—	—	—	—	1000	18	OT-1901/*	82	1.5 (.68)
21 (53)	20 (51)	19½ (50)	500	8	OT-2150/*	59	750	12	OT-2107/*	86	1.63 (.74)
23¼ (60)	22¼ (58)	22¼ (57)	500	7	OT-2450/*	61	500	7	OT-2405/*	90	1.81 (.82)
23¼ (60)	22¼ (58)	22¼ (57)	750	10	OT-2475/*	61	750	10	OT-2407/*	90	1.81 (.82)
23¼ (60)	22¼ (58)	22¼ (57)	—	—	—	—	1000	14	OT-2401/*	90	1.81 (.82)
23¼ (60)	22¼ (58)	22¼ (57)	—	—	—	—	1500	19	OT-2415/*	90	1.81 (.82)
25½ (65)	24½ (62)	24 (61)	500	6	OT-2550/*	63	750	9	OT-2507/*	91	2.06 (.93)
25½ (65)	24½ (62)	24 (61)	750	9	OT-2575/*	63	1000	13	OT-2501/*	91	2.0 (.91)
26¼ (68)	25¼ (65)	25¼ (64)	700	8	OT-2670/*	65	1000	12	OT-2601/*	93	2.19 (.99)
26¼ (68)	25¼ (65)	25¼ (64)	750	9	OT-2675/*	67	—	—	—	—	—
30½ (77)	29½ (75)	28 (71)	750	8	OT-3075/*	74	750	8	OT-3007/*	100	2.38 (1.1)
30½ (77)	29½ (75)	28 (71)	—	—	—	—	1000	11	OT-3001/*	100	2.38 (1.1)
30½ (77)	29½ (75)	28 (71)	—	—	—	—	1250	13	OT-3012/240	100	2.38 (1.1)
33½ (85)	32½ (82)	31 (79)	750	7	OT-3375/*	81	750	7	OT-3307/*	109	2.69 (1.2)
35½ (91)	34¼ (88)	33½ (85)	1000	9	OT-3610/*	85	1500	13	OT-3601/*	118	2.88 (1.3)
38½ (98)	37½ (95)	36 (92)	800	6	OT-3880/*	92	1000	8	OT-3801/*	122	3.19 (1.4)
38½ (98)	37½ (95)	36 (92)	1000	8	OT-3810/*	92	1500	12	OT-3815/*	122	3.19 (1.4)
42½ (108)	41¼ (105)	40 (102)	1250	9	OT-4312/*	101	1500	11	OT-4315/*	134	3.38 (1.5)
47¼ (122)	46¼ (119)	45¼ (115)	—	—	—	—	1350	9	OT-4813/240	181	3.75 (1.7)
47¼ (122)	46¼ (119)	45¼ (115)	—	—	—	—	2250	14	OT-4822/240	181	3.75 (1.7)

OMEGALUX® strip heaters are used principally for convection-type air heating and clamp-on installations. When selecting strip heaters for either, two important factors must be considered:

1. The proper sheath material for resisting any rusting and oxidizing inherent in the process or environment and for withstanding the sheath temperature required.
2. The watt density of the element, or watts per square inch of heated area. This should be low for heating asphalt, molasses and other thick substances with low heat transferability; it can be higher for heating air, metals and other heat-conducting materials.

## SPECIFICATIONS

**Max Sheath Temperature:**  
Iron: 399°C (750°F)

Chrome Steel: 649°C (1200°F)

**Sheath Material:**  
Iron or chrome steel

**Wattage Power:** Iron sheath, 150 to 1250 watts; Chrome steel sheath, 200 to 2250 watts

**Power Voltage:** 120 or 240 Vac

\* Designate voltage, i.e., 120 or 240 Vac. Insert "120" for 120 Vac, "240" for 240 Vac. Model numbers containing /240 are only available in that voltage. Additional strip heater models available with other widths and bolt configurations.

† To determine maximum allowable watt density, see figures C-8 or C-9 (page 80).

**Ordering Examples:** OT-815/120, strip heater with rust resisting iron sheath, 150 W, \$49.

OT-4312/240, strip heater with rust resisting iron sheath, 1250 W, \$101.



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Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

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Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

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Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

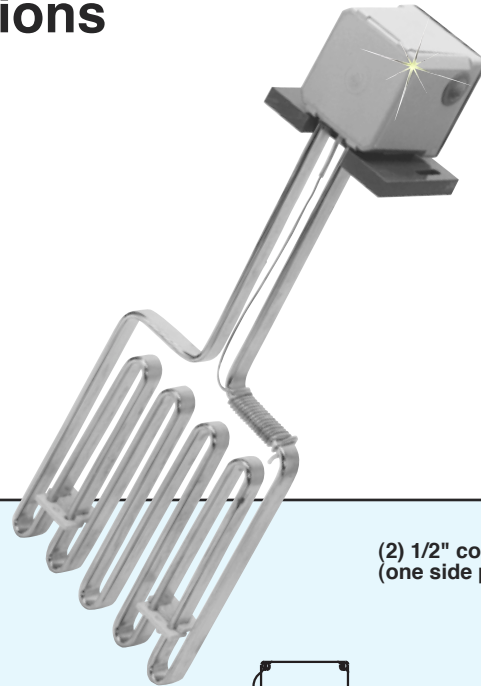
Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters



# OVER-THE-SIDE IMMERSION HEATERS

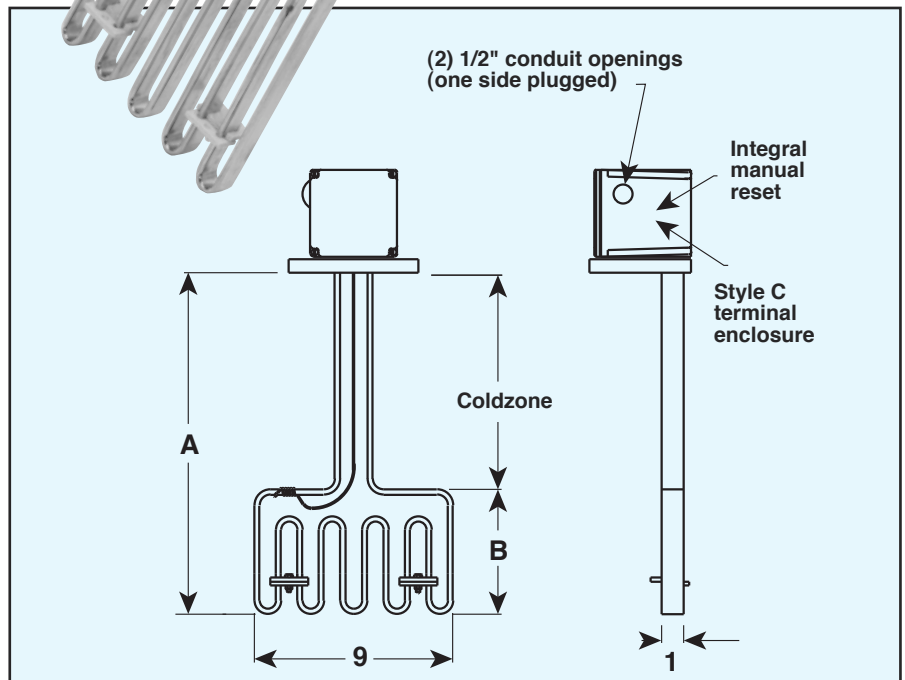
## For Corrosive Solutions

PTHF Series  
**\$500**  
 Basic Unit



PTHF-304, \$500, shown smaller than actual size.

- ✓ Corrosion Resistant
- ✓ Solutions up to 100°C (212°F)
- ✓ Thin Blade Heating Element
- ✓ 3 Phase Design
- ✓ Overtemperature Protection



### FEATURES

- **Thin Blade Heating Element**—304 Stainless Steel Electropolished surface.
- **3 phase, 20 W/in<sup>2</sup>**—provides long life service in many corrosive fluids.
- **Low Profile**—takes up less space in the tank.
- **Integral Over-Temperature Protection**—protects the heater against overheat conditions.
- **PVC Terminal Box and Mounting Plate**—protects wiring against corrosive fumes.
- **Lightweight**—easy to install

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)							
kW	Volts	Phase	Dimensions-in.		Model No.	Price	Wt. lbs
			A	B			
3	240	3	16	7	PTHF-302	\$500	7
3	480	3	16	7	PTHF-304	500	7
4	240	3	18	9	PTHF-402	550	8
4	480	3	18	9	PTHF-404	550	8
6	240	3	22	13	PTHF-602	650	9
6	480	3	22	13	PTHF-604	650	9
8	240	3	27	18	PTHF-802	750	10
8	480	3	27	18	PTHF-804	750	10
10	240	3	31	22	PTHF-1002	825	11
10	480	3	31	22	PTHF-1004	825	11

Note: B dimension is the heated section.

Ordering Example: PTHF-604, 480V, 3 phase immersion heater, \$650.

# HEAVY DUTY SOFT METAL HEATERS WITH CAST IRON SHEATH

CIT Series  
Starts at  
**\$975**

- 3 to 10 kW
- 240V, 1 Phase
- Used for Soft Metal Melting
- Rugged, Reliable
- Efficient Heat Transfer
- Three Configurations Available

## APPLICATIONS

Used with metals such as solder, lead tin, stereotype metals, and babbitt (with 4% or less copper content) which can be melted for top working temperatures of 950°F or less. Not suitable for immersion heating of zinc or aluminum.\*

## FEATURES

Maximum heavy duty construction. 0.475" steel sheath tubular elements are cast into heavy iron bodies. Terminal connections are protected against rough handling and spillage by fully enclosed cast iron terminal box.

Large heat output with good heat transfer and high resistance to overheating.

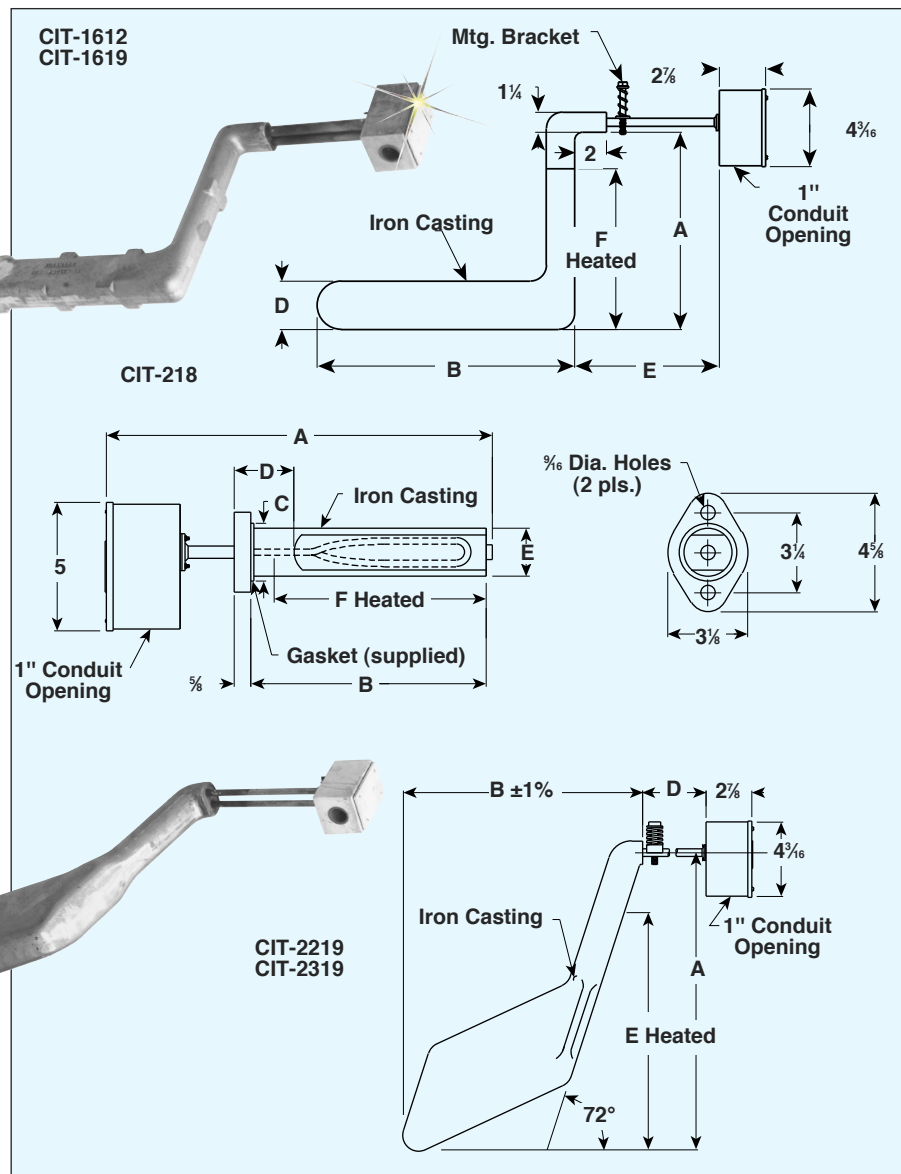
Easy to maintain. Simple to de-energize and remove for occasional pot cleaning or transfer to other melt pots.

Three configurations available including through-the-side mounting (CIT-218) and special stereotype metal melting design (CIT-2219 and CIT-2319).

Mounting flange and heater body are one casting in CIT-218 model. Cold ends of the element extend 2" beyond flange to terminal box.

Stereotype metal heaters CIT-2219 and CIT-2319 have combination of effective heating length, low watt density and shape which permits cold starts without damage to the heater. Also used with low-melt-point alloys.

\* Clamped on OMEGALUX® strip or tubular heaters are used in these applications.



**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)													
kW	Volts	Fig.	Dimensions-in.						Displace-Angle-in <sup>3</sup>	Model No.	Price	Wt. lb	
			A	B	C	D	E	F					
<b>Over-the-Side Mounting</b>													
5	240	A	12 1/4	16	2	3	9	10	—135	CIT-1612	\$1450	40	
5	240	A	19 1/4	16	2	3	6	17	—180	CIT-1619	1550	55	
<b>Through-the-Side Mounting</b>													
3	240	B	—	18	2 1/4	2 1/4	2	17 1/2	—57	CIT-218	\$975	22	
<b>Special Stereotype Design</b>													
5	240	C	18 1/2	12 1/2	3	—	6 1/2	14 1/2	72°—	CIT-2219	\$1500	51	
10	240	C	19	15 1/4	3/4	—	9	15	72°—	CIT-2319	2450	80	

Ordering Example: CIT-1612, 5 kW, 240V heater with a 3" diameter, \$1450.





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### • Temperature

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Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

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Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

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Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

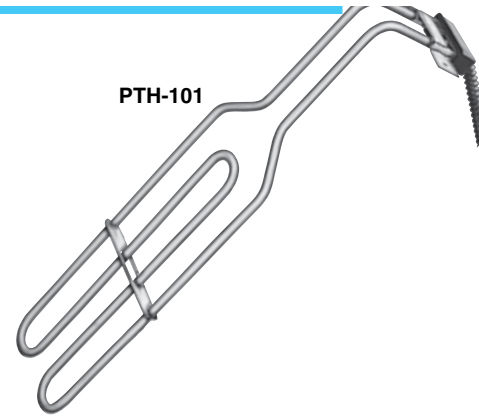
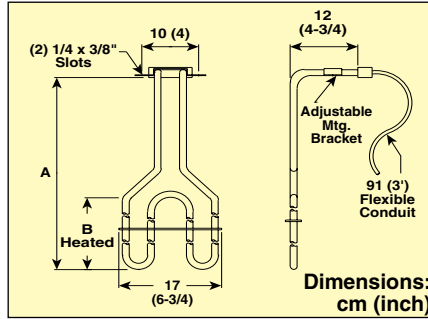
Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

## For Plating Tanks

### PTH Series

- Heavy-Duty
- Passivated 316 SS Sheath for Corrosive Environments
- Portable
- Vapor-Tight Terminal Enclosure
- Stocked for Fast Delivery

The PTH Series consists of heavy-duty, general purpose heaters for plating tanks, rinse tanks, and other tanks containing aqueous solutions. The 316 SS sheath is passivated, providing resistance to corrosion. These heaters are equipped with a vapor-tight terminal enclosure and a 3-foot-long, vinyl-covered flexible conduit containing the 2 power leads and a ground wire. The stainless steel mounting bracket can slide along the element, which makes installation easy.



### To Order

Model No.	kW	Volts	W/in <sup>2</sup>	Dimensions: cm (in)		Wt. kg (lb)
				A	B	
PTH-101	1	120	21	36 (14)	20 (8)	1.5 (4)
PTH-102	1	240	21	36 (14)	20 (8)	1.5 (4)
PTH-202	2	240	31	53 (21)	28 (11)	1.5 (4)
PTH-204	2	480	31	53 (21)	28 (11)	1.5 (4)
PTH-302	3	240	32	66 (26)	41 (16)	1.9 (5)
PTH-304	3	480	32	66 (26)	41 (16)	1.9 (5)
PTH-402	4	240	34	76 (30)	51 (20)	1.9 (5)
PTH-404	4	480	34	76 (30)	51 (20)	1.9 (5)
PTH-602	6	240	34	102 (40)	76 (30)	2.2 (6)
PTH-604	6	480	34	102 (40)	76 (30)	2.2 (6)
PTH-902	9	240	34	137 (54)	112 (44)	20 (8)
PTH-904	9	480	34	137 (54)	112 (44)	20 (8)

**Note:** Liquid level should be above B dimension. If used in solutions that develop a scale on the sheath, periodic cleaning is required. Also available in other sheath materials and electrical ratings. Contact Sales for price and delivery information.

**Ordering Examples:** PTH-101, 120V heater.  
 PTH-304, 480V heater.

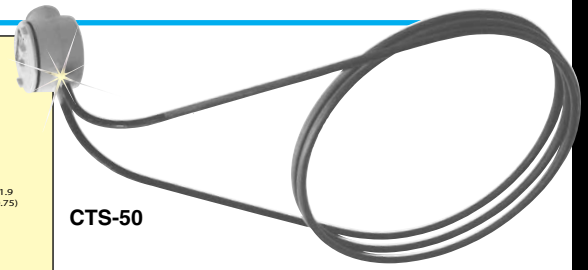
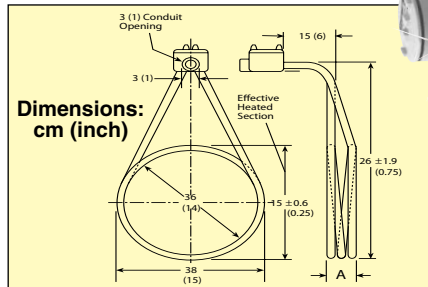
### CT Series

- Lightweight, Thin-Profile Heaters
- For Water and Corrosive Liquids
- Vapor-Tight Terminal Enclosure

The OMEGALUX® CT Series immersion heaters are made of tubular elements contained in a spiral loop to save space. Terminals are housed in a cast-alloy vapor-tight enclosure with a removable lid. These heaters are suitable for many applications, depending on the sheath material the user selects.

#### APPLICATION

Used to heat a variety of solutions depending upon the type of sheath material selected.



### To Order

Model No.	kW	Volts	W/in <sup>2</sup>	Dim: cm (in) A	Sheath	Wt. kg (lb)
CTS-50	5	240	25	5 (2)	Steel	7.5 (20)
CTS-75	7.5	240	40	5 (2)	Steel	7.5 (20)
CTC-50	5	240	25	5 (2)	Copper	7.5 (20)
CTC-75	7.5	240	40	5 (2)	Copper	7.5 (20)
CTSS-50	5	240	25	7 (2¾)	304 SS	7.5 (20)
CTSS-75	7.5	240	40	7 (2¾)	304 SS	7.5 (20)
CTT-50	5	240	44	4 (1½)	Titanium	7.5 (20)
CTT-75	7.5	240	44	6 (2½)	Titanium	7.5 (20)
CTAC-50	5	240	25	7 (2¾)	Carp. stainless #20*	7.5 (20)
CTAC-75	7.5	240	40	7 (2¾)	Carp. stainless #20*	7.5 (20)

\* Carpenter stainless number 20-CB-3.

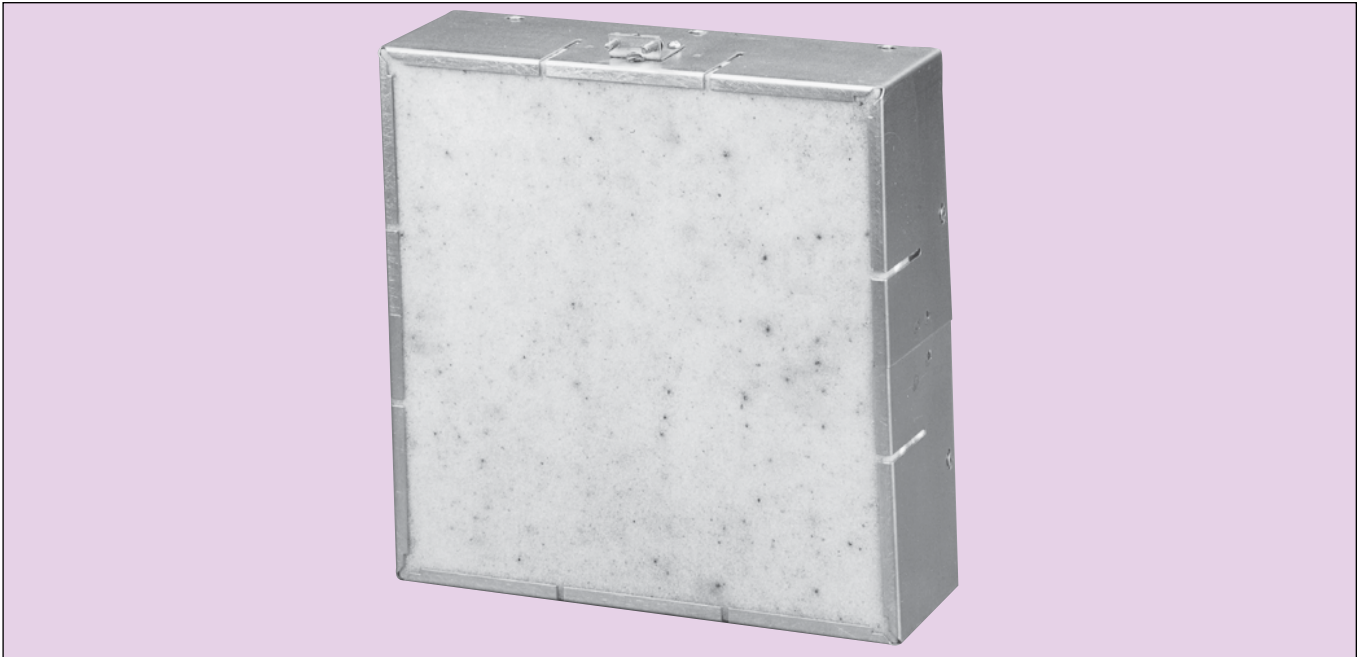
Also available with titanium sheath. Contact OMEGALUX® for availability.

**Ordering Examples:** CTS-50, 240V, steel sheath heater.

CTSS-75, 240V 304 SS sheath heater.

# HIGH WATT DENSITY, QUARTZ-FACED INFRARED RADIANT PANEL HEATERS

## QC and QH Series



- ✓ **High Watt Density**  
QC Series: 40 W/in<sup>2</sup>  
QH Series: 60 W/in<sup>2</sup>
- ✓ **High Temperature**  
1800°F (981°C)
- ✓ **High Purity Fused Quartz Glass Emitting Face**
- ✓ **Output Wavelength Between 2.5 and 6 Microns**
- ✓ **Heavy Gauge Aluminized Steel Housing**

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

### APPLICATIONS

- ✓ **Textile Drying**
- ✓ **Glass Processing**
- ✓ **Thermoforming**
- ✓ **Film Shrinking**
- ✓ **Powder Coating**
- ✓ **Paint Finishing**

OMEGALUX® QH and QC Series quartz infrared radiant panel heaters have the most powerful power output of any infrared panel heater available. They use a fused quartz glass face that is grooved to provide coil support. The QC series uses a 98% pure fused quartz and the QH series uses a 99% pure fused quartz face. This allows for watt densities up to 60 W/in<sup>2</sup> with a maximum temperature rating of 1800°F (981°C). The glass face is cleanable and can withstand great thermal shock. The housing is made of rugged aluminized steel with the electrical terminal housing on the back. Mounting studs for

easy installation are provided, allowing the heaters to be operated face up or down. An optional 476 cm (3/16") i.d. quartz thermowell is also available for use with type K thermocouples for temperature control. The best application for the QC and QH series heaters are where you have little space and need maximum power. They are made in building block sizes from 4 x 10" up to 12 x 12", many in dual voltage models to allow for extra flexibility in installation.

### SPECIFICATIONS

**Power:** 240 Vac, 240/480 Vac dual voltage, 1 phase

**Wattage:** 1600 to 8640 W

**Watt Density:**

**QC Series:** 40 W/in<sup>2</sup>

**QH Series:** 60 W/in<sup>2</sup>

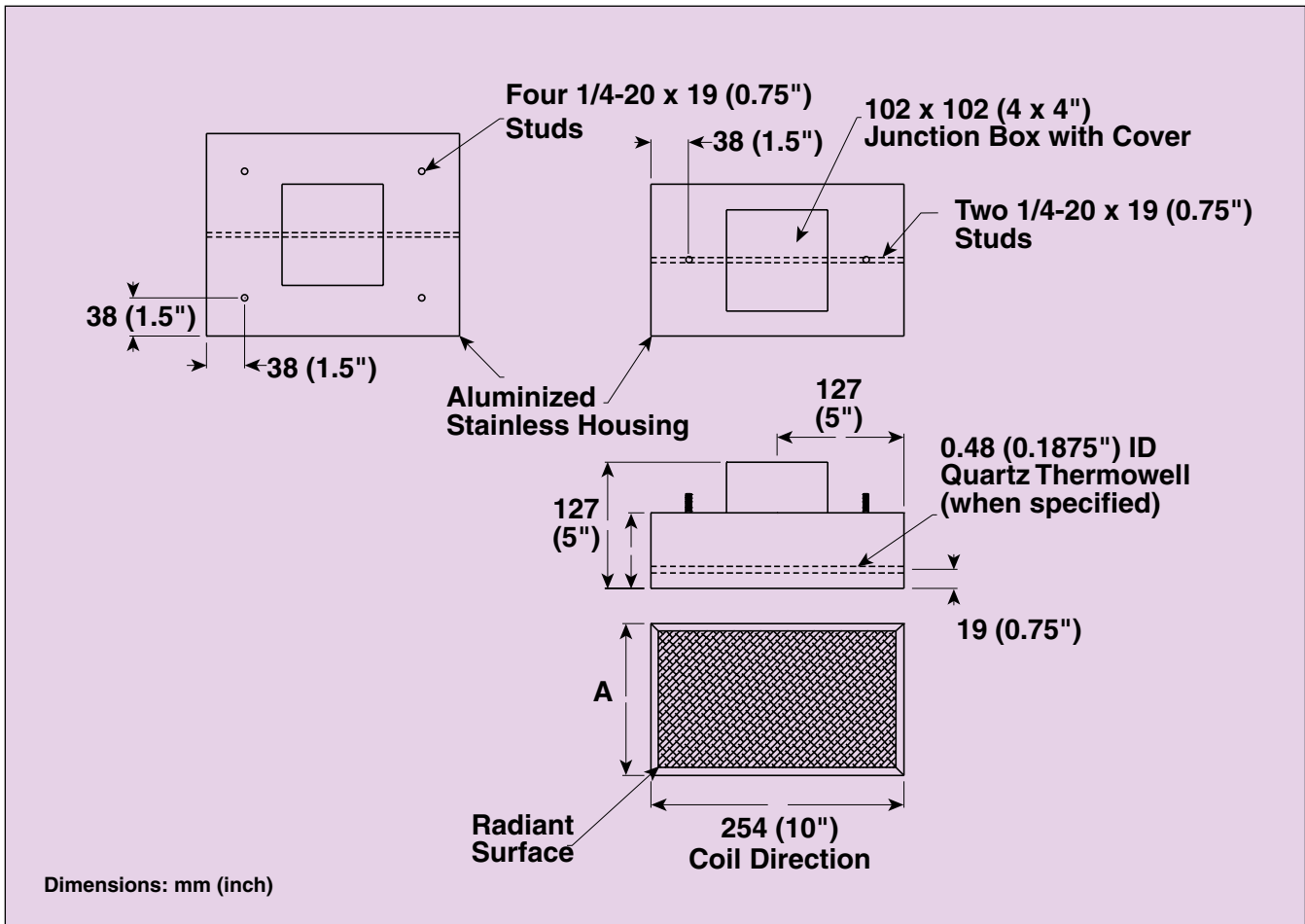
**Maximum Temperature Quartz Face:** 1800°F (981°C)

**Composition of Emitter Face:**

**QC series:** 98% pure fused quartz

**QH Series:** 99% pure fused quartz

**Housing:** aluminized steel



K

Width inch (cm)	Length inch (cm)	Wattage	Voltage	Phase	Without Thermowell Model No.	With Thermowell Model No.	Weight lb (kg)
<b>40 W/in<sup>2</sup> QC Series</b>							
4 (10)	10 (25)	1600	240	1	QC-041040	QC-041040-T	3 (1.4)
6 (15)	10 (25)	2400	240/480	1	QC-061040	QC-061040-T	4 (1.8)
8 (20)	10 (25)	3200	240/480	1	QC-081040	QC-081040-T	5.5 (2.5)
10 (25)	10 (25)	4000	240/480	1	QC-101040	QC-101040-T	7 (3.2)
12 (30)	10 (25)	4800	240/480	1	QC-121040	QC-121040-T	8.3 (3.8)
6 (15)	12 (30)	2880	240/480	1	QC-061240	QC-061240-T	5 (2.3)
12 (30)	12 (30)	5760	240/480	1	QC-121240	QC-121240-T	10 (4.5)
<b>60 W/in<sup>2</sup> QH Series</b>							
4 (10)	10 (25)	2400	240/480	1	QH-041060	QH-041060-T	3 (1.4)
6 (15)	10 (25)	3600	240/480	1	QH-061060	QH-061060-T	4 (1.8)
8 (20)	10 (25)	4800	240/480	1	QH-081060	QH-081060-T	5.5 (2.5)
10 (25)	10 (25)	6000	240/480	1	QH-101060	QH-101060-T	7 (3.2)
12 (30)	10 (25)	7200	240/480	1	QH-121060	QH-121060-T	8.3 (3.8)
6 (15)	12 (30)	4320	240/480	1	QH-061260	QH-061260-T	5 (2.3)
12 (30)	12 (30)	8640	240/480	1	QH-121260	QH-121260-T	10 (4.5)

Comes complete with electrical and mounting hardware, and operator's manual.

**Ordering Example:** QC-061040-T, 40 W/in<sup>2</sup>, 240 W, dual voltage 240/480 Vac heater with optional thermowell.

\*\* Thermowell accepts 3/16" diameter probes.

# HIGH TEMPERATURE CLOTH-FACED INFRARED PANEL HEATERS

## QF Series



- ✓ **870°C (1600°F) Maximum Operating Temperature**
- ✓ **Black Quartz Ceramic Cloth Face**
- ✓ **Output Wavelength Between 2.5 and 6 Microns**
- ✓ **No External Reflectors Required**

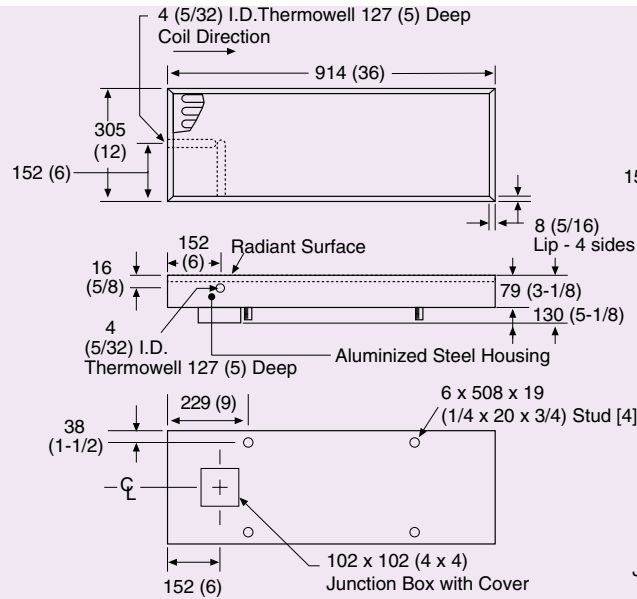
OMEGALUX™ QF Series heaters are very popular infrared panel heaters used in a wide variety of applications. The QF Series panel heaters' radiant surface is constructed through a patented process using bonded high temperature cloth quartz. A black coating is applied to the face of the heater for greater emissivity. A 2.5 cm (1") thick ceramic fiber refractory board is grooved out to support the precision resistance coils. The resistance coil is then housed into the grooved-out refractory board. A layer of durable, high temperature, cement is used to bond the quartz face to the resistance coils as well as to the refractory coil support. The resistance coils used are an iron/chromium/aluminum alloy which can operate up to 1315°C (2400°F). These are then welded to stainless terminals which are routed to the back of the heater for external electrical connections. The welding insures the best possible electrical path. By changing to stainless buss bars and terminals, the conductivity is increased, insuring less heat buildup in the terminals. The heater board is then backed up by a high temperature insulation to prevent back heat loss. Finally, this is all packaged in a sturdy aluminized steel frame.



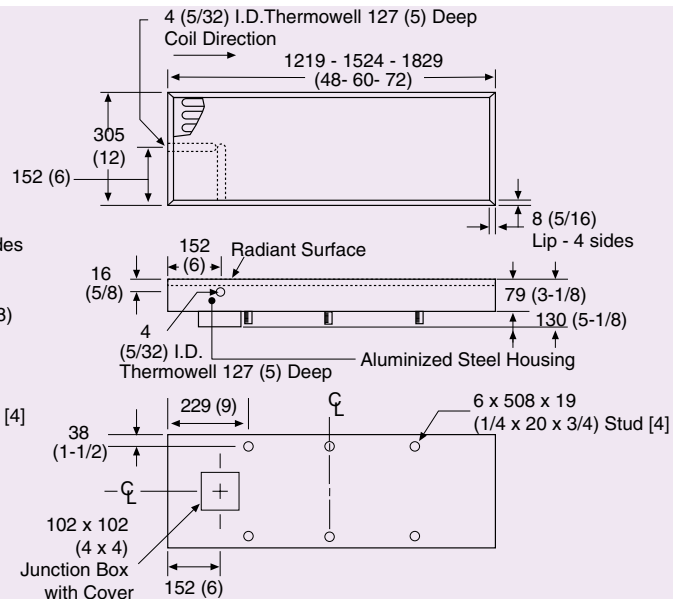
### CHOOSING THE RIGHT IR HEATER

Not all infrared heaters are alike. Here is a list of some of the most important questions to answer when determining which heater to choose.

1. **RESPONSE TIME:** How quickly do heaters need to reach operating temperature? IR heaters can reach operating temperatures as quickly as 2 seconds or take as long as 1 hour. Most take between 5 seconds and 10 minutes.
2. **POWER REQUIREMENTS:** What watt density (usually referred to as watts per square inch) is required?
3. **ENVIRONMENT:** What will the ambient temperature be? Will there be any flux, fibers, hazardous chemicals, or any other matter disturbing the environment?
4. **CONTROL METHOD:** IR heaters can be controlled one of two ways: 1 having the heaters on a percentage timer (open loop) and 2 through the use of a temperature control (closed
5. **PROCESS NEEDS:** Is it a conveyor, indexing, or a stationary process? Does the process call for a cleanable surface on the heater? Are zones in the individual heaters required? Compensation?
6. **APPLICATION PROCESS:** What exactly is the application? Are you trying to cure something? Melt something? Cook something, etc.?
7. **SPACE RESTRICTIONS:** Is space limited?



**Figure C**  
305 W x 914 mm L  
(12" x 36")



**Figure D**  
305 W x 1219, 1524 or 1829 mm L  
(12" x 48", 60" or 72")

## To Order

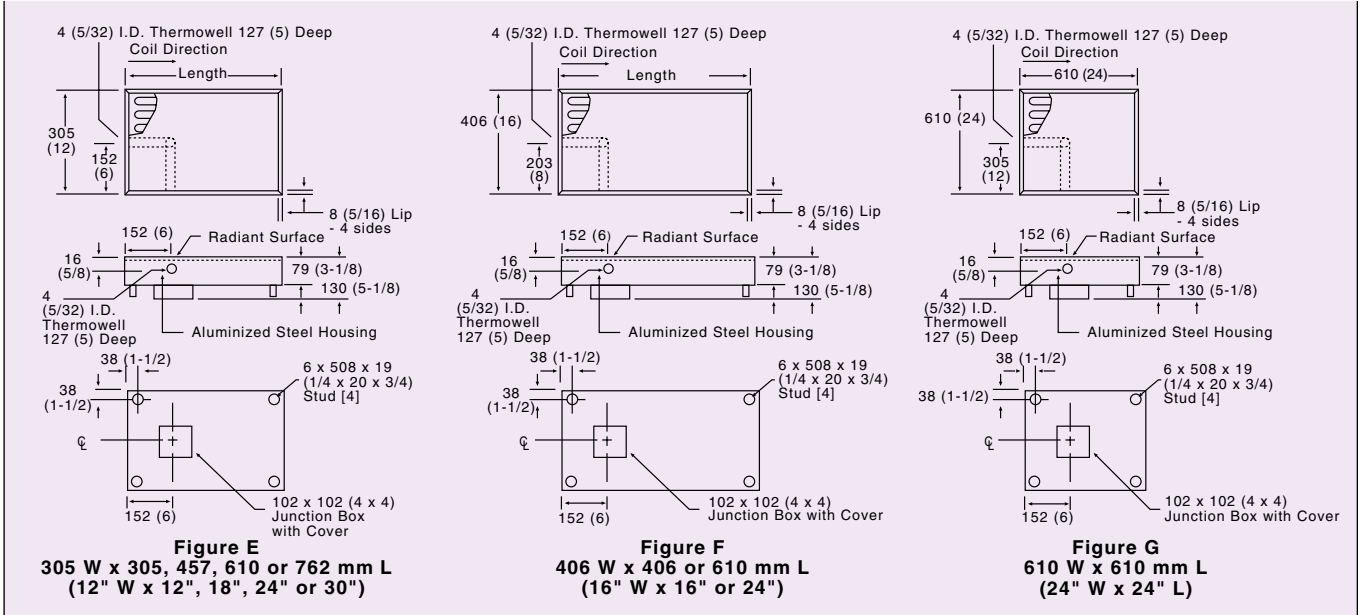
Width cm (in)	Length cm (in)	Wattage	Voltage	Phase	Without Thermowell Model No.	With Thermowell Model No.	Dim. Reference	Weight kg (lb)
<b>10 W/in<sup>2</sup></b>								
15 (6)	30 (12)	720	120	1	QF-061210	QF-061210-T	Fig. A	1.4 (3)
15 (6)	46 (18)	1080	120/240	1	QF-061810	QF-061810-T	Fig. B	2.0 (4.5)
15 (6)	61 (24)	1440	120/240	1	QF-062410	QF-062410-T	Fig. B	2.7 (6)
15 (6)	76 (30)	1800	120/240	1	QF-063010	QF-063010-T	Fig. B	3.4 (7.5)
15 (6)	91 (36)	2160	240/480	1	QF-063610	QF-063610-T	Fig. B	4.1 (9)
15 (6)	122 (48)	2880	240/480	1	QF-064810	QF-064810-T	Fig. B	5.0 (11)
30 (12)	30 (12)	1440	240	1	QF-121210	QF-121210-T	Fig. E	2.7 (6)
30 (12)	46 (18)	2160	240/480	1	QF-121810	QF-121810-T	Fig. E	3.9 (8.5)
30 (12)	61 (24)	2880	240/480	1	QF-122410	QF-122410-T	Fig. E	5.0 (11)
30 (12)	76 (30)	3600	240/480	1	QF-123010	QF-123010-T	Fig. E	6.1 (13.5)
30 (12)	91 (36)	4320	240/480	1	QF-123610	QF-123610-T	Fig. C	6.8 (15)
30 (12)	122 (48)	5760	240/480	1	QF-124810	QF-124810-T	Fig. D	9.1 (20)
30 (12)	152 (60)	7200	240 or 480	3	QF-126010/*	QF-126010/*-T	Fig. D	11.8 (26)
30 (12)	183 (72)	8640	240 or 480	3	QF-127210/*	QF-127210/*-T	Fig. D	14.5 (32)
41 (16)	41 (16)	2560	240/480	1	QF-161610	QF-161610-T	Fig. F	4.5 (10)
61 (24)	61 (24)	5760	240 or 480	Dual	QF-242410/*	QF-242410/*-T	Fig. G	9.1 (20)
<b>15 W/in<sup>2</sup></b>								
15 (6)	30 (12)	1080	120/240	1	QF-061215	QF-061215-T	Fig. A	1.4 (3)
15 (6)	46 (18)	1620	120/240	1	QF-061815	QF-061815-T	Fig. B	2.0 (4.5)
15 (6)	61 (24)	2160	240/480	1	QF-062415	QF-062415-T	Fig. B	2.7 (6)
15 (6)	76 (30)	2700	240/480	1	QF-063015	QF-063015-T	Fig. B	3.4 (7.5)
15 (6)	91 (36)	3240	240/480	1	QF-063615	QF-063615-T	Fig. B	4.1 (9)
15 (6)	122 (48)	4320	240/480	1	QF-064815	QF-064815-T	Fig. B	5.0 (11)
30 (12)	30 (12)	2160	240/480	1	QF-121215	QF-121215-T	Fig. E	2.7 (6)
30 (12)	46 (18)	3240	240/480	1	QF-121815	QF-121815-T	Fig. E	3.9 (8.5)
30 (12)	61 (24)	4320	240/480	1	QF-122415	QF-122415-T	Fig. E	5.0 (11)
30 (12)	76 (30)	5400	240/480	1	QF-123015	QF-123015-T	Fig. E	6.1 (13.5)
30 (12)	91 (36)	6480	240	3	QF-123615/	QF-123615/-T	Fig. C	6.8 (15)
30 (12)	122 (48)	8640	240 or 480	3	QF-124815/*	QF-124815/*-T	Fig. D	9.1 (20)
30 (12)	152 (60)	10800	240 or 480	3	QF-126015/*	QF-126015/*-T	Fig. D	11.8 (26)
30 (12)	183 (72)	12960	240 or 480	3	QF-127215/*	QF-127215/*-T	Fig. D	14.5 (32)
41 (16)	41 (16)	3840	240/480	1	QF-161615	QF-161615-T	Fig. F	4.5 (10)
41 (16)	61 (24)	5760	240 or 480	Dual	QF-162415/*	QF-162415/*-T	Fig. F	6.6 (14.5)
61 (24)	61 (24)	8640	480	Dual	QF-242415/480	QF-242415/480-T	Fig. G	9.1 (20)

Comes complete with mounting hardware and operator's manual.

\* Specify voltage, i.e. insert **240** for 240V or **480** for 480V.

Ordering Example: QF-061810 15 x 46 cm (6" x 18") 1080 Watt heater, 10 W/in<sup>2</sup> Watt density that may be powered by either





To Order								
Width cm (in)	Length cm (in)	Wattage	Voltage	Phase	Without Thermowell Model No.	With Thermowell Model No.	Dim. Reference	Weight kg (lb)
<b>20 W/in<sup>2</sup></b>								
15 (6)	30 (12)	1440	240	1	QF-061220	QF-061220-T	Fig. A	1.4 (3)
15 (6)	46 (18)	2160	240/480	1	QF-061820	QF-061820-T	Fig. B	2.0 (4.5)
15 (6)	61 (24)	2880	240/480	1	QF-062420	QF-062420-T	Fig. B	2.7 (6)
15 (6)	76 (30)	3600	240/480	1	QF-063020	QF-063020-T	Fig. B	3.4 (7.5)
15 (6)	91 (36)	4320	240/480	1	QF-063620	QF-063620-T	Fig. B	4.1(9)
15 (6)	122 (48)	5760	240/480	1	QF-064820	QF-064820-T	Fig. B	5.0 (11)
30 (12)	30 (12)	2880	240/480	1	QF-121220	QF-121220-T	Fig. E	2.7 (6)
30 (12)	46 (18)	4320	240/480	1	QF-121820	QF-121820-T	Fig. E	3.9 (8.5)
30 (12)	61 (24)	5760	240/480	1	QF-122420	QF-122420-T	Fig. E	5.0 (11)
30 (12)	76 (30)	7200	240 or 480	3	QF-123020/*	QF-123020/*-T	Fig. E	6.1 (13.5)
30 (12)	91 (36)	8640	240 or 480	3	QF-123620/*	QF-123620/*-T	Fig. C	6.8 (15)
30 (12)	122 (48)	11520	240 or 480	3	QF-124820/*	QF-124820/*-T	Fig. D	9.1 (20)
30 (12)	152 (60)	14400	240 or 480	3	QF-126020/*	QF-126020/*-T	Fig. D	11.8 (26)
30 (12)	183 (72)	17280	240 or 480	3	QF-127220/*	QF-127220/*-T	Fig. D	14.5 (32)
41 (16)	41 (16)	5120	240 or 480	Dual	QF-161620/*	QF-161620/*-T	Fig. F	4.5 (10)
41 (16)	61 (24)	7680	480	Dual	QF-162420/480	QF-162420/480-T	Fig. F	6.6 (14.5)
61 (24)	61 (24)	11520	480	Dual	QF-242420/480	QF-242420/480-T	Fig. G	9.1 (20)
<b>25 W/in<sup>2</sup></b>								
15 (6)	30 (12)	1800	120/240	1	QF-061225	QF-061225-T	Fig. A	1.4 (3)
15 (6)	46 (18)	2700	240/480	1	QF-061825	QF-061825-T	Fig. B	2.0 (4.5)
15 (6)	61 (24)	3600	240/480	1	QF-062425	QF-062425-T	Fig. B	2.7 (6)
15 (6)	76 (30)	4500	240/480	1	QF-063025	QF-063025-T	Fig. B	3.4 (7.5)
15 (6)	91 (36)	5400	240/480	1	QF-063625	QF-063625-T	Fig. B	4.1(9)
15 (6)	122 (48)	7200	240/480	1	QF-064825	QF-064825-T	Fig. B	5.0 (11)
30 (12)	30 (12)	3600	240/480	1	QF-121225	QF-121225-T	Fig. E	2.7 (6)
30 (12)	46 (18)	5400	240/480	1	QF-121825	QF-121825-T	Fig. E	3.9 (8.5)
30 (12)	61 (24)	7200	240 or 480	3	QF-122425/*	QF-122425/*-T	Fig. E	5.0 (11)
30 (12)	76 (30)	9000	240 or 480	3	QF-123025/*	QF-123025/*-T	Fig. E	6.1 (13.5)
30 (12)	91 (36)	10800	240 or 480	3	QF-123625/*	QF-123625/*-T	Fig. C	6.8 (15)
30 (12)	122 (48)	14400	240 or 480	3	QF-124825/*	QF-124825/*-T	Fig. D	9.1 (20)
30 (12)	152 (60)	18000	240 or 480	3	QF-126025/*	QF-126025/*-T	Fig. D	11.8 (26)
30 (12)	183 (72)	21600	240 or 480	3	QF-127225/*†	QF-127225/*-T	Fig. D	14.5 (32)
41 (16)	41 (16)	6400	240 or 480	Dual	QF-161625/*	QF-161625/*-T	Fig. F	4.5 (10)
41 (16)	61 (24)	9600	480	Dual	QF-162425/480	QF-162425/480-T	Fig. F	6.6 (14.5)
61 (24)	61 (24)	14400	480	Dual	QF-242425/480	QF-242425/480-T	Fig. G	9.1 (20)

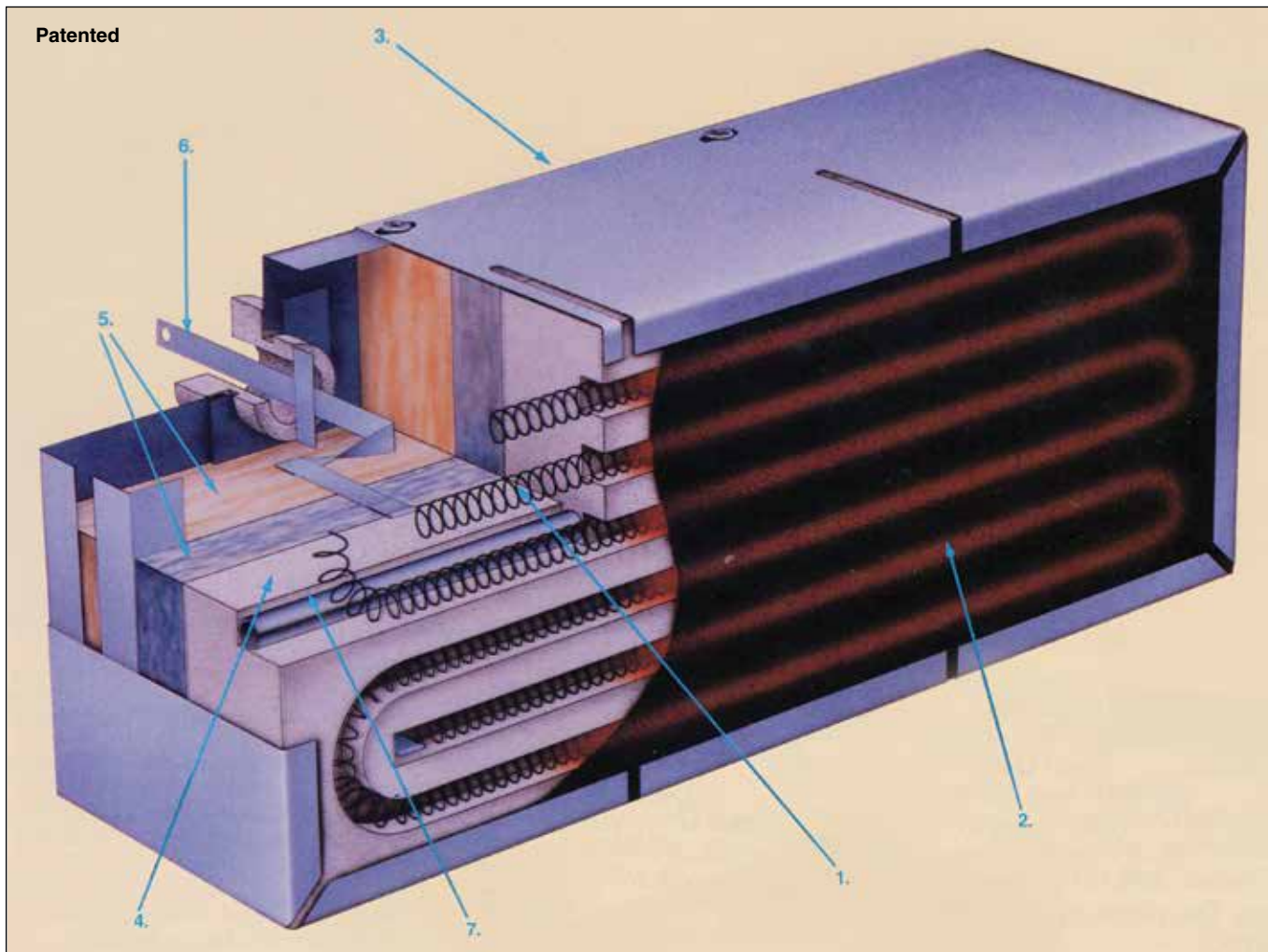
Comes complete with mounting hardware and operator's manual.

\* Specify voltage, i.e. insert **240** for 240V or **480** for 480V.

† This heater has two junction boxes at opposite ends of the panel.

Ordering Example: QF-123625/480, 30 x 91 cm (12" x 36"), 10800 Watt 3 phase heater, 25 W/in<sup>2</sup> Watt density, 240 V ac

# QF SERIES INFRARED PANEL HEATERS



## CONSTRUCTION

1. Heater Element: precision iron/chrome/aluminum resistance wire, designed for uniform emission over entire heating surface and extended life.
2. Surface: rugged black woven ceramic cloth for high radiant energy transfer.
3. Frame: heat resistant, heavy gauge aluminized steel.
4. Heater Element Support: grooved ceramic fiber refractory board is used to support precision coil resistance wire. This helps to insulate the heater as well as reflect the infrared energy onto the application.
5. High Temperature Insulation: to minimize heat loss from the back of the heater.
6. Stainless Steel Terminals: all welded construction, for easy power connection.
7. Optional Quartz Thermowell: high temperature 4 mm ( $5/32$ " ) diameter 127 mm (5" ) long quartz thermowell, with strain relief.

## APPLICATIONS

- ✓ Paint Drying
- ✓ Plastic Forming
- ✓ Wave Soldering
- ✓ Silk Screening
- ✓ Laminating
- ✓ Moisture Removal
- ✓ Thermo Forming

## SPECIFICATIONS

**Maximum Temperature Emitter Face:** 870°C (1600°F)  
**Power:** 120, 240, 480 Vac single and dual voltage, 1 phase, 3 phase and dual phase  
**Wattage:** 720 to 21,600 watts  
**Watt Density:** 10, 15, 20, and 25 W/in<sup>2</sup>  
**Enclosure:** Heavy gauge aluminized steel

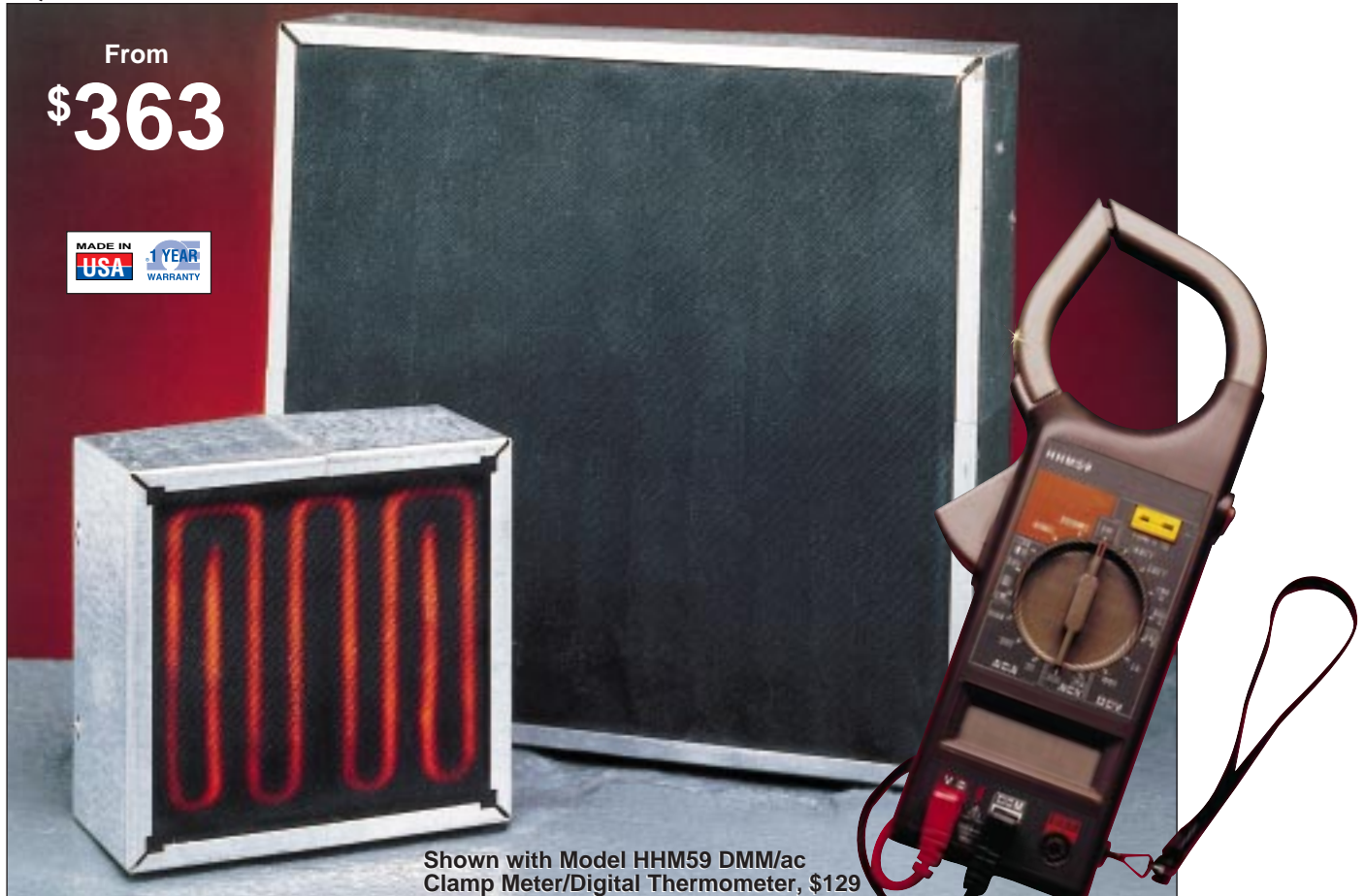
**Note:** QF series heaters are intended for "radiant" heat. Never let material to be heated come into direct contact with the face of the heater. It is recommended that overtemperature control be used to prevent overheating.

## CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel.

# HIGH TEMPERATURE CERAN GLASS-FACED INFRARED PANEL HEATERS

## QG Series



- ✔ Black Ceran Glass Emitter Face
- ✔ 870°C(1600°F) Maximum Emitter Face Temperature
- ✔ Output Wavelength Between 2.5 and 6 Microns
- ✔ Three Watt Densities Available: 10, 15, and 20W/In<sup>2</sup>
- ✔ Uniform IR Coverage

### APPLICATIONS

- ✔ Paint Drying
- ✔ Plastic Coating Curing
- ✔ Laminating
- ✔ Textile Drying
- ✔ Silk Screen Printing
- ✔ Thermoforming

Model No.	Price	Description
HHM59	\$129	Digital Clamp Meter

Complete with wrist strap, 9V battery, carrying case, test leads, type-K beaded wire thermocouple, operator's manual.

OMEGALUX® QG Series heaters use a solid black Ceran™ glass as the emitter face. Maximum power output is 20 Watts/square inch with a maximum operating temperature of 870°C (1600°F) on the face. An optional thermowell from the back of the heater allows for a spring-loaded thermocouple to measure face temperature. This is the best way to use direct temperature control. The heater is available in sizes from 152 x 305 mm (6" x 12") up to 610 x 610 mm (24" x 24"). For medium power applications requiring a cleanable heater surface, the QG Series is ideal. For higher power applications, consider the OMEGALUX® QC or QH Series heaters, which have a quartz emitter face. Heaters are assembled using screws as opposed to rivets, allowing for easy replacement of the glass in the field.

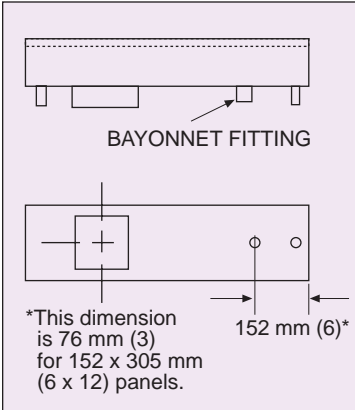
### SPECIFICATIONS

**Power:** 120, 240 and 480 Vac, 120/240 and 240/480 Vac dual voltage, 1 phase  
**Wattage:** 720-8640 Watts  
**Watt Density:** 10, 15, and 20 W/in<sup>2</sup>.  
**Maximum Temperature Emitter Face:** 870°C (1600°F)  
**Housing:** Aluminized steel

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel.

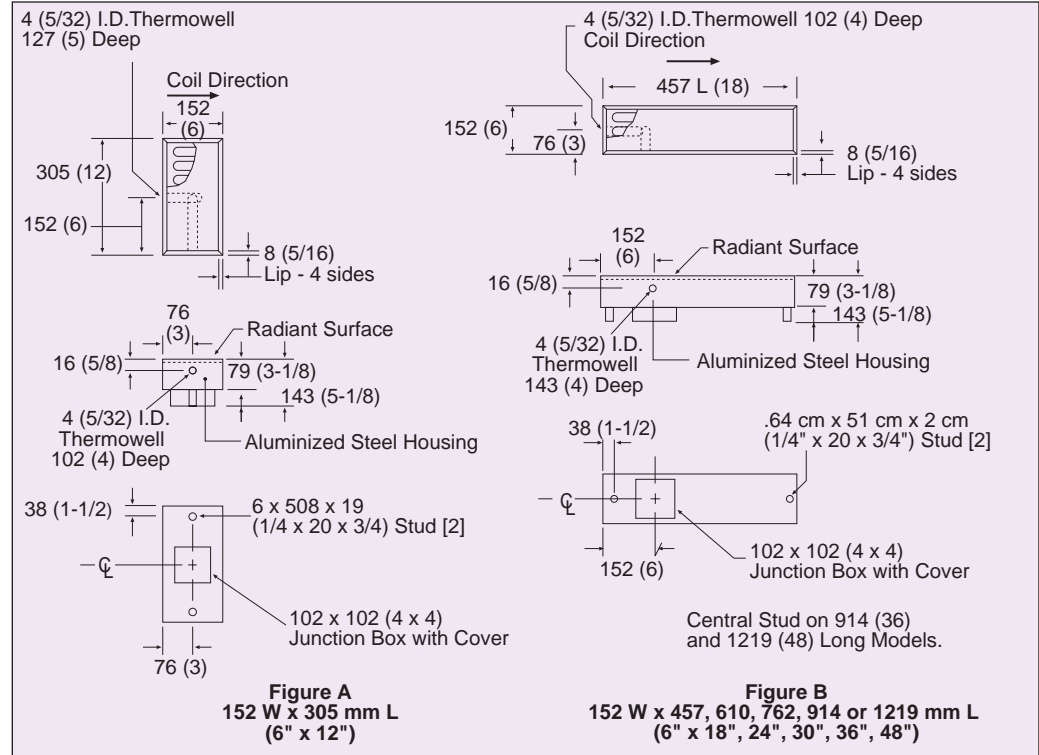
**QG Series**



**Note:** QG Series heaters are intended for "radiant" heat. Never let material to be heated come in direct contact with the face of the heater. It is recommended that overtemperature control be used to prevent overheating.

QG series radiant panel heaters utilize a bayonet fitting for use with a spring loaded thermocouple to measure face temperature, model number OSK1036/BT-090-(\*)-4.25-60-1 (\*insert thermocouple calibration).

**Dimensions shown in mm (inches)**



The QF, QC and QH series radiant panel heaters feature built-in 4 mm (5/32") ID thermowells which accept

3 mm (1/8") diameter probes, as shown in figures A through G.

