OVERVIEW

WATTCO™ duct heaters are composed of open coil, tubular or finned tubular heating elements that are either flanged or inserted in the duct. WATTCO™ supplies two types of duct heaters: air duct heaters and process heaters. Air duct heaters are primarily used in air flowing ventilation systems and comfort heating applications while process duct heaters are mainly used for industrial process heating applications (ovens that require re-circulated air or forced circulation).

WATTCO™ designs and configures your electric duct heaters according to your specifications. Our team is dedicated to research and development of the latest technologies, while striving to meet every customer’s needs by manufacturing first class duct heaters. Our 50-year expertise in developing and manufacturing electric duct heaters make WATTCO™ duct heaters, the most easily adaptable solutions for most non-pressurized air-heating systems.

KEY FEATURES

» 16-gauge satin coat steel
» Exclusive modular construction with stock frame components used with 2” vertical and horizontal dimensional increments for faster delivery
» Single and three-phase tensions
» Stainless steel supports
» Field replaceable heating elements, if required
» ¼” (6 mm) inside diameter thermowell
» 3 ½” (90 mm) thick insulation
» General purpose terminal enclosure
» Primary linear cutout:
  • 160ºF (71ºC)
  • 277/600 VAC
  • 25/10 AMP non-inductive
» Secondary linear cutout:
  • Manual reset with back-up magnetic contactor on units of 300V, 30 kW and less
  • 225ºF (107ºC)
  • 277/600 VAC
  • 25/10 AMP non-inductive
» Special sizes, wattages, and materials available upon request
» Built stainless steel frames available upon request
» American and Canadian Standards Associations (CSA, CSAus) certified

BENEFITS

» Versatile
» Corrosion and oxidation resistant
» Easy to maintain
» Easy to install
» Durable
» Compatible with local power supplies
» Built for safety
» Maximal dielectric strength and heat transfer
» Minimal heat loss
» Maintained wiring cooler
» Clean heat
» Easy service
» Minimal downtime

APPLICATIONS

» Heat treating
» Forced air comfort heating
» Booster air heater
» Air drying operations
» Core drying
» Air pre-heating
» Air handling equipment
» Fan coils
» Terminal reheating
» Multizone reheating
» Heat pump auxiliary systems
» Return air heating
» Resistor load banks
» Annealing

SELECTING YOUR WATTCO™ AIR DUCT HEATER

<table>
<thead>
<tr>
<th>APPLICATIONS</th>
<th>CONSTRUCTION TYPE</th>
<th>TUBULAR ELEMENTS</th>
<th>HEATER TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comfort heating</td>
<td>Flanged duct heater</td>
<td>Finned</td>
<td>QFD</td>
</tr>
<tr>
<td>Comfort heating</td>
<td>Insert duct heater</td>
<td>Finned</td>
<td>QID</td>
</tr>
<tr>
<td>Comfort heating</td>
<td>Flanged duct heater</td>
<td>Incoloy® (non-finned)</td>
<td>QFE</td>
</tr>
<tr>
<td>Comfort heating</td>
<td>Insert duct heater</td>
<td>Finned</td>
<td>QIE</td>
</tr>
</tbody>
</table>

Please call us at 1-800-4WATTCO (1-800-492-8826) for further assistance.
**SELECTING YOUR WATTCO™ AIR DUCT HEATER**

A broad range of custom built electric duct heaters with capacities up to 1000kW is available upon request. WATTCO™ heaters can be used for applications with the following voltages:

- 347 volts/1 phase
- 600 volts/1 phase
- 600 volts/3 phases
- 208/240 volts/1 phase
- 208 volts/3 phases

WATTCO™ duct heaters have the international, American recognized, Canadian Standards Association (CSAus) label, which set the standards for the electric heating industry. Duct heater can include proper built-in safety devices to extend the service life of the heater.

WATTCO™ also manufactures heaters for industrial processes, original equipment manufacturers (OEM) or any other special applications.

**KILOWATTS**

Refer to Figure 3 to choose the appropriate kW for your application.

