

E6 Series Electric Furnace

INSTALLATION INSTRUCTIONS

Downflow & Upflow Models



⚠ WARNING / AVERTISSEMENT

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.

RISQUE DE CHOC ÉLECTRIQUE, D'INCENDIE OU D'EXPLOSION

Le non-respect des avertissements de sécurité pourrait entraîner un fonctionnement dangereux de l'appareil, des blessures graves, la mort ou des dommages matériels.

Un entreteïn incorrect pourrait entraîner un fonctionnement dangereux de l'appareil, des blessures graves, la mort ou des dommages matériels.

- Couper toute alimentation électrique au générateur d'air chaud avant de prodéder aux travaux d'entretein.
- Au moment de l'entretien des commandes, étiquetez tous les fils avant de les débrancher. S'assurer de les raccorder correctement.
- S'assurer que l'appareil fonctionne adéquatement après l'entretien.

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

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IMPORTANT SAFETY INFORMATION

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

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
- Follow all precautions in the literature, on tags, and on labels provided with the equipment. Read and thoroughly understand the instructions provided with the equipment prior to performing the installation and operational checkout of the equipment.
- This furnace may not be used for temporary heating of buildings or structures under construction.

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.

ALL MODELS	CLOSET	ALCOVE
FRONT **	6"	18"
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

For alcove installations allow 18 (46cm) inches minimum clearance from the front of the unit for 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 6](#). 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 3 \(page 13\)](#) 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 in² (1290 cm²) for furnace only. May also include return air grille and frame assembly P/N 902989 or wall mount grille P/N 902999).
 - 235 in² (1516 cm²) with 4 ton A.C. or H.P. installed.
 - 250 in² (1613 cm²) with 4 ton A.C. or H.P. installed & 1" special clearance.
 - 275 in² (1775 cm²) with up to 5 ton A.C. or H.P. installed.
- If using louvered doors, the total free area must be calculated. Nortek louvers are about 70% free area. If using a third party louvered door manufacturer, check their technical specifications to determine the free area.

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.

Plenums & Air Ducts

This unit is designed only for use with a supply and return duct. Air ducts should be installed in accordance with the standards of the National Fire Protection Association Standard for Installation of Air Conditioning Systems (NFPA 90A), Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems (NFPA 90B), and all applicable local codes. NFPA publications are available by visiting www.NFPA.org.

- 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).
- Design the air ducts according to methods described by the Air Conditioning Contractors of America (ACCA).
- Air ducts must be aluminum, tin plate, galvanized sheet steel, or other approved materials for outlet or return air ducts.
- Snap-Lock or Pittsburgh-Lock seams are preferred. All other types of seams must be made tight to prevent leakage.
- It is good practice to seal all connections and joints with industrial grade sealing tape or liquid sealant. Requirements for sealing ducts vary from region to region. Consult with local codes for requirements specific to your area.
- Gas piping must not run in or through any of the air duct system.
- Applicable installation codes may limit the furnace to installation in a single-story residence only. Furnace installations other than closet or alcove require ducted return air systems.

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 when furnace is installed in a closet or alcove:
 - Upflow Alcove installations: Use a coil box with a solid door and an upflow stand. Part numbers can be found in the Technical Specifications Literature. See [Figure 1 \(page 5\)](#).
 - Closet installations: use wall mount return air grill P/N 902988A or equivalent.
 - Downflow alcove installations: the grille (with frame provided) 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 Nortek air conditioning or heat pump coils on top of the furnace. See [Figure 2 \(page 5\)](#).
- 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.
- Wiring materials located in return duct system must conform to NEC Article 300-22(c).
- If return air opening is located below top of furnace, a minimum clearance must be provided between opening and furnace. See [Table 1](#).

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.

Acoustical Ducts

Certain installations may require the use of acoustical lining inside the supply duct work.

- Acoustical insulation must be in accordance with the current revision of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) application standard for duct liners.
- Duct lining must be UL classified batts or blankets with a fire hazard classification of FHC-25/50 or less.
- Fiber duct work may be used in place of internal duct liners if the fiber duct work is in accordance with the current revision of the SMACNA construction standard on fibrous glass ducts. Fibrous duct work and internal acoustical lining must be NFPA Class 1 air ducts when tested per UL Standard 181 for Class 1 ducts.

Unconditioned Spaces

All duct work passing through unconditioned space must be properly insulated to minimize duct losses and prevent condensation. Use insulation with an outer vapor barrier. Refer to local codes for insulation material requirements.

Closed-Off Spaces

Living space not served by, and closed off from the return air ducts to the furnace (by doors, sliding partitions, and other means) must be provided with permanent, uncloseable openings in the doors or partitions to allow air to return to the furnace from all parts of the home. Return air grilles, with a minimum open area of one square inch for every five square feet of living space closed off from the furnace, must be provided in the door or room partition.

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.

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 (Figure 1) 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 with air conditioners or heat pumps, the following optional equipment is recommended: upflow stand, coil cabinet, upflow duct connector, and wall mount grille.

Without 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.