**To Order (Specify Model Number)**

**In Stock For Fast Delivery**

Width cm (in.)	Length cm (in.)	Wattage	Voltage	Phase	Without Thermowell		With Thermowell		Dim. Reference	Weight kg (lb)
					Model Number	Price	Model Number	Price		
<b>10 W/in<sup>2</sup></b>										
15 (6)	30 (12)	720	120	1	QG-061210/120	\$363	QG-061210/120-T	\$388	Fig. A	1.8 (4)
15 (6)	46 (18)	1080	120/240	1	QG-061810	425	QG-061810-T	450	Fig. B	2.7 (6)
15 (6)	61 (24)	1440	120/240	1	QG-062410	488	QG-062410-T	512	Fig. B	3.6 (8)
30 (12)	30 (12)	1440	120/240	1	QG-121210	488	QG-121210-T	513	Fig. E	3.6 (8)
30 (12)	46 (18)	2160	240/480	1	QG-121810	614	QG-121810-T	638	Fig. E	5.4 (12)
30 (12)	61 (24)	2880	240/480	1	QG-122410	725	QG-122410-T	750	Fig. E	6.8 (15)
61 (24)	61 (24)	5760	240/480	1	QG-242410	1275	QG-242410-T	1300	Fig. G	6.8 (15)
<b>15 W/in<sup>2</sup></b>										
15 (6)	30 (12)	1080	120/240	1	QG-061215	363	QG-061215-T	388	Fig. A	1.8 (4)
15 (6)	46 (18)	1620	120/240	1	QG-061815	425	QG-061815-T	450	Fig. B	2.7 (6)
15 (6)	61 (24)	2160	240/480	1	QG-062415	488	QG-062415-T	512	Fig. B	3.6 (8)
30 (12)	30 (12)	2160	240/480	1	QG-121215	488	QG-121215-T	513	Fig. E	3.6 (8)
30 (12)	46 (18)	3240	240/480	1	QG-121815	614	QG-121815-T	638	Fig. E	5.4 (12)
30 (12)	61 (24)	4320	240/480	1	QG-122415	725	QG-122415-T	750	Fig. E	6.8 (15)
41 (16)	61 (24)	5760	240/480	1	QG-162415	900	QG-162415-T	925	Fig. F	9.1 (20)
61 (24)	61 (24)	8640	240	1	QG-242415/240	1275	QG-242415/240-T	1300	Fig. G	6.8 (15)
61 (24)	61 (24)	8640	480	1	QG-242415/480	1275	QG-242415/480-T	1300	Fig. G	12.7 (28)
<b>20 W/in<sup>2</sup></b>										
15 (6)	30 (12)	1440	120/240	1	QG-061220	363	QG-061220-T	388	Fig. A	1.8 (4)
15 (6)	46 (18)	2160	240/480	1	QG-061820	425	QG-061820-T	450	Fig. B	2.7 (6)
15 (6)	61 (24)	2880	240/480	1	QG-062420	488	QG-062420-T	512	Fig. B	3.6 (8)
30 (12)	30 (12)	2880	240/480	1	QG-121220	488	QG-121220-T	513	Fig. E	3.6 (8)
30 (12)	46 (18)	4320	240/480	1	QG-121820	614	QG-121820-T	638	Fig. E	5.4 (12)
30 (12)	61 (24)	5760	240/480	1	QG-122420	725	QG-122420-T	750	Fig. E	6.8 (15)
41 (16)	61 (24)	7860	240/480	1	QG-162420	900	QG-162420-T	925	Fig. F	9.1 (20)

Each heater comes complete with mounting hardware and complete operator's manual. To order detachable, bayonet type temperature probe for monitoring heater temperature, order model OSK1036/BT-090-K-4/4-60-1, \$77 each. Ordering Example: Model QG-242415/240, 8640 Watt, 61 x 61 cm (24" x 24"), 240 Vac single phase heater, \$1275.





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• **Heaters**

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# SINGLE AND DOUBLE FIXED ELEMENT RADIANT PROCESS HEATERS

RAD7363B/480 shown smaller than actual size.



RAD2083B/120 shown smaller than actual size.

## RAD/RADD Series

- ✓ 0.40 to 13.0 kW
- ✓ 120, 208, 240, 480V
- ✓ 816°C (1500°F) Max Sheath Temperature
- ✓ 3/8" Diameter Incoloy Sheath
- ✓ Single Fixed Elements, 1.83 kW/Sq Ft RAD Series
- ✓ Two Fixed Elements, 3.66 kW/Sq Ft RADD Series

### APPLICATIONS (RAD SERIES)

- ✓ Finish curing
- ✓ Latex and resin curing
- ✓ Ink drying
- ✓ Textile and non-woven fabric applications
- ✓ Paper and paper board applications
- ✓ Food processing
- ✓ Ceramic drying

**Caution:** Hazard of fire. These radiant heaters must not be operated in the presence of flammable vapors, gases, or combustible materials without proper ventilation and/or other safety precautions either in compliance with the National Fire Protection Bulletin 86A entitled "Ovens and Furnaces" or the authority having jurisdiction.

### APPLICATIONS (RADD SERIES)

- ✓ Shrink fitting
- ✓ Preheating glass for polishing, drying, sterilizing
- ✓ Fast-moving webs

### FEATURES

**Construction (RAD):** Complete, ready-to connect assembly as illustrated. Power connections are made at each end unless single-end wiring is specified. To specify 18" leads at one end, add "-SE" to model for an additional cost.

## To Order

Length: in (cm) Over-Heated		Volts	RAD Single Element (1.83 kw/ft <sup>2</sup> )		Wt. lb (kg)	RADD 2 Element (3.66 kw/ft <sup>2</sup> )		Wt. lb (kg)	Grille* (Optional) Model No.
All A	B		kW	Model No.		kW	Model No.		
24 <sup>3</sup> / <sub>8</sub> (62)	16 <sup>1</sup> / <sub>2</sub> (42)	120	0.80	RAD2083B/120	4(2)	1.60	RADD2164/120	7(3)	GR-2A
24 <sup>3</sup> / <sub>8</sub> (62)	16 <sup>1</sup> / <sub>2</sub> (42)	208	0.80	RAD2083BV/208	4(2)	1.60	RADD2164V/208	7(3)	GR-2A
24 <sup>3</sup> / <sub>8</sub> (62)	16 <sup>1</sup> / <sub>2</sub> (42)	240	0.80	RAD2083B/240	4(2)	1.60	RADD2164/240	7(3)	GR-2A
30 <sup>5</sup> / <sub>8</sub> (78)	22 <sup>3</sup> / <sub>4</sub> (58)	120	1.10	RAD3113B/120	5(2)	2.20	RADD3224/120	9(4)	GR-3A
30 <sup>5</sup> / <sub>8</sub> (78)	22 <sup>3</sup> / <sub>4</sub> (58)	208	1.10	RAD3113BV/208	5(2)	2.20	RADD3224V/208	9(4)	GR-3A
30 <sup>5</sup> / <sub>8</sub> (78)	22 <sup>3</sup> / <sub>4</sub> (58)	240	1.10	RAD3113B/240	5(2)	2.20	RADD3224/240	9(4)	GR-3A
30 <sup>5</sup> / <sub>8</sub> (78)	22 <sup>3</sup> / <sub>4</sub> (58)	275	1.10	RAD3113BV/275	5(2)	2.20	RADD3224V/275	9(4)	GR-3A
46 <sup>5</sup> / <sub>8</sub> (118)	38 <sup>1</sup> / <sub>2</sub> (98)	208	1.80	RAD4183B/208	8(4)	3.60	RADD4364V/208	11(5)	GR-4A
46 <sup>5</sup> / <sub>8</sub> (118)	38 <sup>1</sup> / <sub>2</sub> (98)	240	1.80	RAD4183B/240	8(4)	3.60	RADD4364/240	11(5)	GR-4A
46 <sup>5</sup> / <sub>8</sub> (118)	38 <sup>1</sup> / <sub>2</sub> (98)	480	1.80	RAD4183BV/480	8(4)	3.60	RADD4364/480	11(5)	GR-4A
61 <sup>3</sup> / <sub>8</sub> (156)	53 <sup>3</sup> / <sub>8</sub> (136)	208	2.50	RAD5253BV/208	10(5)	5.00	RADD5504V/208	14(6)	GR-5A
61 <sup>3</sup> / <sub>8</sub> (156)	53 <sup>3</sup> / <sub>8</sub> (136)	240	2.50	RAD5253B/240	10(5)	5.00	RADD5504/240	14(6)	GR-5A
61 <sup>3</sup> / <sub>8</sub> (156)	53 <sup>3</sup> / <sub>8</sub> (136)	275	2.50	RAD5253BV/275	10(5)	5.00	RADD5504V/275	14(6)	GR-5A
61 <sup>3</sup> / <sub>8</sub> (156)	53 <sup>3</sup> / <sub>8</sub> (136)	480	2.50	RAD5253B/480	10(5)	5.00	RADD5504/480	14(6)	GR-5A
73 <sup>3</sup> / <sub>8</sub> (187)	65 <sup>3</sup> / <sub>4</sub> (167)	208	3.00	RAD6303BV/208	12(5)	6.00	RADD6604V/208	16(7)	GR-6A
73 <sup>3</sup> / <sub>8</sub> (187)	65 <sup>3</sup> / <sub>4</sub> (167)	240	3.00	RAD6303B/240	12(5)	6.00	RADD6604/240	16(7)	GR-6A
73 <sup>3</sup> / <sub>8</sub> (187)	65 <sup>3</sup> / <sub>4</sub> (167)	275	3.00	RAD6303BV/275	12(5)	6.00	RADD6604V/275	16(7)	GR-6A
73 <sup>3</sup> / <sub>8</sub> (187)	65 <sup>3</sup> / <sub>4</sub> (167)	480	3.00	RAD6303B/480	12(5)	6.00	RADD6604/480	16(7)	GR-6A
85 <sup>3</sup> / <sub>8</sub> (218)	78 (198)	208	3.60	RAD7363BV/208	14(6)	7.20	RADD7724V/208	18(8)	(2)GR-4A
85 <sup>3</sup> / <sub>8</sub> (218)	78 (198)	240	3.60	RAD7363B/240	14(6)	7.20	RADD7724/240	18(8)	(2)GR-4A
85 <sup>3</sup> / <sub>8</sub> (218)	78 (198)	480	3.60	RAD7363B/480	14(6)	7.20	RADD7724/480	18(8)	(2)GR-4A

Other sizes and ratings available. Replacement RAD/RADD heater elements are also available. Contact OMEGALUX®. \*Snap-in grille sections protect personnel or work from contact with hot elements. Grille sections are optional and are sold separately.

Ordering Examples: RAD7363B/480, 480V, 3.60 kW.

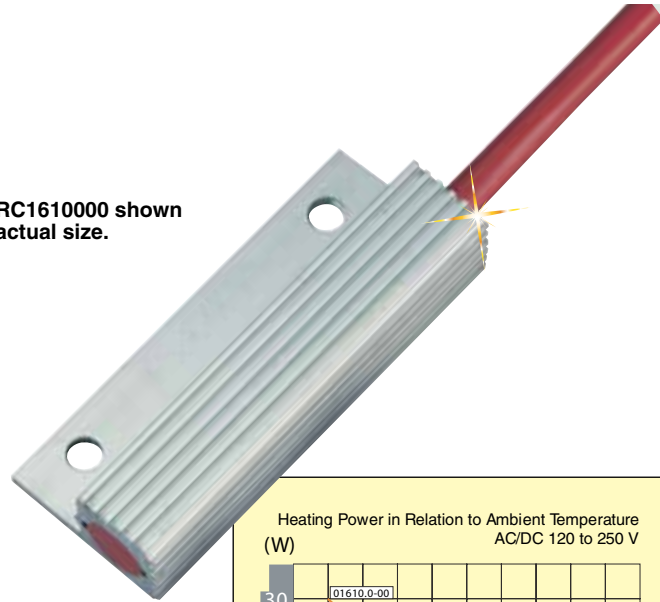
RAD2083B/120, 120V, 0.80 kW.

# HEATER

## RC016 Series



RC1610000 shown actual size.



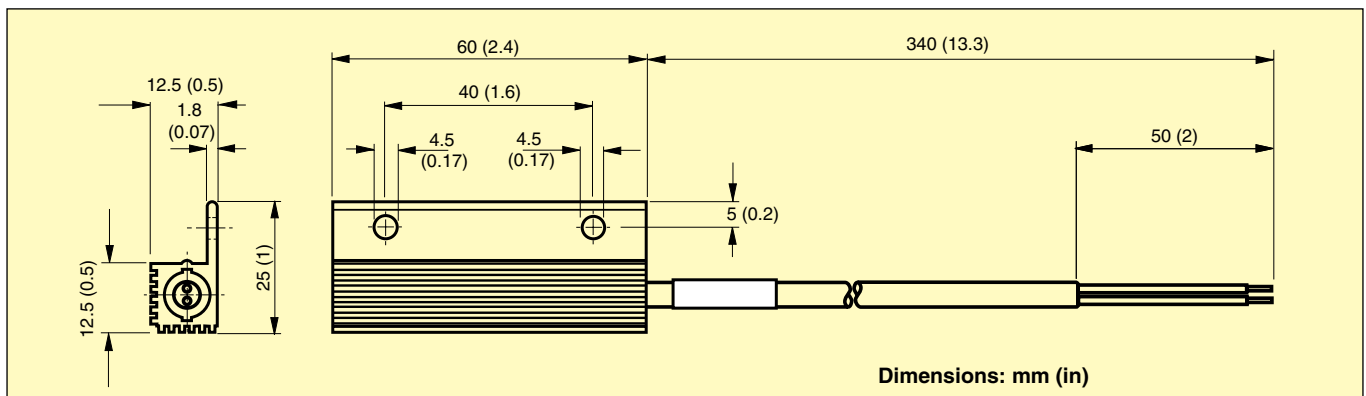
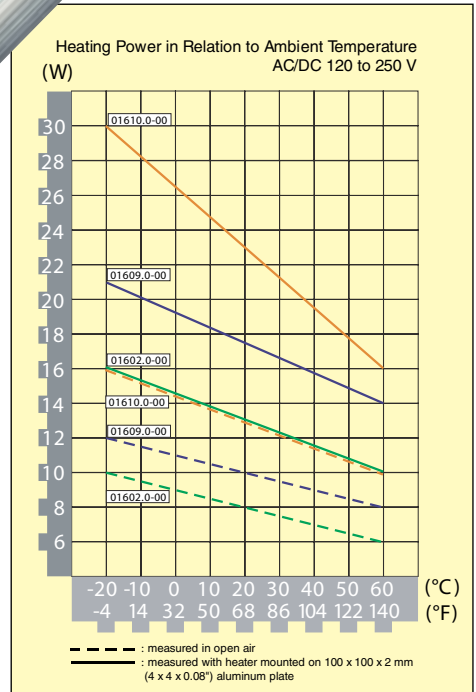
- Temperature Limiting
- Wide Voltage Range
- Energy Saving
- Compact

These small heaters are designed to prevent condensation and to ensure a minimum operating temperature in small enclosures.

### SPECIFICATIONS

**Operating Voltage:** 120 to 240 Vac/Vdc\* (min 110V, max 265V)  
**Heating Element:** PTC resistor, self regulating and temperature limiting  
**Heater Body:** Aluminium, anodized  
**Mounting:** Screw fixing (screws not included)  
**Fitting Position:** Variable

**Operating/Storage Temperature:** -45 to 70°C (-49 to 158°F)  
**Protection Type/Protection Class:** NEMA 1 (IP32)/II (double insulated)  
**Approvals:** VDE + UL File No. E150057  
**Heating Capacity\*:** 13 W  
*Note: Other voltages on request*  
*\* Operating with voltages below 140 Vac/Vdc reduces heating performance by approx. 10%.*  
**Inrush Current Max:** 3.0 A  
**Surface Temperature (Approx):** 170°C (338°F)  
**Connection:** 2 x AWG 22 sheathed cable (silicone)  
**Weight (Approx):** 40 g (0.08 lb)



### To Order

MODEL NO.	DESCRIPTION
RC1610000	Small PTC heater, 13 W, 120 to 240 Vac/Vdc
RC1610001	Small PTC heater, 13 W, 12 to 36 Vac/Vdc

Comes complete with operator's manual.  
 Ordering Example: RC1610000, small semiconductor heater.

# SCREW PLUG IMMERSION HEATERS

## For Small Tanks

RIN Series Starts at

**\$190**



- ✓ ½ and ¾ NPT Brass or Steel Screw Plugs
- ✓ 100 to 1000 Watts
- ✓ 120 and 240V, 1 Phase
- ✓ Dual Pipe Thread Construction
- ✓ Premium Grade Incoloy® or Stainless Steel Sheath

The screw plug immersion heaters feature dual pipe thread construction which allows easy installation into your process and quick connection of electrical conduit.

### SPECIFICATIONS

**Wattage:** 100 to 1000 Watt

**Power:** 120 or 240V, 1 phase

**Watt Density:** 17 to 40 W/in<sup>2</sup>

**Sheath:**

**Type RIN:** ½ or ¾" diameter Incoloy sheath

**Type RINO:** ½ or ¾" diameter stainless steel sheath

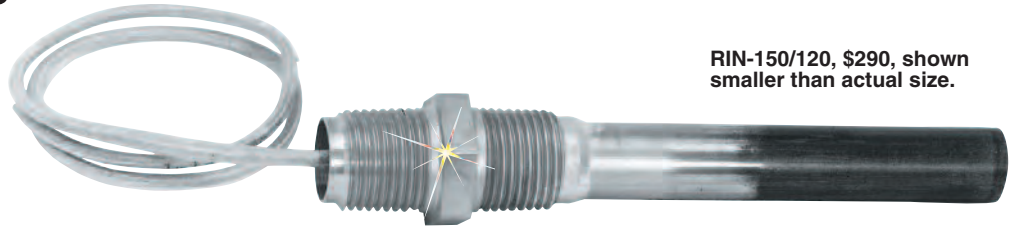
**Screw Plug:**

**Type RIN:** ½ or ¾ NPT brass fitting

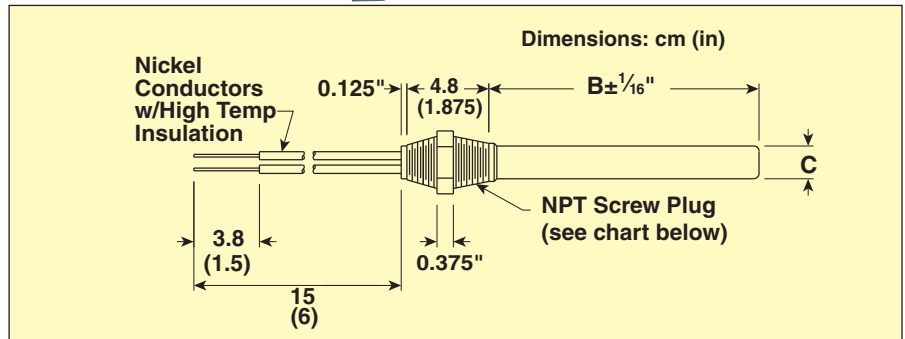
**Type RINO:** ½ or ¾ NPT steel fitting

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.



RIN-150/120, \$290, shown smaller than actual size.



**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

Watts	Volts	Phase	W/in <sup>2</sup>	Dimensions Inches		Pipe Thd.	Model No.	Price	Wt. lb (kg)
				B	C				
<b>RIN Series with Incoloy sheath—brass screw plug</b>									
100	120	1	30	1¾	¾	½	RIN-10/120	\$190	3 (1)
250	120	1	35	3¾	¾	½	RIN-25/120	197	4.5 (2)
250	240	1	35	3¾	¾	½	RIN-25/240	197	4.5 (2)
500	120	1	40	8	¾	½	RIN-50/120	225	10 (5)
500	240	1	40	8	¾	½	RIN-50/240	225	10 (5)
750	120	1	40	12	¾	½	RIN-75/120	245	14 (6)
750	240	1	40	12	¾	½	RIN-75/240	245	14 (6)
300	120	1	25	5	¾	¾	RIN-130/120	265	8 (3)
300	240	1	25	5	¾	¾	RIN-130/240	265	8 (3)
500	120	1	30	6½	¾	¾	RIN-150/120	290	9 (4)
500	240	1	30	6½	¾	¾	RIN-150/240	290	9 (4)
750	120	1	30	10¾	¾	¾	RIN-175/120	280	13 (6)
750	240	1	30	10¾	¾	¾	RIN-175/240	280	13 (6)
1000	120	1	30	13¾	¾	¾	RIN-1100/120	320	15 (7)
1000	240	1	30	13¾	¾	¾	RIN-1100/240	320	15 (7)
<b>RINO Series with stainless steel sheath—steel screw plug</b>									
150	120	1	20	3¾	¾	½	RINO-15/120	\$290	4 (2)
150	240	1	20	3¾	¾	½	RINO-15/240	290	4 (2)
300	120	1	25	8	¾	½	RINO-30/120	225	10 (5)
300	240	1	25	8	¾	½	RINO-30/240	225	10 (5)
500	120	1	25	12	¾	½	RINO-50/120	265	14 (6)
500	240	1	25	12	¾	½	RINO-50/240	265	14 (6)
200	120	1	17	5	¾	¾	RINO-120/120	255	8 (3)
200	240	1	17	5	¾	¾	RINO-120/240	255	8 (3)
300	120	1	18	6½	¾	¾	RINO-130/120	265	9 (4)
300	240	1	18	6½	¾	¾	RINO-130/240	265	9 (4)
500	120	1	20	10¾	¾	¾	RINO-150/120	290	13 (6)
500	240	1	20	10¾	¾	¾	RINO-150/240	290	13 (6)
600	120	1	18	13¾	¾	¾	RINO-160/120	315	15 (7)
600	240	1	18	13¾	¾	¾	RINO-160/240	315	15 (7)

Ordering Example: RIN-10/120, 100 W, 120V screw plug immersion heater, \$190.





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## More than 100,000 Products Available!

### • Temperature

Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

### • pH and Conductivity

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

### • Data Acquisition

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

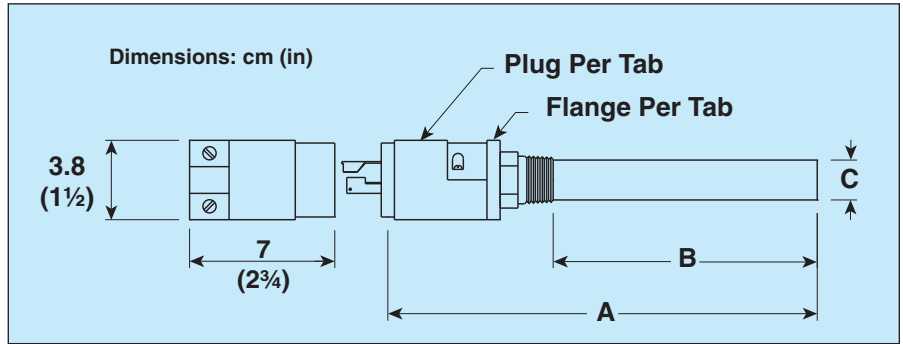
Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# SCREW PLUG IMMERSION HEATERS FOR SMALL TANKS

## RI, RIO, RIS Series



- ✓ Stocked for Fast Delivery
- ✓ 1/2 and 3/4 NPT
- ✓ Cartridge Type Element
- ✓ Premium Quality
- ✓ Rugged Construction



### Type RI with Incoloy Sheath— Brass Pipe Thread

**AVAILABLE FOR FAST DELIVERY!**

To Order (Specify Model Number)									
Watts	Phase	W/in <sup>2</sup>	Dimensions: cm (in)			Std. Pipe Thd.	Model No.	Price	Wt. kg (lb)
			A	B	C				
100	1	31	12 (4 <sup>5</sup> / <sub>16</sub> )	4 (1 <sup>1</sup> / <sub>2</sub> )	1.6 (5 <sup>1</sup> / <sub>16</sub> )	1/2	RI-100/120V	\$150	1 (3)
250	1	33	17 (6 <sup>7</sup> / <sub>16</sub> )	9 (3 <sup>1</sup> / <sub>2</sub> )	1.6 (5 <sup>1</sup> / <sub>16</sub> )	1/2	RI-250/(*)	157	2 (4)
500	1	34	30 (11 <sup>5</sup> / <sub>16</sub> )	16 (7 <sup>7</sup> / <sub>16</sub> )	1.6 (5 <sup>1</sup> / <sub>16</sub> )	1/2	RI-500/(*)	165	5 (10)
750	1	33	40 (15 <sup>3</sup> / <sub>16</sub> )	30 (12)	1.6 (5 <sup>1</sup> / <sub>16</sub> )	1/2	RI-750/(*)	177	6 (14)
300	1	30	21 (8 <sup>1</sup> / <sub>16</sub> )	12 (4 <sup>1</sup> / <sub>16</sub> )	1.6 (5 <sup>1</sup> / <sub>16</sub> )	3/4	RI-1300/(*)	164	4 (8)
500	1	36	26 (10 <sup>1</sup> / <sub>16</sub> )	16 (6 <sup>3</sup> / <sub>16</sub> )	1.9 (6 <sup>1</sup> / <sub>16</sub> )	3/4	RI-1500/(*)	177	4 (9)
750	1	32	37 (14 <sup>3</sup> / <sub>16</sub> )	27 (10 <sup>3</sup> / <sub>16</sub> )	1.9 (6 <sup>1</sup> / <sub>16</sub> )	3/4	RI-1750/(*)	188	6 (13)
1000	1	32	37 (14 <sup>3</sup> / <sub>16</sub> )	34 (13 <sup>3</sup> / <sub>16</sub> )	1.9 (6 <sup>1</sup> / <sub>16</sub> )	3/4	RI-1100/(*)	200	7 (15)

These screw plug immersion heaters feature a dead front nylon twist-lock grounded plug with receptacle. Cord is supplied by the user. The cartridge element is brazed to a standard 1/2" or 3/4" screw plug.

### SPECIFICATIONS

**Power:** 100 to 1000 watts

**Voltage:** 120 or 240 Vac, 1 phase

**Watt Density:** 20 to 36 W/in<sup>2</sup>

**Sheath:** Type RI has a 1.6 cm (5/16") or 1.9 cm (3/4") Incoloy sheath; Type RIO has a 1.6 cm (5/16") or 1.9 cm (3/4") diameter stainless steel sheath; Type RIS has a 1.6 cm (5/16") diameter passivated stainless steel sheath

#### Screw Plug:

Type RI has 1/2" or 3/4" NPT brass screw plug; Type RIO has 1/2" or 3/4" NPT steel screw plug; Type RIS has 1/2" NPT passivated stainless steel screw plug

### Type RIO with SS Sheath—Steel Pipe Thread

Watts	Phase	W/in <sup>2</sup>	Dimensions: cm (in)			Std. Pipe Thd.	Model No.	Price	Wt. kg (lb)
			A	B	C				
150	1	20	17 (6 <sup>7</sup> / <sub>16</sub> )	9 (3 <sup>1</sup> / <sub>2</sub> )	1.6 (5 <sup>1</sup> / <sub>16</sub> )	1/2	RIO-150/120V	\$157	2 (4)
300	1	20	28 (10 <sup>15</sup> / <sub>16</sub> )	16 (7 <sup>7</sup> / <sub>16</sub> )	1.6 (5 <sup>1</sup> / <sub>16</sub> )	1/2	RIO-300/(*)	165	5 (10)
500	1	22	39 (15 <sup>15</sup> / <sub>16</sub> )	30 (12)	1.6 (5 <sup>1</sup> / <sub>16</sub> )	1/2	RIO-500/(*)	177	6 (14)
200	1	20	21 (8 <sup>1</sup> / <sub>16</sub> )	12 (4 <sup>1</sup> / <sub>16</sub> )	1.9 (6 <sup>1</sup> / <sub>16</sub> )	3/4	RIO-1200/(*)	164	4 (8)
300	1	22	26 (10 <sup>1</sup> / <sub>16</sub> )	16 (6 <sup>3</sup> / <sub>16</sub> )	1.9 (6 <sup>1</sup> / <sub>16</sub> )	3/4	RIO-1300/(*)	177	4 (9)
500	1	21	37 (14 <sup>3</sup> / <sub>16</sub> )	27 (10 <sup>3</sup> / <sub>16</sub> )	1.9 (6 <sup>1</sup> / <sub>16</sub> )	3/4	RIO-1500/(*)	188	6 (13)
600	1	20	44 (17 <sup>3</sup> / <sub>16</sub> )	34 (13 <sup>3</sup> / <sub>16</sub> )	1.9 (6 <sup>1</sup> / <sub>16</sub> )	3/4	RIO-1600/(*)	206	7 (15)

### Type RIS with Passivated SS Sheath and Screw Plug

Watts	Phase	W/in <sup>2</sup>	Dimensions - cm (in.)			Std. Pipe Thd.	Model No.	Price	Wt. kg (lb)
			A	B	C				
250	1	35	17 (6 <sup>5</sup> / <sub>16</sub> )	9 (3 <sup>1</sup> / <sub>2</sub> )	1.6 (5 <sup>1</sup> / <sub>16</sub> )	1/2	RIS-255/120V	\$385	3 (6)
500	1	28	28 (10 <sup>15</sup> / <sub>16</sub> )	20 (7 <sup>7</sup> / <sub>16</sub> )	1.6 (5 <sup>1</sup> / <sub>16</sub> )	1/2	RIS-505/120V	430	5 (10)
750	1	31	38 (15 <sup>1</sup> / <sub>16</sub> )	30 (12)	1.6 (5 <sup>1</sup> / <sub>16</sub> )	1/2	RIS-755/120V	460	7 (15)

(\*) To specify voltage, insert "/120V" for 120 Vac or "/240V" for 240 Vac.

**Ordering Examples:** RIO-500/240, 500 W heater, 1.6 cm (5/16") dia. stainless steel sheath and 1/2" NPT steel screw plug powered by 240 Vac, \$177.

RIS-255/120V, 250 W heater, 1.6 cm (5/16") dia. passivated stainless steel sheath and 1/2" NPT steel screw plug powered by 120 Vac, \$385.

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel.



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Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# HEAT CABLE CONNECTION ACCESSORIES

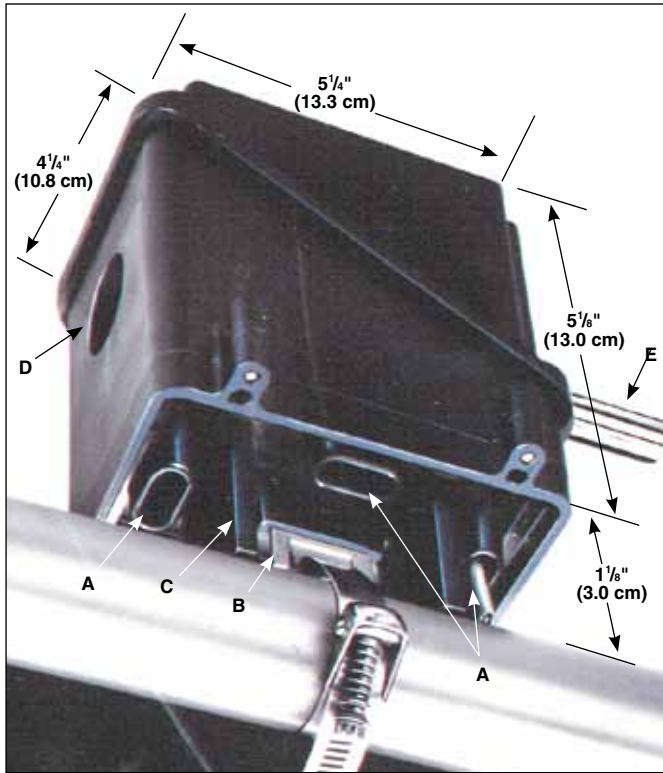
## Junction Box and Controls Enclosure

B

### RTES

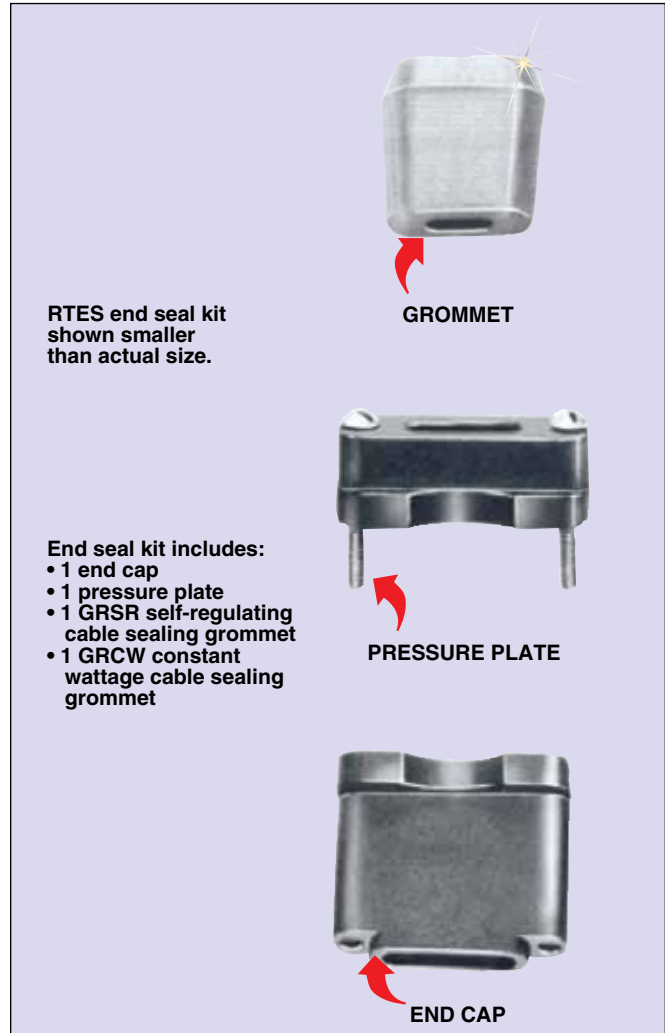
- ✓ Molded Ryton Construction
- ✓ Stainless Steel Hardware
- ✓ NEMA 4X Rated Liquid Tight Design
- ✓ Power Connection or Splice and T Kits

The molded Ryton plastic junction box has outstanding chemical corrosion resistance, superior thermal stability, high strength and rigidity, and is nonflammable.



### TYPICAL DIMENSIONS FOR ENCLOSURES

- A.** Strategically placed cable entries allow maximum flexibility for installation (heating cable cut away for clarity)
- B.** Stainless steel tiedown support provides positive attachment to pipes
- C.** Heavy-duty support legs give stable mounting and provide conduit clearance for applications with up to 3" of insulation
- D.** Opening for 20 mm (3/4") conduit hub
- E.** Stainless steel, sheath temperature sensor (type RTAS only)



The RTES end seal fitting is a NEMA 4X rated enclosure designed to terminate all OMEGALUX® heating cables. This model provides waterproof cable entry for one cable, enclosure support and a waterproof corrosion resistant enclosure. The fitting has two different curved mounting surfaces. One side has a 1 1/2" radius curved surface which provides a stable support on pipes with a diameter of three inches or more. The other side has a 1/2" radius curved surface which permits a better fit on smaller pipes. In addition, this side also has four "feet", for installation on flat surfaces. Attach the RTES end seal fitting to a pipe using OMEGALUX fiberglass tape (to order, visit us online).

### To Order

Model No.	Description
RTES	End seal fitting kit

Ordering Example: RTES, end seal fitting for heating cable.

# EXPLOSION-RESISTANT DRUM HEATERS

## SEPDH Series



- ✓ Factory Mutual Hazardous Area Approval
- ✓ Class I, Div 2, Groups B, C, and D; Class II, Div 2, Groups F and G
- ✓ Inherently Safe
- ✓ Integral Built-In High-Limit Thermal Cutout\*\* Prevents Temperature Runaway
- ✓ Up to 2½ Watts Per Square Inch



SEPDH-C-1300-120-T4A shown smaller than actual size.

OMEGALUX® silicone rubber area drum heaters are low-watt density electrical resistance heaters in blanket form. They are designed to provide a practical, efficient means of freeze protection, viscosity control, melting of solids, and maintaining materials at elevated temperatures in Class I, Division 2 areas.

OMEGALUX® SEPDH drum heaters feature built-in high-limit thermal cutout protection, which, in the event of a primary temperature controller failure, maintains heater sheath temperature below the minimum safe auto-ignition temperature of the material being heated or materials in the area. OMEGALUX® SEPDH drum heaters are compatible with most chemical fluids and oils used in field service. Unlike many other drum heaters, the SEPDH has a thin-line design that lets it fit between the drum and the cradle.

**CAUTION AND WARNING!**  
Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

### SPECIFICATIONS

- Size:** 30 and 55 gallon
- Wattage:** 1000 W (30 gallon)  
1300 W (55 gallon)
- Power:** 120 and 240V
- Dielectric Strength:** Over 2000V
- Thickness:** 4.8 mm (3/16")
- Width:** 203 mm (8")
- Closure:** Two stretch springs

High-Limit Thermostat Temperature	
<b>T4A</b>	70°C (158°F)
<b>T3</b>	145°C (292°F)

To Order	
Model No.	Volts
<b>55 Gallon</b>	
SEPDH-C-1300-120-*	120
SEPDH-C-1300-240-*	240
<b>30 Gallon</b>	
SEPDH-C-1000-120-*	120
SEPDH-C-1000-240-*	240

\* Insert "High-Limit Thermostat Temperature" rating from above table. The maximum allowable sheath temperature ("T" rating) must be specified if drum heater is to be used in a Division 2 area. "C" specifies heaters with adjustable temperature control assembly and temperature ranges from -4 to 163°C (25 to 325°F).

\*\* Article 501 of the NEC requires that the maximum sheath temperature of the heater shall not exceed 80 percent of the auto-ignition temperature of the surrounding atmosphere when heater is continuously energized.

**Auto-Ignition Temperature:** The minimum temperature required to initiate or cause self-sustained combustion of a solid, liquid or gas independently of the heating or heated element (see NFPA 325M, Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids).

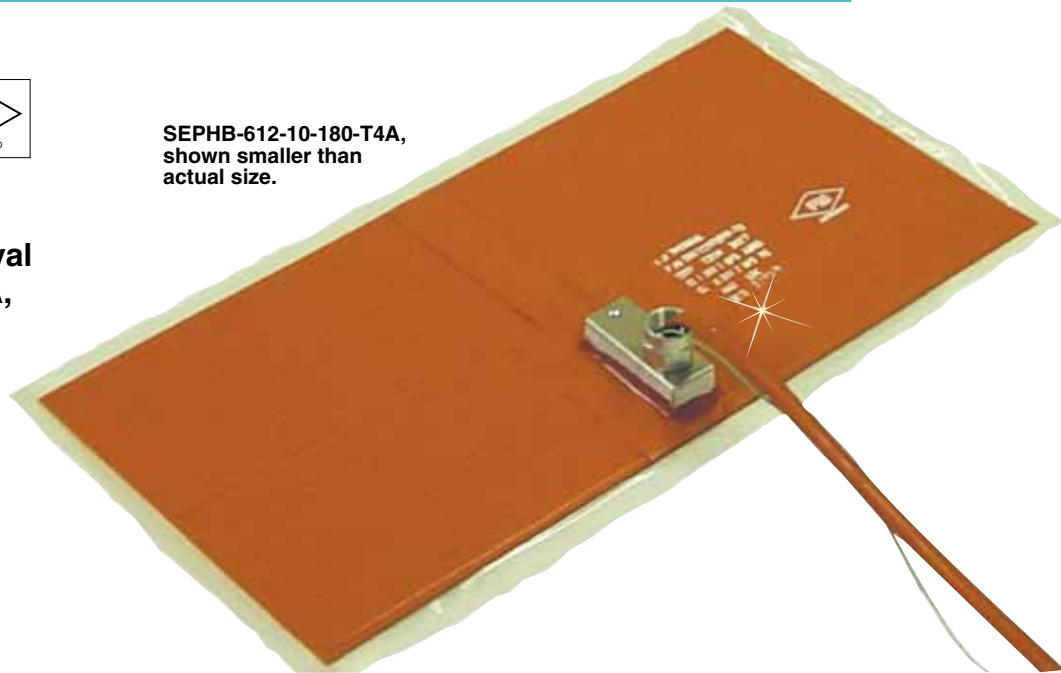
**Ordering Example:** SEPDH-C-1300-120-T3, 55 gallon, 120V drum heater with a T3 rating of 145°C (292°F).

# HEAVY-DUTY, EXPLOSION-RESISTANT HEATING BLANKETS

## SEPHB Series



SEPHB-612-10-180-T4A,  
shown smaller than  
actual size.



- ✓ Factory Mutual Hazardous Area Approval
- ✓ Class I, Div 2, Groups A, B, C, and D; Class II, Div II, Groups F and G
- ✓ Integral Built-In High-Limit Thermal Cutout Prevents Temperature Runaway†
- ✓ Optional Pressure Sensitive Adhesive Available
- ✓ Moisture and Chemical Resistant
- ✓ Maximum Exposure Temperature of 232°C (450°F)

### APPLICATIONS

- ✓ Low-Temperature Ovens
- ✓ Process Vats and Dip Tanks
- ✓ Storage Tanks
- ✓ Hoppers, Dry Storage Bins, Coal Silos
- ✓ Conveyors

OMEGALUX® silicone rubber heavy-duty heating blankets feature built-in high-limit thermal cutout protection, which, in the event of a primary temperature controller failure, maintains blanket sheath temperature below the minimum safe auto-ignition temperature of the material being heated or materials in the area. ("T Rating" in the National Electric Code, Section 500).

OMEGALUX® SEPHB Series blankets are flexible and readily conform to most plane and simple curved surfaces. Blankets are easy to install with optional factory applied pressure-sensitive adhesive, creating a permanent bond.

OMEGALUX® SEPHB blankets are compatible with most chemical fluids and oils commonly encountered in field service. They are exceptionally resistant to weather, moisture, and effects of sunlight, and ozone gases, and they can be used in areas of high radioactivity.

### SPECIFICATIONS

**Wattage:** 180, 360, 720 or 1440 W  
**Power:** 120, 240 and 480V (contact OMEGALUX® for 480V heaters)  
**Dielectric Strength:** 2000V  
**Watt Density:** 2.5 W/in<sup>2</sup>

### High-Limit Thermostat Temperature

T4A	70°C (158°F)
T3	145°C (292°F)

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

### To Order

Volts	Watts	Dimensions: mm (inch)	Model No.
120	180	152 x 305 (6 x 12)	SEPHB-612-180-120-*
240	180	152 x 305 (6 x 12)	SEPHB-612-180-240-*
120	360	152 x 610 (6 x 24)	SEPHB-624-360-120-*
240	360	152 x 610 (6 x 24)	SEPHB-624-360-240-*
120	360	305 x 305 (12 x 12)	SEPHB-1212-360-120-*
240	360	305 x 305 (12 x 12)	SEPHB-1212-360-240-*
120	720	305 x 610 (12 x 24)	SEPHB-1224-720-120-*
240	720	305 x 610 (12 x 24)	SEPHB-1224-720-240-*
120	1440	610 x 610 (24 x 24)	SEPHB-2424-1440-120-T4A
240	1440	610 x 610 (24 x 24)	SEPHB-2424-1440-240-*

\*Insert "High-Limit Thermostat Temperature (T) Rating" from above table.

†Article 501 of the NEC requires that the maximum sheath temperature of the heater shall not exceed 80 percent of the auto-ignition temperature of the surrounding atmosphere when heater is continuously energized.

**Auto-Ignition Temperature:** The minimum temperature required to initiate or cause self-sustained combustion of a solid, liquid or gas independently of the heating or heated element (see NFPA 325M, Fire Hazard Properties of Flammable Liquids, Gases and Volatile Solids).

# SILICONE RUBBER LAMINATED DRUM HEATERS



## Heavy Duty Drum Heaters

### SHDH Series

- ✓ Low Watt Density Electrical Resistance Heater
- ✓ 4.5 Watts/Sq. Inch Exposure Temperature up to 232°C (450°F)
- ✓ Rugged and Flexible Heater Element
- ✓ Constant Watt Density
- ✓ Quick and Simple Installation
- ✓ Moisture and Chemical Resistant
- ✓ Economical
- ✓ Dense Grounding Grid of Tinned Copper Wire

OMEGALUX<sup>®</sup> silicone rubber laminated heavy duty drum Heaters are electrical resistance heaters in blanket form. They are designed to provide a practical efficient means of freeze protection, viscosity control, melting of solids and maintaining materials at elevated temperatures.

OMEGALUX heavy duty drum heaters are totally integrated heating systems consisting of a durable, multi-strand nickel-chromium heating element insulated with two applications of high temperature fiberglass yarn and knitted into tape form. These tapes are laminated between multiple layers of silicone



impregnated fiberglass cloth and a dense grounding grid of tinned copper wire. This thin line design enables use of the standard drum and cradle without any modifications to either. It is thin enough to fit between the drum and its cradle, a problem commonly encountered with other drum heaters.

The optional OMEGALUX thermostatic control combined with the low watt density serpentine heating element ensures even heat distribution across the entire inner surface of the drum

heater and provides a positive prevention from hot spots and overheating sensitive products.

### SPECIFICATIONS

- Power:** 120 and 240V
- Wattage:** 600, 700, 965, 1200 W
- Maximum Continuous Exposure Temperature:** 232°C (450°F)
- Thickness:** 1/8"
- Width:** 4"
- Closure:** One heavy duty spring
- Dielectric Strength:** 2000V
- Watts/Square Inch:** 4.5

### SHDH Series

To Order							
55 gal, 1200 W, 70" long		30 gal 1000 W, 58.5" long		15 gal, 700 W, 46" long		5 gal, 550 W, 35.8" long	
Models Without Adjustable Thermostat*							
Volts	Model No.	Volts	Model No.	Volts	Model No.	Volts	Model No.
120	SHDH-1200-120	120	SHDH-1000-120	120	SHDH-698-120	120	SHDH-550-120
240	SHDH-1200-240	240	SHDH-1000-240	240	SHDH-698-240	240	SHDH-550-240
Models With Adjustable Thermostat 50° to 425°F						5 gal, 550 W, 31" long	
Volts	Model No.	Volts	Model No.	Volts	Model No.	Volts	Model No.
120	SHDH-C-1200-120	120	SHDH-C-1000-120	120	SHDH-C-698-120	120	SHDH-C-600-120
240	SHDH-C-1200-240	240	SHDH-C-1000-240	240	SHDH-C-698-240	240	SHDH-C-600-240

Heaters are supplied with 6<sup>1</sup>/<sub>8</sub>" HSJO 3 prong plug. Plugs are not provided on 240V drum heaters.

\* Remote temperature control recommended. See CPP and CBC Series temperature controllers on the web.

Ordering Example: SHDH-1200-240, 240V drum heater for a 55 gallon drum.

# STRIP HEATERS



## SN and SNH Series

- Rugged, Reliable Premium Quality
- 100 to 1500 Watts
- 2 Terminals at One End
- CSA Certified
- SN Series: 3/4" (1.9 cm) Width
- SNH Series: 1" (2.54 cm) Width



## SPECIFICATIONS

### Sheath Material:

Iron or Chrome Steel

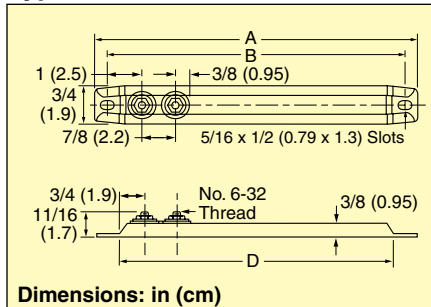
### Max Sheath Temp:

Iron: 399°C (750°F)

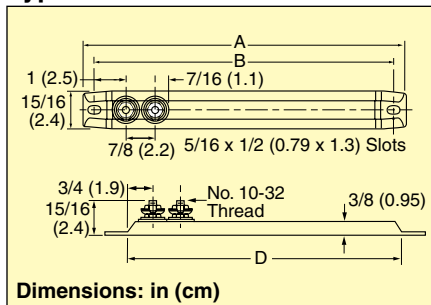
Chrome Steel: 649°C (1200°F)

Power: 120 or 240 Vac

### Type SN



### Type SNH



## To Order

Dimensions: in (cm)			Rust-Resisting Iron Sheath			Chrome Steel Sheath	
A	B	D	Watts	W/In <sup>2</sup>	Model No.	Model No.	Wt. lb (kg)
8 (20)	7 (18)	6 1/2 (17)	250	2	—	SNH-08/120	0.36 (0.16)
9 1/2 (24)	8 1/2 (22)	8 (20)	100	8	SN-910/120	—	0.38 (0.17)
9 1/2 (24)	8 1/2 (22)	8 (20)	300	21	—	SNH-09/120	0.38 (0.17)
10 1/2 (27)	9 1/2 (24)	9 (23)	150	11	SN-1015/120	—	0.5 (0.2)
11 (28)	10 (25)	9 1/2 (24)	350	19	—	SNH-11/120	0.5 (0.2)
12 (30)	11 (28)	10 1/2 (27)	150	9	SN-1215/120	—	0.63 (0.29)
12 (30)	11 (28)	10 1/2 (27)	400	19	—	SNH-12/*	0.63 (0.29)
14 (36)	13 (33)	12 1/2 (32)	450	17	—	SNH-14/*	0.70 (0.32)
15 1/4 (39)	14 1/4 (36)	13 3/4 (35)	200	8	SN-1520/*	—	0.75 (0.34)
15 1/4 (39)	14 1/4 (36)	13 3/4 (35)	500	17	—	SNH-15/	0.75 (0.34)
17 7/8 (45)	16 7/8 (43)	16 3/8 (42)	250	8	SN-1825/*	—	0.85 (0.39)
17 7/8 (45)	16 7/8 (43)	16 3/8 (42)	600	1	—	SNH-18/*	0.85 (0.39)
19 1/2 (50)	18 1/2 (47)	18 (46)	600	15	—	SNH-19/*	0.96 (0.44)
21 (53)	20 (53)	19 1/2 (50)	750	17	—	SNH-21/*	1.0 (0.45)
22 1/2 (57)	21 1/2 (55)	21 (53)	750	16	—	SNH-22/*	1.0 (0.45)
23 3/4 (60)	22 3/4 (58)	22 1/4 (57)	300	7	SN-2430/*	—	1.0 (0.45)
23 3/4 (60)	22 3/4 (58)	22 1/4 (57)	800	16	—	SNH-24/*	1.1 (0.45)
25 1/2 (65)	24 1/2 (62)	24 (61)	900	16	—	SNH-25/*	1.1 (0.50)
27 1/2 (70)	26 1/2 (67)	26 (66)	900	14	—	SNH-27/*	1.1 (0.50)
28 3/4 (73)	27 3/4 (70)	27 1/4 (69)	1000	16	—	SNH-28/*	1.25 (0.57)
30 3/8 (77)	29 3/8 (75)	28 7/8 (73)	450	8	SN-3045/*	—	1.25 (0.57)
30 1/2 (77)	29 3/8 (75)	28 (71)	1000	15	—	SNH-30/*	1.25 (0.57)
33 1/2 (85)	32 3/8 (82)	31 (79)	1000	14	—	SNH-33/*	1.4 (0.64)
35 3/4 (91)	34 3/4 (88)	34 1/4 (87)	600	9	SN-3660/*	—	1.5 (0.68)
35 7/8 (91)	33 3/4 (88)	33 3/8 (85)	1000	13	—	SNH-36/*	1.5 (0.68)
38 1/2 (98)	37 3/8 (95)	36 (91)	1250	15	—	SNH-38/*	1.60 (0.73)
39 7/8 (101)	38 3/4 (98)	37 3/8 (95)	1250	14	—	SNH-40/*	1.60 (0.73)
42 1/2 (108)	41 3/4 (106)	40 (102)	1250	13	—	SNH-43/*	1.80 (0.82)
43 7/8 (111)	42 3/8 (108)	41 3/8 (105)	1250	13	—	SNH-44/*	1.80 (0.82)
45 7/8 (117)	44 3/4 (114)	43 3/8 (110)	1500	14	—	SNH-46/*	1.94 (0.88)
47 7/8 (122)	46 3/4 (119)	45 3/8 (115)	1500	14	—	SNH-48/*	2.0 (0.91)
50 7/8 (129)	49 3/4 (126)	48 3/8 (123)	1500	13	—	SNH-51/	2.13 (0.97)
53 3/8 (136)	52 3/4 (134)	51 3/8 (130)	1500	12	—	SNH-54/	2.25 (1.0)

### CAUTION AND WARNING

Fire and electrical shock may result if products are used improperly or used by non-qualified personnel. See inside back cover for additional warning.

\* Designate voltage, i.e.; insert "120" for 120 Vac or "240" for 240 Vac. Model numbers containing /120 or /240 are only available in that voltage.

† To determine maximum allowable watt density, see Figures online.

Ordering Examples: SNH-08/120, 1" wide strip heater with chrome steel sheath and two terminals at one end.

SN-910/120, 3/4" wide strip heater with rust resisting iron sheath and two terminals at one end.



## U Series Heat Trace Connection Kits/Accessories

### Single Entry Power Connection Kit

- NEMA 4X
- Entry for 1 Cable
- 3/4" Conduit Hub Opening
- Lighted or Non-Lighted

### Multiple Entry Connection Box

- NEMA 4X
- Entry for up to 3 Cables
- Power, Splice or Tee Connection
- 3/4" Conduit Hub Opening

### Above Insulation End Seal Kit

- NEMA 4X
- Fits All Pipe Sizes
- Mounts Above the Insulation for Easy Access
- Lighted or Non-Lighted

### Pipe Standoff Kit

- Brings Cable Outside Insulation to Customer Supplied Junction Box

### Under Insulation End Seal Kit

- 3" Dia. Curved Mounting Surface
- Stainless Steel Hardware
- 1" Wide Strapping Channel for Secure Mounting

### Small Pipe Adapter for Pipes Under 1-1/2" Diameter



### Description

The U-Series Connection Kits represent cutting edge design in heat tracing accessories. Each model in this series is designed to satisfy the unique demands of a particular operation. These high-quality models combine a variety of functions in a convenient, easy-to-use and economical package.

### Applications

These accessories are designed to connect SRL, SRP, SRM/E and CWM heating cables to customer-supplied wiring in any of the following applications:

- Freeze Protection
- Piping Process Temperature Maintenance
- Fluid Flow and Viscosity Maintenance

### Approvals

Factory Mutual (FM) Approved and CSA certified for ordinary areas. ATEX, IECEx, FM, and CSA Approved for hazardous (classified) areas.

### CSA<sup>+</sup> and FM Approved

- Class I, Div. 2 Groups A\*, B, C, D (gases, vapors)
- Class II, Div. 2 Groups E\*, F, G (combustible dust)
- Class III, Div. 2 (easily ignitable fibers & fillings)
- For T-Ratings See Heating Cable
- UPC, UMC, UES, RTES, UESL, SSK Only
- \*CSA Only

### ATEX Approved

-  CE 0359 IIG Ex e IIC T\* Gb Ta -60°C to 195°C
- UPC, UMC, UES, RTES Only
- \* For T-Ratings See Heating Cable

### IECEx Approved:

- ITS 07.0018X Ex e IIC T\* Gb Ta -60°C to 195°C
- UPC, UMC, UES, RTES Only
- \* For T-Ratings See Heating Cable

<sup>†</sup>SSK to have these approvals when a junction box is used that is NEMA 4X rated and certified by appropriate third party agency for use for that application and hazardous locations rating (Div. 2).

### Features

- Molded of Durable Polyphenylene Sulphide Plastic Material\*
- Maximum Pipe Temperature 482°F (250°C)
- Corrosion Resistant
- Thermal Stability
- Non-Flammable
- High Strength and Rigidity
- Captive Hardware
- Stainless Steel Hardware to Ensure the Integrity of the System
- Liquid Tight Design Prevents Moisture from Reaching the Electrical Connections
- All Models are Rated NEMA 4X.



\* This crystalline, high-performance engineering TP is characterized by outstanding high-temperature stability, inherent flame resistance and a broad range of chemical resistance. PPS plastics and compounds provide various combinations of high mechanical strength, impact resistance and electrical insulation, with its high arc resistance and low arc tracking.

## U Series Heat Trace Connection Kits/Accessories (cont'd.)

### Accessories

#### UPC Power Connection Box PCN 393553

NEMA 4X rated junction box designed to connect SRL, SRP, SRM/E and CWM cables to customer supplied power wiring. This kit provides water-resistant cable entry for one cable, enclosure support, terminal block, and a water-resistant corrosion-resistant wiring enclosure with a 3/4" opening to accept a conduit hub (CCH-2 or equal). A pipe strap (PS Series) is required to attach this model to a pipe. Small pipe adapter is available for pipe size less than 1-1/2".

\*Use as end seal for monitor wire cables.

**Kit Dimensions:** 9.78"H x 4.78"W x 3.6"D

#### Kit Includes:

- 1 Junction box with DIN rail & terminal block
- 1 Compression fitting
- 1 Locknut
- 1 Silicone termination boot
- 1 Pipe standoff
- 1 O-ring
- 1 Self-regulating cable grommet
- 1 Constant wattage cable grommet



#### UMC Multiple Entry Connection Box PCN 393561

NEMA 4X rated junction box designed to connect two or three SRL, SRP, SRM/E and CWM cables to customer supplied power wiring. This kit provides water-resistant cable entry, enclosure support, terminal block and a water-resistant, corrosion-resistant wiring enclosure. In addition to splicing or teeing cables, this model can be used to provide power connection to up to three cables from one connection kit. A pipe strap (PS series) is required to attach this model to a pipe. Small pipe adapter is available for pipe size less than 1-1/2".

\*Use as power connection for monitor wire cables.

**Kit Dimensions:** 9.78"H x 8.69"W x 3.6"D

#### Kit Includes:

- 1 Junction box with din rail and terminal block
- 1 Compression fitting
- 1 Locknut
- 3 Silicone termination boots
- 1 Pipe standoff
- 1 O-ring
- 1 Self-regulating cable grommet
- 1 Constant wattage cable grommet
- 1 Self-regulating cable grommet insert
- 1 Constant wattage cable grommet insert

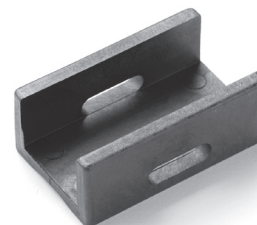


#### SPA Small Pipe Adapter\* PCN 393609

\*Pipe adapter to be used when pipe size is less than 1-1/2" diameter.

#### Kit Includes:

- 1 Small pipe adapter



## U Series Heat Trace Connection Kits/Accessories *(cont'd.)*

### *UES Above Insulation End Seal Kit PCN 393570*

NEMA 4X rated end seal designed of to terminate SRL, SRP, SRM/E and CWM cables. This kit provides water-resistant cable entry for one cable, water-resistant and corrosion-resistant pipe support to bring the cable end outside the insulation for easy access. A pipe strap (PS Series) is required to attach this model to a pipe. Small pipe adapter is available for pipe size less than 1-1/2".

**Kit Dimensions:** 5.5"H x 2.75"W x 2.25"D

**Kit Includes:**

- 1 End cap
- 1 Pipe standoff
- 1 Self-regulating cable grommet
- 1 Constant wattage cable grommet



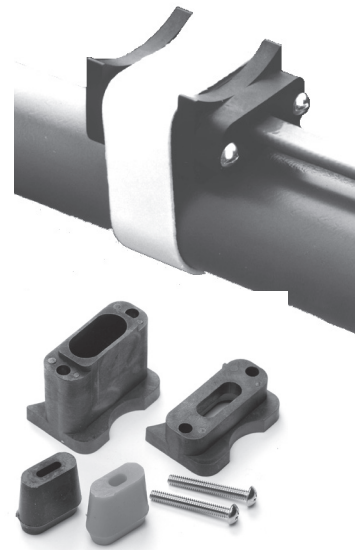
### *RTES Under Insulation End Seal Kit PCN 389570*

NEMA 4X rated enclosure is designed to terminate SRL, SRP, SRM/E and CWM cables. This kit provides water-resistant cable entry for one cable, enclosure support and a water-resistant corrosion-resistant enclosure. The fitting has two different curved mounting surfaces. One side has a 1-1/2" radius curved surface that provides stable support on pipes with a diameter of 3" or more. The other side has a 1/2" radius curved surface which permits a better fit on smaller pipes. A pipe strap (PS Series) is required to attach this model to a pipe. In addition, this side also has four "feet" for installation on flat surfaces.

**Kit Dimensions:** 1.25"H x 1.75"W x 2"D

**Kit Includes:**

- 1 End Cap
- 1 Pressure Plate
- 1 GRSR Self-Regulating Cable Sealing Grommet
- 1 GRCW Constant Wattage Cable Sealing Grommet



### *SSK Single Entry Sealing Kit† PCN 393617*

This kit provides water resistant cable entry for one cable, water-resistant and corrosion-resistant pipe support to bring the cable outside the insulation for easy connection to power. A pipe strap (PS Series) is required to attach this model to a pipe. A small pipe adapter is available for pipe sizes less than 1-1/2". Customer supplied junction box required.

† Approved for CSA Class I, Div. 2 groups A, B, C & D and Class II, Div. 2, Groups F, G when junction box that is used is NEMA 4X rated and certified by appropriate third party agency for use for that application and hazardous locations rating (Div. 2)

**Kit Includes:**

- 1 Compression fitting
- 1 Locknut
- 1 Silicone termination boots
- 1 Pipe standoff
- 1 O-ring
- 1 Self-regulating cable grommet
- 1 Constant wattage cable grommet
- 2 Uninsulated butt splice 14-16 AWG
- 2 Insulated butt splice 14-16 AWG



ACCESSORIES AND CONTROLS

## U Series Heat Trace Connection Kits/Accessories (cont'd.)

### *UESL RED End Seal Signal Light Kit PCN 394257*

NEMA 4X rated end seal designed to power or seal one cable and indicate power on with RED universal voltage 120-277V LED indicator light kit designed for use with SRL, SRP, SRM/E and CWM cables. This model provides water-resistant cable entry and corrosion-resistant wiring enclosure. A pipe strap (PS Series) is required to attach this model to a pipe. Small pipe adapter is available for pipe size less than 1-1/2".

**Kit Dimensions:** 7"H x 3.25"W x 3.25"D

**Kit Includes:**

- 1 Pipe standoff
- 1 Self-regulating cable grommet
- 1 Constant wattage cable grommet
- 1 RED Universal Voltage 120-277V LED Light Assembly
- 2 Insulated parallel splices



### *UESL-G GREEN End Seal Signal Light Kit PCN 394353*

NEMA 4X rated end seal designed to power or seal one cable and indicate power on with GREEN universal voltage 120-277V LED indicator light kit designed for use with SRL, SRP, SRM/E and CWM cables. This model provides water-resistant cable entry and corrosion-resistant wiring enclosure. A pipe strap (PS Series) is required to attach this model to a pipe. Small pipe adapter is available for pipe size less than 1-1/2".