---

**FINNED TUBULAR ELEMENTS vs INCOLOY® UNFINNED TUBULAR ELEMENTS**

<table>
<thead>
<tr>
<th>FINNED TUBULAR ELEMENTS</th>
<th>INCOLOY® UNFINNED TUBULAR ELEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>The most common design</td>
<td>Available for approved special orders only</td>
</tr>
<tr>
<td>Include the highest wattage / cross sectional duct area</td>
<td>» Increase corrosion resistance</td>
</tr>
<tr>
<td>» Increase corrosion resistance</td>
<td>» High humidity environments</td>
</tr>
<tr>
<td>» High humidity environments</td>
<td>» Corrosive chemical contaminants in the air stream</td>
</tr>
<tr>
<td>Energy saver</td>
<td>Protect from electrical shock</td>
</tr>
<tr>
<td>Made of a steel tube with a corrugated steel fin wrapped around it and brazed together</td>
<td>Made of steel or stainless tube</td>
</tr>
<tr>
<td>Maximize the heat transfer surface of the element</td>
<td>Can be installed close to a register or grille</td>
</tr>
<tr>
<td>Provide lower operating temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>Designed for low maintenance</td>
<td>Designed for low maintenance</td>
</tr>
</tbody>
</table>

Please call us at 1-800-4WATTCO (1-800-492-8826) for further assistance.

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![FIG. 2 - INCOLOY® UNFINNED TUBULAR ELEMENT](image)

![FIG. 3 - KILOWATTS](image)
CONSTRUCTION
The two available basic heater frame constructions (Figures 4 and 5) are:

» Insert type
» Flange type

Notes:
» Frames will be constructed with adequate thickness galvanized steel in order to provide sturdiness of the heater.
» The mounting flanges for insertion provide an easy and safe fastening to the duct and do not require the main electrical control panel to be opened.
» Heating elements are made of open nickel chrome.
» High temperature resistant and first grade ceramics support coils horizontally.
» Coils are machine-crimped onto galvanized terminal and secured by a ceramic socket which is resistant to anti-rotating high temperature.
» All heaters are supplied with magnetic contactors and a primary automatic reset thermal cut-out to avoid overheating. Refer to the alternative auxiliary duct heater controls section on page 11.6 for a list of available controls.

TYPICAL DIMENSIONS
» Insert type heaters: Undersized to allow duct installation with A and B dimensions, as shown in Table 1 on Page 5

<table>
<thead>
<tr>
<th>DIM.</th>
<th>in.</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>6 1/2</td>
<td>163</td>
</tr>
<tr>
<td>D</td>
<td>7</td>
<td>178</td>
</tr>
<tr>
<td>E</td>
<td>2</td>
<td>51</td>
</tr>
</tbody>
</table>

FIG. 4 - INSERT TYPE

FIG. 5 - FLANGE TYPE

TYPE QFD

TYPE QID
QFD and QID Air Duct Heaters

» Install the heaters in a horizontal duct with the terminal housing at the side or bottom.
» Use tandem mounting (several heaters in series) when possible.

Note: Units in Table 2 are only examples. For safety reasons, refer to this table as a guideline for custom design orders. Custom designed units will be built according to the requirements of your specific application.

Note: QFE and QIE Incoloy® tubular duct heaters are only available upon request

COMMON FEATURES

» Primary linear cutout: 160°F (71°C) 277/600 VAC, 25/10 AMP non-inductive
» Secondary linear cutout - Manual reset complete with back-up magnetic contactor on units under 300V, 30 kW and less;
  » 225°F (107°C) 277/600 VAC, 25/10 AMP non-inductive

ALTERNATIVE AUXILIARY DUCT HEATER CONTROLS

The following controls are supplied by WATTCO™ on the duct heater or are available as an EEMAC rated control panel for wall mount:

