INDEX

THERMO-AIR AND THERMO-ZONE FRESH AIR HEATERS
- ELECTRIC FRESH AIR HEATERS ................................................................. 2-4
- FEATURES AND SPECIFICATIONS ............................................................ 2-3
- INSTALLATION INSTRUCTIONS ................................................................. 2-4 – 2-5
- TYPICAL APPLICATIONS ............................................................................. 2-2

THERMOLEC ELECTRIC DUCT HEATERS
- FEATURES ........................................................................................................ 2-6
- HOW TO SELECT AND SPECIFY ................................................................. 2-8 – 2-11
- MINIMUM RECOMMENDED DISTANCE FOR SAFETY AND SERVICE .................. 2-10
- POWER AND VOLTAGE REQUIREMENTS ...................................................... 2-12 – 2-13
- SLIP-IN AND FLANGED TYPE DUCT HEATER MODELS .................................. 2-7
- THERMO X AIR MINI FRESH AIR MAKE-UP ................................................. 2-14 – 2-16

THERMO-AIR AND THERMO-ZONE FRESH AIR HEATERS

Equipped with the most advanced Electronic Modulating Controller and Air Flow Sensor (patent pending)

- Just one electrical connection and the unit is ready to perform
- Adjustable duct sensor 0°C to 42°C included

Fresh Air Heater for 6" and 8" Ducts

Today’s airtight homes and offices beg for fresh air. When we trap the heat, excess humidity and indoor pollutants such as cleaning products, smoking and pets, will negatively affect the quality of the air we breathe, making our environment both uncomfortable and unhealthy.

Stale and humid air has to be replaced by fresh air. During winter, the incoming fresh air is at too low a temperature to be comfortable and requires preheating. It is more economical to preheat the incoming air at a specific controlled source than requiring the central system to continually compensate for heat loss.

The THERMO-AIR heater is designed to complement your heating system by preheating this fresh air at the lowest cost, thus continuously providing comfortable ventilation throughout the house.

Equipped with the most advanced modulating controller and air sensor, the THERMO-AIR heater will operate with extremely low air flow (see specifications). The unit uses the minimum amount of energy required to meet your needs. The air flow sensor detects the amount of air flowing through the unit and modulates the heating capacity accordingly, maximizing savings.

The THERMO-AIR heater is a quality product engineered to peak performance and long life.

TYPICAL APPLICATIONS

Heat Recovery Ventilation and Heat Pump
Central Air Furnace
Hydronic or Baseboard Heating

ECCO Supply™
2-2 www.eccosupply.ca

– E.&O.E. – All Prices F.O.B. Our Warehouse – Subject to Change Without Notice – All Taxes Extra – May not be Available at All Branches –
THERMO-AIR AND THERMO-ZONE FRESH AIR HEATERS (cont'd)

FEATURES AND SPECIFICATIONS

Automatic Reset Thermal Cut-out — Safety feature preventing overheating; will reset automatically after cool-off.

Air Flow Sensor — Modulates the heating capacity according to the quantity of air flowing through the heater.

Manual Reset Thermal Cut-out — Additional safety feature which prevents the frame from overheating.

Temperature Sensor — Controls the heater proportionally to maintain the pre-set air temperature in the duct.

Open Coil Elements — Made of the highest grade nickel-chrome resistance wire, they will not age or oxidize, thus assuring longer heater life.

Enclosure — Corrosion resistant galvanized steel.

Built-in Electronic Temperature Controller and Sensor — Proportionally modulates the heating load to match the exact capacity required, thus minimizing operating cost.

Round Collars — Simplifies the installation and considerably reduces field labour.