**Kit Dimensions:** 7"H x 3.25"W x 3.25"D

**Kit Includes:**

- 1 Pipe standoff
- 1 Self-regulating cable grommet
- 1 Constant wattage cable grommet
- 1 GREEN Universal Voltage 120-277V LED Light Assembly
- 2 Insulated parallel splices



### *UAS Ambient-Sensing Thermostat\* PCN 394038*

NEMA 4X rated junction box designed to connect a single SRL, SRP, SRM/E or CWM cable run to power and control cable output via ambient air temperature in non-hazardous areas. This kit provides water-resistant cable entry for one cable, enclosure support, terminal block and a water resistant corrosion resistant wiring enclosure with a 3/4" opening to accept a conduit hub (CCH-2 or equal). Stainless steel sheath probe is 9/16" diameter x 3" long. Switch rated for 22 amps SPDT 120-480 volts. Operating temperature range is -40°F to 160°F (-40°C to 71°C). Temperature set point 0° to 225°F (-81°C to 107°C) with 10°F scale divisions.

**\*Only for ordinary areas.**

**Kit Dimensions:** 9.78"H x 8.69"W x 3.6"D



**Kit Includes:**

- 1 Junction box with DIN rail & terminal block
- 1 Compression fitting
- 1 Locknut
- 1 Silicone termination boot
- 1 Pipe standoff
- 1 O-ring
- 1 Self-regulating cable grommet
- 1 Constant wattage cable grommet

## U Series Heat Trace Connection Kits/Accessories *(cont'd.)*

### *USL Signal Light Kit\** **PCN 393588**

NEMA 4X rated end seal designed to power or seal one cable and indicate power on with universal voltage 120-277 LED indicator light kit designed for use with SRL, SRP, SRM/E and CWM cables. This model provides water-resistant cable entry, enclosure support, terminal block, and corrosion-resistant wiring enclosure. A pipe strap (PS Series) is required to attach this model to a pipe. Small pipe adapter is available for pipe size less than 1-1/2".

\* Only Approved for Ordinary Areas.

**Kit Dimensions:** 9.78"H x 4.78"W x 3.6"D

**Kit Includes:**

- 1 Junction box with DIN rail & terminal block
- 1 Compression fitting
- 1 Locknut
- 1 Silicone termination boot
- 1 Pipe standoff
- 1 O-ring
- 1 Self-regulating cable grommet
- 1 Constant wattage cable grommet
- 1 Universal voltage 120-277V LED light assy.



### *UBC Line-Sensing Thermostat\** **PCN 394011**

NEMA 4X rated junction box designed to connect a single SRL, SRP, SRM/E or CWM cable run to power and control cable output via pipe temperature in non-hazardous areas. This kit provides water-resistant cable entry for one cable, enclosure support, terminal block and a water resistant corrosion resistant wiring enclosure with a 3/4" opening to accept a conduit hub (CCH-2 or equal). Stainless steel bulb is 1/4" diameter x 7-1/4" long with 3ft capillary. Switch rated for 22 amps SPDT 120-480 volts. Operating temperature range is -40°F to 160°F (-40°C to 71°C). Temperature set point 0° to 400°F (-18°C to 200°C) with 10°F.

\* Only approved for ordinary areas.

**Kit Dimensions:** 9.78"H x 8.69"W x 3.6"D

**Kit Includes:**

- 1 Junction box with DIN rail & terminal block
- 1 Compression fitting
- 1 Locknut
- 1 Silicone termination boot
- 1 Pipe standoff
- 1 O-ring
- 1 Self-regulating cable grommet
- 1 Constant wattage cable grommet
- 1 Line-sensing thermostat assembly



ACCESSORIES  
AND CONTROLS

### *AT-1 Aluminum Tape Cable Attachments* **PCN 383355**

180' roll aluminum foil installation tape with pressure sensitive acrylic adhesive. 2-mil thickness with high tensile strength; 2-1/2" wide. 200°F (93°C) rating. Minimum application temperatures 40°F (5°C).

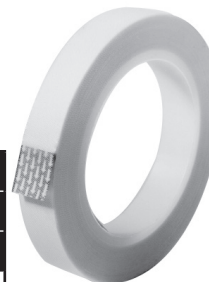


## U Series Heat Trace Connection Kits/Accessories *(cont'd.)*

### *FT-3 Fiberglass Tape Cable Attachments PCN 389941*

66' roll glass cloth installation tape with pressure sensitive thermosetting adhesive. 3/8" wide. 310°F (155°C) rating. Strap at one foot intervals. Minimum application temperature 40°F (5°C).

Tape Type	Rolls Needed per 100' of Pipe								
	Pipe Dia. (In.)								
	1/2"	1	2	3	4	6	8	10	12
FT-3	1	2	4	4	6	8	10	12	15



### *PS-1, PS-3, PS-10 Stainless Steel Pipe Straps PCN 382352, 382360, 382379*

Used for attaching U Series kits to pipe.

- PS-1 1/2" to 3/4" pipes (PCN 382352)
- PS-3 1" to 3-1/2" pipes (PCN 382360)
- PS-10 2-1/2" to 9" pipes (PCN 382379)
- PS-20 9" to 19.5" pipes (PCN 382256)



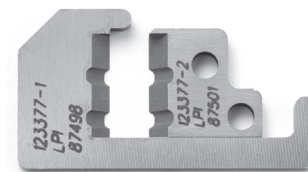
### *Stripping Tool PCN 393510*

Tool for stripping the base jacket and the conductive matrix from the cable buss wires. The tool is stocked with 16 awg blades for stripping SRL, HSRL, SRM/E, HSRM and SRP and Thermwire products.



### *Replacement Blades PCN 393537*

Blade Set for Stripping SRL, HSRL, SRM/E, HSRM and SRP Cables



### *Conduit Hub w/Grounding Lug CCH-2 (385650)*

Corrosion resistant hub for 3/4" conduit. Fits opening in PJB, DL, U Series and DTS. Includes ground connector.



# SILICONE RUBBER HEATERS

## Square/Rectangular Heat Blankets

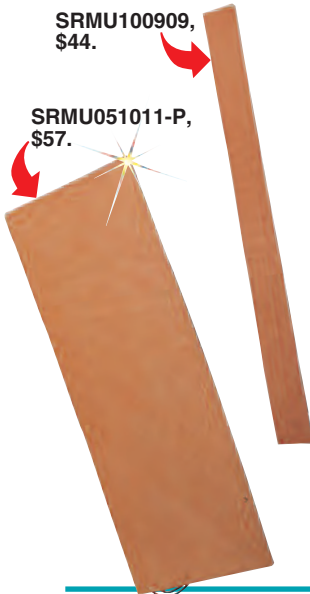
SRMU Series Starts at

**\$44**

9 to 12" Widths

SRMU100909, \$44.

SRMU051011-P, \$57.



**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)						
Width cm (")	Length cm (")	2.5 Watts/in <sup>2</sup> (0.39 Watts/cm <sup>2</sup> )	5 Watts/in <sup>2</sup> (0.78 Watts/cm <sup>2</sup> )	10 Watts/in <sup>2</sup> (1.55 Watts/cm <sup>2</sup> )	Price no PSA	Price with PSA*
22.86 (9)	22.86 (9)	SRMU020909	SRMU050909	SRMU100909	\$44	\$48
22.86 (9)	25.40 (10)	SRMU020910	SRMU050910	SRMU100910	46	51
22.86 (9)	27.94 (11)	SRMU020911	SRMU050911	SRMU100911	49	54
22.86 (9)	30.48 (12)	SRMU020912	SRMU050912	SRMU100912	52	57
25.40 (10)	25.40 (10)	SRMU021010	SRMU051010	SRMU101010	49	54
25.40 (10)	27.94 (11)	SRMU021011	SRMU051011	SRMU101011	52	57
25.40 (10)	30.48 (12)	SRMU021012	SRMU051012	SRMU101012	54	59
25.40 (10)	45.72 (18)	SRMU021018	SRMU051018	N/A	69	76
25.40 (10)	60.69 (24)	SRMU021024	SRMU051024	N/A	84	92
25.40 (10)	76.20 (30)	SRMU021030	SRMU051030	N/A	99	109
25.40 (10)	91.44 (36)	SRMU021036	SRMU051036	N/A	114	126
25.40 (10)	106.68 (42)	SRMU021042	N/A	N/A	129	142
124.40 (10)	121.92 (48)	SRMU021048	N/A	N/A	143	157
27.94 (11)	27.94 (11)	SRMU021111	SRMU051111	SRMU101111	54	58
27.94 (11)	30.48 (12)	SRMU021112	SRMU051112	SRMU101112	58	64
30.48 (12)	20.32 (12)	SRMU021212	SRMU051212	N/A	61	66
30.48 (12)	22.86 (18)	SRMU021218	SRMU051218	N/A	78	86
30.48 (12)	25.40 (24)	SRMU021224	SRMU051224	N/A	95	105
30.48 (12)	27.94 (30)	SRMU021230	N/A	N/A	114	126
30.48 (12)	30.48 (36)	SRMU021236	N/A	N/A	132	145
30.48 (12)	45.72 (42)	SRMU021242	N/A	N/A	149	164
30.48 (12)	60.96 (48)	SRMU021248	N/A	N/A	167	184

\* To order with PSA (Pressure Sensitive Adhesive) add suffix "-P" to Model Number. To custom order 96" leads, add suffix "-096" to model number and \$45 to price.

Ordering Example: SRMU020608-P, 2.5 watt/in<sup>2</sup> 6 x 8" heater, \$40.

## Silicone Rubber Enclosed Heaters

SREH Series Starts at

**\$25**

- ✓ Moisture Resistant
- ✓ Chemical Resistant
- ✓ Radiation Resistant

SREH series enclosure heaters feature our serpentine wound heating element laminated between two layers of 15 mil fiberglass reinforced silicone rubber and bonded to an aluminum mounting plate. The mounting plate comes with two 11 mm (7/16") holes for mounting. The built-in air sensing thermostat regulates the temperature in the enclosure to prevent condensation or freezing. The SREH enclosure heaters can be mounted vertically or horizontally, however optimal control is achieved when mounted vertically.

### SPECIFICATIONS

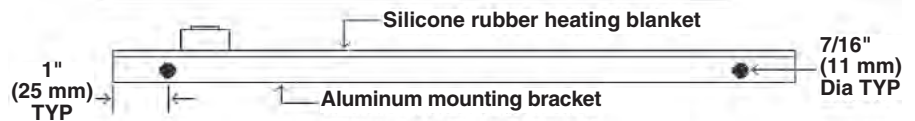
**Operating Voltage:** 120 Vac

**Leads:** 122 cm (48") PFA

**Heating Element:** Laminated between two layers of, 0.015 mil, fiberglass reinforced silicone rubber

SREH600, \$25, shown smaller than actual size.

122 cm (48") PFA Leads



**Silicone Rubber Density:** 16.8 oz/yd<sup>2</sup> (0.06 grams/cm<sup>2</sup>) per layer

**Overall Thickness:** (blanket and bracket) 1/4" (0.64 cm)

**Maximum Energized Exposure Temperature:** 232°C (450°F)

**Maximum De-energized Exposure Temperature:** 260°C (500°F)

**Minimum Exposure Temperature:** -51°C (-60°F)

**Dielectric Strength:** > 2000V  
**Approvals:** UR Pending

To Order (Specify Model Number)						
Width cm (")	Length cm (")	Total Watts	Thermostat		Model Number (120 Vac)	Price
			Opens	Closes		
6.4 (2.5)	15.24 (6)	60	N/A	N/A	SREH600	\$25
6.4 (2.5)	15.24 (6)	60	15°C (60°F)	4°C (40°F)	SREH640	78
6.4 (2.5)	15.24 (6)	60	60°C (140°F)	43°C (110°F)	SREH6110	78
6.4 (2.5)	15.24 (6)	60	82°C (180°F)	65°C (150°F)	SREH6150	78
6.4 (2.5)	30.48 (12)	120	N/A	N/A	SREH1200	32
6.4 (2.5)	30.48 (12)	120	15°C (60°F)	4°C (40°F)	SREH1240	87
6.4 (2.5)	30.48 (12)	120	140°F (60°C)	43°C (110°F)	SREH12110	87
6.4 (2.5)	30.48 (12)	120	180°F (82°C)	65°C (150°F)	SREH12150	87

Ordering Example: SREH1240, 30.48 cm (12"), 120 Watt heater with 15°C (60°F) setpoint thermostat. \$87.



**UNITED STATES**

[www.omega.com](http://www.omega.com)  
1-800-TC-OMEGA  
Stamford, CT.

**CANADA**

[www.omega.ca](http://www.omega.ca)  
Laval(Quebec)  
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## More than 100,000 Products Available!

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Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

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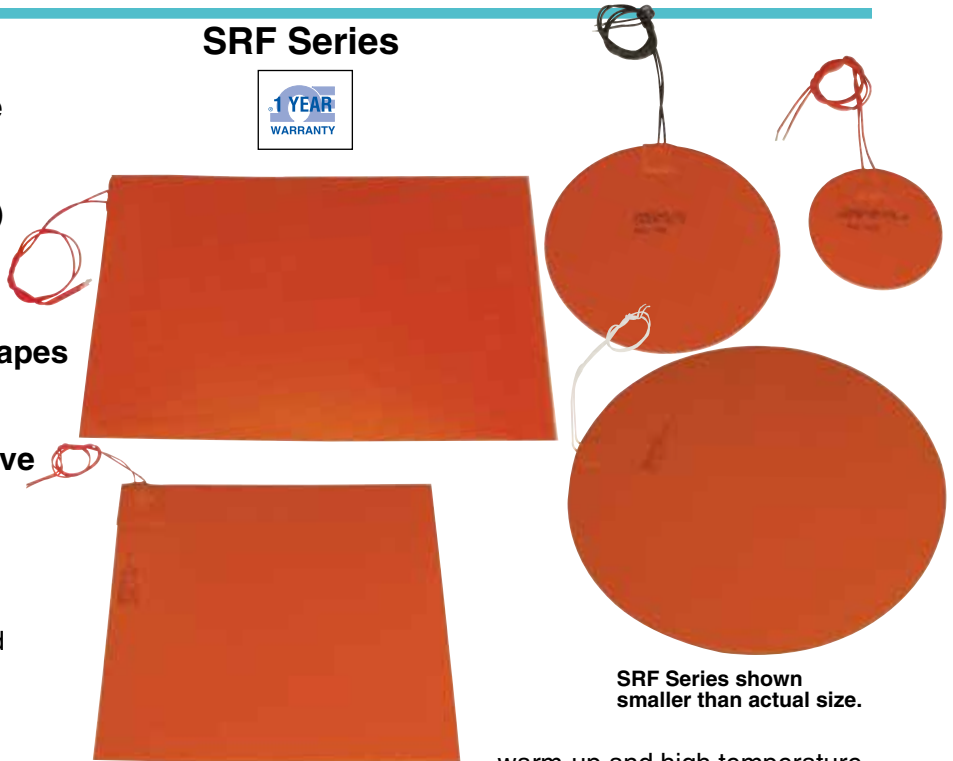


# FLEXIBLE SILICONE RUBBER FIBERGLASS INSULATED HEATERS

## SRF Series



- ✓ Lightweight Thin, Flexible
- ✓ Available in 2.5, 5 and 10 W/in<sup>2</sup>
- ✓ -56 to 232°C (-70 to 450°F) Operating Temperature
- ✓ Etched Foil and Wire Wound Design
- ✓ Round or Rectangular Shapes
- ✓ Available in 115 or 230\*\* Vac
- ✓ Optional Pressure Sensitive Adhesive (PSA)<sup>†</sup>



SRF Series shown smaller than actual size.

OMEGALUX<sup>®</sup> silicone rubber fiberglass insulated flexible heaters can improve heat transfer and speed warm-ups where controlled heating is required in confined areas. Two circuit designs are available: etched foil or wire wound. Heaters with etched foil designed elements are available where the length or width dimension is less than 305 mm (12"). All other heaters where both the length and the width dimensions

exceed 305 mm (12") use the wire-wound element design. Effect of power density: gentle warming is best done with 2.5 W/in<sup>2</sup>. A good all purpose unit is the 5 W/in<sup>2</sup>. Rapid

warm-up and high temperature are achieved with the 10 W/in<sup>2</sup>; however, temperature must be controlled as the safe maximum operating temperature limit of 232°C (450°F) may be exceeded.

### Round Silicone Rubber Heaters

To Order					
Diameter cm (inch)	Total Wattage for Watt Density			Without PSA Model No.	With PSA Model No.
	2.5 W/in <sup>2</sup>	5 W/in <sup>2</sup>	10 W/in <sup>2</sup>		
7.6 (3)	17.5	35	70	SRFR-3/*	SRFR-3/*-P
10 (4)	31.4	62.8	125.6	SRFR-4/*	SRFR-4/*-P
13 (5)	49.0	98.15	196.3	SRFR-5/*	SRFR-5/*-P
15 (6)	70.67	141.3	282.7	SRFR-6/*	SRFR-6/*-P
18 (7)	96.2	192.4	384.8	SRFR-7/*	SRFR-7/*-P
20 (8)	125.65	251.3	502.6	SRFR-8/*	SRFR-8/*-P
23 (9)	157.9	315.8	631.7	SRFR-9/*	SRFR-9/*-P
25 (10)	196.25	392.5	785	SRFR-10/*	SRFR-10/*-P
28 (11)	237.45	474.9	949.8	SRFR-11/*	SRFR-11/*-P
30 (12)	376.8	753.6	1507.2	SRFR-12/*	SRFR-12/*-P

Comes complete with operator's manual

\* Insert watt density: 2 for 2.5 W/in<sup>2</sup>, 5 for 5 W/in<sup>2</sup> or 10 for 10 W/in<sup>2</sup>.

\*\* Most sizes available in 230V. Contact Engineering.

† Heaters with pressure sensitive adhesive: max operating temperature is 149°C (300°F).

**Ordering Examples:** SRFR-3/10, 7.6 cm (3") diameter heater with a watt density of 10 W/in<sup>2</sup> and 70 watts of total power.

SRFR-11/10, 28 cm (11") diameter heater with a 10 W/in<sup>2</sup>, 949 watts.

**CAUTION AND WARNING!**  
 Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

**Rectangular Silicone Rubber Heaters**

<b>To Order</b>						
Width, cm (")	Length, cm (")	Total Wattage for Watt Density			Without PSA Model No.	With PSA Model No.
		2.5 W/in <sup>2</sup>	5 W/in <sup>2</sup>	10 W/in <sup>2</sup>		
2.5 (1)	2.5 (1)	—	—	10	SRFG-101/10	SRFG-101/10-P
2.5 (1)	5 (2)	5	10	—	SRFG-102/*	SRFG-102/*-P
2.5 (1)	7.6 (3)	7.5	15	30	SRFG-103/*	SRFG-103/*-P
2.5 (1)	10 (4)	10	20	40	SRFG-104/*	SRFG-104/*-P
2.5 (1)	13 (5)	12.5	25	50	SRFG-105/*	SRFG-105/*-P
2.5 (1)	15 (6)	15	30	60	SRFG-106/*	SRFG-106/*-P
2.5 (1)	18 (7)	17.5	35	70	SRFG-107/*	SRFG-107/*-P
2.5 (1)	20 (8)	20	40	80	SRFG-108/*	SRFG-108/*-P
2.5 (1)	23 (9)	22.5	45	90	SRFG-109/*	SRFG-109/*-P
2.5 (1)	25 (10)	25	50	100	SRFG-110/*	SRFG-110/*-P
2.5 (1)	28 (11)	27.5	55	110	SRFG-111/*	SRFG-111/*-P
2.5 (1)	30 (12)	30	60	120	SRFG-112/*	SRFG-112/*-P
2.5 (1)	46 (18)	45	90	180	SRFG-118/*	SRFG-118/*-P
2.5 (1)	61 (24)	60	120	240	SRFG-124/*	SRFG-124/*-P
2.5 (1)	76 (30)	75	150	300	SRFG-130/*	SRFG-130/*-P
2.5 (1)	91 (36)	90	180	360	SRFG-136/*	SRFG-136/*-P
2.5 (1)	107 (42)	105	210	420	SRFG-142/*	SRFG-142/*-P
2.5 (1)	122 (48)	120	240	480	SRFG-148/*	SRFG-148/*-P
5 (2)	5 (2)	10	20	40	SRFG-202/*	SRFG-202/*-P
5 (2)	7.6 (3)	15	30	60	SRFG-203/*	SRFG-203/*-P
5 (2)	10 (4)	20	40	80	SRFG-204/*	SRFG-204/*-P
5 (2)	13 (5)	25	50	100	SRFG-205/*	SRFG-205/*-P
5 (2)	15 (6)	30	60	120	SRFG-206/*	SRFG-206/*-P
5 (2)	18 (7)	35	70	140	SRFG-207/*	SRFG-207/*-P
5 (2)	20 (8)	40	80	160	SRFG-208/*	SRFG-208/*-P
5 (2)	23 (9)	45	90	180	SRFG-209/*	SRFG-209/*-P
5 (2)	25 (10)	50	100	200	SRFG-210/*	SRFG-210/*-P
5 (2)	28 (11)	55	110	220	SRFG-211/*	SRFG-211/*-P
5 (2)	30 (12)	60	120	240	SRFG-212/*	SRFG-212/*-P
5 (2)	46 (18)	90	180	360	SRFG-218/*	SRFG-218/*-P
5 (2)	61 (24)	120	240	480	SRFG-224/*	SRFG-224/*-P
5 (2)	76 (30)	150	300	600	SRFG-230/*	SRFG-230/*-P
5 (2)	91 (36)	180	360	720	SRFG-236/*	SRFG-236/*-P
5 (2)	107 (42)	210	420	840	SRFG-242/*	SRFG-242/*-P
5 (2)	122 (48)	240	480	960	SRFG-248/*	SRFG-248/*-P
7.6 (3)	7.6 (3)	22.5	45	90	SRFG-303/*	SRFG-303/*-P
7.6 (3)	10 (4)	30	60	120	SRFG-304/*	SRFG-304/*-P
7.6 (3)	13 (5)	37.5	75	150	SRFG-305/*	SRFG-305/*-P
7.6 (3)	15 (6)	45	90	180	SRFG-306/*	SRFG-306/*-P
7.6 (3)	18 (7)	52.5	105	210	SRFG-307/*	SRFG-307/*-P
7.6 (3)	20 (8)	60	120	240	SRFG-308/*	SRFG-308/*-P
7.6 (3)	23 (9)	67.5	135	270	SRFG-309/*	SRFG-309/*-P
7.6 (3)	25 (10)	75	150	300	SRFG-310/*	SRFG-310/*-P
7.6 (3)	28 (11)	82.5	165	330	SRFG-311/*	SRFG-311/*-P
7.6 (3)	30 (12)	90	180	360	SRFG-312/*	SRFG-312/*-P

Comes complete with operator's manual

\* Insert watt density: 2 for 2.5 W/in<sup>2</sup>, 5 for 5 W/in<sup>2</sup> or 10 for 10W/in<sup>2</sup>.

\*\* Most sizes available in 230V. Consult heater sales and engineering.

**Ordering Examples:** SRFG-208/5-P, 5 x 20 cm (2 x 8") heater with a watt density of 5 W/in<sup>2</sup>, total rated wattage output of 80 watts, with optional pressure sensitive adhesive.

SRFG-208/10, 10 W/in<sup>2</sup>, 160 watts.

**Note:** Heaters are available in only the watt densities where total wattage is shown. Heaters with pressure sensitive adhesive: max operating temperature is 149°C (300°F).

### Rectangular Silicone Rubber Heaters

To Order						
Width, cm (")	Length, cm (")	Total Wattage for Watt Density			Without PSA Model No.	With PSA Model No.
		2.5 W/in <sup>2</sup>	5 W/in <sup>2</sup>	10 W/in <sup>2</sup>		
7.6 (3)	46 (18)	135	270	540	SRFG-318/*	SRFG-318/*-P
7.6 (3)	61 (24)	180	360	720	SRFG-324/*	SRFG-324/*-P
7.6 (3)	76 (30)	225	450	900	SRFG-330/*	SRFG-330/*-P
7.6 (3)	91 (36)	270	540	1080	SRFG-336/*	SRFG-336/*-P
7.6 (3)	107 (42)	315	630	1260	SRFG-342/*	SRFG-342/*-P
7.6 (3)	122 (48)	360	720	1440	SRFG-348/*	SRFG-348/*-P
10 (4)	10 (4)	40	80	160	SRFG-404/*	SRFG-404/*-P
10 (4)	13 (5)	50	100	200	SRFG-405/*	SRFG-405/*-P
10 (4)	15 (6)	60	120	240	SRFG-406/*	SRFG-406/*-P
10 (4)	18 (7)	70	140	280	SRFG-407/*	SRFG-407/*-P
10 (4)	20 (8)	80	160	320	SRFG-408/*	SRFG-408/*-P
10 (4)	23 (9)	90	180	360	SRFG-409/*	SRFG-409/*-P
10 (4)	25 (10)	100	200	400	SRFG-410/*	SRFG-410/*-P
10 (4)	28 (11)	110	220	440	SRFG-411/*	SRFG-411/*-P
10 (4)	30 (12)	120	240	480	SRFG-412/*	SRFG-412/*-P
10 (4)	46 (18)	180	360	720	SRFG-418/*	SRFG-418/*-P
10 (4)	61 (24)	240	480	960	SRFG-424/*	SRFG-424/*-P
10 (4)	76 (30)	300	600	1200	SRFG-430/*	SRFG-430/*-P
10 (4)	91 (36)	360	720	1440	SRFG-436/*	SRFG-436/*-P
10 (4)	107 (42)	420	840	1680	SRFG-442/*	SRFG-442/*-P
10 (4)	122 (48)	480	960	—	SRFG-448/*	SRFG-448/*-P
13 (5)	13 (5)	62.5	125	250	SRFG-505/*	SRFG-505/*-P
13 (5)	15 (6)	75	150	300	SRFG-506/*	SRFG-506/*-P
13 (5)	18 (7)	87.5	175	350	SRFG-507/*	SRFG-507/*-P
13 (5)	20 (8)	100	200	400	SRFG-508/*	SRFG-508/*-P
13 (5)	23 (9)	112.5	225	450	SRFG-509/*	SRFG-509/*-P
13 (5)	25 (10)	125	250	500	SRFG-510/*	SRFG-510/*-P
13 (5)	28 (11)	137.5	275	550	SRFG-511/*	SRFG-511/*-P
13 (5)	30 (12)	150	300	600	SRFG-512/*	SRFG-512/*-P
15 (6)	15 (6)	90	180	360	SRFG-606/*	SRFG-606/*-P
15 (6)	18 (7)	105	210	420	SRFG-607/*	SRFG-607/*-P
15 (6)	20 (8)	120	240	480	SRFG-608/*	SRFG-608/*-P
15 (6)	23 (9)	135	270	540	SRFG-609/*	SRFG-609/*-P
15 (6)	25 (10)	150	300	600	SRFG-610/*	SRFG-610/*-P
15 (6)	28 (11)	165	330	660	SRFG-611/*	SRFG-611/*-P
15 (6)	30 (12)	180	360	720	SRFG-612/*	SRFG-612/*-P
15 (6)	46 (18)	270	540	1080	SRFG-618/*	SRFG-618/*-P
15 (6)	61 (24)	360	720	1440	SRFG-624/*	SRFG-624/*-P
15 (6)	76 (30)	450	900	—	SRFG-630/*	SRFG-630/*-P
15 (6)	91 (36)	540	1080	—	SRFG-636/*	SRFG-636/*-P
15 (6)	107 (42)	630	1260	—	SRFG-642/*	SRFG-642/*-P
15 (6)	122 (48)	720	1440	—	SRFG-648/*	SRFG-648/*-P
18 (7)	18 (7)	122.5	245	490	SRFG-707/*	SRFG-707/*-P
18 (7)	20 (8)	140	280	560	SRFG-708/*	SRFG-708/*-P
18 (7)	23 (9)	157.5	315	630	SRFG-709/*	SRFG-709/*-P

Comes complete with operator's manual. \* Insert watt density: 2 for 2.5 W/in<sup>2</sup>, 5 for 5 W/in<sup>2</sup> or 10 for 10W/in<sup>2</sup>.

\*\* Most sizes available in 230V. Consult heater sales and engineering.

**Ordering Examples:** SRFG-404/5-P, 10 x 10 cm (4 x 4") heater with a watt density of 5 W/in<sup>2</sup>, total rated wattage output of 80 watts, with optional pressure sensitive adhesive.

SRFG-318/5, 5 W/in<sup>2</sup>, 270 watts.

**Note:** Heaters are available in only the watt densities where total wattage is shown.  
Heaters with pressure sensitive adhesive: max operating temperature is 149°C (300°F).

## Rectangular Silicone Rubber Heaters

To Order						
Width, cm (")	Length, cm (")	Total Wattage for Watt Density			Without PSA Model No.	With PSA Model No.
		2.5 W/in <sup>2</sup>	5 W/in <sup>2</sup>	10 W/in <sup>2</sup>		
18 (7)	25 (10)	175	350	700	SRFG-710/*	SRFG-710/*-P
18 (7)	28 (11)	192.5	385	770	SRFG-711/*	SRFG-711/*-P
18 (7)	30 (12)	210	420	840	SRFG-712/*	SRFG-712/*-P
20 (8)	20 (8)	160	320	640	SRFG-808/*	SRFG-808/*-P
20 (8)	23 (9)	180	360	720	SRFG-809/*	SRFG-809/*-P
20 (8)	25 (10)	200	400	800	SRFG-810/*	SRFG-810/*-P
20 (8)	28 (11)	220	440	880	SRFG-811/*	SRFG-811/*-P
20 (8)	30 (12)	240	480	960	SRFG-812/*	SRFG-812/*-P
20 (8)	46 (18)	360	720	1440	SRFG-818/*	SRFG-818/*-P
20 (8)	61 (24)	480	960	—	SRFG-824/*	SRFG-824/*-P
20 (8)	76 (30)	600	1200	—	SRFG-830/*	SRFG-830/*-P
20 (8)	91 (36)	720	1440	—	SRFG-836/*	SRFG-836/*-P
20 (8)	107 (42)	840	1680	—	SRFG-842/*	SRFG-842/*-P
20 (8)	122 (48)	960	1920	—	SRFG-848/*	SRFG-848/*-P
23 (9)	23 (9)	202.5	405	810	SRFG-909/*	SRFG-909/*-P
23 (9)	25 (10)	225	450	900	SRFG-910/*	SRFG-910/*-P
23 (9)	28 (11)	247.5	495	990	SRFG-911/*	SRFG-911/*-P
23 (9)	30 (12)	270	540	1080	SRFG-912/*	SRFG-912/*-P
25 (10)	25 (10)	250	500	1000	SRFG-1010/*	SRFG-1010/*-P
25 (10)	28 (11)	275	550	1100	SRFG-1011/*	SRFG-1011/*-P
25 (10)	30 (12)	300	600	1200	SRFG-1012/*	SRFG-1012/*-P
25 (10)	46 (18)	450	900	—	SRFG-1018/*	SRFG-1018/*-P
25 (10)	61 (24)	600	1200	—	SRFG-1024/*	SRFG-1024/*-P
25 (10)	76 (30)	750	1500	—	SRFG-1030/*	SRFG-1030/*-P
25 (10)	91 (36)	900	1800	—	SRFG-1036/*	SRFG-1036/*-P
25 (10)	122 (48)	1200	—	—	SRFG-1048/*	SRFG-1048/*-P
28 (11)	28 (11)	302.5	605	1210	SRFG-1111/*	SRFG-1111/*-P
28 (11)	30 (12)	330	660	1320	SRFG-1112/*	SRFG-1112/*-P
30 (12)	30 (12)	360	720	—	SRFG-1212/*	SRFG-1212/*-P
30 (12)	46 (18)	540	1080	—	SRFG-1218/*	SRFG-1218/*-P
30 (12)	61 (24)	720	1440	—	SRFG-1224/*	SRFG-1224/*-P
30 (12)	76 (30)	900	—	—	SRFG-1230/*	SRFG-1230/*-P
30 (12)	91 (36)	1080	—	—	SRFG-1236/*	SRFG-1236/*-P
30 (12)	107 (42)	1260	—	—	SRFG-1242/*	SRFG-1242/*-P
30 (12)	122 (48)	1440	—	—	SRFG-1248/*	SRFG-1248/*-P

Comes complete with operator's manual.

\* Insert watt density: 2 for 2.5 W/in<sup>2</sup>, 5 for 5 W/in<sup>2</sup> or 10 for 10W/in<sup>2</sup>.

\*\* Most sizes available in 230V. Consult heater sales and engineering.

**Ordering Example:** SRFG-712/5-P, 18 x 30 cm (7 x 12") heater with a watt density of 5 W/in<sup>2</sup>, total rated wattage output of 420 watts, with optional pressure sensitive adhesive.

**Note:** Heaters are available in only the watt densities where total wattage is shown. Heaters with pressure sensitive adhesive: max operating temperature is 149°C (300°F).

### APPLICATIONS

- ✓ Freeze Protection
- ✓ Low Temperature Ovens
- ✓ Heat Tracing Systems
- ✓ Viscosity Control
- ✓ Dehumidification of Motors and Control Devices

### SPECIFICATIONS

**Wattage:** 5 to 1440 Watts

**Power:** 115 or 230\*\* Vac

**Watt Density:** 2.5, 5 and 10 W/in<sup>2</sup>

**Lead Wire:**

305 mm (12") PFA insulated

**Thickness:** 0.030 to 0.070", except at lead wire exit

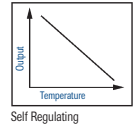
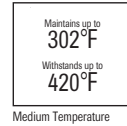
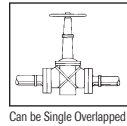
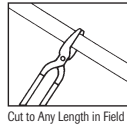
**Dielectric Strength:** 1250 Vac

**Maximum Temperature:** heaters without pressure sensitive adhesive, 232°C (450°F); heaters with pressure sensitive adhesive, 149°C (300°F)

**Minimum Temperature:** -56°C (-70°F)



# Self-Regulating Medium Temperature/ Enhanced Heating Cable



- Self-Regulating, Energy Efficient
- 14 AWG Buss Wire
- Circuit Lengths to 780 Feet
- Process Temperature Maintenance to 302°F (150°C)
- Maximum Exposure Temperature (Power Off) 420°F (215°C)
- Industrial Process Maintenance Applications
- Industrial Freeze Protection Applications
- Freeze Protection of Fire Protection System Piping
- Steam Cleanable On Process Equipment Up to 300 PSIG
- 3, 5, 8, 10, 15 and 20 Watts per Foot
- 120 and 208-277 Volts Available From Stock

## Description

Chromalox SRM/E self-regulating heating cable provides safe, reliable heat tracing for process temperature maintenance and freeze protection of pipes, valves, tanks and similar applications. Constructed of industrial grade 14 AWG buss wire with metal braid and optional overjacketing, SRM/E ensures operating integrity in most hostile industrial environments. The 420°F (215°C) maximum exposure temperature rating allows steam cleaning of process equipment with up to 300 PSIG steam.

## Enhanced Features

- Industrial Grade, 14 gauge buss wire has higher current capacity, allowing longer circuit lengths up to 780 feet.
- Superior matrix to buss wire bonding ensures overall operating integrity and performance.
- High output, 20 Watts per foot heating cable.
- All ratings are available from stock.

## Features

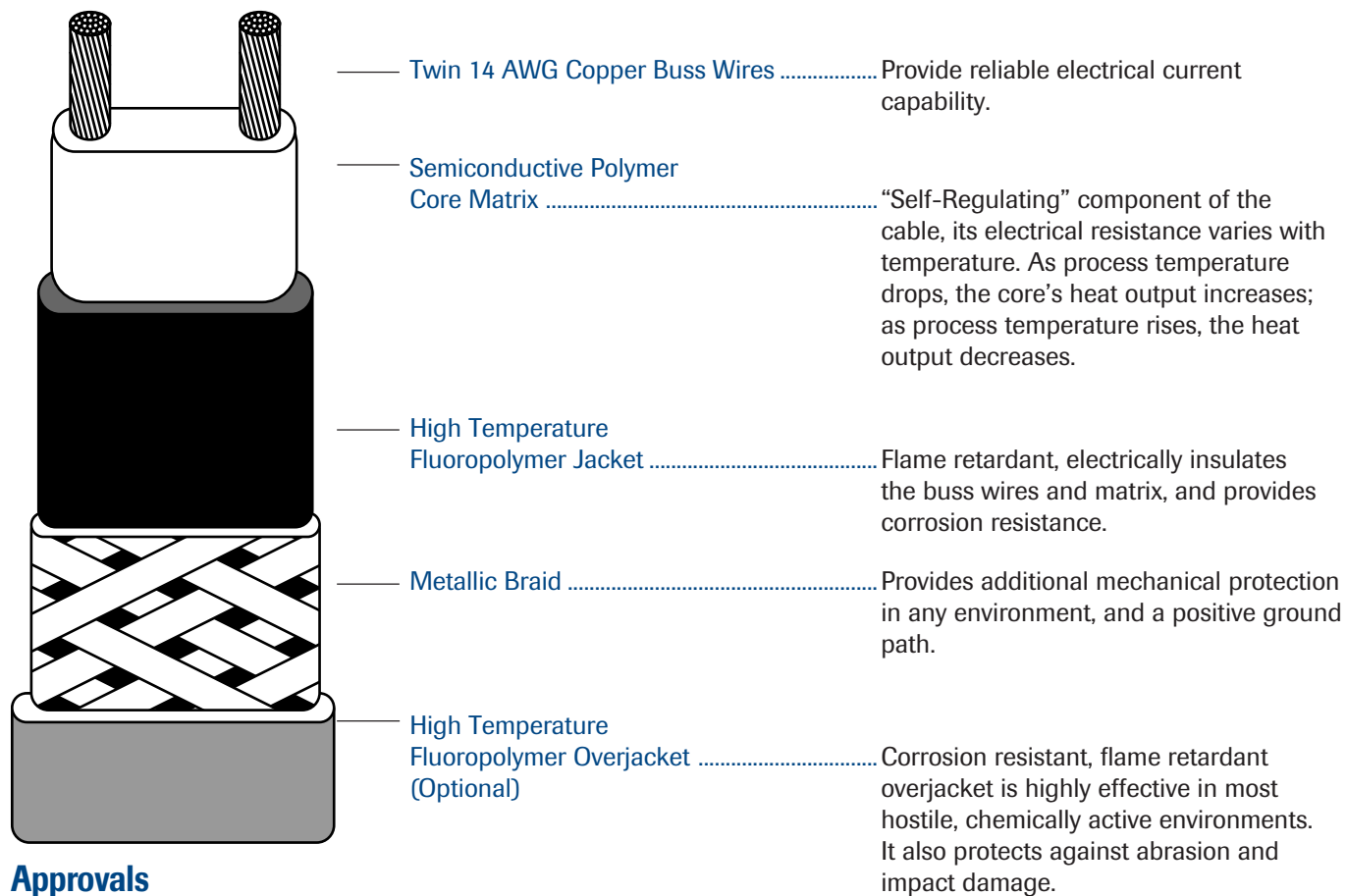
- Energy efficient, self-regulating SRM/E uses less energy when less heat is required.
- Easy to install, SRM/E can be cut to any length (up to maximum circuit length) in the field.
- Field splices can be performed easily in minutes with no scrap or wasted cold sections.
- With lower installed cost than steam tracing, SRM/E features less maintenance expense and down time.
- SRM/E can be single overlapped without burnout, which simplifies heat tracing of in-line process equipment such as valves, elbows and pumps.
- Because SRM/E is self-regulating, overtemperature conditions are virtually impossible.
- Chromalox termination, splice, tee and end seal kits reduce installation time.
- UL listed for use on fire protection system piping



**Chromalox**<sup>®</sup>  
PRECISION HEAT AND CONTROL



## Construction



## Approvals

**FM** - Factory Mutual approved for ordinary areas.

UL Listed, CSA Certified for ordinary areas.

UL Listed for fire protection system piping

FM approved for hazardous (classified) areas when used with Chromalox accessories:

- Class I, Div. 2, Groups B, C, D (gases, vapors)
- Class II, Div. 2, Groups F, G (combustible dust)
- Class III, Div. 2 (easily ignitable fibers and filings)
- 3, 5 and 8 Watt rated T3 Temperature Class
- 10,15 and 20 Watt rated T2D Temperature Class

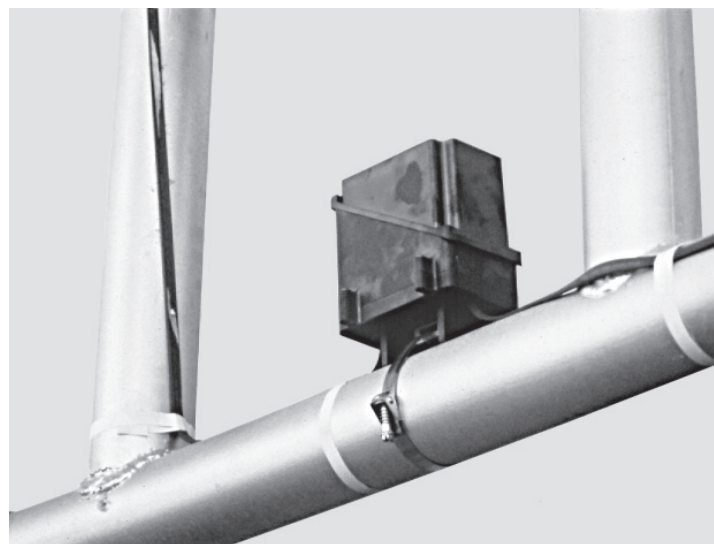
**CSA** Certified for hazardous (classified) areas when used with Chromalox accessories:

- Class I, Div. 2, Groups A, B, C, D
- Class II, Div. 2, Groups F, G
- Temperature Class T3\*

\*Exception: Cable surface temperature shall not exceed 190°C in Class II, Div. 2, Group F; 165°C in Class II, Div. 2, Group G.

## Applications

- Process Temperature Maintenance
- Hydrocarbon and Chemical Product Piping
- Freeze Protection of Periodically Steam-Cleaned Pipes
- Freeze Protection of Fire Protection System Piping
- Fluid Flow and Viscosity Maintenance



## Heating Cable System Design

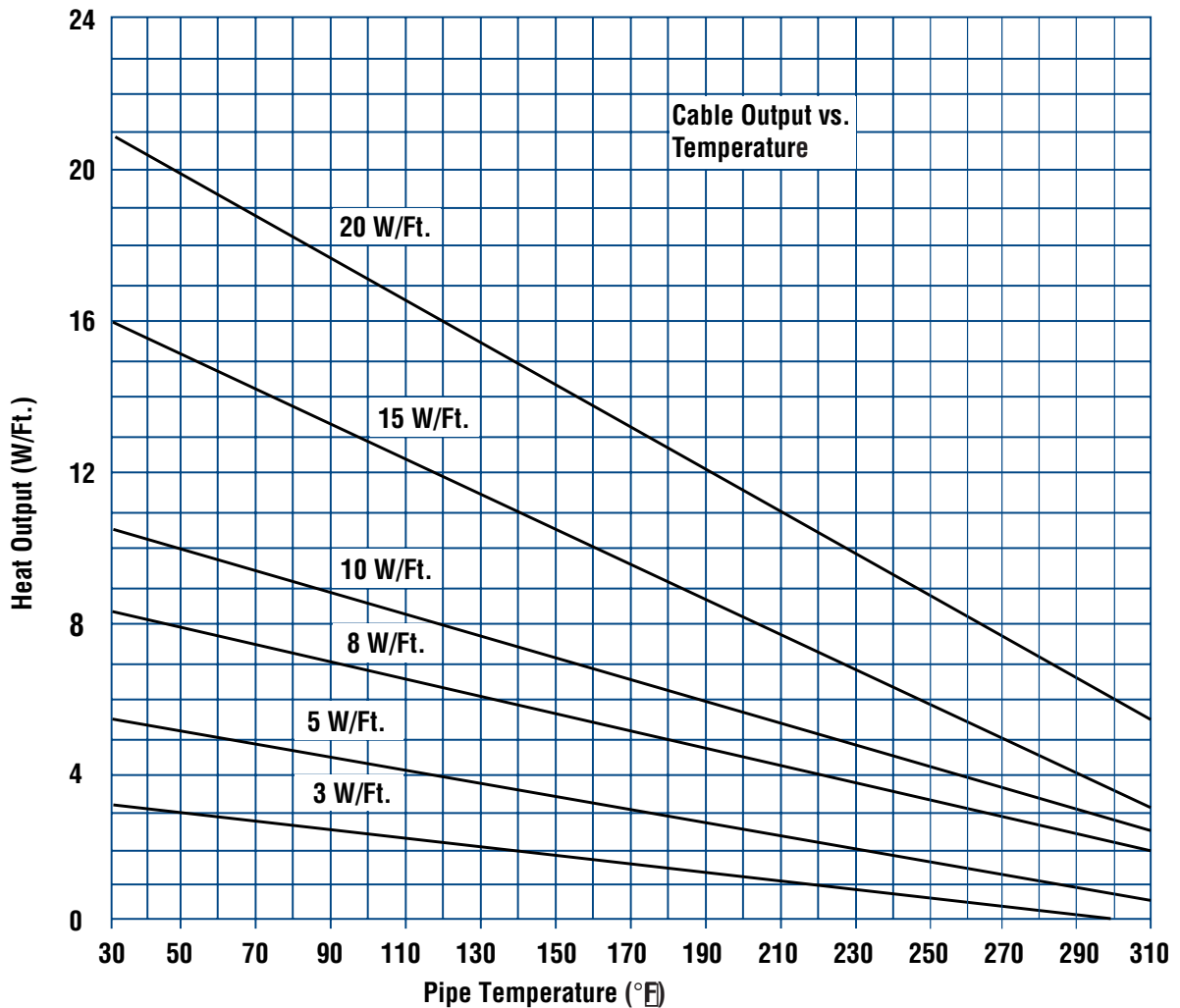
### 1. Calculate Heat Loss

Using the Chromalox Design Guide (PJ304) for Heat Tracing, calculate the heat loss of the system. To calculate the heat loss (Watts) you will need to know pipe diameter, insulation type and thickness, minimum ambient temperature and the pipe maintenance temperature.

### 2. Select Cable Rating

After calculating the heat loss in the pipe and adjusting for any application deviations, you may determine which cable rating to choose. Using the SRM/E Thermal Output Ratings graph, select the lowest cable rating that will provide the output required to offset the heat-loss at the desired maintenance temperature. Adjust the cable output for line voltage if necessary. Consult output wattage at alternative voltage table on page 5.

### Thermal Output Ratings On Insulated Metal Pipe



## Specifications

### Cable Ratings

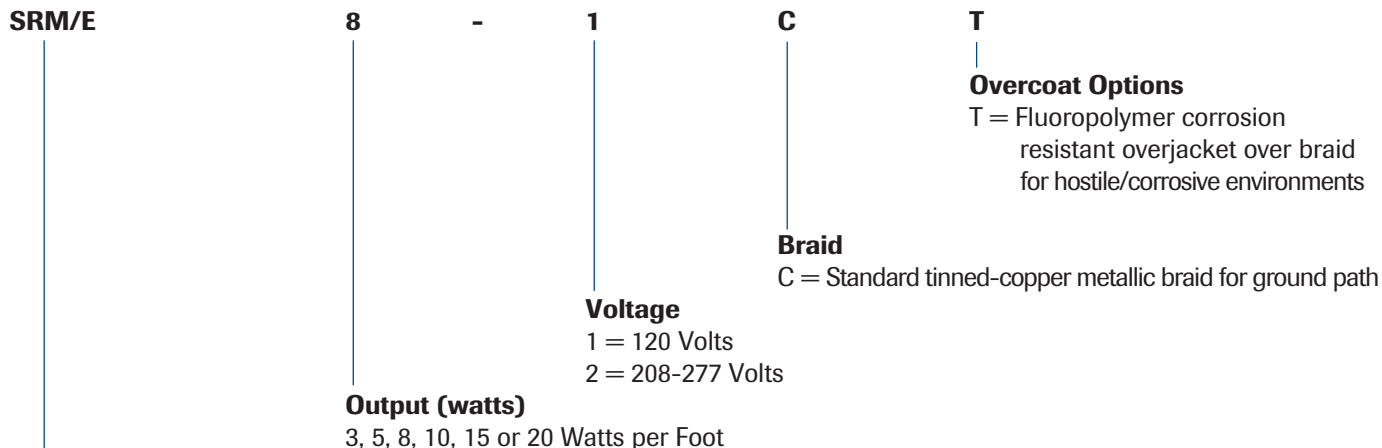
Model Number	Output @ 50°F (W/Ft.)	Nominal Voltage (Vac)	Maximum Circuit Length* (Ft.)
SRM/E 3 -1C	3	120	385
SRM/E 3 -2C	3	240	780
SRM/E 5 -1C	5	120	375
SRM/E 5 -2C	5	240	750
SRM/E 8 -1C	8	120	325
SRM/E 8 -2C	8	240	600
SRM/E 10 -1C	10	120	250
SRM/E 10 -2C	10	240	490
SRM/E 15 -1C	15	120	210
SRM/E 15 -2C	15	240	420
SRM/E 20 -1C	20	120	160
SRM/E 20 -2C	20	240	350

\*See chart on page 4 for maximum circuit lengths by start-up temperature and circuit breaker size.

### Output Wattage at Alternate Voltages (50°F) W/Ft.

Cable Rating	208 Volts	220 Volts	277 Volts
SRM/E 3	2.31	2.55	3.90
SRM/E 5	3.85	4.25	6.45
SRM/E 8	6.40	6.88	10.24
SRM/E 10	8.30	8.80	12.50
SRM/E 15	12.75	13.50	18.45
SRM/E 20	17.60	18.40	24.40

## Model Numbers





## Specifications

### Cable Ratings

Model Number	Output @ 50°F (W/Ft.)	Nominal Voltage (Vac)	Maximum Circuit Length* (Ft.)
SRM/E 3 -1C	3	120	385
SRM/E 3 -2C	3	240	780
SRM/E 5 -1C	5	120	375
SRM/E 5 -2C	5	240	750
SRM/E 8 -1C	8	120	325
SRM/E 8 -2C	8	240	600
SRM/E 10 -1C	10	120	250
SRM/E 10 -2C	10	240	490
SRM/E 15 -1C	15	120	210
SRM/E 15 -2C	15	240	420
SRM/E 20 -1C	20	120	160
SRM/E 20 -2C	20	240	350

\*See chart on page 4 for maximum circuit lengths by start-up temperature and circuit breaker size.

### Output Wattage at Alternate Voltages (50°F) W/Ft.

Cable Rating	208 Volts	220 Volts	277 Volts
SRM/E 3	2.31	2.55	3.90
SRM/E 5	3.85	4.25	6.45
SRM/E 8	6.40	6.88	10.24
SRM/E 10	8.30	8.80	12.50
SRM/E 15	12.75	13.50	18.45
SRM/E 20	17.60	18.40	24.40

## Model Numbers

SRM/E

8

-

1

C

T

### Overcoat Options

T = Fluoropolymer corrosion resistant overjacket over braid for hostile/corrosive environments

### Braid

C = Standard tinned-copper metallic braid for ground path

### Voltage

1 = 120 Volts

2 = 208-277 Volts

### Output (watts)

3, 5, 8, 10, 15 or 20 Watts per Foot

SRM/E

Self-Regulating, Medium Temperature/Enhanced Heating Cable

## Ordering Information

Output (W/Ft.)	Voltage	Model Number	PCN	Output (W/Ft.)	Voltage	Model Number	PCN
<b>3</b>	120	SRM/E 3-1 C	388025	<b>10</b>	120	SRM/E 10-1 C	388201
		SRM/E 3-1 CT	388033			SRM/E 10-1 CT	388210
	208-277	SRM/E 3-2 C	388050		208-277	SRM/E 10-2 C	388236
		SRM/E 3-2 CT	388068			SRM/E 10-2 CT	388244
<b>5</b>	120	SRM/E 5-1 C	388084	<b>15</b>	120	SRM/E 15-1 C	388260
		SRM/E 5-1 CT	388092			SRM/E 15-1 CT	388279
	208-277	SRM/E 5-2 C	388113		208-277	SRM/E 15-2 C	388308
		SRM/E 5-2 CT	388121			SRM/E 15-2 CT	388316
<b>8</b>	120	SRM/E 8-1 C	388148	<b>20</b>	120	SRM/E 20-1 C	388332
		SRM/E 8-1 CT	388156			SRM/E 20-1 CT	388340
	208-277	SRM/E 8-2 C	388172		208-277	SRM/E 20-2 C	388367
		SRM/E 8-2 CT	388180			SRM/E 20-2 CT	388375

**To Order:** Specify length, Model Number, PCN and Installation Accessories.

## Accessories

Chromalox has a complete line of accessories specifically designed for use with SRM/E cable. Use only Chromalox accessories to ensure the performance of the heat trace system.

	Model	Description
Thermostat	RTAS	DL Series air-sensing thermostat with Microswitch® for local control of circuit.
	RTBC	DL Series pipewall-sensing thermostat with Microswitch® for local control of circuit.
Power Connection	RTPC	DL Series power connection set kit.
	RTST	DL Series splice and tee set kit.
	RTES	DL Series end seal kit.
Pipe Straps	PS-1, PS-3, PS-10	Pipe straps to affix thermostat and power connection splice kits to pipes.
Fiberglass Tape	FT-2	Tape to affix cable to pipe, 66' roll x 1/2", install on 12" centers.
Aluminum Tape	AT-1	Tape to aid heat transfer, 180 foot roll. Apply over cable along entire length of circuit.
Caution Labels	CL-1	"Electrical Heat Tracing" caution labels, 5 per package. Install every 10 feet.
Control Panels		Contact your Chromalox representative for Control Panel information.

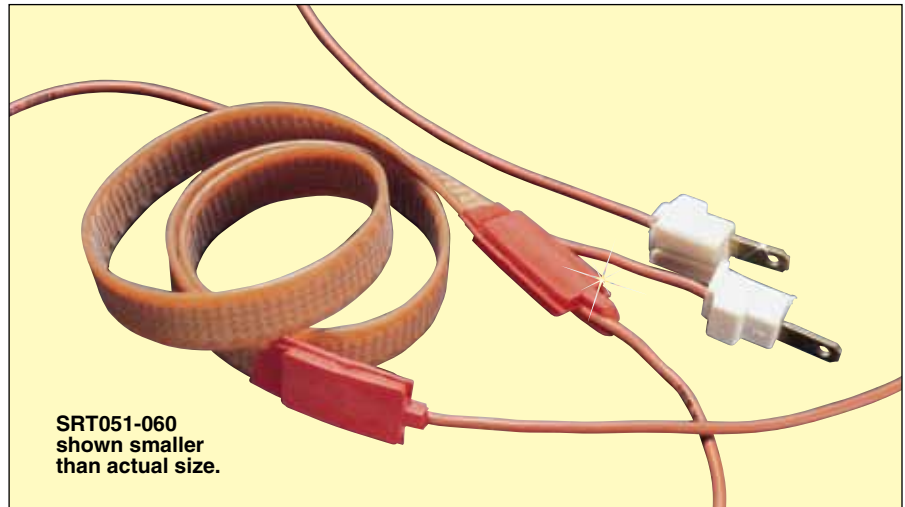
**Note:** For PCN's, refer to the DL Series connection system accessories product data sheet.

PJ314-5  
**PDS SRM/E**  
 APRIL 04

# MEDIUM TEMPERATURE HEATING TAPES

**SRT Series** 

- ✓ Maximum Exposure Temperature up to 230°C (450°F)
- ✓ Uniform Heat Distribution
- ✓ Moisture and Chemical Resistant
- ✓ Integrally Molded Separable Plug
- ✓ Available with Leads Same End†



OMEGALUX® silicone rubber extruded heating tapes are low-watt density electrical resistance heaters designed for temperature maintenance in applications requiring moisture and chemical resistance. Silicone rubber tapes are constructed of finely stranded resistance wires fully insulated with braided fiberglass and knitted into flat tape with fiberglass yarn. These tapes are encapsulated in a void-free silicone rubber sheath.

## SPECIFICATIONS

**Heating Elements:** 36-40 gage finely stranded resistance wire

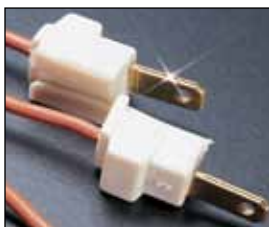
**Heating Elements Insulation:** Double braided fiberglass yarn

**Dielectric Strength:** In excess of 2000V

**Lead Wires:** 16 AWG high temperature 600V silicone rubber insulated lead wire emerging from opposite ends of the heating tape into separate sides of integrally molded separable plug

## APPLICATIONS

- ✓ Silicone rubber extruded heating tapes can be used in direct contact with a metal or conductive surface



Integrally molded separable plug shown.

To Order				
Watts	W/in <sup>2</sup>	Volts	Size cm/m (inch/foot)	Model No.
52	4.3	120	1/0.6 (½/2)	SRT051-020
104	4.3	120	1/1.2 (½/4)	SRT051-040
156	4.3	120	1/1.8 (½/6)	SRT051-060
209	4.3	120	1/2.4 (½/8)	SRT051-080
261	4.3	120	1/3 (½/10)	SRT051-100
313	4.3	120	1/3.7 (½/12)	SRT051-120
104	4.3	120	2.5/0.6 (1/2)	SRT101-020
209	4.3	120	2.5/1.2 (1/4)	SRT101-040
313	4.3	120	2.5/1.8 (1/6)	SRT101-060
418	4.3	120	2.5/2.4 (1/8)	SRT101-080
522	4.3	120	2.5/3 (1/10)	SRT101-100
627	4.3	120	2.5/3.7 (1/12)	SRT101-120
731	4.3	120	2.5/3.7 (1/12)	SRT101-140
836	4.3	120	2.5/4.9 (1/16)	SRT101-160
940	4.3	120	2.5/5.5 (1/18)	SRT101-180
1045	4.3	120	2.5/6.1 (1/20)	SRT101-200
209	4.3	120	5/0.6 (2/2)	SRT201-020
418	4.3	120	5/1.2 (2/4)	SRT201-040
627	4.3	120	5/1.8 (2/6)	SRT201-060
836	4.3	120	5/2.4 (2/8)	SRT201-080
1045	4.3	120	5/3 (2/10)	SRT201-100
1254	4.3	120	5/3.7 (2/12)	SRT201-120*
1463	4.3	120	5/4.3 (2/14)	SRT201-140*
1672	4.3	120	5/4.9 (2/16)	SRT201-160*
1881	4.3	120	5/5.5 (2/18)	SRT201-180*
2090	4.3	120	5/6.1 (2/20)	SRT201-200*

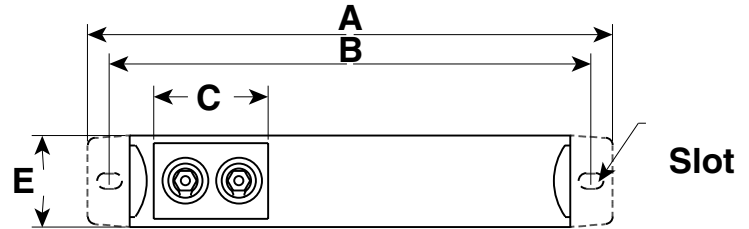
\* Does not come with plug.

Comes complete with instruction sheet.

† To order heaters with power leads exiting the same end of the tape, add suffix "-LSE" to model number. Call Sales for pricing. To order 240V version change the "1" before the "-" in model number to "2". All 240V versions are supplied without plugs. Call for sales prices.

# SEAMLESS STRIP HEATERS WITHOUT MOUNTING TABS

## SSE, SSEM & SSNHM Series



- ✓ 4 cm (1<sup>11</sup>/<sub>16</sub>" ) or 2.9 cm (1<sup>1</sup>/<sub>8</sub>" ) Wide
- ✓ Rugged, Reliable, Premium Quality
- ✓ 200 to 2550 Watts
- ✓ 2 Terminals One End
- ✓ Seamless Construction
- ✓ Select Rust Resisting Iron or Monel Sheath

Seamless strip elements are supplied without mounting tabs as standard. Overall length (dimension A) is with mounting tab; dimension D is length without mounting tabs.

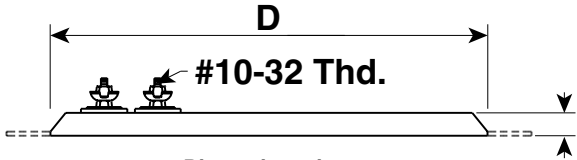
### SPECIFICATIONS

**Sheath Material:** Iron or Monel (SSNHM available only with Monel sheath)

**Maximum Sheath Temperature:** Iron, 750°F; Monel, 950°F

**Power:** 120 or 240 Vac

- C (Terminal Base)**  
 1 <sup>7</sup>/<sub>16</sub> for SSE and SSEM  
 1 <sup>5</sup>/<sub>16</sub> for SSNHM
- E (Width)**  
 1 <sup>11</sup>/<sub>16</sub> for SSE and SSEM  
 1 <sup>1</sup>/<sub>8</sub> or SSNHM



Dimensions: in

To Order						
Dimensions: in (cm)			Watts	W/in <sup>2</sup> †	Monel Sheath Model No.	Weight lb.(kg)
A	B	D				
8 <sup>1</sup> / <sub>8</sub> (21)	7 <sup>7</sup> / <sub>8</sub> (19)	6 <sup>5</sup> / <sub>8</sub> (17)	200	19	SSNHM-08/120	0.36(0.16)
9 <sup>1</sup> / <sub>8</sub> (24)	8 <sup>1</sup> / <sub>8</sub> (23)	8 <sup>1</sup> / <sub>8</sub> (21)	275	19	SSNHM-09/120	0.38(0.17)
11 <sup>1</sup> / <sub>8</sub> (28)	10 <sup>3</sup> / <sub>8</sub> (26)	9 <sup>1</sup> / <sub>8</sub> (24)	300	16	SSNHM-11/120	0.50(0.22)
12 <sup>1</sup> / <sub>8</sub> (31)	11 <sup>1</sup> / <sub>8</sub> (29)	10 <sup>3</sup> / <sub>8</sub> (27)	320	16	SSNHM-12/*	0.63(0.29)
14 <sup>1</sup> / <sub>8</sub> (36)	13 <sup>3</sup> / <sub>8</sub> (34)	12 <sup>3</sup> / <sub>8</sub> (32)	375	14	SSNHM-14/*	0.70(0.32)
15 <sup>1</sup> / <sub>8</sub> (40)	14 <sup>3</sup> / <sub>8</sub> (37)	13 <sup>3</sup> / <sub>8</sub> (35)	415	14	SSNHM-15/*	0.75(0.34)
18 (46)	17 <sup>1</sup> / <sub>4</sub> (44)	16 <sup>1</sup> / <sub>2</sub> (42)	495	13	SSNHM-18/*	1.40(0.64)
19 <sup>1</sup> / <sub>8</sub> (50)	18 <sup>1</sup> / <sub>8</sub> (48)	18 <sup>1</sup> / <sub>8</sub> (46)	550	13	SSNHM-19/*	1.40(0.64)
21 <sup>1</sup> / <sub>8</sub> (54)	20 <sup>3</sup> / <sub>8</sub> (52)	19 <sup>3</sup> / <sub>8</sub> (50)	600	13	SSNHM-21/*	1.63(0.74)
22 <sup>1</sup> / <sub>8</sub> (57)	21 <sup>1</sup> / <sub>8</sub> (56)	22 <sup>1</sup> / <sub>8</sub> (56)	625	13	SSNHM-22/*	1.79(0.81)
23 <sup>1</sup> / <sub>8</sub> (61)	23 <sup>1</sup> / <sub>8</sub> (59)	22 <sup>3</sup> / <sub>8</sub> (57)	675	13	SSNHM-24/*	1.81(0.82)
25 <sup>1</sup> / <sub>8</sub> (65)	24 <sup>1</sup> / <sub>8</sub> (63)	24 <sup>1</sup> / <sub>8</sub> (62)	725	13	SSNHM-25/*	2.06(0.93)
27 <sup>1</sup> / <sub>8</sub> (70)	26 <sup>1</sup> / <sub>8</sub> (68)	26 <sup>1</sup> / <sub>8</sub> (66)	800	13	SSNHM-27/*	2.25(0.10)

\* Designate voltage, i.e.; insert 120 for 120 Vac or 240 for 240 Vac. Model numbers containing /120 or /240 are only available in that voltage. For mounting tab specify "-with mounting tabs" as suffix for an additional cost.