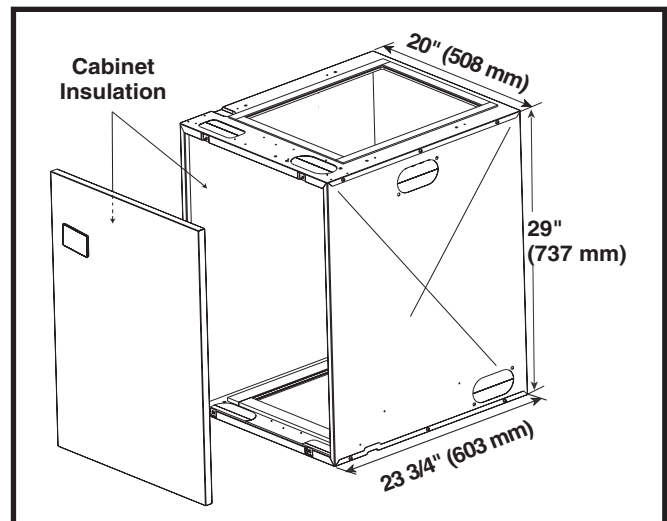


Figure 1. Upflow Coil Cabinet

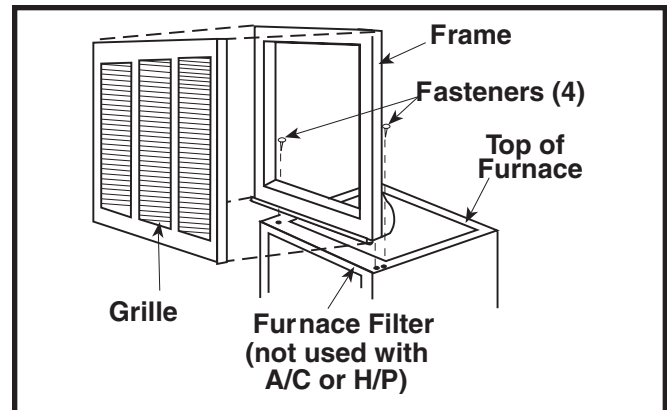


Figure 2. Grille Support Frame & Grille Assembly

With optional upflow stand:

- Stand (Figure 3 (page 6)) only uses filters that come in the box. The filter in the furnace must be removed and discarded. See instructions supplied with the upflow stand for additional details.

Ducted Return Air

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

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

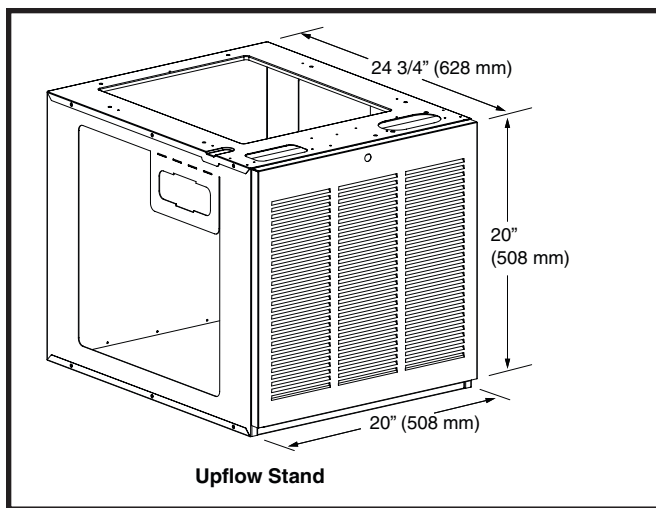


Figure 3. Optional Upflow Stand

Optional Equipment

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

Return Air Grille

A return air grille and frame assembly (Figure 2 (page 5)) is available for use in unducted return air installations. In downflow alcove installations, the grille and frame assembly may be mounted directly to the top of the furnace. In closet installations, a wall mount grille is available for attachment to a door or wall.

Optional Automatic Furnace Damper (901083)

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 7 (page 8)) 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.

This appliance 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. Please read all instructions before installing the unit.

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 19 (page 15). If an upflow stand will be used, see Figure 20 (page 15) 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.