» Duct thermostats
  • QFD (1 stage)
  • QFD (2 stage)
  • QFD (0 - 135 OHM)
» Controller
» Room thermostat
» Bulb holders
» Silent contactors
» SCR controllers
» Sail switch
» Fixed pressure differential switch
» Main disconnect
» Pneumatic electric switches
» On-off switch
» Magnetic contactors
» Step controllers
» Load fuses
» Stage fuses
» HRC fusing
» Control transformers
» Bottom terminal box
» Secondary manual reset thermal cut-out
» Fan interlock relay
» Protective screens
» Pilot lights

TABLE 2

Types QFD/QID Duct Heaters with Finned Elements

<table>
<thead>
<tr>
<th>KW</th>
<th>120V 1t</th>
<th>208V 1t</th>
<th>240V 3t</th>
<th>480V 3t</th>
<th>600V 3t</th>
<th>DIMENSIONS</th>
<th>MINIMUM AIR FLOW</th>
<th>NO. OF ELEMS.</th>
<th>CATALOG NUMBERS</th>
<th>APPROX. WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>6 (152)</td>
<td>6 (152)</td>
<td>50 (1.4)</td>
<td>QFD0010</td>
<td>15 (7)</td>
</tr>
<tr>
<td>2.5</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>—</td>
<td>—</td>
<td>6 (152)</td>
<td>6 (152)</td>
<td>150 (4.2)</td>
<td>QFD0025</td>
<td>15 (7)</td>
</tr>
<tr>
<td>7.5</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>14 (356)</td>
<td>8 (203)</td>
<td>390 (11.0)</td>
<td>QFD0075</td>
<td>20 (9)</td>
</tr>
<tr>
<td>10</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>14 (356)</td>
<td>12 (305)</td>
<td>500 (14.1)</td>
<td>QFD0100</td>
<td>25 (11)</td>
</tr>
<tr>
<td>12.5</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>16 (406)</td>
<td>12 (305)</td>
<td>625 (17.7)</td>
<td>QFD0125</td>
<td>30 (14)</td>
</tr>
<tr>
<td>15</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>18 (457)</td>
<td>12 (305)</td>
<td>750 (21.2)</td>
<td>QFD0150</td>
<td>34 (14)</td>
</tr>
<tr>
<td>17.5</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>18 (457)</td>
<td>14 (356)</td>
<td>875 (24.8)</td>
<td>QFD0175</td>
<td>35 (16)</td>
</tr>
<tr>
<td>20</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>18 (457)</td>
<td>16 (406)</td>
<td>1000 (28.3)</td>
<td>QFD0200</td>
<td>35 (16)</td>
</tr>
<tr>
<td>25</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>20 (508)</td>
<td>18 (457)</td>
<td>1250 (35.4)</td>
<td>QFD0250</td>
<td>50 (23)</td>
</tr>
<tr>
<td>30</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>24 (610)</td>
<td>18 (457)</td>
<td>1500 (42.4)</td>
<td>QFD0300</td>
<td>55 (25)</td>
</tr>
<tr>
<td>35</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>24 (610)</td>
<td>22 (559)</td>
<td>1650 (46.7)</td>
<td>QFD0350</td>
<td>60 (27)</td>
</tr>
<tr>
<td>40</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>26 (660)</td>
<td>24 (610)</td>
<td>2050 (58.0)</td>
<td>QFD0400</td>
<td>70 (32)</td>
</tr>
<tr>
<td>45</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>28 (711)</td>
<td>24 (610)</td>
<td>2200 (62.2)</td>
<td>QFD0450</td>
<td>75 (34)</td>
</tr>
<tr>
<td>50</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>28 (711)</td>
<td>26 (660)</td>
<td>2500 (70.7)</td>
<td>QFD0500</td>
<td>80 (36)</td>
</tr>
<tr>
<td>60</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>30 (762)</td>
<td>30 (762)</td>
<td>3000 (84.9)</td>
<td>QFD0600</td>
<td>95 (43)</td>
</tr>
<tr>
<td>80</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>36 (914)</td>
<td>32 (813)</td>
<td>4000 (113.1)</td>
<td>QFD0800</td>
<td>115 (48)</td>
</tr>
<tr>
<td>100</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>42 (1067)</td>
<td>36 (914)</td>
<td>5250 (148.5)</td>
<td>QFD1000</td>
<td>130 (59)</td>
</tr>
<tr>
<td>120</td>
<td>—</td>
<td>—</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>48 (1219)</td>
<td>36 (914)</td>
<td>6000 (170.0)</td>
<td>QFD1200</td>
<td>150 (68)</td>
</tr>
</tbody>
</table>
## OVERVIEW