**Ordering Example:** SSNHM-14/120, seamless strip heater without mounting tabs, 120 Vac, Monel sheath.

To Order							
Dimensions: in (cm)			Watts	W/in <sup>2</sup> †	Rust-Resisting Iron Sheath Model No.	Monel Sheath Model No.	Wt. lb (kg)
A	B	D					
8 <sup>1</sup> / <sub>8</sub> (21)	7 <sup>7</sup> / <sub>8</sub> (19)	6 <sup>5</sup> / <sub>8</sub> (17)	200	13	SSE-820/120	SSEM-820/120	0.65 (0.29)
10 <sup>1</sup> / <sub>8</sub> (27)	9 <sup>1</sup> / <sub>8</sub> (25)	9 <sup>1</sup> / <sub>8</sub> (23)	275	11	SSE-1027/*	SSEM-1027/*	0.76 (0.34)
12 <sup>1</sup> / <sub>8</sub> (31)	11 <sup>1</sup> / <sub>8</sub> (29)	10 <sup>3</sup> / <sub>8</sub> (27)	320	11	SSE-1232/*	SSEM-1232/*	0.88 (0.40)
14 <sup>1</sup> / <sub>8</sub> (36)	13 <sup>3</sup> / <sub>8</sub> (34)	12 <sup>3</sup> / <sub>8</sub> (32)	375	10	SSE-1437/*	SSEM-1437/*	1.0 (0.45)
15 <sup>1</sup> / <sub>8</sub> (39)	14 <sup>3</sup> / <sub>8</sub> (37)	13 <sup>3</sup> / <sub>8</sub> (35)	415	10	SSE-1541/*	SSEM-1541/*	1.14 (0.51)
18 (46)	17 <sup>1</sup> / <sub>4</sub> (44)	16 <sup>1</sup> / <sub>2</sub> (42)	500	10	SSE-1849/*	SSEM-1849/*	1.40 (0.64)
19 <sup>1</sup> / <sub>8</sub> (50)	18 <sup>1</sup> / <sub>8</sub> (48)	18 <sup>1</sup> / <sub>8</sub> (46)	550	10	SSE-1955/*	SSEM-1955/*	1.50 (0.68)
21 <sup>1</sup> / <sub>8</sub> (54)	20 <sup>3</sup> / <sub>8</sub> (52)	19 <sup>3</sup> / <sub>8</sub> (50)	625	10	SSE-2060/*	SSEM-2060/*	1.63 (0.74)
23 <sup>1</sup> / <sub>8</sub> (61)	23 <sup>1</sup> / <sub>8</sub> (59)	22 <sup>3</sup> / <sub>8</sub> (57)	750	10	SSE-2467/*	SSEM-2467/*	1.81 (0.82)
25 <sup>1</sup> / <sub>8</sub> (65)	24 <sup>1</sup> / <sub>8</sub> (63)	24 <sup>1</sup> / <sub>8</sub> (61)	800	10	SSE-2572/*	SSEM-2572/*	2.06 (0.93)
30 <sup>1</sup> / <sub>8</sub> (78)	29 <sup>1</sup> / <sub>8</sub> (45)	28 <sup>1</sup> / <sub>8</sub> (71)	1000	10	SSE-3085/*	SSEM-3085/*	2.38 (0.11)
33 <sup>1</sup> / <sub>8</sub> (85)	32 <sup>1</sup> / <sub>8</sub> (82)	31 <sup>1</sup> / <sub>8</sub> (79)	1250	12	SSE-3392/*	SSEM-3392/*	2.69 (0.12)
36 (86)	34 <sup>1</sup> / <sub>8</sub> (89)	33 <sup>1</sup> / <sub>8</sub> (85)	1500	13	SSE-3611/*	SSEM-3611/*	2.90 (0.13)
38 <sup>1</sup> / <sub>8</sub> (98)	37 <sup>1</sup> / <sub>8</sub> (95)	36 <sup>1</sup> / <sub>8</sub> (93)	1500	12	SSE-3817/*	SSEM-3817/*	3.20 (0.15)
42 <sup>1</sup> / <sub>8</sub> (108)	41 <sup>1</sup> / <sub>8</sub> (105)	40 <sup>1</sup> / <sub>8</sub> (102)	1500	11	SSE-4315/*	SSEM-4315/*	3.40 (0.15)
48 (122)	46 <sup>1</sup> / <sub>8</sub> (119)	45 <sup>1</sup> / <sub>8</sub> (116)	1650	10	SSE-4816/*	SSEM-4816/*	3.80 (0.17)
54 (137)	52 <sup>1</sup> / <sub>8</sub> (133)	51 <sup>1</sup> / <sub>8</sub> (131)	1875	10	SSE-5418/*	SSEM-5418/*	4.20 (0.19)
64 (163)	62 <sup>1</sup> / <sub>8</sub> (160)	61 <sup>1</sup> / <sub>8</sub> (156)	2250	10	SSE-6422/240	SSEM-6422/240	5.12 (0.23)
72 (183)	70 <sup>1</sup> / <sub>8</sub> (180)	69 <sup>1</sup> / <sub>8</sub> (177)	2550	10	SSE-7225/240	SSEM-7225/240	5.75 (0.26)

/\* Designate voltage, i.e.; insert 120 for 120 Vac or 240 for 240 Vac. Model numbers containing /120 or /240 are only available in that voltage.

† To determine maximum allowable watt density, visit us online. For mounting tab specify "-with mounting tabs" as suffix for an additional cost.

**Ordering Example:** SSEM-3392/120, seamless strip heater without mounting tabs, 120 Vac, Monel sheath.

# RUGGED LOW COST FLEXIBLE HEATING BLANKETS

## SSHB Series



- ✓ Moisture and Chemical Resistant
- ✓ Constant Low Watt Density of 2½ Watts Per Square Inch
- ✓ Maximum Exposure Temperature of 232°C (450°F)
- ✓ Five Standard Sizes
- ✓ Easy to Install
- ✓ 120, 240 or 480V\*
- ✓ Optional Pressure Sensitive Adhesive Available



OMEGALUX® silicone rubber laminated heating blankets are low watt density electrical resistance heaters in blanket form. They are designed for freeze protection as well as process temperature control applications. The rugged heater element is made from multi-strand braided and knitted wire. The vulcanized heater assembly is water tight. Optional pressure sensitive adhesive makes installation easy. Heat from the blanket itself cures the silicone adhesive, creating a permanent bond.

### SPECIFICATIONS

**Power:** 120, 240 and 480V\*  
**Wattage:** 180, 360, 720 or 1440 W  
**Watt Density:** 2.5 W/in<sup>2</sup>  
**Dielectric Strength:** 2000V  
**Lead Wire:** 4' long, 16 AWG, silicone rubber insulated

To Order 480 Vac powered models, add suffix "-480" to model number, for additional cost.

### Heating Blanket Size

6 x 12"
6 x 24"
12 x 12"
12 x 24"
24 x 24"

### APPLICATIONS

- ✓ Storage Tanks
- ✓ Conveyors
- ✓ Water and Feed Troughs
- ✓ Dust Collectors
- ✓ Tank Trucks
- ✓ Process Vats and Dip Tanks
- ✓ Melt Pots

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

### To Order

Volts	Watts	Dimensions (inches)	Model No. (Without Adhesive)	Model No. (With Adhesive)
120	180	6 x 12	SSHB-612-180-120	SSHB-612-180-120-P
240	180	6 x 12	SSHB-612-180-240	SSHB-612-180-240-P
120	360	6 x 24	SSHB-624-360-120	SSHB-624-360-120-P
240	360	6 x 24	SSHB-624-360-240	SSHB-624-360-240-P
120	360	12 x 12	SSHB-1212-360-120	SSHB-1212-360-120-P
240	360	12 x 12	SSHB-1212-360-240	SSHB-1212-360-240-P
120	720	12 x 24	SSHB-1224-720-120	SSHB-1224-720-120-P
240	720	12 x 24	SSHB-1224-720-240	SSHB-1224-720-240-P
120	1440	24 x 24	SSHB-2424-1440-120	SSHB-2424-1440-120-P
240	1440	24 x 24	SSHB-2424-1440-240	SSHB-2424-1440-240-P

\* Contact OMEGALUX® for 480V heaters.

For conduit bracket and RTV adhesive sealant, order **SRL-CB**, for additional cost.

Ordering Example: **SSHB-612-180-120-P**, heater with pressure sensitive adhesive.

# ULTRA-HIGH TEMPERATURE HEATING TAPES

## STH, SST, SWH Series

- ✓ Maximum Exposure Temperature up to 760°C (1400°F)
- ✓ Premium Quality
- ✓ Samox™ Insulated
- ✓ Integrally Molded Separate Plug
- ✓ Available with Leads Same End†

Standard tapes are made from fine gage stranded resistance wires that are double insulated with braided Samox and knitted into flat tapes for maximum flexibility. A heavy insulated tape is made by taking

a standard tape and braiding it between layers of Samox yarn. Wide tapes are made from two or more standard tapes that are sewn between two layers of Samox cloth.

### SPECIFICATIONS

**Heating Elements:** 36-40 gage stranded resistance wire

**Heating Elements Insulated:** Double braided Samox

**Dielectric Strength:** In excess of 2000V

**Lead Wires:** Emerge from opposite ends into separate sides of integrally molded separate plug. Maximum temperature for lead wires is 260°C (500°F).



**Laboratory:** Wide and Heavy Insulated tapes are good for direct contact on conductive surfaces. Do not use standard insulated tapes on a metal or conductive surface.

### To Order

Watts	W/in <sub>2</sub>	Volts	Size	Heavy Insulated Tapes	Standard Insulated Tapes	Total Watts
				Model No.	Model No.	
156	13	120	½" x 2'	STH051-020	SST051-020	160
313	13	120	½" x 4'	STH051-040	SST051-040	310
470	13	120	½" x 6'	STH051-060	SST051-060	470
627	13	120	½" x 8'	STH051-080	SST051-080	620
783	13	240	½" x 10'	STH052-100*	SST052-100*	780
940	13	240	½" x 12'	STH052-120*	SST052-120*	940
313	13	120	1" x 2'	STH101-020	SST101-020	310
627	13	120	1" x 4'	STH101-040	SST101-040	620
940	13	240	1" x 6'	STH102-060*	SST102-060*	940
1245	13	240	1" x 8'	STH102-080*	SST102-080*	1250

Watts	W/in <sub>2</sub>	Volts	Size	Wide Heavy Insulated Tapes	
				Model No.	
313	7.5	120	1¾" x 2'	SWH171-020	
627	7.5	120	1¾" x 4'	SWH171-040	
940	7.5	120	1¾" x 6'	SWH171-060	
1254	7.5	120	1¾" x 8'	SWH171-080	
1570	7.5	240	1¾" x 10'	SWH172-100*	
470	7.8	120	2½" x 2'	SWH251-020	
940	7.8	120	2½" x 4'	SWH251-040	
1411	7.8	120	2½" x 6'	SWH251-060	
1881	7.8	120	2½" x 8'	SWH251-080*	
2351	7.8	240	2½" x 10'	SWH252-100*	
627	8.0	120	3¼" x 2'	SWH351-020	
1254	8.0	120	3¼" x 4'	SWH351-040	
1881	8.0	120	3¼" x 6'	SWH351-060*	
2508	8.0	120	3¼" x 8'	SWH351-080*	
3135	8.0	240	3¼" x 10'	SWH352-100*	

† To order heaters with power leads exiting the same end of the tape, add suffix "-LSE" to model number. Call Sales for prices. To order 240V version change the "1" before the "-" in model number to "2". All 240V versions are supplied without plugs. Call sales for prices.

\* Does not come with plug.

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

Comes with instruction sheet.

# STRIP HEATERS—ONE TERMINAL AT EACH END

## S Series



S-1430/120 shown smaller than actual size.



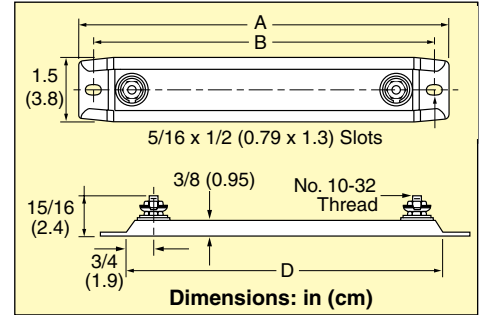
- 1½" (3.8 cm) Wide
- Rugged, Reliable, Premium Quality
- 150 to 2250 Watt
- UL Component Recognized and CSA Certified

OMEGALUX® "S" Series strip heaters are supplied with either a rust-resisting iron or chrome steel sheath to a width of 1½" (3.8 cm). Selecting the sheath material depends upon the process and

environment that the heaters would be exposed too. The "S" series features one terminal on each end conforming in many applications. Additional strip heater application guidelines are available from OMEGA.

### SPECIFICATIONS

**Sheath Material:** Rust resisting iron and chrome steel  
**Max Sheath Temp:** Iron 399°C (750°F), chrome steel 649°C (1200°F)  
**Power:** 120 or 240 Vac



**CAUTION AND WARNING**  
 Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

## To Order

Dimensions: in (cm)			Rust-Resisting Iron Sheath			Chrome Steel Sheath			Wt. lb (kg)
A	B	D	Watts	W/in <sup>2</sup> †	Model No.	Watts	W/in <sup>2</sup> †	Model No.	
8 (20)	7 (18)	6½ (17)	150	10	S-815/*	250	17	S-802/*	0.63 (0.16)
9½ (24)	8½ (22)	8 (20)	200	10	S-920/*	300	15	S-903/*	0.75 (0.34)
12 (30)	11 (28)	10½ (27)	250	9	S-1225/*	250	9	S-1202/*	0.94 (0.43)
12 (30)	11 (28)	10½ (27)	—	—	—	500	17	S-1205/*	0.94 (0.43)
14 (36)	13 (33)	12½ (32)	300	8	S-1430/*	500	14	S-1405/*	1.06 (0.48)
15¼ (39)	14¼ (36)	13¼ (35)	325	8	S-1532/*	500	12	S-1505/*	1.19 (0.54)
17½ (45)	16¾ (43)	16¾ (42)	375	8	S-1837/*	500	10	S-1805/*	1.44 (0.65)
17½ (45)	16¾ (43)	16¾ (42)	500	10	S-1850/*	750	15	S-1807/*	1.44 (0.65)
17½ (45)	16¾ (43)	16¾ (42)	—	—	—	1000	20	S-1801/*	1.44 (0.65)
19½ (50)	18½ (47)	18 (46)	500	9	S-1950/*	500	9	S-1905/*	1.5 (0.68)
19½ (50)	18½ (47)	18 (46)	—	—	—	750	13	S-1907/*	1.57 (0.71)
19½ (50)	18½ (47)	18 (46)	—	—	—	1000	18	S-1901/*	1.57 (0.71)
21 (53)	20 (51)	19½ (50)	500	8	S-2050/*	500	9	S-2005/*	1.75 (0.79)
23¾ (60)	22¾ (58)	22¼ (57)	250	4	S-2425/*	500	7	S-2405/*	1.88 (0.85)
23¾ (60)	22¾ (58)	22¼ (57)	500	7	S-2450/*	750	10	S-2407/*	1.88 (0.85)
23¾ (60)	22¾ (58)	22¼ (57)	—	—	—	1000	14	S-2401/*	1.88 (0.85)
23¾ (60)	22¾ (58)	22¼ (57)	—	—	—	1500	21	S-2415/*	1.88 (0.85)
25½ (65)	24½ (62)	24 (61)	750	10	S-2575/*	1000	12	S-2501/*	2.01 (0.91)
26¾ (68)	25¾ (65)	25¼ (64)	700	8	S-2670/*	750	9	S-2607/*	2.13 (0.97)
30½ (77)	29¾ (75)	28 (71)	750	8	S-3075/*	750	8	S-3007/*	2.13 (0.97)
33½ (85)	32¾ (82)	31 (79)	750	7	S-3375/*	1000	10	S-3301/*	2.63 (1.2)
35¾ (91)	34¾ (88)	33¾ (85)	1000	7	S-3610/*	1000	9	S-3601/*	2.83 (1.3)
38½ (98)	37¾ (95)	36 (91)	1000	8	S-3810/*	1000	8	S-3801/*	3.0 (1.4)
42½ (108)	41¾ (105)	40 (102)	1250	9	S-4312/*	1000	11	S-4301/*	3.38 (1.5)

\* Designate voltage, i.e.; insert "120" or "240" for voltage. Additional strip heater models available with other widths and configurations. Contact OMEGA.

† To determine maximum allowable watt density, see Figures online.

Ordering Examples: S-1405/120, 120 Vac, strip heater with chrome steel sheath and one terminal at each end.

S-815/120, 120 Vac strip heater with rust-resisting iron sheath and one terminal at each end.



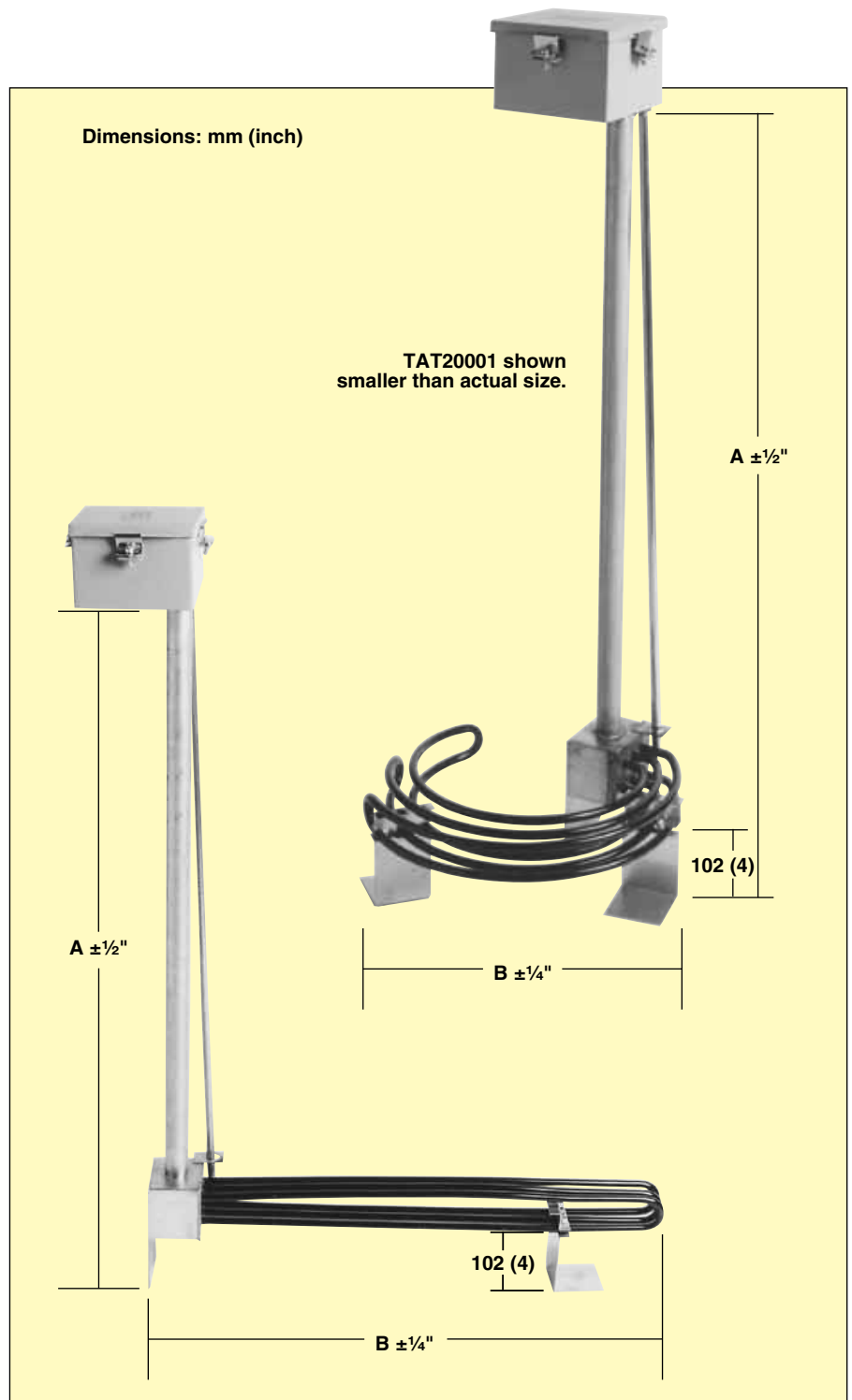
## Tank Immersion Heaters Over-the-Side Immersion Heaters

### TAT1 and TAT2 Series

- Incoloy® 800 Steath Heating Element
- Thermowell Standard
- Lightweight and Portable
- Easy Installation and Removal
- NEMA 4 Electrical Enclosure
- Single- or Three-Phase Wiring

#### Optional Custom Features

- 304 or 316 Stainless Steel Construction for All Wetted Parts
- Passivation of All Wetted Parts; Electropolished or Bright Annealed Surface Treatments for Stainless Steel or Incoloy® Designs (Heating Elements Only)
- NEMA 1 or NEMA 4/7 (Explosion Resistant) Terminal Housings
- Flange, Fixed or Adjustable Bracket on Riser for Mounting
- Mounting Flange for Terminal Housing
- External Power Wiring Options Include Flexible Cord/Plug, Armored Cable, Wire Braided or Plain Lead Wire
- Double- or Single-Pole Thermostat
- Process or Hi-Limit Thermocouple in Thermowell in Place of the Thermostat
- Hi-Limit Thermocouple on Sheath
- Special Riser and/or Sludge Leg Heights
- Up to 12 Elements Per Heater Assembly
- Right-Angle Riser Design



#### Application

OMEGA® Over-the-Side Immersion heaters are specifically designed for heating fluids in tanks. Depending on the tank shape, size, accessibility and working area inside the tank, choose a round or L shaped heater.

Standard sheath materials are Incoloy® 800 and steel with all wetted parts made with compatible alloys.

#### Construction

Tubular heating elements are welded into a liquid-tight junction box. Power leads for the elements travel up through the riser pipe and are connected to a terminal block in a NEMA 4 housing. Unless otherwise specified, heaters are wired for three-phase from the factory but can easily be converted to single-phase.

A thermowell for a 9.5 mm (3/8") diameter bulb is standard to accommodate an optional thermostat. A thermostat can be field installed to mounting lugs located in the electrical enclosure.

102 mm (4") sludge legs keep the elements off the bottom of the tank and above any deposits that may accumulate there.



**Typical Heating Applications: Lightweight Oils, Degreasing Solutions, Mineral Oil,**  
Watt Density 3.6 watt/cm<sup>2</sup> (23 watt/in<sup>2</sup>)

**To Order Visit [omega.com/tat1\\_tat2\\_series](http://omega.com/tat1_tat2_series) for Pricing and Details**

Model No.		Element Shape	A		B		KW	Approximate Net Weight	
240V-3Ph	480V-3Ph		mm	inch	mm	inch		kg	lb
TAT20001	TAT20002	Round	999	39 <sup>5</sup> / <sub>16</sub>	343	13 <sup>1</sup> / <sub>2</sub>	3	8	17
TAT20003	TAT20004		1303	51 <sup>5</sup> / <sub>16</sub>	470	18 <sup>1</sup> / <sub>2</sub>	6	9	20
TAT20005	TAT20006		1303	51 <sup>5</sup> / <sub>16</sub>	597	23 <sup>1</sup> / <sub>2</sub>	9	10	22
TAT10001	TAT10002	Straight	999	39 <sup>5</sup> / <sub>16</sub>	575	22 <sup>5</sup> / <sub>8</sub>	3	7	15
TAT10003	TAT10004		1303	51 <sup>5</sup> / <sub>16</sub>	956	37 <sup>5</sup> / <sub>8</sub>	6	8	18
TAT10005	TAT10006		1303	51 <sup>5</sup> / <sub>16</sub>	1337	52 <sup>5</sup> / <sub>8</sub>	9	9	20

Ordering Example: TAT20001, 3 KW immersion heater, 240V-3 phase.

**Typical Heating Applications: Citric and Phosphoric Acid Solutions, Water Based Chemical Solutions,**  
Watt Density 3.6 watt/cm<sup>2</sup> (23 watt/in<sup>2</sup>)

Model No.		Element Shape	A		B		KW	Approximate Net Weight	
240V-3Ph	480V-3Ph		mm	inch	mm	inch		kg	lb
TAT20007	TAT20008	Round	999	39 <sup>5</sup> / <sub>16</sub>	343	13 <sup>1</sup> / <sub>2</sub>	3	8	17
TAT20009	TAT20010		1303	51 <sup>5</sup> / <sub>16</sub>	470	18 <sup>1</sup> / <sub>2</sub>	6	9	20
TAT20011	TAT20012		1303	51 <sup>5</sup> / <sub>16</sub>	597	23 <sup>1</sup> / <sub>2</sub>	9	10	22
TAT10007	TAT10008	Straight	999	39 <sup>5</sup> / <sub>16</sub>	575	22 <sup>5</sup> / <sub>8</sub>	3	7	15
TAT10009	TAT10010		1303	51 <sup>5</sup> / <sub>16</sub>	956	37 <sup>5</sup> / <sub>8</sub>	6	8	18
TAT10011	TAT10012		1303	51 <sup>5</sup> / <sub>16</sub>	1337	52 <sup>5</sup> / <sub>8</sub>	9	9	20

Ordering Example: TAT20007, 3 KW immersion heater, 240V-3 phase.

**Typical Heating Applications: Process Water, Mild Caustic Solutions (2% maximum), Clean Water,**  
Watt Density 7.4 watt/cm<sup>2</sup> (42 watt/in<sup>2</sup>)

Model No.		Element Shape	A		B		KW	Approximate Net Weight	
240V-3Ph	480V-3Ph		mm	inch	mm	inch		kg	lb
TAT20013	TAT20014	Round	999	39 <sup>5</sup> / <sub>16</sub>	273	10 <sup>3</sup> / <sub>4</sub>	3	7	16
TAT20015	TAT20016		999	39 <sup>5</sup> / <sub>16</sub>	343	13 <sup>1</sup> / <sub>2</sub>	6	8	17
TAT20017	TAT20018		999	39 <sup>5</sup> / <sub>16</sub>	406	16	9	8	18
TAT20019	TAT20020		1303	51 <sup>5</sup> / <sub>16</sub>	470	18 <sup>1</sup> / <sub>2</sub>	12	9	20
TAT20021	TAT20022		1303	51 <sup>5</sup> / <sub>16</sub>	540	21 <sup>1</sup> / <sub>2</sub>	15	10	21
TAT20023	TAT20024		1303	51 <sup>5</sup> / <sub>16</sub>	597	23 <sup>1</sup> / <sub>2</sub>	18	10	22
TAT10013	TAT10014		Straight	999	39 <sup>5</sup> / <sub>16</sub>	371	14 <sup>5</sup> / <sub>8</sub>	3	6
TAT10015	TAT10016	999		39 <sup>5</sup> / <sub>16</sub>	575	22 <sup>5</sup> / <sub>8</sub>	6	7	15
TAT10017	TAT10018	999		39 <sup>5</sup> / <sub>16</sub>	765	30 <sup>1</sup> / <sub>8</sub>	9	7	16
TAT10019	TAT10020	1303		51 <sup>5</sup> / <sub>16</sub>	956	37 <sup>5</sup> / <sub>8</sub>	12	8	18
TAT10021	TAT10022	1303		51 <sup>5</sup> / <sub>16</sub>	1146	45 <sup>1</sup> / <sub>8</sub>	15	9	19
TAT10023	TAT10024	1303		51 <sup>5</sup> / <sub>16</sub>	1337	52 <sup>5</sup> / <sub>8</sub>	18	9	20

Ordering Example: TAT20014, 3 KW immersion heater, 480V-3 phase.

### Custom Engineered/Manufactured Heaters

An electric heater can be very application specific, for sizes and ratings not listed, OMEGA® will design and manufacture an over-the-side immersion heater to meet your requirements.

### Please Specify the Following:

- Application
- Element Watt Density
- Wattage, Voltage and Phase
- "A" and "B" Dimensions
- Element Sheath Material
- Optional Features
- Number of Elements
- Quantity



## Drum Immersion Heaters

- Fits Through the Standard 51 mm (2") Bung Opening in 55 Gallon Drums
- Ideal for Improving the Flow of Lard, Tar, Oils and Other High Viscosity Solutions
- Double Pole 16 to 121°C (60 to 250°F) Thermostat with Over-Temperature Cutout and Pilot Lamp to Indicate Heater On/Off Status
- Only 203 mm (8") of Vertical Riser is Heated, Allowing Liquid Level to Fluctuate without Damaging the Heater
- Adjustable Stainless Steel Mounting Bracket

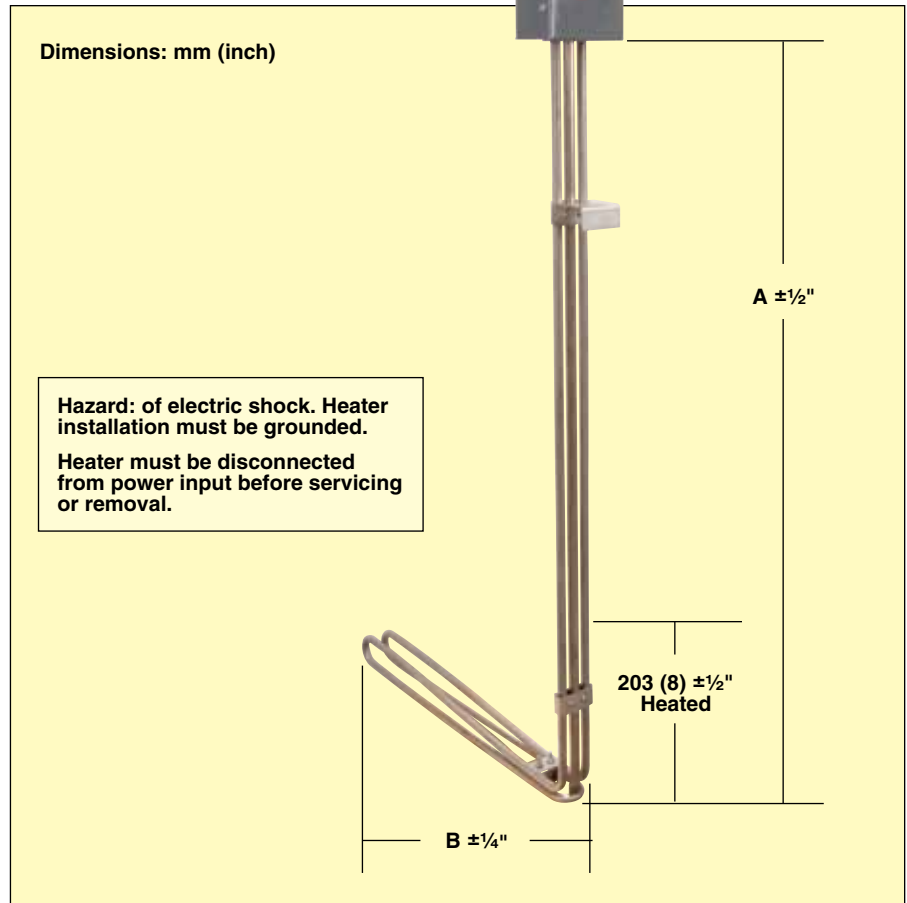
### Optional Features

- Passivation, Electropolished, or Bright Annealed Surface Treatments Available for Stainless Steel or Incoloy Sheath Designs
- NEMA 4 (Moisture Resistant) and/ or NEMA 7 (Explosion Resistant) Terminal Enclosures
- External Power Wiring Options Include Flexible Cord/Plug, Armored Cable, Wire Braided or Plain Lead Wire
- Process or Hi-Limit Thermocouple in Thermowell in Place of the Thermostat

### Installation, Operation and Maintenance Instructions

1. Ensure the Vertical Heated Portion, Which Extends 203 mm (8") Up Riser from Bottom of Element, is Always Fully Immersed
2. Use in Metal Drums, Containers or Heat Resistant Tanks Only
3. All Wiring Should Be in Accordance with NEC/NFPA and Local Codes
4. Use Techniques Safe for the Heater and Surrounding Environment
5. Use Mounting Brackets to Position Heater Away from Tank Wall and Above Sludge Buildup at Bottom of Tank
6. Periodically Remove the Heater to Clean Residues and Inspect for Damage

## TAT3 Series



### Custom Engineered/Manufactured Heaters

An electric heater can be very application specific, for ratings not listed, OMEGA® will design and manufacture an immersion heater to meet your requirements.

### Please specify the following:

- Application
- Wattage, Voltage
- Element Sheath Material
- Element Watt Density
- "A" and "B" Dimensions
- Unheated Section
- Optional Features
- Quantity

### To Order Visit [omega.com/tat3\\_series](http://omega.com/tat3_series) for Pricing and Details

Model No.	Sheath	Watt Density		Watts	Volts	A		B	
		watt/in <sup>2</sup>	watt/cm <sup>2</sup>			mm	inch	mm	inch
TAT30003 TAT30004	Copper	8 32	1.2 5.0	1000 4000	120 240	914	36	483	19
TAT30002 TAT30001	Stainless Steel	8 32	1.2 5.0	1000 4000	120 240	914	36	483	19
TAT30005 TAT30006	Steel	8 32	1.2 5.0	1000 4000	120 240	914	36	483	19

**Note:** This style heater can be manufactured with "A" and "B" dimensions suitable for other applications. Consult Omega with your requirements.  
**Ordering Example:** TAT30003, 1000 watts, 120 Vac immersion heater.

# Tank Immersion Heaters

Rometec srl - [www.rometec.it](http://www.rometec.it) - [info@rometec.it](mailto:info@rometec.it) - Rometec srl - [www.rometec.it](http://www.rometec.it) - [info@rometec.it](mailto:info@rometec.it)

## General Purpose Tank or Reservoir Water

### TAT400 Series

- ✓ Immersion Section of Heater Made of 316 Stainless Steel
- ✓ Cold Riser Extends to the Top of Container Where Control Housing is Located
- ✓ Cord Set with 3-Wire Grounding Plug is Included for Easy Installation and Wiring
- ✓ Adjustable Vapor-Proof Thermostat Control with Temperature Range of 13 to 46°C (55 to 115°F) ( $\pm 3^\circ$ )
- ✓ Hi-Limit Cut Switch Set to 52°C (125°F) ( $\pm 4^\circ$ )
- ✓ Stainless Steel Mounting Bracket Also Supplied for Easy Mounting
- ✓ Pilot Light and On-Off Switch Provided

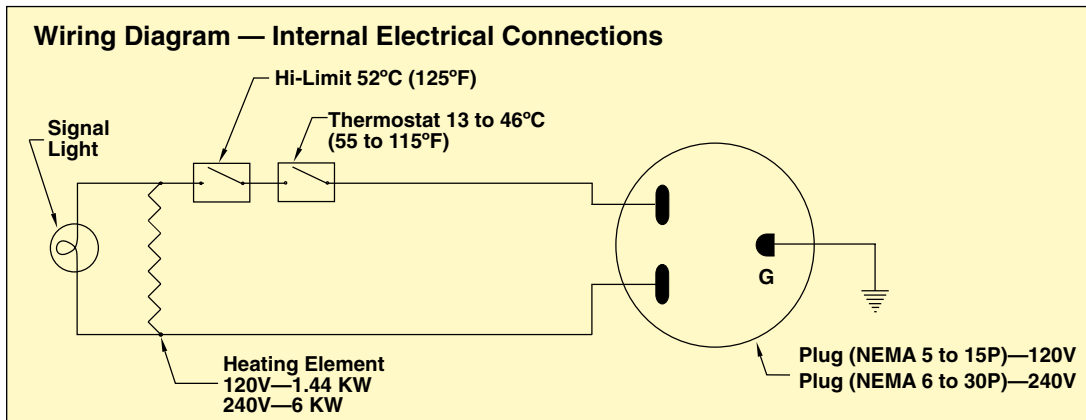
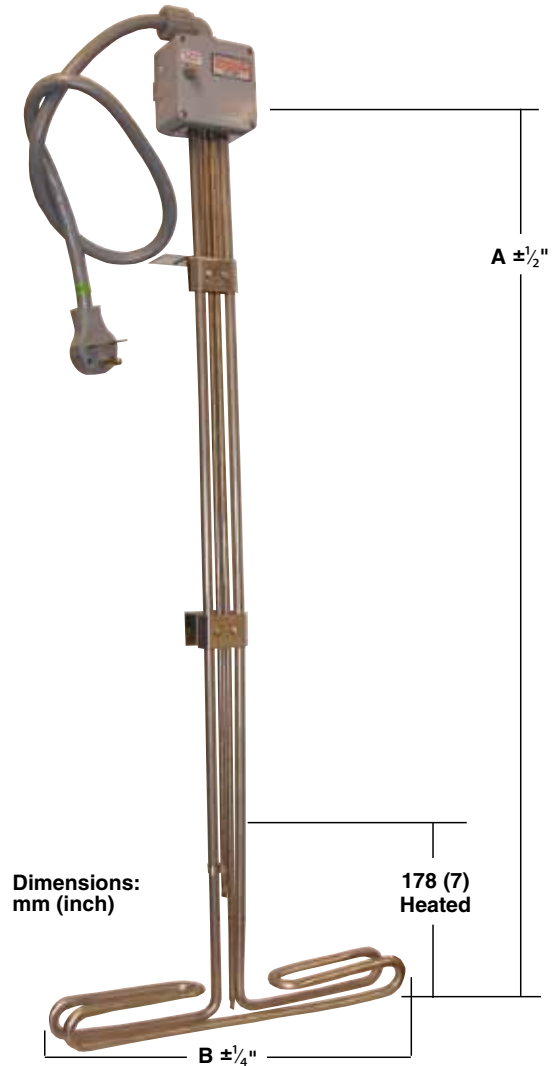
#### Hi-Limit

If the thermostat should fail and its contacts stick in a closed position, the heating element will continue to heat to about 52°C (125°F). At this temperature the Hi-Limit will open and turn the heating element off. After repairing or replacing the thermostat the Hi-Limit can be manually reset.

**Caution:** Hazard of electric shock. Installation must be grounded to earth and heater connected to line input through properly sized GFCI circuit breaker.

Disconnect power to heater before servicing. There should be no body contact with the water while the heater is in the water.

Under NO circumstances should this heater be turned on unless the system is full of water.



**Note: Not for Export to Canada**

To Order									
Model No.		Sheath	Watt Density watt/in <sup>2</sup>	Watts	Volts	A		B	
1.2 m (4') Cord	1.8 m (6') Cord					mm	inch	mm	inch
TAT40012	TAT40017	316 Stainless (Bright Annealed)	51	6000	240	1010	39.75	445	17.5
TAT40016	TAT40013		13	1440	120				

Comes complete with cord set and 3-wire grounding plug.

Ordering Example: TAT40017, 6000 watts immersion heater, 240 Vac.

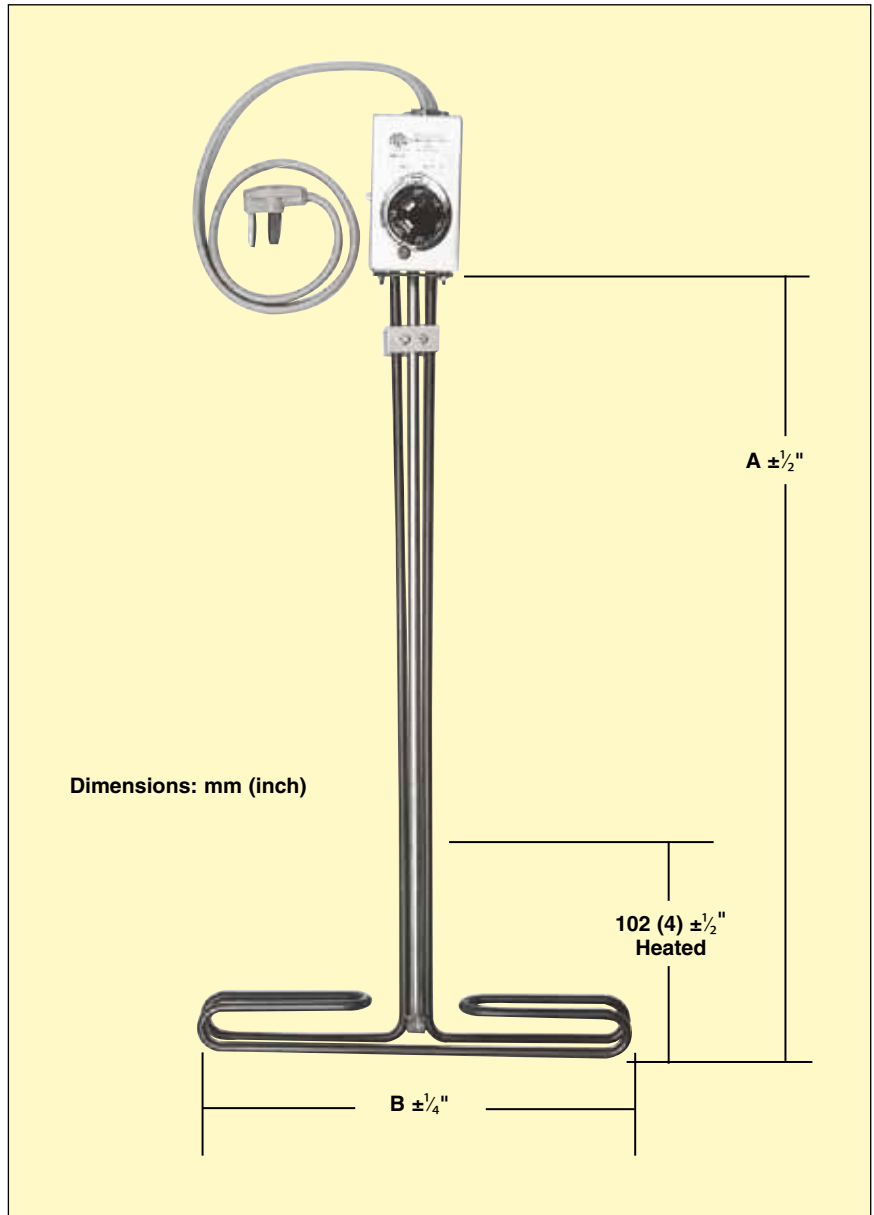
# Tank Immersion Heaters

Rometec srl - [www.rometec.it](http://www.rometec.it) - [info@rometec.it](mailto:info@rometec.it) - Rometec srl - [www.rometec.it](http://www.rometec.it) - [info@rometec.it](mailto:info@rometec.it)

## Sanitizing Sink Immersion Heaters

### TAT4 Series

- ✓ Used for Sterilization of Water Tanks in Restaurants, Taverns and Laboratories
- ✓ Double Pole 16 to 121°C (60 to 250°F) Thermostat with Over-Temperature Cutout; Optional Pilot Lamp to Indicate Heater On/Off Status Available
- ✓ Standard 1.8 m (6') with Grounding Plug [NEMA 5 to 15P for 120V and 6 to 30P for 240V]
- ✓ Adjustable Stainless Steel Mounting Bracket
- ✓ Contact OMEGA for Custom Designs



**Note: Not for Export to Canada**

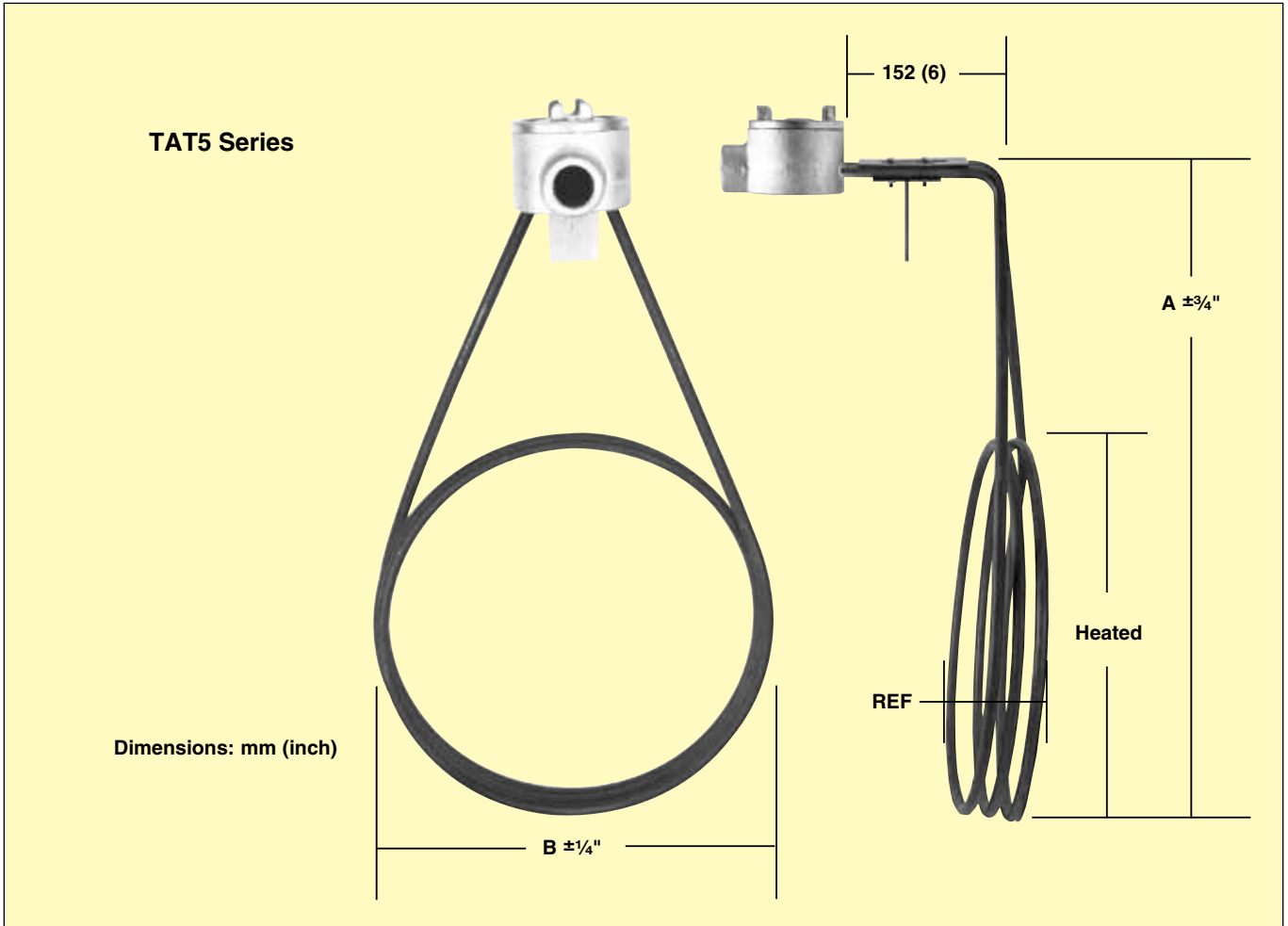
To Order								
Model No.	Sheath	Watt Density watt/in <sup>2</sup>	Watts	Volts	A		B	
					mm	inch	mm	inch
TAT40001	316	65	6000	240			432	17
TAT40002	Stainless Steel	56	4000	240			330	13
TAT40003	(Electropolished)	16	1500	120	660	26	432	17
TAT40004		14	1000	120			330	13
TAT40005	316	65	6000	240			432	17
TAT40006	Stainless Steel	56	4000	240			330	13
TAT40007	(Bright Annealed)	16	1500	120	660	26	432	17
TAT40008		14	1000	120			330	13

Comes complete with 1.8 m (6') cord set with grounding plug.

Ordering Example: TAT40001, 6000 watts immersion heater, 240 Vac.



**Tank Immersion Heaters**  
**Vertical Loop-Low Profile Immersion Heaters**



- Used on Open-Top Tanks for Heating Water, Water-Based Solutions, Citrus Juices, Plating Tanks, Oil Tempering, Salt Baths and Other Mild Corrosive Solutions
- NEMA 4 (Moisture Resistant) Housing with Integral Grounding Terminal is Standard; Other NEMA Ratings Available
- Low-Profile Design with Adjustable SS Mounting Bracket
- Optional Passivated, Electropolished, or Bright Annealed Surface Treatments Available for Stainless Steel or Incoloy® Sheath Designs
- External Power Wiring Options Including Flexible Cord/ Plug, Armor Cable, Braided or Plain Lead Wire
- Optional Hi-Limit Thermocouple on Heater Sheath

**To Order Visit [omega.com/tat5\\_series](http://omega.com/tat5_series) for Pricing and Details**

Model No.	Sheath	Watt Density watt/in <sup>2</sup>	Watts	Volts	mm (inch)		
					A	B	REF
TAT50011 TAT50012	Copper	25 40	5000 7500	240	660 (26)	381 (15)	51 (2)
TAT50013 TAT50014	Stainless Steel	25 40	5000 7500	240	660 (26)	381 (15)	70 (2.75)
TAT50015 TAT50016	Steel	25 40	5000 7500	240	660 (26)	381 (15)	51 (2)

Ordering Example: TAT50011, 5000 watts immersion heater, 240 Vac.



## Deep Tank/Sump Immersion Heaters

- 12 mm (0.475") Diameter Incoloy® Elements and Stainless Steel Wetted Parts Standard
- Designed for Permanent Installation in Outdoor/ Indoor Applications
- 0.61 to 3.6 m (2 to 12') Vertical Riser Height (for Thermostat Designs)
- Weathertight Mounting Hardware Supplied
- Riser Adjustable to Facilitate Mounting Variations
- NEMA 4 Electrical Enclosure with ¾" Conduit Fitting
- 38 mm (1½") Sludge Legs
- Double-Pole 16 to 121°C (60 to 250°F) Pilot Duty Thermostat
- Watertight Thermowell Sized for 9.5 mm (¾") Maximum Diameter Sensing Bulb
- 120V, 208V, 277V, and 575V Versions Available (Contact OMEGA)

### Optional Features

- 316 SS, Steel, or Copper Element Designs
- Passivation, Electropolished, or Bright Annealed Surface Treatments for Stainless Steel or Incoloy Designs (Elements Only)
- Custom or ASI Pressure Rated Flange on Riser for Mounting
- NEMA 1 or NEMA 4/7 (Explosion Resistant) Terminal Housings
- Alternate Single- or Double-Pole Thermostat
- Internally Mounted Definite Purpose Magnetic Contactor, Single Circuit Units Only
- RTD or Process Thermocouple in Thermowell in Place of Thermostat
- Hi-Limit Thermocouple on Element Sheath
- Special Riser or Sludge Leg Heights
- Right-Angle Riser Design for Offset Terminal Housing
- Up to 24 Elements Per Heater Assembly
- ½" DIN Temperature Controller, Internal or Panel Mounted on Terminal Housing and Used with Thermocouple or RTD Probe and Contactor for Heater Control

### Application

These fluid immersion heaters are designed for top mounting in large or deep enclosed tanks having a manhole access or opening suitable to insert and attach the heater. They are usable for either outdoor or indoor applications, within exposed or in-ground tanks and sewerage sumps. They are designed for permanent mounting and can be sealed weathertight with supplied gaskets and adjustable riser fittings.

NEMA 4 terminal housing is easily removable and resealed to facilitate installation. Units are available with element watt densities from 6 watt/in<sup>2</sup> for heavy oils, to 60 watt/in<sup>2</sup> for clean water immersion applications. Element bundle diameters ranging from minimum of 254 mm (10") OD to a maximum of 762 mm (30") OD are available.

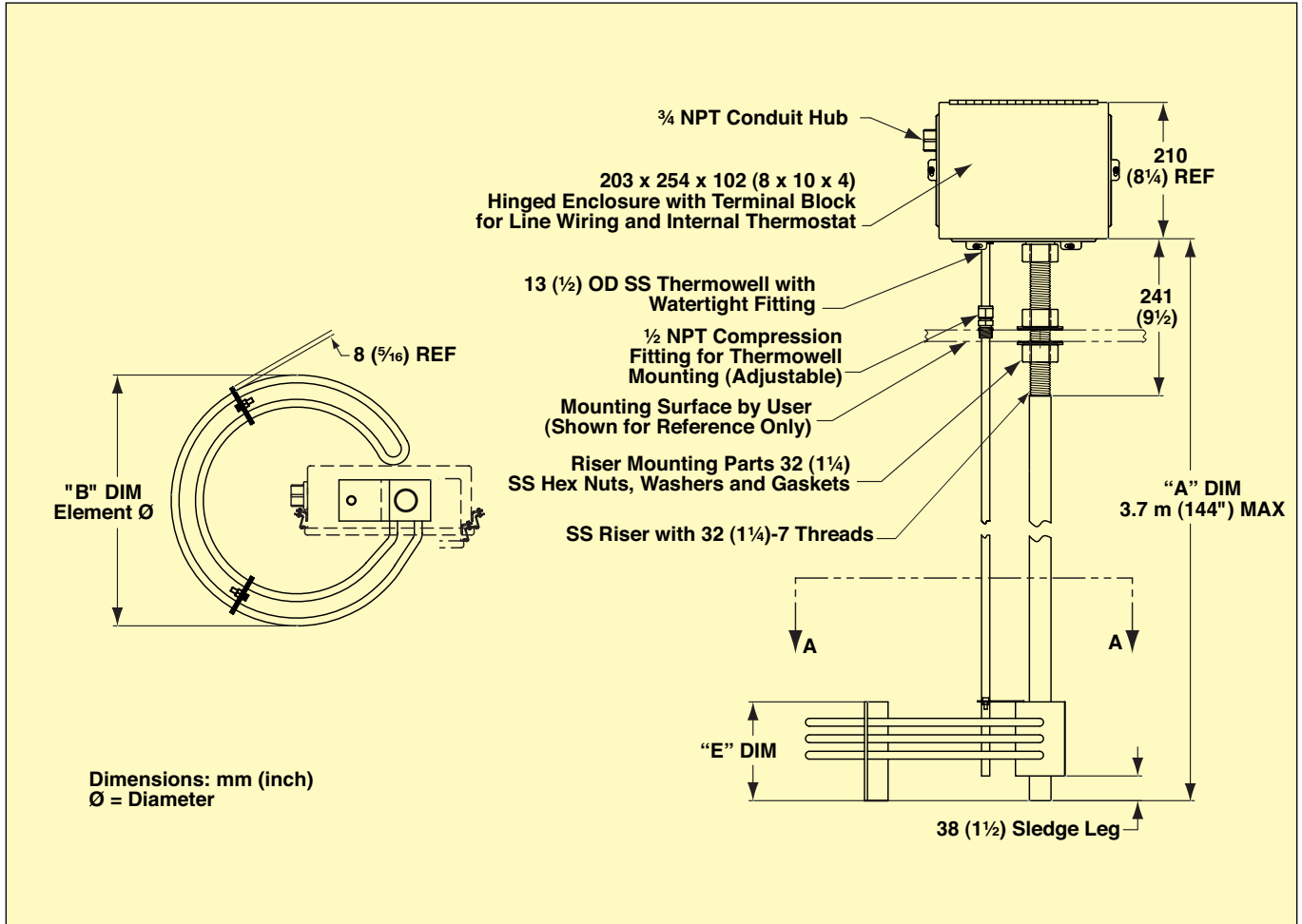
### Construction

The tubular elements are welded into a submersible liquid-tight stainless steel junction box. Element power leads are routed up through adjustable riser pipe and connected to a terminal block inside the upper NEMA 4 terminal housing. Unless specified otherwise, heaters are factory wired for three phase and are easily converted to single phase.

All wetted parts parts are 300 series stainless steel. Standard unit includes 15.5 to 121°C (60 to 250°F) double-pole thermostat mounted in upper housing that has a 9.5 mm (¾") diameter bulb and capillary installed in watertight thermowell with adjustable compression fitting.

TAT6 Series





### Custom Engineered/Manufactured Heaters

An electric heater can be very application specific, for sizes and ratings not listed, OMEGA® will design and manufacture an over-the-side immersion heater to meet your requirements.

### Please Specify the Following:

- Application
- Wattage, Voltage and Phase
- Element Sheath Material
- Number of Elements
- Element Watt Density
- "A" and "B" Dimensions
- Optional Features
- Quantity

### To Order Visit [omega.com/tat6\\_series](http://omega.com/tat6_series) for Pricing and Details

Model No.				KW	Number of Elements	mm (inch)		
240V-1Ph	240V-3Ph	480V-1Ph	480V-3Ph			A	B	E
TAT60001	TAT60002	TAT60003	TAT60004	5	3	1829 (72)	387 (15.25)	190 (7.5)
TAT60005	TAT60006	TAT60007	TAT60008	7.5	6			266 (10.5)
TAT60009	TAT60010	TAT60011	TAT60012	10	9			343 (13.5)
—	TAT60013	TAT60014	TAT60015	15	12			419 (16.5)
—	TAT60016	TAT60017	TAT60018	20	18			571 (22.5)
—	—	TAT60019	TAT60020	30	24			724 (28.5)

Ordering Example: TAT60001, 5 KW immersion heater, 240 Vac, 1 phase.

# OVER-THE-SIDE IMMERSION HEATERS

## For Salt Bath Heating



### TBL Series

- ✓ 3 to 7.5 kW
- ✓ 240 and 480V, 1 Phase
- ✓ Steel or Incoloy® Sheath
- ✓ 20 W/in<sup>2</sup>

### APPLICATIONS

- ✓ Primarily for use in salt baths.
- ✓ Available in other sheath materials and watt densities for most liquids and viscous materials. Contact OMEGALUX.

### FEATURES

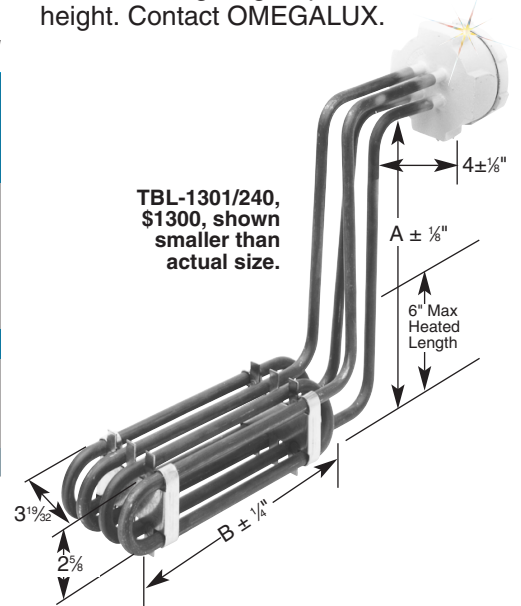
Vapor resistant cast iron terminal box for dependable service. **Optional features** include special voltage or wattage, 3/4" factory installed sludge legs, special riser height. Contact OMEGALUX.

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)							
kW	Phase	W/in <sup>2</sup>	Dimensions—Inches		Model No.	Price	Wt. lb.
			A	B			
<b>Steel Sheath Elements — 20 W/in<sup>2</sup></b>							
3	1	20	11 1/8	13 3/8	TBL-1301/*	\$1300	18
4.5	1	20	11 1/8	15	TBL-4501/*	1350	21
6	1	20	11 1/8	20 5/16	TBL-6001/*	1450	27
7.5	1	20	14 5/8	25 5/16	TBL-7501/*	1600	35
<b>Incoloy Sheath Elements — 20 W/in<sup>2</sup></b>							
3	1	20	11 1/8	13 3/8	TBL-A-131/*	\$1700	18
4.5	1	20	11 1/8	15	TBL-A-451/*	1750	21
6	1	20	11 1/8	20 5/16	TBL-A-601/*	2000	27
7.5	1	20	14 5/8	25 5/16	TBL-A-751/*	2150	35

\* Designate voltage, i.e. insert "240" for 240V or "480" for 480V.

Ordering Example: TBL-1301/240 3 kW heater powered by 240 Vac, \$1300.



TBL-1301/240, \$1300, shown smaller than actual size.

## For Deep Tank Heating

- BLCS Series with Straight Blades
- BLCK-MH Series with Circular Blades
- ✓ 7.5 to 24 kW
- ✓ 240 & 480V, 1 or 3 Phase

### APPLICATIONS

- ✓ Underground Tanks
- ✓ Railroad Tank Cars
- ✓ Oil
- ✓ Asphalt
- ✓ High Viscosity Fluids

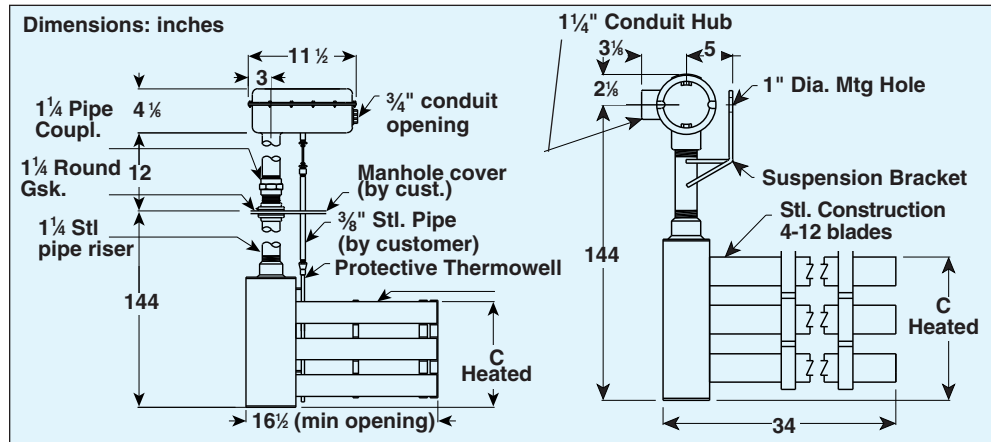
### FEATURES

Integral thermostat on BLCK-MH, 50-250°F, inside weather resistant steel terminal box

4 to 12 Circular blades on BLCK-MH permit entry into tanks with 16 1/2" diameter opening. Split riser adapts to manhole covers.