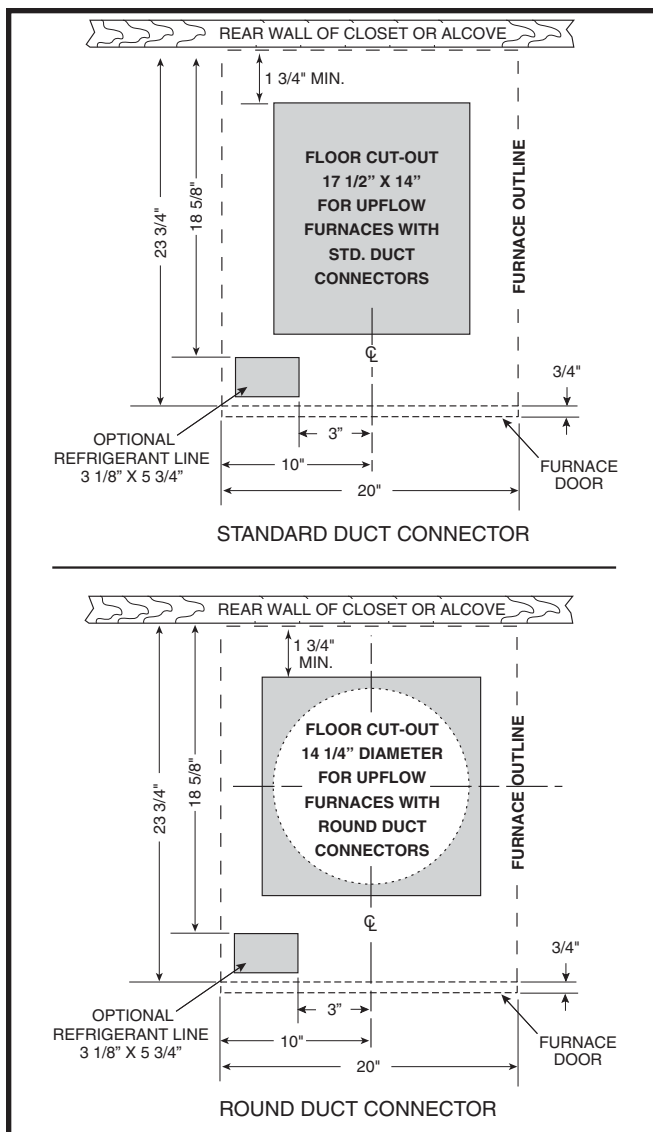


Figure 4. Cut-Out Dimensions for Upflow Furnaces

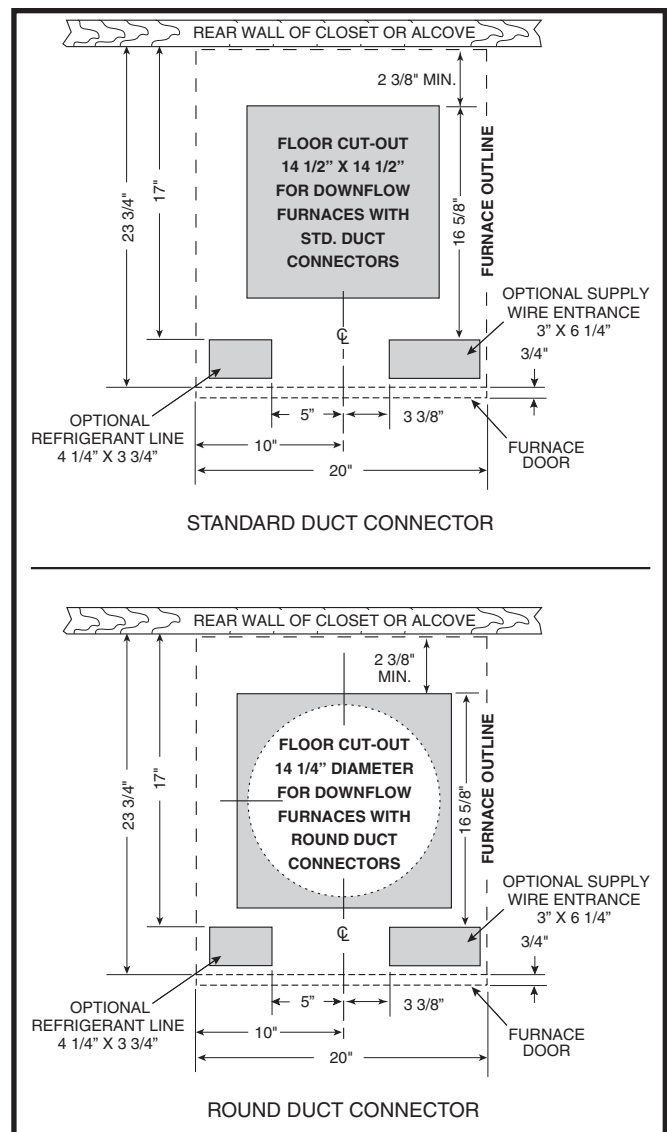


Figure 5. Cut-Out Dimensions for Downflow Furnaces

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 4](#). The cutouts for downflow furnaces are shown in [Figure 5](#).

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 4](#) or [Figure 5](#).

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 6](#) will determine the correct duct connector.

5. Determine which duct connector to use from [Table 2](#) ([page 8](#)).

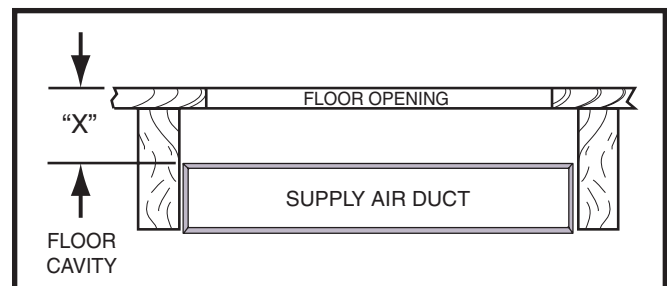


Figure 6. Floor Cavity

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

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

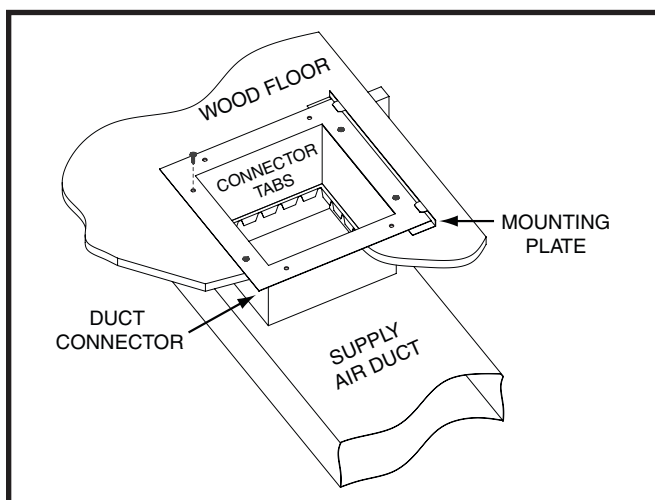


Figure 7. Standard Duct Connector Installed

NOTE: Requirements for sealing ductwork vary from region to region. Consult with local codes for requirements specific to your area.

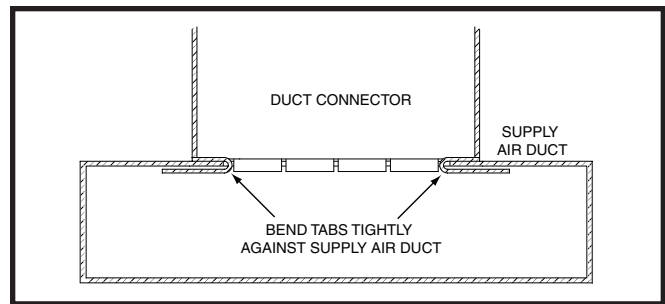


Figure 8. Duct Connector Tabs

Narrow Duct Connectors

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

1. Score and cut the top of the supply air duct as indicated in Option 1 or Option 2 ([Figure 9](#)). With Option 1 choice, cut out the metal from the shaded area.
2. Fold the two flaps (Options 1 or 2) up to form the opening for the duct connector.
3. Install the duct connector with the bottom tabs extending into the supply air duct.
4. Bend the tabs on the bottom of the duct connector upwards and as tight as possible against the supply air duct. See [Figure 10 \(page 9\)](#).
5. Form the flaps (Options 1 or 2) up against the duct connector as tight as possible.
6. 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.
7. Seal all connections with industrial grade sealing tape or liquid sealant.

