

## E7 Series Electric Furnace

# INSTALLATION INSTRUCTIONS

### Downflow & Upflow Models



E7EM MULTI-POISE



E7EU UPFLOW



E7ED DOWNFLOW

## **⚠ WARNING**

### **ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD**

**Failure to follow safety warnings exactly could result in serious injury, death or property damage.**

**Improper servicing could result in dangerous operation, serious injury, death or property damage.**

- **Before servicing, disconnect all electrical power to Appliance both poles.**
- **When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.**
- **Verify proper operation after servicing.**

**DO NOT DESTROY. PLEASE READ CAREFULLY & KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.**

### **ATTENTION INSTALLERS:**

It is your responsibility to know this product better than your customer. This includes being able to install the product according to strict safety guidelines and instructing the customer on how to operate and maintain the equipment for the life of the product. Safety should always be the deciding factor when installing this product and using common sense plays an important role as well. Pay attention to all safety warnings and any other special notes highlighted in the manual. Improper installation of the Appliance or failure to follow safety warnings could result in serious injury, death, or property damage.

These instructions are primarily intended to assist qualified individuals experienced in the proper installation of this appliance. Some local codes require licensed installation/service personnel for this type of equipment. Please read all instructions carefully before starting the installation. Return these instructions to the customer's package for future reference.

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## IMPORTANT SAFETY INFORMATION

INSTALLER: Please read all instructions before servicing this equipment. Pay attention to all safety warnings and any other special notes highlighted in the manual. Safety markings are used frequently throughout this manual to designate a degree or level of seriousness and should not be ignored. **WARNING** indicates a potentially hazardous situation that if not avoided, could result in personal injury or death. **CAUTION** indicates a potentially hazardous situation that if not avoided, may result in minor or moderate injury or property damage.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

## REQUIREMENTS & CODES

### **WARNING:**

**This unit must be installed in accordance with instructions outlined in this manual during the installation, service, and operation of this unit. Unqualified individuals should not attempt to interpret these instructions or install this equipment. Failure to follow safety recommendations could result in possible damage to the equipment, serious personal injury or death.**

- The installer must comply with all local codes and regulations which govern the installation of this type of equipment. Local codes and regulations take precedence over any recommendations contained in these instructions. Consult local building codes and the National Electrical Code (NEC) for special installation requirements.
- All electrical wiring must be completed in accordance with local, state and national codes and regulations and with the National Electric Code (ANSI/NFPA 70) or in Canada the Canadian Electric Code (CSA Z240.6.1, & Z240.9.1).
- Design and construction of the home duct system, must be in accordance with: HUD Manufactured Home Construction & Safety Standard (Title 24, Part 3280) and American National Standards (ANSI) A119.11, C1-NFPA 7.
- Plenums and air ducts must be installed in accordance with the Standard for the Installation of Air Conditioning and Ventilating Systems (NFPA No. 90A) or the Standard for the Installation of Warm Air Heating and Air Conditioning Systems (NFPA No. 90B).
- Follow all precautions in the literature, on tags, and on labels provided with the equipment. Read and thoroughly understand the instructions provided with the equipment prior to performing the installation and operational checkout of the equipment.

This unit E7 is a PARTIAL UNIT AIR CONDITIONER, complying with PARTIAL UNIT requirements of this International Standard, and must only be connected to other units that have been confirmed as complying to corresponding PARTIAL UNIT requirements of this International Standard, UL 60335-2-40/CSA C22.2 No. 60335-2-40, or UL 1995/CSA C22.2 No 236.

### Minimum Installation Clearances

- Access for positioning and servicing the unit must be considered when locating unit. The need to provide clearance for access to panels or doors may require clearance distances over and above the requirements. **For alcove installations allow 24 (61 cm) inches minimum clearance from the front of the unit for future servicing. Closet installations require 6 inches (152 mm) minimum.**
- This appliance must be installed in accordance with clearances listed in [Table 1](#). The Appliance must be installed with ample clearance for easy access to the air filter, blower assembly, burner assembly, controls, and vent connections.

ALL MODELS	CLOSET	ALCOVE
Front **	6" (152 mm)	24" (609 mm)
Back	0"	0"
Sides*	0"	0"
Top	0"	0"
Top & Sides of Duct	0"	0"
Bottom of Duct	0"	0"

\* For upflow application using upflow stand, 3" (76 mm) minimum per side.

\*\* Service Clearance

**Table 1. Minimum Clearance Requirements**

- Locate and install this unit in position as specified on [page 5](#). This unit is designed only for Indoor installations and should be located with consideration of minimizing the length of the supply and return ducts. See [Table 4 \(page 15\)](#), [Table 5 \(page 16\)](#), or the rating plate for circulating airflow data.

### Minimum Unobstructed Airflow

- Sufficient clearance for unobstructed airflow must be maintained in order to achieve rated performance. Air return to the Appliance must have the minimum required total free area:
  - 200 in<sup>2</sup> (1290 cm<sup>2</sup>) for furnace only. May also include return air grille and frame assembly P/N 902989 or wall mount grille P/N 902999).
  - 235 in<sup>2</sup> (1516 cm<sup>2</sup>) with 4 ton or smaller A.C. or H.P. installed.
  - 250 in<sup>2</sup> (1613 cm<sup>2</sup>) with 4 ton or smaller A.C. or H.P. installed & 1" special clearance.
  - 275 in<sup>2</sup> (1775 cm<sup>2</sup>) with up to 5 ton A.C. or H.P. installed.
- If using louvered doors, the total free area must be calculated. Louvered doors installed at the factory are about 70% free area. If using a third party louvered door manufacturer, check their technical specifications to determine the free area.

- For closet installations with less than 6" front clearance, but not less than 1" (25 mm), a louvered door must be used having a minimum 250 sq in2 (1,613 cm2) free area opening directly in line with openings in the Appliance door.

#### **Clearances to Combustible Materials**

- This Appliance is Design Certified in the U.S. and Canada by ETL for the minimum clearances to combustible materials. **NOTE:** The Appliance is listed for installation on combustible or non-combustible flooring. To obtain specific clearance information, refer to the Appliance rating plate, located inside of the Appliance cabinet.
- 0" from all surfaces of Appliance cabinet, ducts, optional coil housing and plenum connector. No separate subbase required for installations on combustible flooring.

## **CIRCULATING AIR REQUIREMENTS**

### **WARNING:**

**All return ducts must be secured to the Appliance with sheet metal screws. All return ducts must be adequately sealed. When return air is provided through the bottom of the unit, the joint between the Appliance and the return air plenum must be air tight.**

**Return air and circulating air ducts must not be connected to any other heat producing device such as a fireplace insert, stove, etc. This may result in fire, explosion, carbon monoxide poisoning, personal injury, or property damage.**

#### **Return Air Connections**

Air return to the Appliance must have a minimum free area opening that meets the minimum installation clearances found on [page 5](#). A return air grille for closet or alcove installations is available. Acceptable installations with return air entering through an opening in the floor, ceiling of a closet, or alcove installation, must meet all of the following requirements:

- The return air opening, regardless of its location, must not be smaller than size specified on unit data label. If located in the floor, the opening must be provided with a means of preventing its inadvertent closure by flat object(s) placed over the opening.
- A return air grille must be used on the Appliance when installed in a closet or alcove:

#### Upflow Alcove installations

- E7EM Models: Use a coil box with a solid door and an upflow stand ([Figure 1 \(page 5\)](#)). Part numbers can be found in the Technical Specifications Literature.
- E7EU Models: Use upflow stand.

#### Closet installations

- All E7 Models: A louvered door must be added in the closet door or above it for adequate air flow.

#### Downflow alcove installations

- E7EM Models: A grille may be attached to the top of the Appliance and all paneling and trim flushed to it. This installation provides an access door for future installation of air conditioning or heat pump coils on top of the Appliance.
- E7ED models are for non-ducted return.
- E7EU Models can be used for ducted return.
- Materials located in return air duct system must have a flame-spread classification of 200 or less.
- Noncombustible pans having 1" (25 mm) upturned flanges must be located beneath openings in a floor-return duct system.

#### **Supply Air Connections**

- Supply duct system must be designed for proper air distribution. Static pressure measured externally to Appliance shall not exceed static pressure rating listed on Appliance nameplate.
- Duct system must be designed so that no supply registers are located in duct system directly below the Appliance.

#### **Filtering Methods - Downflow Appliances**

##### Non-Ducted Return Air

For unducted return air systems, either the optional grille and frame assembly or the optional wall mount grille is recommended.

- E7ED Models: Make sure there is an 18" (457 mm) x 20" (508 mm) filter in the top filter rack and an 18" (457 mm) x 20" (508 mm) filter in the front filter rack.

##### Without A/C or H/P uncased coil

- Use the filter supplied with the Appliance. Make sure the filter is installed mat side down between the filter retainer and Appliance top.

##### With A/C or H/P uncased coil

- Use the optional coil filters; the filter supplied with the Appliance is not used; REMOVE AND DISCARD THIS FILTER.

##### With optional coil housing

- See coil cabinet instructions for specific filtering methods.

##### Ducted Return Air

For ducted return air systems with air conditioners or heat pumps, either providing an access panel in the duct or using the optional coil cabinet is recommended. The duct system must be properly sized to account for any additional external static pressure produced from the chosen filtering method.

**NOTE:** Install a filter with a minimum unrestricted medium area that meets the application requirements of the Appliance in the duct above the coil that is accessible for monthly cleaning or replacement by homeowner.

#### **Filtering Methods - Upflow Appliances**

##### Non-Ducted Return Air

Appliances may be installed with unducted or ducted return air. For unducted systems it is recommended to use an upflow stand for optimal performance.



### Without optional upflow stand

- Install a filter with a minimum unrestricted medium area of 324 in<sup>2</sup> (2087cm<sup>2</sup>) below the coil cabinet/ Appliance assembly that is accessible for monthly cleaning or replacement by the homeowner.

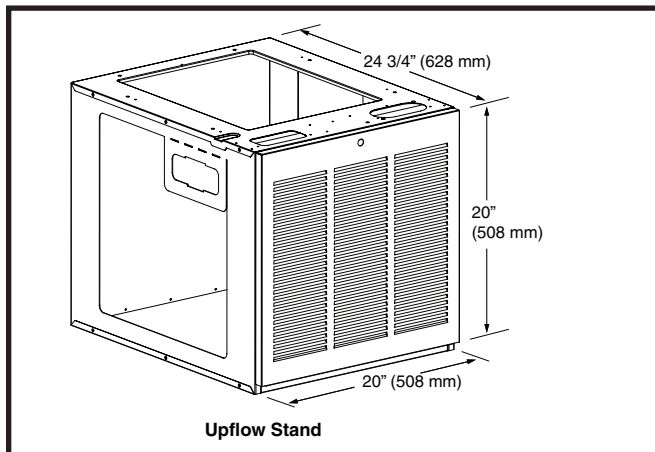
### With optional upflow stand

- Stand (Figure 1) will use filters provided with the unit. Remove any filters in the Appliance and follow proper installation. See instructions supplied with the upflow stand for additional details.

### Ducted Return Air

For ducted systems with air conditioners or heat pumps, the following optional equipment is recommended: coil cabinet and upflow duct connector.

- Install a filter with a minimum unrestricted medium area that meets the application requirements of the Appliance below the coil cabinet/Appliance assembly that is accessible for monthly cleaning or replacement by the homeowner.



**Figure 1. Optional Upflow Stand**

### **Optional Equipment**

**NOTE:** Refer to the instructions supplied with any additional accessories for further installation details. Ventilaira attachment locations are indicated in Figure 17 (page 13), Figure 18 (page 13) & Figure 20 (page 14).

### Optional Automatic Furnace Damper

Appliance may be equipped with the optional automatic damper when a packaged air conditioner is installed and connected to the warm air duct system. This damper (not required) prevents cooled air from discharging through the Appliance cabinet, causing excessive cooling of the immediate area. Refer to the instructions supplied with the damper for details.

### Duct Connectors for Downflow Systems

Duct connectors are recommended for heated air distribution in under-the-floor duct systems. With this system, Appliances may be installed on combustible flooring without a separate sub-base. The Appliance rear mounting plate (Figure 5 (page 7)) supplied with the duct connectors is recommended for use with this type of installation.

## **APPLIANCE INSTALLATION**

**NOTE:** Since all installations are different, the sequence of these steps may differ from the actual installation. These installation procedures are suggested for typical Appliance installations. **Only qualified HVAC technicians should install this Appliance.**

### **General Information**

This Appliance is designed only for indoor installations. Units are approved for single/multistory residential or mobile / modular / manufactured structures in upflow and downflow (freestanding / closet / alcove) configurations. This appliance is intended for use at a maximum altitude of 3048m (10,000ft).

Approved installation, operation, and maintenance of this appliance must be in accordance with the listed specifications contained in these instructions and other documents supplied with the Appliance and/or optional air conditioning equipment. Unless it is noted differently in this manual, only use factory authorized kits and accessories when modifying this appliance. Refer to local authorities having jurisdiction for further information.

### **Before You Install this Appliance**

- ✓ This equipment is securely packaged at the time of shipment and upon arrival should be carefully inspected for damage prior to installing the equipment at the job site. Claims for damage (apparent or concealed) should be filed immediately with the carrier.
- ✓ Check the electrical supply and verify the power supply is adequate for unit operation. The system must be wired and provided with circuit protection in accordance with local building codes. If there is any question concerning the power supply, contact the local power company.
- ✓ Verify the air delivery of the Appliance is adequate to handle the static pressure drop of the coil, filter, and duct work.

### **Locating the Unit**

- Survey the job site to determine the best location for installing the unit. Consideration should be given to availability of electric power, service access, and noise.
- The dimensions of the room or alcove must be able to accommodate the overall size of the unit and the installation clearances in Table 1 (page 3). Physical dimensions for this Appliance are shown in Figure 17 (page 13). If an upflow stand will be used, see Figure 20 (page 14) for component dimensions.
- The unit must be leveled at installation and attached to a properly installed duct system.
- The surface that the Appliance is mounted on must provide sound physical support of the unit.

### **Locating & Cutting Floor Openings**

Floor cut-outs must be carefully located to avoid misalignment of the Appliance and air duct. Standard and round cutouts for upflow Appliances are shown in Figure 2 (page 6). The cutouts for downflow Appliances are shown in Figure 3 (page 6).

1. Measure and mark the centerline of the cutout. Provide minimum clearances at rear and right side walls of closet or alcove for installation of Appliance and wiring.

2. Using the centerline as a starting point, draw the rest of the duct cut-out to the dimensions shown in [Figure 2](#) or [Figure 3](#).

**NOTE:** Additional provisions may be necessary for optional air conditioning or heat pump if refrigerant lines are installed elsewhere than at the front of the Appliance. The refrigerant and entrance supply opening dimensions may be adjusted  $\pm 1/2"$  (13 mm).