<table>
<thead>
<tr>
<th>DIAMETER (&quot;)</th>
<th>A (&quot;)</th>
<th>B (&quot;)</th>
<th>C (&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>12.50</td>
<td>11.50</td>
<td>8.50</td>
</tr>
<tr>
<td>8</td>
<td>12.50</td>
<td>13.75</td>
<td>10.25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MODEL</th>
<th>COLLAR SIZE (&quot;)</th>
<th>KW</th>
<th>VOLTAGE</th>
<th>AMPS</th>
<th>MIN CFM</th>
</tr>
</thead>
<tbody>
<tr>
<td>TER-6-1120</td>
<td>6</td>
<td>1</td>
<td>120/1</td>
<td>8.3</td>
<td>10</td>
</tr>
<tr>
<td>TER-6-1240</td>
<td>6</td>
<td>1</td>
<td>240/1</td>
<td>4.2</td>
<td>10</td>
</tr>
<tr>
<td>TER-6-2120</td>
<td>6</td>
<td>2</td>
<td>120/1</td>
<td>16.7</td>
<td>20</td>
</tr>
<tr>
<td>TER-6-2240</td>
<td>6</td>
<td>2</td>
<td>240/1</td>
<td>8.3</td>
<td>20</td>
</tr>
<tr>
<td>TER-8-3240</td>
<td>8</td>
<td>3</td>
<td>240/1</td>
<td>12.5</td>
<td>30</td>
</tr>
<tr>
<td>TER-8-4240</td>
<td>8</td>
<td>4</td>
<td>240/1</td>
<td>16.7</td>
<td>40</td>
</tr>
<tr>
<td>TER-8-5240</td>
<td>8</td>
<td>5</td>
<td>240/1</td>
<td>20.8</td>
<td>40</td>
</tr>
<tr>
<td>TER-8-6240</td>
<td>8</td>
<td>6</td>
<td>240/1</td>
<td>25.0</td>
<td>40</td>
</tr>
</tbody>
</table>

Specifications are for standard units.
For other sizes, voltages and capacities, please contact your local ECCO Supply Sales Branch.
THERMO-AIR AND THERMO-ZONE FRESH AIR HEATERS (cont’d)

ELECTRIC FRESH AIR HEATERS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>COLLAR (”)</th>
<th>KW</th>
<th>VOLT</th>
<th>AMPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TER-6-1120</td>
<td>6</td>
<td>1</td>
<td>120/1</td>
<td>8.3</td>
</tr>
<tr>
<td>TER-6-1208</td>
<td>6</td>
<td>1</td>
<td>208/1</td>
<td>4.8</td>
</tr>
<tr>
<td>TER-6-1240</td>
<td>6</td>
<td>1</td>
<td>240/1</td>
<td>4.2</td>
</tr>
<tr>
<td>TER-6-2120</td>
<td>6</td>
<td>2</td>
<td>120/1</td>
<td>16.7</td>
</tr>
<tr>
<td>TER-6-2208</td>
<td>6</td>
<td>2</td>
<td>208/1</td>
<td>9.6</td>
</tr>
<tr>
<td>TER-6-2240</td>
<td>6</td>
<td>2</td>
<td>240/1</td>
<td>8.3</td>
</tr>
<tr>
<td>TER-8-3208</td>
<td>8</td>
<td>3</td>
<td>208/1</td>
<td>14.4</td>
</tr>
<tr>
<td>TER-8-3240</td>
<td>8</td>
<td>3</td>
<td>240/1</td>
<td>12.5</td>
</tr>
<tr>
<td>TER-8-4208</td>
<td>8</td>
<td>4</td>
<td>208/1</td>
<td>19.2</td>
</tr>
<tr>
<td>TER-8-4240</td>
<td>8</td>
<td>4</td>
<td>240/1</td>
<td>16.7</td>
</tr>
<tr>
<td>TER-8-5208</td>
<td>8</td>
<td>5</td>
<td>208/1</td>
<td>24.0</td>
</tr>
<tr>
<td>TER-8-5240</td>
<td>8</td>
<td>5</td>
<td>240/1</td>
<td>20.8</td>
</tr>
<tr>
<td>TER-8-6240</td>
<td>8</td>
<td>6</td>
<td>240/1</td>
<td>25.0</td>
</tr>
</tbody>
</table>

NOTE: 10” and 12” Collar Available — P.O.A. Contact your local ECCO Supply Sales Branch for more information.

INSTALLATION INSTRUCTIONS

Mechanical Installation

Please read instructions carefully before installation.

1) The air direction may be either vertical or horizontal, but when the unit is installed horizontally, the cut-out cover must be on top.

2) Do not install elbows closer than 8” to the inlet or the outlet of the unit.

3) The electronic controller shuts down the heater when there is no air flow.
   The minimum amount of air required (in cubic feet per minute) to operate the unit is given in the last column of the table on next page (CFM).

4) Attach the unit to a suitable support. The 6” model is small enough to be located between standard 16” spaced floor joists. Always allow a minimum 1/2” clearance above the heater.