NOTE: Requirements for sealing ductwork vary from region to region. Consult with local codes for requirements specific to your area.

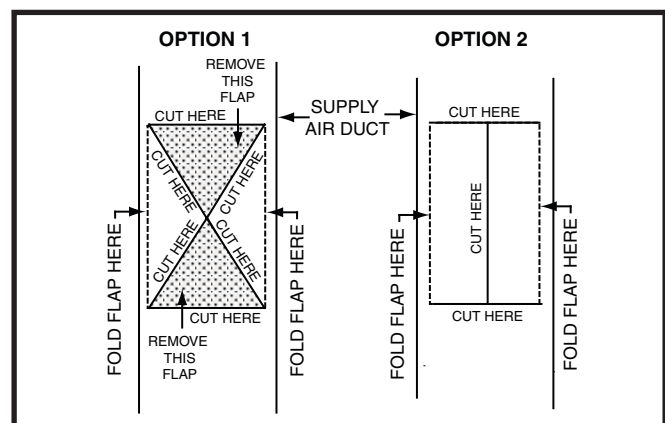


Figure 9. Narrow Air Duct Openings

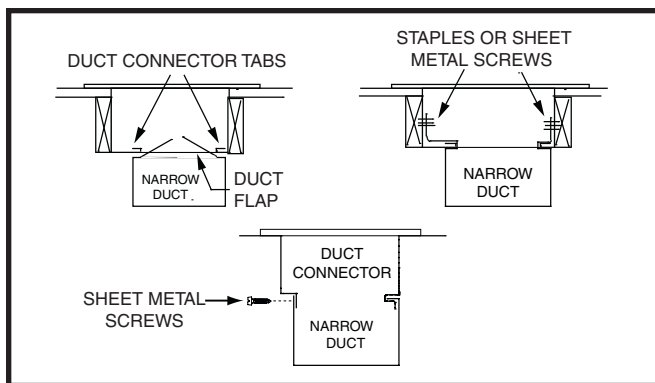


Figure 10. Narrow Ducts

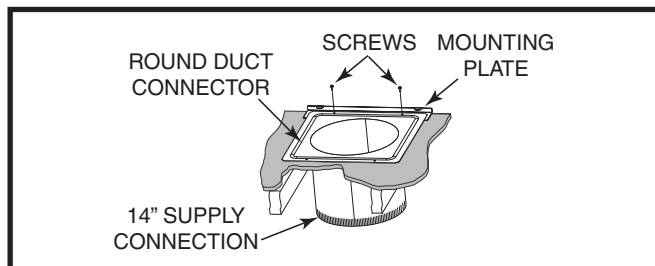


Figure 11. Round Duct Connector Installed

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.

1. Apply a bead of caulking, mastic, or other approved sealant around bottom side of connector.
2. Install and center the duct connector in the floor opening.
3. Install the mounting plate under the back side of the duct connector. See [Figure 11](#). **NOTE:** Align the screw holes in both components.
4. Secure the duct connector and the mounting plate to the wood floor with appropriate size screws.
5. Connect the round supply duct to the underside of the duct connector and secure them with field supplied sheet metal screws.
6. Seal all connections with industrial grade sealing tape or liquid sealant.

NOTE: Requirements for sealing ductwork vary from region to region. Consult with local codes for requirements specific to your area.

Alcove Installation

1. Cut alcove rough openings to minimum dimensions shown in [Figure 12](#). **NOTE:** The height may increase depending on the size of the coil compartment.
2. 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.

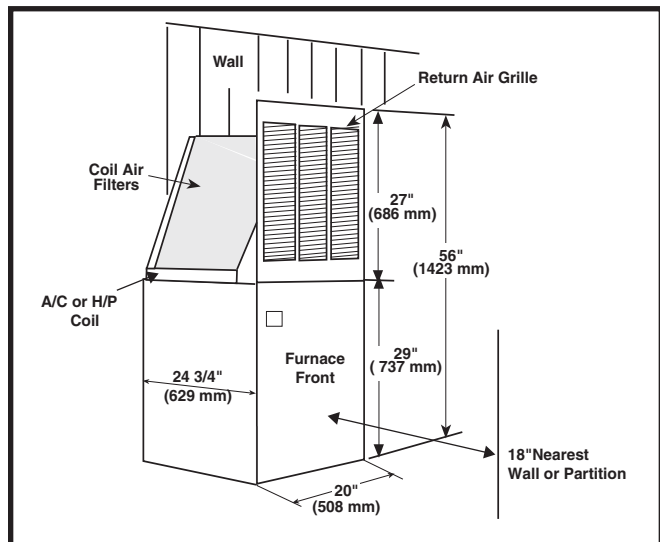


Figure 12. Alcove Installation

Closet Installation

For proper air circulation, closet installations require a return air grill installed in the door or a partially louvered door across the opening. For clearances 6" or greater, the closet must have an open free area of 235 in² minimum. For special clearances between 1" - 5", requirements are a louvered door with a minimum of 250 in² (1613 cm²) free area. A fully louvered closet door is strongly recommended for both installation types. For closet installations, a coil box is recommended to be installed with the furnace. If in upflow configuration, an upflow stand will also be needed. For examples of both types of installations, see [Figure 13](#) (page 10).

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 5) 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 8).

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 19](#) (page 15) 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.

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 19 \(page 15\)](#).
5. See Electrical Wiring section ([page 11](#)) to complete furnace installation.