- Cut out the floor opening  $1/16"$  (1.6 mm) larger than the actual cutout drawn. This will allow some clearance when installing the duct connector.
- Measure from the top of the floor down to the top of the supply air duct to obtain the depth of the floor cavity.

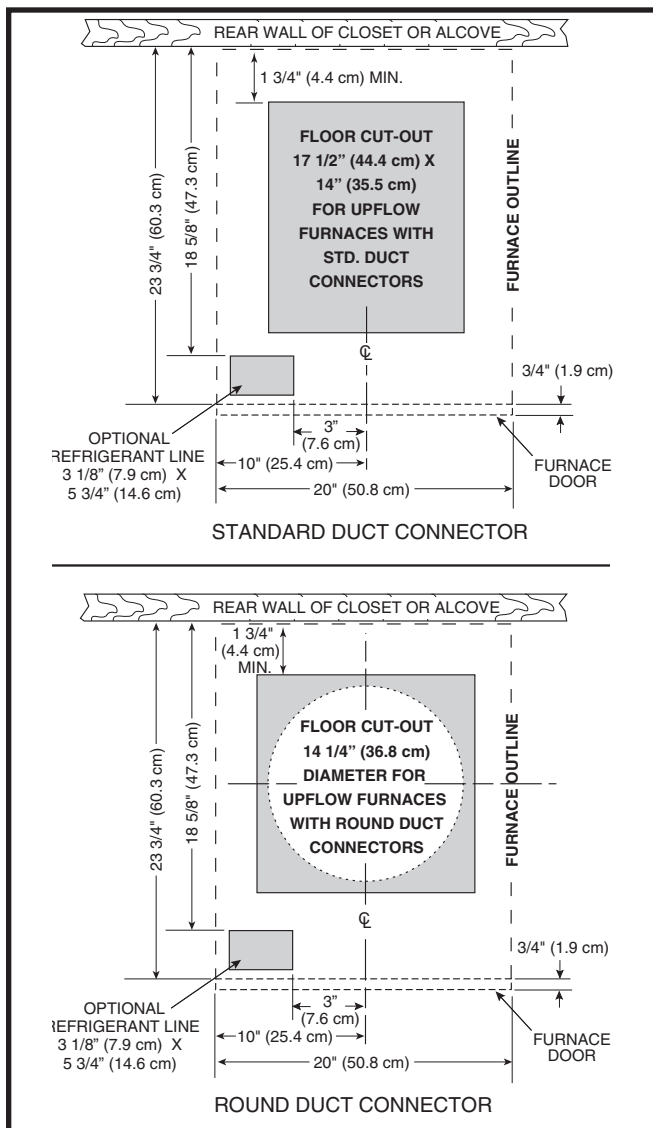
**NOTE:** The depth of the floor cavity (shown as "X") in [Figure 4](#) (page 7) will determine the correct duct connector.

5. Determine which duct connector to use from [Table 2](#) (page 7).

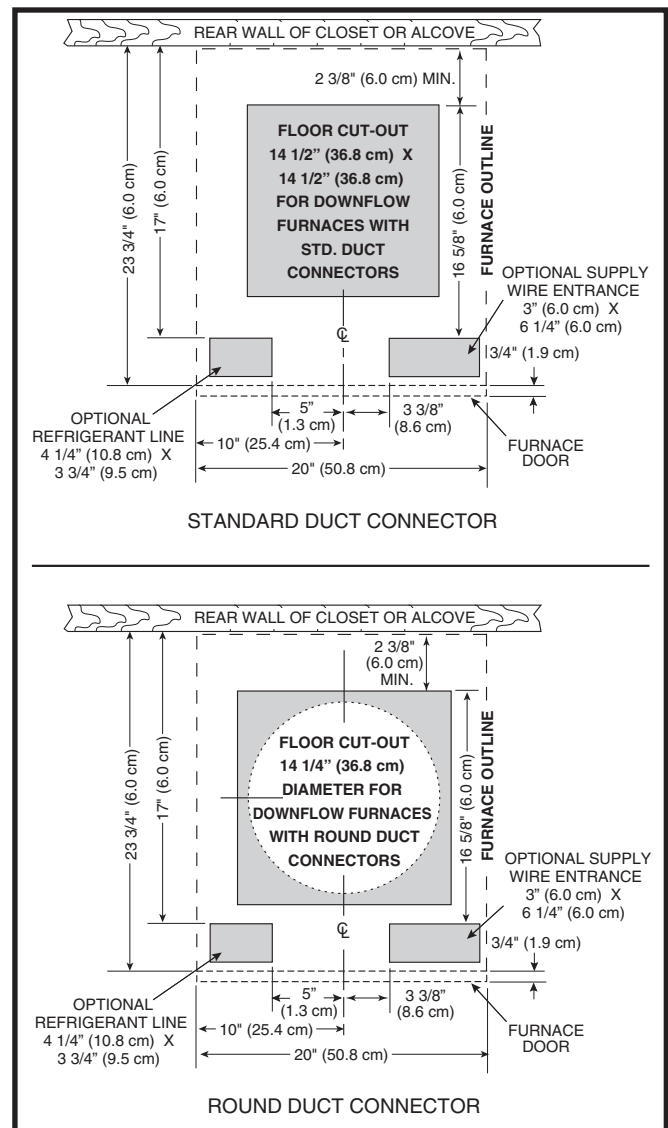
### Standard Duct Connector Installation

The standard duct connector is designed for use on ducts 12" (305 mm) in width. **NOTE:** Ducts narrower than 12" (305 mm) may not allow sufficient clearances for this type of installation. See Narrow Duct Connector section.

- Center the duct connector in the floor opening with bottom tabs resting on top of the supply air duct.
- Mark the cut-out area on the supply air duct by tracing around the connector tabs of the duct connector. See [Figure 5](#) (page 7).
- Remove the duct connector and cut out the marked area of the supply air duct  $1/4"$  (6 mm) larger than the actual cutout drawn.
- Install the duct connector back in the floor opening with the bottom tabs extending into the supply air duct.
- Install the optional mounting plate ([Figure 5](#)) under the back side of the duct connector. Align the screw holes in both components.



**Figure 2. Cut-Out Dimensions for Upflow Appliances**



**Figure 3. Cut-Out Dimensions for Downflow Appliances**

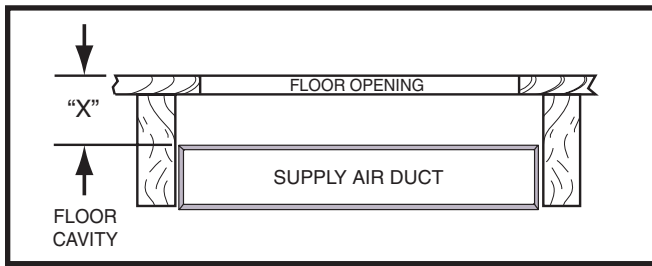


Figure 4. Floor Cavity

IF FLOOR CAVITY "X" IS:	DUCT CONNECTOR TYPE & PART NUMBER	
	STANDARD DUCT	SCREW DOWN
7/8" / (22 mm)	901987A	904008
2" / (51 mm)	901988A	904009
4-1/4" / (108 mm)	901989A	904010
6-1/4" / (159 mm)	901990A	904011
8-1/4" / (210 mm)	901991A	904012
10-1/4" / (260 mm)	901992A	904013
12-1/4" / (311 mm)	901993A	904014

NOTE: Dimensions shown as Inches / (Millimeter)

Table 2. Duct Connector Sizes

- Secure the duct connector and the mounting plate (if using mounting plate on install) to the wood floor with appropriate size screws.
- Bend the connector tabs on the bottom of the duct connector upwards and as tight as possible against the supply air duct. See Figure 6 (page 7).
- Seal all connections with industrial grade sealing tape or liquid sealant. See HUD Code 3280.715 for acceptable standards for sealing products.

### Narrow Duct Connectors

This attachment method should be used if there is insufficient clearance to bend the tabs on a standard 12" (305 mm) duct connector.

- Score and cut the top of the supply air duct as indicated in Option 1 or Option 2 (Figure 7). With Option 1 choice, cut out the metal from the shaded area.
- Fold the two flaps (Options 1 or 2) up to form the opening for the duct connector.
- Install the duct connector with the bottom tabs extending into the supply air duct.
- Bend the tabs on the bottom of the duct connector upwards and as tight as possible against the supply air duct. See Figure 8 (page 8).
- Form the flaps (Options 1 or 2) up against the duct connector as tight as possible.
- Secure the duct connector flaps to the supply air duct with staples (3 minimum) or if a 2x block/joist is not provided, use sheet metal screws (2 minimum).  
**NOTE:** The duct connector tabs may be attached to the air duct with sheet metal screws or other suitable fasteners as long as the duct connector and the air duct are securely attached.
- Seal all connections with industrial grade sealing tape or liquid sealant.

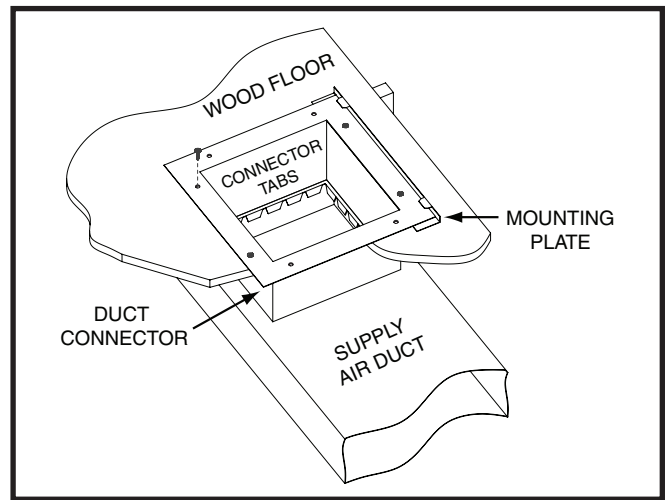


Figure 5. Standard Duct Connector Installed

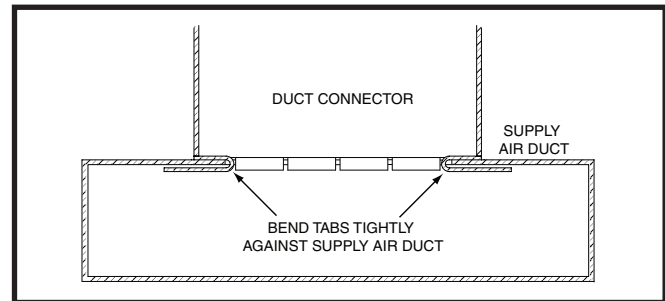


Figure 6. Duct Connector Tabs

### Round Duct Connector Installation

The 14" (355 mm) round duct connector is designed to connect directly to a 14" (355 mm) flexible duct. **NOTE:** Flexible ducts must meet all applicable codes and standards.

- Apply a bead of caulking, mastic, or other approved sealant around bottom side of connector.
- Install and center the duct connector in the floor opening.
- Install the mounting plate under the back side of the duct connector. See Figure 9 (page 8). **NOTE:** Align the screw holes in both components.

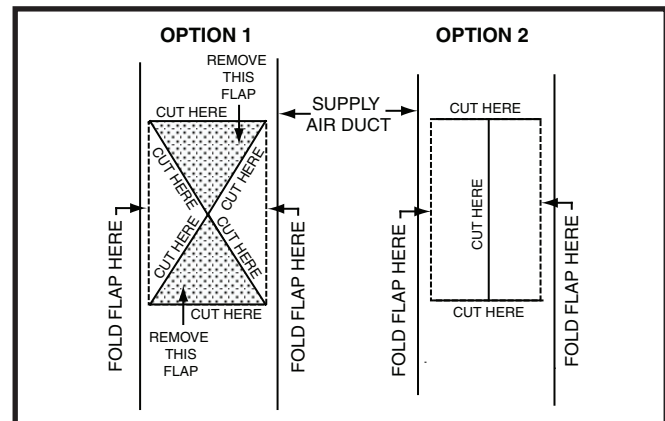
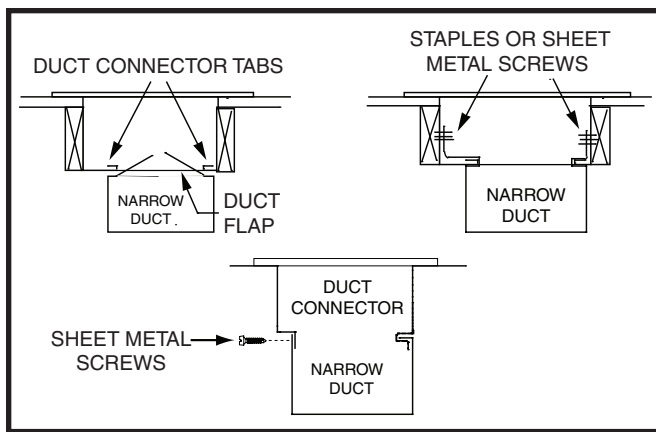
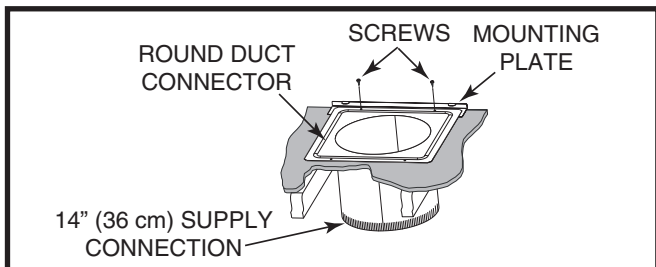


Figure 7. Narrow Air Duct Openings



**Figure 8. Narrow Ducts**



**Figure 9. Round Duct Connector Installed**

4. Secure the duct connector and the mounting plate to the wood floor with appropriate size screws.
5. Connect the round supply duct to the underside of the duct connector and secure them with field supplied sheet metal screws.
6. Seal all connections with industrial grade sealing tape or liquid sealant.

#### Alcove Installation

1. Cut alcove rough openings to minimum dimensions shown in [Figure 10 \(page 8\)](#). **NOTE:** The height may increase depending on the size of the coil compartment.
2. Attach a return air method to the Appliance. Depending on the application, this could be a louvered door coil box, frame and grille assembly, or an upflow stand with solid door coil box.

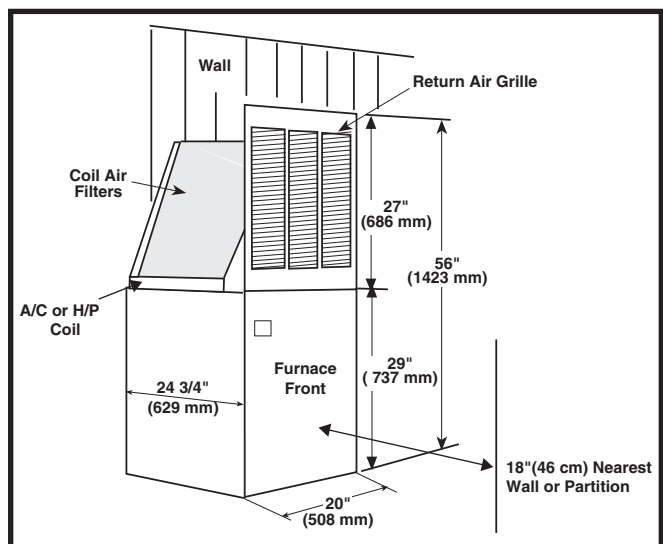
#### Closet Installation

For closet installations, a coil box is recommended to be installed with the Appliance. In all configurations, return air must meet requirements found in Minimum Unobstructed Airflow section. See [Figure 11 \(page 9\)](#).

