

## 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 or property damage.**

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

- **Before servicing, disconnect all electrical power to furnace.**
- **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 furnace 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.

## TABLE OF CONTENTS

<b>IMPORTANT SAFETY INFORMATION.....</b>	<b>3</b>	<b>ELECTRICAL WIRING .....</b>	<b>10</b>
<b>REQUIREMENTS &amp; CODES .....</b>	<b>3</b>	Line Voltage Wiring.....	10
Minimum Installation Clearances.....	3	Connecting Supply Service Wires.....	10
Minimum Unobstructed Airflow .....	3	Grounding .....	11
Clearances to Combustible Materials .....	3	Thermostat / Low Voltage Connections .....	11
<b>CIRCULATING AIR REQUIREMENTS.....</b>	<b>4</b>	Humidifier.....	11
Return Air Connections.....	4	Dehumidification Options.....	11
Supply Air Connections.....	4	Electronic Air Cleaner (EAC) .....	11
Filtering Methods - Downflow Furnaces.....	4	Changing Blower Speed .....	11
Non-Ducted Return Air.....	4	Installing Control Circuit Wiring.....	11
Without A/C or H/P uncased coil .....	4	<b>START-UP &amp; ADJUSTMENTS.....</b>	<b>11</b>
With A/C or H/P uncased coil .....	4	Pre-Start Check List.....	11
With optional coil housing.....	4	Start-up Procedures.....	11
Ducted Return Air.....	4	<b>FIGURES &amp; TABLES.....</b>	<b>12</b>
Filtering Methods - Upflow Furnaces .....	4	Figure 16. E7 Furnace Components .....	12
Non-Ducted Return Air.....	4	Figure 17. E7EM Physical Dimensions .....	13
Without optional upflow stand.....	4	Figure 18. E7EU & E7ED Physical Dimensions.....	13
With optional upflow stand.....	4	Figure 19. E7 Furnace Upflow Stand Dimensions .....	14
Ducted Return Air.....	4	Airflow Data.....	15
Optional Equipment .....	5	Table 4. E7 Airflow Data .....	15
Optional Automatic Furnace Damper.....	5	Table 5. Maximum Allowable Heat Settings.....	15
Duct Connectors for Downflow Systems.....	5	Electrical Data & Diagrams.....	16
<b>FURNACE INSTALLATION.....</b>	<b>5</b>	Figure 20. E7EB Thermostat Connection .....	16
General Information .....	5	Table 6. Unit Specifications.....	16
Before You Install this Furnace.....	5	Table 7. E7 Electrical Specifications .....	17
Locating the Unit.....	5	Figure 21. E7 Motor Control Board .....	17
Locating & Cutting Floor Openings.....	5	Figure 22. E7EB-010H Models .....	18
Standard Duct Connector Installation .....	6	Figure 23. E7EB-012H Models .....	19
Narrow Duct Connectors.....	7	Figure 24. E7EB-015H Models .....	20
Round Duct Connector Installation .....	7	Figure 25. E7EB-017H Models .....	21
Alcove Installation.....	7	Figure 26. E7EB-020H & E7EB-023H Models.....	22
Closet Installation.....	8	Table 8. Control Board Operation .....	23
Upflow Furnaces.....	8	<b>INSTALLATION CHECKLIST.....</b>	<b>24</b>
Over-the-Floor Return Air System (Non-Ducted) .....	8		
Through-the-Floor Return Air System (Ducted) .....	9		

## 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.

## 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.

### 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**

ALL MODELS	CLOSET	ALCOVE
Front **	6"	24"
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" minimum per side.

\*\*Service Clearance

**Table 1. Minimum Clearance Requirements**

**future servicing. Closet installations require 6 inches minimum.**

- This appliance must be installed in accordance with clearances listed in [Table 1](#). The furnace must be installed with ample clearance for easy access to the air filter, blower assembly, burner assembly, controls, and vent connections.
- 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 \(page 15\)](#), 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 furnace 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", a louvered door must be used having a minimum 250 sq in<sup>2</sup> (1,613 cm<sup>2</sup>) free area opening directly in line with openings in the furnace door

### Clearances to Combustible Materials

- This furnace is Design Certified in the U.S. and Canada by ETL for the minimum clearances to combustible materials. **NOTE:** The furnace is listed for installation on combustible or non-combustible flooring. To obtain specific clearance information, refer to the furnace rating plate, located inside of the furnace cabinet.
- 0" from all surfaces of furnace 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 furnace 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 furnace 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 furnace 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 furnace 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 furnace 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 furnace.
- 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" 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 furnace shall not exceed static pressure rating listed on furnace nameplate.

- Duct system must be designed so that no supply registers are located in duct system directly below the furnace.

#### Filtering Methods - Downflow Furnaces

##### 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"x20" filter in the top filter rack and an 18"x30" filter in the front filter rack.

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

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

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

- Use the optional coil filters; the filter supplied with the furnace 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 furnace in the duct above the coil that is accessible for monthly cleaning or replacement by homeowner.

#### Filtering Methods - Upflow Furnaces

##### Non-Ducted Return Air

Furnaces 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

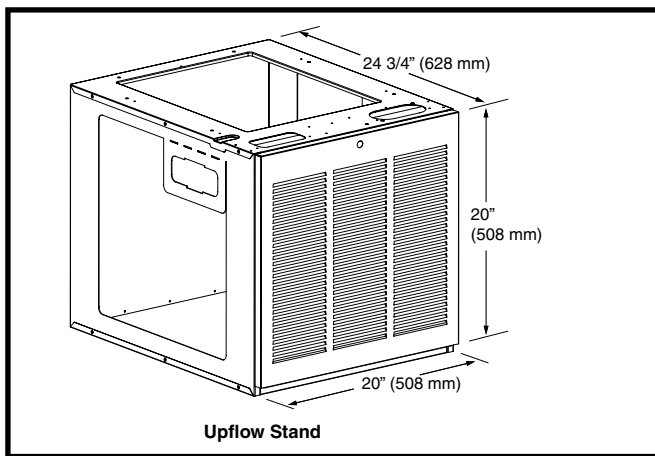
- Install a filter with a minimum unrestricted medium area of 324 in<sup>2</sup> below the coil cabinet/furnace assembly that is accessible for monthly cleaning or replacement by the homeowner.

##### With optional upflow stand

- Stand ([Figure 1](#)) will use filters provided with the unit. Remove any filters in the furnace 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.



**Figure 1. Optional Upflow Stand**

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

#### Optional Equipment

**NOTE:** Refer to the instructions supplied with any additional accessories for further installation details.

#### Optional Automatic Furnace Damper

Furnace 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 furnace 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, furnaces may be installed on combustible flooring without a separate sub-base. The furnace rear mounting plate (Figure 5 (page 7)) supplied with the duct connectors is recommended for use with this type of installation.

### FURNACE 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 furnace installations. **Only qualified HVAC technicians should install this furnace.**

#### General Information

This electric furnace 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.

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 furnace 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 Furnace

- ✓ 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 furnace 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 furnace are shown in Figure 17 (page 13). If an upflow stand will be used, see Figure 19 (page 14) for component dimensions.
- The unit must be leveled at installation and attached to a properly installed duct system.
- The surface that the furnace 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 furnace and air duct. Standard and round cutouts for upflow furnaces are shown in Figure 2 (page 6). The cutouts for downflow furnaces are shown in Figure 3 (page 6).

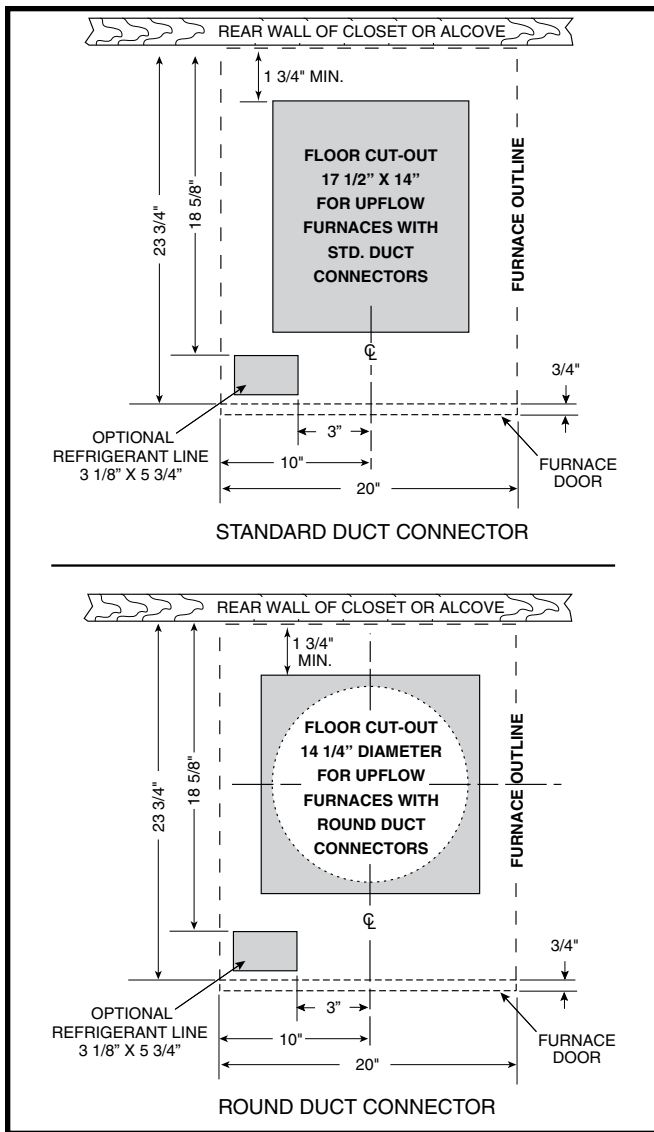
1. Measure and mark the centerline of the cutout. Provide minimum clearances at rear and right side walls of closet or alcove for installation of furnace and wiring.
2. Using the centerline as a starting point, draw the rest of the duct cut-out to the dimensions shown in Figure 2 or Figure 3.

**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 furnace. The refrigerant and entrance supply opening dimensions may be adjusted  $\pm 1/2$ ".

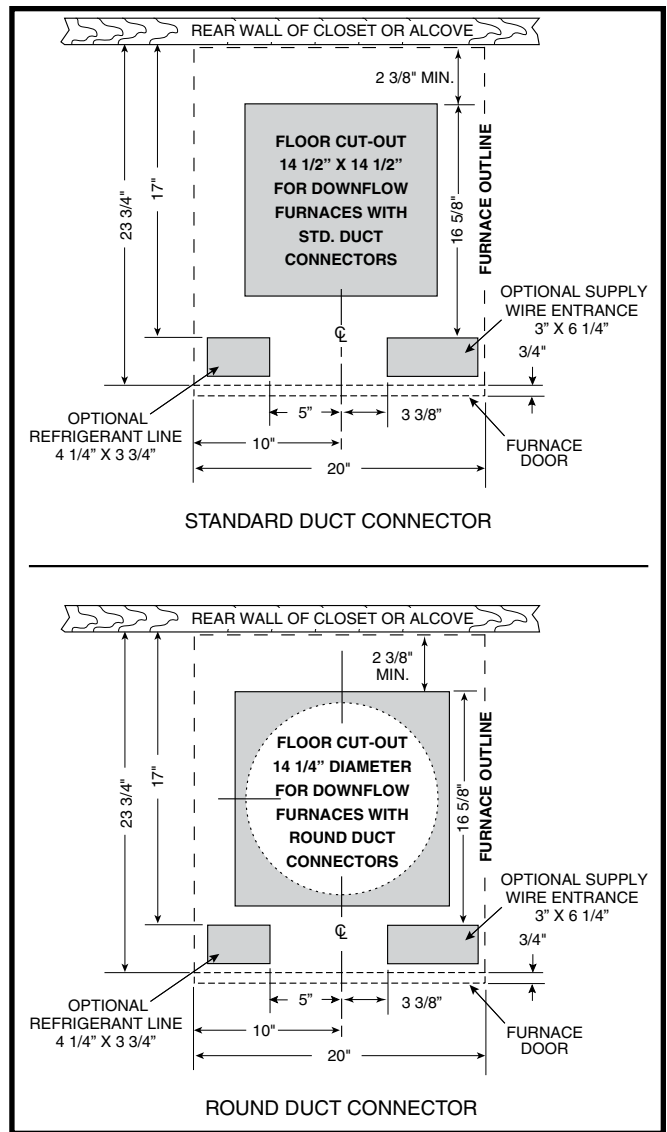
3. Cut out the floor opening  $1/16$ " larger than the actual cutout drawn. This will allow some clearance when installing the duct connector.
4. Measure from the top of the floor down to the top of the supply air duct to obtain the depth of the floor cavity.

**NOTE:** The depth of the floor cavity (shown as "X" in Figure 4 (page 6)) will determine the correct duct connector.

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



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



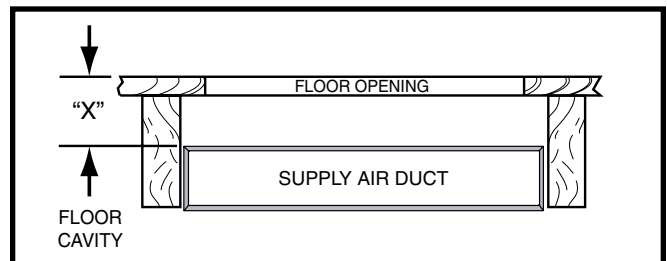
**Figure 3. Cut-Out Dimensions for Downflow Furnaces**

**Standard Duct Connector Installation**

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

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

7. 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 \(page 7\)](#).
8. Seal all connections with industrial grade sealing tape or liquid sealant.



**Figure 4. Floor Cavity**

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

NOTE: Dimensions shown as Inches / (Millimeter)

Table 2. Duct Connector Sizes

### Narrow Duct Connectors

This attachment method should be used if there is insufficient clearance to bend the tabs on a standard 12" 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.

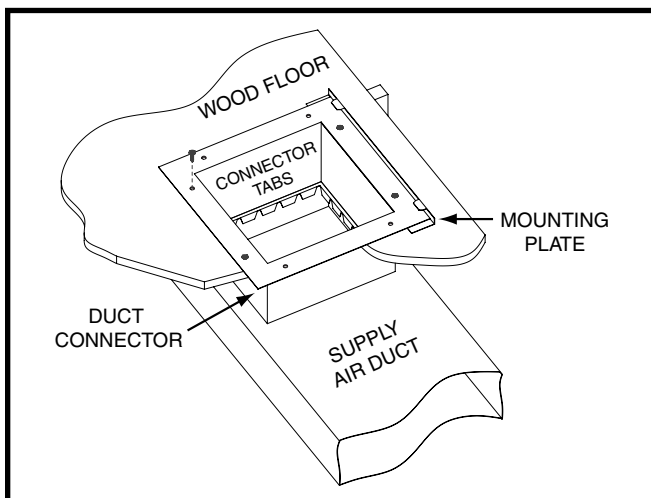


Figure 5. Standard Duct Connector Installed

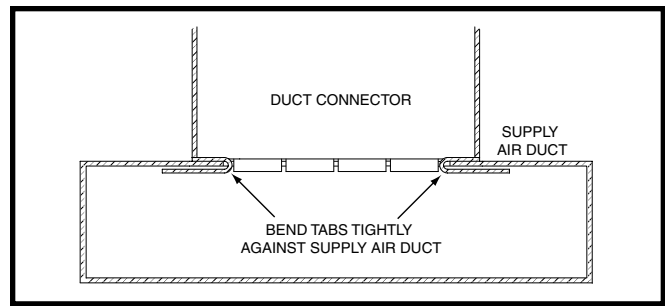


Figure 6. Duct Connector Tabs

### Round Duct Connector Installation

The 14" round duct connector is designed to connect directly to a 14" flexible duct. **NOTE:** Flexible ducts must have a minimum temperature rating of 200° F and 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.
- Secure the duct connector and the mounting plate to the wood floor with appropriate size screws.
- Connect the round supply duct to the underside of the duct connector and secure them with field supplied sheet metal screws.
- Seal all connections with industrial grade sealing tape or liquid sealant.

### Alcove Installation

- 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.
- Attach a return air method to the furnace. 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.

