

# Custom Process Tubular DUCT Forced Air Heaters

Process air duct heaters are used for tempering forced air in many industrial processes. Heater wattage is dependent on air outlet temperature (up to 1200°F [650°C]) and air velocity. Smaller duct heaters can be tandem mounted in place of one large unit to meet space limitations and simplify installation.

Heavy wall Incoloy® tubular heating elements (field replaceable) provide protection against corrosive air environments and resistance to vibration when compared to open coil elements.

Air duct heaters can be designed specifically for high pressure and/or hazardous locations. Turnkey systems including the duct heater, power and temperature control panel, and the temperature and over-temperature sensors can also be provided.

**Our creative team of professionals can design and manufacture your next process forced air duct heating system.**

*Consult us with Your Requirements.*

## Typical Applications

- ↔ *Air Drying/Curing Operations*
- ↔ *Annealing*
- ↔ *Autoclaves*
- ↔ *Booster Air Heater*
- ↔ *Braking Resistor*
- ↔ *Core Drying*
- ↔ *Dehumidification*
- ↔ *Forced Air Comfort Heating*
- ↔ *Heat Treating*
- ↔ *Make-Up Air Heating*
- ↔ *Re-Heating*
- ↔ *Resistor Load Banks*



**Electrical Housings:** NEMA 4 (moisture resistant), NEMA 7 (explosion resistant) and NEMA 12 (dust resistant) are available.

**High Temperature Application:** The electrical housing is separated from the heater flange to lower the ambient temperature of the electrical wiring.



**Finned Duct Heaters**  
See Page 11-113A

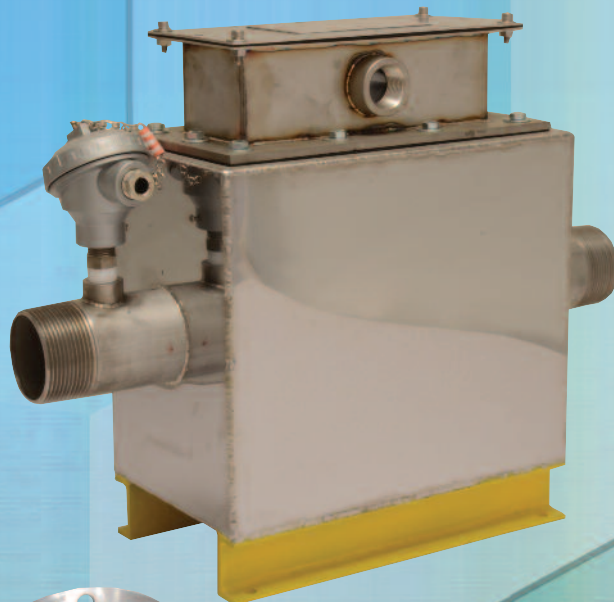


**Element Configuration:** Elements can be U-bends, W-bends and foldback design depending on the requirements of the application.

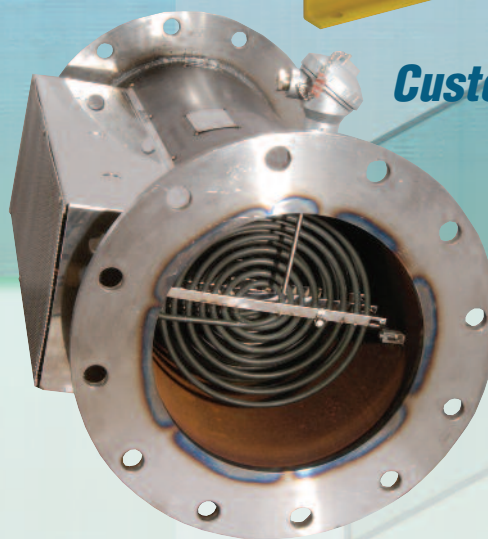
**Selection and Sizing**  
See Page 11-107

**Installation and Wiring**  
See Page 11-111

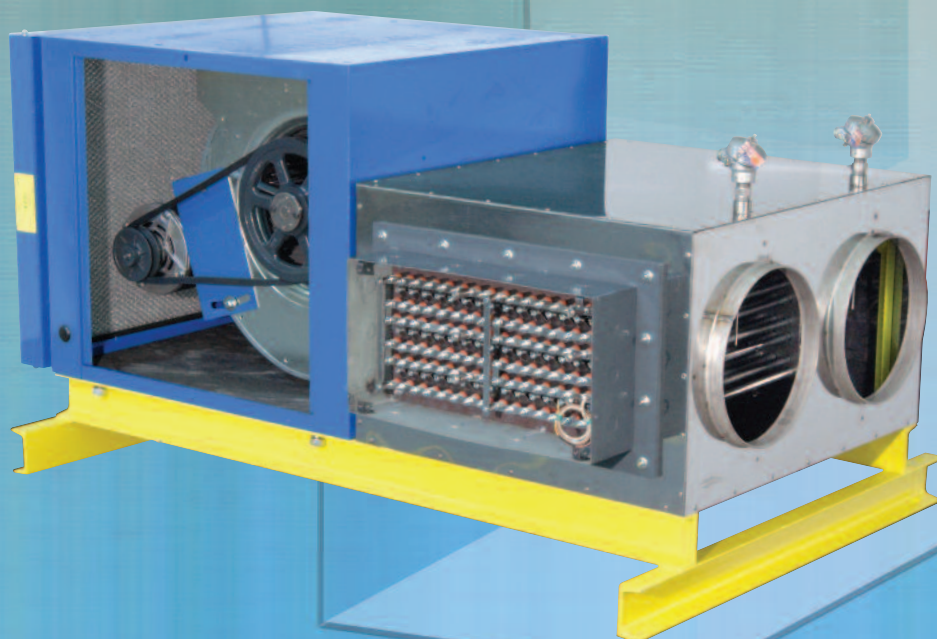
**Standard Designs**  
See Page 11-113



**Custom Designs**



**Duct Heater System:** Tempco can supply the heater and blower assembled, ready for connection to the application duct work. The pictured 48KW, 480V unit produces 1500 CFM of heated air to dry metal parts after being coated with a rust inhibitor.



**Complete Your Thermal Loop System  
with a Tempco Power/Temperature  
Control Panel.**  
See pages 13-56 through 13-63.