1. Cut return air opening in desired position in door or wall. Best practice is above the Appliance. Refer to the Minimum Unobstructed Airflow section ([page 3](#)) for return air opening requirements.
2. Insert four fasteners, securing grille to door or wall.

#### Downflow Appliances

For typical unducted return air downflow applications, an air-conditioner or heat-pump coil can be installed by mounting the coil directly on top of the Appliance without adding sheet metal cavities or cutting and trimming wood panels. Unducted return air systems may be used for closet or alcove installations.



**Figure 10. Alcove Installation**

The steps below describe installation procedures for an under-the-floor supply duct system with a ducted or unducted return air system. Duct connectors are recommended for this application. See [Table 2 \(page 7\)](#).

**NOTE:** Remove refrigerant line knockouts in Appliance only when installing indoor coil of an air conditioner or heat pump system. Refer to instructions supplied with accessory equipment.

1. Route supply circuit(s) and 24V wiring to closet or alcove. See [Figure 17 \(page 13\)](#) or [Figure 18 \(page 13\)](#) for locations. Select appropriate terminal on unit's transformer for either 208V or 230V.
2. Remove Appliance front door and slide back until bottom slots in rear of unit engage with both tabs of optional rear mounting plate. If mounting plate is not used, an equivalent method of securing the rear of the unit may be used as long as it prevents displacement during transport if used in a manufactured home.

**NOTE:** The Appliance does not need to be positioned against the rear mounting plate. The tabs will engage into the slots and allow approximately 1/2" (13 mm) of Appliance adjustment front to back and side to side.

3. Secure front of unit with one or more fasteners at mounting hole(s) provided or at tie-down tab. See [Figure 17 \(page 13\)](#) or [Figure 18 \(page 13\)](#).
4. See Electrical Wiring section ([page 10](#)) to complete Appliance installation.

#### Upflow Appliances

The following steps describe installation instructions for an overhead supply duct system with a return air system that can be either over the floor (unducted) or through the floor (ducted).

**NOTE:** Remove refrigerant line knockouts in Appliance only when installing indoor coil from an air conditioner or heat pump system.

Refer to instructions supplied with accessory equipment.



### Over-the-Floor Return Air System (Non-Ducted)

1. If floor underneath Appliance is made of combustible material, locate a pan fabricated of non-combustible material with 1" (25 mm) upturned flanges under Appliance return air opening. See [Figure 12 \(page 9\)](#).

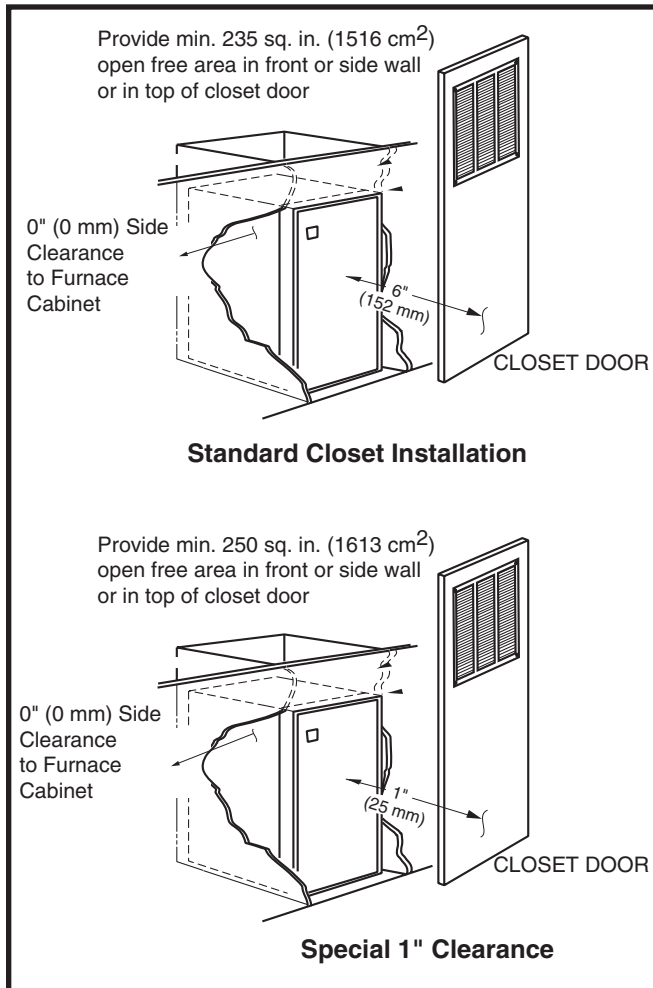


Figure 11. Closet Installation

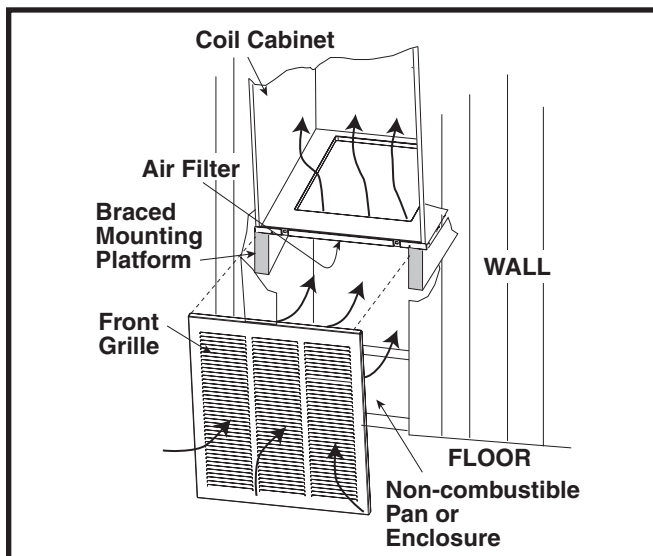


Figure 12. Over-the-Floor Return Air System

2. Use optional upflow stand (refer to the technical specifications literature for part number) with filters or construct a suitably braced mounting platform in closet. See [Figure 13 \(page 9\)](#).
3. Route 230V supply circuit(s) and 24V wiring to closet. See [Figure 17 \(page 13\)](#) or [Figure 18 \(page 13\)](#) for appropriate locations.
4. Position optional coil cabinet onto upflow stand or mounting platform and secure with three or more fasteners.
5. Position Appliance in upflow mode onto coil cabinet and secure with two or more fasteners.
6. Use optional upflow duct connector or field supplied connector to attach Appliance to overhead supply duct. See [Figure 13](#).
7. Install return air grille in closet preferably at same level as upflow stand or below mounting platform. See [Figure 12](#).

### Through-the-Floor Return Air System (Ducted)

1. Prepare Floor Opening(s):
  - a. Mark floor openings as shown in [Figure 2 \(page 6\)](#). Provide minimum clearances at rear and left side walls of closet for installation of Appliance and wiring.
  - b. Cut floor opening on outside edge of marked line so that opening is slightly larger than area marked.
  - c. Additional provisions may be necessary for optional air conditioning if refrigerant lines are installed other than at the front of the Appliance.
2. If return air duct is made of combustible material, locate a pan fabricated of non-combustible material with 1" (25 mm) upturned flanges under Appliance return air opening.
3. Route 230V supply circuit(s) and 24V wiring to closet. See [Figure 17 \(page 13\)](#) or [Figure 18 \(page 13\)](#) for appropriate locations.

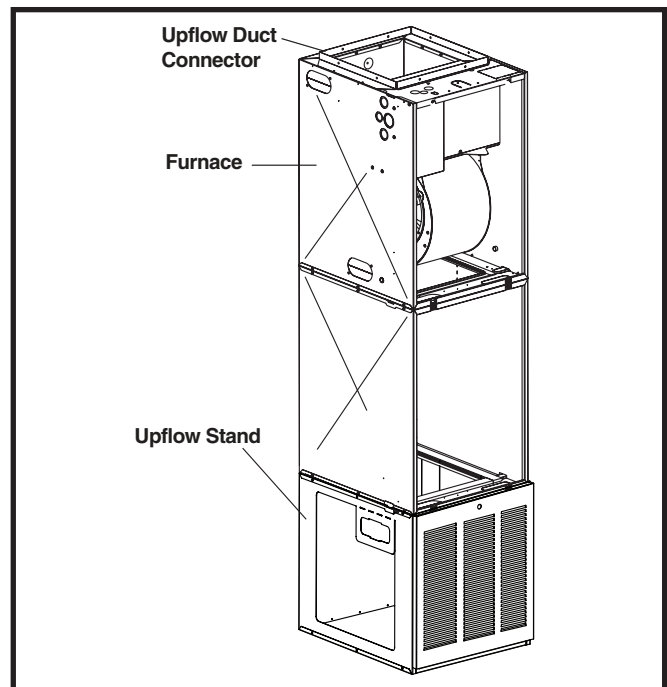


Figure 13. Over-the-Floor Return Air System with Upflow Stand

4. Position optional coil cabinet over floor cutout and secure with three or more fasteners.
5. Position Appliance onto coil cabinet and secure with two or more fasteners.
6. Use optional upflow duct connector or field supplied connector to attach Appliance to overhead supply duct. See [Figure 13](#).

## ELECTRICAL WIRING

### **⚠ WARNING:**

#### **ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD**

**Failure to follow safety warnings exactly could result in serious injury, death or property damage.**

**Improper servicing could result in dangerous operation, serious injury, death or property damage.**

- Before servicing, disconnect all electrical power to Appliance both poles.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.
- Verify proper operation after servicing.

### **⚠ CAUTION:**

**In order to avoid a hazard due to inadvertent resetting of the THERMAL CUT-OUT, this appliance must not be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly switched on and off by the utility.**

- Electrical connections must be in compliance with all applicable local codes and the current revision of the National Electric Code (ANSI/NFPA 70).
- For Canadian installations the electrical connections and grounding shall comply with the current Canadian Electrical Code (CSA C22.1 and/or local codes).

### Line Voltage Wiring

#### IMPORTANT NOTES

- Proper line voltage polarity must be maintained for the control system to operate correctly.
- Circuit breakers installed in this unit provide short-circuit protection of the internal wiring and serve as a disconnect. The circuit breakers **DO NOT** provide over-current protection of the supply wiring and may be sized larger than the branch circuit protection. Overcurrent protection of the supply wiring is provided by the breaker in the distribution panel and must be sized as shown in [Table 7 \(page 18\)](#) and [Table 9 \(page 26\)](#).

It is recommended that the line voltage (230 VAC) to the Appliance be supplied from a dedicated branch circuit containing the correct fuse or circuit breaker for the Appliance. For minimum circuit ampacity and maximum over-current protection, see [Table 7](#) and [Table 9](#). See unit wiring diagrams ([Figure 23 \(page 20\)](#), [Figure 24 \(page 21\)](#), [Figure 25 \(page 22\)](#), [Figure 26 \(page 23\)](#) & [Figure 27 \(page 24\)](#)) for wiring details. Electrical components are shown in [Figure 16 \(page 12\)](#). Supply circuit requirements are listed below:

- -010 model is factory-wired for single-branch supply circuit only.
- -012 models are factory-wired for single-branch supply circuit (single-circuit kit factory installed). Dual-branch circuit can be used by removing factory-installed single-circuit kit. See [Figure 14 \(page 10\)](#).
- -015, -017, -020 and -023 models are factory-wired for dual-branch supply circuit. Single-branch circuit can be used by installing optional single-circuit kit.

### Connecting Supply Service Wires

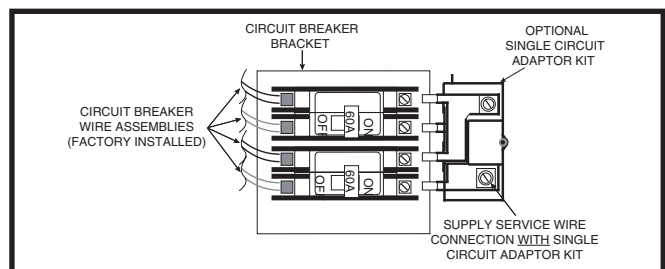
Power entrance for all models may be through the right side or through the bottom of the unit.

1. Remove right-hand control panel (when viewing in downflow position).
2. Locate power supply knockouts in side of unit and in bottom of unit. Remove appropriate plug(s) or knockout opening applicable to selected wire size(s).
3. For Supply Service Wire installations through the top or bottom of the appliance. Add bracket for metal thickness increase for supply wire connections. See [Figure 19](#).

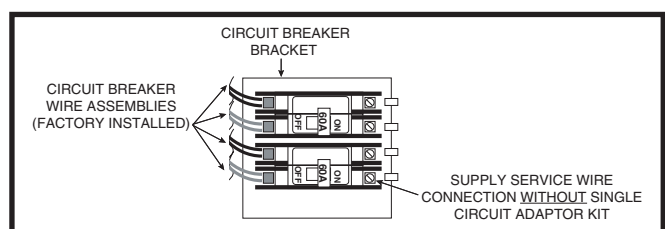
### **⚠ WARNING:**

**To avoid personal injury or property damage, make certain that the motor leads cannot come into contact with non-insulated metal components of the unit.**

4. Install listed cable connector(s) in opening(s). If metal-sheathed conduit is used for incoming power line(s), provide an approved metal clamp on conduit and secure it in entrance knockout.



**Figure 14. Optional Single Circuit Adaptor Kit**



**Figure 15. Installation of Supply Service Wires**

5. Insert supply service wire(s) through cable connector(s) and connect wires to circuit breakers (Figure 14 & Figure 15). **NOTE:** To install single-circuit kit, perform step 5. If single-circuit kit installation is not needed, go to step 6. A spacer has been provided that must be installed as a reinforcement where the whip/conduit enters the unit. Break this spacer in half and use the appropriate size.
6. To install optional single-circuit kit:
  - a. Loosen lugs at supply side of circuit breakers.
  - b. Remove cover from single-circuit kit (if supplied).
  - c. Insert metal buss bars of kit into lugs of circuit breaker.
  - d. Tighten lugs securely (31 in.-lbs. (35 N-m) recommended).
7. Connect service ground wire(s) to grounding lug(s) provided. See Figure 16 (page 12). One ground is required for each supply circuit used.