WATTCO™ process duct heaters are installed in forced air ducts and used for industrial processes (forced air dryers, core drying, annealing) that require medium to high air temperature (at least 750°F/400°C).

Process duct heaters come with the same standard and optional features as air duct heaters.

Please call us at 1-800-4WATTCO (1-800-492-8826) for further assistance in selecting the best WATTCO™ process duct heater for your application.

### TABLE 3

**Process Duct Heaters**

<table>
<thead>
<tr>
<th>KW</th>
<th>STANDARD VOLTAGES</th>
<th>A DIM. (in.)</th>
<th>C DIM. (in.)</th>
<th>D DIM. (in.)</th>
<th>Y DIM. (in.)</th>
<th>CAT. NO.</th>
<th>NET WT. LBS (KG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>208</td>
<td>230</td>
<td>155 (6.1)</td>
<td>135 (5.3)</td>
<td>—</td>
<td>110 (4.3)</td>
<td>AMT-6X</td>
<td>15.4 (7)</td>
</tr>
<tr>
<td>240</td>
<td>230</td>
<td>155 (6.1)</td>
<td>135 (5.3)</td>
<td>—</td>
<td>110 (4.3)</td>
<td>AMT-6X</td>
<td>15.4 (7)</td>
</tr>
<tr>
<td>480</td>
<td>230</td>
<td>155 (6.1)</td>
<td>135 (5.3)</td>
<td>—</td>
<td>110 (4.3)</td>
<td>AMT-6X</td>
<td>15.4 (7)</td>
</tr>
<tr>
<td>600</td>
<td>230</td>
<td>155 (6.1)</td>
<td>135 (5.3)</td>
<td>—</td>
<td>110 (4.3)</td>
<td>AMT-6X</td>
<td>15.4 (7)</td>
</tr>
</tbody>
</table>

**TYPE AMT - INTERMEDIATE TEMPERATURE DESIGN - 27 W/in², (4.2 W/cm²)**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>W/cm</th>
<th>W/in.</th>
<th>B DIM. (mm in.)</th>
<th>E DIM. (mm in.)</th>
<th>F DIM. (mm in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMT</td>
<td>4.2</td>
<td>27</td>
<td>410 (16.1)</td>
<td>150 (5.9)</td>
<td>35 (1.4)</td>
</tr>
<tr>
<td>AML</td>
<td>3.1</td>
<td>20</td>
<td>530 (20.9)</td>
<td>250 (9.8)</td>
<td>51</td>
</tr>
</tbody>
</table>

**TYPE AML - HIGH TEMPERATURE DESIGN (UP TO 950°F OUTLET TEMP.) - 27 W/in², (4.2 W/cm²)**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>W/cm</th>
<th>W/in.</th>
<th>B DIM. (mm in.)</th>
<th>E DIM. (mm in.)</th>
<th>F DIM. (mm in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMT</td>
<td>4.2</td>
<td>27</td>
<td>410 (16.1)</td>
<td>150 (5.9)</td>
<td>35 (1.4)</td>
</tr>
<tr>
<td>AML</td>
<td>3.1</td>
<td>20</td>
<td>530 (20.9)</td>
<td>250 (9.8)</td>
<td>51</td>
</tr>
</tbody>
</table>

**TYPE AML - HIGH TEMPERATURE DESIGN (UP TO 1100°F OUTLET TEMP.) - 20 W/in², (3.1 W/cm²)**

*WHEN ORDERING, PLEASE SPECIFY: Quantity, catalogue number, tension, wattage, shop drawings, and extra features.*