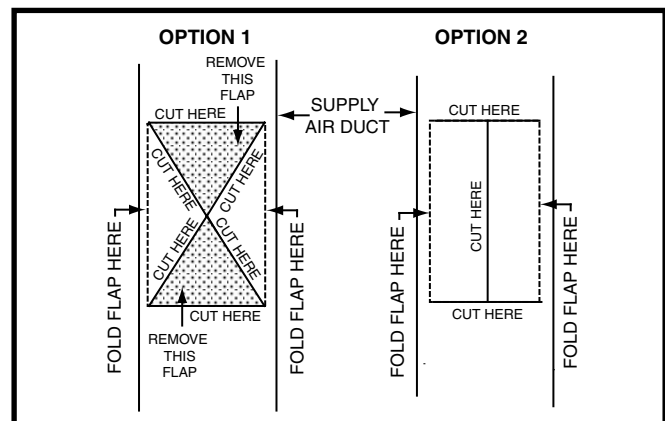
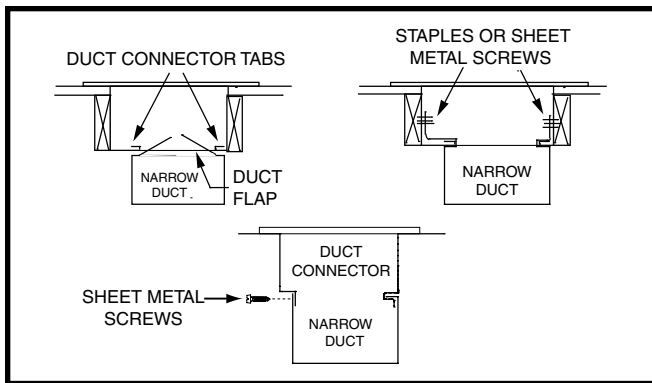
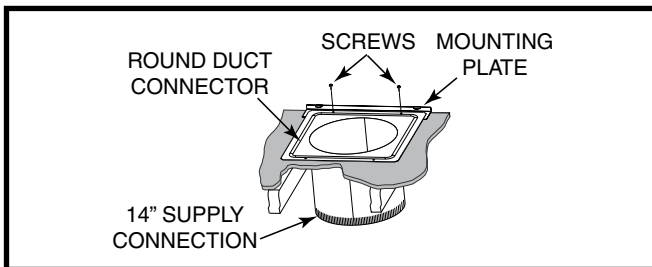


Figure 7. Narrow Air Duct Openings



**Figure 8. Narrow Ducts**



**Figure 9. Round Duct Connector Installed**

### Closet Installation

For closet installations, a coil box is recommended to be installed with the furnace. 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, preferably above top of furnace. Refer to the Minimum Unobstructed Airflow section ([page 3](#)) for return air opening requirements.
2. Insert four fasteners, securing grille to door or wall.

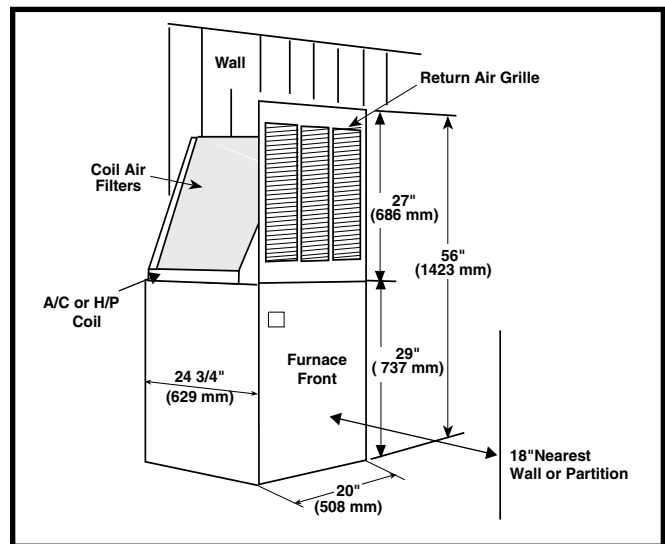
### Downflow Furnaces

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 furnace without adding sheet metal cavities or cutting and trimming wood panels. Unducted return air systems may be used for closet or alcove installations.

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 furnace only when installing indoor coil of an air conditioner or heat pump system. Refer to instructions supplied with accessory equipment.

1. Route 240V supply circuit(s) and 24V wiring to closet or alcove. See [Figure 17 \(page 13\)](#) or [Figure 18 \(page 13\)](#) for locations.
2. Remove furnace 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.



**Figure 10. Alcove Installation**

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

4. 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 \(page 13\)](#).
5. See Electrical Wiring section ([page 10](#)) to complete furnace installation.

### Upflow Furnaces

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 furnace 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 furnace is made of combustible material, locate a pan fabricated of non-combustible material with 1" upturned flanges under furnace return air opening. See [Figure 12 \(page 9\)](#).
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 240V 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 furnace 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 furnace to overhead supply duct. See [Figure 13](#).



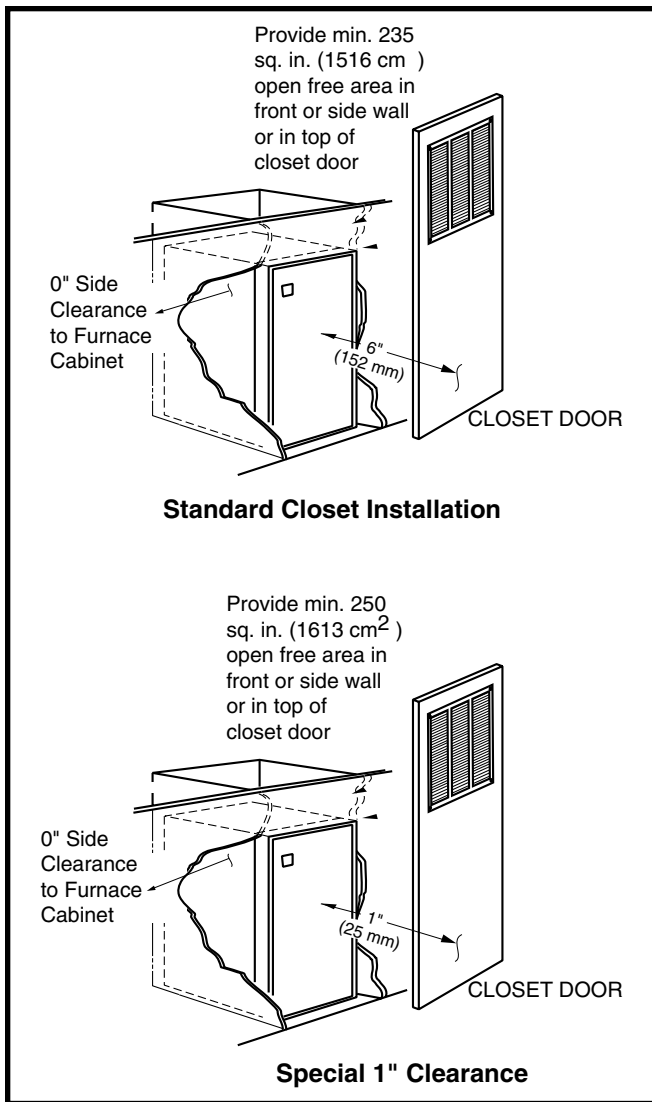


Figure 11. Closet Installation

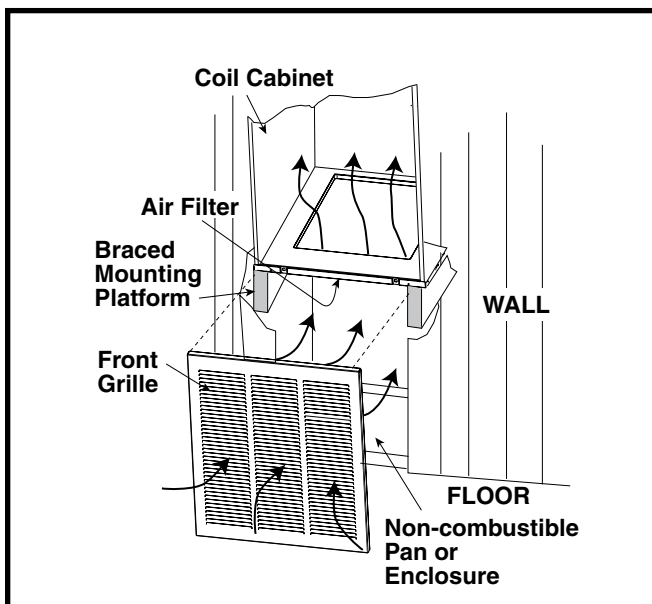


Figure 12. Over-the-Floor Return Air System

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 furnace 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 furnace.
2. If return air duct is made of combustible material, locate a pan fabricated of non-combustible material with 1" upturned flanges under furnace return air opening.
3. Route 240V 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 over floor cutout and secure with three or more fasteners.
5. Position furnace onto coil cabinet and secure with two or more fasteners.
6. Use optional upflow duct connector or field supplied connector to attach furnace to overhead supply duct. See [Figure 13](#).

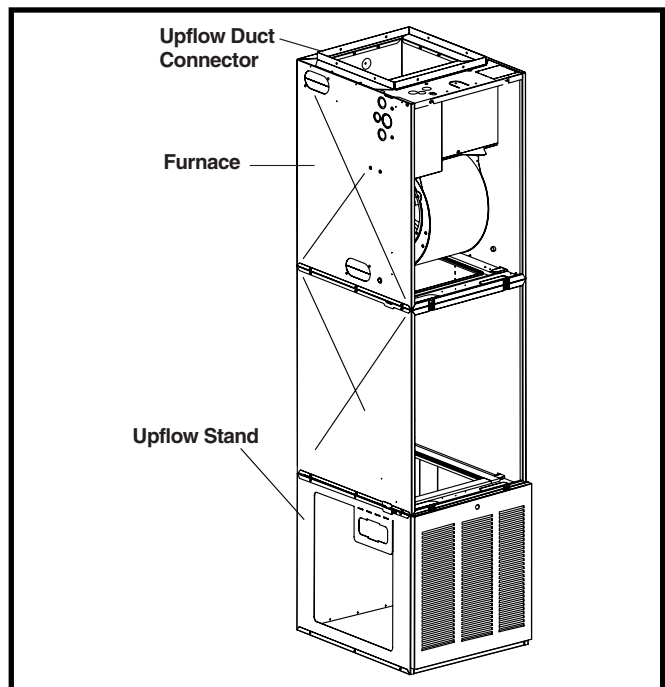


Figure 13. Over-the-Floor Return Air System with Upflow Stand

## ELECTRICAL WIRING

### **WARNING:**

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

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

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

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

- 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 \(page 17\)](#).

It is recommended that the line voltage (240 VAC) to the furnace be supplied from a dedicated branch circuit containing the correct fuse or circuit breaker for the furnace. For minimum circuit ampacity and maximum over-current protection, see [Table 7](#). See unit wiring diagrams ([Figure 22 \(page 18\)](#), [Figure 23 \(page 19\)](#), [Figure 24 \(page 20\)](#), [Figure 25 \(page 21\)](#), & [Figure 26 \(page 22\)](#)) 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

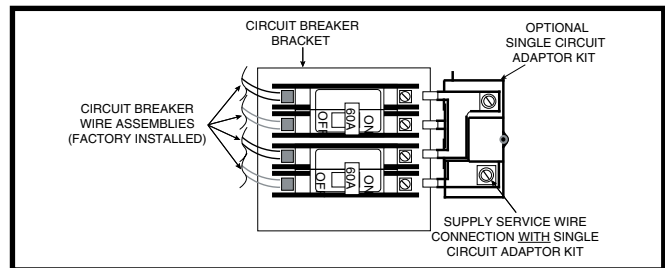
Power entrance for all models may be through the right side or through the bottom of the unit.

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).

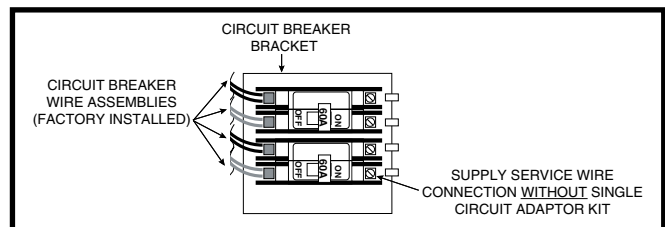
### **WARNING:**

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.

3. 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.
4. 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.
5. 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. recommended).
6. Connect service ground wire(s) to grounding lug(s) provided. See [Figure 16 \(page 12\)](#). One ground is required for each supply circuit used.



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



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

## Grounding

### **WARNING:**

To minimize personal injury, the furnace cabinet must have an uninterrupted or unbroken electrical ground. The controls used in this furnace 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 furnace 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 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 \(page 16\)](#) 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 208/240V.

### 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 21 \(page 17\)](#) 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 21](#).
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	⌋	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)
⋈	⌋	(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.

**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 208/240V. 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 \(page 16\)](#) for allowable heating speeds. See [Table 4 \(page 15\)](#) and [Table 5 \(page 15\)](#) for blower performance data.

### Installing Control Circuit Wiring

**NOTE:** Installation of at least a four-wire thermostat circuit is required with five-wire circuit recommended for future addition of a heat/cool thermostat. Any unused thermostat leads must be properly capped. See [Figure 20 \(page 16\)](#) for various thermostat connections.

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

## START-UP & ADJUSTMENTS

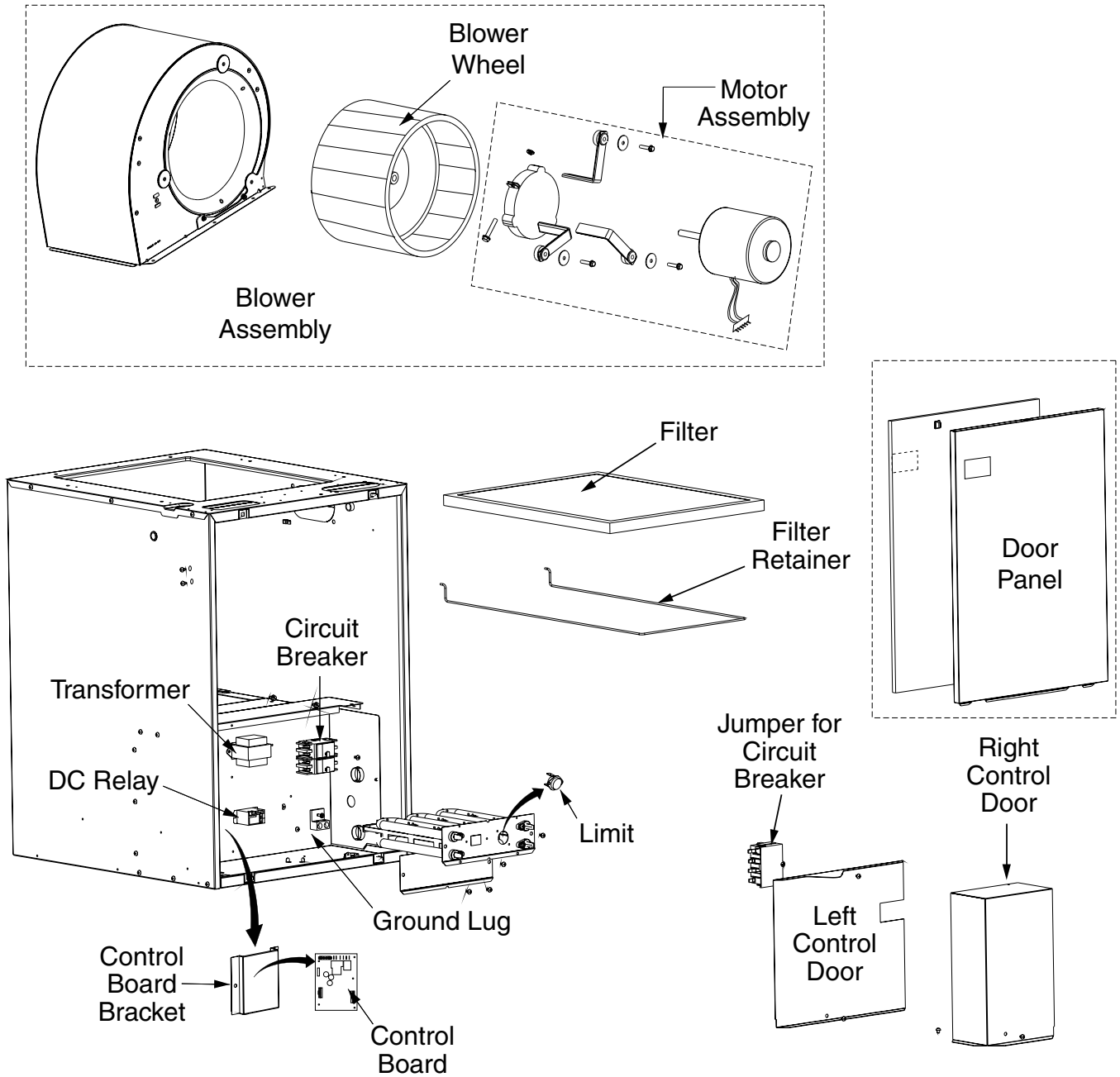
### Pre-Start Check List

- ✓ Verify the polarity of the connections are correct, the line voltage power leads are securely connected and the furnace 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 furnace door.
4. Check all duct connections and tape for air leakage.