## Grounding

### **WARNING:**

**To minimize personal injury, the Appliance cabinet must have an uninterrupted or unbroken electrical ground. The controls used in this Appliance require an earth ground to operate properly. Acceptable methods include electrical wire or conduit approved for ground service. Do not use gas piping as an electrical ground!**

## Thermostat / Low Voltage Connections

- The Appliance is designed to be controlled by a 24 VAC thermostat. The thermostat's wiring must comply with the current provisions of the NEC (ANSI/NFPA 70) and with applicable local codes having jurisdiction.
- The thermostat should be mounted about 5 feet (1.5 m) above the floor on an inside wall. DO NOT install the thermostat on an outside wall or any other location where its operation may be adversely affected by radiant heat from fireplaces, sunlight, or lighting fixtures, and convective heat from warm air registers or electrical appliances. Refer to the thermostat manufacturer's instruction sheet for detailed mounting information. See Figure 20 (page 14) for typical thermostat connections.

## Humidifier

The unit has an output to power a humidifier when the blower is running during a call for heat. This output is rated to 1.0 amp at 208V.

## Dehumidification Options

The motor control board has a **DHUM** or **D** connection (violet wire) that allows the system to increase the amount of humidity that is removed from the circulating air. See Figure 22 (page 19) This is accomplished by reducing the CFM and allowing the cooling coil to become colder. This will only occur when there is a call for cooling. There are many ways that this can be electrically wired.

1. If the room thermostat incorporates a humidity sensor and DHUM output, connect the DHUM on the thermostat to the D terminal on the motor control board. See Figure 22.
2. If using a separate humidistat, connect the **DHUM & R** terminals on the humidistat to the **D & R** terminals on the motor control board of the air handler. In this option, the **DHUM** output of the humidistat must be set so it is only closed when there is a call for dehumidification.
3. If a humidistat is not available, it is an acceptable option to connect the **R & D** terminals on the motor control board together with a field supplied wire. This option causes the blower to run at a reduced CFM for 10 minutes after a call for cooling. **NOTE:** If outdoor unit is a heat pump, connect the **O** terminal to the **D** terminal.

DISPLAY CODE		CURRENT MODE
-	-	Standby is a Rotating Segment
⌈	⌋	Cooling Mode (Y input active)
H	H	Heating Mode (W input active)
F	F	Circulate Fan Mode (G input active)
d	P	Dehum Cooling Mode (DEHUM input active along with Y)
i	i	(one) A Motor Fault has Occurred (BMF active for more than 30 seconds)
t	7	(lower case t) Over Temperatures (The value of the TS input has exceeded 80C all outputs are stopped.)
L	7	Lockout (Ten (10) or more Motor Faults or Over Temperature events have occurred. All outputs are set to off for one hour.

**NOTE:** Display code may be inverted depending on final installation orientation.

**Table 3. FSHE Motor Control Board Display Codes**

## Electronic Air Cleaner (EAC)

The unit has an output to power an electronic air cleaner when the blower is running. This output is rated to 1.0 amp at 208V. See Figure 21 (page 17).

## Changing Blower Speed

### **NOTE TO INSTALLER**

**When the unit is installed, the heating and cooling speeds must be set for that particular installation. The installer is responsible for setting these speeds.**

Blower speed is determined by the DIP switch settings located on the unit control board. Pins 1-4 set the speed for heating. Pins 5-8 set the speed for cooling/heat pump. Refer to Table 6 (page 17) for allowable heating speeds. See Table 4 (page 15) and Table 5 (page 16) for blower performance data.

## Installing Control Circuit Wiring

**NOTE:** Installation of at least a four-wire thermostat circuit is required. However best practice is to use five-wire for future addition of a heat/cool thermostat. Any unused thermostat leads must be properly capped. See Figure 20 (page 14) for various thermostat connections.

1. Install the 24V control-circuit cable through plastic bushing at either side of Appliance.
2. Route control circuit wiring to wall thermostat and outdoor section, if installed.

## START-UP & ADJUSTMENTS

### Pre-Start Check List

- ✓ Verify the polarity of the connections are correct, the line voltage power leads are securely connected and the Appliance is properly grounded. Refer to the appropriate wiring diagram.
- ✓ Verify the thermostat wires are securely connected to the correct leads on the terminal strip of the circuit board.
- ✓ Check blower motor connectors for proper connection.

### Start-up Procedures

1. Reinstall control box cover(s).
2. Switch circuit breaker(s) to the ON position.
3. Replace outer Appliance door.
4. Check all duct connections and tape for air leakage.

## FIGURES & TABLES

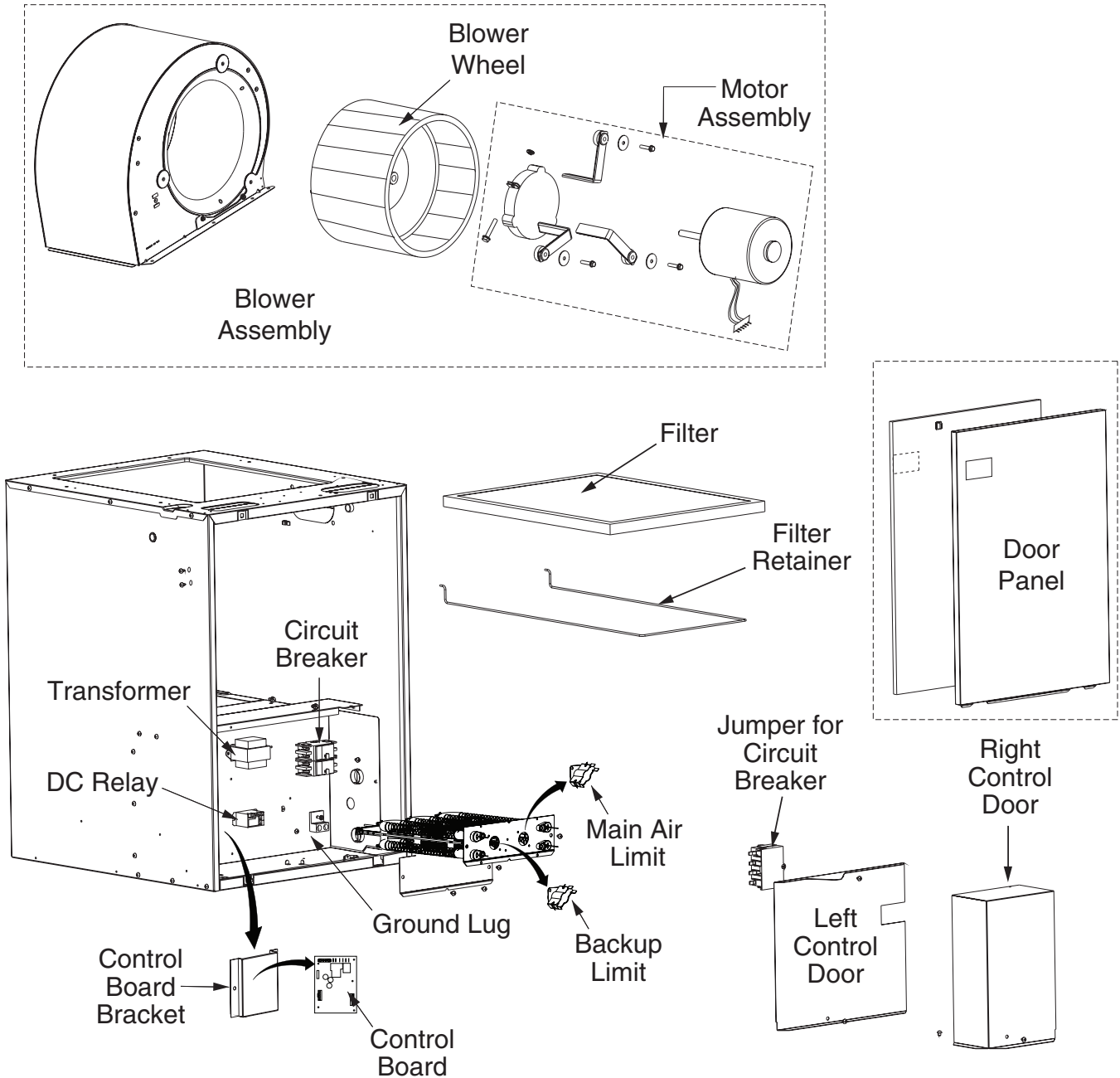


Figure 16. E7 Appliance Components (Multi-Poise Shown)