(continues on next page)
THERMO-AIR AND THERMO-ZONE FRESH AIR HEATERS (cont'd)
INSTALLATION INSTRUCTIONS (cont'd)

Electrical Installation
Please conform to all local and national electrical codes for wiring. The heater should be supplied by a separate cable, of appropriate gauge, and with appropriate protection.

Please refer to the following table:

<table>
<thead>
<tr>
<th>THERMO-AIR MODEL</th>
<th>THERMO-ZONE MODEL</th>
<th>COLLAR DIA (&quot;)</th>
<th>KW</th>
<th>VOLTS</th>
<th>AMPs</th>
<th>WIRE GAUGE</th>
<th>FUSES</th>
<th>MIN AIR FLOW CFM</th>
</tr>
</thead>
<tbody>
<tr>
<td>TER-6-1120</td>
<td>ZON-6-1120</td>
<td>6</td>
<td>1</td>
<td>120/1</td>
<td>8.3</td>
<td>14</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>TER-6-1208</td>
<td>ZON-6-1208</td>
<td>6</td>
<td>1</td>
<td>208/1</td>
<td>4.8</td>
<td>14</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>TER-6-1240</td>
<td>ZON-6-1240</td>
<td>6</td>
<td>1</td>
<td>240/1</td>
<td>4.2</td>
<td>14</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>TER-6-2120</td>
<td>ZON-6-2120</td>
<td>6</td>
<td>2</td>
<td>120/1</td>
<td>16.7</td>
<td>12</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>TER-6-2208</td>
<td>ZON-6-2208</td>
<td>6</td>
<td>2</td>
<td>208/1</td>
<td>9.6</td>
<td>14</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>TER-6-2240</td>
<td>ZON-6-2240</td>
<td>6</td>
<td>2</td>
<td>240/1</td>
<td>8.3</td>
<td>14</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>TER-8-3208</td>
<td>ZON-8-3208</td>
<td>8</td>
<td>3</td>
<td>208/1</td>
<td>14.4</td>
<td>12</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>TER-8-3240</td>
<td>ZON-8-3240</td>
<td>8</td>
<td>3</td>
<td>240/1</td>
<td>12.5</td>
<td>14</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>TER-8-4208</td>
<td>ZON-8-4208</td>
<td>8</td>
<td>4</td>
<td>208/1</td>
<td>19.2</td>
<td>10</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>TER-8-4240</td>
<td>ZON-8-4240</td>
<td>8</td>
<td>4</td>
<td>240/1</td>
<td>16.7</td>
<td>12</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>TER-8-5208</td>
<td>ZON-8-5208</td>
<td>8</td>
<td>5</td>
<td>208/1</td>
<td>24.0</td>
<td>10</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>TER-8-5240</td>
<td>ZON-8-5240</td>
<td>8</td>
<td>5</td>
<td>240/1</td>
<td>20.8</td>
<td>10</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>TER-8-6240</td>
<td>ZON-8-6240</td>
<td>8</td>
<td>6</td>
<td>240/1</td>
<td>25.0</td>
<td>10</td>
<td>30</td>
<td>60</td>
</tr>
</tbody>
</table>

To convert the air flow to litres/sec, multiply the value in CFM by 0.47

Special Instructions for each type of unit:
Thermo-Air
When the unit is installed and connected, set the potentiometer on the controller to the desired temperature. Please check the air direction carefully. The temperature sensor must be located on the air outlet side. When the unit is manufactured, this sensor is installed on the left side. It may have to be moved to the right if the air outlet is on the right. There are pre-punched holes on the right side to accommodate this change.

Thermo-Zone
When the unit is installed and connected, set the potentiometer on the controller to “R” (remote). Install the thermostat far from a heat source, on a wall where there is no air draft. Connect the two thermostat wires to the two “S S” marked terminals on the controller.
THERMOLEC ELECTRIC DUCT HEATERS

FEATURES

Standard

Mercury Contactors
Used to power individual stages of heating. They allow a silent operation and are exceptionally reliable.

Optional

Disconnect Switch
A built-in disconnect switch allows user to disconnect heaters individually in order to safely perform maintenance tasks.

Automatic Reset Cut-Out
The automatic reset thermal cut-out is a fail-safe, fixed temperature, disc type safety device that opens the circuit when its set point is reached. It automatically resets and returns the heater to operating conditions.

Fuses
Used to protect the total load or individual stages.

Transformer
Built-in control transformer supplies 24 volts to the control circuit.

