# Duct Heater Pricing

## Warren Technology
2050 West 73 Street, Hialeah, Florida 33016 · Telephone (305) 556-6933 · Fax (305) 557-6157
Website: [www.warrenhvac.com](http://www.warrenhvac.com) · E-mail: warren@warrenhvac.com

## Table of Contents
- Item
- Tag
- Quantity
- Model
- KW
- Line Volts
- Phase
- Control Volts
- Steps
- Duct Width
- Duct Height
- Base List
- Contactors
- Power Fuse
- UL Required Accessories

## Accessory List

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessory 1</td>
<td>10</td>
</tr>
<tr>
<td>Accessory 2</td>
<td>5</td>
</tr>
<tr>
<td>Accessory 3</td>
<td>20</td>
</tr>
</tbody>
</table>

## Freight
- Total List: $1000
- Multiplier: 1.2
- Extra Charge: 5%
- Heater Net: $1200
- Freight: $100
- Total Net: $1300
What the Wholesaler, Distributor or Counter Sales Person
Must Know Before Selling a Warren Duct Heater

1. How many Kilowatts (KW)?
2. What Line Voltage, Phase and Hertz?
3. What Control Voltage?
4. What duct size? (Dim. In inches)
   a. Width
   b. Height
   Note: Control panel always mounts on duct height
5. What type of construction? Check one:
   a. Slip-In
   b. Flange Mount 1"
   c. Slip-In with Remote Panel
   d. Flanged 1" w/Remote Panel
   e. Bottom Mount Application
6. What type of ductwork?
   a. Sheet Metal, No Insulation
   b. Sheet Metal, Internally Lined
   c. Sheet Metal, Externally Wrap
   d. Fiber Board
7. Heaters require either a fan interlock relay or an air pressure switch for interlock to meet code and UL.
   Fan Interlock Relay?
   A/P Switch?
8. Heaters drawing 48 amps or more, total load, must have their circuits fused by the manufacturer. **Under 48 Amps, They Do Not!**
   Fuse the Circuits?
   Do not fuse?
9. Do you need a control transformer to get you low voltage control or is there already one in the system?
   Need a Transformer
   Don't need Transformer
10. How many steps (or stages) in the heater?

MAXIMUM KW PER STEP (OR STAGE)

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Phase</th>
<th>KW</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 Volt</td>
<td>1</td>
<td>5.5</td>
</tr>
<tr>
<td>208 Volt</td>
<td>1</td>
<td>9.8</td>
</tr>
<tr>
<td>240 Volt</td>
<td>1</td>
<td>11.5</td>
</tr>
<tr>
<td>277 Volt</td>
<td>1</td>
<td>13.0</td>
</tr>
<tr>
<td>208 Volt</td>
<td>3</td>
<td>15.0</td>
</tr>
<tr>
<td>240 Volt</td>
<td>3</td>
<td>17.2</td>
</tr>
<tr>
<td>480 Volt</td>
<td>3</td>
<td>25.0</td>
</tr>
</tbody>
</table>

11. Other optional controls or remarks?
HORIZONTAL MOUNTING POSITIONS

P1
AIR FLOW RIGHT
PANEL LEFT

P2
AIR FLOW LEFT
PANEL LEFT

P3
AIR FLOW RIGHT
PANEL RIGHT

P4
AIR FLOW LEFT
PANEL RIGHT

P9
BOTTOM MOUNT

P10
BOTTOM MOUNT
ENGINEERING DATA

The following load calculations and recommended operating ranges are based on standard 75ºF entering air (comforting heating). Consult factory for other applications.

1. Conversion:  1 KW = 3413 B.T.U.

2. Load Requirement:  KW = \( \frac{\text{cubic Feet per Min. x Temperature Rise}}{3160} \)

3. Ohm’s Law:  Watts = \( \frac{(\text{Volts})^2}{\text{Resistance}} = \text{Volts} \times \text{Amps} \)

4. Line Current, 1 phase:  Amps = \( \frac{\text{Watts}}{\text{Volts}} \)

5. Line Current, 3 phase:  Amps = \( \frac{\text{Watts}}{(\text{Volts} \times 1.73)} \)

6. Pressure Drop:  Inches \( H_2O = \left( \frac{\text{KW} \times \text{ft}^2}{760} \right) \times \left( \frac{\text{velocity in f.p.m.}}{500} \right)^2 \)

7. C.F.M. / F.P.M. Velocity Relationship:  VEL./F.P.M. = \( \frac{\text{C.F.M.}}{(\text{Duct Area/Ft.}^2)} \)

8. KW per square foot:  KW / sq. ft = \( \frac{\text{KW}}{[(\text{Duct width} \times \text{Duct height}) / 144]} \)

HEAT-VELOCITY RELATIONSHIP

The following graph shows the recommended ranges for combinations of heat and velocity, which will result in safe operating temperatures.