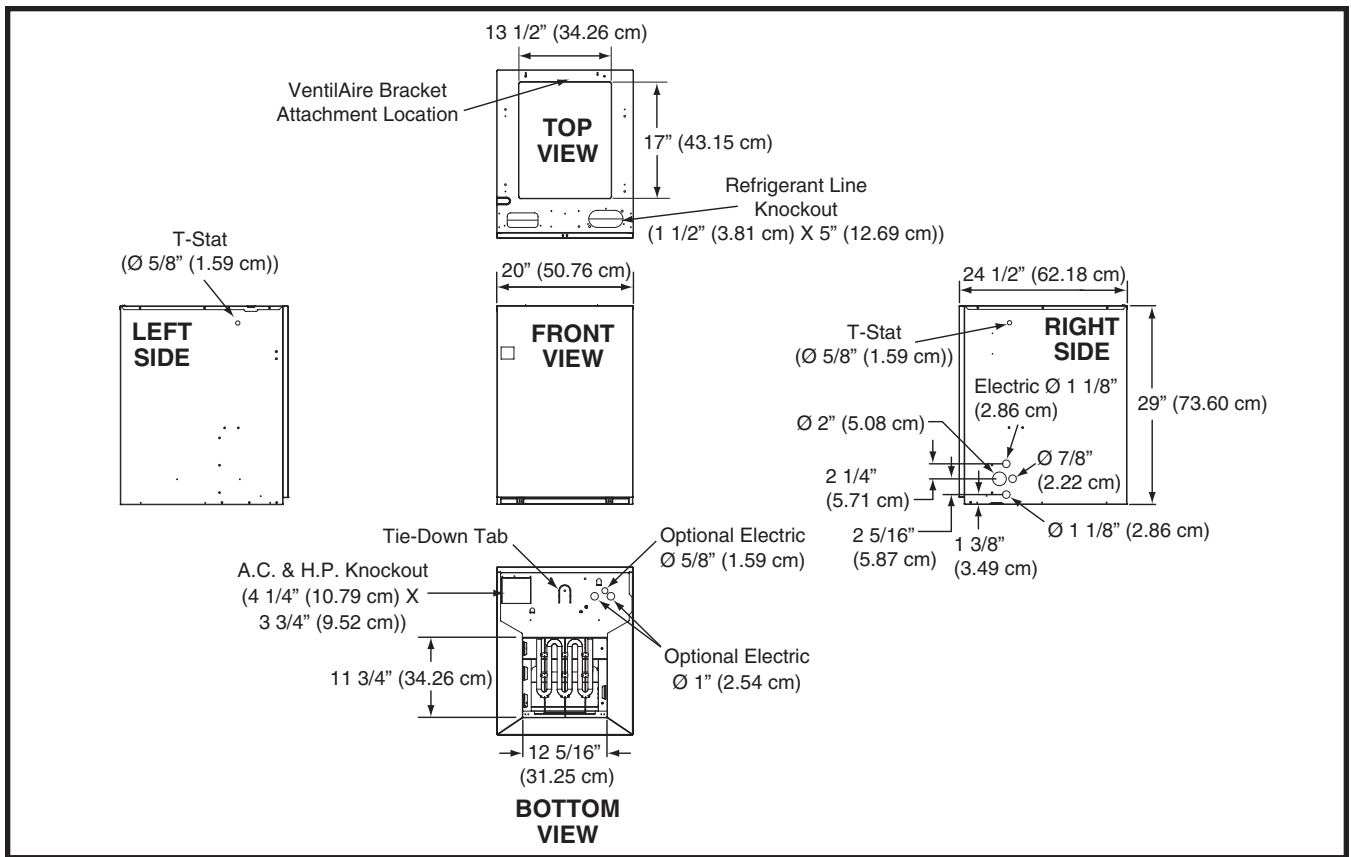


Figure 17. E7EM Physical Dimensions

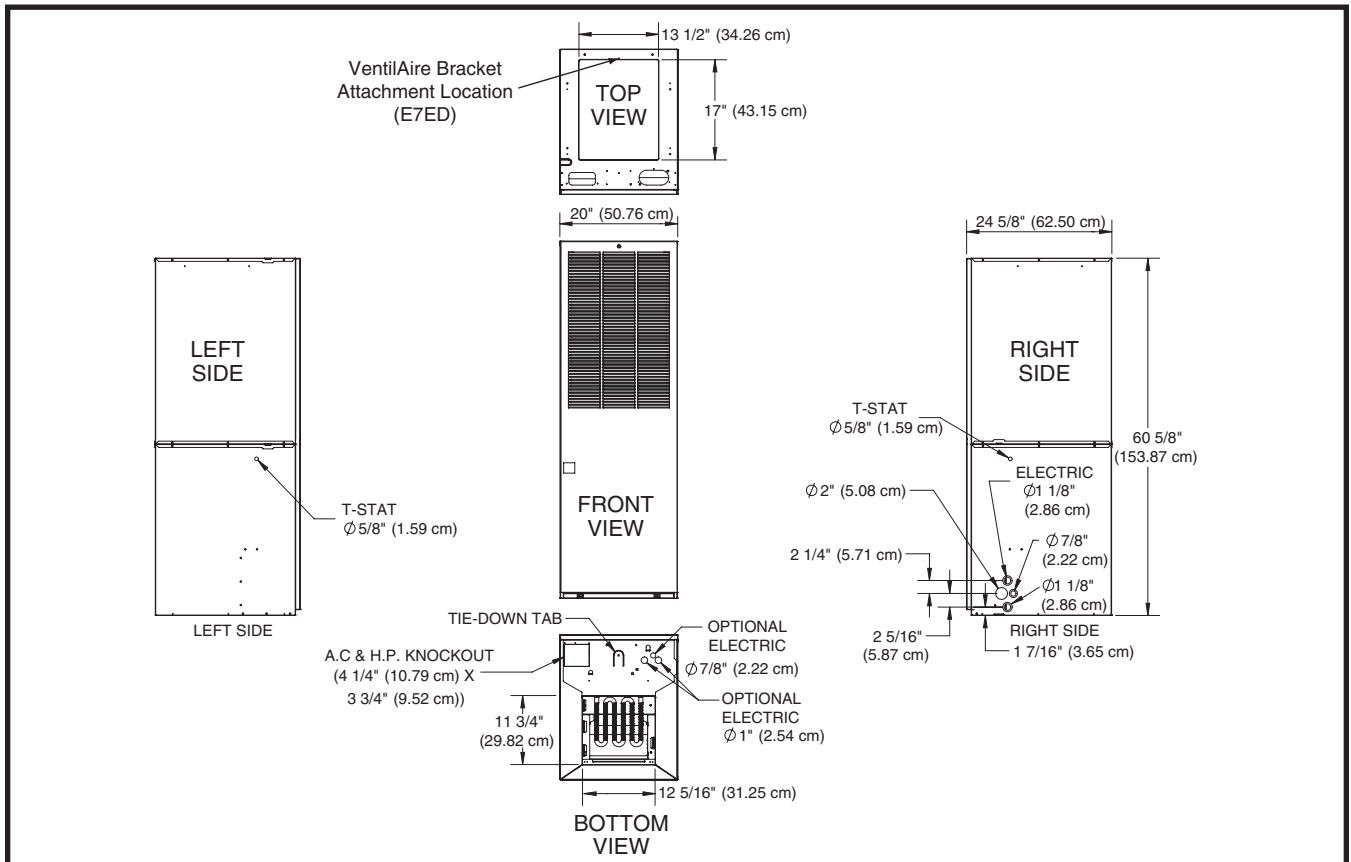
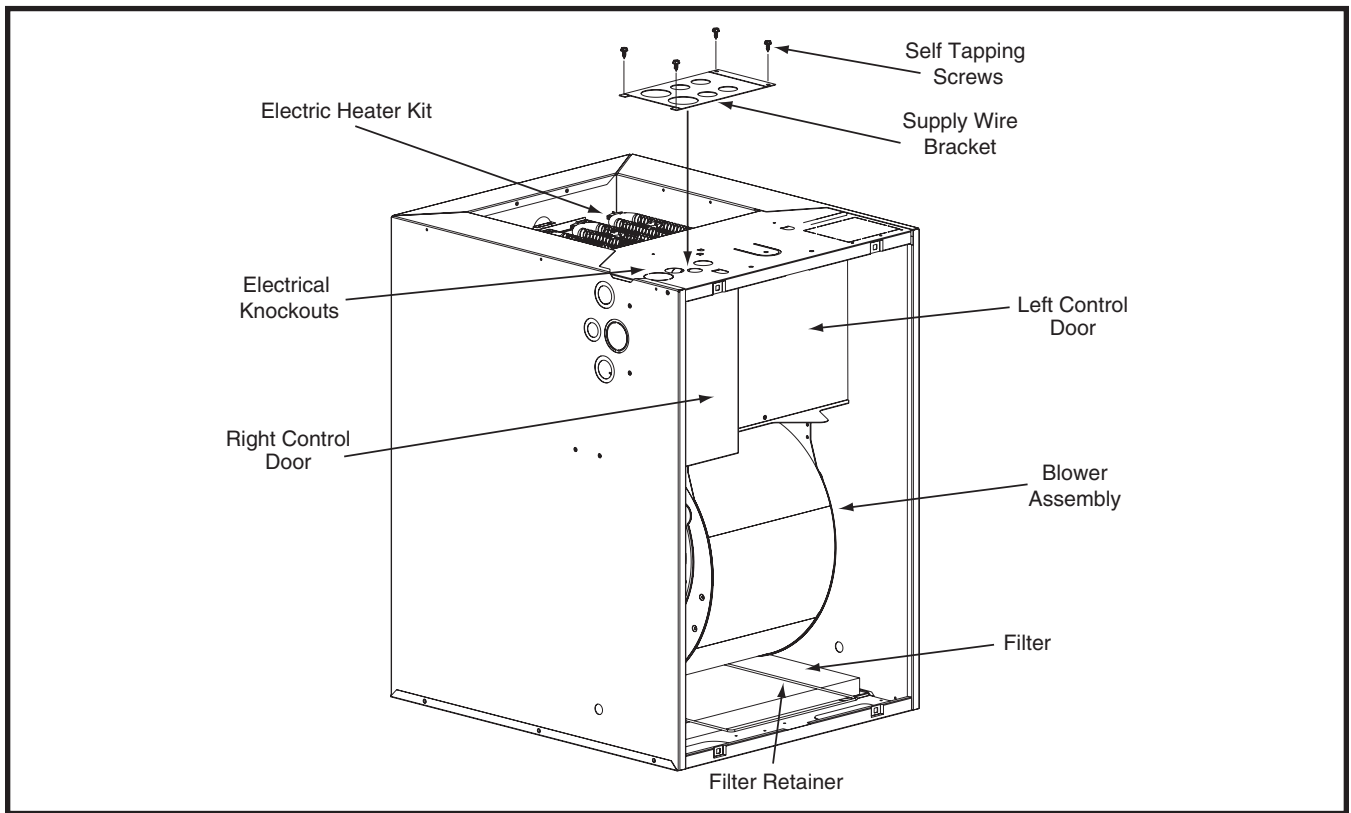
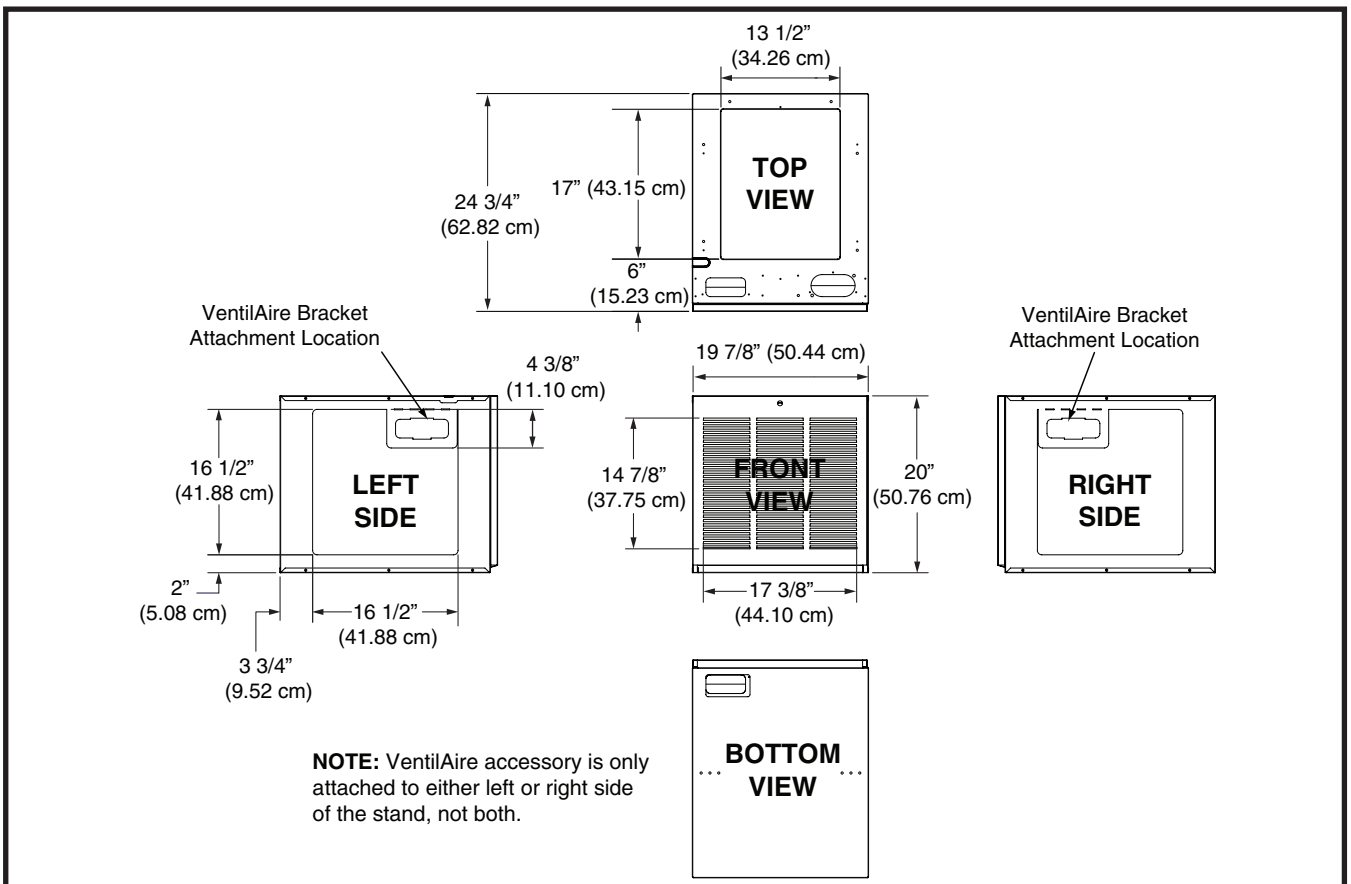


Figure 18. E7EU & E7ED Physical Dimensions



**Figure 19. E7 Supply Wire Bracket**



**Figure 20. E7 Appliance Upflow Stand Dimensions**

## Airflow Data

AIRFLOW (CFM)										
MODEL NUMBER	MOTOR SWITCH SETTINGS (0=OFF, 1=ON)				EXTERNAL STATIC PRESSURE (IN. W.C.)					
					0.1	0.2	0.3	0.4	0.5	0.6
	1/5	2/6	3/7	4/8	CFM	CFM	CFM	CFM	CFM	CFM
E7E*-0**K3	0	0	0	0	685	640	606	560	513	460
	1	0	0	0	770	727	692	648	599	552
	0	1	0	0	854	815	779	737	685	645
	1	1	0	0	939	902	865	825	771	737
	0	0	1	0	1,012	974	938	899	850	813
	1	0	1	0	1,084	1,047	1,011	973	930	888
	0	1	1	0	1,157	1,119	1,084	1,047	1,009	964
	1	1	1	0	1,197	1,166	1,130	1,093	1,056	1,017
	0	0	0	1	1,245	1,215	1,178	1,143	1,105	1,066
	1	0	0	1	1,293	1,263	1,225	1,192	1,154	1,114
	0	1	0	1	1,344	1,312	1,278	1,242	1,206	1,169
	1	1	0	1	1,394	1,361	1,330	1,291	1,257	1,223
	0	0	1	1	1,434	1,401	1,369	1,332	1,299	1,267
	1	0	1	1	1,473	1,441	1,408	1,373	1,340	1,311
	0	1	1	1	1,514	1,483	1,451	1,417	1,386	1,355
	1	1	1	1	1,555	1,525	1,494	1,460	1,431	1,398

AIRFLOW (m³/h)										
MODEL NUMBER	MOTOR SWITCH SETTINGS (0=OFF, 1=ON)				EXTERNAL STATIC PRESSURE (PA)					
					25	50	75	100	125	150
	1/5	2/6	3/7	4/8	CFM	CFM	CFM	CFM	CFM	CFM
E7E*-0**K3	0	0	0	0	1164	1087	1030	951	872	782
	1	0	0	0	1308	1235	1176	1101	1018	938
	0	1	0	0	1451	1385	1324	1252	1164	1096
	1	1	0	0	1595	1533	1470	1402	1310	1252
	0	0	1	0	1719	1655	1594	1527	1444	1381
	1	0	1	0	1842	1779	1718	1653	1580	1509
	0	1	1	0	1966	1901	1842	1779	1714	1638
	1	1	1	0	2034	1981	1920	1857	1794	1728
	0	0	0	1	2115	2064	2001	1942	1877	1811
	1	0	0	1	2197	2146	2081	2025	1961	1893
	0	1	0	1	2283	2229	2171	2110	2049	1986
	1	1	0	1	2368	2312	2260	2193	2136	2078
	0	0	1	1	2436	2380	2326	2263	2207	2153
	1	0	1	1	2503	2448	2392	2333	2277	2227
	0	1	1	1	2572	2520	2465	2407	2355	2302
	1	1	1	1	2642	2591	2538	2481	2431	2375

**NOTES:**

1. Motor switch settings for heating speeds use HEAT switches 1, 2, 3, and 4. For cooling speeds use COOL switches 5, 6, 7, and 8.
2. Data is shown with filter

**Table 4. E7 Airflow Data**

E7E*-0**K3	MAXIMUM HEATING AIRFLOW SETTING							
	E7EM				E7ED		E7EU	
	DOWNFLOW		UPFLOW		DOWNFLOW		UPFLOW	
	MH	RES	MH	RES	MH	RES	MH	RES
10	0001	0101	0001	0101	0101	0101	0101	0101
12		0011						
15		0101	0101	0101	0101	0101	0101	0101
17								
20								
23		0011	0001	0011	0001			0011

**NOTES:**

- MH and Res represent Manufactured Housing and Residential (modular home) applications, respectively
- To comply with government mandated efficiency standards, speed settings with higher CFM values than listed in this table are not allowed in Electric resistance heat only mode

**Table 5. Maximum Allowable Heat Settings**

The maximum heat rise at 0.4" w.c. (100 Pa) external static pressure (ESP) for simultaneous Heat Pump and Electric Resistance operation is 75°F (41.7°C). To determine the blower minimum speed\* for this mode operation, use the calculation below; an example of E7E\*-023\* and a 4 ton heat pump is also provided in both metric and imperial calculations.