4 to 12 Circular blades on BLCS require manhole access that will accept 34" blade length. One-piece riser.

1 1/4 inch steel pipe riser, 12 ft. std. length



kW	Dimensions		With Circular Blades Model No.	Price	With Straight Blades Model No.	Price	Wt. lb.
	A (ft.)	C (in)					
<b>Regular Oil — 18 W/in<sup>2</sup></b>							
12	12	8 7/8	BLCK-MH618/240/*	\$4950	BLCS-618/240/*	\$4150	42
12	12	8 7/8	BLCK-MH618/480/*	4950	BLCS-618/480/*	4150	42
16	12	12	BLCK-MH824/240/*	5700	BLCS-824/240/*	4650	55
16	12	12	BLCK-MH824/480/*	5700	BLCS-824/480/*	4650	55
20	12	15 1/8	BLCK-MH1030/240/3P	6450	BLCS-1030/240/3P	5250	75
20	12	15 1/8	BLCK-MH1030/480/*	6450	BLCS-1030/480/*	5250	75
24	12	18 1/4	BLCK-MH1236/240/3P	7150	BLCS-1236/240/3P	5950	90
24	12	18 1/4	BLCK-MH1236/480/*	7150	BLCS-1236/480/*	5950	90

\* Designates phase, i.e. insert "1" for 1 phase or "3" for 3 phase. Model numbers including phase are only available in that phase.

Note: BLCS and BLCK-MH Series heaters are also available for fuel oil with a watt density of 12 W/in<sup>2</sup>. Contact OMEGALUX for details.





**UNITED STATES**

[www.omega.com](http://www.omega.com)  
1-800-TC-OMEGA  
Stamford, CT.

**CANADA**

[www.omega.ca](http://www.omega.ca)  
Laval(Quebec)  
1-800-TC-OMEGA

**GERMANY**

[www.omega.de](http://www.omega.de)  
Deckenpfronn, Germany  
0800-8266342

**UNITED KINGDOM**

[www.omega.co.uk](http://www.omega.co.uk)  
Manchester, England  
0800-488-488

**FRANCE**

[www.omega.fr](http://www.omega.fr)  
Guyancourt, France  
088-466-342

**CZECH REPUBLIC**

[www.omegaeng.cz](http://www.omegaeng.cz)  
Karviná, Czech Republic  
596-311-899

**BENELUX**

[www.omega.nl](http://www.omega.nl)  
Amstelveen, NL  
0800-099-33-44



## More than 100,000 Products Available!

### • Temperature

Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

### • pH and Conductivity

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

### • Data Acquisition

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters



**TEC-FGEC100 Series**



All models shown smaller than actual size.

- ✓ Compact Design
- ✓ DC Operation
- ✓ Reliable Solid-State Construction

**Applications**

- ✓ Control Panels/Outdoor Enclosures, Analytical/Medical Instrumentation, Industrial Instrumentation, Food and Beverage Cooling and Telecom Cabinets

The air to air thermoelectric coolers employ forced air convection provided by IP54 axial fans. It forms part of the standard range which provides assemblies from 60 to 200W. The FGT100 and FGT200 series thermostats are available for control.

**Specifications**

Model No.	TEC-FGEC101	TEC-FGEC102	TEC-FGEC103	TEC-FGEC104
Rated Cooling Power: Watt	60	100	150	200
Typical Current (Measured after 5 Minutes @ 68°F): Amp	3.3	5.8	8.5	12
Nominal Voltage	24 Vdc			
Operating Temperature °C (°F)	-10 to 50 (14 to 122)			
Cold Side Airflow @ Zero Static Pressure: cfm	53.5	58	73	107
Hot Side Airflow @ Zero Static Pressure: cfm	53.5	115	135	135
L10 @ 40°C (Fans): Hours	65,000			
Weight (Approximate): kg (lb)	3 (6.61)	4.5 (9.92)	5.5 (12.1)	7.5 (16.53)
Standard Lead Length: mm (inch)	600 (23.62)			
Length: L1/L2, mm (inch)	230 (9.06)/ 180 (7.09)	300 (11.81)/ 230 (9.06)	300 (11.81)/ 250 (9.84)	400 (15.75)/ 350 (13.78)
Width: W1/W2, mm (inch)	122 (4.8)/102 (4.02)	153 (6.02)/123 (4.84)	153 (6.02)/153 (6.02)	153 (6.02)/153 (6.02)
Height: H1/H2, mm (inch)	67 (2.64)/83.7 (3.30)	74 (2.91)/90.02 (3.55)	80 (3.15)/85 (3.35)	86 (3.39)/100 (3.94)



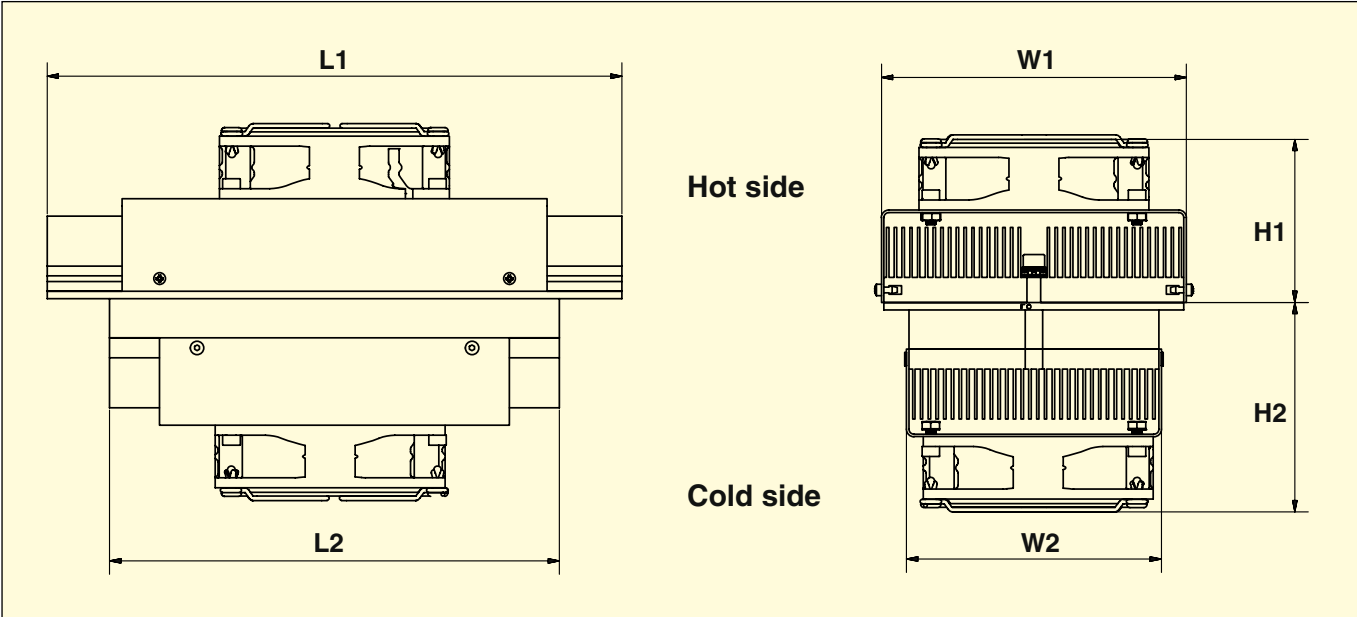
TEC-FGEC103

TEC-FGEC102

TEC-FGEC104

TEC-FGEC101

All models shown smaller than actual size.



<b>To Order Visit <a href="http://omega.com/tec-fgec100">omega.com/tec-fgec100</a> for Pricing and Details</b>	
<b>Part No.</b>	<b>Description</b>
<b>TEC-FGEC101</b>	60 W, 24 Vdc, air to air thermoelectric cooler
<b>TEC-FGEC102</b>	100 W, 24 Vdc, air to air thermoelectric cooler
<b>TEC-FGEC103</b>	150 W, 24 Vdc, air to air thermoelectric cooler
<b>TEC-FGEC104</b>	200 W, 24 Vdc, air to air thermoelectric cooler

Comes complete with operator's manual.  
**Ordering Examples:** TEC-FGEC101, 60 W, 24 Vdc, air to air thermoelectric cooler.  
 TEC-FGEC104, 200 W, 24 Vdc, air to air thermoelectric cooler.

# STRIP HEATERS—3 TERMINALS/3 HEAT

TH and STTH Series



TH-15/120V shown  
smaller than actual size.

STTH-2307 shown  
smaller than actual size.

- ✓ 1½" (3.8 cm) Wide
- ✓ Rugged, Reliable  
Premium Quality
- ✓ 400 to 3000 Watt
- ✓ CSA Certified

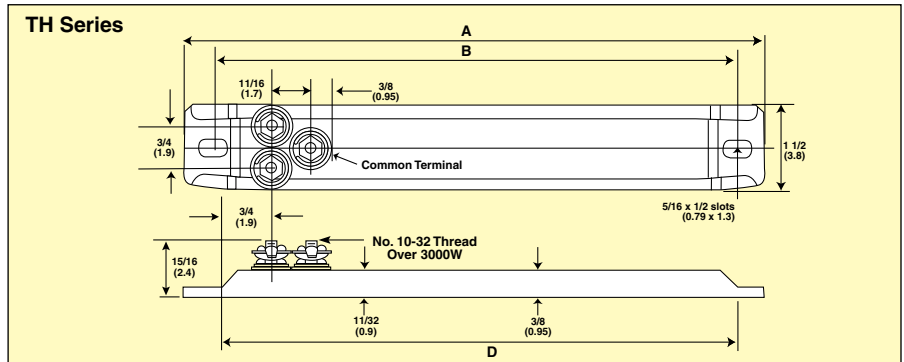
Three terminals split the total rated wattage into two equal circuits. By using a three-heat switch, ¼, ½ or full wattage may be obtained. Use the two equal circuits in parallel to obtain full wattage.

## SPECIFICATIONS

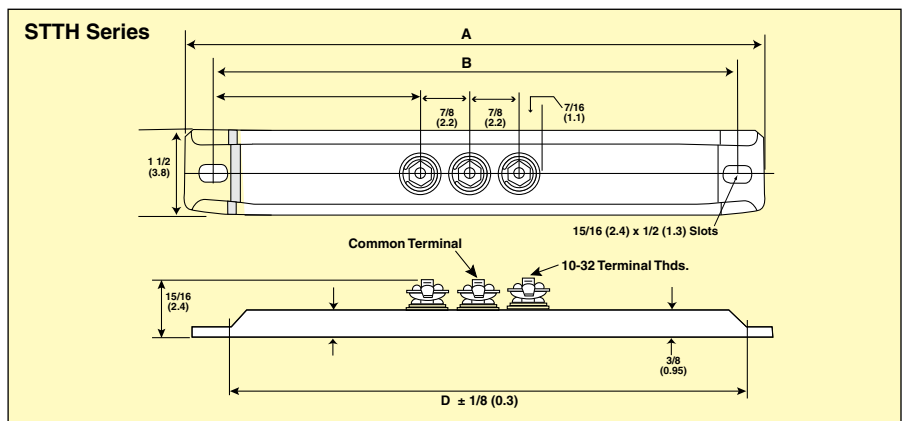
**Sheath Material:** Chrome Steel

**Max Sheath Temp:** 649°C  
(1200°F)

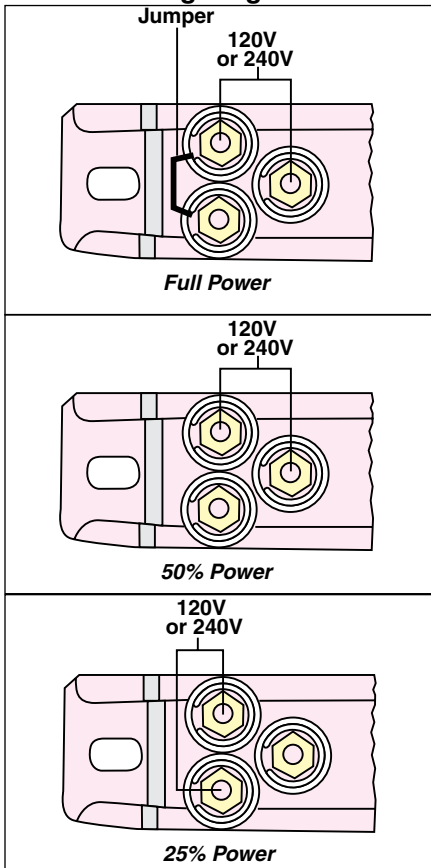
**Power:** 120 or 240 Vac



Dimensions: inches (cm)



**Wiring Diagrams**



**To Order**

Dimensions: inches (cm)						
A	B	D	Watts	W/in <sup>2</sup>	Model No.	Wt. (lb)
<b>TH Series</b>						
10 1/2 (27)	9 1/2 (24)	9 (23)	400	17	TH-10/120	0.75 (0.3)
12 (30)	11 (28)	10 1/2 (27)	500	17	TH-12/*	0.88 (0.4)
15 1/4 (39)	14 1/2 (37)	13 3/4 (35)	750	18	TH-15/*	1.13 (0.5)
17 1/2 (45)	16 1/4 (43)	16 (42)	1000	20	TH-18/*	1.38 (0.6)
23 3/4 (60)	22 3/4 (60)	22 1/4 (57)	1250	17	TH-24/*	1.38 (0.6)
30 1/2 (77)	29 3/4 (75)	28 (71)	1500	16	TH-30/*	2.38 (1.08)
35 1/2 (91)	34 3/4 (88)	33 3/4 (85)	1750	15	TH-36/*	2.88 (1.3)
42 1/2 (108)	41 3/4 (105)	40 (102)	1500	11	TH-43/*	3.38 (1.5)
42 1/2 (108)	41 3/4 (106)	40 (102)	2000	15	TH-431/*	3.38 (1.5)
47 1/2 (122)	46 3/4 (119)	45 3/4 (115)	1700	11	TH-48/*	3.70 (1.7)
47 1/2 (122)	46 3/4 (119)	45 3/4 (115)	2250	14	TH-481/*	3.70 (1.7)
53 1/2 (137)	52 3/4 (134)	51 3/4 (130)	2000	11	TH-54/*	4.12 (1.9)
53 1/2 (137)	52 3/4 (134)	51 3/4 (130)	2500	14	TH-541/*	4.12 (1.9)
63 1/2 (162)	62 3/4 (160)	61 3/4 (156)	2250	10	TH-64/*	4.85 (2.2)
63 1/2 (162)	62 3/4 (160)	61 3/4 (156)	3000	13	TH-641/*	4.85 (2.2)
71 1/2 (183)	70 3/4 (180)	69 3/4 (176)	2500	10	TH-72/*	5.65 (2.6)
71 1/2 (183)	70 3/4 (180)	69 3/4 (176)	3000	13	TH-721/240	5.65 (2.6)
<b>Type STTH</b>						
23 (58)	22 (56)	21 1/2 (55)	750	12	STTH-2307	1.38 (0.6)
23 3/4 (60)	22 3/4 (60)	22 1/4 (57)	1000	15	STTH-2401	1.38 (0.6)

\* Designate voltage, i.e., insert "120" for 120 Vac or "240" for 240 Vac. Those model numbers containing /120 or /240 are only available in that voltage.

† To determine maximum allowable watt density, visit us online.

**Ordering Examples:** TH-36/120, 3 terminal 120V, strip heater.

STTH-2307/240V, 3 terminal 240V strip heater.

# OVER-THE-SIDE IMMERSION HEATERS FOR CLEAN WATER APPLICATIONS

## TLC and KTLC Series



- ✓ Copper Sheath Heating Elements
- ✓ Monel Riser and Junction Box
- ✓ 120, 240, 480V, 1 and 3 Phase
- ✓ 2 to 18 kW
- ✓ Optional Thermostat Kits are Available to Fit into Terminal Box

## FEATURES

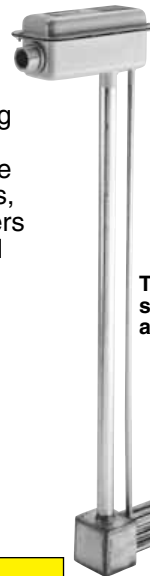
These heaters are lightweight and portable and provide convenient solutions to many heating applications. TLC Series heaters have two or three straight heating elements, while KTLC Series heaters have two or three curved heating elements.

## APPLICATIONS

For clean water heating applications (pH 6 to 8).

## SPECIFICATIONS

**Wattage:** 2 to 18 kW  
**Power:** 120, 240, 480V, 1 and 3 phase  
**Watt Density:** 40W/in<sup>2</sup>



TLC-220A-036/120V shown smaller than actual size.



KTLC-220A-036/120V shown smaller than actual size.

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

## To Order

kW	Riser (A) cm (in)	Straight Elements		Curved Elements		Weight lb (kg)
		Min. Tank Clearance (B)—cm (in)	Model No.	Min. Tank Clearance (B)—cm (in)	Model No.	
<b>Two Elements — Copper, 40 W/in.<sup>2</sup></b>						
2	91 (36)	31 (12¼)	TLC-220A-036/120	27 (10⅝)	KTLC-220A-036/120	7 (3)
2	91 (36)	31 (12¼)	TLC-220A-036/*	27 (10⅝)	KTLC-220A-036/*	7 (3)
4	91 (36)	57 (22¼)	TLC-240A-036/120	35 (13¾)	KTLC-240A-036/120	9 (4)
4	91 (36)	57 (22¼)	TLC-240A-036/*	35 (13¾)	KTLC-240A-036/*	9 (4)
6	91 (36)	75 (29½)	TLC-260A-036/*	41 (16⅞)	KTLC-260A-036/*	9 (4)
6	121 (48)	75 (29½)	TLC-260TI-048/240	—	—	11 (5)
8	91 (36)	95 (37¾)	TLC-280A-036/*	47 (18⅝)	KTLC-280A-036/*	11 (5)
10	121 (48)	103 (45)	TLC-210A-048/*	54 (21¼)	KTLC-210A-048/*	14 (6)
12	121 (48)	133 (52½)	TLC-212A-048/*	59 (23½)	KTLC-212A-048/*	16 (7)
<b>Three Elements — Copper, 40 W/in.<sup>2</sup></b>						
3	91 (36)	31 (12¼)	TLC-330A-036/120	27 (10⅝)	KTLC-330A-036/120	12 (5)
3	91 (36)	31 (12¼)	TLC-330A-036/240/**	27 (10⅝)	KTLC-330A-036/240/**	12 (5)
3	91 (36)	31 (12¼)	TLC-330A-036/480/**	27 (10⅝)	KTLC-330A-036/480/**	12 (5)
6	91 (36)	57 (22¼)	TLC-360A-036/120	35 (13¾)	KTLC-360A-036/120	12 (5)
6	91 (36)	57 (22¼)	TLC-360A-036/240/**	35 (13¾)	KTLC-360A-036/240/**	12 (5)
6	91 (36)	57 (22¼)	TLC-360A-036/480/**	35 (13¾)	KTLC-360A-036/480/**	12 (5)
9	91 (36)	75 (29½)	TLC-390A-036/240/**	41 (16⅞)	KTLC-390A-036/240/**	13 (6)
9	91 (36)	75 (29½)	TLC-390A-036/480/**	41 (16⅞)	KTLC-390A-036/480/**	13 (6)
12	121 (48)	95 (37¾)	TLC-312A-048/240/**	47 (18⅝)	KTLC-312A-048/240/**	16 (8)
12	121 (48)	95 (37¾)	TLC-312A-048/480/**	47 (18⅝)	KTLC-312A-048/480/**	16 (8)
15	121 (48)	103 (45)	TLC-315A-048/240/**	54 (21¼)	KTLC-315A-048/240/**	17 (8)
15	121 (48)	103 (45)	TLC-315A-048/480/**	54 (21¼)	KTLC-315A-048/480/**	17 (8)
18	121 (48)	133 (52½)	TLC-318A-048/240/**	60 (23½)	KTLC-318A-048/240/**	18 (8)
18	121 (48)	133 (52½)	TLC-318A-048/480/**	60 (23½)	KTLC-318A-048/480/**	18 (8)

\* To designate voltage, insert “-240V” for 240V or “-480V” for 480V. \*\* Add the suffix “3P” to model number for 3 phase power.

Optional thermostat kits are available online to fit into heater terminal box.

Ordering Examples: TLC-220A-036/240V, 2 kW heater powered by 1 phase 240 Vac.

TLC-330A-036/240V/3P, 3 kW heater powered by 3 phase 240 Vac.

# CORROSIVE FLUIDS OVER-THE SIDE IMMERSION HEATERS



TLI & KTLI Series Starts at

**\$1100**

- ✓ Heavy-Duty Incoloy® Heating Elements
- ✓ Incoloy Riser and Junction Box
- ✓ 2 to 18 kW
- ✓ Optional Thermostat Kits are Available to Fit into Terminal Box

## FEATURES

These over-the-side immersion heaters are designed for vessels where through the side immersion heaters cannot be conveniently installed. These heaters are installed through the top of the vessel with the heated portion of the unit along the side or at the bottom of the tank.

## CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

Natural circulation of the fluid inside the vessel allows for even heat distribution. Terminal houses or lead wires are provided for power connections.

## APPLICATIONS

Alkaline soaking and cleaning copper sulfate, electro cleaners, mild acid baths, wash and dip tanks containing alkali, oakite, caustic soda, detergent and other aqueous solutions.

## SPECIFICATIONS

**Wattage:** 2 to 18 kW

**Power:** 120, 240, 480V, 1 and 3 phase

**Watt Density:** 40 W/in<sup>2</sup>



**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)								
		Straight Elements				Curved Elements		
kW	Riser (A) in (cm)	Min. Tank Clearance (B) in (cm)	Model No.	Price	Min. Tank Clearance (B) in (cm)	Model No.	Price	Wt. lb (kg)
<b>Two Elements—Incoloy, 40 W/in<sup>2</sup></b>								
2	36 (91)	12¼ (31)	TLI-220A-036/120	\$1100	10% (27)	KTLI-220A-036/120	\$1250	8 (4)
2	36 (91)	12¼ (31)	TLI-220A-036/*	1100	10% (27)	KTLI-220A-036/*	1250	8 (4)
4	36 (91)	22¼ (57)	TLI-240A-036/120	1250	13¾ (35)	KTLI-240A-036/120	1350	8 (4)
4	36 (91)	22¼ (57)	TLI-240A-036/*	1250	13¾ (35)	KTLI-240A-036/*	1350	8 (4)
6	36 (91)	29½ (75)	TLI-260A-036/*	1350	16% (41)	KTLI-260A-036/*	1450	10 (5)
8	36 (91)	37% (95)	TLI-280A-036/*	1500	18% (47)	KTLI-280A-036/*	1500	12 (5)
10	48 (121)	45 (103)	TLI-210A-048/*	1550	21¼ (54)	KTLS-210A-048/*	1600	14 (6)
12	48 (121)	52½ (133)	TLI-212A-048/*	1650	23½ (59)	KTLS-212A-048/*	1700	16 (7)
<b>Three Element—Incoloy, 40 W/in<sup>2</sup></b>								
3	36 (91)	12¼ (31)	TLI-330A-036/120	\$1300	10% (27)	KTLI-330A-036/120	\$1400	9 (4)
3	36 (91)	12¼ (31)	TLI-330A-036/240/**	1300	10% (27)	KTLI-330A-036/240/**	1400	9 (4)
3	36 (91)	12¼ (31)	TLI-330A-036/480/**	1400	10% (27)	KTLI-330A-036/480/**	1400	9 (4)
6	36 (91)	22¼ (57)	TLI-360A-036/120	1400	13¾ (35)	KTLI-360A-036/120	1550	10 (5)
6	36 (91)	22¼ (57)	TLI-360A-036/240/**	1400	13¾ (35)	KTLI-360A-036/240/**	1550	10 (5)
6	36 (91)	22¼ (57)	TLI-360A-036/480/**	1400	13¾ (35)	KTLI-360A-036/480/**	1550	10 (5)
9	36 (91)	29½ (75)	TLI-390A-036/240/**	1500	16% (41)	KTLI-390A-036/240/**	1650	12 (5)
9	36 (91)	29½ (75)	TLI-390A-036/480/**	1500	16% (41)	KTLI-390A-036/480/**	1650	12 (5)
12	48 (121)	37% (95)	TLI-312A-048/240/**	1600	18% (47)	KTLI-312A-048/240/**	1800	14 (6)
12	48 (121)	37% (95)	TLI-312A-048/480/**	1600	18% (47)	KTLI-312A-048/480/**	1800	14 (6)
15	48 (121)	45 (103)	TLI-315A-048/240/**	1750	21¼ (54)	KTLI-315A-048/240/**	1900	16 (7)
15	48 (121)	45 (103)	TLI-315A-048/480/**	1750	21¼ (54)	KTLI-315A-048/480/**	1900	16 (7)
18	48 (121)	52½ (133)	TLI-318A-048/240/**	1850	23½ (60)	KTLI-318A-048/240/**	2000	18 (8)
18	48 (121)	52½ (133)	TLI-318A-048/480/**	1850	23½ (60)	KTLI-318A-048/480/**	2000	18 (8)

\* Designate voltage, i.e. insert 240 for 240 V for 480 for 480 V.

Optional thermostat kits are available to fit into heater terminal box.

\*\* Add the suffix "3P" to the model number for 3 phase power.

**Ordering Examples:** TLI-220A-036/480, 2 kW heater powered by 1 phase 240 Vac, \$1100.

TLI-330A-036/2403P, 3 kW heater powered by 3 phase 240 Vac, \$1350.



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### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

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Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters



# OVER-THE SIDE IMMERSION HEATERS FOR MEDIUM WEIGHT OILS

TLO and KTLO Series Starts at

**\$850**



- ✓ 2 to 10 kW
- ✓ 120, 240, 480V, 1 and 3 Phase
- ✓ Heavy Duty Steel Heating Elements, Riser and Junction Box
- ✓ Optional Thermostat Kits are Available to Fit into Terminal Box
- ✓ Low Watt Density for Heating Medium Weight Oils

## FEATURES

Tubular heating elements are brazed into a junction box. All wetted parts of TLO & KTLO Series heaters are steel. Sludge legs (to keep heated portion of the unit off the bottom of the tank) are standard.

## APPLICATIONS

Medium weight oils, alkali, soaking cleaners, degreasing solutions, caustics, solvent type oils, heat transfer fluids.

## SPECIFICATIONS

Wattage: 2 to 10 kW  
Power: 120, 240, 480V, 1 and 3 phase  
Watt Density: 20 W/in<sup>2</sup>

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

TLO-220A-036/120V, \$850, shown smaller than actual size.



KTLO-220A-036/120V, \$950, shown smaller than actual size.

**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Riser (A) cm (in)	Straight Elements			Curved Elements			Weight lb (kg)
		Min. Tank Clearance (B)-cm (in)	Model No.	Price	Min. Tank Clearance (B)-cm (in)	Model No.	Price	
<b>Two Elements — Steel, 20 W/in<sup>2</sup></b>								
2	91 (36)	57 (22¼)	TLO-220A-036/120	\$850	35 (13¾)	KTLO-220A-036/120	\$950	9 (4)
2	91 (36)	57 (22¼)	TLO-220A-036/*	850	35 (13¾)	KTLO-220A-036/*	950	9 (4)
3	91 (36)	75 (29½)	TLO-230A-036/120	1000	35 (16⅙)	KTLO-230A-036/120	1100	10 (5)
3	91 (36)	75 (29½)	TLO-230A-036/*	1000	35 (16⅙)	KTLO-230A-036/*	1100	10 (5)
5	121 (48)	103 (45)	TLO-250A-048/120	1150	57 (21¼)	KTLO-250A-048/120	1300	10 (5)
5	121 (48)	103 (45)	TLO-250A-048/*	1150	57 (21¼)	KTLO-250A-048/*	1300	12 (5)
6	121 (48)	133 (52½)	TLO-260A-048/*	1250	59 (23½)	KTLO-260A-048/*	1400	13 (6)
7	121 (48)	144 (56½)	TLO-260A-048/*	1250	59 (24⅙)	KTLO-260A-048/*	1400	14 (7)
<b>Three Elements — Steel, 20 W/in<sup>2</sup></b>								
3	91 (36)	57 (22¼)	TLO-330A-036/120	\$950	35 (13¾)	KTLO-330A-036/120	\$1050	12 (4)
3	91 (36)	57 (22¼)	TLO-330A-036/240/**	950	35 (13¾)	KTLO-330A-036/240/**	1050	12 (4)
3	91 (36)	57 (22¼)	TLO-330A-036/480/**	950	35 (13¾)	KTLO-330A-036/480/**	1050	12 (4)
4.5	91 (36)	75 (29½)	TLO-345A-036/120	1100	41 (16⅙)	KTLO-345A-036/120	1200	13 (6)
4.5	91 (36)	75 (29½)	TLO-345A-036/240/**	1100	41 (16⅙)	KTLO-345A-036/240/**	1200	13 (6)
4.5	91 (36)	75 (29½)	TLO-345A-036/480/**	1100	41 (16⅙)	KTLO-345A-036/480/**	1200	13 (6)
6	121 (48)	95 (37⅞)	TLO-360A-048/120	1150	47 (18⅝)	KTLO-360A-048/120	1300	13 (6)
6	121 (48)	95 (37⅞)	TLO-360A-048/240/**	1150	47 (18⅝)	KTLO-360A-048/240/**	1300	13 (6)
6	121 (48)	95 (37⅞)	TLO-360A-048/480/**	1150	47 (18⅝)	KTLO-360A-048/480/**	1300	13 (6)
7.5	121 (48)	103 (45)	TLO-375A-048/120	1300	54 (21¼)	KTLO-375A-048/120	1400	14 (6)
7.5	121 (48)	103 (45)	TLO-375A-048/240/**	1300	54 (21¼)	KTLO-375A-048/240/**	1400	14 (6)
7.5	121 (48)	103 (45)	TLO-375A-048/480/**	1300	54 (21¼)	KTLO-375A-048/480/**	1400	14 (6)
9	121 (48)	133 (52½)	TLO-390A-048/240/**	1400	60 (23½)	KTLO-390A-048/240/**	1500	15 (7)
9	121 (48)	133 (52½)	TLO-390A-048/480/**	1400	60 (23½)	KTLO-390A-048/480/**	1500	15 (7)
10	121 (48)	145 (56½)	TLO-310A-048/240/**	1450	63 (24⅙)	KTLO-310A-048/240/**	1600	16 (7)
10	121 (48)	145 (56½)	TLO-310A-048/480/**	1450	63 (24⅙)	KTLO-310A-048/480/**	1600	16 (7)

\* Designate voltage, i.e. insert "-240" for 240V or "-480" for 480V.

\*\* Add the suffix "3P" to the model number for 3 phase power. Optional thermostat kits : AR-115-KIT-4 (0-100F), AR-219-KIT-4 (60-250F), and AR-519-KIT-4 (200-550F) are available to fit into heater terminal box.

Note: TLO-2 and KTLO-2 Series are available in 4 kW units, contact OMEGA LUX for details.



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# OVER-THE SIDE IMMERSION HEATERS FOR MILDLY CORROSIVE FLUIDS



TLS and KTLS Series Starts at

## \$1100

- ✓ 2 to 18 kW
- ✓ 120, 240, 480V, 1 and 3 Phase
- ✓ Stainless Steel Sheath and Riser Elements
- ✓ Optional Thermostat Kits are Available to Fit into Terminal Box

### FEATURES

These over-the-side immersion heaters are designed for installing in the top of a tank with the heated portion directly immersed along the side or at the bottom. This provides easy removal of the heater and ample working space inside the tank.

### APPLICATIONS

Alkaline cleaners (electrified), alkaline soaking cleaners, copper sulfate, electroless copper, electro cleaners, mild acid baths, wash tanks dip tanks containing alkali, oakite, caustic soda, detergent and other aqueous solutions

### SPECIFICATIONS

Wattage: 2 to 18 kW  
 Power: 120, 240, 480V, 1 & 3  
 Watt Density: 40 W/in<sup>2</sup>

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.



TLS-220A-036/120V, \$1100, shown smaller than actual size.

KTLS-220A-036/120V, \$1200, shown smaller than actual size.

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

kW	Riser (A) cm (in)	Straight Elements			Curved Elements			Wt. lb (kg)
		Min. Tank Clearance (B)-cm (in)	Model No.	Price	Min. Tank Clearance (B)-cm (in)	Model No.	Price	
<b>Two Elements — Stainless Steel, 40 W/in.<sup>2</sup></b>								
2	91 (36)	31 (12¼)	TLS-220A-036/120	\$1100	27 (10%)	KTLS-220A-036/120	\$1200	8 (4)
2	91 (36)	31 (12¼)	TLS-220A-036/*	1100	27 (10%)	KTLS-220A-036/*	1200	8 (4)
4	91 (36)	57 (22¼)	TLS-240A-036/120	1200	35 (13%)	KTLS-240A-036/120	1300	8 (4)
4	91 (36)	57 (22¼)	TLS-240A-036/*	1200	35 (13%)	KTLS-240A-036/*	1300	8 (4)
6	91 (36)	75 (29½)	TLS-260A-036/120	1300	41 (16%)	KTLS-260A-036/120	1400	10 (5)
6	91 (36)	75 (29½)	TLS-260A-036/*	1300	41 (16%)	KTLS-260A-036/*	1400	10 (5)
8	91 (36)	95 (37%)	TLS-280A-036/*	1450	47 (18%)	KTLS-280A-036/*	1450	12 (5)
10	121 (48)	103 (45)	TLS-210A-048/*	1500	54 (21¼)	KTLS-210A-048/*	1550	14 (6)
12	121 (48)	133 (52½)	TLS-212A-048/*	1600	59 (23%)	KTLS-212A-048/*	1650	16 (7)
<b>Three Elements — Stainless Steel, 40 W/in.<sup>2</sup></b>								
3	91 (36)	31 (12¼)	TLS-330A-036/120	\$1250	27 (10%)	KTLS-330A-036/120	\$1350	9 (4)
3	91 (36)	31 (12¼)	TLS-330A-036/240/**	1250	27 (10%)	KTLS-330A-036/240/**	1350	9 (4)
3	91 (36)	31 (12¼)	TLS-330A-036/480/**	1250	27 (10%)	KTLS-330A-036/480/**	1350	9 (4)
6	91 (36)	57 (22¼)	TLS-360A-036/120	1400	35 (13%)	KTLS-360A-036/120	1500	10 (5)
6	91 (36)	57 (22¼)	TLS-360A-036/240/**	1400	35 (13%)	KTLS-360A-036/240/**	1500	10 (5)
6	91 (36)	57 (22¼)	TLS-360A-036/480/**	1400	35 (13%)	KTLS-360A-036/480/**	1500	10 (5)
9	91 (36)	75 (29½)	TLS-390A-036/240/**	1450	41 (16%)	KTLS-390A-036/240/**	1600	12 (5)
9	91 (36)	75 (29½)	TLS-390A-036/480/**	1450	41 (16%)	KTLS-390A-036/480/**	1600	12 (5)
12	121 (48)	95 (37%)	TLS-312A-048/240/**	1550	47 (18%)	KTLS-312A-048/240/**	1700	14 (6)
12	121 (48)	95 (37%)	TLS-312A-048/480/**	1550	47 (18%)	KTLS-312A-048/480/**	1700	14 (6)
15	121 (48)	103 (45)	TLS-315A-048/240/**	1650	54 (21¼)	KTLS-315A-048/240/**	1850	16 (7)
15	121 (48)	103 (45)	TLS-315A-048/480/**	1650	54 (21¼)	KTLS-315A-048/480/**	1850	16 (7)
18	121 (48)	133 (52½)	TLS-318A-048/240/**	1750	60 (23½)	KTLS-318A-048/240/**	1950	18 (8)
18	121 (48)	133 (52½)	TLS-318A-048/480/**	1750	60 (23½)	KTLS-318A-048/480/**	1950	18 (8)

\* Designate voltage, i.e. insert "240" for 240V for "480V" for 480V. \*\* Add the suffix "3P" to the model number for 3 phase power.

Optional thermostat kits are available to fit into heater terminal box.

Ordering Examples: TLS-220A-036/240, 2 kW heater powered by 1 phase 240 Vac, \$1100.

TLS-330A-036/240/3P, 3 kW heater powered by 3 phase 240 Vac, \$1250.



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# HEAVY-DUTY OVER-THE-SIDE IMMERSION HEATERS

TLC and KTLC Series Starts at

**\$190**



## FEATURES

- ✓ Copper Sheath and Riser (40 W/in<sup>2</sup>)
- ✓ Steel Sheath and Riser (20 W/in<sup>2</sup>)
- ✓ Stainless Steel Sheath and Riser (40 W/in<sup>2</sup>)
- ✓ Incoloy Sheath and Riser (40 W/in<sup>2</sup>)
- ✓ 91 and 122 cm (36 and 48") Riser Heights
- ✓ Moisture Resistant Terminal Enclosure
- ✓ Thermowell
- ✓ 10 cm (4") Sludge Legs Increases A Dimension 8.9 cm (3½") Keeping Heated Section off Bottom of Tank

**TLC and KTLC Series:** Copper sheath heating elements for clean water.

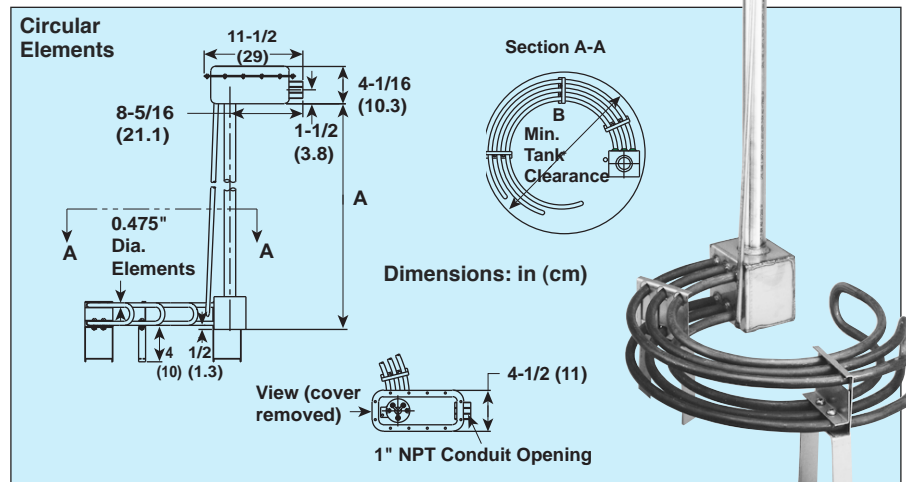
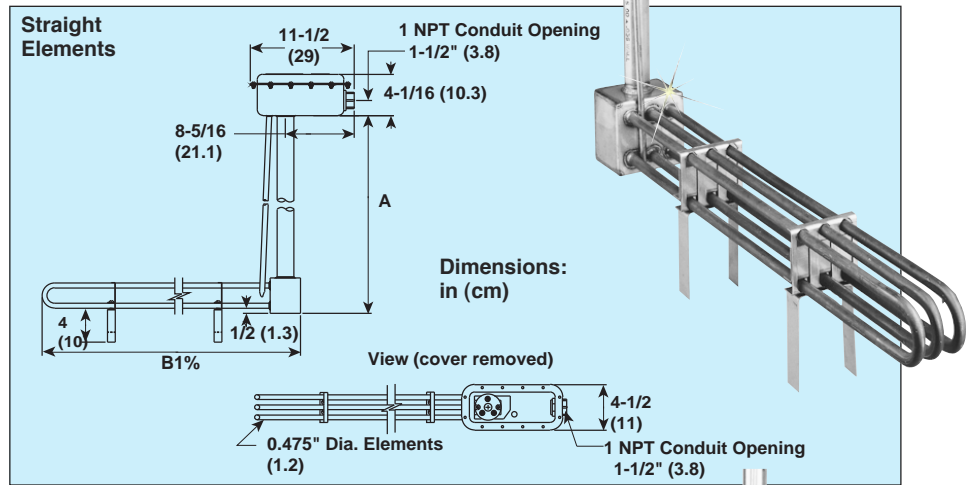
**TLS and KTLS Series:** Stainless steel sheath heating elements for mild corrosive solutions.

**TLI and KTLI Series:** Incoloy sheath heating elements for corrosive fluids.

**TLO and KTLO Series:** Steel sheath heating elements for medium weight oils.

**Optional Thermostat Kits:** Containing OMEGALUX® AR-type thermostat and mounting hardware are available to fit in heater terminal box.

Lightweight, portable, easy to install L-shape construction, puts the heat at the bottom of the tank and the terminal enclosure at the top of the



tank. These heaters are convenient answers for many immersion. Heating applications capacities, dimensions and sheaths fit a wide range of heating applications. Easy to install and remove for cleaning with straight or circular element designs to fit many tank configurations.

**Construction:** All wetted parts of these immersions heaters are made of the same metal or ally for optimum corrosion resistance.

All gasketed terminal boxes are steel, coated with acid resistant paint finish.

**Corrosion Resistance:** Wide choice of sheath materials should provide corrosion resistance in heating liquids. Check chemical composition of solution before selecting sheath material.

Sludge legs, or compatible metals, keep heated section off bottom of vessel, 10 cm (4") standard height. Included with each heater [increases A Dimension by 8.9 cm (3½")]. Sludge legs are standard on all heaters.

**MOST POPULAR MODELS HIGHLIGHTED!**

### OPTIONAL THERMOSTAT KITS

AR-115-KIT-4	0-100°F	\$190
AR-219-KIT-4	60-250°F	190
AR-519-KIT-4*	200-550°F	190

\* Note: Not UL Listed or CSA Certified with 200-550°F Thermostat Kit.

**Caution:** Contact OMEGALUX® when bath temperatures exceed 400°F in any given application.

# OVER-THE-SIDE IMMERSION HEATERS FOR CLEAN WATER APPLICATIONS

TLC and KTLC Series Starts at

**\$1000**



- ✓ Copper Sheath Heating Elements
- ✓ Monel Riser and Junction Box
- ✓ 120, 240, 480V, 1 and 3 Phase
- ✓ 2 to 18 kW
- ✓ Optional Thermostat Kits are Available to Fit into Terminal Box

## FEATURES

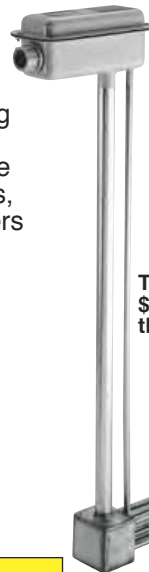
These heaters are lightweight and portable and provide convenient solutions to many heating applications. TLC Series heaters have two or three straight heating elements, while KTLC Series heaters have two or three curved heating elements.

## APPLICATIONS

For clean water heating applications (pH 6 to 8).

## SPECIFICATIONS

**Wattage:** 2 to 18 kW  
**Power:** 120, 240, 480V, 1 and 3 phase  
**Watt Density:** 40W/in<sup>2</sup>



TLC-220A-036/120V, \$1000, shown smaller than actual size.



KTLC-220A-036/120V, \$1100, shown smaller than actual size.

**CAUTION AND WARNING!**  
 Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Riser (A) cm (in)	Straight Elements			Curved Elements			Weight lb (kg)
		Min. Tank Clearance (B)—cm (in)	Model No.	Price	Min. Tank Clearance (B)—cm (in)	Model No.	Price	
<b>Two Elements — Copper, 40 W/in.<sup>2</sup></b>								
2	91 (36)	31 (12¼)	TLC-220A-036/120	\$1000	27 (10½)	KTLC-220A-036/120	\$1100	7 (3)
2	91 (36)	31 (12¼)	TLC-220A-036/*	1000	27 (10½)	KTLC-220A-036/*	1100	7 (3)
4	91 (36)	57 (22¼)	TLC-240A-036/120	1150	35 (13¾)	KTLC-240A-036/120	1250	9 (4)
4	91 (36)	57 (22¼)	TLC-240A-036/*	1150	35 (13¾)	KTLC-240A-036/*	1250	9 (4)
6	91 (36)	75 (29½)	TLC-260A-036/*	1200	41 (16½)	KTLC-260A-036/*	1300	9 (4)
6	121 (48)	75 (29½)	TLC-260TI-048/240	1300	—	—	—	11 (5)
8	36 (91)	95 (37¾)	TLC-280A-036/*	1300	47 (18½)	KTLC-280A-036/*	1400	11 (5)
10	121 (48)	103 (45)	TLC-210A-048/*	1400	54 (21¼)	KTLC-210A-048/*	1500	14 (6)
12	121 (48)	133 (52½)	TLC-212A-048/*	1450	59 (23½)	KTLC-212A-048/*	1600	16 (7)
<b>Three Elements — Copper, 40 W/in.<sup>2</sup></b>								
3	91 (36)	31 (12¼)	TLC-330A-036/120	\$1100	27 (10½)	KTLC-330A-036/120	\$1250	12 (5)
3	91 (36)	31 (12¼)	TLC-330A-036/240/**	1100	27 (10½)	KTLC-330A-036/240/**	1250	12 (5)
3	91 (36)	31 (12¼)	TLC-330A-036/480/**	1100	27 (10½)	KTLC-330A-036/480/**	1250	12 (5)
6	91 (36)	57 (22¼)	TLC-360A-036/120	1250	35 (13¾)	KTLC-360A-036/120	1400	12 (5)
6	91 (36)	57 (22¼)	TLC-360A-036/240/**	1250	35 (13¾)	KTLC-360A-036/240/**	1400	12 (5)
6	91 (36)	57 (22¼)	TLC-360A-036/480/**	1250	35 (13¾)	KTLC-360A-036/480/**	1400	12 (5)
9	91 (36)	75 (29½)	TLC-390A-036/240/**	1350	41 (16½)	KTLC-390A-036/240/**	1500	13 (6)
9	91 (36)	75 (29½)	TLC-390A-036/480/**	1350	41 (16½)	KTLC-390A-036/480/**	1500	13 (6)
12	121 (48)	95 (37¾)	TLC-312A-048/240/**	1450	47 (18½)	KTLC-312A-048/240/**	1600	16 (8)
12	121 (48)	95 (37¾)	TLC-312A-048/480/**	1450	47 (18½)	KTLC-312A-048/480/**	1600	16 (8)
15	121 (48)	103 (45)	TLC-315A-048/240/**	1550	54 (21¼)	KTLC-315A-048/240/**	1700	17 (8)
15	121 (48)	103 (45)	TLC-315A-048/480/**	1550	54 (21¼)	KTLC-315A-048/480/**	1700	17 (8)
18	121 (48)	133 (52½)	TLC-318A-048/240/**	1650	60 (23½)	KTLC-318A-048/240/**	1800	18 (8)
18	121 (48)	133 (52½)	TLC-318A-048/480/**	1650	60 (23½)	KTLC-318A-048/480/**	1800	18 (8)

\* To designate voltage, insert "-240" for 240V or "-480" for 480V. \*\* Add the suffix "3P" to model number for 3 phase power.

Optional thermostat kits are available to fit into heater terminal box (see page 108).

Ordering Examples: TLC-220A-036/240, 2 kW heater powered by 1 phase 240 Vac, \$1000.

TLC-330A-036/240/3P, 3 kW heater powered by 3 phase 240 Vac, \$1100.



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### • Heaters

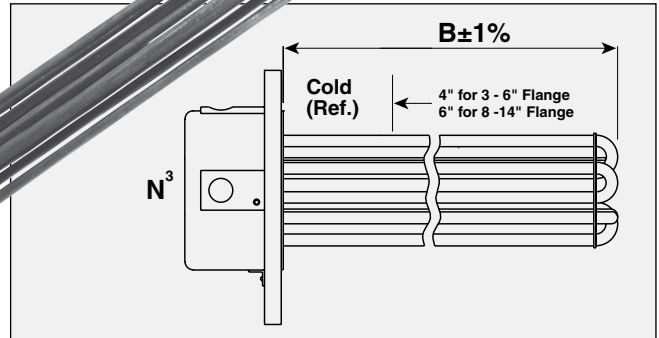
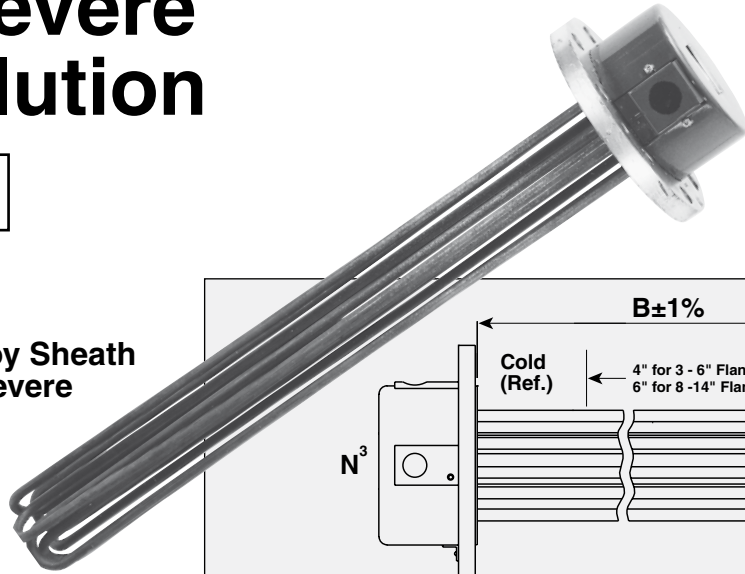
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# Flanged Immersion Heaters for Severe Corrosive Solution

TMIS Series



- ✓ 3, 5 & 6 Inch, 68 kg (150 lb) Stainless Steel Flange
- ✓ Rugged 0.475" Diameter Incoloy Sheath Heating Elements for Use in Severe Corrosive Solutions
- ✓ 240 and 480 V, 3 Phase
- ✓ 2 to 24 kW



## Features

Rugged Construction. Sturdy 0.475" diameter Incoloy elements, welded to stainless steel flanges-corrosion resistance provides superior rigidity and strength. Heavy-duty jumper straps and terminal posts assure permanent tightness of connections and an extra margin of current carrying capacity.

## Applications

For severe corrosive solutions. For solutions with chemicals with more severe corrosive properties than can be used with other sheath materials and where corrosive action is accelerated by higher sheath temperatures.

For heavy solution concentrations in the 30 to 50% range. It should be noted that with high concentration, only the less corrosive chemicals may be put in the solution.

## CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

*Please note: Approved pressure and/or temperature limiting controls must be used to assure safe operation in the event of system malfunctions.*

## Specifications

**Wattage:** 2 to 24 kW

**Power:** 240 and 480 V, 3 phase

**Watt Density:** 15W/in<sup>2</sup>

**Terminal Enclosure:** General purpose NEMA 1 rated (other enclosures available).

To Order						
E-1 General Purpose Enclosure <sup>1</sup>						
kW	Circ	Phase	B Dim cm (inches)	Model No.	Weight kg (lb)	N <sup>3</sup> Dim. cm (inches)
<b>3 Inch-150 lbs, SS Flange, 3 Incoloy Elements — 15 W/in<sup>2</sup></b>						
2	1	3	46 (18 <sup>1</sup> / <sub>16</sub> )	TMIS-3025L*/3P	7 (16)	2.54 (1)
4	1	3	84 (33 <sup>1</sup> / <sub>16</sub> )	TMIS-3045L*/3P	8 (18)	2.54 (1)
6	1	3	122 (48 <sup>1</sup> / <sub>16</sub> )	TMIS-3065L*/3P	10 (21)	2.54 (1)
<b>5 Inch-150 lbs, SS Flange, 6 Incoloy Elements — 15 W/in<sup>2</sup></b>						
4	1	3	46 (18 <sup>1</sup> / <sub>16</sub> )	TMIS-6045L*/3P	12 (27)	2.54 (1)
8	1	3	84 (33 <sup>1</sup> / <sub>16</sub> )	TMIS-6085L*/3P	15 (33)	2.54 (1)
12	1	3	122 (48 <sup>1</sup> / <sub>16</sub> )	TMIS-6125L*/3P	17 (37)	2.54 (1)
<b>6 Inch-150 lbs, SS Flange, 12 Incoloy Elements — 15 W/in<sup>2</sup></b>						
8	1	3	46 (18)	TMIS-1208L*/3P 5033	36 (60)	2.54 (1)
12	1	3	64 (25 <sup>1</sup> / <sub>8</sub> )	TMIS-1212L*/3P 5118	27 (67)	2.54 (1)
16	1	3	84 (33)	TMIS-1216L*/3P 5149	34 (76)	2.54 (1)
20	1	3	103 (40 <sup>1</sup> / <sub>2</sub> )	TMIS-1220L*/3P 5325	38 (84)	2.54 (1)
24	1	3	47 (122)	TMIS-1224L*/3P 5836	50 (111)	2.54 (1)

\* Designate voltage, i.e. insert 240 for 240 V or 480 V.

**Note:** Larger flange sizes and kW ratings are available. contact OMEGA.

<sup>1</sup> Heaters with General Purpose & Moisture Resistant Enclosures are UL Listed and CSA Certified.

**Ordering Example:** TMIS-3025L/240/3P, is a 2kW, 3 phase, 240 Vac flanged immersion heater.

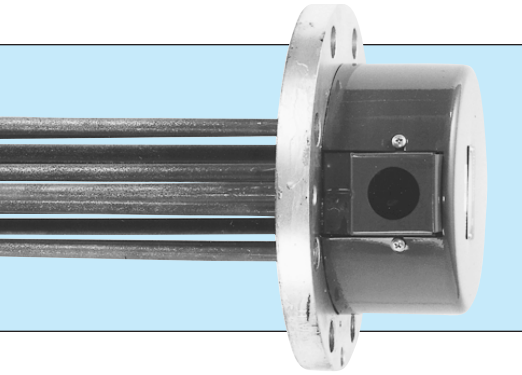


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# FLANGED IMMERSION HEATERS

TMO



- 3 to 80 kW
- Low Watt Density, 23 W/in<sup>2</sup>
- Rugged Steel Sheath
- U.L. Component Recognized with General Purpose Enclosure
- For Low Viscosity Oil

**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

kW	Circ.	Dim. B in (cm)	Wt. lb (kg)	E-1 General Purpose Encl. <sup>1</sup>		E-2 Moisture Tight/Explosion Res. Encl. <sup>2</sup>		Dim.N in (cm)	
				Model No.	Price	Model No.	Price		
<b>3 Inch-150 lbs. Steel Flange, 3 Steel Sheath Elements — 23 W/in<sup>2</sup></b>									
3	1	18 <sup>1</sup> / <sub>16</sub> (46)	16 (7)	TMO-3035/240/*	\$1050	1 (3)	TMO-3035E2/240/*	\$1300	¾ (2)
3	1	18 <sup>1</sup> / <sub>16</sub> (46)	16 (7)	TMO-3035/480/*	1050	1 (3)	TMO-3035E2/480/*	1300	¾ (2)
4.5	1	25 <sup>3</sup> / <sub>16</sub> (64)	17 (8)	TMO-3045/240/*	1150	1 (3)	TMO-3045E2/240/*	1350	¾ (2)
4.5	1	25 <sup>3</sup> / <sub>16</sub> (64)	17 (8)	TMO-3045/480/*	1150	1 (3)	TMO-3045E2/480/*	1350	¾ (2)
6	1	33 <sup>1</sup> / <sub>16</sub> (84)	18 (8)	TMO-3065/240/*	1250	1 (3)	TMO-3065E2/240	1450	¾ (2)
6	1	33 <sup>1</sup> / <sub>16</sub> (84)	18 (8)	TMO-3065/480/*	1250	1 (3)	TMO-3065E2/240/3P	1450	¾ (2)
9	1	48 <sup>1</sup> / <sub>16</sub> (122)	21 (10)	TMO-3095/240/*	1400	1 (3)	TMO-3095E2/240	1600	¾ (2)
9	1	48 <sup>1</sup> / <sub>16</sub> (122)	21 (10)	TMO-3095/480/*	1400	1 (3)	TMO-3095E2/240/3P	1600	¾ (2)

† U.L. Listed

/\* Add the suffix "3P" to the model number for 3-phase power.

/\*\* Designate voltage, insert "240V" for 240 Vac or "480V" for 480 Vac.

Note: Larger flange sizes and kW ratings are available.

Ordering Examples: Model TMO-3035/240 is a 3 kW heater powered by 3 phase 240 VAC, \$975

Model TMO-6065/240/3P, is a 6 kW heater powered by 3 phase 240 VAC, \$1200.

<sup>1</sup>Heaters with General Purpose and Moisture Resistant Enclosures are UL Listed and CSA Certified. <sup>2</sup>Heaters with Explosion Resistant Enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.

**MOST POPULAR MODELS HIGHLIGHTED!**

kW	Circ. & Ph.	Dim. B in (cm)	Wt. lbs. (kg)	General Purpose Encl. <sup>1</sup>		Dim. N in (cm)	E-3 Explosion Res. Encl. <sup>2</sup>		Dim. N in (cm)	E-4 Moisture Res. Encl. <sup>1</sup>		Dim N in (cm)
				Model No.	Price		Model No.	Price		Model No.	Price	
<b>5 Inch-150 Lb. Steel Flange, 6 Steel Sheath Elements — 23 W/in<sup>2</sup></b>												
6	1-3	18 <sup>1</sup> / <sub>16</sub> (46)	27 (12)	†TMO-6065/**/3P	\$1900	1 (3)	TMO-6065E3/**/3P	\$2400	1½ (4)	TMO-6065E4/**/3P	\$2350	1 (3)
7.5	1-3	19 <sup>1</sup> / <sub>16</sub> (50)	30 (14)	†TMO-6075/**/3P	1900	1 (3)	TMO-6075E3/**/3P	2450	1½ (4)	TMO-6075E4/**/3P	2350	1 (3)
9	1-3	25 <sup>3</sup> / <sub>16</sub> (64)	32 (15)	†TMO-6095/**/3P	2050	1 (3)	TMO-6095E3/**/3P	2600	1½ (4)	TMO-6095E4/**/3P	2500	1 (3)
12	1-3	33 <sup>1</sup> / <sub>16</sub> (84)	33 (15)	†TMO-6125/**/3P	2220	1 (3)	TMO-6125E3/**/3P	2750	1½ (4)	TMO-6125E4/**/3P	2650	1 (3)
15	1-3	40 <sup>1</sup> / <sub>16</sub> (103)	35 (16)	†TMO-6155/**/3P	2400	1 (3)	TMO-6155E3/**/3P	2950	1½ (4)	TMO-6155E4/**/3P	2850	1 (3)
20	2-3	52 <sup>1</sup> / <sub>16</sub> (132)	38 (17)	†TMO-6205/240/3P	2650	1 (3)	TMO-6205E3/240/3P	3200	1½ (4)	TMO-6205E4/240/3P	3100	1 (3)
20	1-3	52 <sup>1</sup> / <sub>16</sub> (132)	38 (17)	†TMO-6205/480/3P	2650	1 (3)	TMO-6205E3/480/3P	3200	1½ (4)	TMO-6205E4/480/3P	3100	1 (3)
25	2-3	65 <sup>1</sup> / <sub>16</sub> (165)	42 (19)	TMO-6255/240/3P	2950	1 (3)	TMO-6255E3/240/3P	3500	1½ (4)	TMO-6255E4/240/3P	3400	1 (3)
25	1-3	65 <sup>1</sup> / <sub>16</sub> (165)	42 (19)	TMO-6255/480/3P	2950	1 (3)	TMO-6255E3/480/3P	3500	1½ (4)	TMO-6255E4/480/3P	3400	1 (3)
30	2-3	78 <sup>1</sup> / <sub>16</sub> (198)	46 (21)	TMO-6305/240/3P	3250	1 (3)	TMO-6305E3/240/3P	3750	1½ (4)	TMO-6305E4/240/3P	3700	1 (3)
30	1-3	78 <sup>1</sup> / <sub>16</sub> (198)	46 (21)	TMO-6305/480/3P	3250	1 (3)	TMO-6305E3/480/3P	3750	1½ (4)	TMO-6305E4/480/3P	3700	1 (3)
<b>6 Inch-150 Lb. Steel Flange, 12 Steel Sheath Elements — 23 W/in<sup>2</sup></b>												
18	2-3	25 <sup>3</sup> / <sub>16</sub> (64)	67 (30)	TMO-1218/240/3P	\$3400	1 (3)	TMO-1218E3/240/3P	\$4250	1½ (4)	TMO-1218E4/240/3P	\$4000	1½ (4)
18	2-3	25 <sup>3</sup> / <sub>16</sub> (64)	67 (30)	TMO-1218/480/3P	3400	1 (3)	TMO-1218E3/480/3P	4250	1½ (4)	TMO-1218E4/480/3P	4000	1½ (4)
24	2-3	33 (84)	76 (34)	TMO-1224/240/3P	3750	2 (5)	TMO-1224E3/240/3P	4600	1½ (4)	TMO-1224E4/240/3P	4350	1½ (4)
24	2-3	33 (84)	76 (34)	TMO-1224/480/3P	3750	1 (3)	TMO-1224E3/480/3P	4600	1½ (4)	TMO-1224E4/480/3P	4350	1½ (4)
30	2-3	40 <sup>1</sup> / <sub>2</sub> (103)	84 (38)	TMO-1230/240/3P	4100	2 (5)	TMO-1230E3/240/3P	4950	1½ (4)	TMO-1230E4/240/3P	4700	1½ (4)
30	2-3	40 <sup>1</sup> / <sub>2</sub> (103)	84 (38)	TMO-1230/480/3P	4100	1 (3)	TMO-1230E3/480/3P	4950	1½ (4)	TMO-1230E4/480/3P	4700	1½ (4)
36	2-3	48 (122)	111 (50)	TMO-1236/240/3P	4400	2 (5)	TMO-1236E3/240/3P	5300	1½ (4)	TMO-1236E4/240/3P	5000	1½ (4)
36	2-3	48 (122)	111 (50)	TMO-1236/480/3P	4400	1 (3)	TMO-1236E3/480/3P	5300	1½ (4)	TMO-1236E4/480/3P	5000	1½ (4)
<b>8 Inch-150 Lb. Steel Flange, 18 Steel Sheath Elements — 23 W/in<sup>2</sup></b>												
30	3-3	32 <sup>1</sup> / <sub>8</sub> (84)	112 (51)	TMO-1830R1/**/3P	\$5400	1 (3)	TMO-1830R1E3/**/3P	\$6550	¾ (2)	TMO-1830R1E4/**/3P	\$6200	1½ (4)
40	3-3	43 <sup>1</sup> / <sub>16</sub> (111)	125 (57)	TMO-1840R1/**/3P	5400	1 (3)	TMO-1840R1E3/**/3P	6550	¾ (2)	TMO-1840R1E4/**/3P	6200	1½ (4)
50	3-3	51 <sup>1</sup> / <sub>8</sub> (132)	130 (59)	TMO-1850R1/240/3P	6650	1 (3)	TMO-1850R1E3/240/3P	7800	1 (3)	TMO-1850R1E4/240/3P	7500	1½ (4)
50	3-3	51 <sup>1</sup> / <sub>8</sub> (132)	130 (59)	TMO-1850R1/480/3P	6650	1 (3)	TMO-1850R1E3/480/3P	7800	¾ (2)	TMO-1850R1E4/480/3P	7550	1½ (4)
80	3-3	78 <sup>1</sup> / <sub>8</sub> (200)	147 (67)	TMO-1880R1/240/3P	8500	1½ (3)	TMO-1880R1E3/240/3P	8500	1½ (3)	TMO-1880R1E4/240/3P	9300	1½ (4)
80	3-3	78 <sup>1</sup> / <sub>8</sub> (200)	147 (67)	TMO-1880R1/480/3P	8500	1 (3)	TMO-1880R1E3/480/3P	8500	¾ (2)	TMO-1880R1E4/480/3P	9300	1½ (4)

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Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

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Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# SEVERE CORROSIVE SOLUTION FLANGED IMMERSION HEATERS

TMI Series  
Starts at

**\$1550**



- ✓ Heavy-Duty for Severe Corrosive Solutions
- ✓ 3 to 8" 150 lb Steel Flange
- ✓ 3 to 50 kW
- ✓ Premium Grade Incoloy® Sheath

## FEATURES

**Rugged construction.** Sturdy 0.475" (1.2 cm) diameter Incoloy elements, welded to steel flanges provide superior rigidity and strength. Heavy-duty jumper straps and terminal posts assure permanent tightness of connections and an extra margin of current carrying capacity.