**FIGURES & TABLES**



**Figure 16. E7 Furnace Components  
(Multi-Poise Shown)**

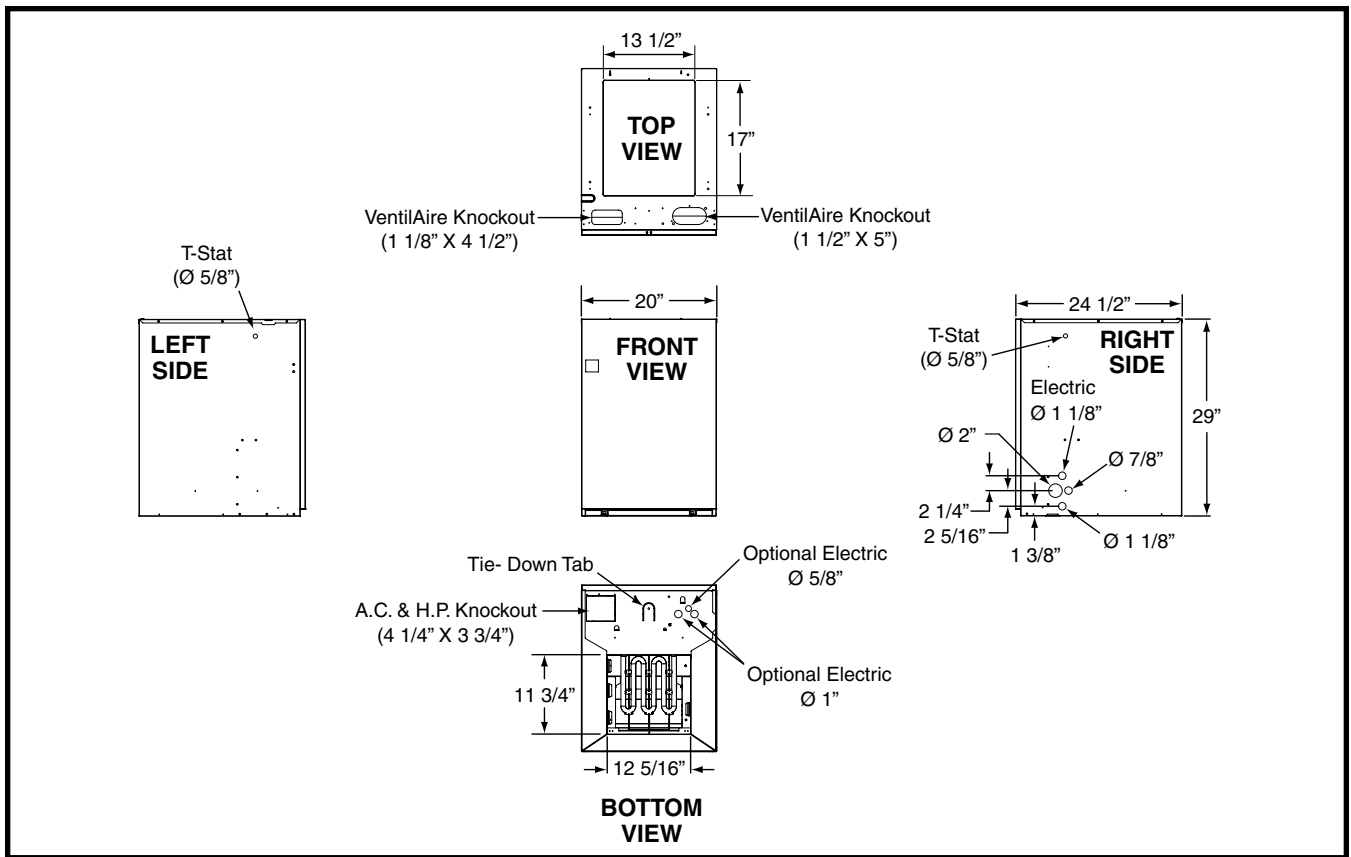


Figure 17. E7EM Physical Dimensions

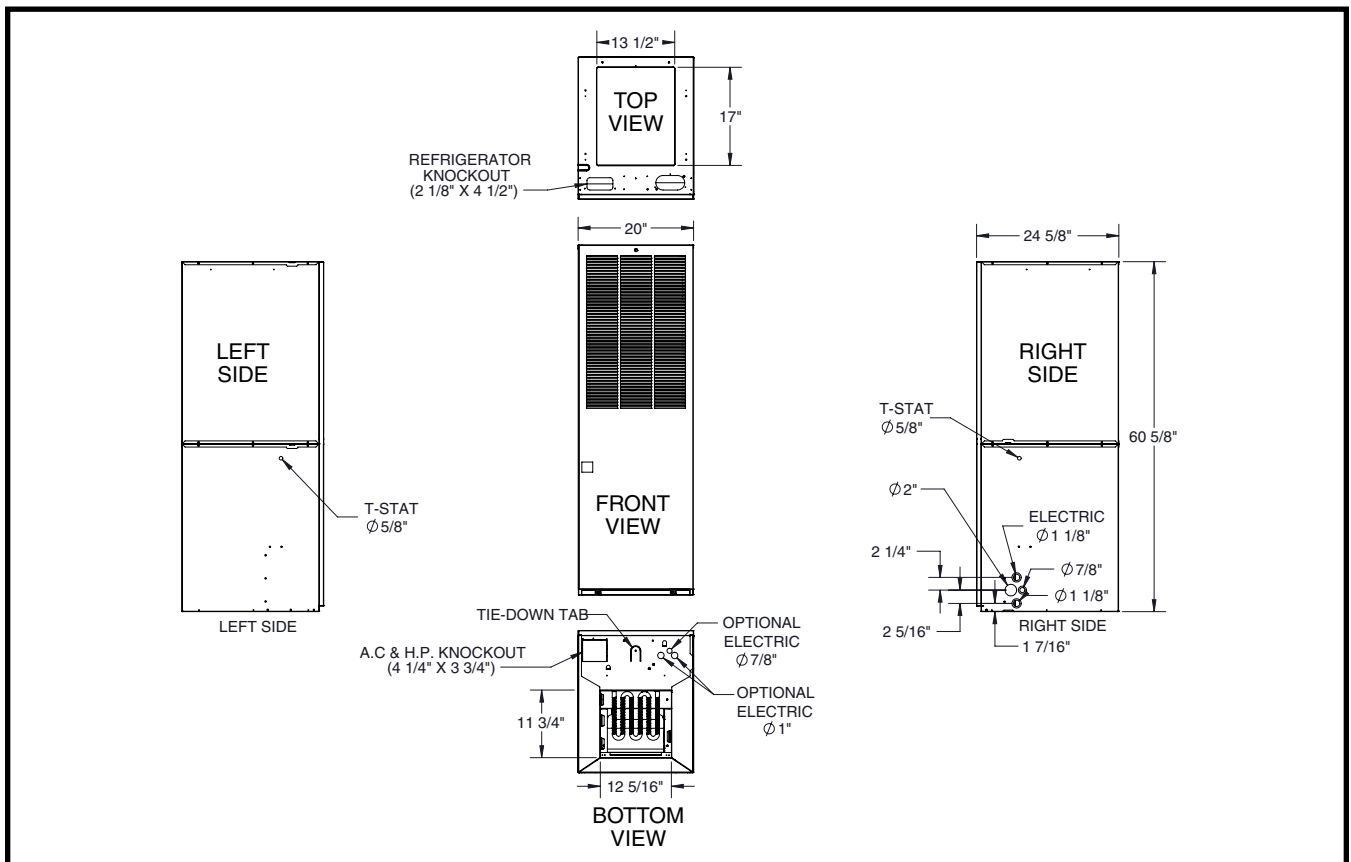
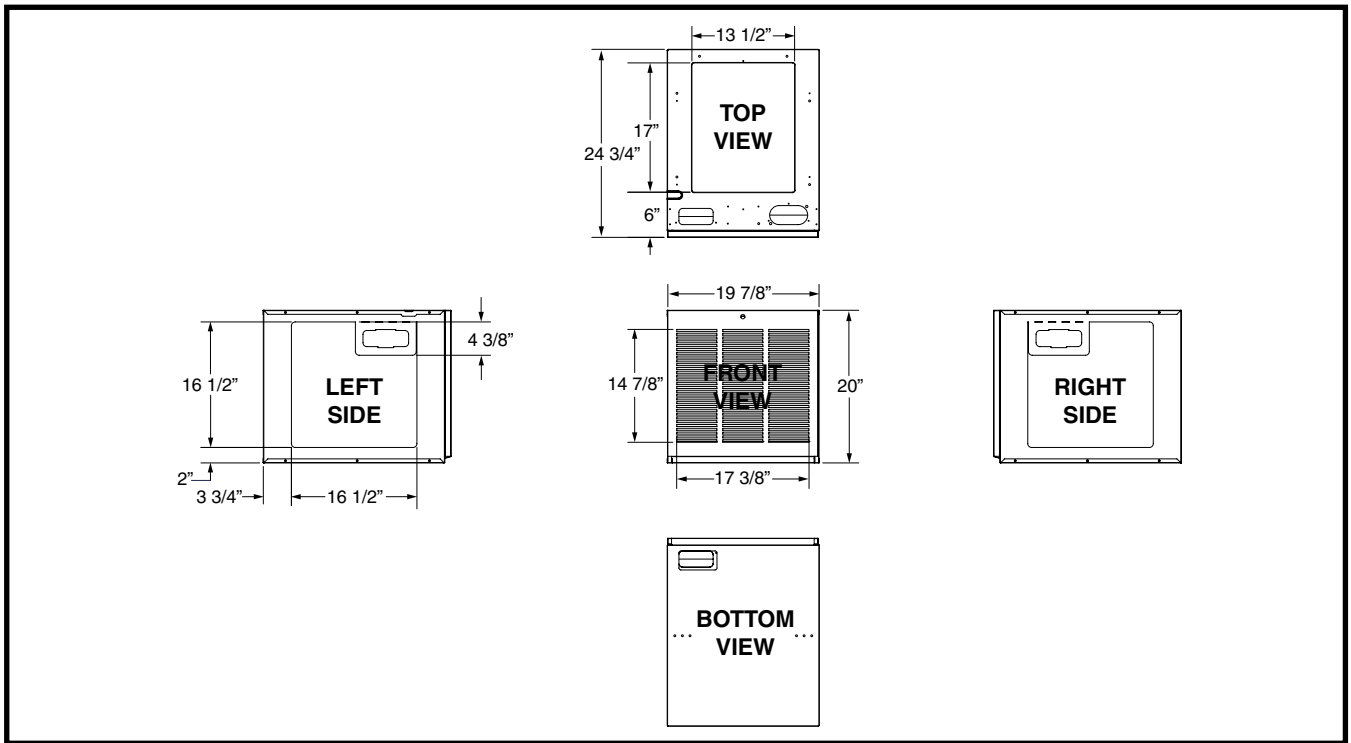


Figure 18. E7EU & E7ED Physical Dimensions



**Figure 19. E7 Furnace 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**H1	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	

**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. To comply with government mandated efficiency standards, two openings are required for airflows above 1600 CFM.
3. Data is shown with filter

**Table 4. E7 Airflow Data**

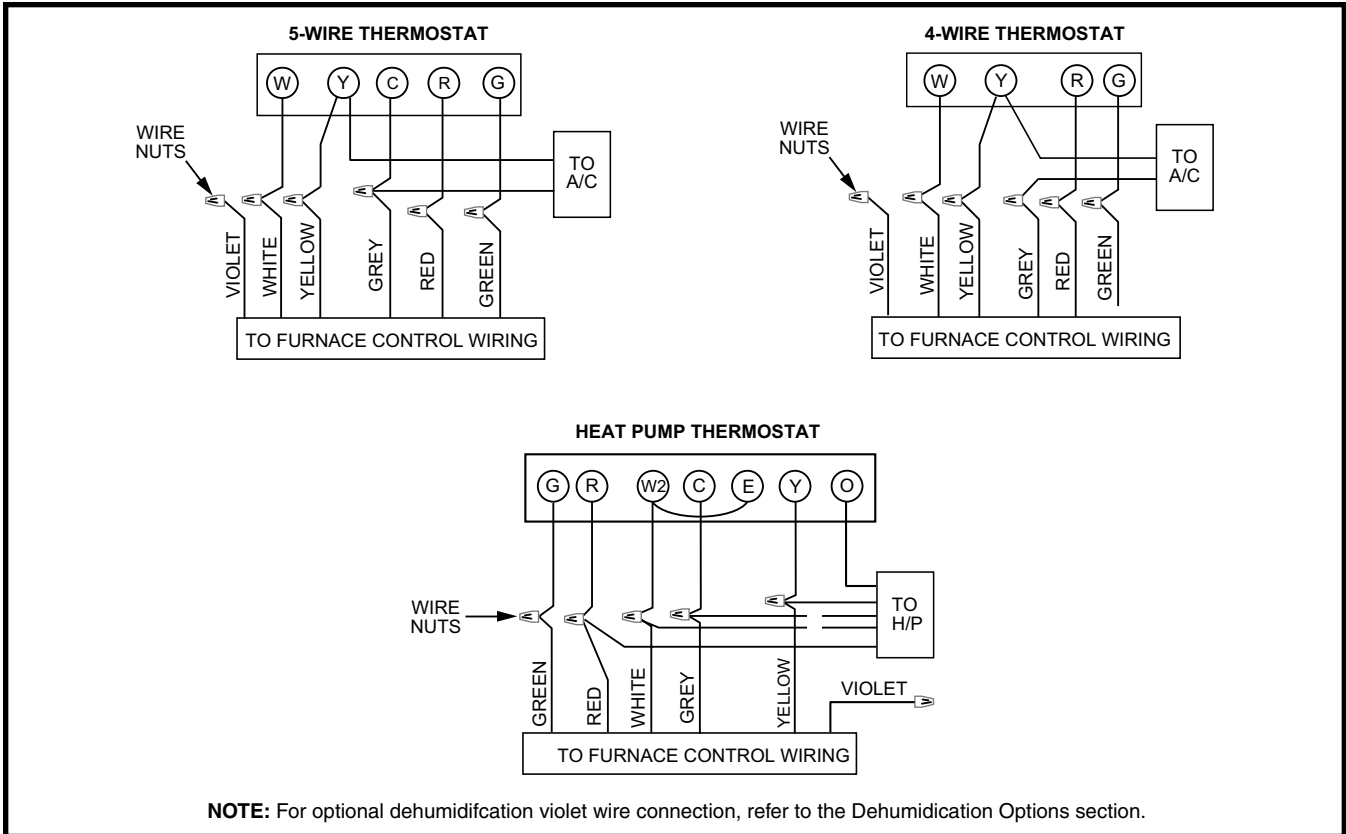
E7E*-0**H1	MAXIMUM HEATING AIRFLOW SETTING							
	E7EM				E7ED		E7EU	
	DOWNFLOW		UPFLOW		DOWNFLOW		UPFLOW	
	MH	RES	MH	RES	MH	RES	MH	RES
10	0001	0101	0001	0101	0101	0101	0101	0101
12		0011	0101					
15		0101						
17								
20								
23								

**NOTES:**

1. MH and Res represent Manufactured Housing and Residential (modular home) applications, respectively
2. To comply with government mandated efficiency standards, speed settings with higher CFM values than listed in this table are not allowed in HEAT mode

**Table 5. Maximum Allowable Heat Settings**

## Electrical Data & Diagrams



**Figure 20. E7EB Thermostat Connection**

FURNACE MODELS E7-	010H	012H	015H	017H	020H	023H
Rated Heating Output, Btuh (see note 1)	35,000	41,000	53,000	57,000	70,000	75,000
Watts (Total kw, Heating Elements & Blower)	10.4	12.0	15.4	16.6	20.4	22.0
Supply Voltage	240 Volts/60Hz/1-Phase					
Heating Elements, No. (Total kw)	2 (10.0)	2 (11.6)	3 (15.0)	3 (16.2)	4 (20.0)	4 (21.6)
Motor Speed, H.P. Rating, Amps	16 Speed, 1/2 HP, 3.6 A					
Test ESP, in. w.c. Max	0.3					
Optional Cooling Available with factory installed blower	2.0 - 4.0 Ton (See Note 3)					
Optional Heat Pump Available with factory installed blower	2.0 - 4.0 Ton					
Air Filter (Standard)	18" x 20" x 1" (nominal)					
Furnace Dimensions	Multi-Poise	Width-20" (508mm), Height-29" (737mm) (see note 2), Depth-24 1/2" (623mm)				
	Upflow/Downflow	Width-20" (508mm), Height-60 5/8" (1546mm) (see note 2), Depth-24 1/2" (623mm)				