\* During a simultaneous Y and W call, the control board will output the highest of the two speeds, so the "blower minimum speed" can be either dipswitches 1-4 (HEAT) or 5-8 (COOL). If calculated airflow does not coordinate to an exact blower speed, select the next highest airflow setting.

$$\text{Metric: } \text{airflow} \left( \frac{m^3}{h} \right) = \frac{(kW \text{ of Electric Heat} + \text{Heat Pump tonnage} * 3.517 \frac{kW}{AC \text{ tonnage}}) * 2985 \left( \frac{K * m^3}{W * h} \right)}{\text{maximum temperature rise (K)}}$$

$$\text{Imperial: } \text{airflow} \left( \frac{ft^3}{min} \right) = \frac{(kW \text{ of Electric Heat} * 3412 + \text{Heat Pump tonnage} * 12000)}{1.08 \frac{ft^3 * BTU / hour}{min * ^\circ F} * \text{maximum temperature rise (} ^\circ F)}$$

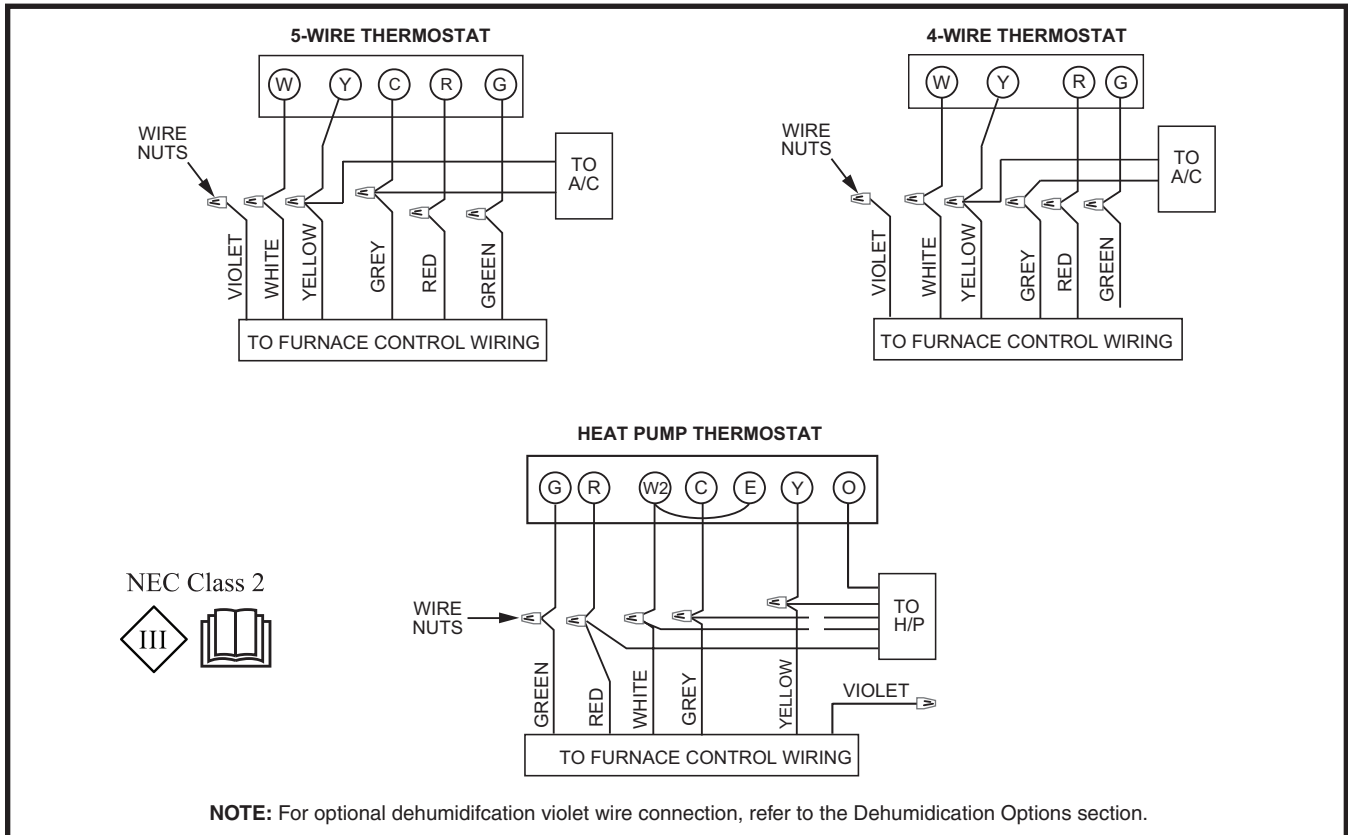
Example Calculations:

$$\text{Metric: } \text{airflow} \left( \frac{m^3}{h} \right) = \frac{(21.6 + 4 * 3.517) * 2985}{41.7} = 2552 \frac{m^3}{h}$$

$$\text{Imperial: } \text{airflow} \left( \frac{ft^3}{min} \right) = \frac{(21.6 * 3412 + 4 * 12000)}{1.08 * 75} = 1502 \text{ CFM}$$



## Electrical Data & Diagrams



**Figure 21. E7 Thermostat Connection**

APPLIANCE MODELS E7-	SUPPLY VOLTAGE	010K	012K	015K	017K	020K	023K
Number of Heating elements		2	2	3	3	4	4
Rated Heating Output, Btuh	230V~ 60Hz 1 Phase	31,000	36,000	47,000	51,000	63,000	68,000
Heating Element total kW		9.2	10.7	13.8	14.9	18.4	19.8
Watts (Total kw, Heating Elements & Blower)		9.6	11.1	14.2	15.3	18.8	20.2
Rated Heating Output, Btuh	208V~ 60Hz 1 Phase	26,000	30,000	38,000	42,000	51,000	55,000
Heating Element total kW		7.5	8.7	11.3	12.2	15	16.2
Watts (Total kw, Heating Elements & Blower)		7.9	9.1	11.7	12.6	15.4	16.6
Test ESP, in. w.c. Max		0.4					
Optional Cooling Available with factory installed blower		2.0 - 4.0 ton					
Optional Heat Pump Available with factory installed blower		2.0 - 4.0 ton					
Air Filter (Standard)		18" (45.7 cm) x 20" (50.8 cm) x 1" (2.54 cm) (nominal)					
Appliance Dimensions	Multi-Poise	Width-20" (508mm), Height-29" (737mm), Depth-24 1/2" (623mm)					
	Upflow/Downflow	Width-20" (508mm), Height-60 5/8" (1546mm), Depth-24 1/2" (623mm)					

**NOTE:** Heating output rated at listed voltage.

**Table 6. Unit Specifications**

MODEL NUMBER E7E*-	SUPPLY CIRCUIT	230V~				208V~			
		TOTAL AMPERES	MAXIMUM OVER-CURRENT RATING	MINIMUM CIRCUIT AMPACITY	CIRCUIT BREAKER SIZE	TOTAL AMPERES	MAXIMUM OVER-CURRENT RATING	MINIMUM CIRCUIT AMPACITY	CIRCUIT BREAKER SIZE
010K3	Single	43.7	48.5	54.7	60	39.9	44.7	49.9	50
012K3	Single	50.1	54.9	62.6	70	45.7	50.4	57.1	60
	Dual "A"	27.0	31.7	33.7	35	24.7	29.5	30.9	35
	Dual "B"	23.2	23.2	28.9	30	20.9	20.9	26.2	30
015K3	Single	63.7	68.4	79.6	80	58.0	62.7	72.5	80
	Dual "A"	43.7	48.5	54.7	60	39.9	44.7	49.9	50
	Dual "B"	20.0	20.0	25.0	25	18.1	18.1	22.6	25
017K3	Single	68.5	73.2	85.6	90	62.3	67.1	77.9	80
	Dual "A"	43.1	43.1	53.9	60	39.0	39.0	48.8	50
	Dual "B"	25.4	30.1	31.7	35	23.3	28.1	29.1	30
020K3	Single	83.7	88.4	104.6	110	76.0	80.8	95.0	100
	Dual "A"	43.7	48.5	54.7	60	39.9	44.7	49.9	50
	Dual "B"	39.9	39.9	49.9	50	36.1	36.1	45.1	50
023K3	Single	90.1	94.8	112.6	125	81.8	86.6	102.3	110
	Dual "A"	43.7	48.5	54.7	60	39.9	44.7	49.9	50
	Dual "B"	46.3	46.3	57.9	60	41.9	41.9	52.4	60

**NOTE:** Wire size must be in accordance to the applicable revision of the NEC and all other applicable codes.

**Table 7. E7 Electrical Specifications**

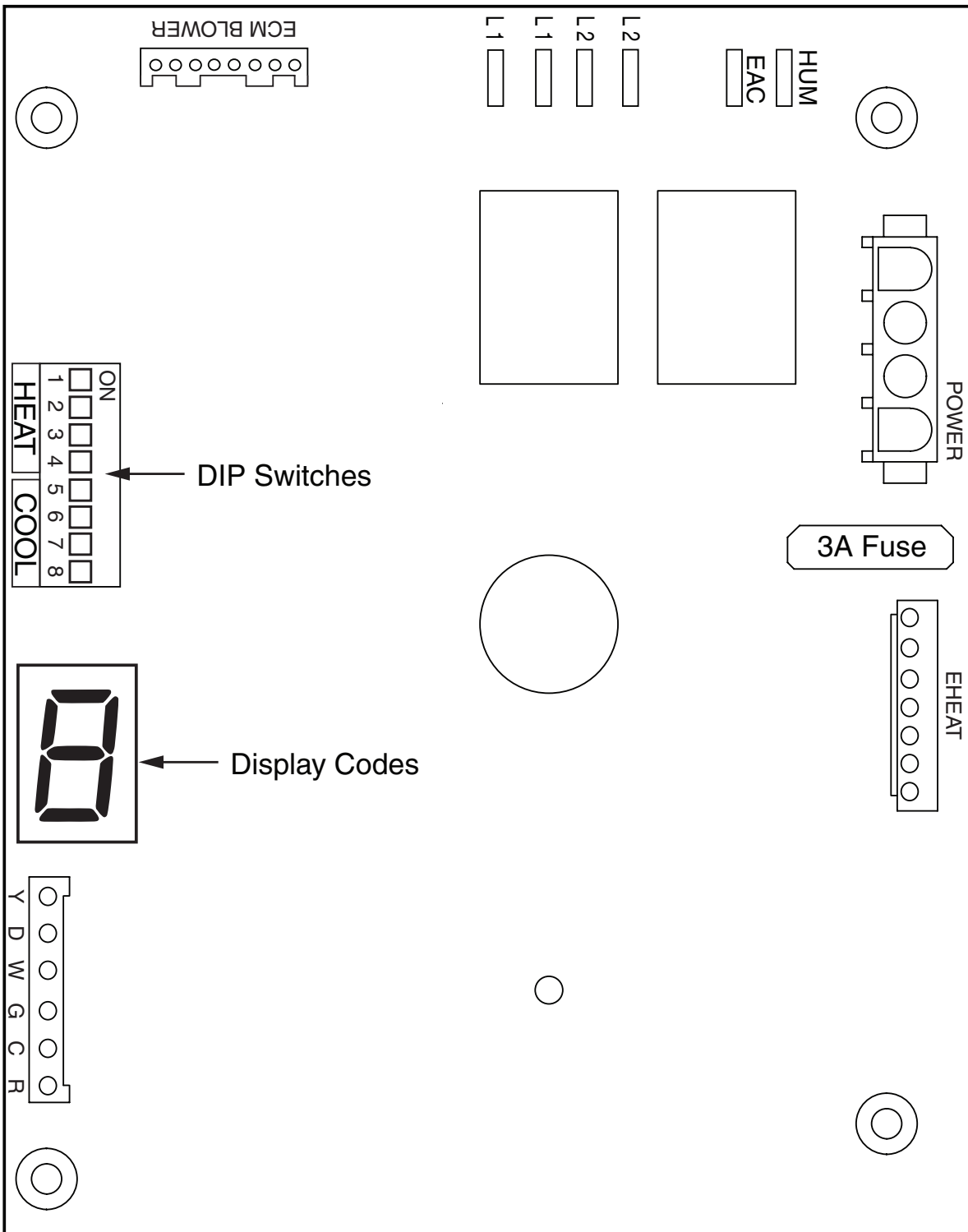


Figure 22. E7 Motor Control Board

# WIRING DIAGRAM

## Model: 10kW Electric Furnace with FSHE ECM

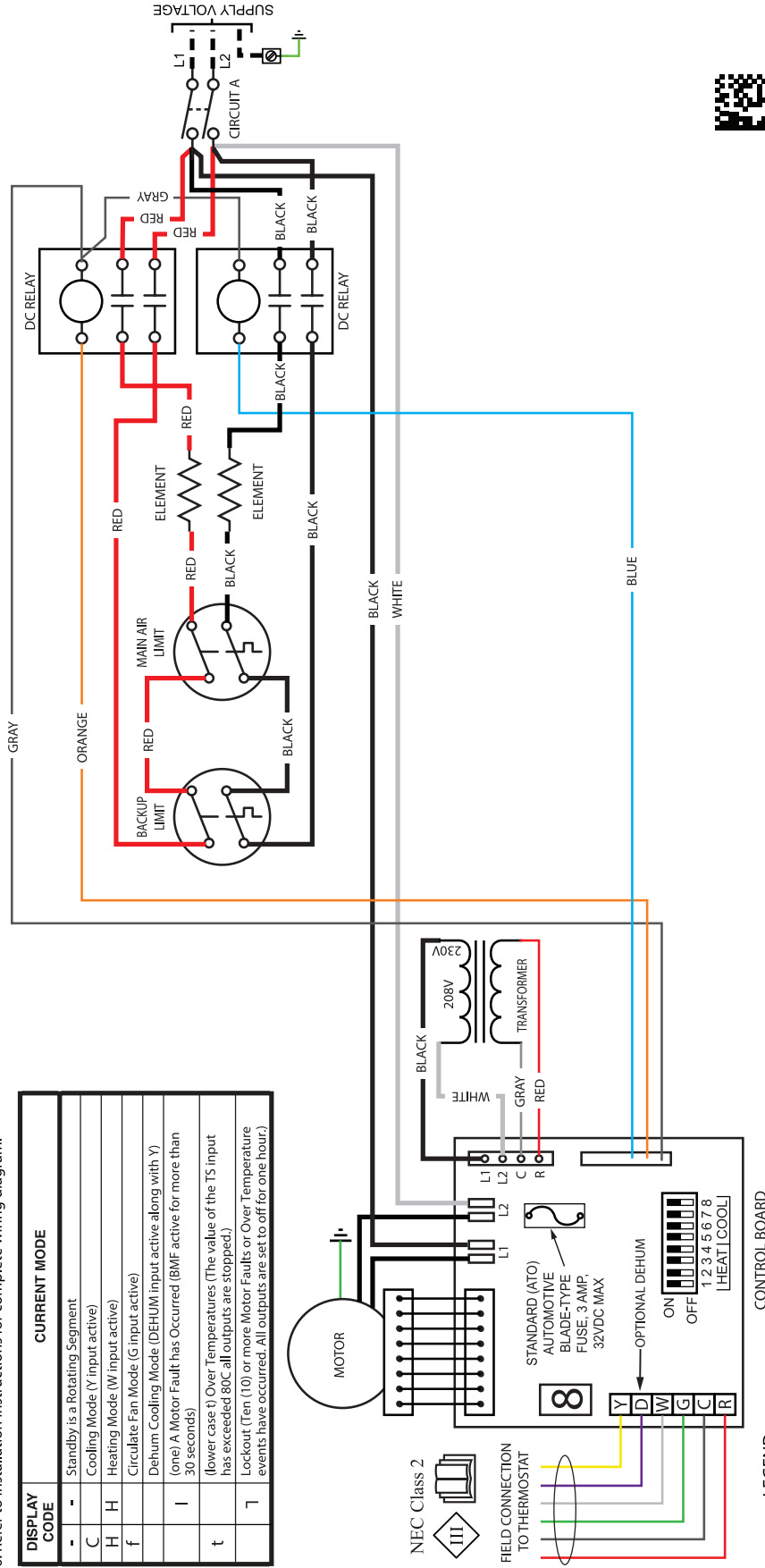
208/230VAC

1Ph/60Hz

- NOTES:**
1. Supply wire size must be in accordance to the applicable revision of the NEC and all other applicable codes.
  2. To change blower speed refer to installation instructions.
  3. Refer to appliance installation instructions for thermostat connections.
  4. If any wire in this unit is to be replaced it must be replaced with 105°C thermoplastic copper wire of the same gauge.
  5. Not suitable for use on systems exceeding 120V to ground.
  6. Refer to installation instructions for complete wiring diagram.