Solid State Relay
Electronic contactor used to silently and proportionally control the heater in response to a pulsed signal.

SCR Controller
The SCR is a time proportioning type controller that modulates the heater and supplies the exact amount of power to match the heat demand. It is compatible with thermistor thermostat (RT or DT), 0-10 Vdc, 4-20 mA, 0-135 ohms input signals.

Optional

Tubular Incoloy Element

Airflow Switch
Used to prevent a heater from operating if there is no airflow. Provided with a pitot tube which, when installed into the duct, makes it sensitive to velocity pressure as well as to static pressure.

Highest Grade Open Coil

Magnetic Contactors
Used to power individual stages of heating or as back-up for safety switches.

All Thermolec Heaters are CSA and NRTL/C approved.

The “NRTL/C” indicator adjacent to the CSA Mark signifies that the product has been evaluated to the applicable ANSI/UL and CSA Standards, for use in the US and Canada. NRTL, i.e. Nationally Recognized Testing Laboratory, is a designation granted by the US Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to US Standards.
THERMOLEC ELECTRIC DUCT HEATERS

SLIP-IN AND FLANGED TYPE DUCT HEATER MODELS

- SC  Slip-In Open Coil (Fig. 1)
- ST  Slip-in Tubular
- FC  Flanged Open Coil
- FT  Flanged Tubular (Fig. 2)
- RFC Round Collar Open Coil (Fig. 3)
- RFT Round Collar with Tubular Elements

NOTE: All Thermolec heaters are CSA and NRTL/C approved.
HOW TO SELECT AND SPECIFY

Heater Capacity

Given CFM (volume of air in cubic feet per minute) and Δ°T (temperature rise in °F), the KW capacity can be determined from the formulas:

\[ \text{KW} = \frac{\text{cfm} \times \Delta \text{°T}}{3000} \]

\[ \text{Temperature Rise, °F} = \frac{\text{KW} \times 3000}{\text{CMF}} \]

**NOTE:** The above formulas are for standard air. Consult your local ECCO Supply Sales Branch for non-standard air conditions.

*This formula is for quick calculation and contains a loss allowance of 5%.

Air Flow Requirements and Minimum Velocity

When there is a choice in heater face dimensions the specification writer has several good reasons for favouring the smaller rather than the larger heater face area: the smaller sized, higher velocity electric coil will perform better, weigh less and cost less per KW than an otherwise identical larger coil.

The main selection criteria are KW per square foot of face area (or duct size) and Design Velocity.

<table>
<thead>
<tr>
<th>KW PER SQUARE FOOT RANGE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5</td>
<td>High cost per KW</td>
</tr>
<tr>
<td>5 to 12</td>
<td>Medium cost per KW</td>
</tr>
<tr>
<td>12 to 20</td>
<td>Low cost per KW</td>
</tr>
<tr>
<td>Over 20</td>
<td>Medium cost per KW</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FACE VELOCITY IN FEET PER MINUTE (FPM)</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 400</td>
<td>Requires derating of watts density on elements. Specify proportional control.</td>
</tr>
<tr>
<td>400 to 2000</td>
<td>Most economical range</td>
</tr>
<tr>
<td>Over 2000</td>
<td>Specify special coil supports</td>
</tr>
</tbody>
</table>

Unlike hot water or steam coils, electric coils will generate 100% of the heating capacity (i.e. the heat output is constant as long as the heater is energized) regardless of the air flow. A drop in air flow through an electric coil below the minimum required FPM (feet per minute) will increase both the coil temperature and the exhausted air, which may result in high limit cut-outs tripping.

Another frequent cause of unnecessary cut-out tripping is the uneven distribution of air flow over the coil surface, resulting in “hot spots”. In order to achieve trouble-free performance, provide adequate air flow as per “air flow requirement” chart (on page 391) and ensure even air flow distribution by following sound industry practice in design and installation of ductwork and equipment.

The Thermolec CSA NRTL/C listing is limited to 22.5 KW per square foot of duct area for open coil heaters and 13 KW per square foot of duct area for tubular element heaters.

Air Flow Requirements for ON-OFF Control

The minimum air flow required through a duct heater depends on the KW per square foot of face area for the highest capacity ON-OFF stage. In general 400 FPM is adequate in most applications.