**(800) 323-6859 • Email: [sales@tempco.com](mailto:sales@tempco.com)**

## Duct Heaters

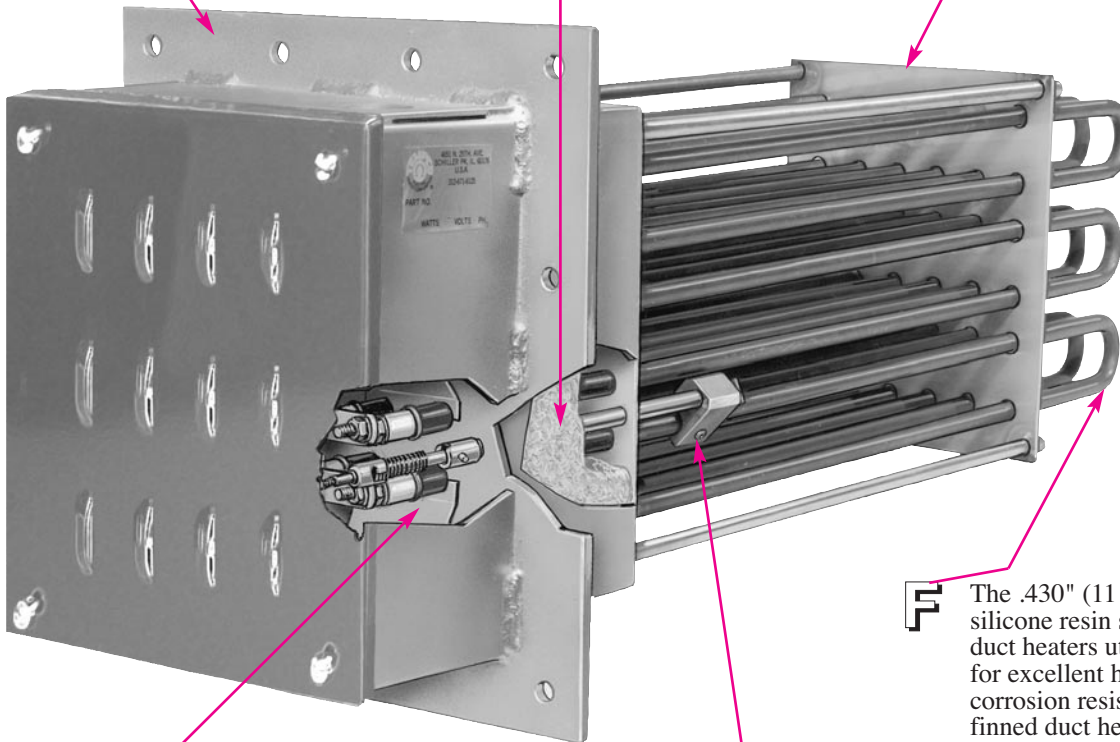
### Forced Air Tubular and Finned Tubular Duct Heaters

**A** NEMA 1 terminal box enclosure with vented cover to help keep wiring cooler. Optional enclosures: NEMA 4 (moisture resistant), NEMA 7 (explosion resistant) and NEMA 12 (dust resistant).

**B** 3-1/2 inches (89 mm) of mineral insulation in a stainless steel enclosure below the mounting flange, minimizes heat losses while keeping the electrical wiring cooler.

**C** The heavy duty frame is composed of a 1/4 inch (6 mm) thick steel mounting flange, stainless steel support plate and corner posts to securely hold the heating elements rigid in any mounting position.

#### Standard Features

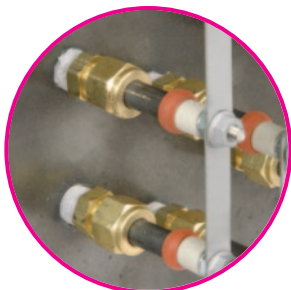


Finned Duct Heater

**D** Standard field replaceable elements are held in place with single-screw quick-release "V" clamps. Pressure resistant designs utilizing welded elements, bulkhead fittings, or compression fittings to attach elements to the flange are available to limit leakage of ducted air or gases into the terminal enclosure. Welded elements are used for gas tight applications.

**E** A 9/32" (7 mm) inside diameter thermowell accessed through a 1/8" NPT tapped hole in the flange allows installation of an optional Type J or K thermocouple for sensing temperature within the element bundle. It can be clamped directly to an element for use as a high limit providing a faster response. An excellent safeguard for your system.

**F** The .430" (11 mm) diameter elements are silicone resin sealed. High temperature tubular duct heaters utilize Incoloy® sheath material for excellent high temperature scaling and corrosion resistance. The medium temperature finned duct heaters have stainless steel fins on a corrosion resistant stainless steel sheath. High temperature Incoloy® elements have all bends repressed in special dies to recompact the MgO refractory to eliminate any electrical insulation voids and hot spots.



Compression Fittings



Bulkhead Fittings



Duct Heaters have been certified as Recognized Components by Underwriters Laboratories (File Number E90771) to meet UL standard 1030, and CSA certified to meet Canadian Standard C22.2, No 72 and 88 (File Number 043099).

These files specify end use limitations and conditions of acceptability for the use of this type of heater. For additional information consult Tempco.

*If you require UL, CSA, or other NRTL Agency Approvals, please specify when ordering.*

### Checklist — Selecting a High Temperature Tubular Duct Heater

#### ✓ Sizing the Duct Heater

To properly match a duct heater to an application, the wattage, air velocity and element watt density must be determined.

Formulas and graphs on the following pages that will aid you in your design include:

- Wattage calculation formulas and table
- Element Watt Density vs. Sheath Temperature and Air Velocity Graph
- Pressure Drop vs. Air Velocity Graph

**In most applications the following design limitations should be adhered to:**

- Maximum watt density of 40 watts/in<sup>2</sup> (6.2 watts/cm<sup>2</sup>)
- Maximum element sheath temperature of 1400°F (760°C)
- Minimum air velocity of 200 feet per minute (61 meters per minute)
- Maximum voltage for UL certified heaters is 480V.
- Maximum voltage for CSA certified heaters is 600V.

#### ✓ Calculating Minimum Wattage Requirement

##### Calculating Minimum Wattage Requirement

Table is for quick-estimation purposes and is based on air under standard conditions (70°F inlet air temperature at 14.7 PSIA).



**Note:** If air flow is given in CFM at operating temperature and pressure it can be converted to SCFM (Standard Cubic Feet per Minute) with the following formula (use the equations to the right for compressed air):

$$SCFM = CFM \times \frac{P}{14.7} \times \frac{530}{T + 460}$$

P = operating pressure (gauge pressure + 14.7)

T = operating temperature

Remember when calculating wattage to use the maximum anticipated air flow and to compensate for any heat losses.

**For free air use equations:**

$$KW = \frac{SCFM \times \text{Temperature rise } (^\circ F)}{3000}$$

or

$$KW = \frac{SCMM \times \text{Temperature rise } (^\circ C)}{47}$$

**For compressed air use equations:**

$$KW = \frac{CFM^* \times \text{Density}^* (\text{lbs/cu. ft.}) \times \text{Temperature rise } (^\circ F)}{228}$$

or

$$KW = \frac{CMM^* \times \text{Density}^* (\text{kgs/cu. m}) \times \text{Temperature rise } (^\circ C)}{57.5}$$

\*At heater inlet temperature and pressure

**Note: The free air equations include a 6% safety factor.**

##### KWH to Heat Air at Selected Flow Rates

Amt. of Air CFM	Temperature Rise (°F)											
	50	100	150	200	250	300	350	400	450	500	600	
100	1.7	3.3	5	6.7	8.3	10	11.7	13.3	15	16.7	20	
200	3.3	6.7	10	13.3	16.7	20	23.3	26.7	30	33.3	40	
300	5.0	10.0	15	20.0	25.0	30	35.0	40.0	45	50.0	60	
400	6.7	13.3	20	26.7	33.3	40	46.7	53.3	60	66.7	80	
500	8.3	16.7	25	33.3	41.7	50	58.3	66.7	75	83.3	100	
600	10.0	20.0	30	40.0	50.0	60	70.0	80.0	90	100.0	120	
700	11.7	23.3	35	46.7	58.3	70	81.7	93.3	105	116.7	140	
800	13.3	26.7	40	53.3	66.7	80	93.3	106.7	120	133.3	160	
900	15.0	30.0	45	60.0	75.0	90	105.0	120.0	135	150.0	180	
1000	16.7	33.3	50	66.7	83.3	100	116.7	133.3	150	166.7	200	
1100	18.3	36.7	55	73.3	91.7	110	128.3	146.7	165	183.3	220	
1200	20.0	40.0	60	80.0	100.0	120	140.0	160.0	180	200.0	240	