DISPLAY CODE	CURRENT MODE
-	Standby is a Rotating Segment
C	Cooling Mode (Y input active)
H	Heating Mode (W input active)
f	Circulate Fan Mode (G input active)
I	Dehum Cooling Mode (DEHUM input active along with Y)
t	(one) A Motor Fault has Occurred (BMF active for more than 30 seconds)
T	(lower case t) Over Temperatures (The value of the TS input has exceeded 80C all outputs are stopped.) Lockout (Ten (10) or more Motor Faults or Over Temperature events have occurred. All outputs are set to off for one hour.)

1. La taille du câblage d'alimentation doit être conforme à la révision applicable des codes NEC et des autres codes applicables.
2. Pour changer la vitesse du ventilateur, consultez les instructions d'installation.
3. Consultez les instructions d'installation de l'appareil pour les branchements du thermostat.
4. Si l'un ou l'autre des fils de cette unité requiert un remplacement, il doit être remplacé par un fil en cuivre thermoplastique 105 °C du même gabarit.
5. Ne convient pas à l'utilisation sur les systèmes qui excèdent 120 V à la terre.
6. Consultez les instructions d'installation pour un schéma de câblage complet.



**LEGEND:**  
 - - - - - FIELD WIRING  
 \_\_\_\_\_ LOW VOLTAGE  
 \_\_\_\_\_ HIGH VOLTAGE

NOTE: DISPLAY CODE may be inverted depending on final installation orientation.

**Backup Limit Part Number**  
 1045337



**1045501A**  
 (REPLACES 10455010)  
 09/23

Figure 23. E7E-010K Models



# WIRING DIAGRAM

## Model: 12kw Electric Furnace with FSHE ECM

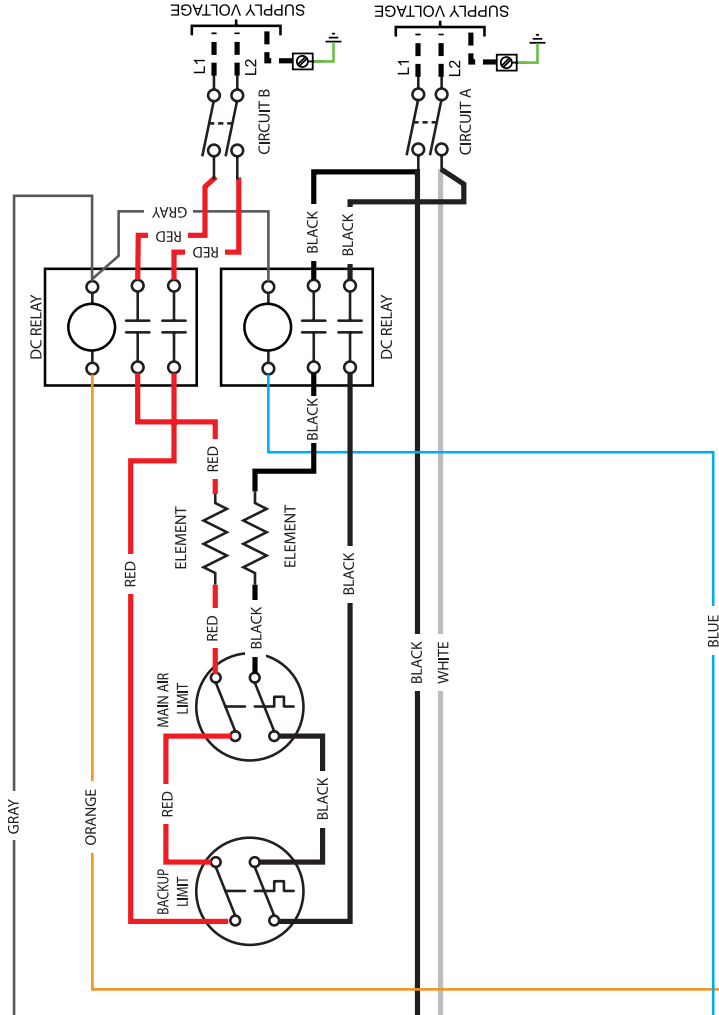
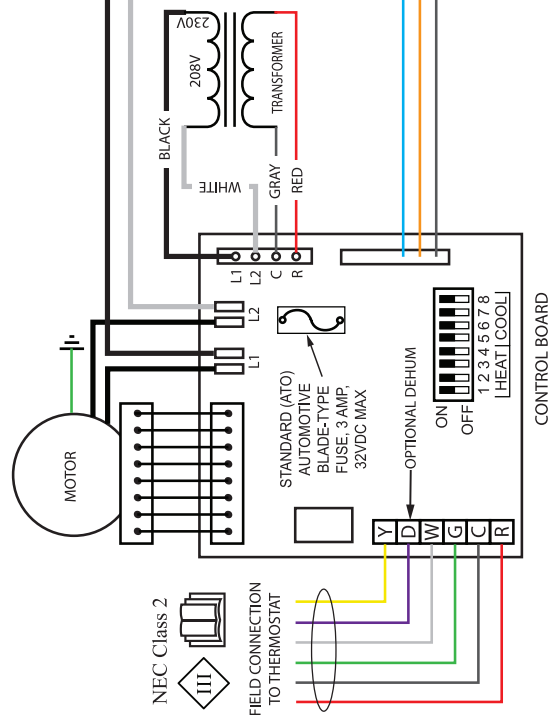
208/230VAC

1Ph/60Hz

**NOTES:**  
 1. Supply wire size must be in accordance to the applicable revision of the NEC and all other applicable codes.  
 2. To change blower speed refer to installation instructions for thermostat connections.  
 3. Refer to appliance installation instructions for thermostat connections.  
 4. If any wire in this unit is to be replaced it must be replaced with 105°C thermoplastic copper wire of the same gauge.  
 5. Not suitable for use on systems exceeding 120V to ground.  
 6. Refer to installation instructions for complete wiring diagram.

1. La taille du câblage d'alimentation doit être conforme à la révision applicable des codes NEC et des autres codes applicables.
2. Pour changer la vitesse du ventilateur, consultez les instructions d'installation.
3. Consultez les instructions d'installation de l'appareil pour les branchements du thermostat.
4. Si l'un ou l'autre des fils de cette unité requiert un remplacement, il doit être remplacé par un fil en cuivre thermoplastique 105 °C du même gabarit.
5. Ne convient pas à l'utilisation sur les systèmes qui excèdent 120V à la terre.
6. Consultez les instructions d'installation pour un schéma de câblage complet.

DISPLAY CODE	CURRENT MODE
-	Standby is a Rotating Segment
C	Cooling Mode (Y input active)
H	Heating Mode (W input active)
F	Circulate Fan Mode (G input active)
I	Dehum Cooling Mode (DEHUM input active along with Y)
†	(one) A Motor Fault has Occurred (BMF active for more than 30 seconds)
L	(lower case t) Over Temperatures (The value of the TS input has exceeded 80C all outputs are stopped.)
L	Lockout (Ten (10) or more Motor Faults or Over Temperature events have occurred. All outputs are set to off for one hour.)



**LEGEND:**  
 - - - FIELD WIRING  
 \_\_\_\_\_ LOW VOLTAGE  
 \_\_\_\_\_ HIGH VOLTAGE

NOTE: DISPLAY CODE may be inverted depending on final installation orientation.

Backup Limit Part Number  
 1045337



**1045502A**  
 (REPLACES 10455020)  
 09/23

Figure 24. E7E-012K Models

# WIRING DIAGRAM

## Model: 15kW Electric Furnace with FSHE ECM

208/230VAC

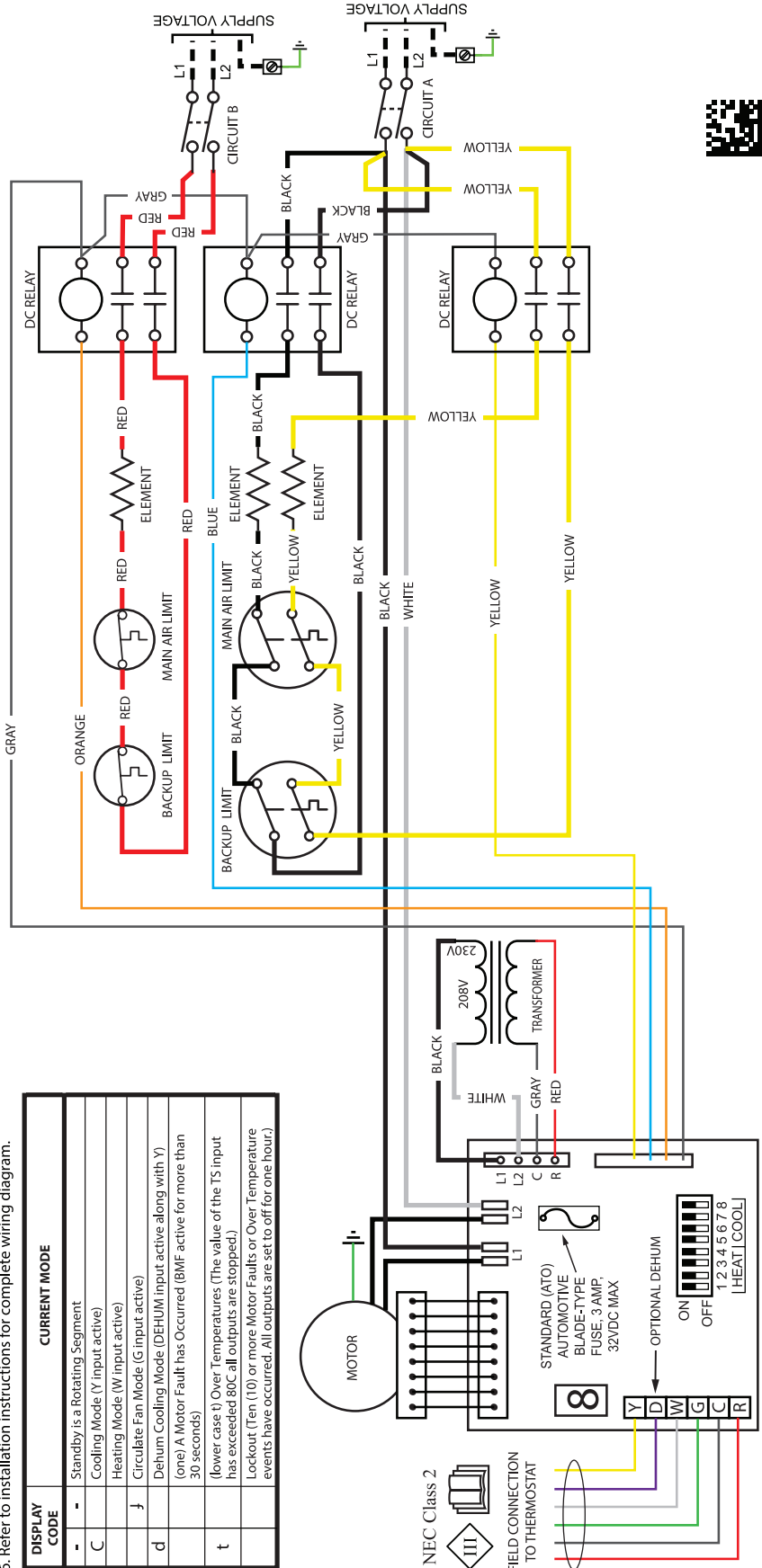
1Ph/60HZ

### NOTES:

- Supply wire size must be in accordance to the applicable revision of the NEC and all other applicable codes.
- To change blower speed refer to installation instructions.
- Refer to appliance installation instructions for thermostat connections.
- If any wire in this unit is to be replaced it must be replaced with 105°C thermoplastic copper wire of the same gauge.
- Not suitable for use on systems exceeding 120V to ground.
- Refer to installation instructions for complete wiring diagram.

DISPLAY CODE	CURRENT MODE
-	Standby is a Rotating Segment
C	Cooling Mode (Y input active)
H	Heating Mode (W input active)
f	Circulate Fan Mode (G input active)
d	Dehum Cooling Mode (DEHUM input active along with Y)
	(one) A Motor Fault has Occurred (BMF active for more than 30 seconds)
t	(lower case t) Over Temperatures (The value of the TS input has exceeded 80C all outputs are stopped). Lockout (Ten (10) or more Motor Faults or Over Temperature events have occurred. All outputs are set to off for one hour).

- La taille du câblage d'alimentation doit être conforme à la révision applicable des codes NEC et des autres codes applicables.
- Pour changer la vitesse du ventilateur, consultez les instructions d'installation.
- Consultez les instructions d'installation de l'appareil pour les branchements du thermostat.
- Si l'un ou l'autre des fils de cette unité requiert un remplacement, il doit être remplacé par un fil en cuivre thermoplastique 105 °C du même gabarit.
- Ne convient pas à l'utilisation sur les systèmes qui excèdent 120V à la terre.
- Consultez les instructions d'installation pour un schéma de câblage complet.



NOTE: DISPLAY CODE may be inverted depending on final installation orientation.