Air Flow Requirement for full SCR Control

An SCR controlled heater may be considered as having an “infinite” number of control stages, and consequently the air flow requirements of the chart (on page 391) for minimum air flow does not apply. As a general rule, heaters equipped with FULL SCR will require an air velocity of at least 300 FPM. For lower design velocities please consult your local ECCO Sales Branch.

Exclusive Feature

The special Thermo-V unit for VAV applications allows the heater to perform down to 50 FPM.
THERMOLEC ELECTRIC DUCT HEATERS  (cont’d)

HOW TO SELECT AND SPECIFY  (cont’d)

Open Coil vs Tubular Elements
Thermolec manufactures both open coil and tubular duct heaters. It is widely acknowledged that tubular elements find practical application under certain circumstances (service conditions include possible contact by personnel, presence of dust or particles in the air flows or atmospheric conditions). But, where heating filtered air is the sole function, the open coil heater is superior for many reasons:

- Longer life
- More kilowatts per square foot
- Less stratification by equal distribution of the elements
- Lower wire surface temperature
- Less maintenance
- Greater serviceability
- Better heat distribution across heater face
- Less pressure drop
- Lighter weight
- Low shipping costs
- Less sensitivity to moisture
- More flexibility of size and capacity
- Cost effective
- Smaller size
- Large electrical clearance

---

Air Velocity (FPM) vs. Pressure Drop for Tubes

Minimum Air Velocity for Tubes

---

– E.&O.E. – All Prices F.O.B. Our Warehouse – Subject to Change Without Notice – All Taxes Extra – May not be Available at All Branches –

ECCO Supply™ www.eccosupply.ca 2-9
THERMOLEC ELECTRIC DUCT HEATERS

HOW TO SELECT AND SPECIFY (cont’d)

Universal Mounting of Thermolec Heaters

Unique Feature

By design, all Thermolec heaters are made non-sensitive to air flow direction. The built-in high limit thermal cut-outs are located in such a way that the air flow could be in any direction without impairing safety and the same heater could be installed in a horizontal or vertical duct.

Multiple Heaters in a Duct

Normally, electric heaters are not designed to be used in series in a heating installation. For very large heaters, manufacturing, shipping, field handling, and installation can be simplified by using two or more units specially designed for parallel installation. Each section has its own cut-outs and terminal blocks are provided to interconnect the controls in the field.

Clearance

Thermolec heaters are CSA and NRTL/C approved for zero clearance to combustible material. This means that there is no distance restrictions between the section of the duct housing, the heater, and combustible material. However, space should be provided to install and service the duct heater. Please see the minimum recommended installation clearances figures below.

MINIMUM RECOMMENDED DISTANCE FOR SAFETY AND SERVICE

![Diagram of heater installation clearances]

Installation Clearances

– E.&O.E. – All Prices F.O.B. Our Warehouse – Subject to Change Without Notice – All Taxes Extra – May not be Available at All Branches –

2-10 www.eccosupply.ca
THERMOLEC ELECTRIC DUCT HEATERS (cont’d)

HOW TO SELECT AND SPECIFY (cont’d)

Heater Installation

Details of the Thermolec Mechanical Construction

Model SC Dimensions

Model FC Dimensions

Model RFC Dimensions

Conversion to metric:

1” = 25.4 mm
3/4” = 19.05 mm

– E.&O.E. – All Prices F.O.B. Our Warehouse – Subject to Change Without Notice – All Taxes Extra – May not be Available at All Branches –
POWER AND VOLTAGE REQUIREMENTS

Nominal and Standard Supply Voltages

While a utility's voltage may be referred to by means of a nominal figure, actual applied voltage may vary over a fairly wide range depending on factors like the system's power distribution lines, and many others. For instance, a nominal voltage of 575V / 3PH / 60Hz may variously be called 550V, 575V or 600V depending more on what the specification writer is accustomed to calling it than on the actual voltage supplied to the heater. Designing a heater for 550V when in fact 600V is supplied to it will result in almost 10% more current and 20% more KW capacity since current is proportional to the voltage and KW is proportional to the square of the voltage. Conversely, application of a lower voltage results in a corresponding under-performance of the heater. It is therefore of the utmost importance to ensure that the correct voltage is specified.

For safety reasons, Thermolec standard supply voltages have been chosen to be the highest for each voltage range, as shown in the table below. Heaters designed for lower voltages in each range are available and will be supplied when a customer expressly specifies a lower supply voltage.