**Note:** For additional information or help with your application please consult TEMPCO.

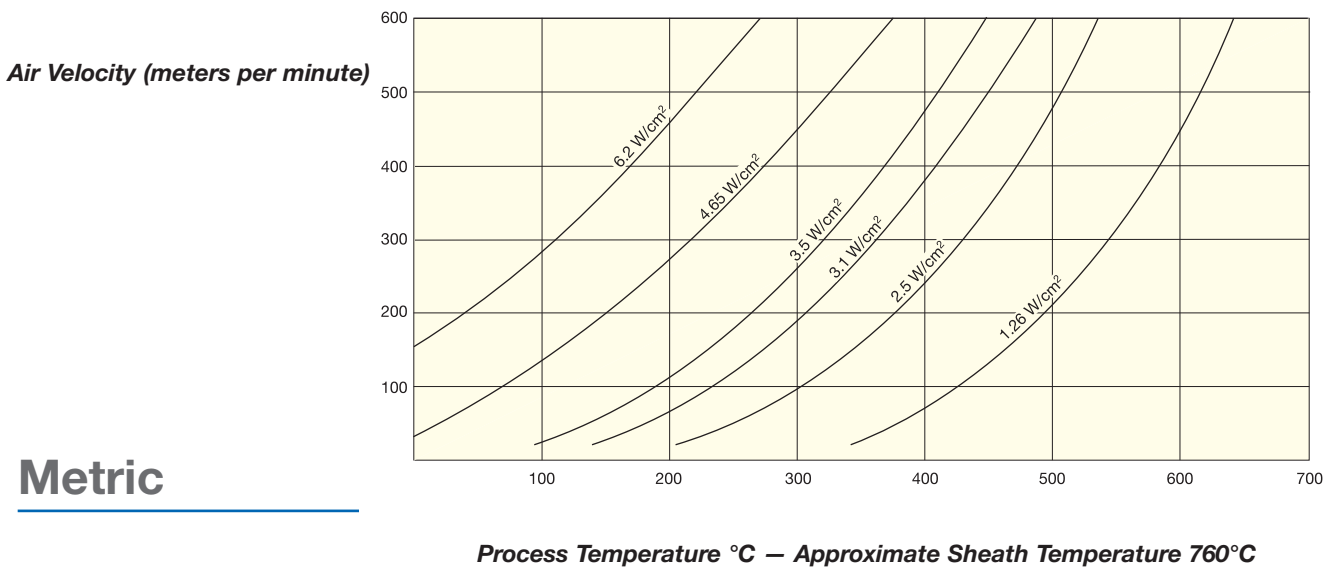
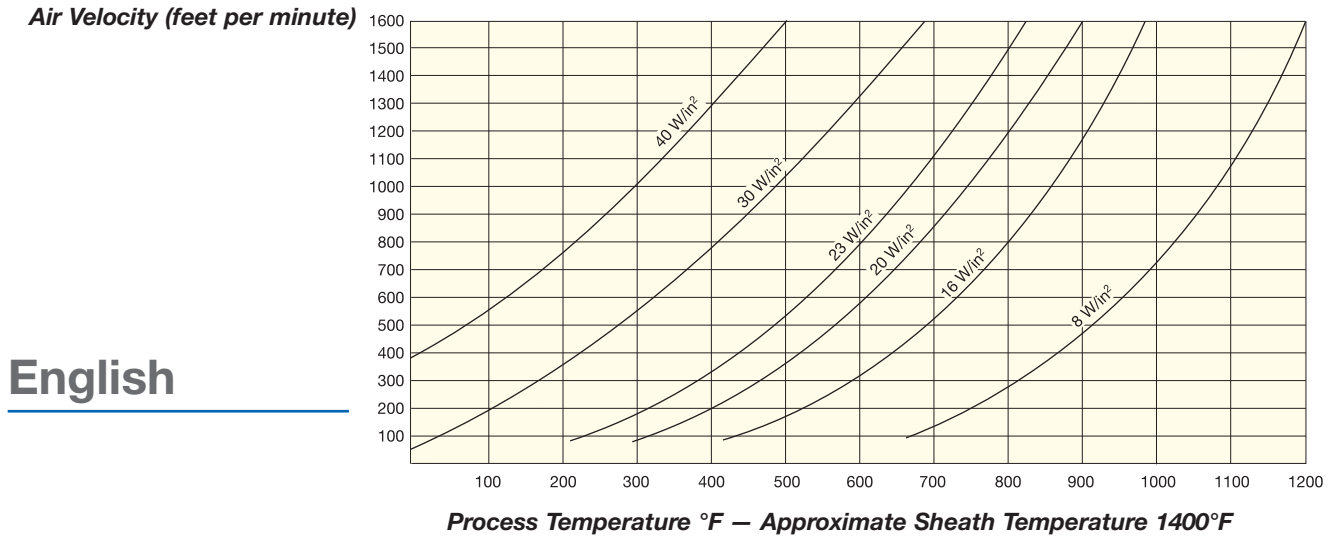
### Checklist – Selecting the Proper Duct Heater, *continued*

#### Element Watt Density vs. Air Temperature and Air Velocity

Use graph (English or Metric) to plot

Outlet Air Temperature vs. Outlet Air Velocity to determine Element Watt Density

The recommended watt density is based on a maximum element sheath temperature of 1400°F (760°C). 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. Selecting a lower watt density for the heating elements will extend heater life expectancy.