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

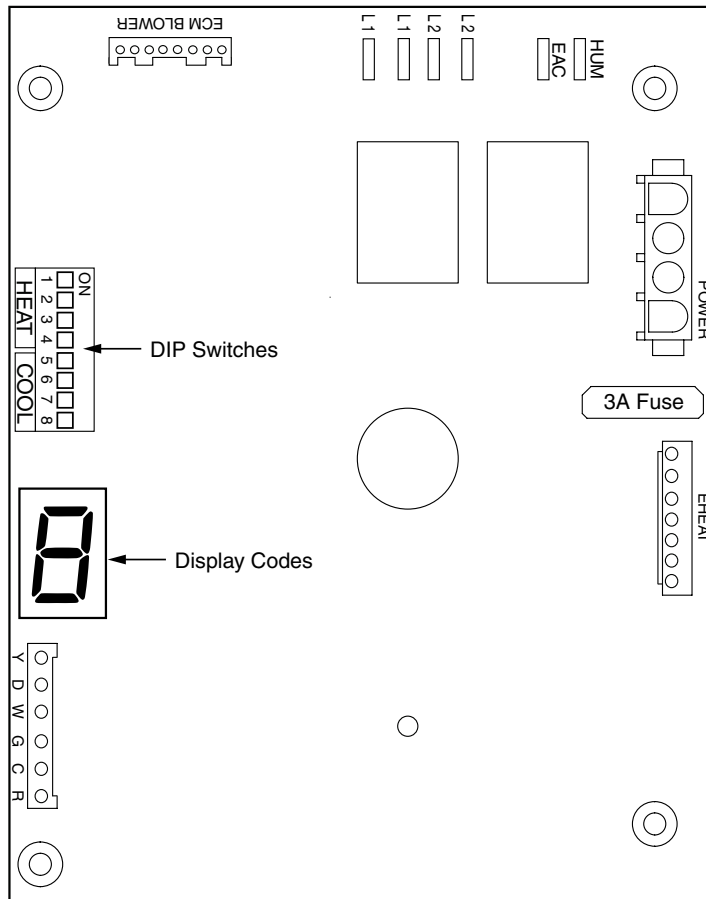
**Table 6. Unit Specifications**



MODEL NUMBER E7E*-	SUPPLY CIRCUIT	TOTAL AMPERES	MAXIMUM OVER-CURRENT RATING	MINIMUM CIRCUIT AMPACITY
010H1	Single	45.3	60	57
012H1	Single	51.6	70	65
	Dual "A"	27.8	35	35
	Dual "B"	24.2	35	30
015H1	Single	66.1	90	83
	Dual "A"	45.3	60	57
	Dual "B"	20.8	30	26
017H1	Single	71.1	90	89
	Dual "A"	45.0	60	56
	Dual "B"	26.1	35	33
020H1	Single	86.9	110	109
	Dual "A"	45.3	60	57
	Dual "B"	41.7	60	52
023H1	Single	93.6	125	117
	Dual "A"	45.3	60	57
	Dual "B"	48.0	60	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 21. E7 Motor Control Board**

# WIRING DIAGRAM

Model: 10kW Electric Furnace with FSHE ECM

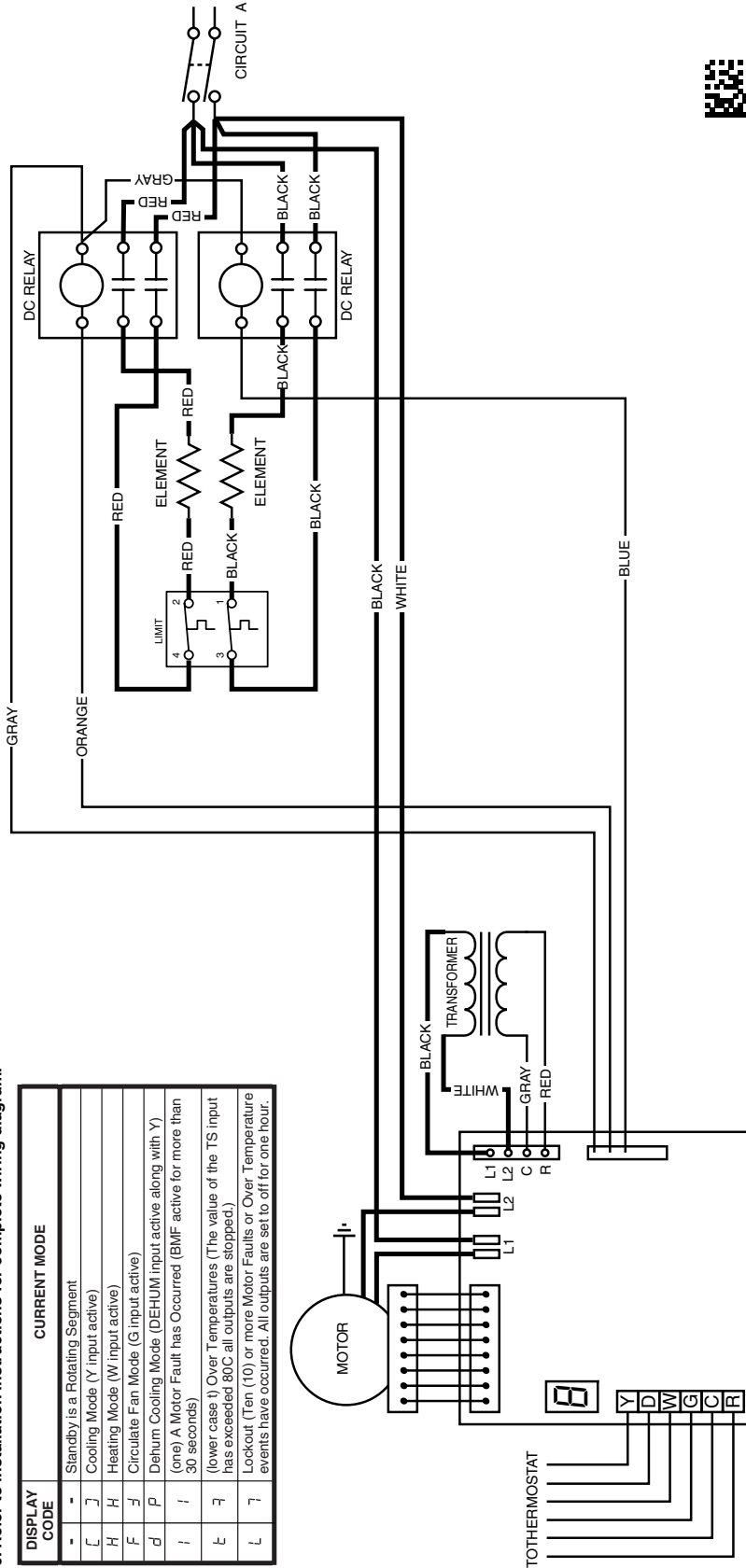
240VAC

1Ph/60Hz

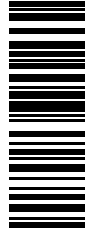
- NOTES:
1. Supply wire size must be in accordance to the applicable revision of the NEC and all other applicable codes.
  2. To change blower speed refer to installation instructions.
  3. Refer to furnace installation instructions for thermostat connections.
  4. If any wire in this unit is to be replaced 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)
d	Dehum Cooling Mode (DEHUM input active along with Y)
f	(one) A Motor Fault has Occurred (BMF active for more than 30 seconds)
L	(lower case l) 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.

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 la fournaise 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.



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



10257210  
03/19



Figure 22. E7EB-010H Models

# WIRING DIAGRAM

Model: 12kW Electric Furnace with FSHE ECM

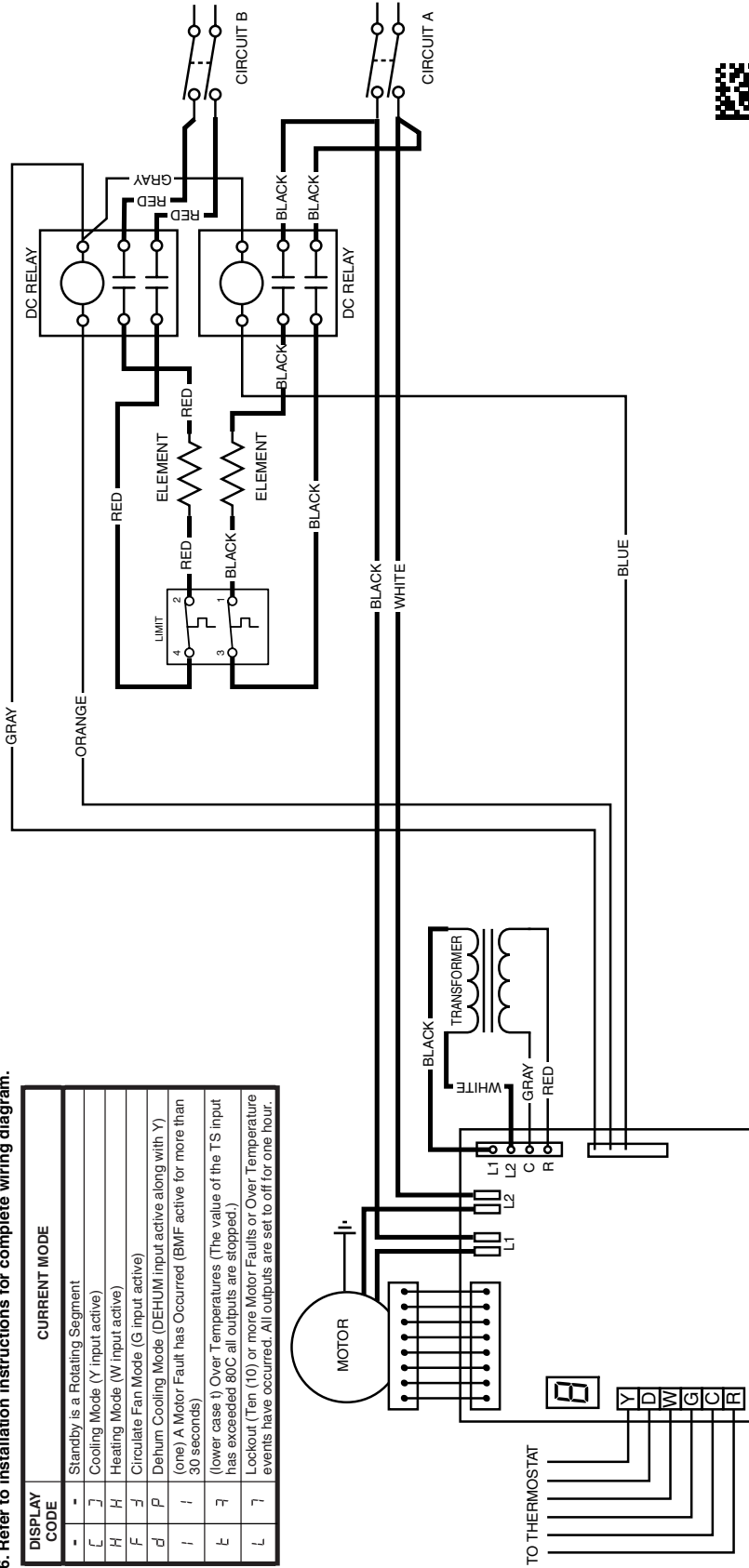
240VAC

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 furnace 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)
d	Dehumid Cooling Mode (DEHUM input active along with Y)
l	(one) A Motor Fault has Occurred (BMF active for more than 30 seconds)
E	(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.

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 la fournaise 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 conviend 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.



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



10257550  
03/19



Figure 23. E7EB-012H Models

# WIRING DIAGRAM

## Model: 15kW Electric Furnace with FSHE ECM

240VAC

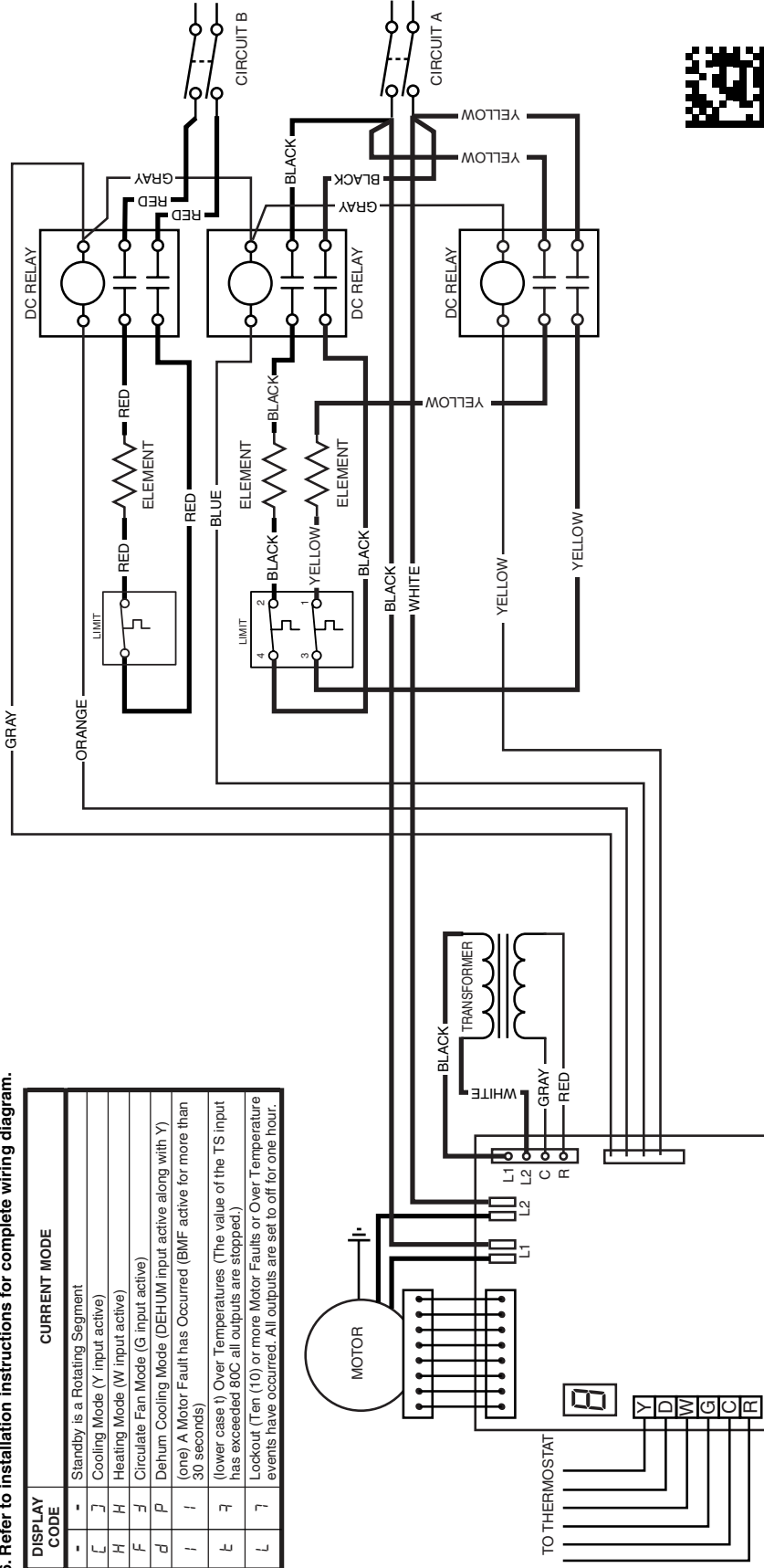
1Ph/60Hz

### 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 furnace 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
L	Cooling Mode (Y input active)
H	Heating Mode (W input active)
F	Circulate Fan Mode (G input active)
d	Dehumidification Mode (DEHUM input active along with Y)
i	(one) A Motor Fault has Occurred (BMF active for more than 30 seconds)
E	(lower case E) 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.

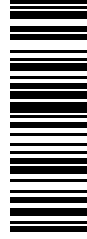
1. La taille du câblage d'alimentation doit être conforme à la révision applicable des codes NEC et des autres codes applicables.
2. Pour changer la vitesse du ventilateur, consultez les instructions d'installation.
3. Consultez les instructions d'installation de la fournaise pour les branchements du 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.