### Standard Voltages

<table>
<thead>
<tr>
<th>COMMON Nominal Voltages</th>
<th>110</th>
<th>115</th>
<th>120</th>
<th>220</th>
<th>230</th>
<th>240</th>
<th>277</th>
<th>318</th>
<th>332</th>
<th>347</th>
<th>380</th>
<th>416</th>
<th>440</th>
<th>460</th>
<th>480</th>
<th>550</th>
<th>575</th>
<th>600</th>
</tr>
</thead>
<tbody>
<tr>
<td>THERMOLEC Standard Voltages</td>
<td>120</td>
<td>208</td>
<td>208</td>
<td>220</td>
<td>240</td>
<td>240</td>
<td>277</td>
<td>347</td>
<td>380</td>
<td>380</td>
<td>416</td>
<td>416</td>
<td>480</td>
<td>480</td>
<td>600</td>
<td>600</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Selection Code

The selection code describes the duct heater completely, including all features and options.

For example:

**Features**
- 6 KW capacity
- 2 stages
- 208/1/60 voltage
- Dimensions: 30" × 8" (W × H)

**Options**
- Flanged frame
- Pressure differential switch
- Toggle-type disconnect switch
- Protective screens on both sides
- Vertical Air flow

### Standard Built-In Controls

All duct heaters shall be complete with the following built-in controls:
- High limit cut-outs, magnetic contactors as required, control transformer and air flow sensor as standard components.
THERMOLEC ELECTRIC DUCT HEATERS (cont’d)

POWER AND VOLTAGE REQUIREMENTS (cont’d)

347 (277) V. Single Phase Power Supply

When capacities are below 7 KW at 277 V and 8 KW at 347 V Thermolec recommends the use of the following arrangements to obtain the most economical cost for heaters and electrical distribution.

600 V / 3 Ph or (480 C / 3 Ph)
4 wires
POWER SUPPLY

These voltages are generally derived from a 600 (480) volts – 3 phase – 4 wire power supply.
A group of 347 (277) volt – 1 phase heaters should be distributed as equally as practical over the three phases in order to keep current imbalance to a minimum.
Neutral conductor should not be broken by any switching or protective device, be it internal or external to the heater.

Line Current
The table below shows line current per one KW capacity at various voltages. The following formulas apply:

<table>
<thead>
<tr>
<th>SINGLE PHASE</th>
<th>THREE PHASE (Star or Delta loads)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Current in Amperes = ( \frac{\text{Watts}}{\text{Line Voltage}} )</td>
<td>Line Current in Amperes = ( \frac{\text{Watts}}{1.73 \times \text{Line Voltage}} )</td>
</tr>
</tbody>
</table>

| THERMOLEC Standard Voltages | 120 | 208 | 208 | 220 | 240 | 240 | 277 | 277 | 347 | 380 | 380 | 416 | 416 | 480 | 480 | 600 | 600 |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 ph                        | 1 ph| 3 ph| 1 ph| 1 ph| 3 ph | 1 ph| 1 ph| 1 ph| 1 ph| 3 ph | 1 ph| 3 ph | 1 ph| 1 ph| 3 ph | 1 ph| 3 ph | 1 ph|
| MULTIPLIER Amp/KW           | 8.33| 4.81| 2.78| 4.55| 4.17 | 2.41| 3.61| 2.88| 2.63 | 1.52 | 2.40 | 1.39 | 2.08 | 1.20 | 1.67 | 0.96| 0.96 |

Multipliers to calculate Line Currents
(Line current in amperes = Multiplier \( \times \) KW capacity)
Example: The line current for 40 KW / 600V / 3 phases heater is: \( 40 \times 0.96 = 38.4 \) amperes.
THERMO X AIR MINI FRESH AIR MAKE-UP

- Provides up to 90 CFM of tempered fresh air
- Three position push button room controller with pilot lights
- Modulated heat
- Washable filter
- Compact size

Today’s airtight homes and offices beg for fresh air. When we trap the heat, excess humidity and indoor pollutants such as cleaning products, smoking and pets, will negatively affect the quality of the air we breathe, making our environment both uncomfortable and unhealthy.

In new construction the ventilation code requires the installation of a system to provide adequate fresh air. During winter, the incoming fresh air is at too low a temperature to be comfortable and requires preheating. It is more economical to preheat the incoming air at a specific, controlled source than requiring the central system to continually compensate for heat loss.