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

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

### Checklist — Selecting the Proper Duct Heater, *continued*

**Element Watt Density vs. Sheath Temperature and Air Velocity**

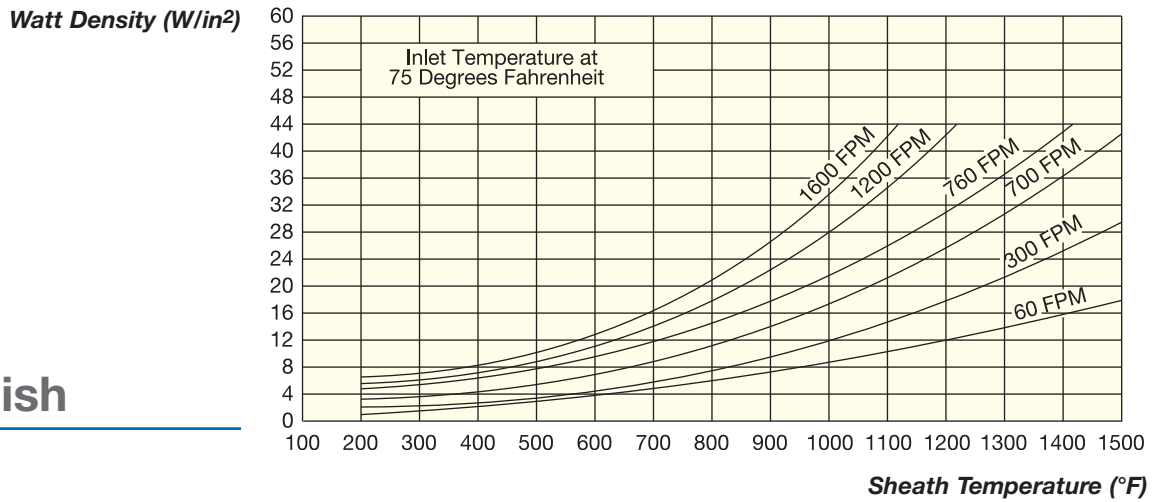
Use graph (English or Metric) to plot

Watt Density vs. Air Velocity to determine Sheath Temperature

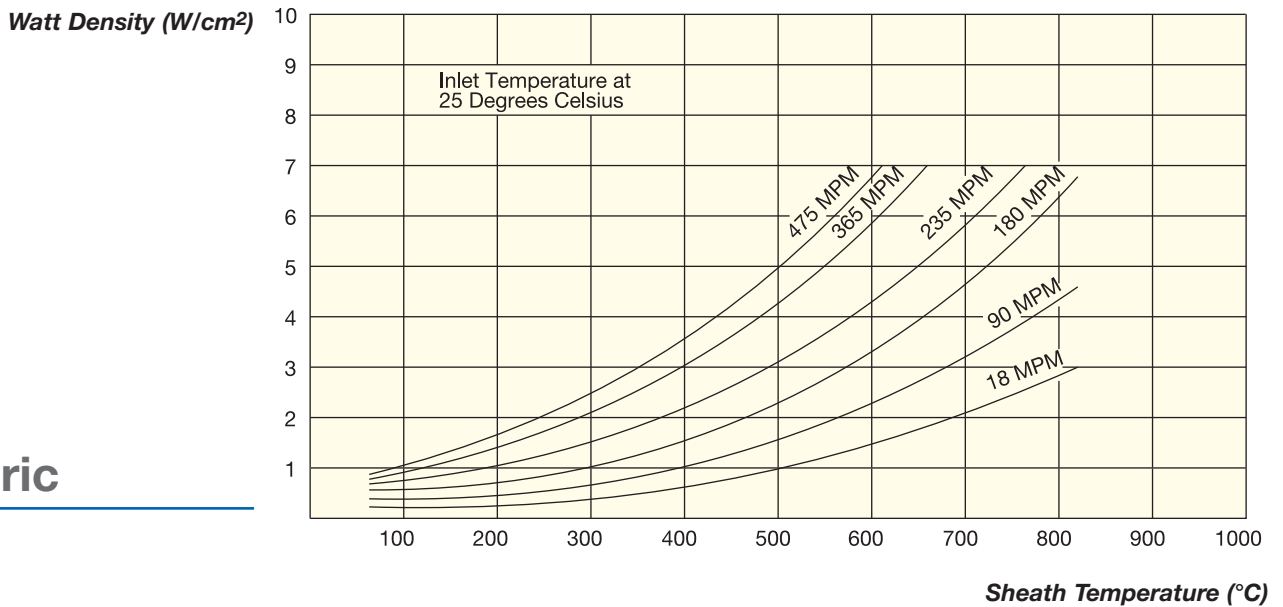
or

Watt Density vs. Sheath Temperature to determine the required Air Velocity

### English



### Metric



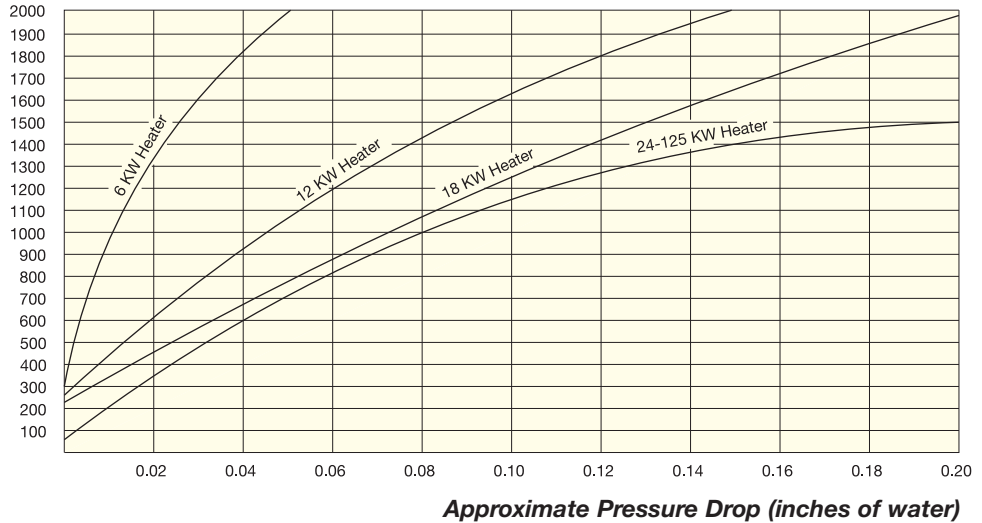
### Checklist — Selecting the Proper Duct Heater, *continued*

**Pressure Drop vs. Air Velocity**

Use graph (English or Metric) to plot

Pressure Drop vs. Air Velocity for standard duct heaters sizes used to properly Size Blowers

Air Velocity (feet per minute)

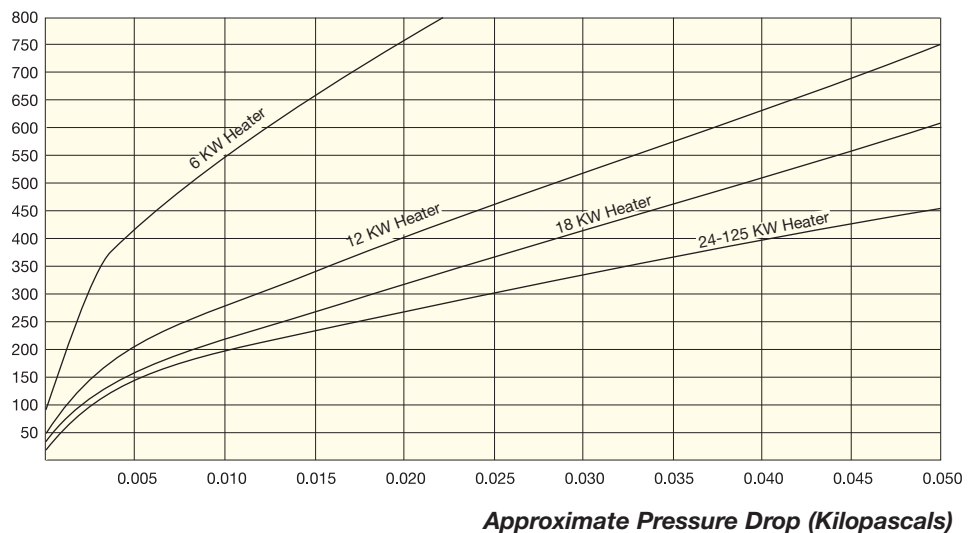


English

### Calculating Air Velocity

$$\text{Velocity (feet/minute)} = \frac{\text{SCFM (CFM measured at standard conditions)}}{\text{Duct cross sectional area at heater in square feet}}$$

Air Velocity (meters per minute)



Metric

### Duct Heater Installation Recommendations

#### Installation Recommendations

1. Tempco Duct Heaters may be bolted to the ductwork through the side, bottom or top. Bottom and side mounting are preferred to minimize wiring/terminal enclosure temperatures.
2. Before mounting, consideration should be given to the strength of the ductwork required to support the weight of the heater. Add additional hangers or supports as required.
3. The inlet side of the unit should be at least 48 inches downstream from any change in duct size or duct direction.
4. To minimize pressure drop, mount the duct with the narrow width of the heater perpendicular to the air flow.
5. Duct heaters may be mounted in tandem to increase the KW that can be installed.
6. Process temperature sensing should be located downstream from the duct heater.
7. Air flows must never be interrupted. Such events will cause overheating and/or premature heater burnout. Your installation should include high limit temperature controls. All standard duct heaters have a thermowell attached to one element for installing a thermocouple to sense element temperature. Additional protection for the heater from low air flow can be achieved by installing an air flow switch or pressure switch on the inlet side.
8. Select the terminal housing that provides the best terminal protection from the environment surrounding the application.