10270540  
(Replaces 10257220)

05/19



Figure 24. E7EB-015H Models

# WIRING DIAGRAM

**Model: 17kw Electric Furnace with FSHE ECM**

**240VAC**

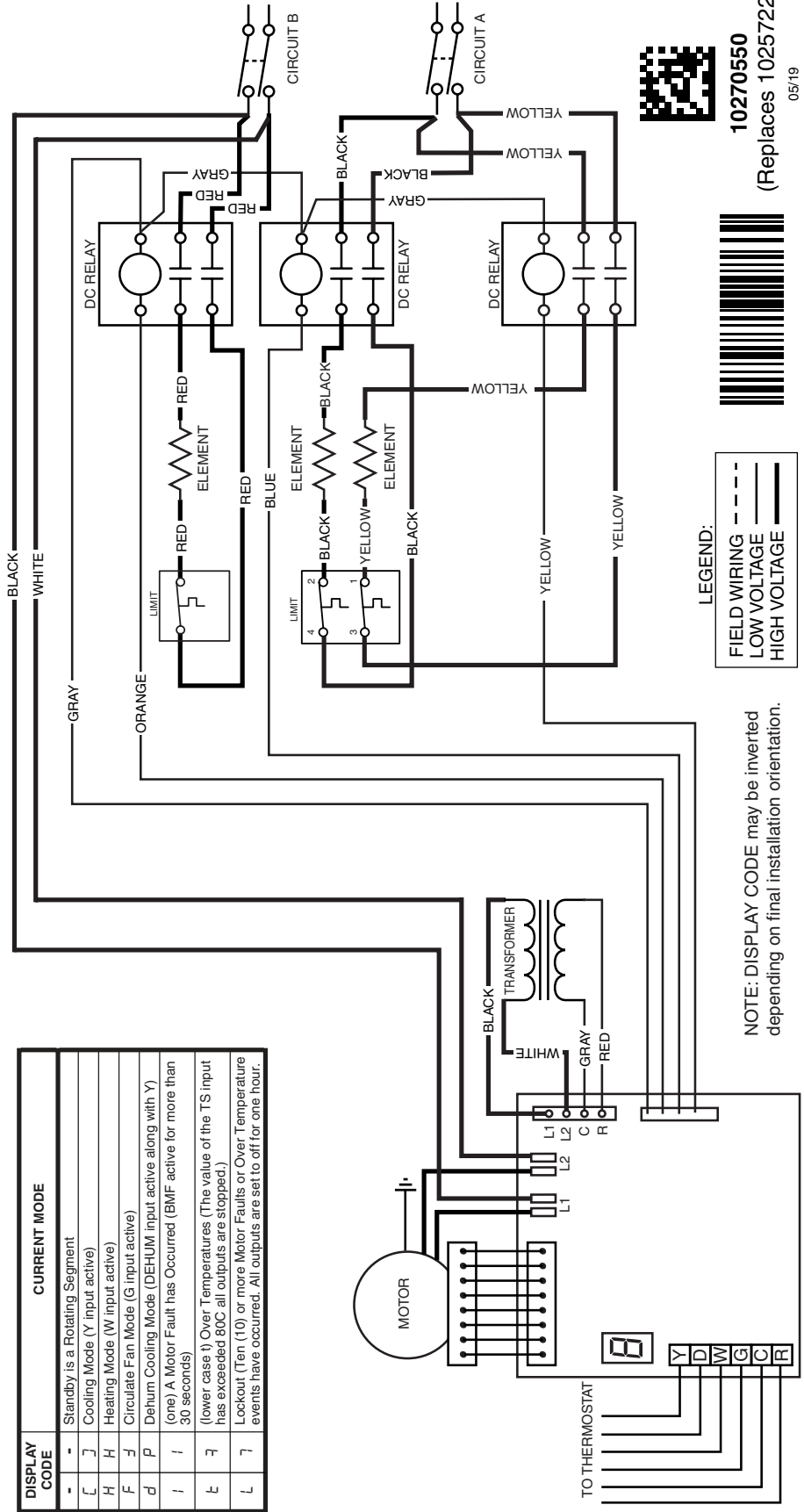
**1Ph/60Hz**

**NOTES:**

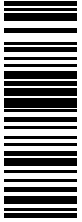
1. Supply wire size must be in accordance to the applicable revision of the NEC and all other applicable codes.
2. To change blower speed refer to installation instructions
3. Refer to furnace installation instructions for thermostat connections.
4. If any wire in this unit is to be replaced it must 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 la fournaise 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
C	Cooling Mode (Y input active)
H	Heating Mode (W input active)
F	Circulate Fan Mode (G input active)
d	Dehumid Cooling Mode (DEHUM input active along with Y)
i	(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.)
L	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.



**10270550**  
(Replaces 10257220)  
05/19



Figure 25. E7EB-017H Models

# WIRING DIAGRAM

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

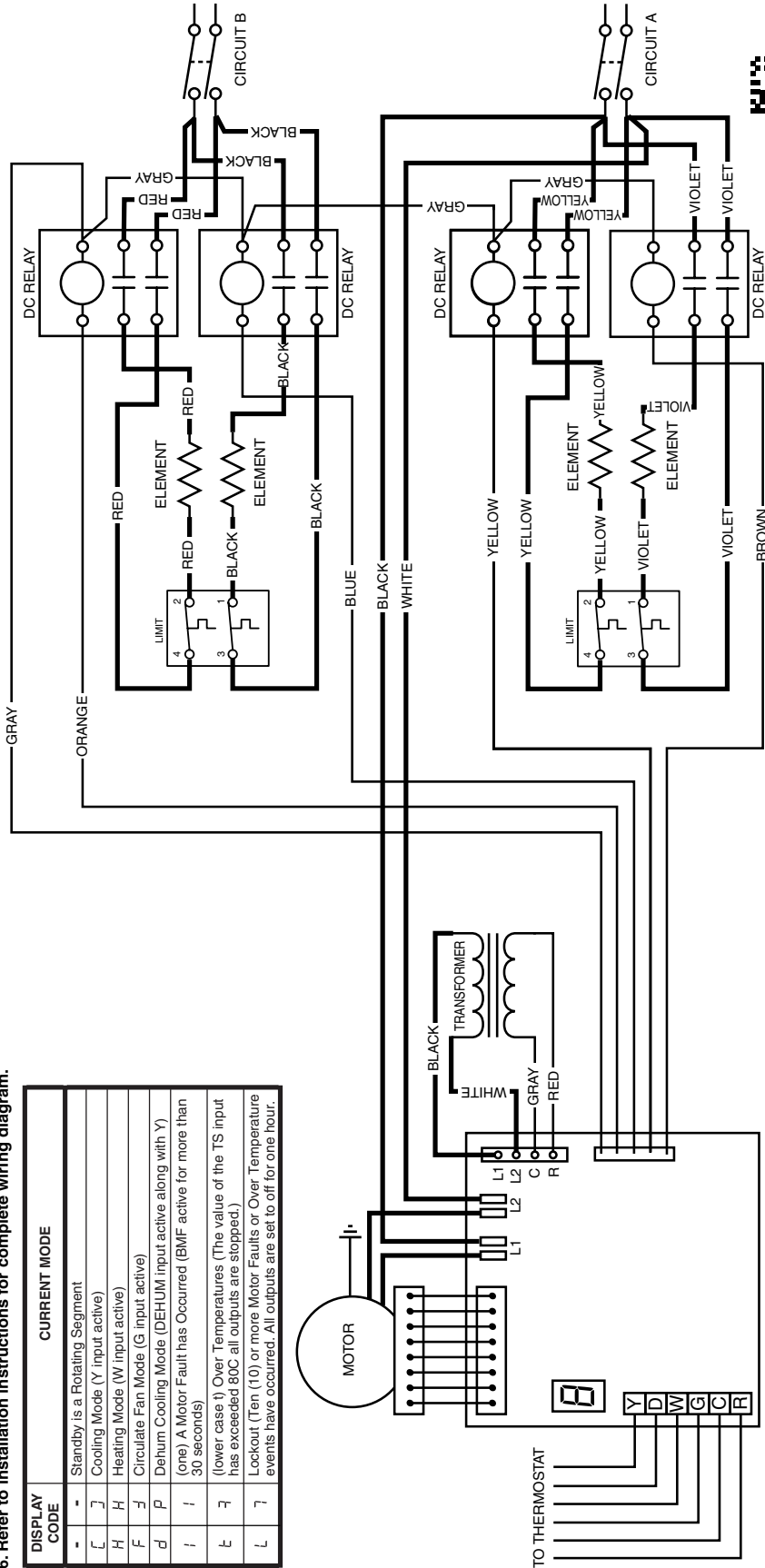
240VAC

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 furnace 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.

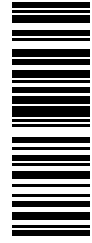
DISPLAY CODE	CURRENT MODE
-	Standby is a Rotating Segment
C	Cooling Mode (Y input active)
H	Heating Mode (W input active)
F	Circulate Fan Mode (G input active)
d	Dehum Cooling Mode (DEHUM input active along with Y)
l	(one) A Motor Fault has Occurred (BMF active for more than 30 seconds)
l	(lower case l) 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.

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 la fournaise 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.



10257230  
03/19



Figure 26. E7EB-020H & E7EB-023H Models

CONTROL SIGNAL & MODE	OPERATION	TOTAL KW	BOARD ACTION
<b>W HEAT</b>	<b>ON</b>	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		
<b>OFF</b>	-	Heat stages off immediately	
		Blower turns off after 15 second delay	
<b>W &amp; Y AUX HEAT</b>	<b>ON</b>	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**

**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 furnace?	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 furnace 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



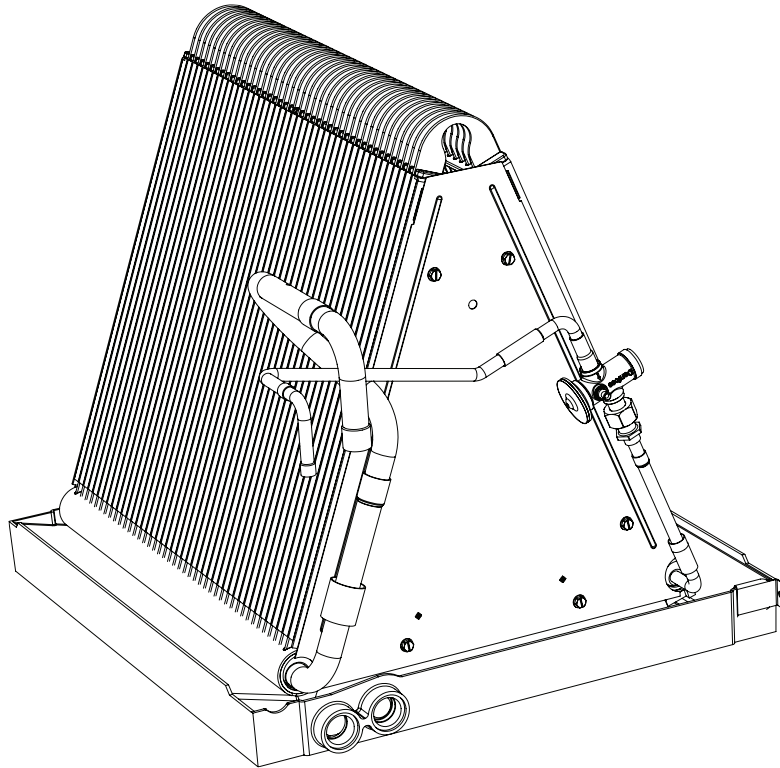
**Complies with H.U.D. Manufactured Home Construction & Safety Standards.**





# INSTALLATION INSTRUCTIONS

## C84DA Series Split System Uncased Indoor Coils - Downturn



### IMPORTANT

For installation only in or with a mobile home furnace, modular blower, or designated air mover that complies with HUD Manufactured Home Construction Safety Standard 24 CFR part 3280.

### IMPORTANT

#### 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 furnace 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.

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

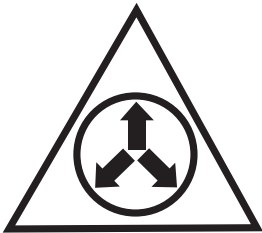
## IMPORTANT SAFETY INFORMATION

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.

---

### **WARNING:**

---



NITROGEN	
HEALTH	1
FLAMMABILITY	0
REACTIVITY	0
0 Minimal Hazard    1 Slight Hazard	

**C84DA coils are pressurized with Nitrogen at the factory. Avoid direct face exposure or contact with valve when gas is escaping. Always ensure adequate ventilation is present during the depressurization process. Any uncertainties should be addressed before proceeding.**

---

### **WARNING:**

---

**PROPOSITION 65 WARNING: This product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.**

---

### **WARNING:**

---

**Improper installation, service, adjustment, or maintenance may cause explosion, fire, electrical shock or other hazardous conditions which may result in personal injury or property damage. Unless otherwise noted in these instructions, only factory authorized kits or accessories may be used with this product.**

---

### **WARNING:**

---

**This unit must be installed in accordance with the 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. If you do not possess mechanical skills or tools, call your local dealer for assistance. Under no circumstances should the equipment owner attempt to install and/or service 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 for special installation requirements.
- Familiarize yourself with the controls that shut off the electrical power to the unit. If the unit needs to be shut down for an extended period of time, turn off electrical power at the circuit breaker. For your safety always turn off the electrical power before performing service or maintenance on the unit.
- Installation of equipment may require brazing operations. Installer must comply with safety codes and wear appropriate safety equipment (safety glasses, work gloves, fire extinguisher, etc.) when performing brazing operations.
- Read the Installation Instructions supplied with the furnace or air handler. Always observe all safety requirements outlined in this manual and on the furnace or air handler markings before installing the coil.
- 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.

## GENERAL INFORMATION

C84DA series coils are designed for upflow or downflow applications and are equipped with down turned refrigerant connections and are ready for brazing.

- Check the coils orifice size and confirm that it's suitable for application with the intended outdoor unit. Depending on application, additional installer supplied orifice or TXV may be required.
- Optional cooling/heating equipment must be properly sized and installed in accordance with the furnace manufacturer's specifications and approved recommendations.
- Heating only furnace air circulators may have to be replaced with multi-speed Heating/Cooling blowers to upgrade the air delivery (CFM) when an add-on coil is installed. Refer to Table 1 (page 6) for coil specifications, recommended CFM, and allowances for pressure drop across the coil and filters.
- Verify that the air delivery of the furnace/air handler is adequate to handle the static pressure drop of the coil, filter, and duct work.
- If precise forming of refrigerant lines is required, a copper tubing bender is recommended. Avoid sharp bends and contact of the refrigerant lines with metal surfaces.
- Refrigerant lines should be wrapped with pressure sensitive neoprene or other suitable material where they pass against sharply edged sheet metal.
- The coil enclosure (if provided) and suction line must be insulated as needed to prevent condensate from forming and causing property damage.
- Do not remove seals from the coil until the tubing connections are ready to be made.
- Close-off plates are available in some air filter kits. Refer to the Replacement Parts List for available part numbers. Install the necessary close-off plates around the refrigerant lines and drain line where required. Reinstall all inner and outer panels of the furnace/air handler that were previously removed when installing the indoor coil.

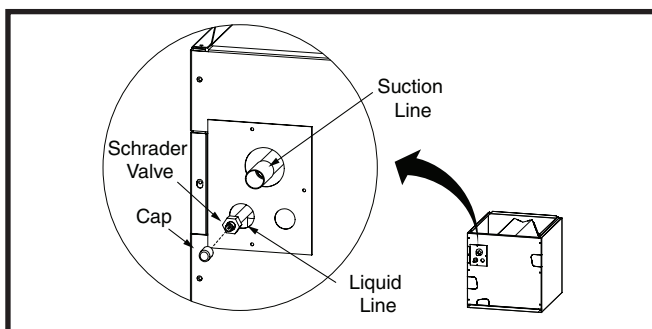


Figure 1. Suction & Liquid Line Locations

## COIL INSTALLATION

### ⚠ WARNING:

#### ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

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

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

- Before servicing, disconnect all electrical power to the furnace and outdoor condensing unit.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.
- Verify proper operation after servicing.

### ⚠ CAUTION:

The coil must be level to ensure proper condensate drainage. An unlevel installation may result in structural damage, premature equipment failure, or possible personal injury.

### ⚠ IMPORTANT:

For installation only in or with a mobile home furnace, modular blower, or designated air mover that complies with HUD Manufactured Home Construction Safety Standard 24 CFR part 3280.

#### Upflow Installations

1. Disconnect all electrical power to the furnace.
2. Install the coil case on the furnace air discharge opening and level it as needed to ensure proper condensate drainage. If needed, make a plate to adapt the coil to the air discharge opening. See Figure 2 (page 6) for coil dimensions.
3. Make and install the plenum over the coil. Insulate as required.
4. Seal the enclosure as required to minimize air leakage.
5. Connect the refrigerant lines as outlined in the Refrigerant Line Connection section.

#### Downflow Installations

These coils may be installed in downflow applications. It is required that the furnace and coil cabinets are securely mounted together before setting in place. Fossil fuel applications require the coil to be placed in the supply air stream only.

## Refrigerant Line Connections System Depressurization

1. Remove the cap (Figure 1) from the end of the liquid line.
2. Verify pressurization by depressing the Schrader valve on the end of the liquid line. Listen for any escaping gas. If there is no pressure, test the coil for leakage.
  - If leakage is found, clearly mark the location of the leak and return the coil to the distributor for processing.
  - If no leaks are found, the coil may be installed.
3. Depress the valve to relieve all pressure from the coil.

### Connecting the Linesets

1. Route and cut both lineset tubes to proper length in accordance with the outdoor unit specifications. Verify the ends are round, clean, and free of any burrs.
2. Cut off the fitting on the 3/8" line of the coil. Swage as needed to fit the line set.
3. Connect the suction and liquid lineset tubes.

---

### CAUTION:

---

**It is recommended that a wet rag be wrapped around the suction line in front of the close off plate before applying heat. Failure to keep components cool during brazing may result in structural damage, premature equipment failure, or possible personal injury.**

---

4. Braze the individual connections with dry nitrogen flowing through the joints. This will prevent internal oxidation and scaling from occurring.

**IMPORTANT: To prevent internal oxidation and scaling from occurring, braze all connections with dry nitrogen flowing through the joints.**

5. Wrap the refrigerant lines with pressure sensitive neoprene or other suitable material especially where the lines enter the opening in the sheet metal.
6. Evacuate the system of moisture and non-condensables to prevent low efficiency operation or damage to the unit. The suggested range of evacuation is 250 - 500 microns.
7. Charge the system with refrigerant. **Please Refer to the outdoor unit installation manual for additional charging instructions.**
8. Check the system for leaks, including the lineset and the brazed joints.

**NOTE:** Apply a soap and water solution on each joint or union with a small paintbrush. If bubbling is observed, the connection is not adequately sealed.