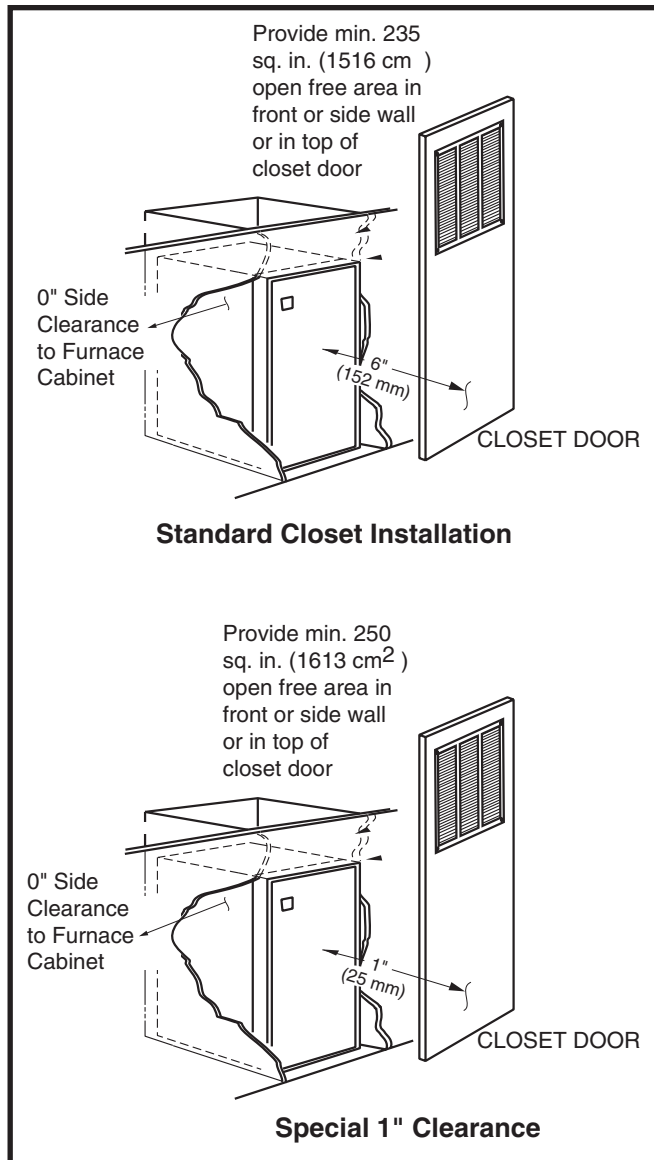


Figure 13. Closet Installation

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 14](#).
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 15 \(page 11\)](#).
3. Route 240V supply circuit(s) and 24V wiring to closet. See [Figure 19 \(page 15\)](#) 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 15](#).
7. Install return air grille in closet preferably at same level as upflow stand or below mounting platform. See [Figure 14](#).

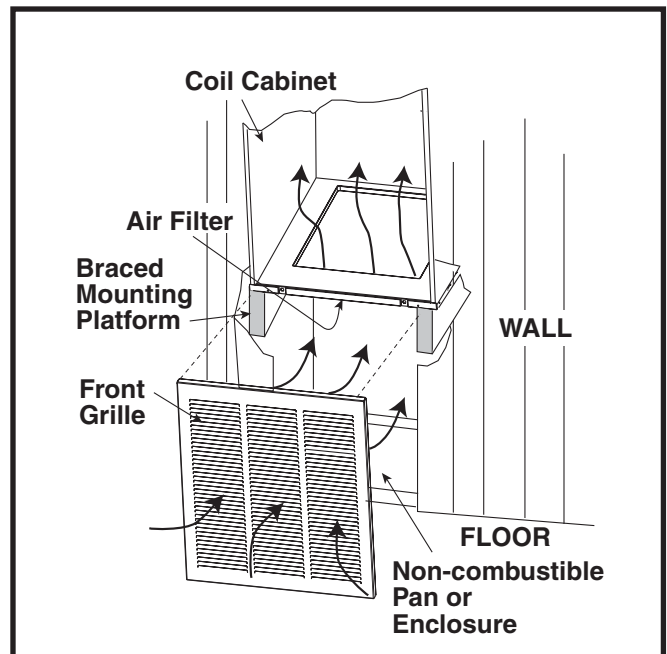


Figure 14. Over-the-Floor Return Air System

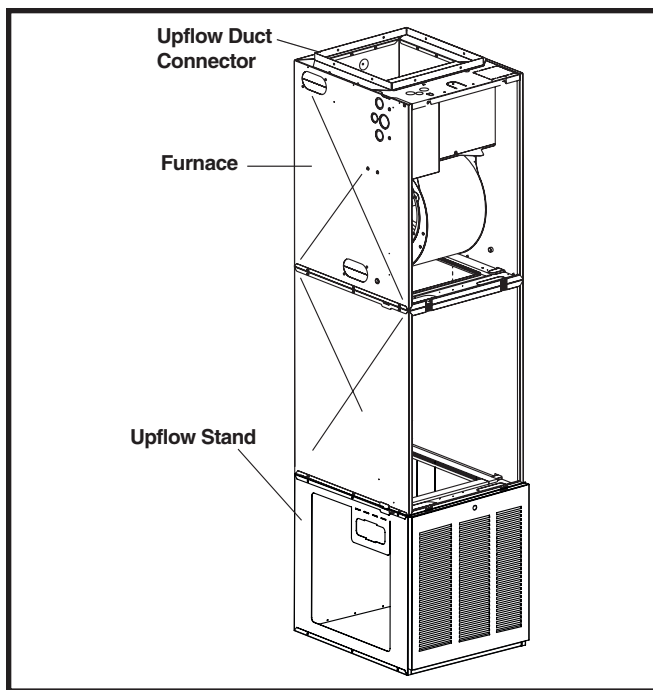


Figure 15. Over-the-Floor Return Air System with Upflow Stand

NOTE: Be sure to provide an adequate free return air area as described in the Closed-Off Spaces section (page 5).