## SPECIFICATIONS

**Wattage:** 3 to 50 kW  
**Power:** 240 and 480 Vac, 1 and 3 phase



TMI-3065/240, \$1700, shown with optional Type E-3 Enclosure<sup>2</sup>, shown smaller than actual size.



Gasket Seal Included

See page F-49 for dimensional references.

**Watt Density:** 23 W/in<sup>2</sup>  
**Terminal Enclosure:** General purpose, Type E-2 Type E-3 or Type E-4.

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)											
kW	Circ. & Ph.	Dim. in (cm) B	Wt. lb (kg)	E-1 General Purpose Encl. <sup>1</sup>		Dim. in (cm) N	E-2 Moisture Resistant/Explosion-Resistant Encl. <sup>2</sup>		Dim. in (cm) N	Dim. in (cm) N	
				Model No.	Price		Model No.	Price			
<b>3 Inch-150 lb. Steel Flange, 3 Incoloy Sheath Elements — 23 W/in<sup>2</sup></b>											
3	1	18 <sup>3</sup> / <sub>16</sub> (46)	16 (7)	TMI-3035/240/*	\$1550	1 (3)	TMI-3035E2/240/*	\$1700	3/4 (2)		
3	1	18 <sup>3</sup> / <sub>16</sub> (46)	16 (7)	TMI-3035/480/*	1550	1 (3)	TMI-3035E2/240/*	1700	3/4 (2)		
4.5	1	25 <sup>3</sup> / <sub>16</sub> (64)	17 (8)	TMI-3045/240/*	1600	1 (3)	TMI-3045E2/240/*	1800	3/4 (2)		
4.5	1	25 <sup>3</sup> / <sub>16</sub> (64)	17 (8)	TMI-3045/480/*	1600	1 (3)	TMI-3045E2/480/*	1800	3/4 (2)		
6	1	33 <sup>3</sup> / <sub>16</sub> (84)	18 (8)	TMI-3065/240/*	1700	1 (3)	TMI-3065E2/240/*	1900	3/4 (2)		
6	1	33 <sup>3</sup> / <sub>16</sub> (84)	18 (8)	TMI-3065/480/*	1700	1 (3)	TMI-3065E2/480/*	1900	3/4 (2)		
7.5	1-3	40 <sup>3</sup> / <sub>16</sub> (103)	19 (9)	TMI-3075/240/3P	1800	1 (3)	TMI-3075E2/240/3P	2000	3/4 (2)		
7.5	1-3	40 <sup>3</sup> / <sub>16</sub> (103)	19 (9)	TMI-3075/480/3P	1800	1 (3)	TMI-3075E2/480/3P	2000	3/4 (2)		
9	1-3	48 <sup>3</sup> / <sub>16</sub> (122)	21 (9)	TMI-3095/240/3P	1900	1 (3)	TMI-3095E2/480/3P	2100	3/4 (2)		
9	1	48 <sup>3</sup> / <sub>16</sub> (122)	21 (9)	TMI-3095/480/*	1900	1 (3)	TMI-3095E2/240/*	2100	3/4 (2)		
<b>5 Inch-150 Lb. Steel Flange, 6 Incoloy Sheath Elements — 23 W/in<sup>2</sup></b>											
				General Purpose Encl. <sup>1</sup>			E-3 Explosion Res. Encl. <sup>2</sup>			E-4 Moisture Res. Encl. <sup>1</sup>	
9	1-3	25 <sup>3</sup> / <sub>16</sub> (64)	32 (15)	TMI-6095/**/3P	\$2600	1 (3)	TMI-6095E3/**/3P	\$3100	1 1/2 (4)	TMI-6095E4/**/3P	\$3000 1 (3)
12	1-3	33 <sup>3</sup> / <sub>16</sub> (84)	33 (15)	TMI-6125/**/3P	2800	1 (3)	TMI-6125E3/**/3P	3300	1 1/2 (4)	TMI-6125E4/**/3P	3250 1 (3)
15	1-3	40 <sup>3</sup> / <sub>16</sub> (103)	35 (16)	TMI-6155/**/3P	3000	1 (3)	TMI-6155E3/**/3P	3500	1 1/2 (4)	TMI-6155E4/**/3P	3400 1 (3)
20	1-3	52 <sup>3</sup> / <sub>16</sub> (46)	38 (17)	TMI-6205/**/3P	3300	1 (3)	TMI-6205E3/**/3P	3800	1 1/2 (4)	TMI-6205E4/**/3P	3700 1 (3)
25	1-3	65 <sup>3</sup> / <sub>16</sub> (64)	42 (19)	TMI-6255/**/3P	3600	1 (3)	TMI-6255E3/**/3P	4150	1 1/2 (4)	TMI-6255E4/**/3P	4050 1 (3)
30	2-3	78 <sup>3</sup> / <sub>16</sub> (84)	46 (21)	TMI-6305/**/3P	3950	1 (3)	TMI-6305E3/**/3P	4450	1 1/2 (4)	TMI-6305E4/**/3P	4400 1 (3)
<b>6 Inch-150 Lb. Steel Flange, 12 Incoloy Sheath Elements — 23 W/in<sup>2</sup></b>											
18	2-3	25 <sup>3</sup> / <sub>16</sub> (64)	67 (30)	TMI-1218/**/3P	\$4100	1 (3)	TMI-1218E3/**/3P	\$4950	1 1/2 (4)	TMI-1218E4/**/3P	\$4650 1 1/2 (4)
24	2-3	33 (84)	76 (34)	TMI-1224/**/3P	4500	1 (3)	TMI-1224E3/**/3P	5350	1 1/2 (4)	TMI-1224E4/**/3P	5100 1 1/2 (4)
30	2-3	40 <sup>1</sup> / <sub>2</sub> (103)	84 (38)	TMI-1230/**/3P	4900	1 (3)	TMI-1230E3/**/3P	5750	1 1/2 (4)	TMI-1230E4/**/3P	5450 1 1/2 (4)
36	2-3	48 (122)	111(50)	TMI-1236/**/3P	5250	1 (3)	TMI-1236E3/**/3P	6100	1 1/2 (4)	TMI-1236E4/**/3P	5850 1 1/2 (4)
<b>8 Inch-150 Lb. Steel Flange, 18 Incoloy Sheath Elements — 23 W/in<sup>2</sup></b>											
30	3-3	32 <sup>7</sup> / <sub>16</sub> (112)	112(51)	TMI-1830R1/**/3P	\$6350	1 (3)					
40	3-3	43 <sup>1</sup> / <sub>16</sub> (125)	125(57)	TMI-1840R1/**/3P	7150	1 (3)					
50	3-3	51 <sup>1</sup> / <sub>16</sub> (103)	130(59)	TMI-1850R1/**/3P	7800	1 (3)					

\* Add the suffix "/3P" to the model number for 3 phase power. /\*\* Designate voltage, i.e., "240" for 240 Vac or "480" for 480 Vac. **Note:** Larger flange sizes and kW rating available. Contact OMEGALUX.<sup>®1</sup> Heaters with General Purpose and Moisture Resistant Enclosures are UL Listed and CSA Certified. <sup>2</sup> Heaters with Explosion Resistant Enclosures are CSA NRTL/C Certified and are not intended for use in hazardous areas. **Ordering Examples:** TMI-6095/240/3P, kW heater power by 3 phase 240 Vac, \$2600. TMI-3035/240, 3kW heater powered by 1 phase 240 Vac, \$1550.



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### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

### • pH and Conductivity

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# HEATER FOR MEDIUM WEIGHT OIL

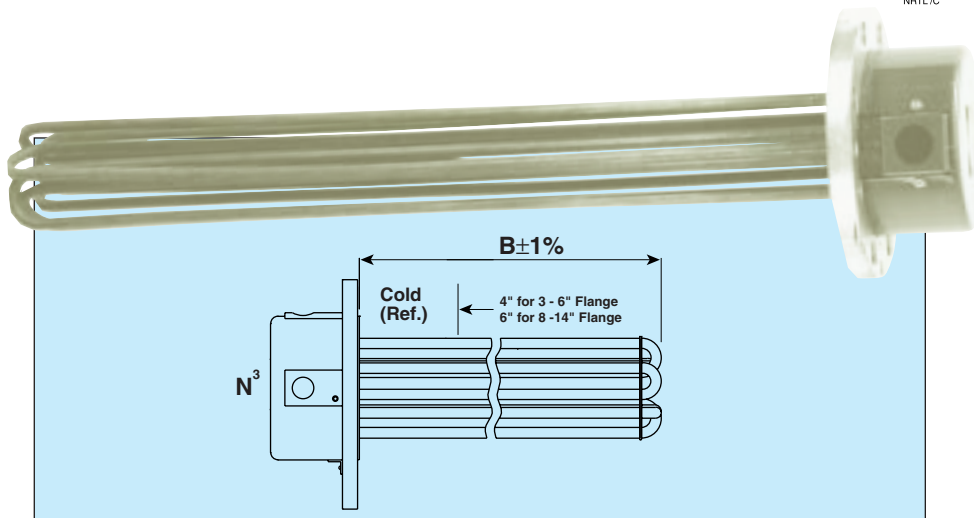


## TMO Series

- ✓ UL Listed
- ✓ 3 to 24 kW
- ✓ Low Watt Density, 15 W/in<sup>2</sup>
- ✓ 3.5 and 6 Inch 150 lb. steel Flange
- ✓ High Grade Steel Sheath

### FEATURES

**Heavy coil construction** — Watt density on the heating coil is designed for low watt density operation by increasing the coil diameter and length to give maximum coil surface area and limit coil surface temperature, providing longer coil life.



### SPECIFICATIONS

**Wattage:** 3 to 80kW  
**Power:** 240 and 480 VAC, 1 & 3 phase  
**Watt Density:** 15 W/in<sup>2</sup>

### APPLICATIONS

**Heating medium viscosity oil** — Suitable for heating medium bodied oils such as industrial gear oils or numbers 4 and 5 residual fuel oils. Heating provides low ambient temperature protection, ensuring that oil remains fluid to lubricate effectively and reduce load on gear motor drives.

### To Order (Specify Model Number)

kW	Dim. B in (cm)	Wt. lb(kg)	E1 General Purpose Enclosure <sup>1</sup>		Dim. N in(cm)	E2 Moisture Resistant/ Explosion Res. Encl. <sup>2</sup>		Dim. N in(cm)
			Model No.	Price		Model No.	Price	
<b>3 Inch-150 lbs. Steel Flange, 3 Steel Sheath Elements — 15 W/in<sup>2</sup></b>								
3	25 <sup>3</sup> / <sub>16</sub> (64)	17(8)	TMO-30315/240/	*\$727	1 (3)	TMO-30315E2/240/*	\$927	¾ (2)
3	25 <sup>3</sup> / <sub>16</sub> (64)	17(8)	TMO-30315/480/	*727	1 (3)	TMO-30315E2/480/*	927	¾ (2)
4	33 <sup>3</sup> / <sub>16</sub> (84)	18 (8)	TMO-30415/240/	*818	1 (3)	TMO-30415E2/240/*	1017	¾ (2)
4	33 <sup>3</sup> / <sub>16</sub> (84)	18 (8)	TMO-30415/480/	*818	1 (3)	TMO-30415E2/480/*	1017	¾ (2)
6	48 <sup>3</sup> / <sub>16</sub> (122)	21 (10)	TMO-30615/240/	*965	1 (3)	TMO-30615E2/240/*	1173	¾ (2)
6	48 <sup>3</sup> / <sub>16</sub> (122)	21 (10)	TMO-30615/240/*	965	1 (3)	TMO-30615E2/240/*	1173	¾ (2)

**Ordering Example:** Model TMO-30315/240, is a 3kW heater powered by 1 phase 240 VAC, \$727.

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

### To Order (Specify Model Number)

kW	Circ. & Ph.	Dim. B in (cm)	Wt. lb (kg)	General Purpose Encl. <sup>1</sup>		Dim. N in (cm)	E3 Explosion Res. Encl. <sup>2</sup>		Dim. N in (cm)	E4 Moisture Res. Encl. <sup>1</sup>		Dim. N in (cm)
				Model No.	Price		Model No.	Price		Model No.	Price	
<b>5 Inch-150 Lb. Steel Flange, 6 Stainless Sheath Elements — 15 W/in<sup>2</sup></b>												
8	1-3	33 <sup>3</sup> / <sub>16</sub> (84)	33 (15)	TMO-60825/**/3P	\$1477	1 (3)	TMO-60825E3/**/3P	\$2014	1½ (4)	TMO-60825E4/**/3P	\$1929	1 (3)
10	1-3	40 <sup>3</sup> / <sub>16</sub> (103)	34 (15)	TMO-61025/**/3P	1627	1 (3)	TMO-61025E3/**/3P	2167	1½ (4)	TMO-61025E4/**/3P	2086	1 (3)
12	1-3	48 <sup>3</sup> / <sub>16</sub> (122)	37 (17)	TMO-61225/**/3P	1782	1 (3)	TMO-61225E3/**/3P	2320	1½ (4)	TMO-61225E4/**/3P	2232	1 (3)
15	1-3	57 <sup>3</sup> / <sub>16</sub> (145)	40 (18)	TMO-61525/**/3P	2091	1 (3)	TMO-61525E3/**/3P	2541	1½ (4)	TMO-61525E4/**/3P	2541	1 (3)
18	1-3	68 <sup>3</sup> / <sub>16</sub> (173)	43 (20)	TMO-61825/**/3P	2378	1 (3)	TMO-61855E3/**/3P	2914	1½ (4)	TMO-61825E4/**/3P	2822	1 (3)
<b>6 Inch-150 Lb. steel Flange, 12 Cooper Sheath Elements — 15 W/in<sup>2</sup></b>												
12	2-3	25 <sup>3</sup> / <sub>16</sub> (64)	67 (30)	TMO-1212F1/**/3P	2687	1 (3)	TMO-1212F1E3/**/3P	3534	1½ (4)	TMO-1212F1E4/**/3P	3280	1½ (4)
16	2-3	33 (84)	76 (34)	TMO-1216F1/**/3P	3035	1 (3)	TMO-1216F1E3/**/3P	3813	1½ (4)	TMO-1216F1E4/**/3P	3533	1½ (4)
20	2-3	40 <sup>3</sup> / <sub>16</sub> (103)	84 (38)	TMO-1220F1/240/3P	3226	2 (5)	TMO-1220F1E3/240/3P	4000	1½ (4)	TMO-1220F1E4/240/3P	3741	1½ (4)
20	2-3	40 <sup>3</sup> / <sub>16</sub> (103)	84 (38)	TMO-1220F1/480/3P	3226	1 (3)	TMO-1220F1E3/480/3P	4000	1½ (4)	TMO-1220F1E4/480/3P	3741	1½ (4)
24	2-3	48(122)	111 (50)	TMO-1224F1/240/3P	3475	2 (5)	TMO-1224F1E3/240/3P	4241	1½ (4)	TMO-1224F1E4/240/3P	4037	1½ (4)
24	2-3	48 (122)	111 (50)	TMO-1224F1/480/3P	3475	1 (3)	TMO-1224F1E3/480/3P	4241	1½ (4)	TMO-1224F1E4/480/3P	4037	1½ (4)

/\* Add the suffix "/3P" to the catalog number for 3 phase power.  
 /\*\* Designate voltage, i.e., 240 for 240 VAC or 480 for 480 VAC.  
 Note: Larger flange sizes and kW rating available. Contact Omegalux®

Enclosures are UL Listed and CSA Certified.  
<sup>2</sup>Heaters with Explosion Resistant Enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.  
 Ordering Example: Model TMO-60825/240/3P, is a 8kW heater



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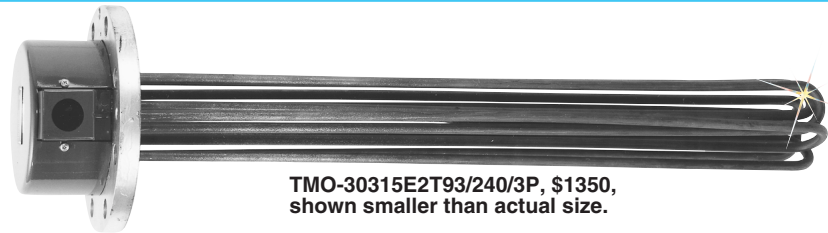
### • Heaters

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# FLANGED IMMERSION HEATER FOR SUMP OIL APPLICATIONS

## TMO Series

Starts at  
**\$1350**



TMO-30315E2T93/240/3P, \$1350, shown smaller than actual size.

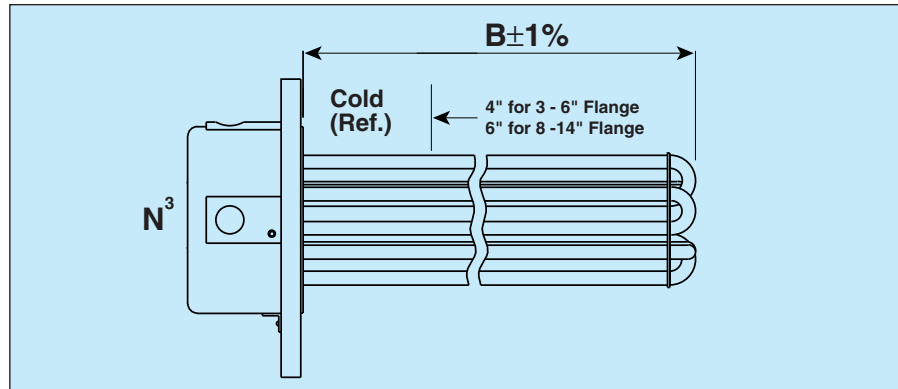
- ✓ Type E-2 Moisture Tight/Explosion Resistant Enclosure Standard\*
- ✓ 240V Models Include an Integral 3 Phase Thermostat
- ✓ 3" (8 cm) 150 lb (68 kg) Steel Flange
- ✓ Low Watt Density Steel Sheath Elements Suitable for Heating Sump Oil
- ✓ 3 to 6 kW
- ✓ 240 and 480V, 3 Phase

### FEATURES

**Moisture tight/ explosion resistant enclosure** provides dual protection from damaging effects of moisture and containment of an electrical flash within the terminal enclosure or the thermostat.

**Adjustable thermostat.** Sensitive, long lasting mechanism provides positive temperature control between 10°C (60°F) and 121°C (250°F).

*Please Note: Approved pressure and/or temperature limit controls are recommended.*



### APPLICATION

**Maintain proper lube oil temperature** — Controls the bulk oil temperature in lube oil reservoirs within preset limit, assuring effective lubrication action to system components. Ideally suited for compressor and engine crankcase, hydraulic oil reservoirs, bearing and gear cases, and other applications requiring oil to be maintained at minimum temperature.

### SPECIFICATIONS

**Wattage:** 3 to 6 kW  
**Power:** 240 and 480V, 3 phase  
**Watt Density:** 15 W/in<sup>2</sup>  
**Terminal Enclosure:** Type E2 moisture tight/explosion resistant enclosure standard. Other enclosures available. Contact OMEGALUX.

**Thermostat:** All models have an integral adjustable thermostat temperature range 15 to 121°C (60 to 250°F). For 240V heaters, the thermostat is wired for 240V 3 phase power. Therefore, no external contactor is required. For 480V heaters, the thermostat is only wired for 480V, single phase. Consequently, an external contactor is required.

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

**MOST POPULAR MODEL HIGHLIGHTED!**

To Order (Specify Model Number)								
kW	Volts	Circuit	Phase	Dim. B in. (cm)	Wt. lb (Kg)	E-2 Moisture Tight/Explosion Resistant Enclosure*	Price	Dim. N in. (cm)
						Model No.		
3	240	1	3	25¼ (64)	24 (11)	TMO-30315E2T93/240/3P	\$1350	1½ (4)
3	480	1	3	25¼ (64)	24 (11)	TMO-30315E2T93/480/3P	1350	1½ (4)
4	240	1	3	33⅓ (84)	25 (11)	TMO-30415E2T93/240/3P	1700	1½ (4)
4	480	1	3	33⅓ (84)	25 (11)	TMO-30415E2T93/480/3P	1700	1½ (4)
6	240	1	3	48⅓ (122)	29 (13)	TMO-30615E2T93/240/3P	1850	1½ (4)
6	480	1	3	48⅓ (122)	29 (13)	TMO-30615E2T93/240/3P	1850	1½ (4)

**Note:** Other flange sizes and kW ratings are available. Contact OMEGALUX.

\* Heaters with Explosion Resistant Enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.

**Ordering Examples:** TMO-30415E2T93/480/3P is a 480V, 3-Phase heater, \$1700.

TMO-30615E2T93/240/3P. is a 240V, 3 phase heater. \$1850.





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## More than 100,000 Products Available!

### • Temperature

Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

### • pH and Conductivity

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

### • Data Acquisition

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters



# FLANGED IMMERSION HEATERS FOR MILD CORROSIVE SOLUTIONS



## TMS Series

- ✓ 240 and 480 V, 1 & 3 Phase
- ✓ 3 to 36 kW
- ✓ Premium Grade Stainless Steel (8% Nickel) Sheathed Heating Elements for Use in Mild Corrosive Solutions
- ✓ Time Tested
- ✓ Heavy Duty

### FEATURES

**Rugged construction.** Sturdy stainless steel .475" (1.2 cm) diameter elements, welded to steel flanges provide superior rigidity and strength. Heavy duty jumper straps and terminal parts assure permanent tightness of connections and an extra margin of current carrying capacity.

**Long life elements.** High grade 304 series stainless steel outer sheath provides the benefits of strength and durability in those applications where stainless performance is required.

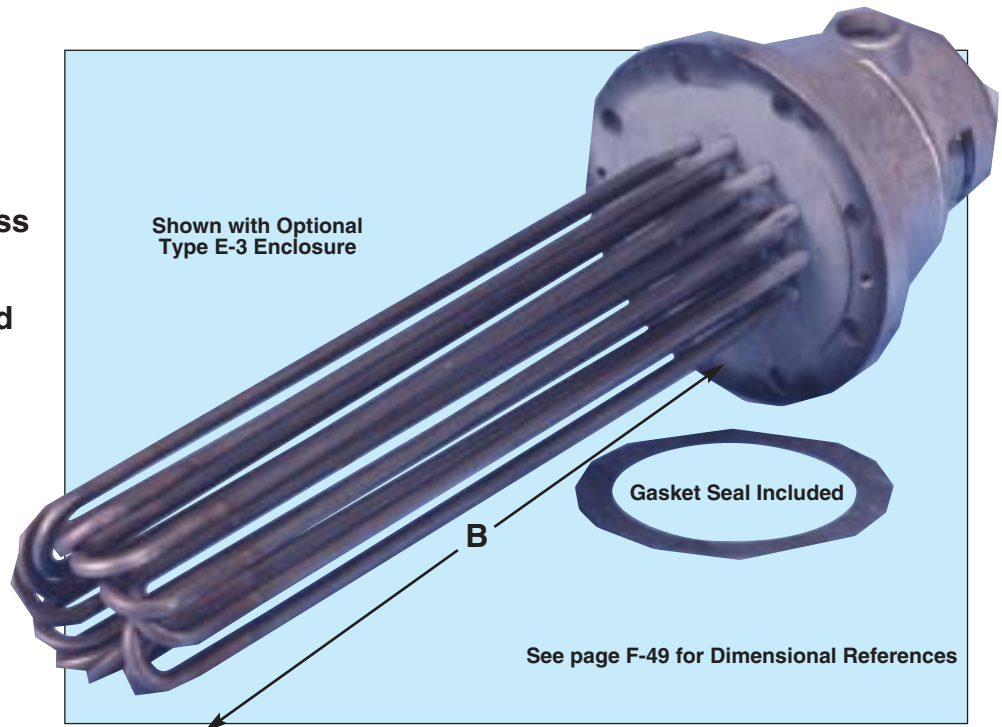
### SPECIFICATIONS

**Wattage:** 3 to 36 kW  
**Power:** 240 and 480 V, 1 & 3 phase  
**Watt Density:** 23 W/in<sup>2</sup>  
**Terminal Enclosure:** General purpose NEMA 1 rated. Other enclosures available. Contact OMEGALUX®

*Please Note: Approved pressure and/or temperature limiting controls must be used to assure safe operation in the event of system malfunctions. See Temperature Section! Heaters with General Purpose & Moisture Resistant Enclosures are UL Listed and CSA Certified and Not Intended for use in Hazardous Areas.*

**Ordering Example: Model TMS-3035M/240/3P** Is a 3 kW heater powered by 3 phase 240 VAC, **\$837.**

**Ordering Example: Model TMS-6095M/480/3P** Is a 9 kW heater powered by 3 phase 480 VAC, **\$1526.**



### To Order (Specify Model Number)

kW	Circ.	Dim. in. (cm) B	E-1 General Purpose Encl. <sup>1</sup>		Wt. lb (kg)	Dim. in. (cm) N
			Model No.	Price		
<b>3 Inch-150 lb. Steel Flange, 3 Stainless Steel Elements — 23 W/in<sup>2</sup></b>						
3	1	18 <sup>1</sup> / <sub>6</sub> (46)	TMS-3035M/240/*	\$837	16 (7)	1 (3)
3	1	18 <sup>1</sup> / <sub>6</sub> (46)	TMS-3035M/480/*	837	16 (7)	1 (3)
4.5	1	25 <sup>3</sup> / <sub>6</sub> (64)	TMS-3045M/240/*	961	17 (8)	1 (3)
4.5	1	25 <sup>3</sup> / <sub>6</sub> (64)	TMS-3045M/480/*	961	17 (8)	1 (3)
6	1	33 <sup>3</sup> / <sub>6</sub> (84)	TMS-3065M/240/*	1125	18 (8)	1 (3)
6	1	33 <sup>3</sup> / <sub>6</sub> (84)	TMS-3065M/480/*	1125	18 (8)	1 (3)
7.5	1	40 <sup>3</sup> / <sub>6</sub> (103)	TMS-3075M/240/3P	1266	19 (9)	1 (3)
7.5	1	40 <sup>3</sup> / <sub>6</sub> (103)	TMS-3075M/480/3P	1266	19 (9)	1 (3)
9	1	48 <sup>3</sup> / <sub>6</sub> (122)	TMS-3095M/480/*	1435	21 (10)	1 (3)
9	1	48 <sup>3</sup> / <sub>6</sub> (122)	TMS-3095M/240/3P	1435	21 (10)	1 (3)
<b>5 Inch-150 lb. Steel Flange, 6 Stainless Steel Elements — 23 W/in<sup>2</sup></b>						
9	1	25 <sup>3</sup> / <sub>6</sub> (64)	TMS-6095M/**/3P	1526	32 (15)	1 (3)
12	1	33 <sup>3</sup> / <sub>6</sub> (84)	TMS-6125M/**/3P	1690	33 (15)	1 (3)
15	1	40 <sup>3</sup> / <sub>6</sub> (103)	TMS-6155M/**/3P	1949	35 (16)	1 (3)
20	2	52 <sup>1</sup> / <sub>6</sub> (46)	TMS-6205M/240/3P	2388	38 (17)	1 (3)
20	1	52 <sup>1</sup> / <sub>6</sub> (46)	TMS-6205M/480/3P	2388	38 (17)	1 (3)
25	2	65 <sup>1</sup> / <sub>6</sub> (64)	TMS-6255M/240/3P	2779	42 (19)	1 (3)
25	1	65 <sup>1</sup> / <sub>6</sub> (84)	TMS-6255M/480/3P	2779	42 (19)	1 (3)
30	2	78 <sup>3</sup> / <sub>6</sub> (84)	TMS-6305M/**/3P	3277	46 (21)	1 (3)
<b>6 Inch-150 lb. Steel Flange, 12 Stainless Steel Elements — 23 W/in<sup>2</sup></b>						
18	2	25 <sup>3</sup> / <sub>6</sub> (64)	TMS-1218M/**/3P	3174	67 (30)	1 (3)
24	2	33 (84)	TMS-1224M/**/3P	3372	76 (34)	1 (3)
30	2	40 <sup>1</sup> / <sub>2</sub> (103)	TMS-1230M/**/3P	3510	84 (38)	1 (3)
36	2	48 (122)	TMS-1236M/**/3P	3814	111 (50)	1 (3)

<sup>1</sup>/\* Add the suffix "3P" to the model number for 3 phase power.  
<sup>2</sup>\*\* Designate voltage, i.e., 240 for 240 VAC or 480 for 480 VAC.  
 Note: Larger flange sizes and kW rating available. Contact OMEGALUX®.





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0800-8266342

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Amstelveen, NL  
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## More than 100,000 Products Available!

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Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

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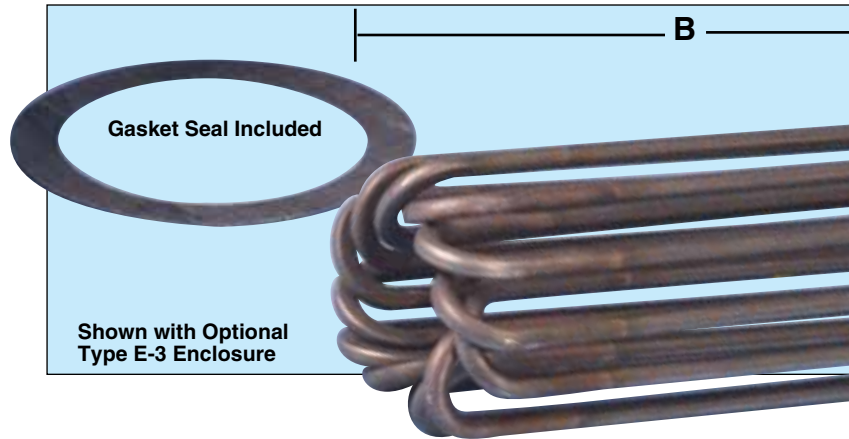
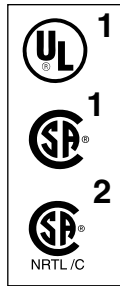
### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# ENHANCED IMMERSION HEATERS FOR PROCESS WATER

## TMS Series

- ✓ Long Life Heating Elements with Stainless Steel (8% Nickel) Sheath
- ✓ For Very Weak Solutions or Industrial Process Water
- ✓ Zinc Coated Steel Flange
- ✓ 6 to 72 kW
- ✓ 240 and 480 V, 1 and 3 Phase



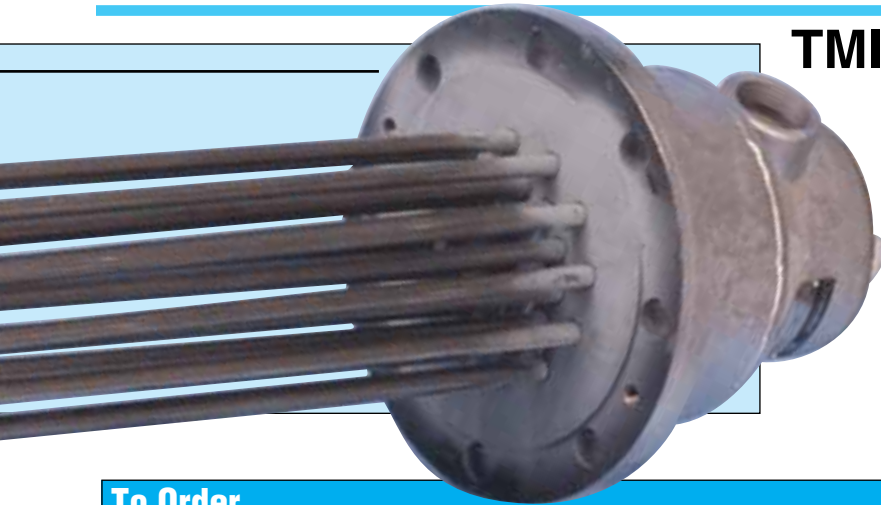
To Order							
kW	Circ.	Dim. in. (cm) B	Wt. lb (kg)	E-1 General Purpose Encl. <sup>1</sup>		E-2 Moisture/ Explosion Res. Encl. <sup>2</sup>	
				Model No.	Dim. in (cm) N	Model No.	Dim in (cm) N
<b>3 Inch-150 Lb. Steel Flange, 3 Stainless Steel Elements — 45 W/in<sup>2</sup></b>							
6	1	18 <sup>1</sup> / <sub>16</sub> (46)	16 (7)	TMS-3065/240/*	1 (3)	TMS-3065E2/240/*	3/4 (2)
6	1	18 <sup>1</sup> / <sub>16</sub> (46)	16 (7)	TMS-3065/480/*	1 (3)	TMS-3065E2/480/*	3/4 (2)
9	1	25 <sup>3</sup> / <sub>16</sub> (64)	17 (8)	TMS-3095/240/*	1 (3)	TMS-3095E2/240/*	3/4 (2)
9	1	25 <sup>3</sup> / <sub>16</sub> (64)	17 (8)	TMS-3095/480/*	1 (3)	TMS-3095E2/480/*	3/4 (2)
12	1	33 <sup>1</sup> / <sub>16</sub> (84)	18 (8)	TMS-3125/240	1 1/4 (3)	TMS-3125E2/240	1 (3)
12	1	33 <sup>1</sup> / <sub>16</sub> (84)	18 (8)	TMS-3125/240/3P	1 (3)	TMS-3125E2/240/3P	3/4 (2)
12	1	33 <sup>1</sup> / <sub>16</sub> (84)	18 (8)	TMS-3125/480/*	1 (3)	TMS-3125E2/480/*	3/4 (2)
15	1	40 <sup>9</sup> / <sub>16</sub> (103)	20 (9)	TMS-3155/240	1 1/4 (3)	TMS-3155E2/240	1 1/4 (3)
15	1	40 <sup>9</sup> / <sub>16</sub> (103)	20 (9)	TMS-3155/240/3P	1 (3)	TMS-3155E2/240/3P	3/4 (2)
15	1	40 <sup>9</sup> / <sub>16</sub> (103)	20 (9)	TMS-3155/480/*	1 (3)	TMS-3155E2/480/*	3/4 (2)
18	1	48 <sup>1</sup> / <sub>16</sub> (122)	21 (10)	TMS-3185/240	1 1/4 (3)	TMS-3185E2/240	1 1/4 (3)
18	1	48 <sup>1</sup> / <sub>16</sub> (122)	21 (10)	TMS-3185/240/3P	1 (3)	TMS-3185E2/240/3P	3/4 (2)
18	1	48 <sup>1</sup> / <sub>16</sub> (122)	21 (10)	TMS-3185/480/*	1 (3)	TMS-3185E2/480/*	3/4 (2)

kW	Circ. & Ph.	Dim. in. (cm) B	Wt. lb (kg)	General Purpose Encl. <sup>1</sup>		Dim. in. (cm) N	E-3 Explosion Res. Encl. <sup>2</sup>		Dim. in. (cm) N	E-4 Moisture Res. Encl. <sup>1</sup>	
				Model No.	Model No.		Model No.	Model No.			
<b>5 Inch-150 Lb. Steel Flange, 6 Stainless Sheath Elements — 45 W/in<sup>2</sup></b>											
12	1-3	18 <sup>1</sup> / <sub>16</sub> (46)	30 (14)	TMS-6125/**/3P	1 (3)	TMS-6125E3/**/3P	1 1/2 (4)	TMS-6125E4/**/3P	1 (3)		
15	1-3	19 <sup>3</sup> / <sub>16</sub> (50)	31 (14)	TMS-6155/**/3P	1 (3)	TMS-6155E3/**/3P	1 1/2 (4)	TMS-6155E4/**/3P	1 (3)		
18	1-3	25 <sup>3</sup> / <sub>16</sub> (64)	33 (15)	TMS-6185/**/3P	1 (3)	TMS-6185E3/**/3P	1 1/2 (4)	TMS-6185E4/**/3P	1 (3)		
24	2-3	33 <sup>1</sup> / <sub>16</sub> (84)	37 (17)	TMS-6245/240/3P	1 (3)	TMS-6245E3/240/3P	1 1/2 (4)	TMS-6245E4/240/3P	1 (3)		
24	1-3	33 <sup>1</sup> / <sub>16</sub> (84)	37 (17)	TMS-6245/480/3P	1 (3)	TMS-6245E3/480/3P	1 1/2 (4)	TMS-6245E4/480/3P	1 (3)		
30	2-3	40 <sup>9</sup> / <sub>16</sub> (103)	40 (18)	TMS-6305/**/3P	1 (3)	TMS-6305E3/**/3P	1 1/2 (4)	TMS-6305E4/**/3P	1 (3)		
40	2-3	52 <sup>1</sup> / <sub>16</sub> (132)	51 (23)	TMS-6405/**/3P	1 (3)	TMS-6405E3/**/3P	1 1/2 (4)	TMS-6405E4/**/3P	1 (3)		
50	2-3	65 <sup>1</sup> / <sub>16</sub> (165)	64 (29)	TMS-6505/**/3P	1 (3)	TMS-6505E3/**/3P	1 1/2 (4)	TMS-6505E4/**/3P	1 (3)		
60	2-3	78 <sup>1</sup> / <sub>16</sub> (198)	77 (35)	TMS-6605/**/3P	1 (3)	TMS-6605E3/**/3P	1 1/2 (4)	TMS-6605E4/**/3P	1 (3)		
<b>6 Inch-150 Lb. steel Flange, 12 Copper Sheath Elements — 45 W/in<sup>2</sup></b>											
36	2-3	25 <sup>1</sup> / <sub>16</sub> (64)	67 (30)	TMS-1236/**/3P	1 (3)	TMS-1236E3/**/3P	1 1/2 (4)	TMS-1236E4/**/3P	1 1/2 (4)		
48	2-3	33 (84)	76 (34)	TMS-1248/**/3P	1 †(3)	TMS-1248E3/**/3P	1 1/2 (4)	TMS-1248E4/**/3P	1 1/2 (4)		
60	2-3	40 1/2 (103)	84 (38)	TMS-1260/**/3P	1 †(3)	TMS-1260E3/**/3P	1 1/2 (4)	TMS-1260E4/**/E4	1 1/2 (4)		
72	2-3	48 (122)	111 (50)	TMS-1272/**/3P	1 †(3)	TMS-1272E3/**/3P	1 1/2 (4)	TMS-1272E4/**/3P	1 1/2 (4)		

/\* Add the suffix "/3P" to the model number for 3 phase power.  
 /\*\* Designate voltage, i.e., "240" for 240 Vac or "480" for 480V.  
 †48, 60 and 72 kW 240 Vac units have 1 1/4" N dim.  
**Note:** Larger flange sizes and kW rating available. Please contact OMEGALIX for specific details.

UL Listed and CSA Certified.  
<sup>2</sup> Heaters with Explosion Resistant Enclosures are CSA NRTL/C Certified and are not intended for use in hazardous areas. **Ordering Examples:** TMS-3065/240/3P, is a 6 kW heater powered by 3 phase 240 Vac.

# HEATERS FOR SOLUTION WATER



## TMI Series

- ✓ Rugged 0.475" (1.2 cm) Diameter Incoloy® Sheath
- ✓ 6 to 72 kW
- ✓ 3 to 6" (7.6 to 15.2 cm) Flange Sizes Available
- ✓ For Weak Corrosive Solutions or Severe Hard Water
- ✓ Zinc Coated Steel Flange

### To Order

kW	Circ.	Dimensions in. (cm) B	Wt. lb (kg)	E-1 General Purpose Encl. <sup>1</sup>		E-2 Moisture/ Explosion Res. Encl. <sup>2</sup>		Dim in (cm) N
				Model No.	Dim. in (cm) N	Model No.	Dim in (cm) N	
<b>3 Inch-150 Lb. Steel Flange, 3 Incoloy Sheath Elements — 45 W/in<sup>2</sup></b>								
6	1	18 <sup>1</sup> / <sub>16</sub> (46)	16 (7)	TMI-3065H/240/*	1 (3)	TMI-3065HE2/240/*		¾ (2)
6	1	18 <sup>1</sup> / <sub>16</sub> (46)	16 (7)	TMI-3065H/480/*	1 (3)	TMI-3065HE2/480/*		¾ (2)
9	1	25 <sup>3</sup> / <sub>16</sub> (64)	17 (8)	TMI-3095H/240/*	1 (3)	TMI-3095HE2/240/*		¾ (2)
9	1	25 <sup>3</sup> / <sub>16</sub> (64)	17 (8)	TMI-3095H/480/*	1 (3)	TMI-3095HE2/480/*		¾ (2)
12	1	33 <sup>1</sup> / <sub>16</sub> (84)	18 (8)	TMI-3125H/240	1 ¼ (3)	TMI-3125HE2/240		1 (3)
12	1	33 <sup>1</sup> / <sub>16</sub> (84)	18 (8)	TMI-3125H/240/3P	1 (3)	TMI-3125HE2/240/3P		¾ (2)
12	1	33 <sup>1</sup> / <sub>16</sub> (84)	18 (8)	TMI-3125H/480/*	1 (3)	TMI-3125HE2/480/*		¾ (2)
15	1	40 <sup>9</sup> / <sub>16</sub> (103)	20 (9)	TMI-3155H/240	1 ¼ (3)	TMI-3155HE2/240		1 ¼ (3)
15	1	40 <sup>9</sup> / <sub>16</sub> (103)	20 (9)	TMI-3155H/240/3P	1 (3)	TMI-3155HE2/240/3P		¾ (2)
15	1	40 <sup>9</sup> / <sub>16</sub> (103)	20 (9)	TMI-3155H/480/*	1 (3)	TMI-3155HE2/480/*		¾ (2)
15	1	48 <sup>1</sup> / <sub>16</sub> (122)	21 (10)	TMI-3185H/240	1 ¼ (3)	TMI-3185HE2/240		1 ¼ (3)
18	1	48 <sup>1</sup> / <sub>16</sub> (122)	21 (10)	TMI-3185H/240/3P	1 (3)	TMI-3185HE2/240/3P		¾ (2)
18	1	48 <sup>1</sup> / <sub>16</sub> (122)	21 (10)	TMI-3185H/480/*	1 (3)	TMI-3185HE2/480/*		¾ (2)

kW	Circ. & Ph.	Dim. in (cm) B	Wt lb (kg)	General Purpose Encl. <sup>1</sup>		E-3 Explosion Res. Encl. <sup>2</sup>		E-4 Moisture Res. Encl. <sup>1</sup>	
				Model No.	Dim. in (cm) N	Model No.	Dim. in (cm) N	Model No.	Dim in (cm) N
<b>5 Inch-150 Lb. Steel Flange, 6 Incoloy Sheath Elements — 45 W/in<sup>2</sup></b>									
12	1-3	18 <sup>1</sup> / <sub>16</sub> (46)	30 (14)	TMI-6125H/**/3P	1 (3)	TMI-6125HE3/**/3P	1 ½ (4)	TMI-6125HE4/**/3P	1 (3)
15	1-3	19 <sup>1</sup> / <sub>16</sub> (50)	31 (14)	TMI-6155H/**/3P	1 (3)	TMI-6155HE3/**/3P	1 ½ (4)	TMI-6155HE4/**/3P	1 (3)
18	1-3	25 <sup>3</sup> / <sub>16</sub> (64)	33 (15)	TMI-6185H/**/3P	1 (3)	TMI-6185HE3/**/3P	1 ½ (4)	TMI-6185HE4/**/3P	1 (3)
24	2-3	33 <sup>1</sup> / <sub>16</sub> (84)	37 (17)	TMI-6245H/240/3P	1 (3)	TMI-6245HE3/240/3P	1 ½ (4)	TMI-6245HE4/240/3P	1 (3)
24	1-3	33 <sup>1</sup> / <sub>16</sub> (84)	37 (17)	TMI-6245H/480/3P	1 (3)	TMI-6245HE3/480/3P	1 ½ (4)	TMI-6245HE4/480/3P	1 (3)
30	2-3	40 <sup>9</sup> / <sub>16</sub> (103)	40 (18)	TMI-6305H/**/3P	1 (3)	TMI-6305HE3/**/3P	1 ½ (4)	TMI-6305HE4/**/3P	1 (3)
40	2-3	52 <sup>1</sup> / <sub>16</sub> (132)	51 (23)	TMI-6405H/**/3P	1 (3)	TMI-6405HE3/**/3P	1 ½ (4)	TMI-6405HE4/**/3P	1 (3)
50	2-3	65 <sup>1</sup> / <sub>16</sub> (165)	64 (29)	TMI-6505H/**/3P	1 (3)	TMI-6505HE3/**/3P	1 ½ (4)	TMI-6505HE4/**/3P	1 (3)
15	2-3	78 <sup>1</sup> / <sub>16</sub> (198)	77 (35)	TMI-6605H/**/3P	1 (3)	TMI-6605HE3/**/3P	1 ½ (4)	TMI-6605HE4/**/3P	1 (3)
<b>6 Inch-150 Lb. Steel Flange, 12 Incoloy Elements — 45 W/in<sup>2</sup></b>									
36	2-3	25 <sup>1</sup> / <sub>8</sub> (64)	67 (30)	TMI-1236H/**/3P	1 (3)	TMI-1236HE3/**/3P	1 ½ (4)	TMI-1236HE4/**/3P	1 ½ (4)
48	2-3	33 (84)	76 (34)	TMI-1248H/**/3P	1 †(3)	TMI-1248HE3/**/3P	1 ½ (4)	TMI-1248HE4/**/3P	1 ½ (4)
60	2-3	40 <sup>1</sup> / <sub>2</sub> (103)	84 (38)	TMI-1260H/**/3P	1 †(3)	TMI-1260HE3/**/3P	1 ½ (4)	TMI-1260HE4/**/3P	1 ½ (4)
72	2-3	48 (122)	111 (50)	TMI-1272H/**/3P	1 †(3)	TMI-1272HE3/**/3P	1 ½ (4)	TMI-1272HE4/**/3P	1 ½ (4)

\* Add the suffix "/3P" to the model number for 3 phase power.  
 /\*\* Designate voltage, i.e., "240" for 240 Vac or "480" for 480V.  
 † 48, 60 and 72 kW 240 Vac units have 1 ½" N dim.

Note: Larger flange sizes and kW rating available.  
 Please contact OMEGALUX for specific details.

<sup>1</sup> Heaters with General Purpose & Moisture Resistant

<sup>2</sup> Heaters with Explosion Resistant Enclosures are CSA NRTL/C Certified and are not intended for use in hazardous areas.

Ordering Examples: TMI-3065H/240/3P, is a 6 kW heater powered by 3 phase 240 Vac.

TMI-6125H/240/3P, is a 12 kW heater powered by 3 phase 240 Vac.

# IMMERSION HEATERS FOR SMALL TANK APPLICATIONS

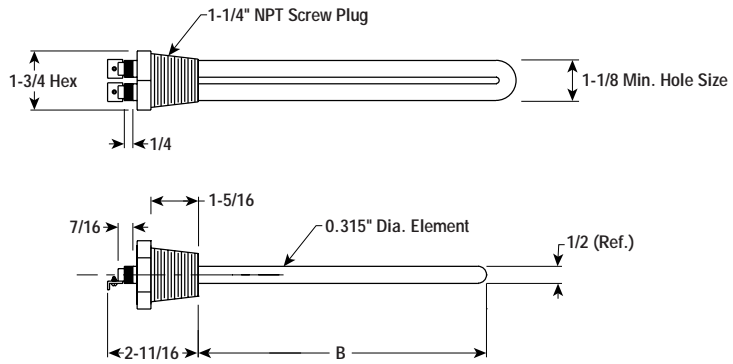
Basic Unit  
**\$124**

## Style TMW-2

- ✓ 1 1/4" NPT Brass Screw Plug
- ✓ Copper Sheath Element
- ✓ 64 - 86 W/In<sup>2</sup>
- ✓ 750 - 5,000 Watts
- ✓ 120 and 240 Volt, Single Phase
- ✓ Without Terminal Cover
- ✓ Without Thermowell



### Dimensions (Inches)

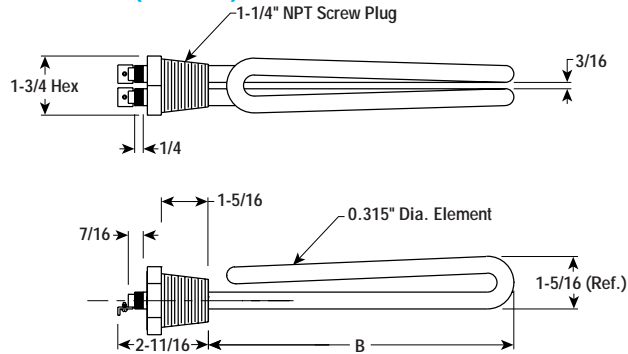


### APPLICATION

- Clean Water Heating



### Dimensions (Inches)



### To Order (Specify Model Number)

Watts	Volts	Phase	W/In <sup>2</sup>	DIM B (In.)	Model No.	Price	Wt. (Lb.)
<b>Straight Element</b>							
750	120	1	64	6-1/8	TMW-207A/120	\$124	0.5
750	240	1	64	6-1/8	TMW-207A/240	124	0.5
1,000	120	1	85	6-1/8	TMW-210A/120	136	0.5
1,000	240	1	85	6-1/8	TMW-210A/240	136	0.5
1,250	120	1	82	7-7/8	TMW-212A/120	150	1
1,250	240	1	82	7-7/8	TMW-212A/240	150	1
1,500	120	1	86	9-1/16	TMW-215A/120	161	1.25
1,500	240	1	86	9-1/16	TMW-215A/240	161	1.25
<b>Foldback Element</b>							
2,000	120	1	85	6-5/8	TMW-220A/120	188	1.5
2,000	240	1	85	6-5/8	TMW-220A/240	188	1.5
2,500	240	1	80	8-1/2	TMW-225A/240	209	2
3,000	240	1	78	10-3/16	TMW-230A/240	242	2.25
4,000	240	1	77	13-9/16	TMW-240A/240	268	2.5
5,000	240	1	76	16-15/16	TMW-250A/240	288	3

Ordering Example: TMW-212A/120, is a 120 V, Single Phase, 1,250 Watt Heater, \$150.





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• **Flow and Level**

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

• **pH and Conductivity**

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

• **Data Acquisition**

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

• **Pressure, Strain and Force**

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

• **Heaters**

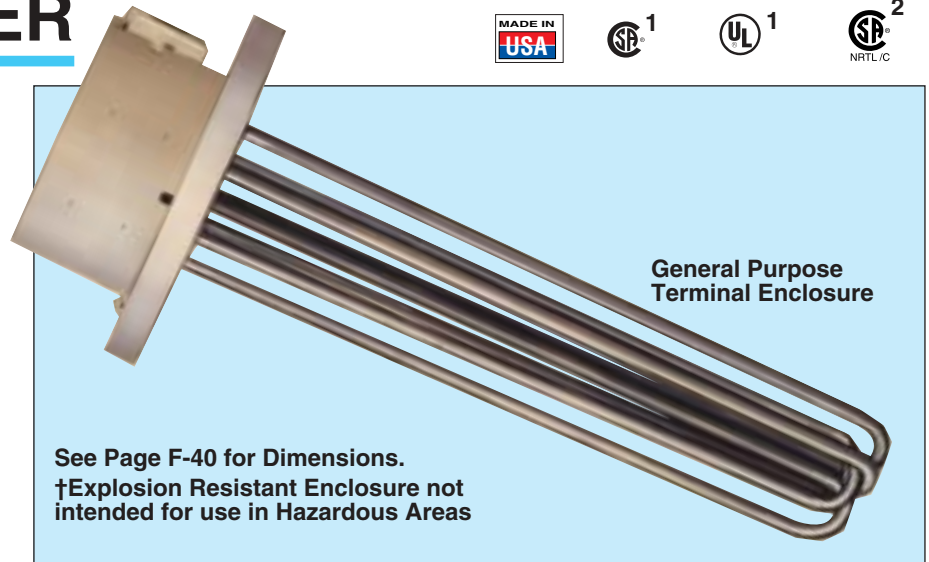
Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# FLANGED IMMERSION HEATERS FOR CLEAN WATER



## TM Series

- ✓ Flange Sizes 3" to 5" of High Grade Steel
- ✓ General Purpose, NEMA 1 Rated Enclosure or Moisture Resistant, Explosion Resistant† Enclosure Available
- ✓ Sturdy 0.475" Diameter Copper Elements
- ✓ 6 to 150 kW
- ✓ 240 and 480 Vac Power, 1 and 3 Phase



See Page F-40 for Dimensions.  
†Explosion Resistant Enclosure not intended for use in Hazardous Areas

Please note: Approved pressure and/or temperature limited controls must be used to assure safe operation in the event of system malfunctions. See Temperature Section.

## APPLICATIONS

**For clean water pH 6 to 8** – Clean municipal water such as used in washing, rinsing and industrial processes with a pH factor range of pH 6 to pH 8.

**For non-corrosive solutions** – Non-corrosive water solutions or weak alkaline or acid content of up to 1% by volume, such as sodium carbonate, sodium chlorate or other neutral salts.

## To Order (Specify Model Number) MOST POPULAR ITEMS HIGHLIGHTED

kW	Circ.	Dim. in (cm)	Wt. lbs (kg)	E1 Gen. Purpose Encl. <sup>1</sup>		Dim. in (cm)	E-2 Moisture Resistant/ Explosion Res. Encl. <sup>2</sup>		Dim. in (cm)	
				Model No.	Price		Model No.	Price		
<b>3 Inch-150 lb. Steel Flange, 3 Copper Sheath Elements — 45 W/in<sup>2</sup></b>										
6	1	18 <sup>1</sup> / <sub>16</sub> (46)	16(7)	TM-3065/240/*	\$762	1 (3)	TM-3065E2/240/*	\$965	¾ (2)	
6	1	18 <sup>1</sup> / <sub>16</sub> (46)	16(7)	TM-3065/480/*	762	1 (3)	TM-3065E2/480/*	965	¾ (2)	
9	1	25 <sup>3</sup> / <sub>16</sub> (64)	17(8)	TM-3095/240/*	856	1 (3)	TM-3095E2/240/*	1051	¾ (2)	
9	1	25 <sup>3</sup> / <sub>16</sub> (64)	17(8)	TM-3095/480/*	856	1 (3)	TM-3095E2/480/*	1051	¾ (2)	
12	1	33 <sup>1</sup> / <sub>16</sub> (84)	18 (8)	TM-3125/240	839	1½ (3)	TM-3125E2/240	1156	1 (3)	
12	1	33 <sup>1</sup> / <sub>16</sub> (84)	18 (8)	TM-3125/240/3P	953	1 (3)	TM-3125E2/240/3P	1156	¾ (2)	
12	1	33 <sup>1</sup> / <sub>16</sub> (84)	18 (8)	TM-3125/480/*	953	1 (3)	TM-3125E2/480/*	1156	¾ (2)	
15	1	40 <sup>9</sup> / <sub>16</sub> (103)	20 (9)	TM-3155/240	1051	1 (3)	TM-3155E2/240	1266	1¼ (3)	
15	1	40 <sup>9</sup> / <sub>16</sub> (103)	20 (9)	TM-3155/240/3P	1051	1½ (3)	TM-3155E2/240/3P	1266	¾ (2)	
15	1	40 <sup>9</sup> / <sub>16</sub> (103)	20 (9)	TM-3155/480/*	1051	1 (3)	TM-3155E2/480/*	1266	¾ (2)	
18	1	48 <sup>3</sup> / <sub>16</sub> (122)	21(10)	TM-3185/240	1141	1½ (3)	TM-3185E2/240	1344	1¼ (3)	
18	1	48 <sup>3</sup> / <sub>16</sub> (122)	21(10)	TM-3185/240/*	1141	1 (3)	TM-3185E2/240/3P	1344	¾ (2)	
18	1	48 <sup>3</sup> / <sub>16</sub> (122)	21(10)	TM-3185/480/*	1141	1 (3)	TM-3185E2/480/*	1344	¾ (2)	

## To Order (Specify Model Number)

kW	Circ. & Ph.	Dim. in (cm)	Weight lb (kg)	E-1 Gen. Purpose Encl. <sup>1</sup>		Dim. in (cm)	E-3 Explosion Res. Encl. <sup>2</sup>		Dim. in (cm)	E-4 Moisture Res. Encl. <sup>1</sup>		Dim. in (cm)
				Model No.	Price		Model No.	Price		Model No.	Price	
<b>5 Inch-150 Lb. Steel Flange, 6 Copper Sheath Elements — 45 W/in<sup>2</sup></b>												
12	1-3	18 <sup>1</sup> / <sub>16</sub> (46)	30 (14)	TM-6125/**/3P	\$1138	1 (3)	TM-6125E3/**/3P	\$1680	1½ (4)	TM-6125E4/**/3P	\$1589	1 (3)
15	1-3	19 <sup>3</sup> / <sub>16</sub> (50)	31 (14)	TM-6155/**/3P	1173	1 (3)	TM-6155E3/**/3P	1709	1½ (4)	TM-6155E4/**/3P	1627	1 (3)
18	1-3	25 <sup>3</sup> / <sub>16</sub> (64)	33 (15)	TM-6185/**/3P	1309	1 (3)	TM-6185E3/**/3P	1850	1½ (4)	TM-6185E4/**/3P	1766	1 (3)
24	2-3	33 <sup>1</sup> / <sub>16</sub> (84)	37 (17)	TM-6245/240/3P	1583	1 (3)	TM-6245E3/240/3P	2124	1½ (4)	TM-6245E4/240/3P	2044	1 (3)
24	1-3	33 <sup>1</sup> / <sub>16</sub> (84)	37 (17)	TM-6245/480/3P	1583	1 (3)	TM-6245E3/480/3P	2124	1½ (4)	TM-6245E4/480/3P	2044	1 (3)
30	2-3	40 <sup>9</sup> / <sub>16</sub> (103)	40 (18)	TM-6305/**/3P	1848	1 (3)	TM-6305E3/**/3P	2389	1½ (4)	TM-6305E4/**/3P	2304	1 (3)
40	2-3	52 <sup>1</sup> / <sub>16</sub> (132)	51 (23)	TM-6405/**/3P	2304	1 (3)	TM-6405E3/**/3P	2849	1½ (4)	TM-6405E4/**/3P	2759	1 (3)
60	2-3	78 <sup>3</sup> / <sub>16</sub> (198)	77 (35)	TM-6605/480/3P	3283	1 (3)	TM-6605E3/480/3P	3833	1½ (4)	TM-6605E4/680/3P	3745	1 (3)

/\* Add the suffix "/3P" to the model number for 3 phase power.  
/\*\* Specify voltage, i.e., 240 for 240 VAC or 480 for 480 VAC.  
Note: Larger flange sizes and kW rating available. Please contact OMEGALUX for specific details.  
Ordering Example: Model TM-3065/240/3P, is a 6kW heater powered by 3 phase 240 VAC, \$762.

Ordering Example: Model TM-6125/480/3P, is a 12kW heater powered by 3 phase 480 VAC, \$1138.  
<sup>1</sup>Heaters with General Purpose and Moisture Resistant Enclosures are UL Listed and CSA Certified. <sup>2</sup>Heaters with Explosion Resistant Enclosures are CSA NRTL/C certified and are not intended for use in hazardous areas.



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### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters



# RUGGED SCREW PLUG IMMERSION HEATERS

## For Small Tanks



TM-1036G shown smaller than actual size.

### TM/TMO Series

- ✓ 1 NPT Screw Plug
- ✓ Tubular Element Design
- ✓ 350 to 1500W
- ✓ Heavy Duty Construction

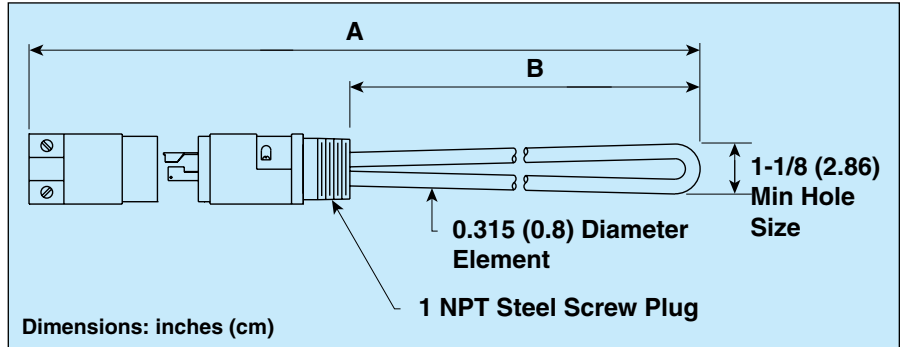
These screw plug immersion heaters feature a dead front Nylon Twist Lock grounded plug with receptacle. This makes power connection easier.