9. Properly dispose of all removed parts.

## Condensate Drain

---

### CAUTION:

---

**The coil must be level to ensure proper condensate drainage. Improper condensate disposal may result in structural damage, premature equipment failure, or possible personal injury.**

---

- Methods for disposing of condensate vary according to local codes. Refer to local codes or authority having jurisdiction for restrictions and proper condensate disposal requirements.
- All condensate pans have primary and secondary drain connections to meet FHA requirements. If the application is located in or above a living space where damage may result from condensate overflow, a separate 3/4 inch drain must be provided from the secondary drain connection and a secondary drain pan must be installed under the entire unit. Run secondary drain lines to a place where they are noticeable if used.
- The coil condensate pan is designed with 3/4" NPSC drain connections. Use a PVC or similar material fitting to attach the drain line to the pan. **NOTE:** The fitting should be hand tightened only. Overtightening may crack the drain pan and cause condensate to leak.
- The drain pan **MUST** be drained with field supplied tubing and looped to form a trap.

**IMPORTANT: Failure to install a trap may result in condensation overflowing the drain pan, resulting in substantial water damage to surrounding area.**

- Prime the trap with water. Insulate the drain if it is located in an unconditioned space, and test the condensate line for leaks. Consult local codes for additional restrictions or precautions.
- Route the lines to a suitable drain, avoiding sharp bends and pinching of the lines. The drain should maintain a minimum horizontal slope in the direction of discharge of not less than 1" vertical for every 10 ft of horizontal run.
- During system checkout, inspect the drain line and connections to verify proper condensate drainage.

## **Air Filter**

Air filters are not supplied as an integral part of this coil; however, an air filter kit is available. Refer to the Replacement Parts List for available part numbers.

The filter must be installed upstream of the coil and inspected frequently. When the filter becomes clogged with dust or lint, it should be replaced (disposable type) or cleaned (washable type). It is recommended that filters be inspected and replaced at least twice during the year. Generally it is best to replace or clean the filters at the start of each heating and cooling season.

---

## **MAINTENANCE & SERVICE**

---

### **WARNING:**

---

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

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

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

- **Before servicing, disconnect all electrical power to the furnace and outdoor condensing unit.**
  - **When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.**
  - **Verify proper operation after servicing.**
- 

### **CAUTION:**

---

**Do not operate the system without a suitable filter in the return air duct system. Always replace the filter with the same size and type.**

---

To ensure optimum performance and to minimize possible equipment failure, the following maintenance tasks should be performed periodically on this equipment:

1. The air filter installed with the system should be checked and cleaned or replaced twice per year.
2. Check the coil, drain pan, and condensate drain line for cleanliness at the start of each heating and cooling season. Clean as needed.

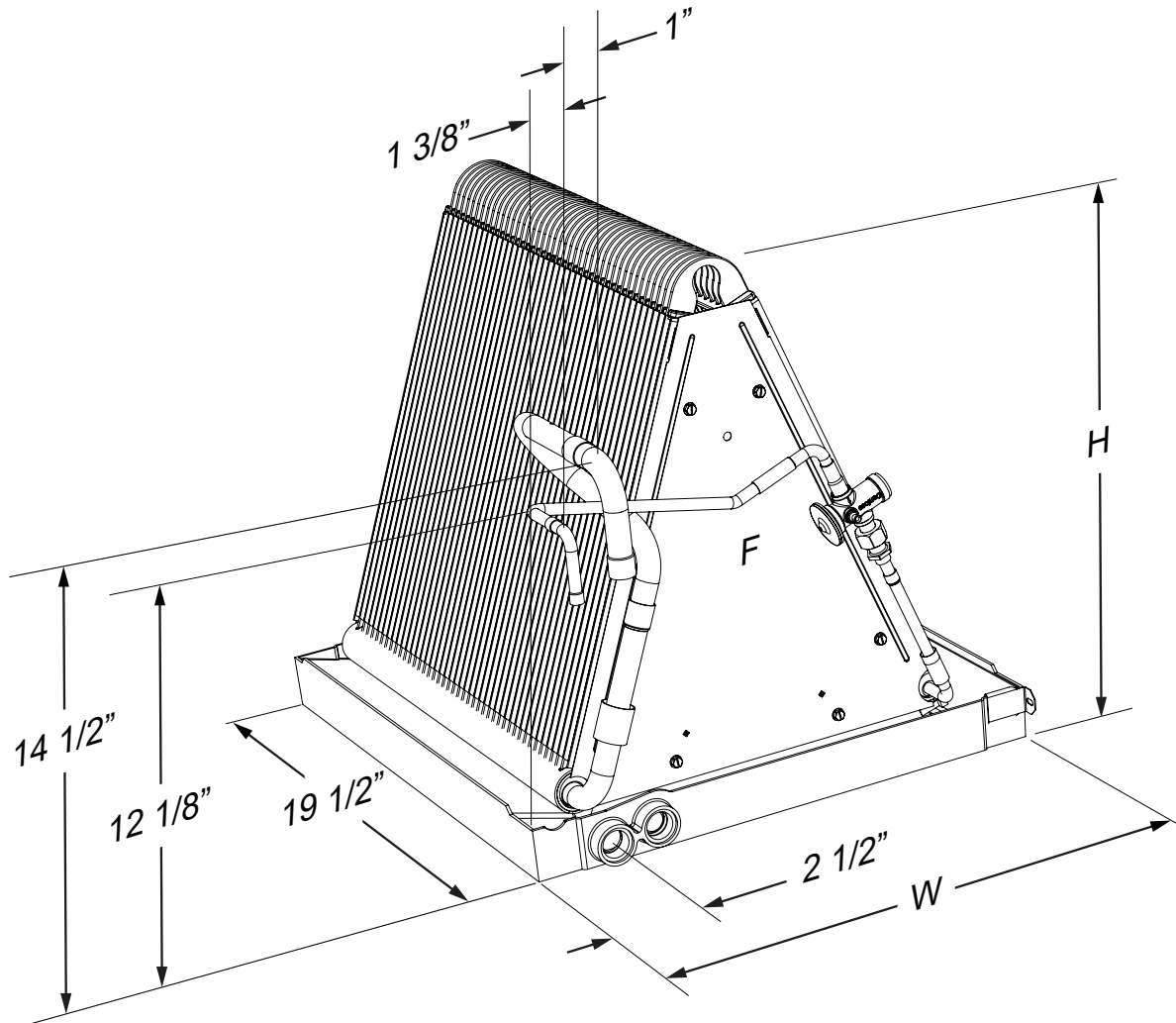
## COIL SPECIFICATIONS & DIMENSIONS

C84DA-	X24	X30	X36	X42	X43	X48	X49	X60
Nominal Capacity (BTU/hour)	24,000	30,000	36,000	42,000	42,000	48,000	48,000	60,000
Nominal Airflow (CFM)	800	1,000	1,200	1,400	1,400	1,600	1,600	2,000
W - Width (in.)	18 1/8	18 1/8	18 1/8	18 1/8	18 1/8	18 1/8	18 1/8	18 1/8
H - Height (in.)	18	18	18	18	25	25	29	29
D - Depth (in.)	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2
Connection - Liquid Line (in.)	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Connection - Suction Line (in.)	3/4	3/4	3/4	7/8	7/8	7/8	7/8	7/8

**NOTES:**

1. Individual restrictors are available by part number - PN 664\*\*\* (where \*\*\* represents the size).  
Example: 664103 is a restrictor 0.103 in diameter.
2. Refer to sales specification sheets for Listed/Certified combinations of equipment and required accessories.
3. Refer to the current AHRI directory for certified ratings of split systems.

**Table 1. Coil Specifications**



**Figure 2. C84DA Coil Dimensions**



**INSTALLER: PLEASE LEAVE THESE  
INSTRUCTIONS WITH THE EQUIPMENT OWNER.**





# INSTALLATION INSTRUCTIONS

**RSA3ME4M1 - RN24K, RN30K, SN36K, SN42K, SN48K & SN60K  
(2, 2.5, 3, 3.5, 4 & 5 TON) SERIES - SINGLE PHASE MODELS**

## IMPORTANT

### 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 unit 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.

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

- IMPORTANT SAFETY INFORMATION..... 2**
- AIR CONDITIONER INSTALLATION..... 2**
  - General Information ..... 2
  - Before You Install this Unit ..... 2
  - Packaging Removal ..... 3
  - Locating the Air Conditioner ..... 3
  - Clearance Requirements ..... 3
  - Ground Installations ..... 3
  - Roof Installation ..... 3
  - Accessory Mounting Kits ..... 3
  - Connecting Refrigerant Tubing Between the Indoor & Outdoor Unit..... 3
- ELECTRICAL WIRING ..... 4**
  - Pre-Electrical Checklist..... 4
  - Line Voltage ..... 4
  - Grounding ..... 5
- START UP & ADJUSTMENTS ..... 5**
  - Pre-Start Check List ..... 5
  - Start-Up Procedures..... 5
    - Air Circulation - Indoor Blower ..... 5
    - System Cooling ..... 5
    - System Heating (optional) ..... 5
- AIR CONDITIONER MAINTENANCE..... 6**
  - Panel Removal ..... 6
  - Panel Installation..... 6
- REFRIGERANT CHARGING ..... 7**
  - Charging the Unit in AC mode..... 7
    - If the outdoor temperature is 65 degrees F or higher:..... 7
    - If the outdoor temperature is below 65 degrees F:..... 7
- ELECTRICAL INFORMATION ..... 8**
  - Figure 4. Wiring Diagram for RSA3ME4M1RN (2 & 2.5 Ton Units)..... 8
  - Figure 5. Wiring Diagram for RSA3ME4M1SN (3, 3.5, & 4 Ton Units)..... 9
  - Figure 6. Wiring Diagram for RSA3ME4M1SN (5 Ton Units) ..... 10
- INSTALLATION CHECKLIST..... 12**
- REPLACEMENT PARTS ..... 12**

## IMPORTANT

For installation only in HUD manufactured home per Construction Safety 24 CFR part 3280.

## 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.

---

### **WARNING:**

---

**Shut off all electrical power to the unit before performing any maintenance or service on the system. Failure to comply may result in personal injury or death.**

---

---

### **WARNING:**

---

**Unless noted otherwise in these instructions, only factory authorized parts or accessory kits may be used with this product. Improper installation, service, adjustment, or maintenance may cause explosion, fire, electrical shock or other hazardous conditions which may result in personal injury or property damage**

---

---

### **WARNING:**

---

**RSA3ME4M1 split system air conditioners are shipped charged with R410A refrigerant and ready for installation. If repairs make it necessary for evacuation and charging, it should only be attempted by qualified trained personnel thoroughly familiar with this equipment. Under no circumstances should the owner attempt to install and/or service this equipment. Failure to comply with this warning could result in property damage, personal injury, or death.**

---

---

### **WARNING:**

---

**The information listed in this manual must be followed 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.**

---

---

## **CAUTION:**

---

**This unit uses refrigerant R-410A. DO NOT use any other refrigerant in this unit. Use of another refrigerant will damage the unit.**

---

- 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 (ANSI) 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 Part 1 CSA C.22.1.
- This equipment contains liquid and gaseous refrigerant under high pressure. **DO NOT USE ANY PORTION OF THE CHARGE FOR PURGING OR LEAK TESTING.** Installation or servicing should only be performed by qualified trained personnel thoroughly familiar with this type equipment.
- Fully annealed, refrigerant grade copper tubing should be used when installing the system. Refrigerant suction line tubing should be fully insulated.
- Installation of equipment may require brazing operations. Installer must comply with safety codes and wear appropriate safety equipment (safety glasses, work gloves, fire extinguisher, etc.) when performing brazing operations.
- 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.
- When refrigerant tubing and electrical wiring penetrates a structure's envelope, the openings should be made to be suitably water-tight after their installation.
- This unit is designed for outdoor installations only and should be positioned as shown on [page 3](#).

## AIR CONDITIONER INSTALLATION

### General Information

The RSA3ME4M1 series air conditioner is designed only for outdoor rooftop or ground level installations. This unit has been tested for capacity and efficiency in accordance with AHRI Standards and will provide many years of safe and dependable comfort, providing it is properly installed and maintained. Abuse, improper use, and/or improper maintenance can shorten the life of the appliance and create unsafe hazards.

To achieve optimum performance and minimize equipment failure, it is recommended that periodic maintenance be performed on this unit. The ability to properly perform maintenance on this equipment requires certain mechanical skills and tools.

### Before You Install this Unit

- ✓ The cooling load of the area to be conditioned must be calculated and a system of the proper capacity selected. It is recommended that the area to be conditioned be completely insulated and vapor sealed.
- ✓ 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

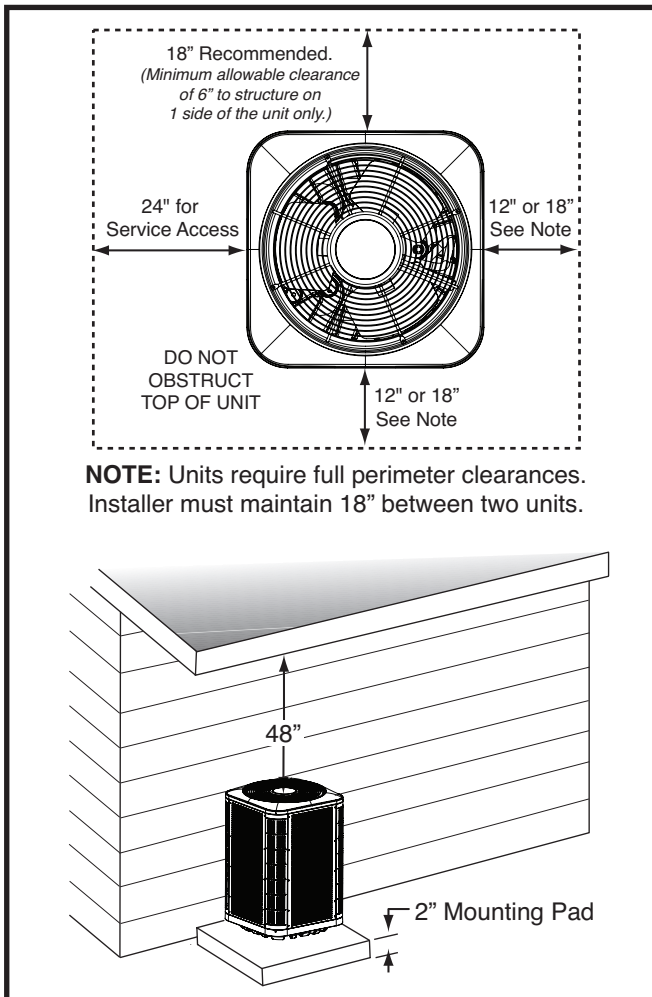
- local building codes. If there is any question concerning the power supply, contact the local power company.
- ✓ The indoor section (air handler, furnace, etc) should be installed before routing the refrigerant tubing. Refer to the indoor unit's installation instructions for installation details.
  - ✓ All units are securely packed at the time of shipment and upon arrival should be carefully inspected for damage prior to installing the equipment at the job site. Verify coil fins are straight. If necessary, comb fins to remove flattened or bent fins. Claims for damage (apparent or concealed) should be filed immediately with the carrier.
  - ✓ Please consult your dealer for maintenance information and availability of maintenance contracts. Please read all instructions before installing the unit.

### Packaging Removal

**NOTE:** To prevent damage to the tubing connections, carefully remove the carton and user's manual from the equipment. Discard the shipping carton.

### Locating the Air Conditioner

- Survey the job site to determine the best location for mounting the outdoor unit.
- Sufficient clearance for unobstructed airflow through the outdoor coil must be maintained in order to achieve rated performance. See [Figure 1](#) for minimum clearances to obstructions.



**Figure 1. Clearance Requirements**

- Overhead obstructions ([Figure 1](#)), poorly ventilated areas, and areas subject to accumulation of debris should be avoided.
- The unit should not be placed under roofing or other overhangs which are not guttered; that would allow water or ice to fall into the unit's discharge opening.
- Consideration should be given to availability of electric power, service access, noise, and shade.

### Clearance Requirements

- The general recommendation is for the units to be installed with 18 inches of clearance on 3 sides and with 24 inches of clearance for the service access side to the unit's service panel.
- For installations that are space constrained, one side of the unit, adjacent to the service panel, may have its air side clearance reduced to a minimum of 6 inches. The other side adjacent to the service panel requires 24 inches for service access. The remaining two sides, at a minimum shall require 12 inches of clearance.
- A minimum of 18 inches between two units must be maintained for proper performance.

### Ground Installations

The unit should be installed on a solid base, that is level and located at least 2 inches above grade\*.

**Note:** *It is recommended that poured concrete mounting bases are not be attached or adjacent to the building structure or foundation.*

### Roof Installation

The unit may only be installed on a structure that is capable of supporting the total weight of the unit and its anchorage. The support for the base of the unit may not slope more than 1/8 inch per foot. The minimum clearance for the base of the unit to the roof-line is 2 inches\* for residential applications.

**Note on ground and roof clearances:** *Heat pump and other applications should account for the accumulation of snow and raise the base of the unit accordingly. (At a minimum, a 6 inch clearance is required.)*

### Accessory Mounting Kits

Kits for other mounting methods and accessories can be found in the technical sales literature for the unit. Or the literature library on NortekHVAC.com.