#### Wiring

1. Power supply conductors must have a minimum ampacity of 125% of the maximum heater load and be rated for the ambient temperature of the heater enclosure.
2. The air handler should run on a time delay after the heater is de-energized. This allows the elements to cool without overheating adjacent areas.
3. Duct heaters drawing more than 48 Amps are divided into smaller branch circuits, each drawing 48 Amps or less. Please note that the number of circuits, can be changed to accommodate any wiring requirements you may have.



**Note:** Before you proceed to make any changes on factory prewired heaters, check the heater wiring schematic or consult Tempco.

*All electrical wiring must be done in accordance with national and local electrical codes.*



#### Maintenance Recommendations

1. Never perform any type of service on duct heaters prior to disconnecting all power supply lines.
2. After long periods of idle use, clean elements prior to start-up.
3. Periodically clean the elements even during regular use so as not to allow dirt to build up on the elements.
4. Periodically check that mounting screws or bolts have not become loose from blower vibration.
5. Periodically check that electrical connections are clean and tight.
6. Failed elements are field replaceable, minimizing downtime and saving the cost of a complete new heater.

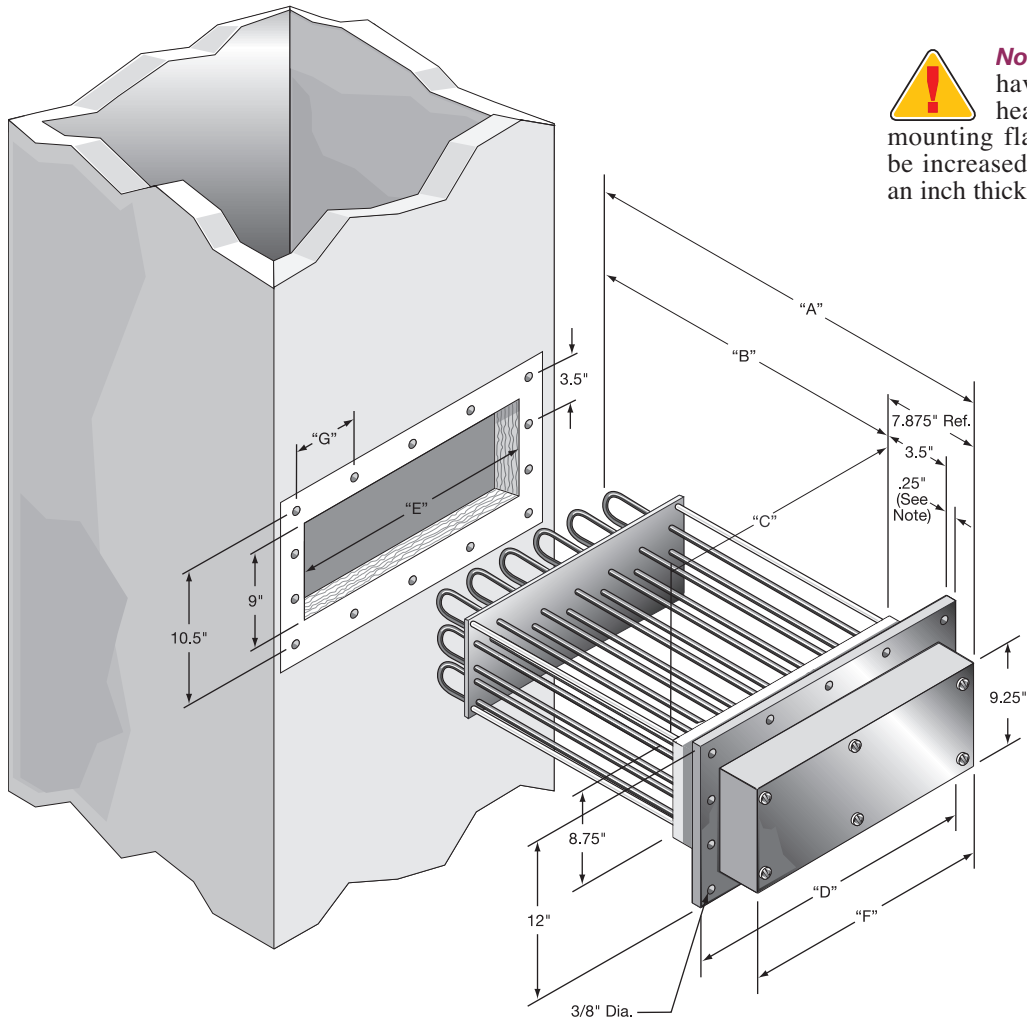


### Standard Duct Heater Features

#### Design Features

- \* NEMA 1 General Purpose Ventilated Enclosure
- \* Painted Steel Mounting Flange
- \* Single- and Three-Phase Wiring
- \* 3-1/2" (89 mm) Insulation
- \* Field Replaceable Incoloy® 840 Elements
- \* Element Bends Re-pressed
- \* 1/4" (6 mm) Inside Diameter Thermowell
- \* Stainless Steel Support Plate and Corner Posts