### SPECIFICATIONS

**Wattage:** 350 to 1500 W

**Power:** 120 or 240 Vac

**Watt Density:** 20 to 86 W/in<sup>2</sup>



**Sheath Material:** Type TM has a high watt density copper sheath, ideal for water heating applications. Type TMO has a lower watt density steel sheath for oil heating applications.

**Screw Plug:** Type TM has a 1" brass screw plug. Type TMO has 1" steel screw plug.

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

### To Order

Watts	Volts	Phase	W/in <sup>2</sup>	Dimensions: in (cm)		Standard Pipe Thread	Model No.	Weight oz.
				A	B			
<b>TM Series - Copper Sheath Element for Water Heating - Brass Screw Plug</b>								
350	120	1	46	8 <sup>5</sup> / <sub>8</sub> (22)	4 <sup>3</sup> / <sub>8</sub> (11)	1	TM-1036G/120	14
500	120	1	43	10 <sup>3</sup> / <sub>4</sub> (27)	6 <sup>1</sup> / <sub>2</sub> (17)	1	TM-1051G/120	14
750	120	1	64	10 <sup>3</sup> / <sub>4</sub> (27)	6 <sup>1</sup> / <sub>2</sub> (17)	1	TM-1076G/120	16
750	240	1	64	10 <sup>3</sup> / <sub>4</sub> (27)	6 <sup>1</sup> / <sub>2</sub> (17)	1	TM-1076G/240	16
1000	120	1	85	10 <sup>3</sup> / <sub>4</sub> (27)	6 <sup>1</sup> / <sub>2</sub> (17)	1	TM-1101G/120	16
1000	240	1	85	10 <sup>3</sup> / <sub>4</sub> (27)	6 <sup>1</sup> / <sub>2</sub> (17)	1	TM-1101G/240	16
1500	120	1	86	13 <sup>5</sup> / <sub>8</sub> (35)	9 <sup>3</sup> / <sub>8</sub> (24)	1	TM-1415G/120	17
1500	240	1	86	13 <sup>5</sup> / <sub>8</sub> (35)	9 <sup>3</sup> / <sub>8</sub> (24)	1	TM-1415G/240	17
<b>TMO Series - Steel Sheath Element for Oil Heating - Steel Screw Plug</b>								
350	120	1	20	13 <sup>1</sup> / <sub>16</sub> (35)	8 <sup>7</sup> / <sub>8</sub> (23)	1	TMO-1036G/120	16
500	120	1	20	17 <sup>3</sup> / <sub>16</sub> (44)	13 (33)	1	TMO-1051G/120	18
500	240	1	20	17 <sup>3</sup> / <sub>16</sub> (44)	13 (33)	1	TMO-1051G/240	18
750	120	1	20	23 <sup>1</sup> / <sub>8</sub> (59)	18 <sup>7</sup> / <sub>8</sub> (48)	1	TMO-1076G/120	20
750	240	1	20	23 <sup>1</sup> / <sub>8</sub> (59)	18 <sup>7</sup> / <sub>8</sub> (48)	1	TMO-1076G/240	20
900	120	1	21	25 <sup>5</sup> / <sub>8</sub> (65)	21 <sup>3</sup> / <sub>8</sub> (54)	1	TMO-1091G/120	22
900	240	1	21	25 <sup>5</sup> / <sub>8</sub> (65)	21 <sup>3</sup> / <sub>8</sub> (54)	1	TMO-1091G/240	22

Ordering Examples: TM-1036G/120, 350 W, 120V heater.  
TMO-1051G/120, 500 W, 120V heater.

# WRAP-AROUND TOTE TANK HEATERS

## TOTE Series



- ✔ Fits Any Tote Tank from 1 to 1.2 m (40 to 48") Square
- ✔ Comes in Heights of 0.9, 1.1 or 1.2 m (36, 42 or 48")
- ✔ 2 Heating Zones
- ✔ 2 Built-In Adjustable Thermostats
- ✔ 2 Built-In High-Limit Thermostats
- ✔ Adjustable Nylon Straps with Buckles
- ✔ Flexible Silicone-Impregnated Cloth Facing and Liner
- ✔ 6 mm (¼") Fiberglass Insulation
- ✔ 1.8 m (6') Power Cord

The OMEGA® TOTE Series tank heaters are flexible wrap-around surface heaters offered in different sizes based on height. These heaters provide a quick, easy, non-invasive way to warm your product. They fit nearly every standard tote tank utilizing adjustable nylon straps with buckles. There are 3 straps for placing around the tank and 2 for across the top. Units include an adjustable thermostat and a manual reset high-limit thermostat for each of the 2 zones.

### SPECIFICATIONS

**Adjustable Thermostat Setting:** 10 to 70°C (50 to 160°F)

**High-Limit Thermostat Setting:** Approximately 90°C (195°F)

**High-Limit Thermostat Reset:** Manual



TOTE481-ADJ/120V shown smaller than actual size.

**Maximum Exposure Temperature:** 230°C (450°F)

**Outer Sheath and Liner:** Silicone impregnated

**Attachment Method:** Nylon straps with adjustable buckles

**Fiberglass Insulation:** 6 mm (0.25")

**Total Blanket Length:** Approximately 5 m (16.5')

**Heated Length:** Approx 4.1 m (13.5')

**Height:** 0.9 m (36"), 1.1 m (42") or 1.2 m (48")

**Wattage:** 1440 or 2880 W

**Power Cord:** 1.8 m (6') with standard power plug

**Power:** 120 or 240 Vac

### To Order

Model No.	Description	Weight
TOTE361-ADJ/120V	Tote heater with thermostat, 120V, 1440 W, 0.9 m (36") height	18 kg (40 lb)
TOTE362-ADJ/240V	Tote heater with thermostat, 240V, 2880 W, 0.9 m (36") height	18 kg (40 lb)
TOTE421-ADJ/120V	Tote heater with thermostat, 120V, 1440 W, 1.1 m (42") height	20 kg (45 lb)
TOTE422-ADJ/240V	Tote heater with thermostat, 240V, 2880 W, 1.1 m (42") height	20 kg (45 lb)
TOTE481-ADJ/120V	Tote heater with thermostat, 120V, 1440 W, 1.2 m (48") height	22 kg (50 lb)
TOTE482-ADJ/240V	Tote heater with thermostat, 240V, 2880 W, 1.2 m (48") height	22 kg (50 lb)
TOTE-COVER	Tote insulated top cover	

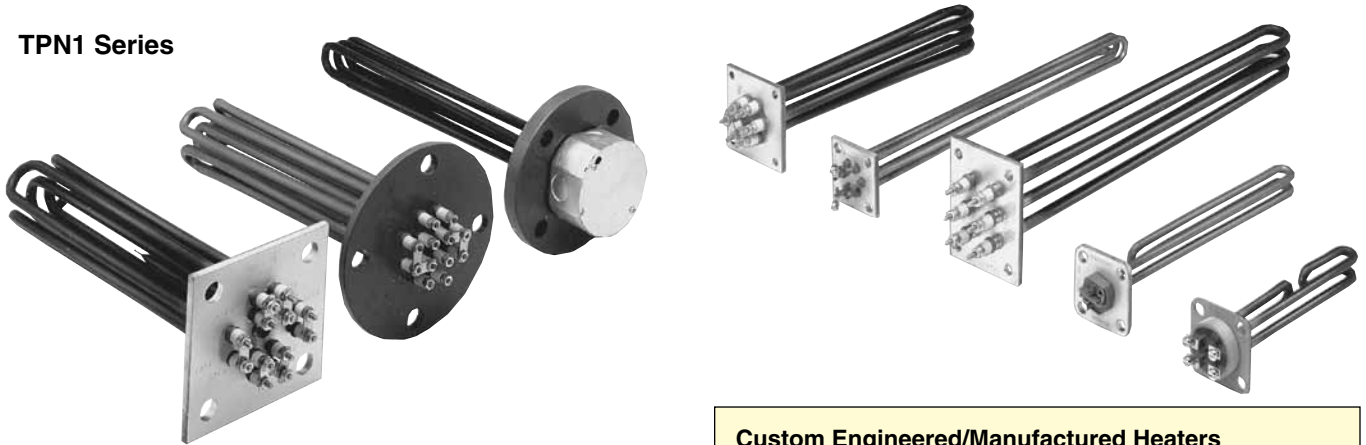
*Comes complete with adjustable and high-limit thermostats for each of 2 heat zones.*

**Ordering Example:** TOTE361-ADJ/120V, tote heater with thermostat, 120V, 1440 W, 0.9 m (36") height, and TOTE-COVER, tote insulated top cover.



## Flanged Immersion Heaters with Custom Size and Shape Flanges

### TPN1 Series



#### Typical Applications

- Hot Air Dryers
- Dehumidifying Dryers
- Heat Exchange Systems
- Water and Water Solutions
- Steam Tables
- Air Heating

#### Custom Immersion Heaters

This design consists of tubular heating elements silver brazed or TIG welded to a flange cut from steel or stainless steel plate. Flange plate size, thickness and shape are determined by the application. A fiber gasket is supplied with each heater. This type construction also lends itself to be easily and economically engineered into new equipment.

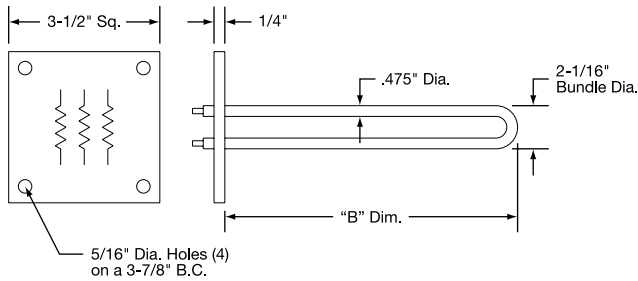
#### Custom Engineered/Manufactured Heaters

An electric heater can be very application specific; for sizes and ratings not listed, OMEGA will design and manufacture a flanged immersion heater to meet your requirements.

#### Please Specify the Following:

- ✓ Wattage, Voltage and Phase
- ✓ Element Immersion Length
- ✓ Flange Size and Material
- ✓ Electrical Enclosure, if required
- ✓ Element Sheath Material
- ✓ Optional Features
- ✓ Element Watt Density

### 3 1/2" Square Steel Flange, 3 Elements



Supplied with gasket (GSK-111-102)

**To Order Visit [omega.com/tpn1](http://omega.com/tpn1) for Pricing and Details**

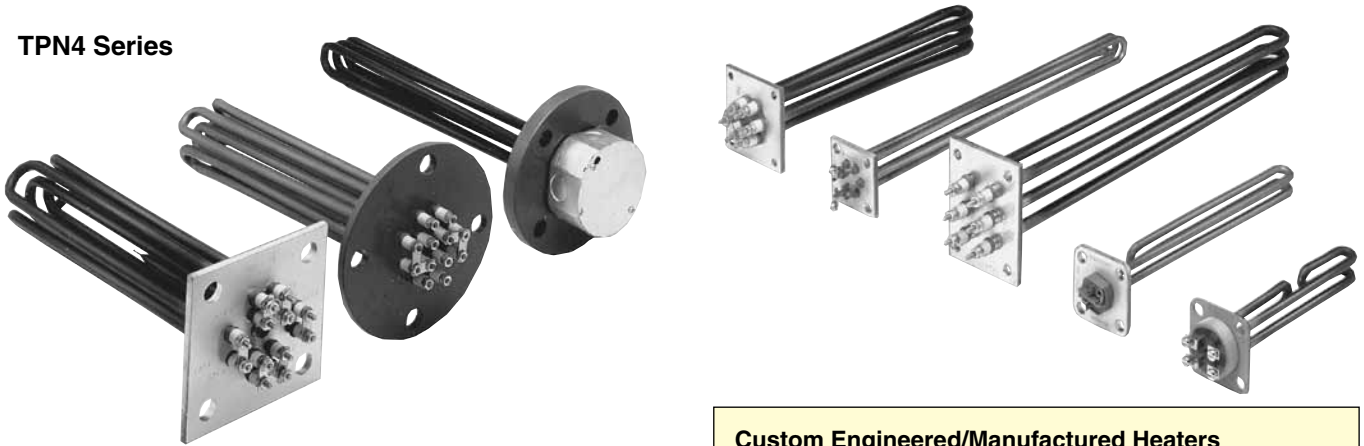
Model No.			Approx Weight		Element Sheath Material	KW	Watt Density		B	
240V-3Ph Y	480V-3Ph Y	575V-3Ph Y	kg	lb			Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>	mm	inch
TPN01400	TPN01401	—	1.4	3	Incoloy® 800	1.5	2.3	15	316	12 <sup>7</sup> / <sub>16</sub>
TPN01173	TPN01174	TPN01402	1.4	3		2.5	3.7	24	316	12 <sup>7</sup> / <sub>16</sub>
TPN01403	TPN01404	TPN01405	1.4	3		3	4.8	31	316	12 <sup>7</sup> / <sub>16</sub>
TPN01175	TPN01201	TPN01406	1.8	4		3.5	3.7	24	454	17 <sup>7</sup> / <sub>8</sub>
TPN01407	TPN01176	TPN01408	1.8	4		4	4.2	27	454	17 <sup>7</sup> / <sub>8</sub>
TPN01409	TPN01410	TPN01411	1.8	4		5	5.3	34	454	17 <sup>7</sup> / <sub>8</sub>
TPN01351	TPN01373	—	1.4	3	Steel	2.5	3.7	24	316	12 <sup>7</sup> / <sub>16</sub>
TPN01311	TPN01412	—	1.8	4		3.5	3.7	24	454	17 <sup>7</sup> / <sub>8</sub>

Ordering Example: TPN01173, 2.5 KW, 240 Vac, 3 phase flanged immersion heater.



## Flanged Immersion Heaters with Custom Size and Shape Flanges

### TPN4 Series



#### Typical Applications

- Hot Air Dryers
- Dehumidifying Dryers
- Heat Exchange Systems
- Water and Water Solutions
- Steam Tables
- Air Heating

#### Custom Immersion Heaters

This design consists of tubular heating elements silver brazed or TIG welded to a flange cut from steel or stainless steel plate. Flange plate size, thickness and shape are determined by the application. A fiber gasket is supplied with each heater. This type construction also lends itself to be easily and economically engineered into new equipment.

#### Custom Engineered/Manufactured Heaters

An electric heater can be very application specific; for sizes and ratings not listed, OMEGA will design and manufacture a flanged immersion heater to meet your requirements.

#### Please Specify the Following:

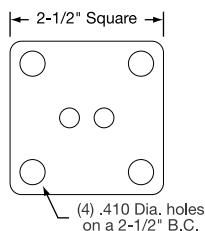
- ✓ Wattage, Voltage and Phase
- ✓ Element Immersion Length
- ✓ Flange Size and Material
- ✓ Electrical Enclosure, if required
- ✓ Element Sheath Material
- ✓ Optional Features
- ✓ Element Watt Density

### Hot Water Tank Heater, 2 1/2" Square Steel Flanged, 1 Incoloy® 800 Element



Supplied with gasket (GSK-111-101)

- 2 1/2" square x 1/4" thick flange with gasket
- 70 watt/in<sup>2</sup> Incoloy® 800 tubular heating element
- 10-32 plated screw terminals
- Optional ceramic terminal block for high temperature applications



### To Order Visit [omega.com/tpn4](http://omega.com/tpn4) for Pricing and Details

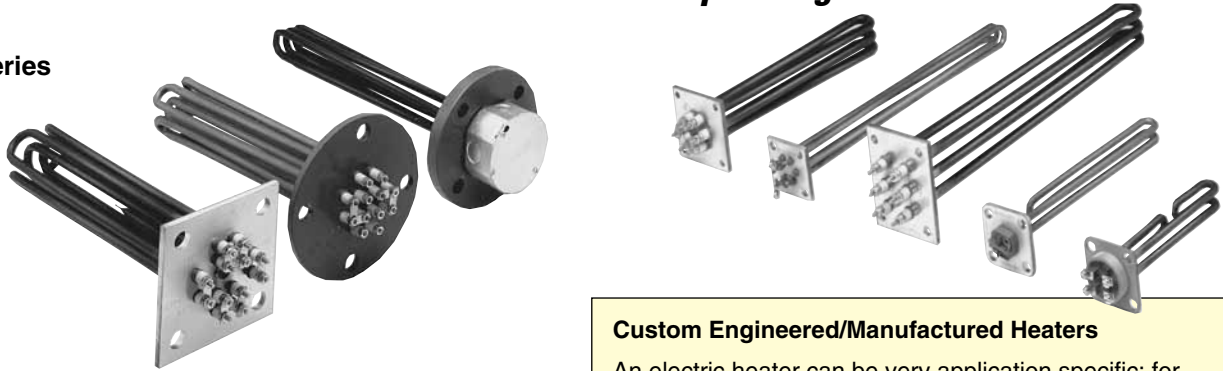
Model No.		KW	Immersed Length	
120V	240V		mm	inch
—	TPN01484	1.0	235	9 1/4
TPN01485	TPN01486	1.25	279	11
TPN01487	TPN01488	1.5	187	7 3/8
TPN01489	TPN01490	2.0	279	9
—	TPN01491	2.5	273	10 3/4
—	TPN01167	3.0	313	12 5/16
—	TPN01492	3.5	349	13 3/4
—	TPN01493	4.0	400	15 3/4
—	TPN01494	4.5	413	16 1/4
—	TPN01287	5.0	483	19

Ordering Example: TPN01167, 3 KW, 240 Vac, 3 phase flanged immersion heater.



## Flanged Immersion Heaters with Custom Size and Shape Flanges

### TPN7 Series



#### Typical Applications

- Hot Air Dryers
- Dehumidifying Dryers
- Heat Exchange Systems
- Water and Water Solutions
- Steam Tables
- Air Heating

#### Custom Immersion Heaters

This design consists of tubular heating elements silver brazed or TIG welded to a flange cut from steel or stainless steel plate. Flange plate size, thickness and shape are determined by the application. A fiber gasket is supplied with each heater. This type construction also lends itself to be easily and economically engineered into new equipment.

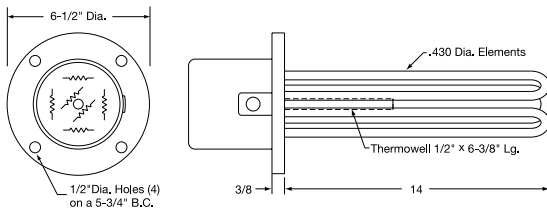
#### Custom Engineered/Manufactured Heaters

An electric heater can be very application specific; for sizes and ratings not listed, OMEGA will design and manufacture a flanged immersion heater to meet your requirements.

#### Please Specify the Following:

- ✓ Wattage, Voltage and Phase
- ✓ Element Immersion Length
- ✓ Flange Size and Material
- ✓ Electrical Enclosure, if required
- ✓ Element Sheath Material
- ✓ Optional Features
- ✓ Element Watt Density

### 6 1/2" Diameter Steel Flange, 6 Incoloy® 800 Elements, 1 Circuit



Supplied with gasket (GSK-102-103)

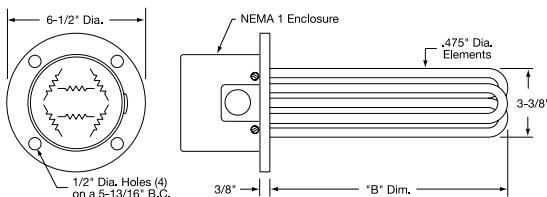
### To Order Visit [omega.com/tpn7](http://omega.com/tpn7) for Pricing and Details

Model No.	Approx Weight		Element Sheath Material	KW	Watt Density	
	kg	lb			Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>
460V-3Ph			Incoloy® 800	9	7.1	46
TPN01706	4.5	10				
TPN01707	4.5	10				

Heaters can be factory rewired for 230V-3PH.

Ordering Example: TPN01706, 9 KW flanged immersion heater.

### 6 1/2" Diameter Steel Flange, 6 Elements, 2 Circuits



Supplied with gasket (GSK-102-103)

Model No.				Approx Weight		Element Sheath Material	KW	Watt Density		B	
208V-3Ph	230V-3Ph	460V-3Ph	575V-3Ph	kg	lb			Watt/cm <sup>2</sup>	Watt/in <sup>2</sup>	mm	inch
TPN01448	TPN01177	TPN01178	TPN01449	4.5	10	Incoloy® 800	9	7.8	50	432	17
TPN01450	TPN01451	TPN01452	TPN01453	4.5	10		10.5	8.1	42	432	17
TPN01454	TPN01204	TPN01179	TPN01455	4.5	10		12	7.8	50	432	17
TPN01319	TPN01456	TPN01321	—	4.5	10	Copper	12	7.4	48	432	17
TPN01457	TPN01458	TPN01459	—	5.4	12		15	10.9	70	711	28

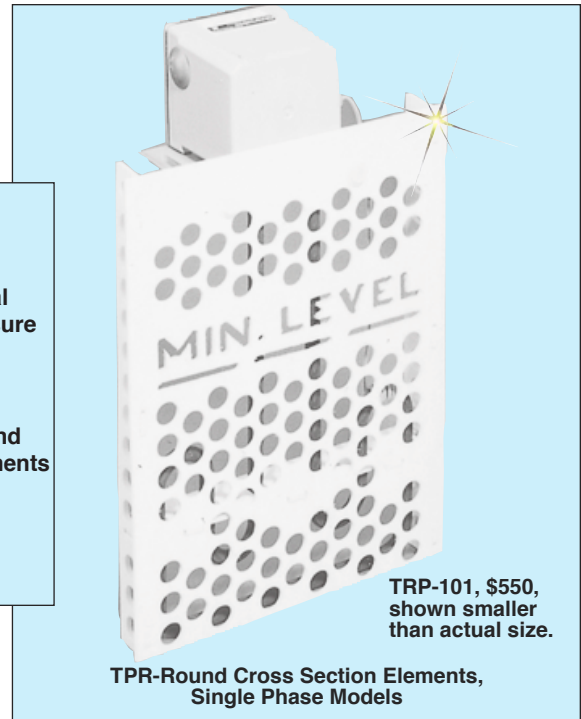
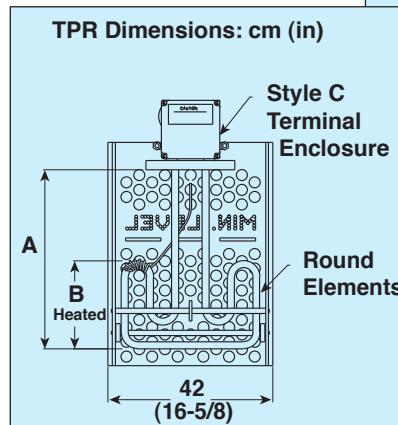
Ordering Example: TPN01448 9 KW 208V 3 phase flanged immersion heater

# CORROSION RESISTANT OVER-THE-SIDE IMMERSION HEATERS

TPR Series Starts at  
**\$550**



- TPR—Round Cross Section Elements**
- ✓ Fluoropolymer Coated Stainless Steel Elements
  - ✓ 20 W/in<sup>2</sup>
  - ✓ 1 to 8 kW
  - ✓ 120, 240 and 480V, 1 Phase
  - ✓ Moisture Resistant Terminal Enclosure



## FEATURES

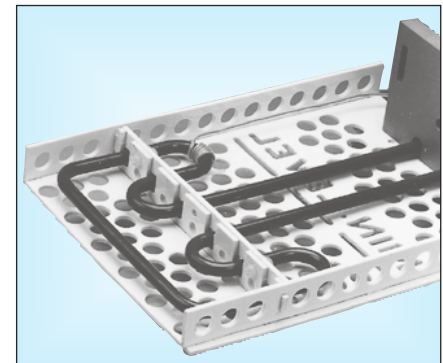
- ✓ Moisture Resistant Terminal Enclosure
- ✓ Standard Polypropylene Guard
- ✓ Side Mounted Construction with PVC Mounting Flange
- ✓ Overtemperature Protection Integral Manual Reset Cutout [116°C (240°F)]
- ✓ Low Profile, Light Weight

**3. Low Profile:** Single and three phase heaters have flat profiles which permit maximum work area and minimum interference with plating process. Heater projects less than 2" away from the side of the tank.

*Continued on page 114*

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.



**■ MOST POPULAR MODEL HIGHLIGHTED!**

### To Order (Specify Model Number)

Watts	Volts	Dimensions: cm (in)		Model No.	Price	Weight kg (lb)
		A	B			
1000	120	33 (13)	15 (6)	<b>TPR-101</b>	<b>\$550</b>	2 (4)
1000	240	33 (13)	15 (6)	TPR-102	550	2 (4)
2000	240	53 (21)	30 (12)	TPR-202	650	2 (5)
2000	480	53 (21)	30 (12)	<b>TPR-204</b>	<b>650</b>	2 (5)
3000	240	66 (26)	43 (17)	TPR-302	800	3 (6)
3000	480	66 (26)	43 (17)	TPR-304	800	3 (6)
4000	240	79 (31)	56 (22)	TPR-402	1050	3 (7)
4000	480	79 (31)	56 (22)	TPR-404	1050	3 (7)
6000	240	107 (42)	84 (33)	TPR-602	1300	5 (10)
6000	480	107 (42)	84 (33)	TPR-604	1350	5 (10)
8000	240	135 (53)	112 (44)	TPR-802	1750	5 (12)
8000	480	135 (53)	112 (44)	TPR-804	1750	5 (12)

**Ordering Example:** TPR-202 single phase, round cross section element immersion heater, 2000 W, 240V, \$650.

# CORROSION RESISTANT OVER-THE-SIDE IMMERSION HEATERS

TPF Series  
Starts at  
**\$915**

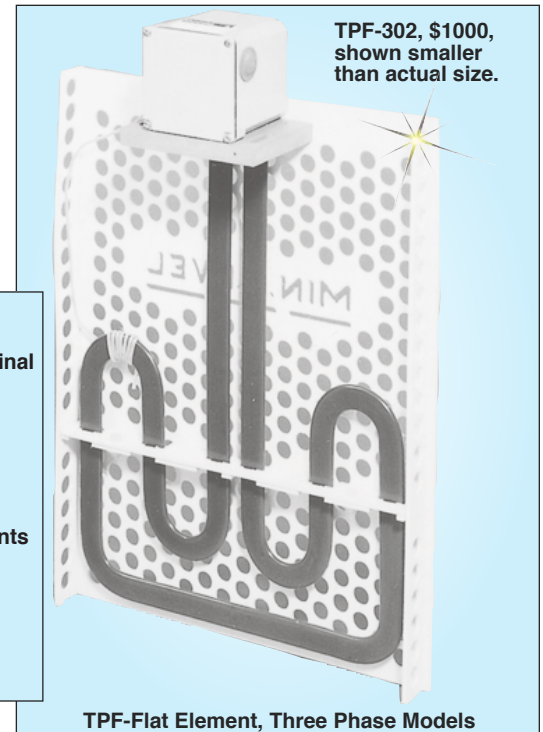
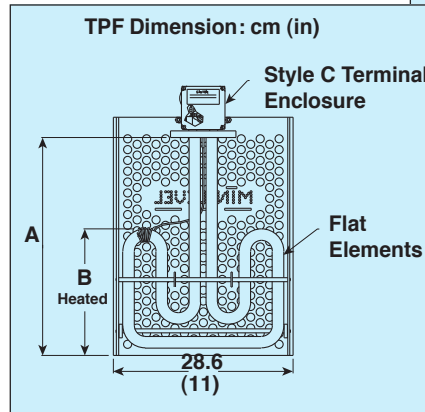


## TPF – Flat Elements

- ✓ Fluoropolymer Coated Stainless Steel Thinblade Elements
- ✓ 20 W/in<sup>2</sup>
- ✓ 3 to 10 kW
- ✓ 240 and 480V, 3 Phase
- ✓ Moisture Resistant Terminal Enclosure

## FEATURES

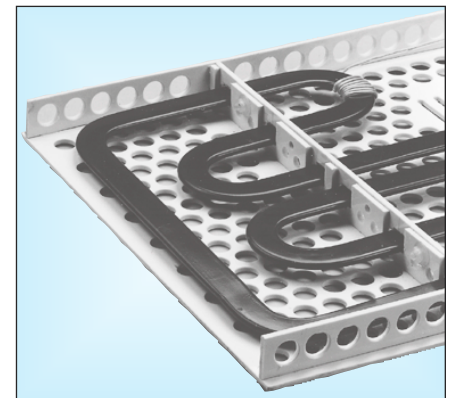
- ✓ Moisture Resistant Terminal Enclosure
- ✓ Standard Polypropylene Guard
- ✓ Side Mounted Construction with PVC Mounting Flange
- ✓ Overtemperature Protection Integral Manual Reset Cutout (240°F)
- ✓ Low Profile, Light Weight



8. **Low Watt Density:** 20 watts per square inch heat output suitable for almost all corrosive solutions.
9. **Light Weight:** Simple design permits easy installation and removal for cleaning.

### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.



### 4. Vapor Tight Terminal:

Enclosure of PVC material with left or right hand conduit entry.

### 5. Mounting Bracket:

Made of PVC material with conveniently located mounting slots.

### 6. Polypropylene Guard:

Standard on all units. It protects the heater from work in process in heating tank. Guard easily disassembles for ease of cleaning heating elements.

### 7. Grounded Construction:

With metal sheath heating elements to allow for proper grounding safety.

**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model Number)

Watts	Volts	Dimensions: cm (in)		Model No.	Price	Weight kg (lb)
		A	B			
3000	240	51 (20)	28 (11)	<b>TPF-302</b>	<b>\$1000</b>	4 (8)
3000	480	51 (20)	28 (11)	<b>TPF-304<sup>1</sup></b>	<b>795</b>	4 (8)
4000	240	58 (23)	36 (14)	<b>TPF-402</b>	<b>1100</b>	4 (9)
4000	480	58 (23)	36 (14)	<b>TPF-404<sup>1</sup></b>	<b>1100</b>	4 (9)
6000	240	76 (30)	53 (21)	<b>TPF-602</b>	<b>1450</b>	5 (11)
6000	480	76 (30)	53 (21)	<b>TPF-604<sup>1</sup></b>	<b>1450</b>	5 (11)
8000	240	94 (37)	71 (28)	<b>TPF-802</b>	<b>1750</b>	5 (12)
8000	480	94 (37)	71 (28)	<b>TPF-804<sup>1</sup></b>	<b>1750</b>	5 (12)
10000	240	112 (44)	89 (35)	<b>TPF-1002</b>	<b>2150</b>	6 (14)
10000	480	112 (44)	89 (35)	<b>TPF-1004<sup>1</sup></b>	<b>2150</b>	6 (14)

<sup>1</sup> Not UL Listed or CSA Certified.

**Ordering Example:** TPF-404, three phase, flat element immersion heater, 4000 W, 480V, \$1100. It is not UL Listed or CSA Certified.



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Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters





## Screw Plug Immersion Heaters

### TSP Series

- Stainless Steel, Brass or Steel Screw Plugs
- Four Standard Screw Plug Sizes—25.4 mm (1"), 31.8 mm (1¼"), 50.8 mm (2"), 63.5 mm (2½")
- Recompacted Element Bends Restore Insulation Resistance after Forming
- Thermowell for Optional Bulb and Capillary Thermostat, RTD or Thermocouple Probe
- Corrosion-Resistant Electrical Wiring Hardware
- Four Standard Sheath Materials—Copper, Steel, 316 Stainless Steel and Incoloy® 800
- NEMA 1 Round Terminal Housing
- Silicone Resin Element Seal Standard

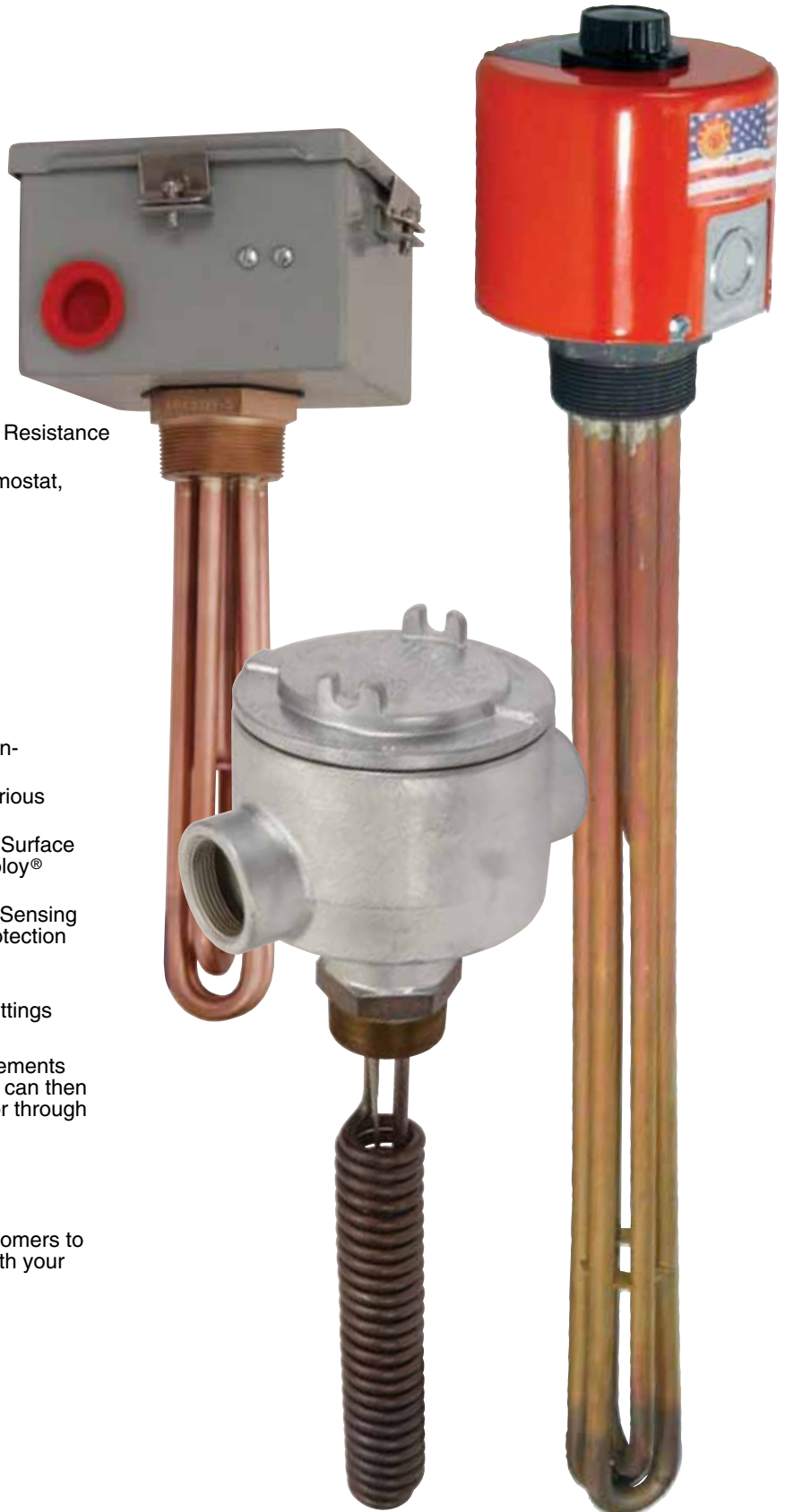
### Optional Features

- NEMA 4 Moisture-Proof and/or NEMA 7 Explosion-Resistant Terminal Housings
- Integral Single or Double Pole Thermostats in Various Temperature Ranges to Suit the Application
- Passivation, Electropolishing or Bright Annealing Surface Treatments Available for Stainless Steel and Incoloy® Elements
- Type J and K Thermocouples or RTD Probes for Sensing Process Temperatures, or Over-Temperature Protection when Attached to the Sheath
- Special Sheath Materials
- Special Straight Bulkhead or European Thread Fittings

Screw plug immersion heaters consist of tubular elements welded or brazed into a threaded screw plug which can then be inserted into a threaded opening in a tank wall or through a mating full or half coupling.

### Need Customer Assistance?

We take pride in our record of working with our customers to develop the right heater for the job. Call OMEGA with your requirements.



## Screw Plug Immersion Heaters

### Checklist—Selecting the Proper Screw Plug Heater

#### ✓ Determine a Safe and Efficient Element Watt Density

**Element Watt Density** is the wattage dissipated per square inch of the element sheath surface and is calculated with the following formula.

$$\text{Watt Density} = \frac{\text{element wattage}}{\pi \times \text{element diameter} \times \text{element heated length}}$$

For a particular application, element watt density will govern element sheath temperature. Factors to consider when choosing a suitable watt density are:

1. Many materials are heat sensitive and can decompose or be damaged if the element is running too hot.
2. Air and other gases that are poor conductors of heat require watt densities matched to the velocity of the gas flow to prevent element overheating.
3. When heating hard water and cleaning solutions mineral deposits can build up on the element sheath, acting as a heat insulator and raising the internal element temperature. If these deposits cannot be periodically removed, use a lower watt density element to increase heater life expectancy.

#### ✓ Select the Element Sheath Material

##### Sheath Material Selection

**CORROSION.** In addition to selecting a sheath material that is compatible with the heated medium, other factors that affect corrosion need to be considered.

1. The temperature of the corrodent. As temperature increases the degree of corrosion increases. Also remember that usually the element temperature is higher than the material it is heating.
2. The degree of aeration to which a corrodent is exposed. Stagnant conditions can deprive the stainless steels of oxygen, which is required to maintain their corrosion resistant surface.
3. Velocity of the corrodent. Increased velocity can increase the corrosion rate.

##### Typical Applications

**Copper Sheath**—Process water, water with very weak chemical solutions, demineralized, deionized or pure water, hot water storage for washrooms, showers, cleaning and rinsing parts, for freeze protection of cooling towers and sprinkler systems and other aqueous solutions not corrosive to copper sheath. Sheath temperatures to 177°C (350°F).

**Incoloy® Sheath**—Weak chemical solutions, oils, tar, caustic soda, detergent, alkaline solutions, molten salts, demineralized, deionized or pure water (sheath passivation is recommended), and other aqueous solutions not corrosive to Incoloy® sheath. Air, gas mixtures and superheated steam. Sheath temperatures to 871°C (1600°F).

**Steel Sheath**—Fluid heat transfer media, tar, high to low viscosity petroleum oils, asphalt, wax, paraffin, degreasing solvents, alcohol, molten salt, and other solutions not corrosive to steel sheath. Sheath temperatures to 399°C (750°F).

### Surface Treatments for Stainless Steel and Incoloy® Elements and Other Wetted Parts to Improve Corrosion Resistance

Screw Plug Immersion Heater surfaces in contact with the material being heated can be passivated or electro-polished to improve their resistance to corrosion.

**Passivation** removes surface contamination, usually iron, so that the optimum corrosion resistance of the stainless steel is maintained. Surface contamination would come from the small amount of steel that may be worn off a tool during the manufacturing process. Passivating is accomplished by dipping the heater in a warm solution of nitric acid.

**Electro-Polishing** is an electrochemical process that removes surface imperfections and contaminants, enhancing the corrosion resisting ability of the stainless steels. The resultant surface is clean, smooth and bright. Many medical and food applications require this finish.

#### ✓ Select the Terminal Housing Type

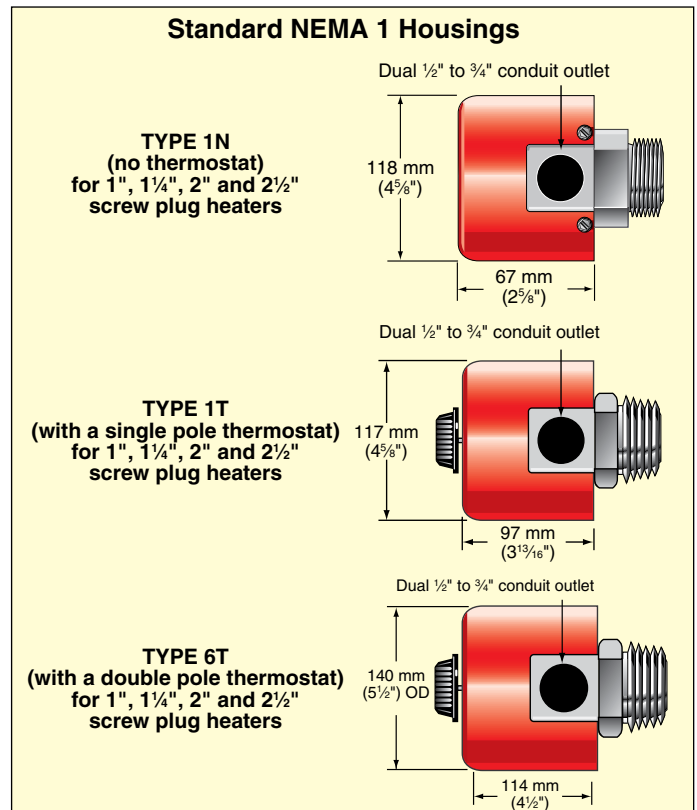
Standard catalog screw plug immersion heaters are supplied with the Type 1N general purpose (NEMA 1) terminal housing with a single Dual ½ to ¾ conduit knockout as shown on the previous page. Additional housings with and without a thermostat include:

**Moisture Resistant (NEMA 4)**

**Explosion Resistant (NEMA 7)**

**Moisture/Explosion Resistant (NEMA 4/7)**

If the housings on this and the following page do not meet the size, construction or other criteria of your application, consult OMEGA with your requirements.

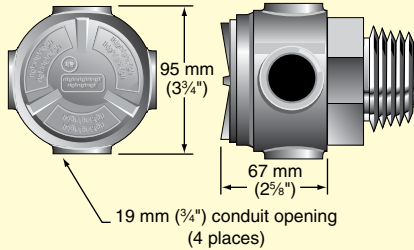




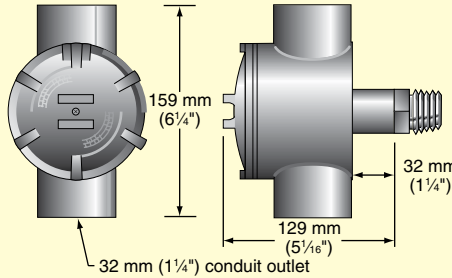
# Screw Plug Immersion Heaters

**Standard NEMA 4 and/or 7 Housings**  
 NEMA 4 rating requires the use of the cover gasket.

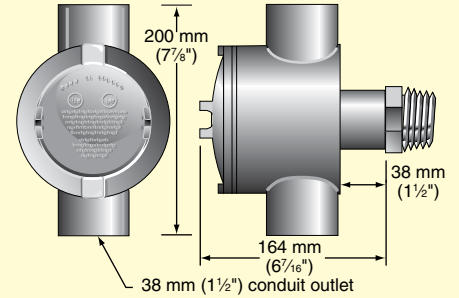
**TYPE 2N**  
 (no thermostat)  
 for 1", 1 1/4", 2" and 2 1/2"  
 screw plug heaters



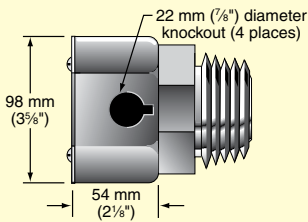
**TYPE 2T**  
 (with a single pole thermostat)  
 for 1" and 1 1/4" screw plug heaters



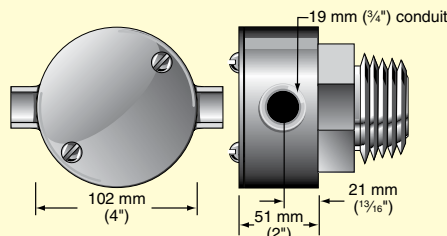
**TYPE 3T**  
 (with a double pole thermostat)  
 for 2" and 2 1/2" screw plug heaters



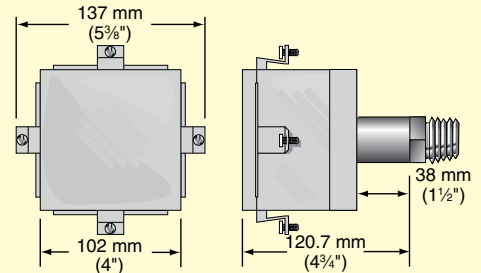
**Alternate NEMA 1 Housing**  
**Type 3N**  
 (no thermostat)  
 for 1", 1 1/4", 2" and 2 1/2"  
 screw plug heaters



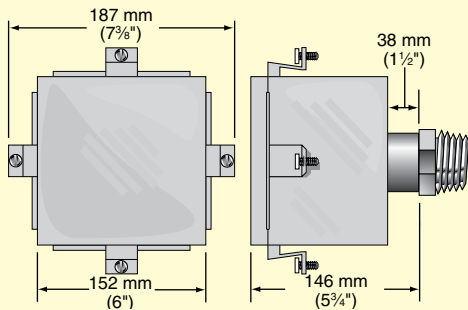
**Alternate NEMA 4 Housing**  
**TYPE 4N**  
 (no thermostat)  
 for 1", 1 1/4", 2" and 2 1/2"  
 screw plug heaters



**Alternate NEMA 4 Housing**  
**TYPE 4T**  
 (with a single pole thermostat)  
 for 1" and 1 1/4" screw plug heaters

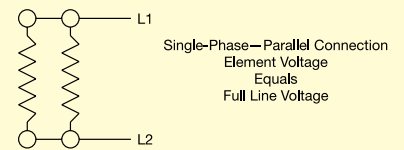
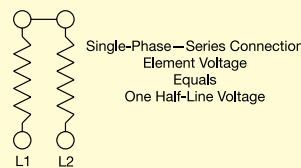
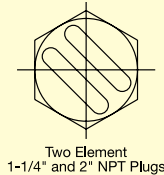


**Alternate NEMA 4 Housing**  
**TYPE 5T**  
 (with a single or double pole thermostat)  
 for 2" and 2 1/2" screw plug heaters



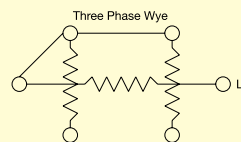
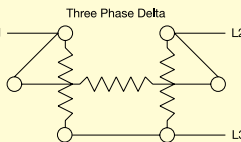
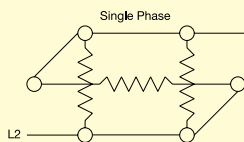
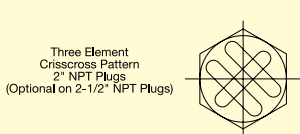
Explosion resistant terminal housings are intended to provide containment of an explosion in the enclosure only. No portion of the heater assembly outside the enclosure is covered under this NEMA rating. Abnormal use of a heater which results in excessive temperature can create hazardous conditions such as a fire. Never perform any type of service nor remove the housing cover prior to disconnecting all electrical power to the heater.

## Wiring Diagrams — Screw Plug Heaters with Two Elements

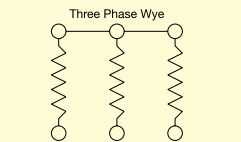
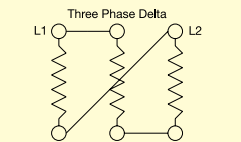
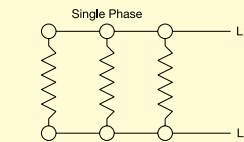
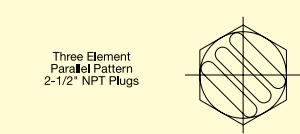


**Note:** Dual-Voltage heaters are factory wired for the higher voltage (series connection) unless otherwise specified. Easily rewired for lower voltage operation (parallel connection).

## Wiring Diagrams — Screw Plug Heaters with Three Elements



**Note:** Standard screw plug immersion heaters with three elements, factory wired for three-phase delta, can be rewired for single-phase operation with no wattage change. Wattage can be reduced to one-third of the designed wattage by switching from three-phase delta to wye connection.



**CAUTION:** Heaters wired for three-phase wye should not be changed to single-phase or three-phase delta connection, since this will increase wattage and watt density on the elements by three times the original designed wattage, causing premature heater failure.

## Screw Plug Immersion Heaters

### TSP Series

- Brass Screw Plug
- Copper Sheath Heating Elements
- NEMA 1 Terminal Housing

60 watts/in<sup>2</sup> (9.3 watts/cm<sup>2</sup>)—Typical Applications: Clean Water

**To Order Visit [omega.com/tsp01840\\_series](http://omega.com/tsp01840_series) for Pricing and Details**

Model Number			Nominal Pipe Size	Immersed Length		KW	Approximate Net Weight	
120V-1Ph	120/240V	240V-1Ph		mm	inch		kg	lbs
TSP01840	—	TSP01841	1 NPT 1 element	114	4½	0.5	1	2
TSP01842	—	TSP01843		165	6½	0.75	1	2
TSP01844	—	TSP01845		168	6⅝	1	1	2
TSP01846	—	TSP01847		203	8	1.25	1	2
TSP01848	—	TSP01849	1 NPT 1 element	235	9¼	1.5	1	3
TSP01850	—	TSP01851		318	12½	2	1	3
TSP01852	—	TSP01853		375	14¾	2.5	1	3
TSP01854	—	TSP01855		426	16¾	3	1	3
—	—	TSP01856	533	21	4	1	3	
TSP01857	—	TSP01858	1¼ NPT 1 element	111	4⅝	0.5	1	3
TSP01859	—	TSP01860		162	6⅝	0.75	1	3
—	TSP01861	—	1¼ NPT 2 elements	111	4⅝	1	1	3
—	TSP01862	—		162	6⅝	1.5	1	3
—	TSP01863	—		216	8½	2	1	3
—	TSP01864	—		273	10¾	2.5	2	4
—	TSP01865	—		381	15	3	2	4
—	—	TSP01866		483	19	4	2	4
—	—	TSP01867	597	23½	5	2	4	
—	—	TSP01868	699	27½	6	2	5	

Model Number					Nominal Pipe Size	Immersed Length		KW	Approximate Net Weight	
120V-1Ph	120/240V	240V-3Ph	240/480V	480V-3Ph		mm	inch		kg	lbs
—	TSP01869	—	TSP01870	—	2 NPT 2 elements	206	8⅝	2	2	4
—	TSP01871	—	TSP01872	—		283	11⅝	3	2	4
—	TSP01873	—	TSP01874	—		384	15⅝	4	2	5
—	TSP01875	—	TSP01876	—		460	18⅝	5	2	5
—	—	—	TSP01877	—	2 elements	537	21⅝	6	3	6
—	—	—	TSP01878	—		676	26⅝	8	3	6
—	—	—	TSP01879	—		816	32⅝	10	3	6
TSP01880	—	TSP01881	—	TSP01882*	2 NPT 3 elements	206	8⅝	3	2	4
TSP01883	—	TSP01884	—	TSP01885*		283	11⅝	4.5	2	5
—	—	TSP01886	—	TSP01887		384	15⅝	6	2	5
—	—	TSP01888	—	TSP01889		460	18⅝	7.5	3	6
—	—	TSP01890	—	TSP01891	3 elements	537	21⅝	9	3	6
—	—	TSP01892	—	TSP01893		676	26⅝	12	3	7
—	—	TSP01894	—	TSP01895		816	32⅝	15	4	8
TSP01896	—	TSP01897	—	TSP01898*	2½ NPT 3 elements	194	7⅝	3	2	4
—	—	TSP01899	—	TSP01900*		225	8⅝	3.75	2	5
TSP01901	—	TSP01902	—	TSP01903*		270	10⅝	4.5	2	5
—	—	TSP01904	—	TSP01905		371	14⅝	6	3	6
—	—	TSP01906	—	TSP01907	3 elements	448	17⅝	7.5	3	6
—	—	TSP01908	—	TSP01909		524	20⅝	9	3	7
—	—	TSP01910	—	TSP01911		664	26⅝	12	4	8
—	—	TSP01912	—	TSP01913		803	31⅝	15	4	9
—	—	TSP01914	—	TSP01915		943	37⅝	18	5	10

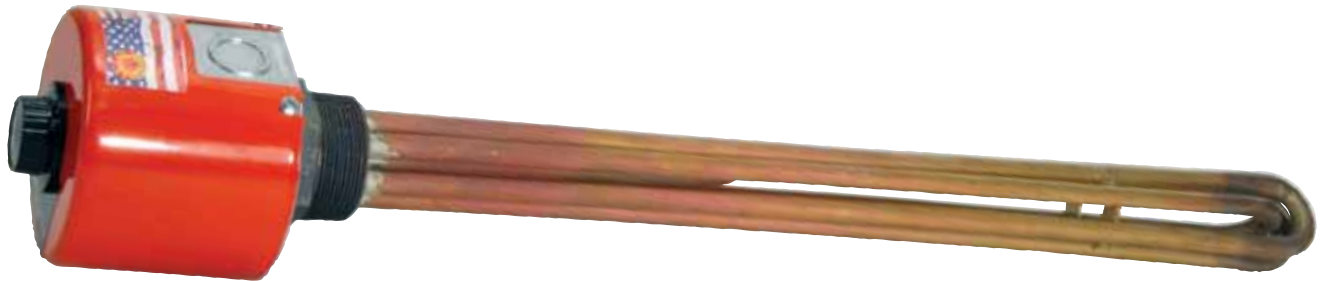
Note: Dual-Voltage heaters are 1-Phase and are wired for the higher voltage unless otherwise specified.  
\* 3-phase only. Other 3-phase heaters are convertible to 1-phase.



## Screw Plug Immersion Heaters

### TSP Series

- 316 Stainless Steel Screw Plug
- 316 Stainless Steel Sheath Heating Elements
- NEMA 1 Terminal Housing



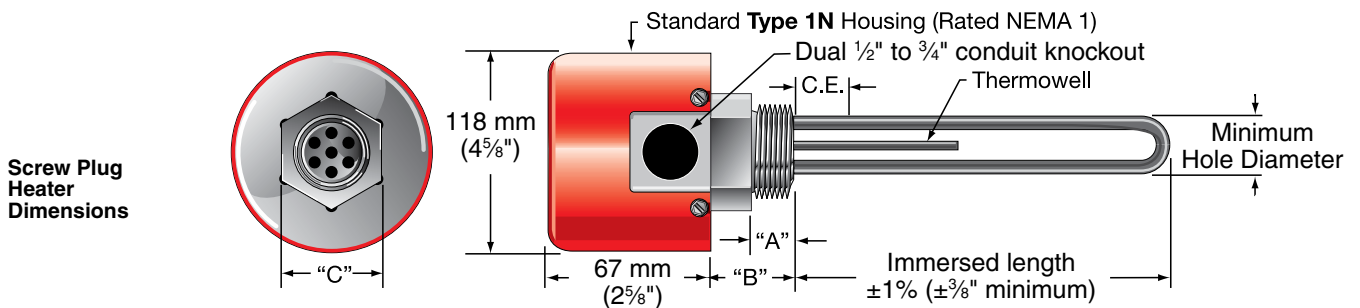
60 watts/in<sup>2</sup> (9.3 watts/cm<sup>2</sup>)—Typical Applications: Deionized Water and Demineralized Water

**To Order Visit [omega.com/tsp01840\\_series](http://omega.com/tsp01840_series) for Pricing and Details**

Model Number			Nominal Pipe Size	Immersed Length		KW	Approximate Net Weight	
120V-1Ph	240V-3Ph	480V-3Ph		mm	inch		kg	lbs
TSP01822	TSP01823	TSP01824*	2½" NPT 2 elements	194	7⅝"	3	3	7
TSP01825	TSP01826	TSP01827*		270	10⅝"	4.5	3	7
—	TSP01828	TSP01829		372	14⅝"	6	4	8
—	TSP01830	TSP01831		448	17⅝"	7.5	4	8
—	TSP01832	TSP01833		524	20⅝"	9	4	9
—	TSP01834	TSP01835		664	26⅝"	12	5	10
—	TSP01836	TSP01837		803	31⅝"	15	5	11
—	TSP01838	TSP01839		943	37⅝"	18	5	12

Note: Dual-Voltage heaters are 1-Phase and are wired for the higher voltage unless otherwise specified.

\*3-phase only. Other 3-phase heaters are convertible to 1-phase.



Screw Plug NPT	Minimum Hole Diameter		A		B		C		Thermowell Bulb Size		Standard Cold Ends (CE)		Element Diameter	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
1	29	1⅛	22	⅞	32	1¼	35	1⅜	6.4	¼	25	1	8	0.315
1¼	35	1⅜	24	1⅝	33	1⅙	44	1¾	6.4	¼	25	1	9	0.315
2	57	2¼	27	1⅙	40	1⅙	64	2½	9.5	⅜	50	2	11	0.430
2½	64	2½	33	1⅝	52	2⅙	76	3	9.5	⅜	50	2	12	0.475



## Screw Plug Immersion Heaters

### TSP Series

- Stainless Steel, Brass or Steel Screw Plugs
- Four Standard Screw Plug Sizes—25.4 mm (1"), 31.8 mm (1¼"), 50.8 mm (2"), 63.5 mm (2½")
- Recompacted Element Bends Restore Insulation Resistance after Forming
- Thermowell for Optional Bulb and Capillary Thermostat, RTD or Thermocouple Probe
- Corrosion-Resistant Electrical Wiring Hardware
- Four Standard Sheath Materials—Copper, Steel, 316 Stainless Steel and Incoloy® 800
- NEMA 1 Round Terminal Housing
- Silicone Resin Element Seal Standard

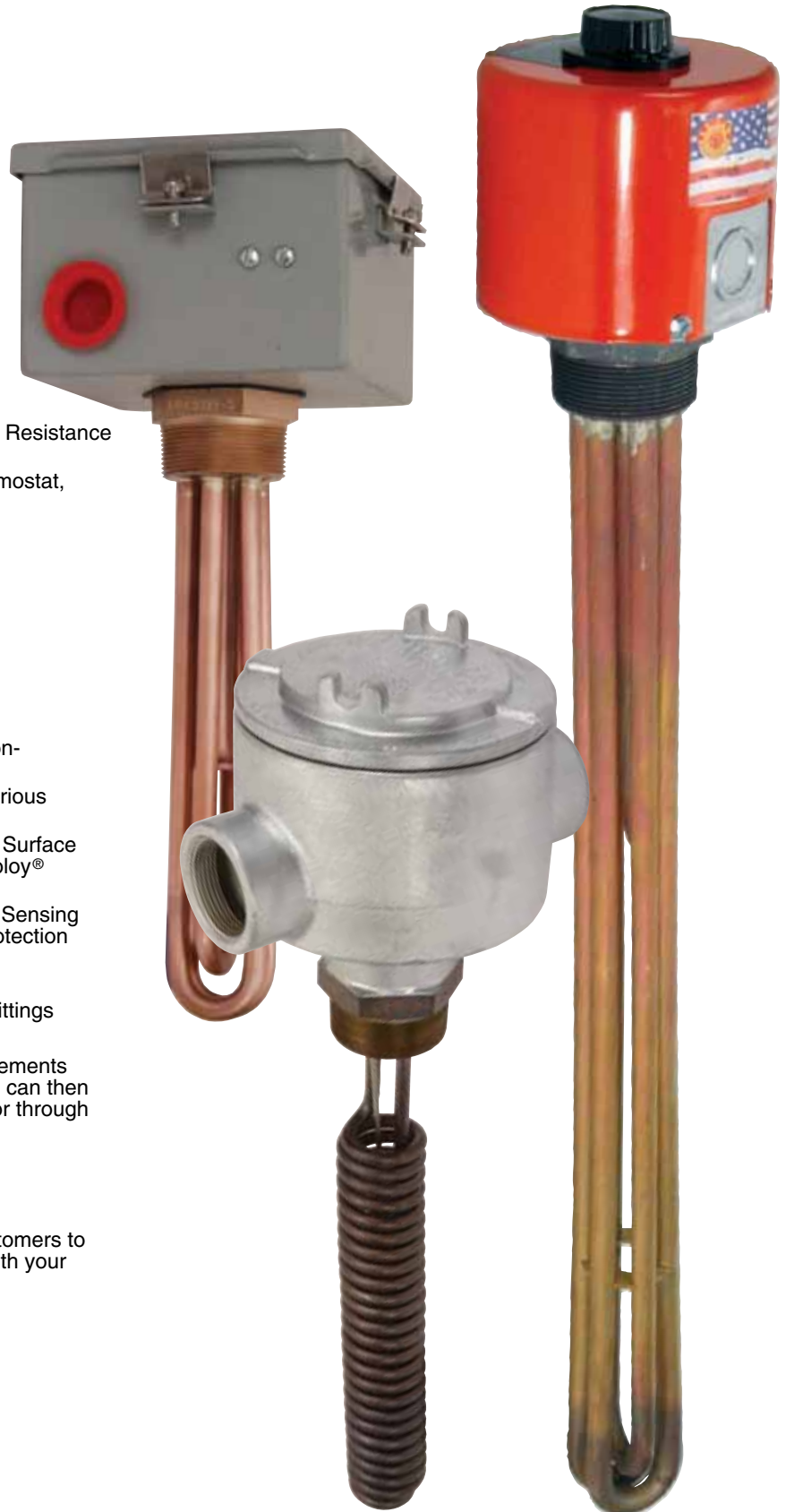
### Optional Features

- NEMA 4 Moisture-Proof and/or NEMA 7 Explosion-Resistant Terminal Housings
- Integral Single or Double Pole Thermostats in Various Temperature Ranges to Suit the Application
- Passivation, Electropolishing or Bright Annealing Surface Treatments Available for Stainless Steel and Incoloy® Elements
- Type J and K Thermocouples or RTD Probes for Sensing Process Temperatures, or Over-Temperature Protection when Attached to the Sheath
- Special Sheath Materials
- Special Straight Bulkhead or European Thread Fittings

Screw plug immersion heaters consist of tubular elements welded or brazed into a threaded screw plug which can then be inserted into a threaded opening in a tank wall or through a mating full or half coupling.

### Need Customer Assistance?

We take pride in our record of working with our customers to develop the right heater for the job. Call OMEGA with your requirements.



## Screw Plug Immersion Heaters

### Checklist—Selecting the Proper Screw Plug Heater

#### ✓ Determine a Safe and Efficient Element Watt Density

**Element Watt Density** is the wattage dissipated per square inch of the element sheath surface and is calculated with the following formula.

$$\text{Watt Density} = \frac{\text{element wattage}}{\pi \times \text{element diameter} \times \text{element heated length}}$$

For a particular application, element watt density will govern element sheath temperature. Factors to consider when choosing a suitable watt density are:

1. Many materials are heat sensitive and can decompose or be damaged if the element is running too hot.
2. Air and other gases that are poor conductors of heat require watt densities matched to the velocity of the gas flow to prevent element overheating.
3. When heating hard water and cleaning solutions mineral deposits can build up on the element sheath, acting as a heat insulator and raising the internal element temperature. If these deposits cannot be periodically removed, use a lower watt density element to increase heater life expectancy.

#### ✓ Select the Element Sheath Material

##### Sheath Material Selection

**CORROSION.** In addition to selecting a sheath material that is compatible with the heated medium, other factors that affect corrosion need to be considered.