When the fresh air required is 90 CFM or less the new THERMO X AIR mini fresh air make-up offers the optimum solution at the lowest total cost.

The THERMO X AIR mini fresh air make-up is designed to complement your heating system by pre-heating this fresh air at the lowest cost, thus continuously providing comfortable ventilation throughout the house.

Equipped with the most advanced modulating controller and air sensor, the THERMO X AIR mini fresh air make-up uses the minimum amount of energy required to meet your needs. The air flow sensor detects the amount of air flowing through the unit and modulates the heating capacity accordingly, maximizing savings.

The THERMO X AIR system is a quality product engineered for peak performance and long life.

<table>
<thead>
<tr>
<th>#</th>
<th>MODEL</th>
<th>COLLAR SIZE (&quot;</th>
<th>KW</th>
<th>VOLTAGE</th>
<th>AMPS</th>
<th>CFM</th>
</tr>
</thead>
<tbody>
<tr>
<td>801290</td>
<td>FER-1.5-120</td>
<td>6</td>
<td>1.5</td>
<td>120/1</td>
<td>12.5</td>
<td>45</td>
</tr>
<tr>
<td>801291</td>
<td>FER-1.5-240</td>
<td>6</td>
<td>1.5</td>
<td>120/240/1</td>
<td>6.25</td>
<td>45</td>
</tr>
<tr>
<td>801292</td>
<td>FER-2-240</td>
<td>6</td>
<td>2</td>
<td>120/240/1</td>
<td>8.3</td>
<td>60</td>
</tr>
<tr>
<td>801293</td>
<td>FER-3-240</td>
<td>6</td>
<td>3</td>
<td>120/240/1</td>
<td>12.5</td>
<td>90</td>
</tr>
</tbody>
</table>

Other capacities and voltages available.
THERMO X AIR MINI FRESH AIR MAKE-UP (cont’d)

Features and Specifications

- **Automatic Reset Thermal Cut-out**: Safety feature preventing overheating, will reset automatically after cool-off.
- **Air Flow Sensor**: Modulates the heating capacity according to the quantity of air flowing through the heater.
- **Manual Reset Thermal Cut-out**: Additional safety feature which prevents the frame from overheating.
- **Temperature Sensor**: Controls the heater proportionally to maintain the pre-set air temperature in the duct.
- **Open Coil Elements**: Made of the highest grade nickel-chrome resistance wire, they will not age or oxidize, thus assuring longer heater life.
- **Washable Filter**: Easy access filter.
- **Enclosure**: Corrosion resistant galvanized steel.
- **Fan**: High quality tube axial fan with ball bearings for lowest noise and longest life.

**One Touch Room Control**
- Allows for full or intermittent ventilation.
- Pilot lights indicate the selected mode.

<table>
<thead>
<tr>
<th>DIA</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>16.00&quot;</td>
<td>11.50&quot;</td>
<td>8.00&quot;</td>
</tr>
</tbody>
</table>

**Typical Application**
- **One Touch Room Control**
- **Connection to Exhaust Fan Supplied**: 120VAC up to 3 amps. max. output to drive simultaneously an exhaust fan when required.

– E.&O.E. – All Prices F.O.B. Our Warehouse – Subject to Change Without Notice – All Taxes Extra – May not be Available at All Branches –
Standard Components Included in All Heaters
- Slip-in Mounting
- Open Coil Elements
- Auto and Manual High Limit Cutouts
- Magnetic Contactors
- Airflow Switch
- Transformer

Optional Equipment
1. Built-in Disconnect Switch
2. Room Thermostat (RT)
3. Duct Thermostat (DT)
4. Flanged Mounting
5. Dual Fuel Control
6. Grade A Elements
7. Pilot Lights
8. Remote Adjustable Duct Sensor (RADS)
9. Remote Adjustable Room Sensor (RARS)
10. Nema 4 Control Box
11. Remote Control Box
12. Insulated Terminal Box
13. Dust Tight Control Box
14. Recess Terminal Box
15. Protective Screens (both sides)
16. Tubular Elements (expect 3-week lead time)
17. Full Break Contactors

QUOTE PROCESS NOTES: Wholesale quote requests can be faxed or emailed to your local ECCO Supply branch. Quotes will be returned within 2 business days. Submittal drawings will be created and forwarded to you for approval. These drawings need to be signed off and returned before an order can be processed.