Backup Limit Part Numbers  
1045337 & 1045338

1045503A  
(REPLACES 10455030)

9/23

Figure 25. E7E-015K Models

# WIRING DIAGRAM

## Model: 17kW Electric Furnace with FSHE ECM

208/230VAC

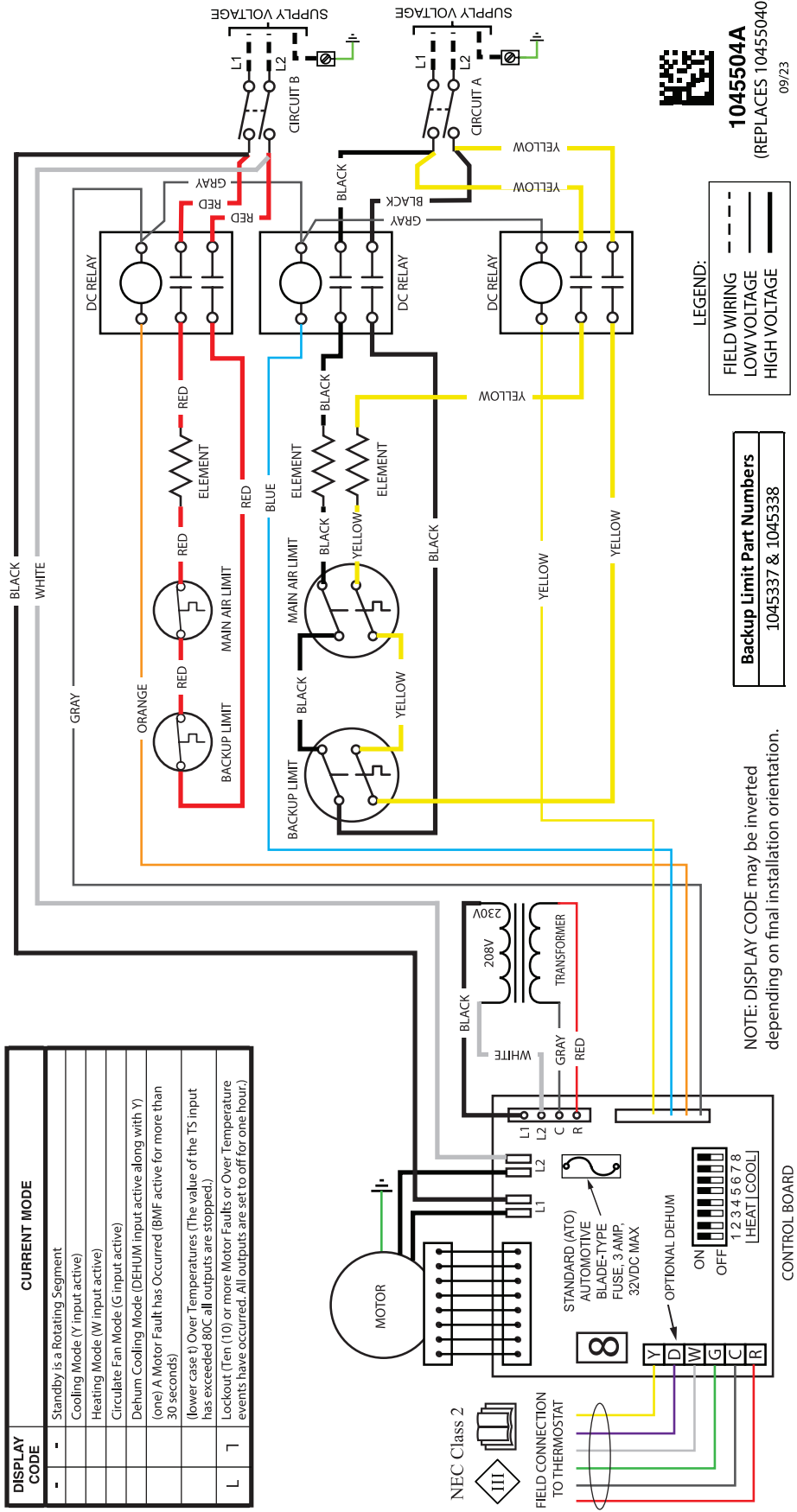
1Ph/60Hz

### NOTES:

1. Supply wire size must be in accordance to the applicable revision of the NEC and all other applicable codes.
2. To change blower speed refer to installation instructions.
3. Refer to appliance installation instructions for thermostat connections.
4. If any wire in this unit is to be replaced it must be replaced with 105°C thermoplastic copper wire of the same gauge.
5. Not suitable for use on systems exceeding 120V to ground.
6. Refer to installation instructions for complete wiring diagram.

1. La taille du câblage d'alimentation doit être conforme à la révision applicable des codes NEC et des autres codes applicables.
2. Pour changer la vitesse du ventilateur, consultez les instructions d'installation.
3. Consultez les instructions d'installation de l'appareil pour les branchements du thermostat.
4. Si l'un ou l'autre des fils de cette unité requiert un remplacement, il doit être remplacé par un fil en cuivre thermoplastique 105 °C du même gabarit.
5. Ne convient pas à l'utilisation sur les systèmes qui excèdent 120 V à la terre.
6. Consultez les instructions d'installation pour un schéma de câblage complet.

DISPLAY CODE	CURRENT MODE
-	Standby is a Rotating Segment
-	Cooling Mode (Y input active)
-	Heating Mode (W input active)
-	Circulate Fan Mode (G input active)
-	Dehum Cooling Mode (DEHUM input active along with Y)
-	(one) A Motor Fault has Occurred (BMF active for more than 30 seconds)
-	(lower case t) Over Temperatures (The value of the TS input has exceeded 80C all outputs are stopped)
L 7	Lockout (Ten (10) or more Motor Faults or Over Temperature events have occurred. All outputs are set to off for one hour.)



Backup Limit Part Numbers  
1045337 & 1045338

1045504A  
(REPLACES 10455040)  
09/23

NOTE: DISPLAY CODE may be inverted depending on final installation orientation.

Figure 26. E7E-017K Models

# WIRING DIAGRAM

## Model: 20kW and 23kW Electric Furnace with FSHE ECM

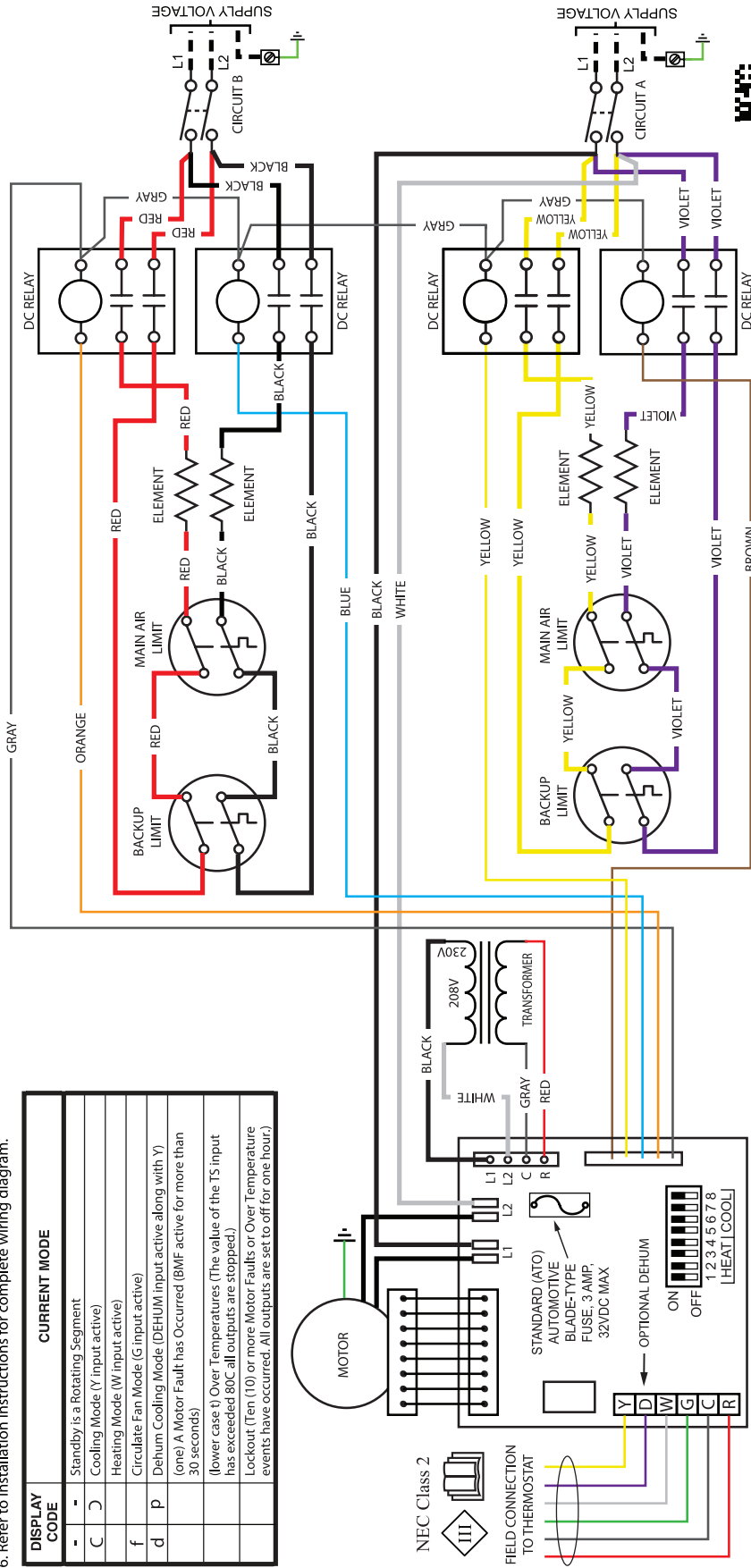
208/230VAC

1Ph/60Hz

- NOTES:**
1. Supply wire size must be in accordance to the applicable revision of the NEC and all other applicable codes.
  2. To change blower speed refer to installation instructions.
  3. Refer to appliance installation instructions for thermostat connections.
  4. If any wire in this unit is to be replaced it must be replaced with 105°C thermoplastic copper wire of the same gauge.
  5. Not suitable for use on systems exceeding 120V to ground.
  6. Refer to installation instructions for complete wiring diagram.

DISPLAY CODE	CURRENT MODE
-	Standby is a Rotating Segment
C	Cooling Mode (Y input active)
D	Heating Mode (W input active)
f	Circulate Fan Mode (G input active)
d	Dehum. Cooling Mode (DEHUM input active along with Y)
	(one) A Motor Fault has Occurred (BMF active for more than 30 seconds)
	(lower case t) Over Temperatures (The value of the TS input has exceeded 80C, all outputs are stopped).
	Lockout (Ten (10) or more Motor Faults or Over Temperature events have occurred. All outputs are set to off for one hour.)

1. La taille du câblage d'alimentation doit être conforme à la révision applicable des codes NEC et des autres codes applicables.
2. Pour changer la vitesse du ventilateur, consultez les instructions d'installation.
3. Consultez les instructions d'installation de l'appareil pour les branchements du thermostat.
4. Si l'un ou l'autre des fils de cette unité requiert un remplacement, il doit être remplacé par un fil en cuivre thermoplastique 105 °C du même gabarit.
5. Ne convient pas à l'utilisation sur les systèmes qui excèdent 120V à la terre.
6. Consultez les instructions d'installation pour un schéma de câblage complet.



NOTE: DISPLAY CODE may be inverted depending on final installation orientation.

Backup Limit Part Numbers  
1045337 & 1045337

1045505A  
(REPLACES 10455050)  
09/23

Figure 27. E7E-020K & E7E-023K Models



CONTROL SIGNAL & MODE	OPERATION	TOTAL KW	BOARD ACTION
W HEAT	ON	10	Stage 1 Heat on immediately
			HEAT Blower on after 3 second delay
			Stage 2 heat on after 10 second delay
		12	Stage 1 Heat on immediately
			HEAT Blower on after 3 second delay
			Stage 2 heat on after 10 second delay
		15	Stage 1 Heat on immediately
			HEAT Blower on after 3 second delay
			Stage 2 heat on after 10 second delay
			Stage 3 heat on after 20 second delay
		17	Stage 1 Heat on immediately
			HEAT Blower on after 3 second delay
			Stage 2 heat on after 10 second delay
			Stage 3 heat on after 20 second delay
		20	Stage 1 Heat on immediately
			HEAT Blower on after 3 second delay
			Stage 2 heat on after 10 second delay
			Stage 3 heat on after 20 second delay
	Stage 4 heat on after 30 second delay		
23	Stage 1 Heat on immediately		
	HEAT Blower on after 3 second delay		
	Stage 2 heat on after 10 second delay		
	Stage 3 heat on after 20 second delay		
	Stage 4 heat on after 30 second delay		
OFF	-	Heat stages off immediately	
		Blower turns off after 15 second delay	
W & Y AUX HEAT	ON	10	Stage 1 Heat on immediately
			Blower on after 3 second delay (HEAT or COOL speed, whichever is greater)
			Stage 2 heat on after 10 second delay
		12	Stage 1 Heat on immediately
			Blower on after 3 second delay (HEAT or COOL speed, whichever is greater)
			Stage 2 heat on after 10 second delay
		15	Stage 1 Heat on immediately
			Blower on after 3 second delay (HEAT or COOL speed, whichever is greater)
			Stage 2 heat on after 10 second delay
			Stage 3 heat on after 20 second delay
		17	Stage 1 Heat on immediately
			Blower on after 3 second delay (HEAT or COOL speed, whichever is greater)
			Stage 2 heat on after 10 second delay
			Stage 3 heat on after 20 second delay
		20	Stage 1 Heat on immediately
			Blower on after 3 second delay (HEAT or COOL speed, whichever is greater)
			Stage 2 heat on after 10 second delay
			Stage 3 heat on after 20 second delay
			Stage 4 heat on after 30 second delay
		23	Stage 1 Heat on immediately
			Blower on after 3 second delay (HEAT or COOL speed, whichever is greater)
Stage 2 heat on after 10 second delay			
Stage 3 heat on after 20 second delay			
Stage 4 heat on after 30 second delay			

**Table 8. Control Board Operation**

CONTROL SIGNAL & MODE	OPERATION	TOTAL KW	BOARD ACTION
W & Y AUX HEAT (Continued)	OFF	-	Heat stages off immediately
			Blower turns off after 15 second delay
G FAN	ON	-	Blower on immediately (35% of COOL)
	OFF	-	Blower off immediately
Y HEAT PUMP AND COOL	ON	-	COOL blower on immediately
	OFF	-	COOL blower off after 40 second delay
Y & D COOL WITH DEHUM	ON	-	70% COOL blower on immediately
			100% COOL blower after 10 minutes
	OFF	-	COOL blower off after 40 second delay

**Table 8. Control Board Operation - Continued**

240V~					
MODEL NUMBER E7E*-	SUPPLY CIRCUIT	TOTAL AMPERES	MAXIMUM OVER-CURRENT RATING	MINIMUM CIRCUIT AMPACITY	CIRCUIT BREAKER SIZE
010H*	Single	45	50	57	60
012H*	Single	52	56	65	70
	Dual "A"	28	32	35	35
	Dual "B"	24	24	30	35
015H*	Single	66	71	83	90
	Dual "A"	45	50	57	60
	Dual "B"	21	21	26	30
017H*	Single	71	76	89	90
	Dual "A"	45	45	56	60
	Dual "B"	26	31	33	35
020H*	Single	87	91	109	110
	Dual "A"	45	50	57	60
	Dual "B"	42	42	52	60
023H*	Single	94	98	117	125
	Dual "A"	45	50	57	60
	Dual "B"	48	48	60	60

**NOTE:** Wire size must be in accordance to the applicable revision of the NEC and all other applicable codes.

**Table 9. Electrical Specifications of Legacy 240V E7 Appliances for Reference**



## INSTALLATION CHECKLIST

<b>INSTALLER NAME:</b>		
CITY:	STATE:	
<b>INSTALLATION ADDRESS:</b>		
CITY:	STATE:	
UNIT MODEL #		
UNIT SERIAL #		
Minimum clearances as shown in <a href="#">Table 1 (page 3)</a> ?	YES	NO
Has the owner's information been reviewed with the homeowner?	YES	NO
Has the literature package been left near the Appliance?	YES	NO

ELECTRICAL SYSTEM		
Electrical connections tight?	YES	NO
Line voltage polarity correct?	YES	NO
Supply Voltage: ..... VOLTS		
Has the thermostat been calibrated?	YES	NO
Is the thermostat level?	YES	NO
Is the Appliance grounded properly?	YES	NO
Is the heat anticipator setting correct?	YES	NO

COMBUSTION AIR & VENTING SYSTEM		
Is there adequate fresh air supply for ventilation?	YES	NO
Filter(s) secured in place?	YES	NO
Filter(s) clean?	YES	NO



We Encourage  
Professionalism



Through Technician  
Certification by NATE

**Intertek**

**Complies with H.U.D. Manufactured Home Construction & Safety Standards.**