### Connecting Refrigerant Tubing Between the Indoor & Outdoor Unit

## CAUTION:

**When connecting refrigerant line-sets together, it is highly recommended that dry nitrogen be flowing through the joints during brazing to prevent internal oxidation and scaling. Copper oxides, internal to the system can damage the compressors bearings and seals, block small orifices and microchannels or otherwise damage components.**

---

## CAUTION:

---

When performing brazing operations always protect the system components and seals from the possibility of heat damage. Remove all caps, plugs and Schrader valve cores on piping system components just prior to assembly and brazing. Use good brazing practices to protect components from the heat and flame of the brazing torch.

---

After outdoor and indoor unit placement has been determined, route refrigerant tubing between the equipment in accordance with sound installation practices.

- Refrigerant tubing should be routed in a manner that minimizes the length of tubing and the number of bends in the tubing. If precise forming of refrigerant lines is required, a copper tubing bender is recommended. Avoid sharp bends and contact of the refrigerant lines with metal surfaces.
  - Refrigerant tubing should be supported in a manner that the tubing will not vibrate or abrade during system operation.
  - Tubing should be kept clean of foreign debris during installation.
  - Every effort should be made by the installer to ensure that the field installed refrigerant containing components of the system have been installed in accordance with these instructions and sound installation practices to insure reliable system operation and longevity.
  - The maximum recommended interconnecting refrigerant line lengths is 75 ft. and the vertical elevation difference between the indoor and outdoor sections should not exceed 20 ft.
  - A filter dryer is provided with the unit and must be installed in the liquid line of the system. If the installation replaces a system with a filter dryer already present in the liquid line, the filter dryer must be replaced with the one supplied with the unit. The filter dryer must be installed in strict accordance with the manufacturer's installation instructions.
  - Optional equipment such as liquid line solenoid valves, low ambient, etc., should be installed in strict accordance with the manufacturer's installation instructions.
  - After the completion of all brazing operations and when the components have been properly cooled, replace all the seals, Schrader cores and caps which had been previously removed. It is recommended that all seals be either lubricated with a light coat of refrigerant oil. Always verify that oil applied matches the oil type listed on the compressor nameplate. A thread sealant which is compatible with the system refrigerant and oil can be sparingly applied if desired.
- 

## CAUTION:

---

If repairs are necessary to the refrigerant line-set or indoor setup after the initial installation, then when servicing, cover or seal openings to minimize the exposure of the refrigerant system to air to prevent accumulation of moisture and other contaminants.

---

## ELECTRICAL WIRING

### WARNING:

#### ELECTRICAL SHOCK OR FIRE HAZARD

To avoid risk of electrical shock, personal injury, or death, disconnect all electrical power to the unit before performing any maintenance or service. The unit may have more than one electrical supply.

Label all wires prior to disconnection when servicing the unit. Wiring errors can cause improper and dangerous operation.

- All electrical connections must be in compliance with all applicable local codes and ordinances, and with 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).

#### Pre-Electrical Checklist

- ✓ Verify that the voltage, frequency, and phase of the supply source match the specifications on the unit rating plate.
- ✓ Verify that the service provided by the utility is sufficient to handle the additional load imposed by this equipment. Refer to the unit wiring label for proper voltage wiring.
- ✓ If replacing an existing unit, verify that the: current wiring, unit disconnect and circuit breaker is properly sized and rated for the new units requirements. Verify that information with the MCA and MOP values on the unit nameplate.
- ✓ Verify factory wiring is in accordance with the unit wiring diagram. See [Figure 4, \(page 8\)](#), [Figure 5, \(page 9\)](#) & [Figure 6, \(page 10\)](#). Inspect for loose connections.

#### Line Voltage

- A wiring diagram is located on the inside cover of the electrical box of the outdoor unit. The installer should become familiar with the wiring diagram before making any electrical connections to the outdoor unit.
- **An electrical disconnect must be located within sight of and readily accessible to the unit.** This switch shall be capable of electrically de-energizing the outdoor unit.
- Line voltage to the unit should be supplied from a dedicated branch circuit containing the correct fuse or circuit breaker for the unit. Incoming field wiring and minimum size of electrical conductors and circuit protection must be in compliance with information listed on the outdoor unit data label. Any other wiring methods must be acceptable to authority having jurisdiction.
- The outdoor unit requires both power and control circuit electrical connections. Refer to the wiring diagram/schematic for identification and location of outdoor unit field wiring interfaces. See [Figure 4, \(page 8\)](#), [Figure 5, \(page 9\)](#) & [Figure 6, \(page 10\)](#). Make all electrical connections in accordance with all applicable codes and ordinances.
- Overcurrent protection must be provided at the branch circuit distribution panel and sized as shown on the unit rating label and according to applicable local codes. See the unit rating plate for minimum circuit ampacity (MCA) and maximum overcurrent protection (MOP) limits.
- Provide power supply for the unit in accordance with the unit wiring diagram, and the unit rating plate. Connect the line-voltage leads to the terminals on the contactor inside the control compartment.

- Use only copper wire for the line voltage power supply to this unit in strict accordance of the NEC (ANSI/NFPA 70), applicable local codes, and the instructions provided with the equipment. Use proper code agency listed conduit and a conduit connector for connecting the supply wires to the unit. Use of rain tight conduit is recommended.
- 208/230 Volt units are shipped from the factory wired for 230 volt operation. For 208V operation, remove the lead from the transformer terminal marked 240V and connect it to the terminal marked 208V.
- Optional equipment requiring connection to the power or control circuits must be wired in strict accordance of the NEC (ANSI/NFPA 70), applicable local codes, and the instructions provided with the equipment.

## Grounding

### **WARNING:**

**The unit cabinet must have an uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. Do not use gas piping as an electrical ground!**

This unit must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code (ANSI/NFPA 70) or the CSA C22.1 Electrical Code. Use the grounding lug provided in the control box for grounding the unit.

#### Thermostat Connections

- Thermostat connections should be made in accordance with the instructions supplied with the thermostat and the indoor equipment.
- The outdoor unit is designed to operate from a 24 VAC Class II control circuit. The control circuit wiring must comply with the current provisions of the NEC (ANSI/NFPA 70) and with applicable local codes having jurisdiction.

#### Low Voltage Connections

- The outdoor unit is designed to operate from a 24 VAC Class II control circuit which is provided by the indoor unit. The control circuit wiring must comply with the current provisions of the NEC (ANSI/NFPA 70) and with applicable local codes having jurisdiction.
- The low voltage wires must be properly connected to the outdoor unit's low voltage terminal block and as indicated on the units wiring diagram.

## START UP & ADJUSTMENTS

### Pre-Start Check List

- √ Verify that the outdoor unit is installed according to all instructions in this document.
- √ Verify that the indoor unit is appropriate for use with the refrigerant listed on the outdoor unit. And that it has the proper design pressure for the outdoor unit equipment type.
- √ Verify the indoor unit and thermostat have been installed in accordance with that equipment's instructions.
- √ Verify line voltage power leads are securely connected and that both indoor and outdoor units are properly grounded.
- √ Verify that the power supplied by branch circuits for both the indoor and outdoor equipment is:
  - the proper voltage for the equipment, and
  - that the overcurrent protection device is properly sized, and
  - that the supply wiring is the correct gauge.

- √ Verify that the low voltage and thermostat wiring are securely connected to the proper terminals for all equipment.
- √ Verify that the low voltage transformer has been properly connected with that unit's instructions.
- √ Verify that the refrigerant line-set has been properly routed between the units, connected appropriately, is properly secured and protected from damage, and that it has the correct piping insulation installed.
- √ Verify that the refrigerant system and lines are leak free by inspection with a leak detector or the soap-bubble method.
- √ Verify that any attached indoor ducting has been properly installed and sealed.
- √ Verify that the indoor condensate drain line and trap are properly installed and functioning.
- √ Verify that all removable panels have been re-installed, and all cabinet enclosures and fan guards are secure.
- √ Verify that the air filters are clean and properly installed.
- √ Verify that the thermostat is set to the stand-by, or off setting. And the fan switch is set to automatic or off.

### Start-Up Procedures

The thermostat's function mode should be set to OFF and the fan mode should be set to AUTO. Close all electrical disconnects to energize the system.

#### Air Circulation - Indoor Blower

1. Set the thermostat system mode on OFF and the fan mode to ON.
2. Verify the blower runs continuously. Check the air delivery at the supply registers and adjust register openings for balanced air distribution. If insufficient air is detected, examine ductwork for leaks or obstructions.
3. Set the thermostat fan mode to AUTO and verify the blower stops running.

#### System Cooling

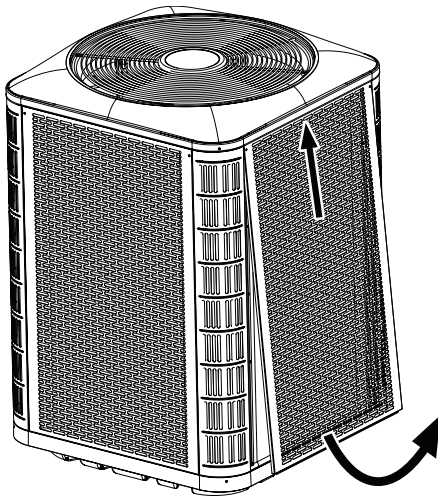
1. Set the thermostat's system mode to COOL and the fan mode to AUTO. Gradually lower the thermostat temperature setpoint below room temperature and verify the outdoor unit and indoor blower energize.
  2. Verify blower wheel is spinning in direction indicated by arrow. Feel the air being circulated by the indoor blower and verify that it is cooler than ambient temperature. Listen for any unusual noises. If unusual sounds occur, determine the source of the noise and correct as necessary.
  3. Verify HI and LO refrigerant pressures.
  4. Allow the system to operate for several minutes and then set the temperature selector above room temperature. Verify the fan and compressor cycle off with the thermostat.
- NOTE:** The blower should also stop unless fan mode is set to the ON position.

#### System Heating (optional)

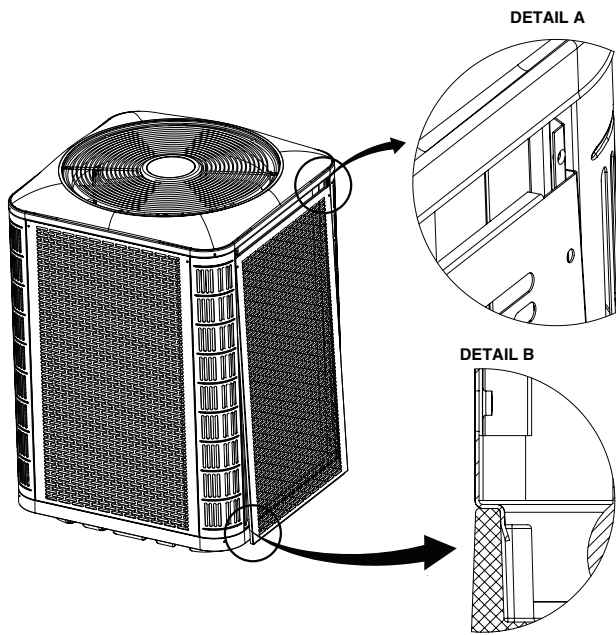
1. Set the thermostat's system mode to HEAT and the temperature mode above room temperature.
2. Verify the optional heating equipment (furnace or electric heat) and indoor blower energize. Feel the air being circulated by the indoor blower and verify that it is warmer than ambient temperature. Listen for any unusual noises. If unusual sounds occur, determine the source of the noise and correct as necessary.

### **WARNING:**

**To prevent electrical shock, personal injury, or death, disconnect all electrical power to the unit before performing any maintenance or service. The unit may have more than one electrical supply.**



**Figure 2. Panel Removal**



**Figure 3. Panel Installation**

Proper maintenance is important to achieve optimum performance from the air conditioner. The ability to properly perform maintenance on this equipment requires certain mechanical skills and tools. If you do not possess these skills, contact your dealer for maintenance. Consult your local dealer about the availability of maintenance contracts. Routine maintenance should include the following:

- Inspect and clean or replace air filters at the beginning of each heating and cooling season, or more frequently if required.
- Inspect the condensate drains in the unit's basepan and the outdoor coil at the beginning of each cooling season. Remove any debris. Clean the outdoor coil and louvers as necessary using a mild detergent and water. Rinse thoroughly with water.
- To access the outdoor coil on units equipped with louvered panels, refer to [Figure 2, \(page 6\)](#) for panel removal and [Figure 3, \(page 6\)](#) for panel installation.
- Inspect the electrical connections for tightness at the beginning of each heating and cooling season. Service as necessary.
- Do not attempt to add additional oil or grease to motors unequipped with oil tubes or grease fittings. Most outdoor unit motors are manufactured with sealed, permanently lubricated bearings that are designed for the life of the equipment without maintenance.
- The compressor is hermetically sealed and shipped from the factory with the proper oil charge for most installations. Lubricating oil should only be added by trained personnel and is typically only required for long line-sets or tall riser applications.

#### **Panel Removal (Select Units)**

1. Remove screws securing the panel.
2. Slide the panel up towards the top pan in order to clear the bottom flange from the base pan. See [Figure 2](#).
3. Swing the bottom of the panel out and pull the panel down to remove it from the unit.

#### **Panel Installation (Select Units)**

1. Insert the top corners of side panel flanges into the corner post channels as shown in Detail A in [Figure 3](#).
2. Slide the panel up into the top pan. (You may need to push on the center of the panel at the top in order to clear the top pan edge).
3. Swing the panel in and push down until the panel is resting on the top edge of the base pan wall as shown in Detail B.
4. Insert screws into the panel to secure it to the unit.

## REFRIGERANT CHARGING

### **WARNING:**

**RSA3ME4M1 Split System Air Conditioners are shipped charged with R410A refrigerant and ready for installation. If repairs make it necessary for evacuation and charging, it should only be attempted by qualified trained personnel thoroughly familiar with this equipment. Under no circumstances should the owner attempt to install and/or service this equipment. Failure to comply with this warning could result in property damage, personal injury, or death.**

After refrigerant line connections are completed, it is required that you leak check and evacuate the indoor section and all line connections (using proper methods) before finalizing the full system refrigerant charge.

- Refer to the Quick Reference Data sheet for additional charging information for this unit with the approved Nortek indoor units. For reference, these units are listed in the AHRI Directory with all approved combinations of indoor coils and units. Installing these outdoor units on systems that combine it with an indoor coil or unit not listed there, is not recommended. When approved combinations of indoor and outdoor units are installed, they should be set up to operate within the airflow and other operational parameters prescribed in all of the units provided instructions and technical specifications.
- Installation of this outdoor unit with other, non-listed indoor unit combinations may require different airflows, expansion devices, charge values and system setup from the instructions provided here and with this unit. Nortek does not recommend the use of this product in unlisted combinations, and the system performance and efficiency values of unlisted unit combinations may be different than the listed product combinations.
- The refrigerant charge can be checked and adjusted through the service ports provided external to the outdoor unit. Use only gage line sets which have a “Schrader” depression device present to actuate the valve.
- An automatic high-pressure switch is factory-installed in these units and is located on the discharge line after the unit's compressor. This switch is designed to protect the system when very high pressures occur during abnormal conditions. Under normal conditions, the switch is closed. If the system pressure rises to 650 psig, then the switch will open and de-energize the contactor coil in the outdoor unit. The switch will close again once the liquid pressure decreases to 460 psig and allow the unit to restart.

#### **Charging the Unit in AC mode**

If the outdoor temperature is 65 degrees F or higher:

After completing the refrigerant line connections, leak checking the system, and evacuating the indoor section and all line connections (using proper methods), perform the following steps:

1. Determine the recommended charge addition (if applicable) for the system being installed. This information is in the unit's QRD (Quick Reference Data sheet).

2. Calculate the amount of additional refrigerant needed for the line set length of the actual installation. This information is on the first page of the unit's QRD (Quick Reference Data sheet).
3. Weigh in the additional charge amounts determined by step 1 and 2 above.
4. Adjust the charge to match the superheat (for fixed orifice systems) or subcooling (for TXV systems). There are three different resources for doing this:
  - a.) The chargecalculator.com website. This will walk you through the charging process step by step.
  - b.) The charging tables on the inside of the outdoor unit's electrical box cover panel. These tables provide superheat targets for fixed orifice systems and subcooling targets for TXV systems. The system should be charged so that the measured superheat/subcooling are within 1 degree F of the target listed in the table.

#### **For fixed orifice systems:**

- If your measured superheat at the suction valve is **LESS THAN** the recommended superheat value in the table then **REMOVE** refrigerant.
- If your measured superheat at the suction valve is **GREATER THAN** the recommended superheat value in the table then **ADD** refrigerant.

#### **For TXV systems:**

- If your measured subcooling at the liquid valve is **LESS THAN** the recommended subcooling value in the table then **ADD** refrigerant.
  - If your measured subcooling at the liquid valve is **GREATER THAN** the recommended subcooling value in the table then **REMOVE** refrigerant.
- c.) The charging tables in the Supplemental Charging Information, can be found online in the literature library. The tables can also be accessed by scanning the QR code on the unit's electrical panel. The pressures listed in these tables are for reference only and are to be used in troubleshooting a system. **The system should be charged to match the superheat or subcooling targets as previously noted and not to match the system pressures.** Follow the same procedure described in 4b above.