1. The temperature of the corrodent. As temperature increases the degree of corrosion increases. Also remember that usually the element temperature is higher than the material it is heating.
2. The degree of aeration to which a corrodent is exposed. Stagnant conditions can deprive the stainless steels of oxygen, which is required to maintain their corrosion resistant surface.
3. Velocity of the corrodent. Increased velocity can increase the corrosion rate.

##### Typical Applications

**Copper Sheath**—Process water, water with very weak chemical solutions, demineralized, deionized or pure water, hot water storage for washrooms, showers, cleaning and rinsing parts, for freeze protection of cooling towers and sprinkler systems and other aqueous solutions not corrosive to copper sheath. Sheath temperatures to 177°C (350°F).

**Incoloy® Sheath**—Weak chemical solutions, oils, tar, caustic soda, detergent, alkaline solutions, molten salts, demineralized, deionized or pure water (sheath passivation is recommended), and other aqueous solutions not corrosive to Incoloy® sheath. Air, gas mixtures and superheated steam. Sheath temperatures to 871°C (1600°F).

**Steel Sheath**—Fluid heat transfer media, tar, high to low viscosity petroleum oils, asphalt, wax, paraffin, degreasing solvents, alcohol, molten salt, and other solutions not corrosive to steel sheath. Sheath temperatures to 399°C (750°F).

### Surface Treatments for Stainless Steel and Incoloy® Elements and Other Wetted Parts to Improve Corrosion Resistance

Screw Plug Immersion Heater surfaces in contact with the material being heated can be passivated or electro-polished to improve their resistance to corrosion.

**Passivation** removes surface contamination, usually iron, so that the optimum corrosion resistance of the stainless steel is maintained. Surface contamination would come from the small amount of steel that may be worn off a tool during the manufacturing process. Passivating is accomplished by dipping the heater in a warm solution of nitric acid.

**Electro-Polishing** is an electrochemical process that removes surface imperfections and contaminants, enhancing the corrosion resisting ability of the stainless steels. The resultant surface is clean, smooth and bright. Many medical and food applications require this finish.

#### ✓ Select the Terminal Housing Type

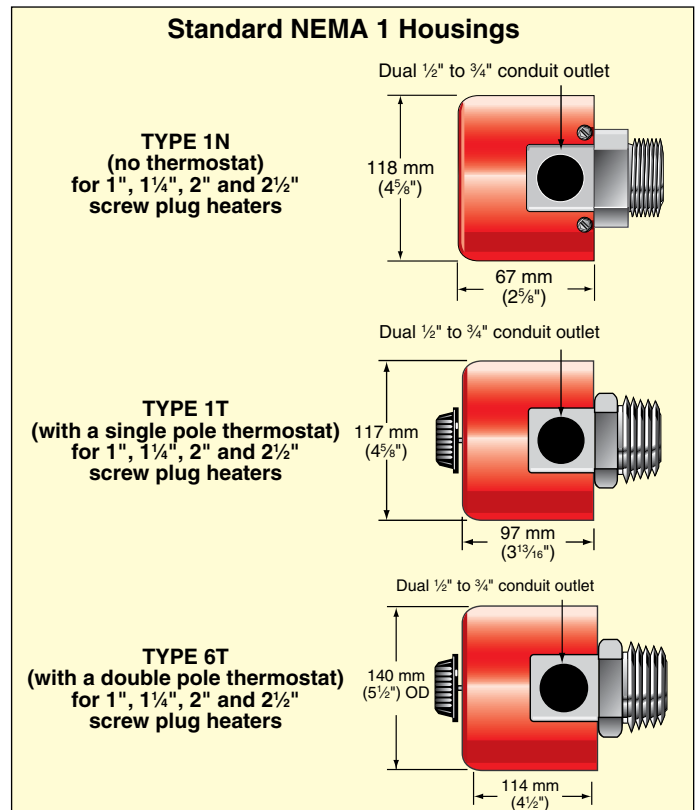
Standard catalog screw plug immersion heaters are supplied with the Type 1N general purpose (NEMA 1) terminal housing with a single Dual ½ to ¾ conduit knockout as shown on the previous page. Additional housings with and without a thermostat include:

**Moisture Resistant (NEMA 4)**

**Explosion Resistant (NEMA 7)**

**Moisture/Explosion Resistant (NEMA 4/7)**

If the housings on this and the following page do not meet the size, construction or other criteria of your application, consult OMEGA with your requirements.

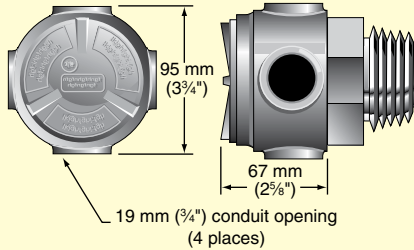




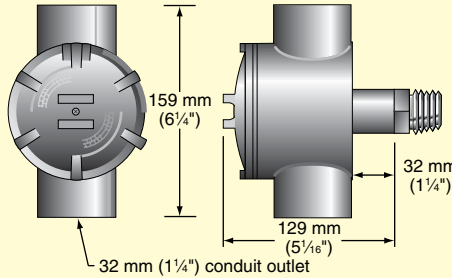
# Screw Plug Immersion Heaters

**Standard NEMA 4 and/or 7 Housings**  
 NEMA 4 rating requires the use of the cover gasket.

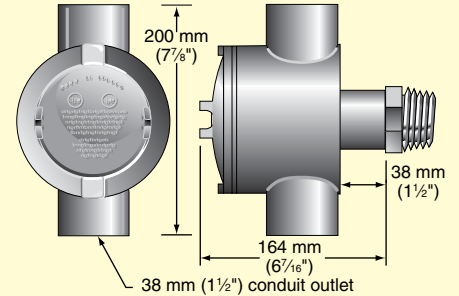
**TYPE 2N**  
 (no thermostat)  
 for 1", 1 1/4", 2" and 2 1/2"  
 screw plug heaters



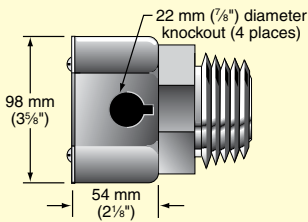
**TYPE 2T**  
 (with a single pole thermostat)  
 for 1" and 1 1/4" screw plug heaters



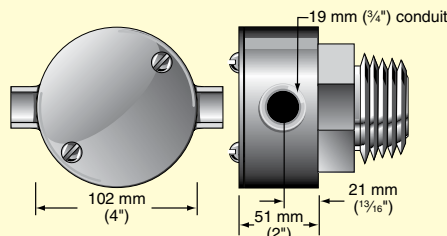
**TYPE 3T**  
 (with a double pole thermostat)  
 for 2" and 2 1/2" screw plug heaters



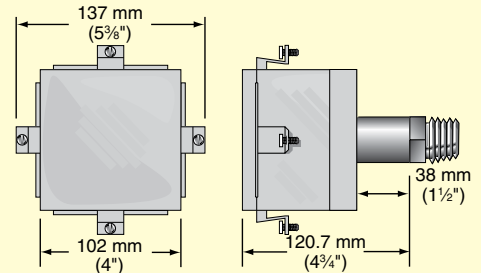
**Alternate NEMA 1 Housing**  
**Type 3N**  
 (no thermostat)  
 for 1", 1 1/4", 2" and 2 1/2"  
 screw plug heaters



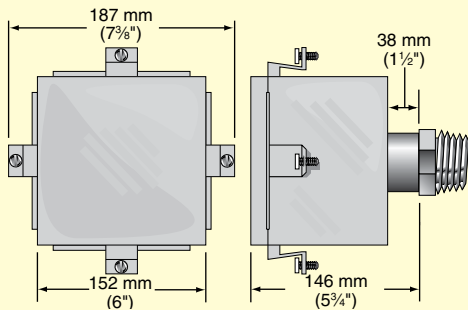
**Alternate NEMA 4 Housing**  
**TYPE 4N**  
 (no thermostat)  
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 screw plug heaters



**Alternate NEMA 4 Housing**  
**TYPE 4T**  
 (with a single pole thermostat)  
 for 1" and 1 1/4" screw plug heaters

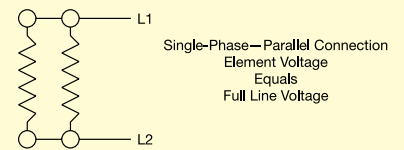
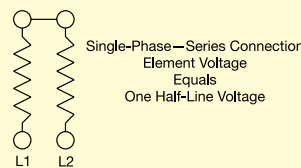
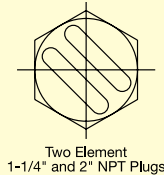


**Alternate NEMA 4 Housing**  
**TYPE 5T**  
 (with a single or double pole thermostat)  
 for 2" and 2 1/2" screw plug heaters



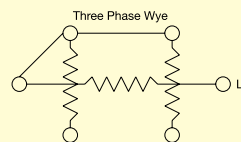
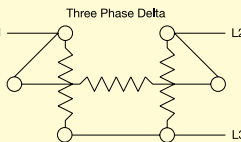
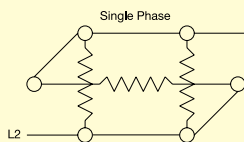
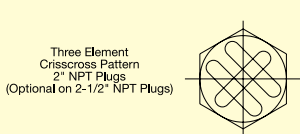
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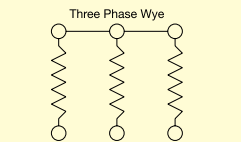
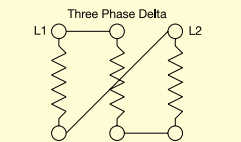
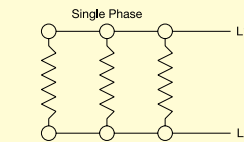
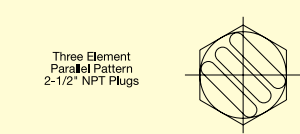


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TSP01848	—	TSP01849	1 element	235	9¼	1.5	1	3	
TSP01850	—	TSP01851		318	12½	2	1	3	
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TSP01854	—	TSP01855		426	16¾	3	1	3	
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TSP01857	—	TSP01858	1¼ NPT	111	4⅝	0.5	1	3	
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—	TSP01861	—	1¼ NPT	111	4⅝	1	1	3	
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—	—	TSP01866			483	19	4	2	4
—	—	TSP01867	597		23½	5	2	4	
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Model Number					Nominal Pipe Size	Immersed Length		KW	Approximate Net Weight	
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—	TSP01871	—	TSP01872	—		283	11⅝	3	2	4
—	TSP01873	—	TSP01874	—		384	15⅝	4	2	5
—	TSP01875	—	TSP01876	—		460	18⅝	5	2	5
—	—	—	TSP01877	—	2 elements	537	21⅝	6	3	6
—	—	—	TSP01878	—		676	26⅝	8	3	6
—	—	—	TSP01879	—		816	32⅝	10	3	6
TSP01880	—	TSP01881	—	TSP01882*	2 NPT	206	8⅝	3	2	4
TSP01883	—	TSP01884	—	TSP01885*		283	11⅝	4.5	2	5
—	—	TSP01886	—	TSP01887		384	15⅝	6	2	5
—	—	TSP01888	—	TSP01889		460	18⅝	7.5	3	6
—	—	TSP01890	—	TSP01891	3 elements	537	21⅝	9	3	6
—	—	TSP01892	—	TSP01893		676	26⅝	12	3	7
—	—	TSP01894	—	TSP01895		816	32⅝	15	4	8
TSP01896	—	TSP01897	—	TSP01898*	2½ NPT	194	7⅝	3	2	4
—	—	TSP01899	—	TSP01900*		225	8⅝	3.75	2	5
TSP01901	—	TSP01902	—	TSP01903*		270	10⅝	4.5	2	5
—	—	TSP01904	—	TSP01905		371	14⅝	6	3	6
—	—	TSP01906	—	TSP01907	3 elements	448	17⅝	7.5	3	6
—	—	TSP01908	—	TSP01909		524	20⅝	9	3	7
—	—	TSP01910	—	TSP01911		664	26⅝	12	4	8
—	—	TSP01912	—	TSP01913		803	31⅝	15	4	9
—	—	TSP01914	—	TSP01915		943	37⅝	18	5	10

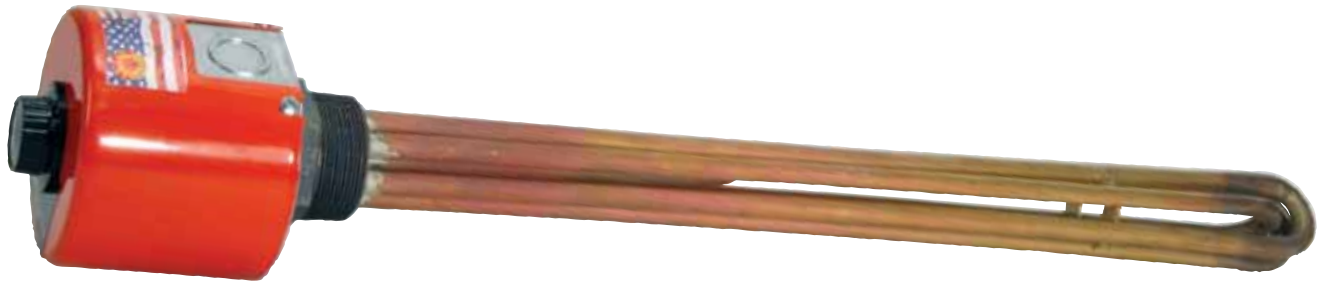
Note: Dual-Voltage heaters are 1-Phase and are wired for the higher voltage unless otherwise specified.  
 \* 3-phase only. Other 3-phase heaters are convertible to 1-phase.



## Screw Plug Immersion Heaters

### TSP Series

- 316 Stainless Steel Screw Plug
- 316 Stainless Steel Sheath Heating Elements
- NEMA 1 Terminal Housing



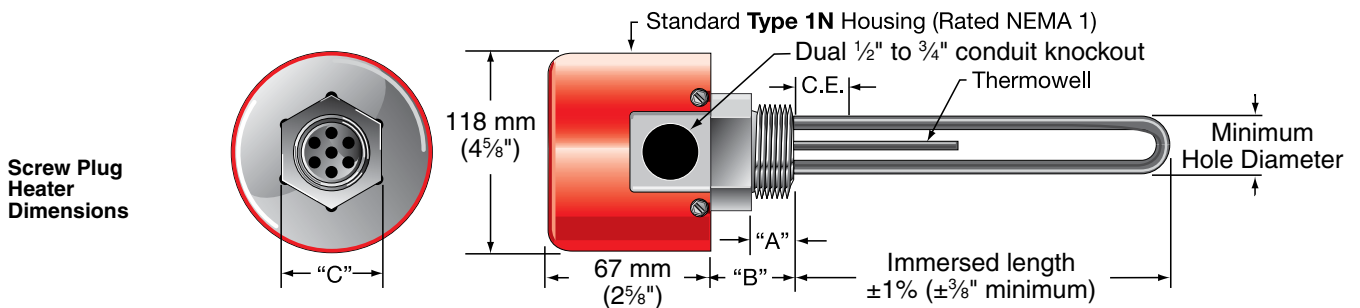
60 watts/in<sup>2</sup> (9.3 watts/cm<sup>2</sup>)—Typical Applications: Deionized Water and Demineralized Water

**To Order Visit [omega.com/tsp01840\\_series](http://omega.com/tsp01840_series) for Pricing and Details**

Model Number			Nominal Pipe Size	Immersed Length		KW	Approximate Net Weight	
120V-1Ph	240V-3Ph	480V-3Ph		mm	inch		kg	lbs
TSP01822	TSP01823	TSP01824*	2½" NPT 2 elements	194	7⅝"	3	3	7
TSP01825	TSP01826	TSP01827*		270	10⅝"	4.5	3	7
—	TSP01828	TSP01829		372	14⅝"	6	4	8
—	TSP01830	TSP01831		448	17⅝"	7.5	4	8
—	TSP01832	TSP01833		524	20⅝"	9	4	9
—	TSP01834	TSP01835		664	26⅝"	12	5	10
—	TSP01836	TSP01837		803	31⅝"	15	5	11
—	TSP01838	TSP01839		943	37⅝"	18	5	12

Note: Dual-Voltage heaters are 1-Phase and are wired for the higher voltage unless otherwise specified.

\*3-phase only. Other 3-phase heaters are convertible to 1-phase.



Screw Plug NPT	Minimum Hole Diameter		A		B		C		Thermowell Bulb Size		Standard Cold Ends (CE)		Element Diameter	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
1	29	1⅛	22	⅞	32	1¼	35	1⅜	6.4	¼	25	1	8	0.315
1¼	35	1⅜	24	1⅝	33	1⅙	44	1¾	6.4	¼	25	1	9	0.315
2	57	2¼	27	1⅙	40	1⅙	64	2½	9.5	⅜	50	2	11	0.430
2½	64	2½	33	1⅝	52	2⅙	76	3	9.5	⅜	50	2	12	0.475

# FLANGED IMMERSION HEATERS FOR BOILERS AND WATER HEATERS

TTSF Series Starts at **\$310**

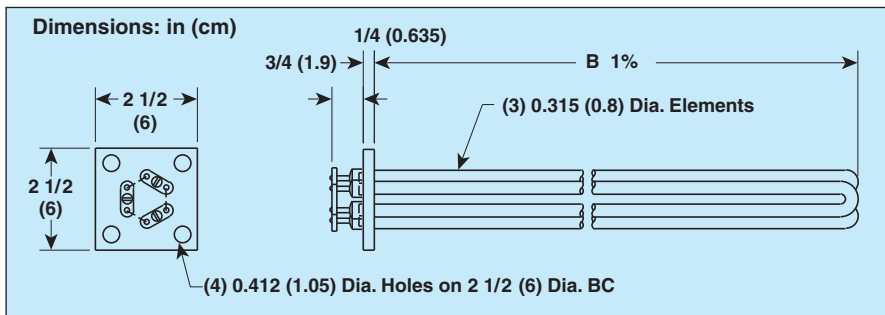


- ✓ 2½" (6 cm) Square Steel Flange
- ✓ Premium Quality
- ✓ Rugged Construction
- ✓ U.L. Component Recognized

Type TTSF heaters are used in industrial water boilers and storage tanks. They feature high watt density for rapid heat transfer. The steam boiler heaters feature the highest quality, high nickel Incoloy® sheath that provides the highest practical protection available against hard water containing minerals, scale and salts while resisting stress, corrosion, cracking, and sulphur attack. The water heater has a copper sheath and copper face plate. These heaters are not supplied with enclosures since they are normally mounted in boilers or tanks which have a surrounding enclosure for terminal protection.



TTSF-009, \$370, shown smaller than actual size.



**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)								
kW	Volts	Circ.	Phase	W/in. <sup>2</sup>	Dim. B in.(cm)	Model No.	Price	Wt. lb (kg)
<b>Steam Boiler Heater Specifications—Incoloy Sheath</b>								
5	208	1	3	94	12 (30)	TTSF-009	\$370	2 (0.9)
5	240	1	3	94	12 (30)	TTSF-010	370	2 (0.9)
10	208	1	3	79	24 <sup>7</sup> / <sub>16</sub> (61)	TTSF-005	415	3 (1)
10	240	1	3	79	24 <sup>7</sup> / <sub>16</sub> (61)	TTSF-006	415	3 (1)
10	480	1	3	79	24 <sup>7</sup> / <sub>16</sub> (61)	TTSF-007	415	3 (1)
15	208	1	3	82	34 (84)	TTSF-002	450	4 (2)
15	240	1	3	82	34 (84)	TTSF-003	450	4 (2)
15	480	1	3	82	34 (84)	TTSF-001	465	4 (2)
<b>Water Heater Specifications—Copper Sheath/Copper Face Plate</b>								
13.5	208	1	3	184	13 <sup>7</sup> / <sub>16</sub> (34)	TTSF-3135	\$310	2 (0.9)
13.5	480	1	3	184	13 <sup>7</sup> / <sub>16</sub> (34)	TTSF-3135	310	2 (0.9)
15	480	1	3	153	17 <sup>7</sup> / <sub>16</sub> (44)	TTSF-3150	395	3 (1)
18	480	1	3	153	21 <sup>1</sup> / <sub>16</sub> (53)	TTSF-3180	420	4 (2)

Ordering Examples: TTSF-009, 5 kW, 208V, flanged immersion heater Incoloy sheath, \$370. TTSF-3135, 13.5 kW 480V, immersion heater, copper sheath/copper face plate, \$310.

## SPECIFICATIONS

**Wattage:** 5 to 18 kW  
**Power:** 208 and 240 or 480 Vac, 3 Phase  
**Watt Density:** 79 to 184 W/in.<sup>2</sup>  
**Sheath:** 0.315" (0.8 cm) dia. Incoloy (steam boiler heater) or copper (water heater).

## CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.



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Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

# FOOD EQUIPMENT HEATERS WITH LOW LIQUID CUTOUT

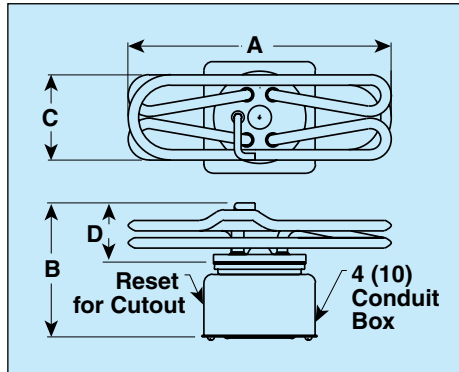
## TTUH-CO Series



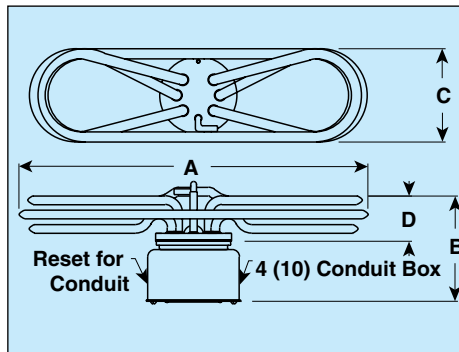
- ✓ Brass Flange
- ✓ Copper Sheath
- ✓ High Watt Density
- ✓ Without Contactor
- ✓ Integral Low Liquid Thermal Cutout

## FEATURES

The TTUH-CO series heater is mounted through a 6 cm (2<sup>5</sup>/<sub>16</sub>" ) diameter opening in bottom of vessel. Heater is inserted with gasket through top of vessel or through hand hole. Mount combination terminal box and clamp over the element flange and use bolt to draw mounting clamp tightly to the tank.



Dimensions: inch (cm)



TTUH-CO-15/208V shown smaller than actual size.



TTUH-CO-303/240/3P shown smaller than actual size.

To Order							
kW	W/in <sup>2</sup>	Dimensions: inch (cm)				Model No.	Wt. lb (kg)
		A	B	C	D		
<b>TTUH-CO Series — Single Phase W/cutout — 2<sup>1</sup>/<sub>2</sub>" Minimum Liquid Depth</b>							
1.5	62	7 <sup>7</sup> / <sub>16</sub> (19)	4 <sup>13</sup> / <sub>16</sub> (12)	3 <sup>1</sup> / <sub>16</sub> (8)	2 <sup>3</sup> / <sub>8</sub> (6)	TTUH-CO-15/*	3 (1)
2	60	9 <sup>7</sup> / <sub>16</sub> (23)	4 <sup>13</sup> / <sub>16</sub> (12)	3 <sup>1</sup> / <sub>16</sub> (8)	2 <sup>1</sup> / <sub>8</sub> (5)	TTUH-CO-20/*	3 (1)
2.5	40	6 <sup>3</sup> / <sub>4</sub> (17)	4 <sup>13</sup> / <sub>16</sub> (12)	3 <sup>1</sup> / <sub>16</sub> (8)	2 <sup>1</sup> / <sub>8</sub> (5)	TTUH-CO-25/*	3 <sup>1</sup> / <sub>8</sub> (1)
3	55	6 <sup>3</sup> / <sub>4</sub> (17)	4 <sup>13</sup> / <sub>16</sub> (12)	3 <sup>1</sup> / <sub>16</sub> (8)	2 <sup>1</sup> / <sub>8</sub> (5)	TTUH-CO-30/*	3 <sup>1</sup> / <sub>4</sub> (1)
4	64	9 <sup>1</sup> / <sub>2</sub> (24)	4 <sup>13</sup> / <sub>16</sub> (12)	3 <sup>1</sup> / <sub>16</sub> (8)	2 <sup>1</sup> / <sub>8</sub> (5)	TTUH-CO-40/*	3 <sup>7</sup> / <sub>8</sub> (2)
5	70	12 <sup>3</sup> / <sub>4</sub> (32)	5 <sup>3</sup> / <sub>8</sub> (14)	4 (10)	2 <sup>11</sup> / <sub>16</sub> (7)	TTUH-CO-50/*	5 (2)
6	73	14 <sup>1</sup> / <sub>2</sub> (37)	5 <sup>3</sup> / <sub>8</sub> (14)	4 (10)	2 <sup>11</sup> / <sub>16</sub> (7)	TTUH-CO-60/*	6 (3)
7	85	14 <sup>1</sup> / <sub>2</sub> (37)	5 <sup>3</sup> / <sub>8</sub> (14)	4 (10)	2 <sup>11</sup> / <sub>16</sub> (7)	TTUH-CO-70/240	6 (3)
<b>TTUH-CO Series — Three Phase with Cutout — 3" Minimum Liquid Depth</b>							
3	55	8 <sup>3</sup> / <sub>4</sub> (22)	5 <sup>1</sup> / <sub>16</sub> (15)	3 <sup>1</sup> / <sub>8</sub> (8)	2 <sup>3</sup> / <sub>4</sub> (7)	TTUH-CO-303/*/3P	4 (2)
4	74	8 <sup>3</sup> / <sub>4</sub> (22)	5 <sup>13</sup> / <sub>16</sub> (15)	3 <sup>1</sup> / <sub>8</sub> (8)	2 <sup>3</sup> / <sub>4</sub> (7)	TTUH-CO-403/*/3P	5 (2)
5	73	11 (28)	5 <sup>13</sup> / <sub>16</sub> (15)	3 <sup>1</sup> / <sub>8</sub> (8)	2 <sup>3</sup> / <sub>4</sub> (7)	TTUH-CO-503/**/3P	5 (2)
6	72	11 <sup>1</sup> / <sub>16</sub> (28)	5 <sup>3</sup> / <sub>4</sub> (16)	4 <sup>1</sup> / <sub>16</sub> (10)	3 (8)	TTUH-CO-603/*/3P	5 (2)
7	78	11 <sup>1</sup> / <sub>16</sub> (28)	5 <sup>3</sup> / <sub>4</sub> (16)	4 <sup>1</sup> / <sub>16</sub> (10)	3 (8)	TTUH-CO-703/208/3P	4 <sup>1</sup> / <sub>2</sub> (2)
8	69	14 <sup>1</sup> / <sub>2</sub> (37)	5 <sup>3</sup> / <sub>4</sub> (16)	4 <sup>1</sup> / <sub>16</sub> (10)	3 (8)	TTUH-CO-803/208/3P	6 (3)
9	78	14 <sup>1</sup> / <sub>2</sub> (37)	5 <sup>3</sup> / <sub>4</sub> (16)	4 <sup>1</sup> / <sub>16</sub> (10)	3 (8)	TTUH-CO-903/208/3P	6 (3)

\* Designate voltage, i.e. insert "208" for 208V or "240" for 240V.  
 /\*\* Designate voltage, i.e., "208" for 208V or "240" for 240V, or "480" for 480V.  
 Note: Other kW rating and voltages are available. Contact OMEGALUX®.  
 Ordering Examples: TTUH-CO-15/208, 1.5 kW heater powered by 208 Vac.  
 TTUH-CO-303/240/3P, 3 kW heater powered by 240 Vac 3 phase.

When mounting in a closed tank, a hand hole should be cut in the side of the tank only large enough to insert the heater and reach to the bottom of the tank to insert in the 6 cm (2<sup>5</sup>/<sub>16</sub>" ) diameter mounting hole. See To Order table for heater dimensions.

## SPECIFICATIONS

**Wattage:** 1.5 to 9 kW  
**Power:** 208 and 240 or 480V, 1 and 3 Phase  
**Watt Density:** 40 to 85 W/in<sup>2</sup>  
 Note: All models have an integral low-liquid cutout to protect the heater.

**CAUTION AND WARNING!**

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warning.

# FOOD EQUIPMENT HEATERS

## TTUH Series

- ✓ High Watt Density
- ✓ Brass Flange
- ✓ Copper Sheath
- ✓ Without Integral Low Liquid Cutout
- ✓ Most Models UL Listed

## FEATURES

The TTUH-CO heater is mounted through a 2 7/16" dia. opening in bottom of vessel. Heater is inserted with gasket through top of vessel or through hand hole. Mount combination terminal box and clamp over the element flange and use bolt to draw mounting clamp tightly to tank.

When mounting in a closed tank, a hand hole should be cut in the side of the tank only large enough to insert the heater and reach to the bottom of the tank to insert in the 2 7/16" dia. mounting hole. See How to Order Table for heater dimensions.

## APPLICATIONS

For coffee urns, steam tables, kettles, humidifiers and other commercial uses.

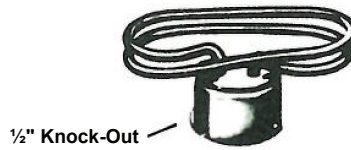
## SPECIFICATIONS

**Wattage:** 1 to 12 kW  
**Power:** 120, 208, 240 and 480 V, one and three phase  
**Watt Density:** 42 to 98 W/in<sup>2</sup>

*Note: These models do not have a built-in low liquid cutout.*

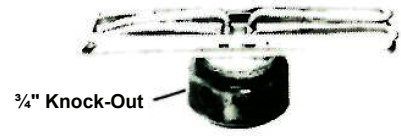
### CAUTION AND WARNING!

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.



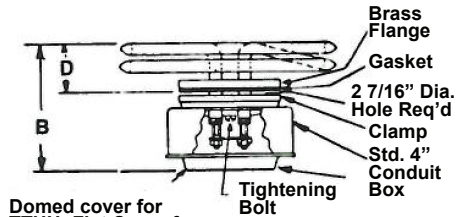
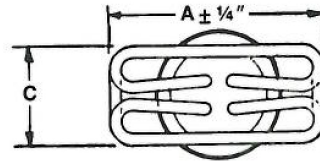
1/2" Knock-Out

TTUH Series — 1 through 4 kW Single Phase Shown



3/4" Knock-Out

TTUH Series — 5 through 7 kW Single Phase Shown



Domed cover for TTUH; Flat Cover for TTUH-CO

**Ordering Example:** TTUH-15A/120 is a 1.5 kW heater powered by 120 VAC.

**Ordering Example:** TTUH-503/240/3P is a 5 kW heater powered by 3 phase 240 VAC.

To Order (Specify Model Number)							
kW	W/in <sup>2</sup>	Dimensions: inch (cm)				Catalog No.	Wt. lbs.
		A	B	C	D ‡		
<b>TTUH Series — 1 ph, 2 1/2" Minimum Liquid Depth</b>							
1	42	6 3/4	4 9/16	4 1/4	2 5/16	†TTUH-10A/120	2 3/4
1.5	57	6 3/4	4 9/16	4 1/4	2 5/16	†TTUH-15A/*	2 3/4
2	57	6 3/4	4 9/16	4 1/4	2 5/16	†TTUH-20A/*	2 3/4
2.5	58	6 3/4	4 9/16	4 1/4	2 5/16	†TTUH-25A/*	2 7/8
3	55	6 3/4	4 9/16	4 1/4	2 5/16	†TTUH-30A/*	3
4	53	9 1/2	4 9/16	4	1 3/8	†TTUH-40A/*	3 3/8
5	39	12 3/4	4 9/16	4	1 11/16	†TTUH-50/**	4 1/2
6	42	14 1/2	4 9/16	4	1 11/16	†TTUH-60/**	5 1/2
7	49	14 1/2	4 9/16	4	1 11/16	†TTUHs70/**	5 1/2
<b>TTUH Series — 3 ph, 3" Minimum Liquid Depth</b>							
3	55	8 3/4	4 5/8	3 1/8	1 15/16	TTUH-303/208/3P	3 1/2
3	55	8 3/4	4 5/8	3 1/8	1 15/16	†TTU H-303/240/3P	3 1/2
4	74	8 3/4	4 5/8	3 1/8	1 15/16	†TTUH-403/208/3P	3 1/2
4	74	8 3/4	4 5/8	3 1/8	1 15/16	†TTU H-403/240/3P	3 1/2
4	74	8 3/4	4 5/8	3 1/8	1 15/16	TTUH-403/480/3P	3 1/2
5	73	11	4 5/8	3 1/8	1 15/16	†TTUH-503/**/3P	4 1/2
6	67	11 1/16	5	4 1/16	2 3/8	†TTUH-603/240/3P	4 1/2
6	67	11 1/16	5	4 1/16	2 3/8	TTUH-603/480/3P	4 1/2
7	78	11 1/16	5	4 1/16	2 3/8	†TTUH-703/**/3P	4 1/2
8	69	11 1/8	5	4 1/16	2 3/8	TTUH-803/**/3P	4 1/2
12	98	17 3/4	5	4 1/16	2 3/8	TTU H-1203/240/3P	5 1/2

† UL listed.

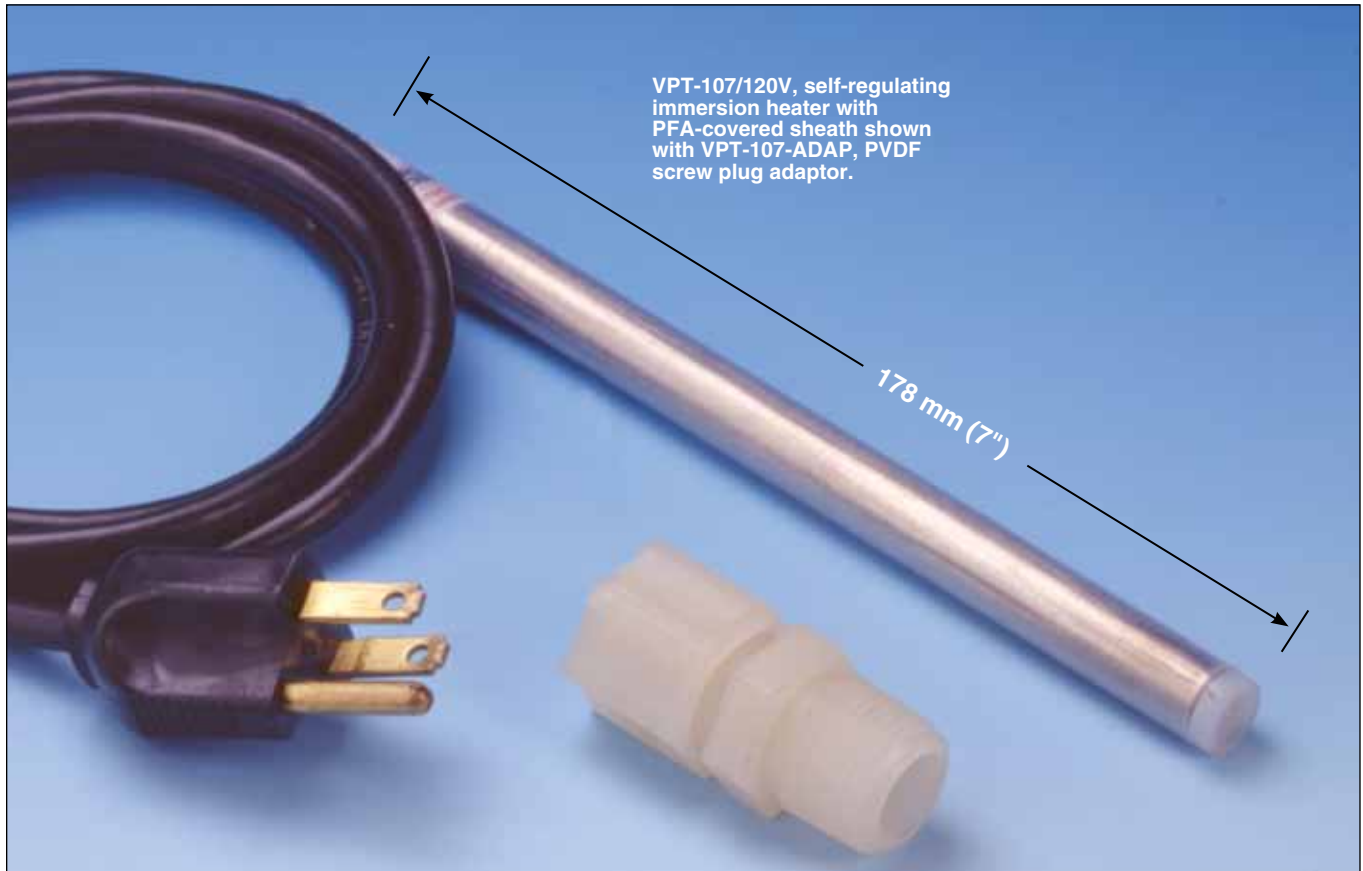
‡ Minimum liquid level should be maintained at 1/2" above D dimension.

\* Designate voltage, i.e., insert 120 for 120V, 240 for 240 V or 480 for 480 V

\*\* Designate voltage, i.e., insert 208 for 208 Var 240 for 240 V

# SELF-REGULATING IMMERSION HEATERS

## With Stainless Steel or PFA-Covered Stainless Steel Sheaths

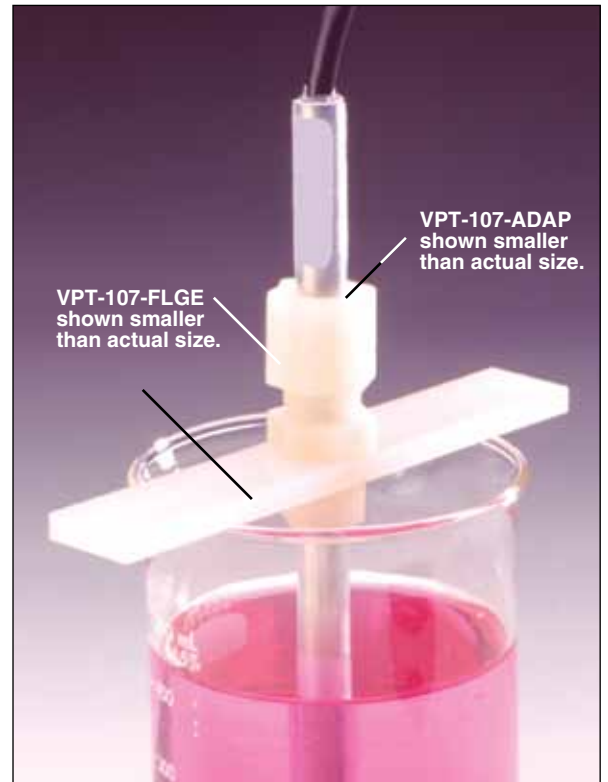
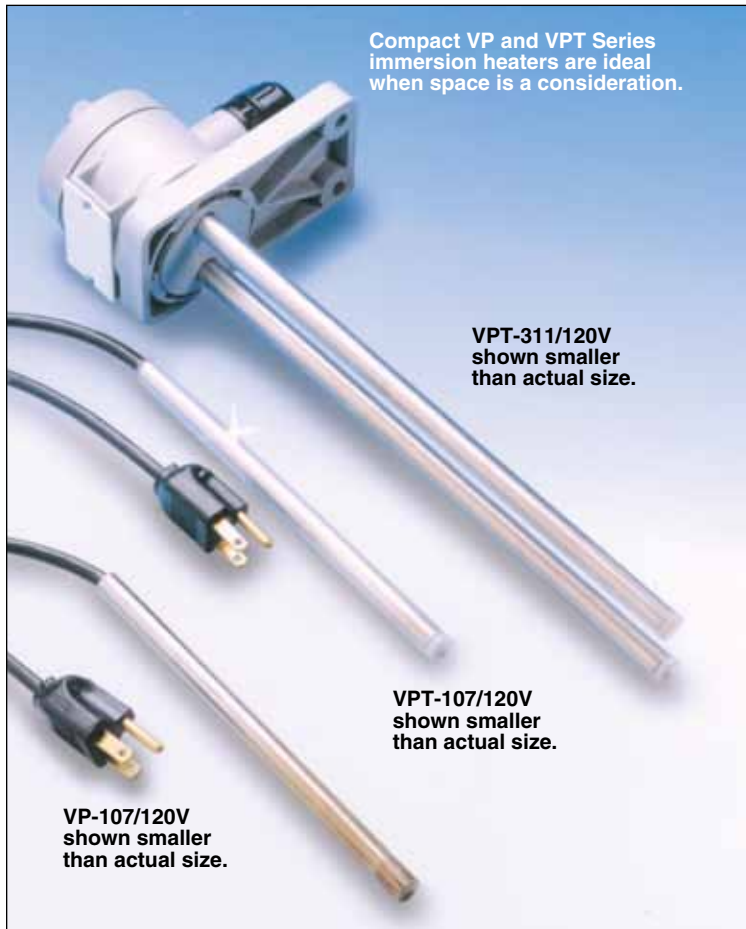


### VP Series

#### VP and VPT Series

- ✓ Self-Regulating, Fully Grounded
- ✓ Stainless Steel—or PFA-Covered Stainless Steel Sheaths
- ✓ Solid State Heating Element, Temperatures Up to 100°C (212°F)
- ✓ Auto-Stabilized Temperature Ensures Uniform Heating
- ✓ Lightweight, Easy to Handle, Rapid Heating

The OMEGA® VP and VPT Series self-regulating, fully grounded immersion heaters are ideal for insertion into small tanks, vessels, and appliances as well as into compressors, oils, fluids, and plating cells. Available in stainless steel or a PFA sheath for corrosive environments, both models are shatterproof; are grounded with a 3-wire, 1.2 m (4') long power cord; and have a solid state heating element. Best suited for applications in which heating, excess temperature-protection controls, and regulating components must be fitted in a small space, these heaters are lightweight, easy-to-handle, rapid-heating [maximum surface temperature is 100°C (212°F) units designed not to overheat. Auto-stabilized temperature prevents hot spots, thereby ensuring uniform heating. Accessories include a ½ NPT PVDF screw plug adaptor that holds the heater securely in place, and a polypropylene mounting flange that permits vertical suspension of the heater into small vessels.



Polypropylene mounting flange allows vertical suspension

## SPECIFICATIONS

### Wattage:

VP-107, VPT-107: 100  
VP-311, VPT-311: 300

### Voltage:

120 or 240 Vac

### Power Leads:

VP-107, VPT-107: 1.2 m (4') power cord with 3-prong plug (no plug on 240V models);  
VP-311, VPT-311: 0.9 m (3') flexible conduit and fitting with 3-conductor leads

### Sheath Length:

VP-107, VPT-107: 179 mm (7")  
VP-311, VPT-311: 279 mm (11")

### Heated Length:

VP-107, VPT-107: last 76 mm (3")  
VP-311, VPT-311: last 152 mm (6")

### Diameter:

VP Series: 11 mm (7/16")  
VPT Series: 13 mm (1/2")

### Shipping Weight:

Approx. 453 g (1 lb)

To Order	
Single-Element Heater	
Model No.	Description
VP-107/*	100 W stainless steel sheath immersion heater
VP-107-ADAP	1/2 NPT PVDF screw plug adaptor for VP-107/* immersion heater
VPT-107/*	100 W stainless steel sheath immersion heater with PFA covering
VPT-107-ADAP	1/2 NPT PVDF screw plug adaptor for VPT-107/* immersion heater
VPT-107-FLGE	Polypropylene mounting flange (used with VP-107-ADAP or VPT-107-ADAP)
Dual-Element Over-the-Side Small Tank Heater	
VP-311/*	300 W stainless steel sheath immersion heater
VPT-311/*	300 W stainless steel sheath immersion heater with PFA covering

\* Designate voltage (i.e., insert "120V" for 120 Vac or "240V" for 240 Vac).

Ordering Example: VPT-107/120V, 120 Vac, 100 W, PFA-covered immersion heater.

VP-311/240VAC, 300 W stainless steel sheath immersion heater.



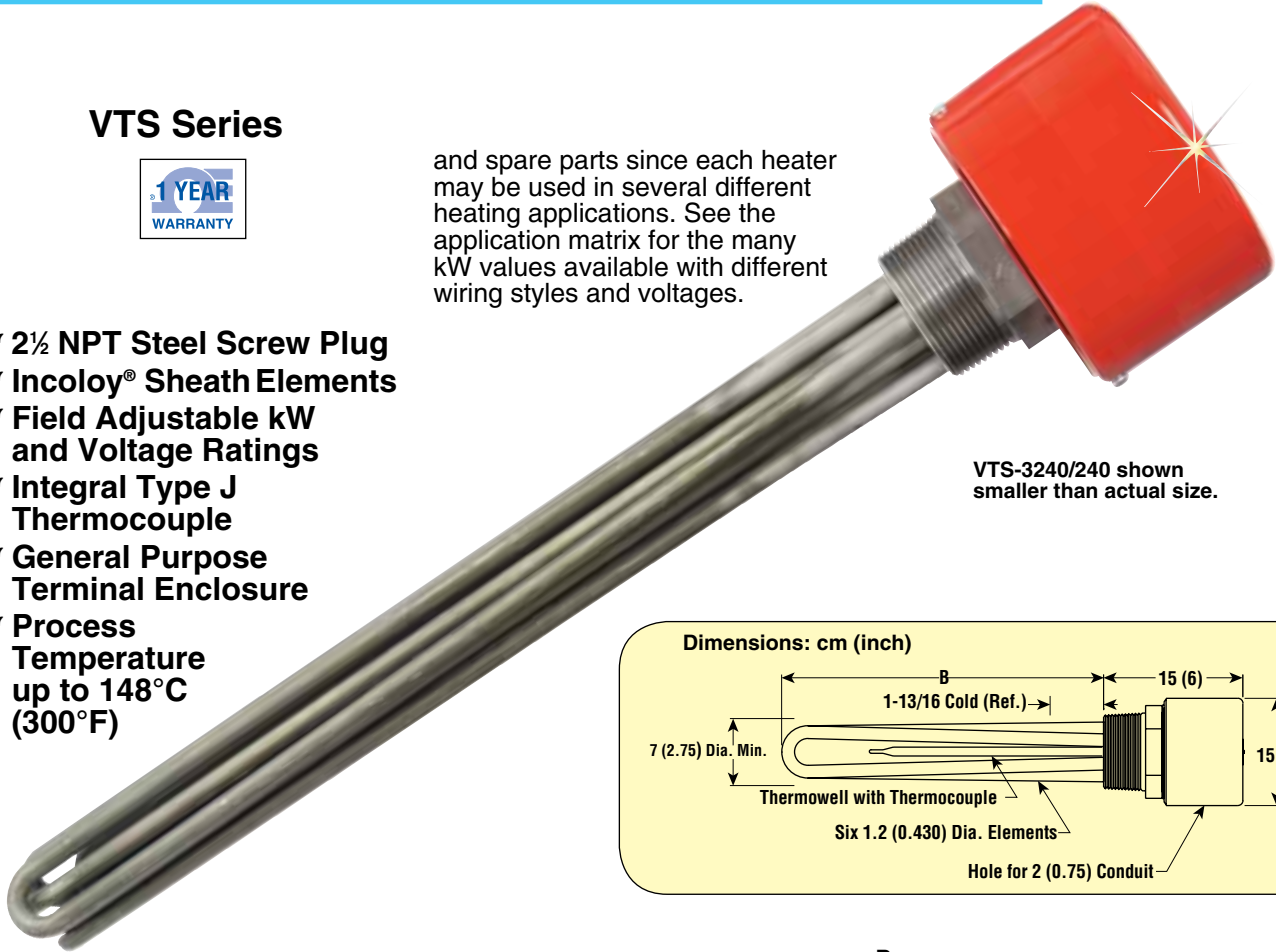
# FIELD ADJUSTABLE SCREW PLUG IMMERSION HEATER/CLEAN WATER AND OIL APPLICATIONS

## VTS Series

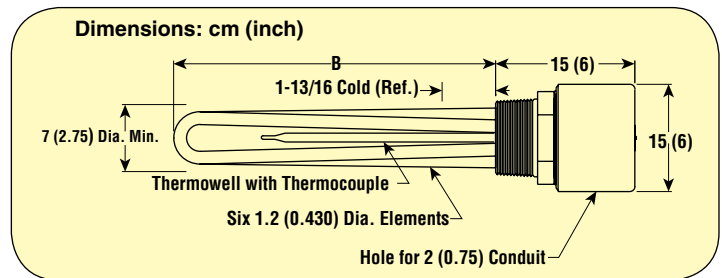


and spare parts since each heater may be used in several different heating applications. See the application matrix for the many kW values available with different wiring styles and voltages.

- 2½ NPT Steel Screw Plug
- Incoloy® Sheath Elements
- Field Adjustable kW and Voltage Ratings
- Integral Type J Thermocouple
- General Purpose Terminal Enclosure
- Process Temperature up to 148°C (300°F)



VTS-3240/240 shown smaller than actual size.



OMEGALUX® field adjustable screw plug immersion heaters can be applied to a variety of clean water and oil applications. The unique versatility of this design allows field adjustment of the rating by simple connections to the six elements of the heater. This simplifies selection

## SPECIFICATIONS

**Wattage:**  
**Water:** 0.5 to 40 kW  
**Oil:** 0.5 to 10 kW  
**Watt Density:**  
**Water:** 2 to 80 W/in<sup>2</sup>  
**Oil:** 2 to 23 W/in<sup>2</sup>

## Power:

**1 Phase:** 120, 208, 240 and 480V  
**3 Phase:** 208, 240 and 480V  
**Sheath:** 1.2 cm (0.430") diameter Incoloy  
**Screw Plug:** 6.4 cm (2.5") steel  
**Enclosure:** General purpose, NEMA 1 rated enclosure can be rotated 360° to match conduit connections

## To Order

Maximum kW	Maximum Volts	Dim cm (inch) B	Model No.	Weight kg (lb)
See Applications Matrix on next page for rating		51 (20 <sup>3</sup> / <sub>16</sub> )	VTS-3180/240	5.5 (12)
		51 (20 <sup>3</sup> / <sub>16</sub> )	VTS-3180/480	5.5 (12)
		77 (30 <sup>3</sup> / <sub>8</sub> )	VTS-3200/240	7 (15)
		51 (20 <sup>3</sup> / <sub>16</sub> )	VTS-3240/240	5.5 (12)
		51 (20 <sup>3</sup> / <sub>16</sub> )	VTS-3240/480	5.5 (12)
		77 (30 <sup>3</sup> / <sub>8</sub> )	VTS-3400/480	7 (15)

**Note:** 240 and 480 in model number indicates max voltage rating. Other voltages can be used. See application matrix for details.

**Ordering Examples:** VTS-3240/240, field adjustable heater, 240 Vac maximum.

VTS-3200/240, immersion heater, field adjustable, 240V.

**Selection Example: Light oil heating application, 2.75 kW 240V 3-phase capacity**

1. Select oil application matrix
2. Locate 2.75 kW on chart. Use 3 kW as next higher rating. Confirm that 20 W/in<sup>2</sup> is suitable for light oil.
3. Find column with 240 Volt 3-phase power
4. Intersection of row and column is model number VTS-3240/480. Confirm 3-phase and single-phase available. Note there is spare capacity for back up or for future increase in requirements.
5. Locate model number **VTS-3240/480** in the "To Order" table for price. When received, this heater will have instructions on wiring for the required rating. Contact Omega's Application Engineers with any questions.

**Application Matrix—Oil**

Model No.					
kW	W/in <sup>2</sup>	120 Volts 1 phase	208 Volts 1 or 3 phase	240 Volts 1 or 3 phase	480 Volts 1 or 3 phase
0.50	2			VTS-3240/480	
0.75	5	VTS-3240/480*	VTS-3240/480*		
1.50	5	VTS-3240/480	VTS-3240/480	VTS-3240/480	VTS-3180/480
2.25	15		VTS-3240/480*	VTS-3180/480*	
2.50	6	VTS-3400/480	VTS-3400/480	VTS-3400/480	
3.00	20	VTS-3240/240*	VTS-3240/240*	VTS-3240/480*	
4.50	15	VTS-3180/240	VTS-3240/480	VTS-3180/480	VTS-3180/480
5.00	11	VTS-3200/240	VTS-3200/240	VTS-3200/240	
6.00	20	VTS-3240/240	VTS-3240/240	VTS-3240/480	VTS-3240/480
10.00	21			VTS-3400/480	VTS-3400/480

**Application Matrix—Water**

Model No.					
kW	W/in <sup>2</sup>	120 Volts 1 phase	208 Volts 1 or 3 phase	240 Volts 1 or 3 phase	480 Volts 1 or 3 phase
0.50	2			VTS-3240/480	
0.75	5	VTS-3240/480*	VTS-3240/480*		
1.50	5	VTS-3240/480	VTS-3240/480	VTS-3240/480	VTS-3180/480
2.25	15		VTS-3240/480*	VTS-3180/480*	
2.50	6	VTS-3400/480	VTS-3400/480	VTS-3400/480	
3.00	20	VTS-3240/240*	VTS-3240/240*	VTS-3240/480*	
4.50	15	VTS-3180/240	VTS-3240/480	VTS-3180/480	VTS-3180/480
5.00	11	VTS-3200/240	VTS-3200/240	VTS-3200/240	
6.00	20	VTS-3240/240	VTS-3240/240	VTS-3240/480	VTS-3240/480
9.00	59			VTS-3400/480	VTS-3400/480
10.00	21			VTS-3400/480	VTS-3400/480
12.00	78			VTS-3240/240*	VTS-3240/480*
18.00	59			VTS-3180/240	VTS-3180/480
20.00	80			VTS-3200/240	VTS-3400/480*
24.00	78			VTS-3240/240	VTS-3240/480
40.00	80				VTS-3400/480

Note: Shaded items are 3 phase only  
 \*Items have 100% spare capacity

# STRIP HEATERS

WS Series



- ✓ 2 1/2" (6 cm) Wide
- ✓ Rugged, Reliable, Premium Quality
- ✓ 400 to 1500 Watt
- ✓ 2 Terminals at Right Angle at One End
- ✓ CSA Certified

The OMEGALUX® WS series strip heater features 2 terminals placed at a right angle on one end. A standard width of 2 1/2" (6 cm) makes them ideal for most strip heater applications.



WS-850/120 shown smaller than actual size.

## SPECIFICATIONS

### Sheath Material:

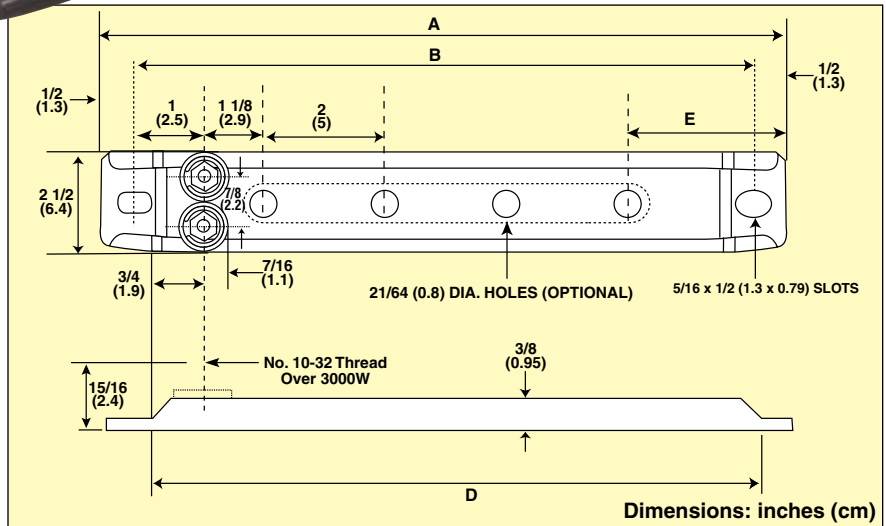
Iron or Chrome Steel

### Maximum Sheath Temperature:

Iron: 399°C (750°F)

Chrome Steel: 649°C (1200°F)

Power: 120 or 240 Vac



### CAUTION AND WARNING

Fire and electrical shock may result if products are used improperly or installed or used by non-qualified personnel. See inside back cover for additional warnings.

**To Order Visit [omega.com/ws\\_heater](http://omega.com/ws_heater) for Pricing and Details**

Rust-Resisting Sheath								Chrome Steel Sheath			
Model No.	Dimensions: in (cm)				No of Mtg Holes**	Watts	W/In <sup>2</sup> †	Model No.	Watts	W/In <sup>2</sup>	Weight lb (kg)
	A	B	D	E							
WS-640/*	6 1/2 (17)	5 1/2 (14)	5 (13)	1 7/8 (5)	2	400	14	WS-605/*	500	25	0.75 (0.3)
WS-850/*	8 1/2 (22)	7 1/2 (19)	7 (18)	1 7/8 (5)	3	500	16	WS-806/*	600	19	1.0 (0.4)
WS-1260/*	12 (30)	11 (28)	10 1/2 (27)	3 3/8 (9)	4	600	12	WS-1208/*	800	16	1.40 (0.6)
WS-1575/*	15 1/4 (39)	14 1/4 (36)	13 3/4 (35)	2 5/8 (7)	6	750	11	WS-1501/*	1000	14	1.88 (0.9)
WS-2185/*	21 (53)	20 (51)	19 1/2 (50)	2 3/8 (6)	9	850	8	WS-2101/*	1250	12	2.28 (1)
WS-2510/*	25 1/2 (65)	24 1/2 (62)	24 (61)	2 5/8 (7)	11	1000	8	WS-2515/*	1500	12	2.63 (1.2)

**Note:** If terminal housing is required with a WS strip heater, use a type SE-AC-1 mounted sideways. Ceramic post terminal insulators can also be used.

\* Designate voltage, i.e., insert "120" for 120 Vac or "240" for 240 Vac.

\*\* 21/64" diameter holes optional. Standard heaters have two mounting holes.

† To determine maximum allowable watt density, see Figures C-8 or C-9 available at [omega.com](http://omega.com).

Ordering Example: WS-1575/240, 2 1/2" wide, 240 Vac strip heater.

# Nextel® Ceramic or 96% Silica



Nextel 312 is an Alumina-Borica-Silica fiber that is braided without the aid of organic, glass or metal inserts. This sleeving retains strength and flexibility at continuous exposure to 1200°C (2200°F). Short exposures to 1425°C (2600°F) can be tolerated. Most common metals (except molten copper and tin) do not attack the fibers.

Because Nextel 312 Ceramic Fibers contain no residual acids or chlorides, there are no chemicals present to corrode or etch the wires. Even in a test involving exposure to 96 percent relative humidity, no noticeable electrolytic corrosion was detected.

Not recommended for use in abrasive environments without the protection of Inconel® overbraiding or a thermowell.



- ✓ Six Sizes
- ✓ 1.5, 3.0, 4.5, 6.0, 9.0, 12 mm ( $\frac{1}{16}$ ,  $\frac{1}{8}$ ,  $\frac{3}{16}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ " Diameter Thermocouple Wire Insulation
- ✓ Low Thermal Conductivity
- ✓ Dimensionally Stable
- ✓ Non-Hygroscopic
- ✓ Maintains Strength at Higher Temperatures

### Effects of Chemicals on XC Sleeving

Chemical	Percent Strength Retention*
NH <sub>4</sub> OH (ammonium hydroxide)	78
HCl (hydrochloric acid)	85
H <sub>2</sub> SO <sub>4</sub> (sulfuric acid)	38
H <sub>3</sub> PO <sub>4</sub> (phosphoric acid)	less than 1
NaOH (sodium hydroxide)	less than 1
KOH (potassium hydroxide)	less than 1
CaO (calcium oxide-lime)	48

\* After exposure to 10 percent chemical baths.

This material is intended for industrial applications only. In addition, OMEGA does not recommend this material for food, cosmetic, medical, or pharmaceutical use.

### To Order Visit [omega.com/xc\\_xc4\\_sleeving](http://omega.com/xc_xc4_sleeving) for Pricing and Details

Nextel 312	Nextel 440	Dimensions: mm (inch)				
Model No.	Model No.	Nom. ID	Wall Thickness	Cov. ** %	Picks/ per inch	Yards/ lb
XC-116	XC4-116	1.5 ( $\frac{1}{16}$ )	0.74 (0.029)	92	13	85
XC-18	XC4-18	3.0 ( $\frac{1}{8}$ )	0.81 (0.032)	83	13	36
XC-316	XC4-316	4.5 ( $\frac{3}{16}$ )	0.89 (0.035)	91	11	27
XC-14	XC4-14	6.0 ( $\frac{1}{4}$ )	0.92 (0.036)	81	12	25
XC-38	XC4-38	9.0 ( $\frac{3}{8}$ )	0.94 (0.037)	72	10	17
XC-12	XC4-12	12 ( $\frac{1}{2}$ )	1.1 (0.045)	71	11	12

Silica		Dimensions: mm (inch)	
Model No.	Nominal Inside Diameter	Wall Thickness	
XS-116	1.5 ( $\frac{1}{16}$ )	0.71 (0.028)	
XS-18	3.0 ( $\frac{1}{8}$ )	0.89 (0.035)	
XS-316	4.5 ( $\frac{3}{16}$ )	0.89 (0.035)	
XS-14	6.0 ( $\frac{1}{4}$ )	0.89 (0.035)	
XS-38	9.0 ( $\frac{3}{8}$ )	0.89 (0.035)	
XS-12	12 ( $\frac{1}{2}$ )	0.89 (0.035)	

Silica Insulation Available

### Nextel 312

- ✓ 1200°C (2200°F) Continuous Rating
  - ✓ 1425°C (2600°F) Short Term Rating
- ### Nextel 440
- ✓ 1375°C (2500°F) Continuous Rating
  - ✓ 1550°C (2800°F) Short Term Rating
- ### Silica (96% SiO<sub>2</sub>)
- ✓ 982°C (1800°F) Continuous Rating

Silica is chemically compatible in many environments such as air, oxygen, nitrogen, argon, ammonia, carbon monoxide, chlorine, hydrogen chloride and sulfur dioxide. It is also stable in a vacuum, in contact with water, various hydrocarbons, ammonium hydroxide, and hydrochloric, nitric, and sulfuric acids.

Stocked in 10, 25, 50 and 100' lengths.

\*\* % coverage is the sleeve length when it is expanded to the nominal inside diameter as compared to the relaxed length. (Measured length x % coverage = actual length covered.) **Note:** The length is measured when the sleeving is empty and in a relaxed state.

**Ordering Example:** XC-14-25, 25' of 1/4" Nextel 312 insulation, 1200°C (2200°F) continuous temperature rating.

**Note:** Published price is based on market value at time of printing and is subject to change due to fluctuations in value of raw material