#### Typical Installation



#### Standard (Non-Stock) Duct Heater Construction Specifications

Dimensions Reference Number	"A"		"B"		"C"		"D"		"E"		"F"		"G"		Number of Elements	Approximate Net Weight	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm		lbs	kgs
1	27 <sup>7</sup> / <sub>8</sub>	708	20	508	2 <sup>3</sup> / <sub>4</sub>	70	6 <sup>1</sup> / <sub>2</sub>	165	3	76	3 <sup>3</sup> / <sub>8</sub>	92	2 <sup>1</sup> / <sub>2</sub>	64	6	22	10
2	27 <sup>7</sup> / <sub>8</sub>	708	20	508	4 <sup>3</sup> / <sub>4</sub>	121	8 <sup>1</sup> / <sub>2</sub>	216	5	127	5 <sup>5</sup> / <sub>8</sub>	143	3 <sup>1</sup> / <sub>2</sub>	89	12	31	14
3	27 <sup>7</sup> / <sub>8</sub>	708	20	508	6 <sup>3</sup> / <sub>4</sub>	171	10 <sup>1</sup> / <sub>2</sub>	267	7	178	7 <sup>7</sup> / <sub>8</sub>	194	3	76	18	41	19
4	27 <sup>7</sup> / <sub>8</sub>	708	20	508	8 <sup>3</sup> / <sub>4</sub>	222	12 <sup>1</sup> / <sub>2</sub>	318	9	229	9 <sup>5</sup> / <sub>8</sub>	244	2 <sup>3</sup> / <sub>4</sub>	70	24	51	23
5	27 <sup>7</sup> / <sub>8</sub>	708	20	508	10 <sup>3</sup> / <sub>4</sub>	273	14 <sup>1</sup> / <sub>2</sub>	368	11	279	11 <sup>1</sup> / <sub>8</sub>	295	3 <sup>1</sup> / <sub>4</sub>	83	30	62	28
6	27 <sup>7</sup> / <sub>8</sub>	708	20	508	12 <sup>3</sup> / <sub>4</sub>	324	16 <sup>1</sup> / <sub>2</sub>	419	13	330	13 <sup>3</sup> / <sub>8</sub>	346	3 <sup>3</sup> / <sub>4</sub>	95	36	73	33
7	27 <sup>7</sup> / <sub>8</sub>	708	20	508	14 <sup>3</sup> / <sub>4</sub>	375	18 <sup>1</sup> / <sub>2</sub>	470	15	381	15 <sup>5</sup> / <sub>8</sub>	397	4 <sup>1</sup> / <sub>4</sub>	108	42	84	38
8	27 <sup>7</sup> / <sub>8</sub>	708	20	508	16 <sup>3</sup> / <sub>4</sub>	425	20 <sup>1</sup> / <sub>2</sub>	521	17	432	17 <sup>5</sup> / <sub>8</sub>	448	4 <sup>3</sup> / <sub>4</sub>	121	48	95	43
9	27 <sup>7</sup> / <sub>8</sub>	708	20	508	18 <sup>3</sup> / <sub>4</sub>	476	22 <sup>1</sup> / <sub>2</sub>	572	19	483	19 <sup>5</sup> / <sub>8</sub>	498	5 <sup>1</sup> / <sub>4</sub>	133	54	106	48
10	27 <sup>7</sup> / <sub>8</sub>	708	20	508	20 <sup>3</sup> / <sub>4</sub>	527	24 <sup>1</sup> / <sub>2</sub>	622	21	533	21 <sup>3</sup> / <sub>8</sub>	549	5 <sup>3</sup> / <sub>4</sub>	146	60	117	53
11	32 <sup>7</sup> / <sub>8</sub>	835	25	635	20 <sup>3</sup> / <sub>4</sub>	527	24 <sup>1</sup> / <sub>2</sub>	622	21	533	21 <sup>5</sup> / <sub>8</sub>	549	5 <sup>3</sup> / <sub>4</sub>	146	60	130	59
12	40 <sup>3</sup> / <sub>8</sub>	1026	32 <sup>1</sup> / <sub>2</sub>	826	20 <sup>3</sup> / <sub>4</sub>	527	24 <sup>1</sup> / <sub>2</sub>	622	21	533	21 <sup>5</sup> / <sub>8</sub>	549	5 <sup>3</sup> / <sub>4</sub>	146	60	155	70
13	49 <sup>7</sup> / <sub>8</sub>	1254	41 <sup>1</sup> / <sub>2</sub>	1054	20 <sup>3</sup> / <sub>4</sub>	527	24 <sup>1</sup> / <sub>2</sub>	622	21	533	21 <sup>5</sup> / <sub>8</sub>	549	5 <sup>3</sup> / <sub>4</sub>	146	60	180	82



### Standard (Non-Stock) Duct Heaters

Watt Density		Dimensions Reference Number	Part Number			Part Number			
W/in <sup>2</sup>	W/cm <sup>2</sup>		240V-1Ph (C*)	240V-3Ph (C*)	Replacement Elements	480V-1 Ph (C*)	480V-3 Ph (C*)	Replacement Elements	
20	3.1	6	1	TDH01002 (1)	TDH01003 (1)	THE03405	TDH01004 (1)	TDH01005 (1)	THE03819
		12	2	TDH01006 (1)	TDH01007 (1)	THE03405	TDH01008 (1)	TDH01009 (1)	THE03819
		18	3	TDH01010 (2)	TDH01011 (1)	THE03405	TDH01012 (1)	TDH01013 (1)	THE03819
		24	4	TDH01014 (2)	TDH01015 (2)	THE03405	TDH01016 (1)	TDH01017 (1)	THE03819
		30	5	—	TDH01018 (2)	THE03405	TDH01019 (2)	TDH01020 (1)	THE03819
		36	6	—	TDH01021 (2)	THE03405	TDH01022 (2)	TDH01023 (1)	THE03819
		42	7	—	TDH01024 (2)	THE03405	TDH01025 (2)	TDH01026 (1)	THE03819
		48	8	—	TDH01027 (4)	THE03405	TDH01028 (2)	TDH01029 (2)	THE03819
		54	9	—	TDH01030 (3)	THE03405	TDH01031 (3)	TDH01032 (2)	THE03819
		60	10	—	TDH01033 (4)	THE03405	TDH01034 (4)	TDH01035 (2)	THE03819
		75	11	—	TDH01036 (4)	THE03845	TDH01037 (4)	TDH01038 (2)	THE03846
		100	12	—	—	—	—	TDH01039 (4)	THE03847
		125	13	—	—	—	—	TDH01040 (4)	THE03848
30	4.7	9	1	TDH01072 (1)	TDH01073 (1)	THE03849	TDH01074 (1)	TDH01075 (1)	THE03851
		18	2	TDH01076 (2)	TDH01077 (1)	THE03849	TDH01078 (1)	TDH01079 (1)	THE03851
		27	3	TDH01080 (3)	TDH01081 (2)	THE03849	TDH01082 (2)	TDH01083 (1)	THE03851
		36	4	—	TDH01084 (2)	THE03849	TDH01085 (2)	TDH01086 (1)	THE03851
		45	5	—	TDH01087 (5)	THE03849	TDH01088 (2)	TDH01089 (2)	THE03851
		54	6	—	TDH01090 (3)	THE03849	TDH01091 (3)	TDH01092 (2)	THE03851
		63	7	—	TDH01093 (7)	THE03849	TDH01094 (3)	TDH01095 (2)	THE03851
		72	8	—	TDH01096 (4)	THE03849	TDH01097 (4)	TDH01098 (2)	THE03851
		81	9	—	TDH01099 (6)	THE03849	TDH01100 (6)	TDH01101 (3)	THE03851
		90	10	—	TDH01102 (5)	THE03849	TDH01103 (4)	TDH01104 (4)	THE03851
		115	11	—	TDH01105 (10)	THE03850	TDH01106 (5)	TDH01107 (4)	THE03852
		150	12	—	—	—	—	TDH01108 (4)	THE03853
		190	13	—	—	—	—	TDH01109 (5)	THE03854

(C\*) = Number of Branch Circuits per heater (48 amps each branch max). For different circuit wiring configurations consult Tempco.

### Ordering Information

#### Catalog Heaters

Order by catalog number for catalog heaters.

**Standard lead time is 3 to 4 weeks.**

Note that Replacement Element Part Numbers for each heater are also listed.

#### Custom Engineered/Manufactured Heaters

For sizes and ratings not listed, **TEMPCO** will design and manufacture a Duct Heater to meet your requirements. Specify if UL or CSA approval required.