If the outdoor temperature is below 65 degrees F:

After completing the refrigerant line connections, leak checking the system, and evacuating the indoor section and all line connections (using proper methods), perform the following steps:

1. Determine the recommended charge addition (if applicable) for the system being installed. This information is in the unit's QRD (Quick Reference Data sheet).
2. Calculate the amount of additional refrigerant needed for the line set length of the actual installation. This information is on the first page of the unit's QRD (Quick Reference Data sheet).
3. Weigh in the additional charge amounts determined by step 1 and 2 above.
4. Return to the system when the outdoor temperature is 65 degrees F or higher and follow the steps defined in step 4 of the “If the outdoor temperature is 65 degrees F or higher” section above.

# WIRING DIAGRAM

## Split System Air Conditioner (Outdoor Section)

## Single Phase

### NOTES:

1. Disconnect all power before servicing.
2. For supply connections use copper conductors only.
3. Not suitable on systems that exceed 150 volts to ground.
4. For replacement wires use conductors suitable for 105 deg C.
5. For ampacities and overcurrent protection, see unit rating plate.
6. Connect to 24 VAC/40VA/class 2 circuit. See furnace/airhandler installation instructions for control circuit and optional relay/transformer kits.
7. Caution: The Low Voltage wiring in this unit shall not be grounded to this unit.

1. Couper le courant avant de faire l'entretien.
2. Employez uniquement des conducteurs en cuivre.
3. Ne convient pas aux installations de plus de 150 volt a la terre.

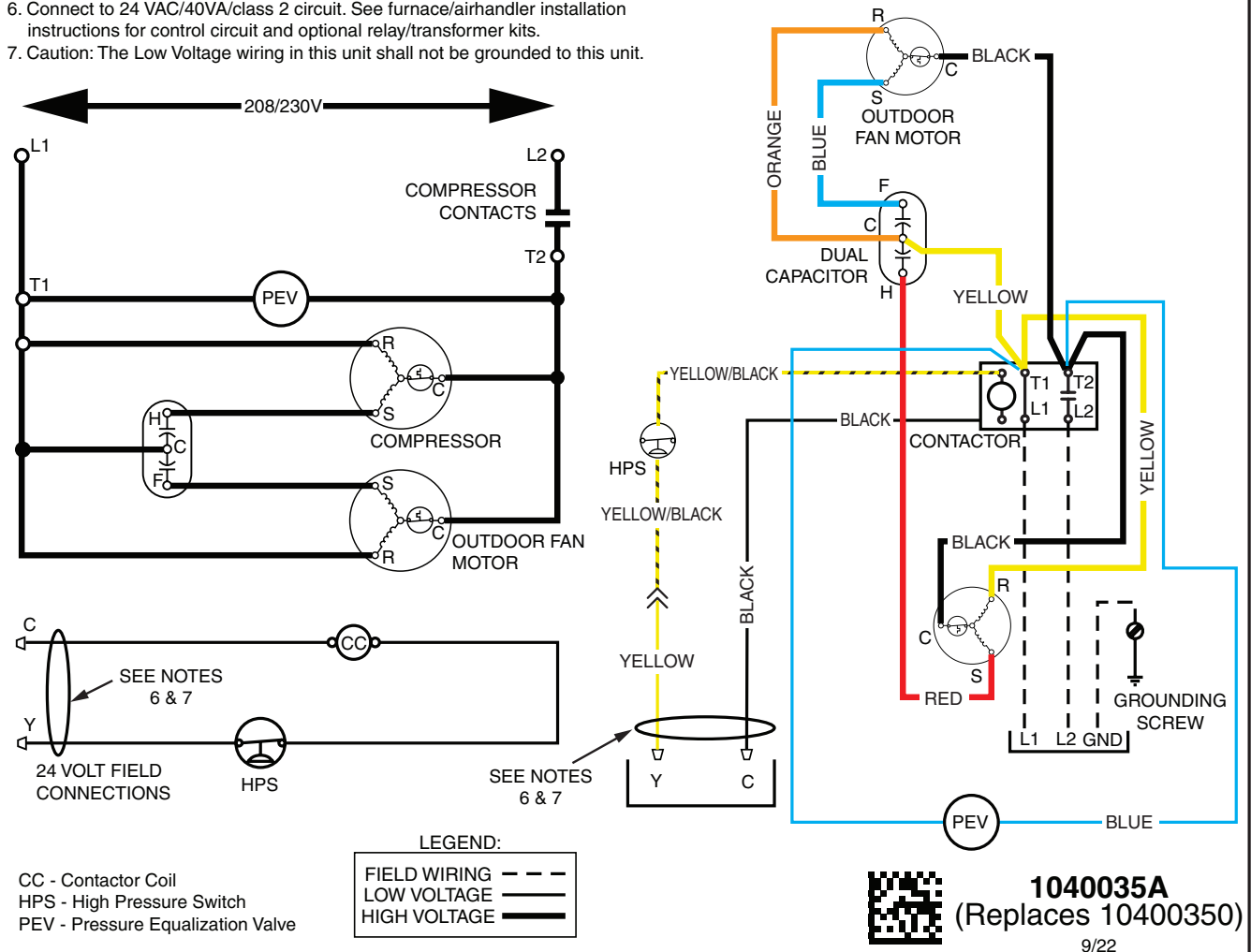


Figure 4. Wiring Diagram for RSA3ME4M1RN (2 & 2.5 Ton Units)



# WIRING DIAGRAM

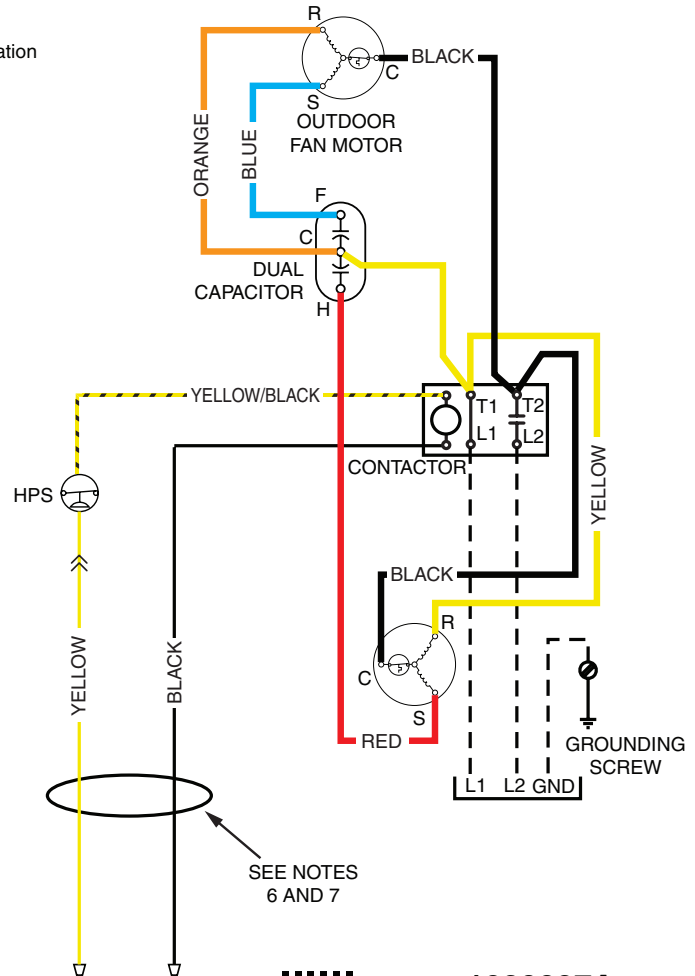
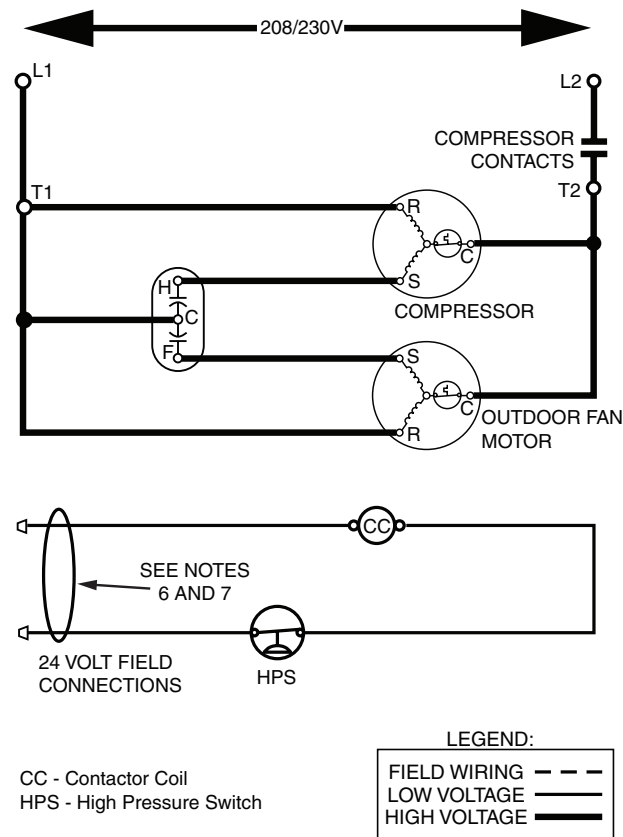
## Split System Air Conditioner (Outdoor Section)

## Single Phase

### NOTES:

1. Disconnect all power before servicing.
2. For supply connections use copper conductors only.
3. Not suitable on systems that exceed 150 volts to ground.
4. For replacement wires use conductors suitable for 105 deg C.
5. For ampacities and overcurrent protection, see unit rating plate.
6. Connect to 24 VAC/40VA/class 2 circuit. See furnace/airhandler installation instructions for control circuit and optional relay/transformer kits.
7. Caution: The Low Voltage wiring shall not be grounded to this unit.

1. Couper le courant avant de faire letretien.
2. Employez uniquement des conducteurs en cuivre.
3. Ne convient pas aux installations de plus de 150 volt a la terre.



**1039827A**  
(Replaces 10398270)

9/22

Figure 5. Wiring Diagram for RSA3ME4M1SN (3, 3.5, & 4 Ton Units)

# WIRING DIAGRAM

## Split System Air Conditioner (Outdoor Section) With ECM Outdoor Motor

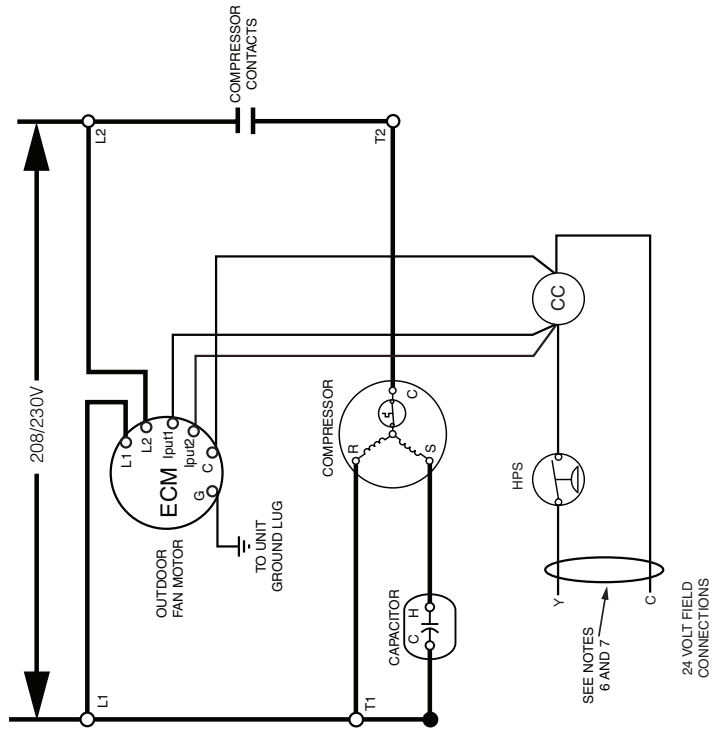
208/230V

Single Phase / 60 Hz.

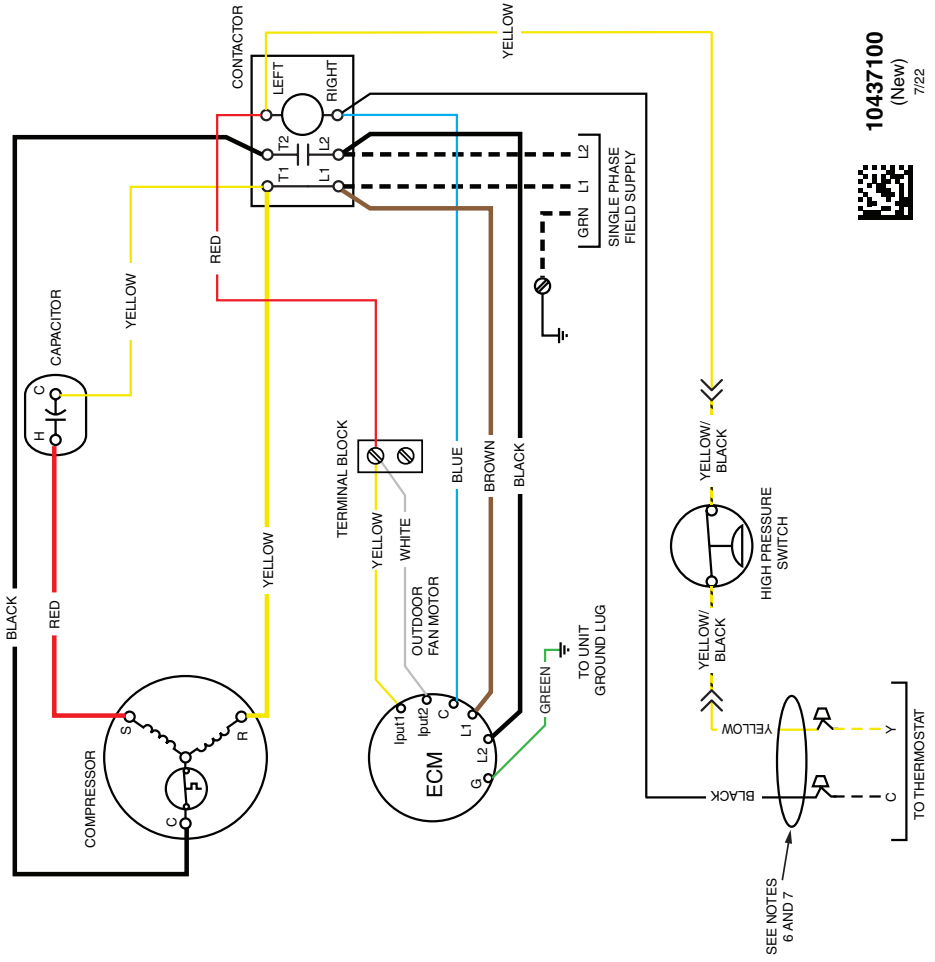
**NOTES:**

1. Disconnect all power before servicing.
2. For supply connections use copper conductors only.
3. Not suitable on systems that exceed 150 volts to ground.
4. For replacement wires use conductors suitable for 105°C.
5. For ampacities and overcurrent protection, see unit rating plate.
6. Connect to 24 vac/40va/class 2 circuit. See furnace/air handler installation instructions for control circuit and optional relay/transformer kits.
7. Caution: The Low Voltage wiring shall NOT be grounded to this unit.

1. Couper le courant avant de faire leretien.
2. Employez uniquement des conducteurs en cuivre.
3. Ne convient pas aux installations de plus de 150 volt a la terre.



CC- CONTACTOR COIL  
HPS- HIGH PRESSURE SWITCH



10437100  
(New)  
7/22

Figure 6. Wiring Diagram for RSA3ME4M1SN (5 Ton Units)



## INSTALLATION CHECKLIST

<b>INSTALLATION ADDRESS:</b>		
CITY:	STATE:	
UNIT MODEL #		
UNIT SERIAL #		
<b>INSTALLER NAME:</b>		
CITY	STATE	
Unit Installed Minimum clearances shown on <a href="#">page 3</a> ?	YES	NO
Has the owner's information been reviewed with the customer?	YES	NO
Has the Literature Package been left with the unit?	YES	NO

REFRIGERATION SYSTEM		
Was unit given 24 hr warm up period for crankcase heaters?	YES	NO
Stage-1 Liquid Pressure (high side):		
Stage-1 Suction Pressure (low side):		

ELECTRICAL SYSTEM		
Electrical connections tight?	YES	NO
Line voltage polarity correct?	YES	NO
Rated Voltage:		
Maximum deviation of voltage from average volts:		
Has the thermostat been calibrated?	YES	NO
Is the thermostat level?	YES	NO
Is the heat anticipator setting correct? (If Applicable)	YES	NO

### REPLACEMENT PARTS

Replacement parts are available through your distributor. Please have the complete model and serial number of the unit when ordering replacement parts.

#### ELECTRICAL:

- Capacitors
- Compressors
- Contactors
- Pressure Switches
- Relays
- Temperature Limit Switches
- Thermostats
- Time Delay Relays
- Transformers

#### MOTORS:

- Blower Motor
- Fan Motor

#### COMPONENTS:

- Blower Assembly
- Cabinet Panels
- Expansion Valves
- Fan Grille
- Filter/Driers