Through-the-Floor Return Air System (Ducted)

1. Prepare Floor Opening(s):
 - a. Mark floor openings as shown in Figure 4 (page 7). 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 19 (page 15) 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 15.

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."

AVERTISSEMENT:

RISQUE DE CHOC ÉLECTRIQUE, D'INCENDIE OU D'EXPLOSION

Le non-respect des avertissements de sécurité pourrait entraîner un fonctionnement dangereux de l'appareil, des blessures graves, la mort ou des dommages matériels.

Un entreteïn incorrect pourrait entraîner un fonctionnement dangereux de l'appareil, des blessures graves, la mort ou des dommages matériels

- Couper toute alimentation électrique au générateur d'air chaud avant de prodéder aux travaux d'entreteïn.
- Au moment de l'entreteïn des commandes, étiquetez tous les fils avant de les débrancher. S'assurer de les raccorder correctement.
- S'assurer que l'appareil fonctionne adéquatement après l'entreteïn.

- 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. Verify the incoming neutral line is connected to the white wire and the incoming hot line is connected to the black wire. The furnace will not operate unless the polarity and ground are properly connected.

- **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 5 (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 5. See unit wiring diagrams (Figure 22, Figure 23, Figure 24, & Figure 25) for wiring details. Electrical components are shown in Figure 18 (page 14). 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 16.
- -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 16 & Figure 17). **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 (45 in.-lbs. recommended).
6. Connect service ground wire(s) to grounding lug(s) provided. One ground is required for each supply circuit used. See Figure 18 (page 14).

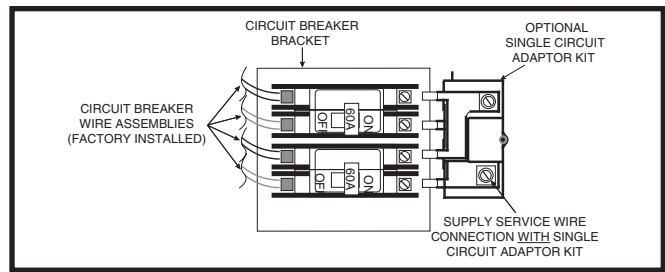


Figure 16. Optional Single Circuit Adaptor Kit

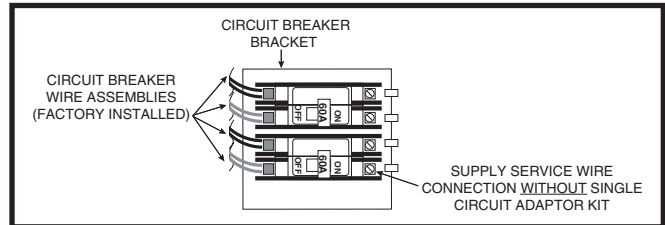


Figure 17. Installation of Supply Service Wires

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 21 (page 16) for typical thermostat connections.
- For proper indoor blower operation and temperature rise, the E6 electric furnace requires that the system thermostat be configured NOT to call for the indoor blower to operate in the heating mode. Refer to your specific thermostat installation instructions for details on the heating mode indoor blower configuration.
- This E6 series electric furnace incorporates an integrated control. The thermostat's 1st stage compressor signal, **Y**, must be connected to the **YELLOW** control wire at the furnace to enable the indoor blower off-delay in the cooling mode.

4-TON BLOWER WITH COIL AND COIL AND FILTERS, @ 0.3" ESP				
PIN NO.	SPEED	CFM	BLOWER SPEED	BLOWER LEAD
#1	Low	880	Low	Red
#2	Med.-Low	1,170	Med-LO	Yellow
#3	Med.-High	1,310	Med-Hi	Blue
#4	High	1,460	High	Black
5-TON BLOWER, WITH COIL AND COIL FILTERS, @ 0.3" ESP				
PIN NO.	SPEED	CFM	BLOWER SPEED	BLOWER LEAD
#1	Low	990	Low	Red
#2	Med.-Low	1,320	Med-LO	Yellow
#3	Med.-High	1,620	Med-Hi	Blue
#4	High	1,790	High	Black

Table 3. Blower Speed and Performance Data

Selecting Blower Speed

See [Table 3](#) for blower speed as set by blower leads. Since the blower leads connect to the control box, blower speed selection is through use of the proper color-coded blower lead located inside the control box. The speed(s) set by the factory may be different from that shown on the wiring diagrams. See the unit control box for factory set blower speed(s).

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.

The selected heating blower lead is attached to HEAT on the control board. The selected cooling blower lead is attached to COOL on the control board.

- **For New Heating Speed:** Remove heating blower lead from HEAT on the control board. Choose desired speed and install new blower lead on that terminal.
- **For New Cooling Speed:** Remove cooling blower lead from COOL on the control board. Install new blower lead on that terminal.
- **Same Speed, Heating & A/C:** Install white jumper wire (supplied with unit) between HEAT & COOL of the control board. See [Table 3](#) for blower performance data.

Blower Installation

1. Turn off all electrical supply circuits to the furnace at the main service panel.
2. Remove furnace front door and switch furnace circuit breaker(s) to OFF.
3. Disconnect the motor plug from the control panel receptacle.
4. Remove one screw from left side of blower and three screws from right side of blower. Slide blower forward to remove.
5. Install new blower. **NOTE:** Make sure the side flanges engage under side mounting tabs. Three tabs on one side and one on the other. The long tab is in the rear.
6. Replace screws removed from blower in step 4.
7. Connect the motor plug to the control panel receptacle.
8. Switch circuit breaker(s) to ON.
9. Reinstall furnace front door and turn on electrical supply circuits to the furnace.