**Please Specify** the following:

- Duct size
- Air flow velocity
- Inlet and outlet temperature
- Wattage, voltage and phase
- Number of circuits
- Element watt density
- Element sheath material
- Mounting flange material
- Insulation thickness
- Electrical enclosure type
- Over-temperature thermocouple, if required
- UL or CSA approval
- Any other modifications

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

### Power Control Panels for Process Heaters



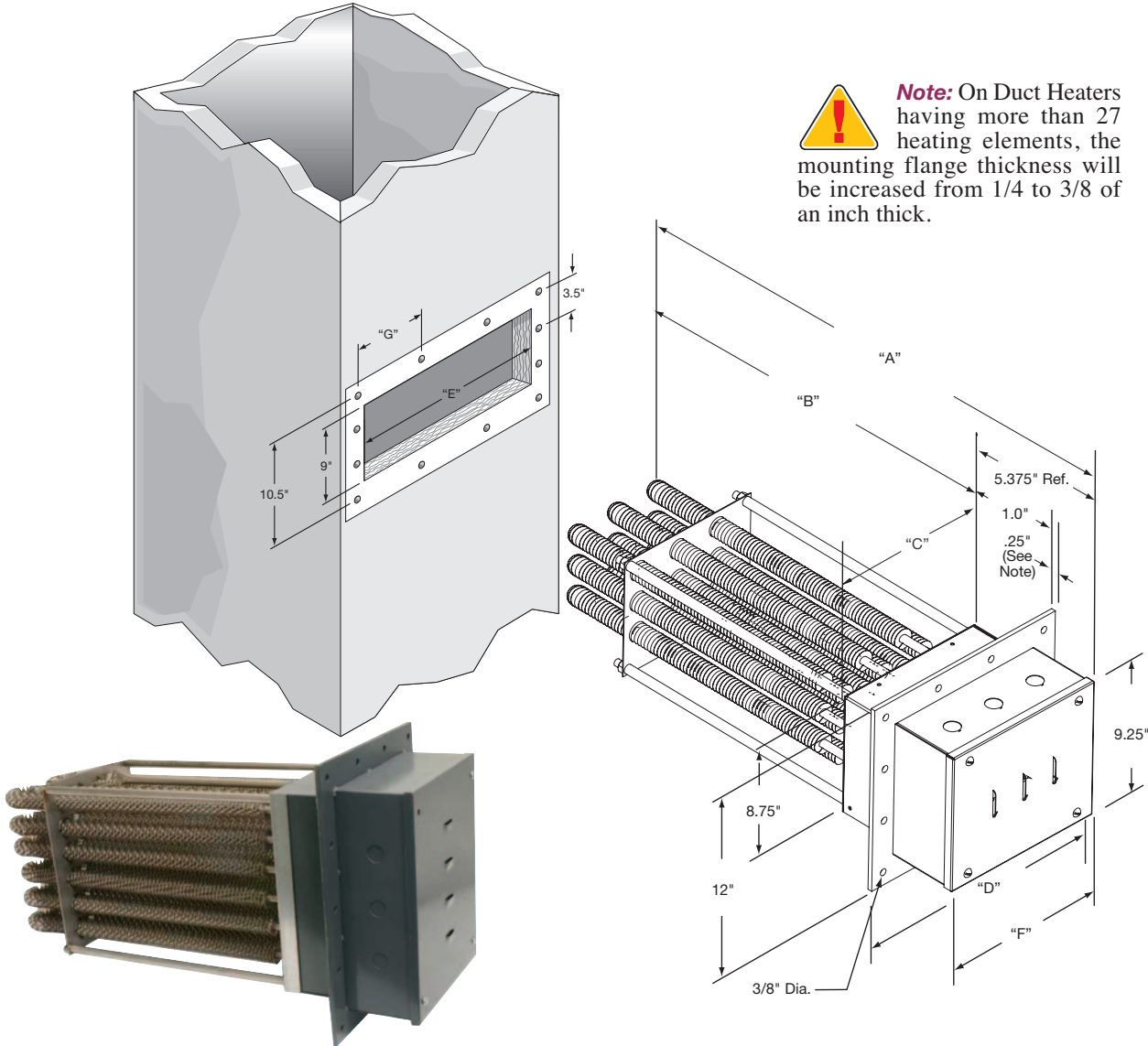
**Note:** Power Control Panels featuring mechanical or solid state controls with all other necessary components can be provided by TEMPCO for any size duct heater. Refer to Section 13, pages 13-56 through 13-63 for complete details.



## Finned Duct Heaters

### Design Features

- \* NEMA 1 General Purpose Ventilated Enclosure
- \* Stainless Steel Mounting Flange and Terminal Box
- \* Single- and Three-Phase Wiring
- \* 1" (25 mm) Insulation
- \* Field Replaceable .430 Diameter Stainless Steel Elements
- \* 9/32" (7 mm) ID Sensor Thermowell
- \* Stainless Steel Support Plate and Corner Posts
- \* Stainless Steel Insulation Housing



**Note:** On Duct Heaters having more than 27 heating elements, the mounting flange thickness will be increased from 1/4 to 3/8 of an inch thick.

**Standard (Non-Stock) Duct Heater Construction Specifications**

Dimensions Reference Number	"A"		"B"		"C"		"D"		"E"		"F"		"G"		Number of Elements	Approximate Net Weight	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm		lbs	kgs
1	25 <sup>3</sup> / <sub>8</sub>	645	20	508	3 <sup>1</sup> / <sub>4</sub>	95	7	177.8	4	102	4 <sup>1</sup> / <sub>4</sub>	108	2 <sup>3</sup> / <sub>4</sub>	70	3	22	10
2	25 <sup>3</sup> / <sub>8</sub>	645	20	508	6 <sup>1</sup> / <sub>4</sub>	159	9 <sup>1</sup> / <sub>2</sub>	241	6.5	165	6 <sup>3</sup> / <sub>4</sub>	171	4	102	6	31	14
3	25 <sup>3</sup> / <sub>8</sub>	645	20	508	8 <sup>3</sup> / <sub>4</sub>	222	12	305	9	229	9 <sup>1</sup> / <sub>4</sub>	235	3 <sup>1</sup> / <sub>2</sub>	89	9	41	19
4	25 <sup>3</sup> / <sub>8</sub>	645	20	508	11 <sup>3</sup> / <sub>4</sub>	298	14 <sup>1</sup> / <sub>2</sub>	368	12	305	11 <sup>3</sup> / <sub>4</sub>	298	3 <sup>1</sup> / <sub>4</sub>	83	12	51	23
5	25 <sup>3</sup> / <sub>8</sub>	645	20	508	13 <sup>3</sup> / <sub>4</sub>	349	17	432	14	356	14 <sup>1</sup> / <sub>4</sub>	362	3 <sup>7</sup> / <sub>8</sub>	98	15	62	28
6	25 <sup>3</sup> / <sub>8</sub>	645	20	508	16 <sup>1</sup> / <sub>4</sub>	413	19 <sup>1</sup> / <sub>2</sub>	495	16.5	419	16 <sup>3</sup> / <sub>4</sub>	425	4 <sup>1</sup> / <sub>2</sub>	114	18	73	33
7	25 <sup>3</sup> / <sub>8</sub>	645	20	508	18 <sup>3</sup> / <sub>4</sub>	476	22	559	19	483	19 <sup>1</sup> / <sub>4</sub>	489	4 <sup>3</sup> / <sub>8</sub>	105	21	84	38
8	25 <sup>3</sup> / <sub>8</sub>	645	20	508	21 <sup>3</sup> / <sub>4</sub>	552	24 <sup>1</sup> / <sub>2</sub>	622	22	559	21 <sup>3</sup> / <sub>4</sub>	552	4 <sup>7</sup> / <sub>8</sub>	117	24	95	43
9	25 <sup>3</sup> / <sub>8</sub>	645	20	508	23 <sup>3</sup> / <sub>4</sub>	603	27	686	24	610	24 <sup>1</sup> / <sub>4</sub>	616	5 <sup>1</sup> / <sub>8</sub>	130	27	106	48
10	25 <sup>3</sup> / <sub>8</sub>	645	20	508	26 <sup>1</sup> / <sub>4</sub>	679	29 <sup>1</sup> / <sub>2</sub>	749	27	686	26 <sup>3</sup> / <sub>4</sub>	679	5 <sup>3</sup> / <sub>8</sub>	143	30	117	53
11	30 <sup>1</sup> / <sub>4</sub>	768	24 <sup>7</sup> / <sub>8</sub>	632	26 <sup>3</sup> / <sub>4</sub>	679	29 <sup>1</sup> / <sub>2</sub>	749	27	686	26 <sup>3</sup> / <sub>4</sub>	679	5 <sup>3</sup> / <sub>8</sub>	143	30	130	59
12	37 <sup>1</sup> / <sub>4</sub>	946	31 <sup>7</sup> / <sub>8</sub>	810	26 <sup>3</sup> / <sub>4</sub>	679	29 <sup>1</sup> / <sub>2</sub>	749	27	686	26 <sup>3</sup> / <sub>4</sub>	679	5 <sup>3</sup> / <sub>8</sub>	143	30	155	70
13	45	1143	39 <sup>3</sup> / <sub>8</sub>	1006	26 <sup>3</sup> / <sub>4</sub>	679	29 <sup>1</sup> / <sub>2</sub>	749	27	686	26 <sup>3</sup> / <sub>4</sub>	679	5 <sup>3</sup> / <sub>8</sub>	143	30	180	82



### Standard (Non-Stock) Finned Tubular Duct Heaters

Watt Density		Dimensions Reference Number	Part Number			Part Number			
W/in <sup>2</sup>	W/cm <sup>2</sup>		240V-1Ph (C*)	240V-3Ph (C*)	Replacements Elements	480V-1 Ph (C*)	480V-3 Ph (C*)	Replacements Elements	
42	6.5	6	1	FDH01002 (1)	FDH01003 (1)	THF00706	FDH01004 (1)	FDH01005 (1)	THF00707
		12	2	FDH01006 (1)	FDH01007 (1)	THF00706	FDH01008 (1)	FDH01009 (1)	THF00707
		18	3	FDH01010 (2)	FDH01011 (1)	THF00706	FDH01012 (1)	FDH01013 (1)	THF00707
		24	4	FDH01014 (2)	FDH01015 (2)	THF00706	FDH01016 (1)	FDH01017 (1)	THF00707
		30	5	—	FDH01018 (2)	THF00706	FDH01019 (2)	FDH01020 (1)	THF00707
		36	6	—	FDH01021 (2)	THF00706	FDH01022 (2)	FDH01023 (1)	THF00707
		42	7	—	FDH01024 (2)	THF00706	FDH01025 (2)	FDH01026 (1)	THF00707
		48	8	—	FDH01027 (4)	THF00706	FDH01028 (2)	FDH01029 (2)	THF00707
		54	9	—	FDH01030 (3)	THF00706	FDH01031 (3)	FDH01032 (2)	THF00707
		60	10	—	FDH01033 (4)	THF00706	FDH01034 (4)	FDH01035 (2)	THF00707
		75	11	—	FDH01036 (4)	THF00710	FDH01037 (4)	FDH01038 (2)	THF00711
		100	12	—	—	—	—	FDH01039 (4)	THF00714
		125	13	—	—	—	—	FDH01040 (4)	THF00716
62	9.6	9	1	FDH01041 (1)	FDH01042 (1)	THF00708	FDH01043 (1)	FDH01044 (1)	THF00709
		18	2	FDH01045 (2)	FDH01046 (1)	THF00708	FDH01047 (1)	FDH01048 (1)	THF00709
		27	3	FDH01049 (3)	FDH01050 (2)	THF00708	FDH01051 (2)	FDH01052 (1)	THF00709
		36	4	—	FDH01053 (2)	THF00708	FDH01054 (2)	FDH01055 (1)	THF00709
		45	5	—	FDH01056 (5)	THF00708	FDH01057 (2)	FDH01058 (2)	THF00709
		54	6	—	FDH01059 (3)	THF00708	FDH01060 (3)	FDH01061 (2)	THF00709
		63	7	—	FDH01062 (7)	THF00708	FDH01063 (3)	FDH01064 (2)	THF00709
		72	8	—	FDH01065 (4)	THF00708	FDH01066 (4)	FDH01067 (2)	THF00709
		81	9	—	FDH01068 (6)	THF00708	FDH01069 (6)	FDH01070 (3)	THF00709
		90	10	—	FDH01071 (5)	THF00708	FDH01072 (4)	FDH01073 (4)	THF00709
		115	11	—	FDH01074 (10)	THF00712	FDH01075 (5)	FDH01076 (4)	THF00713
		150	12	—	—	—	—	FDH01077 (4)	THF00715
		190	13	—	—	—	—	FDH01078 (5)	THF00717

(C\*) = Number of Branch Circuits per heater (48 amps each branch max). For different circuit wiring configurations consult Tempco.

The 42 watt/sq.in. heaters are rated for outlet air temperatures up to 475°F at a minimum 1000 SFPM inlet air velocity.

The 62 watt/sq.in. heaters are rated for outlet air temperatures up to 500°F at a minimum 1750 SFPM air velocity.

Heaters are designed for ambient air heating at a nominal inlet temperature range of 60°- 100°F.

Inlet air temperature should not exceed 300°F.

Maximum recommended sheath operating temperature is 1000°F. If a higher temperature is needed, an unfinned alloy sheath TDH unit should be used.

### Ordering Information

#### Catalog Heaters

Order by catalog number for catalog heaters.

**Standard lead time is 3 to 4 weeks.**

Note that Replacement Element Part Numbers for each heater are also listed.

#### Custom Engineered/Manufactured Heaters

For sizes and ratings not listed, **TEMPCO** will design and manufacture a Duct Heater to meet your requirements. Specify if UL or CSA approval required.

**Please Specify** the following:

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Duct size                    | <input type="checkbox"/> Element watt density      | <input type="checkbox"/> Over-temperature thermocouple, if required |
| <input type="checkbox"/> Air flow velocity            | <input type="checkbox"/> Element sheath material   | <input type="checkbox"/> UL or CSA approval                         |
| <input type="checkbox"/> Inlet and outlet temperature | <input type="checkbox"/> Mounting flange material  | <input type="checkbox"/> Any other modifications                    |
| <input type="checkbox"/> Wattage, voltage and phase   | <input type="checkbox"/> Insulation thickness      |   |
| <input type="checkbox"/> Number of circuits           | <input type="checkbox"/> Electrical enclosure type |   |

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