Installing Control Circuit Wiring

NOTE: Installation of a five-wire thermostat circuit is recommended for future addition of a heat/cool thermostat. See [Figure 21 \(page 16\)](#) for various E6 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.
3. Set anticipator to the setting listed in the thermostat's installation instructions.

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

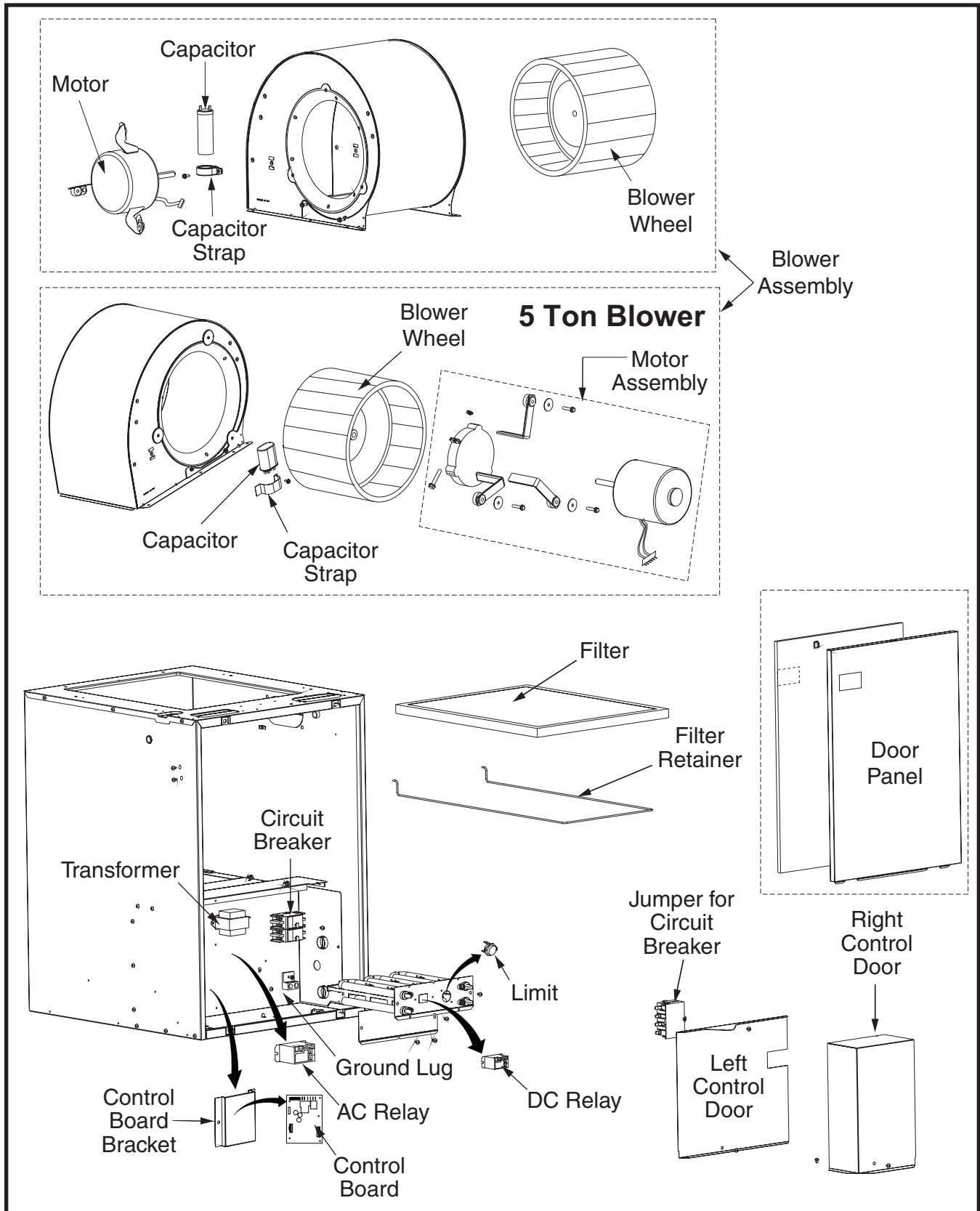


Figure 18. E6 Furnace Components

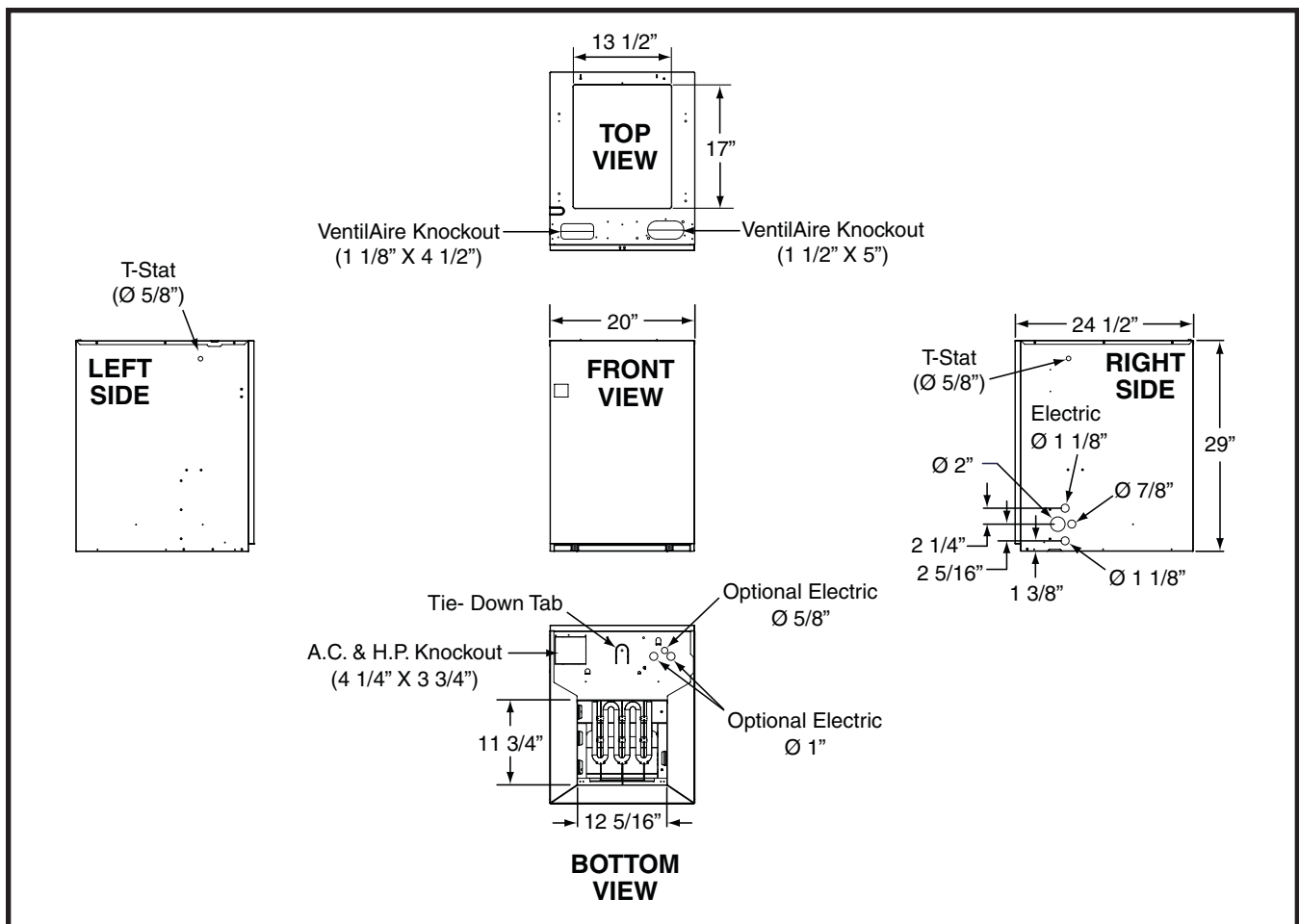


Figure 19. E6 Furnace Physical Dimensions

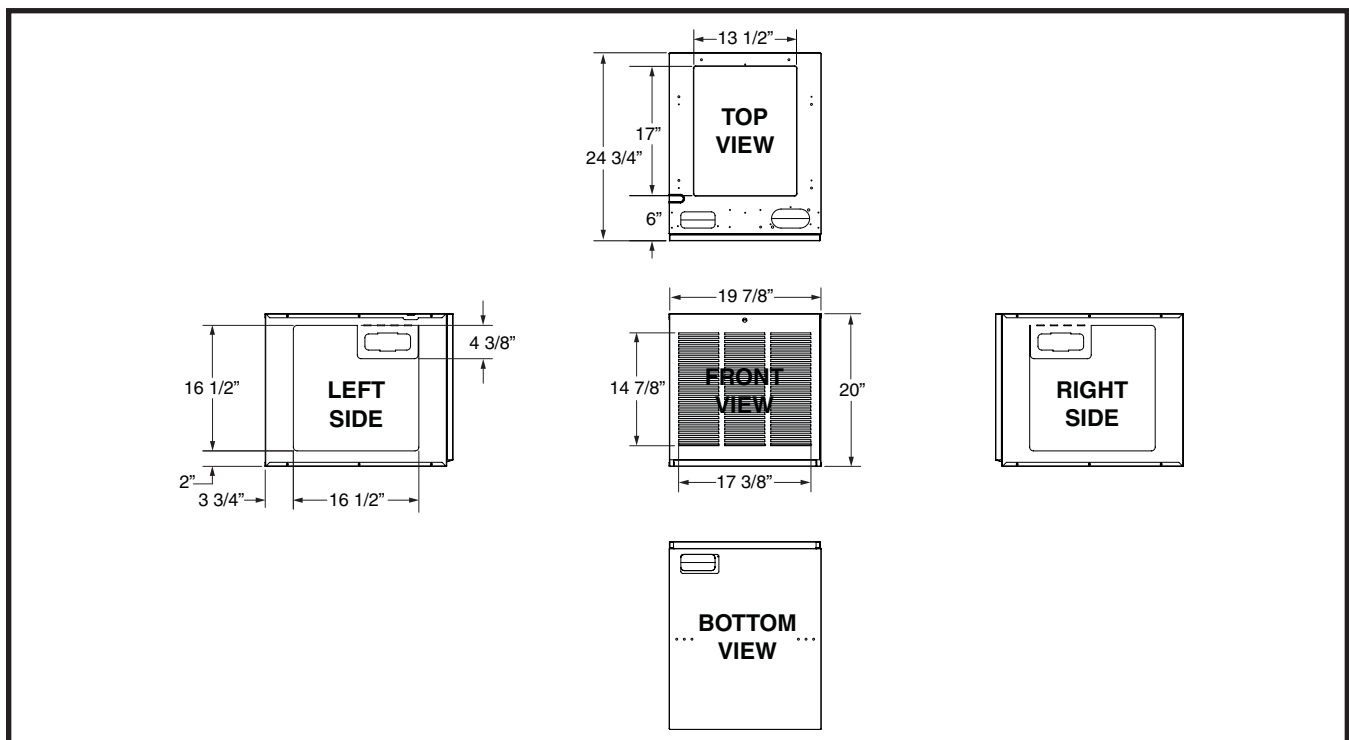


Figure 20. E6 Furnace Upflow Stand Dimensions

Electrical Data

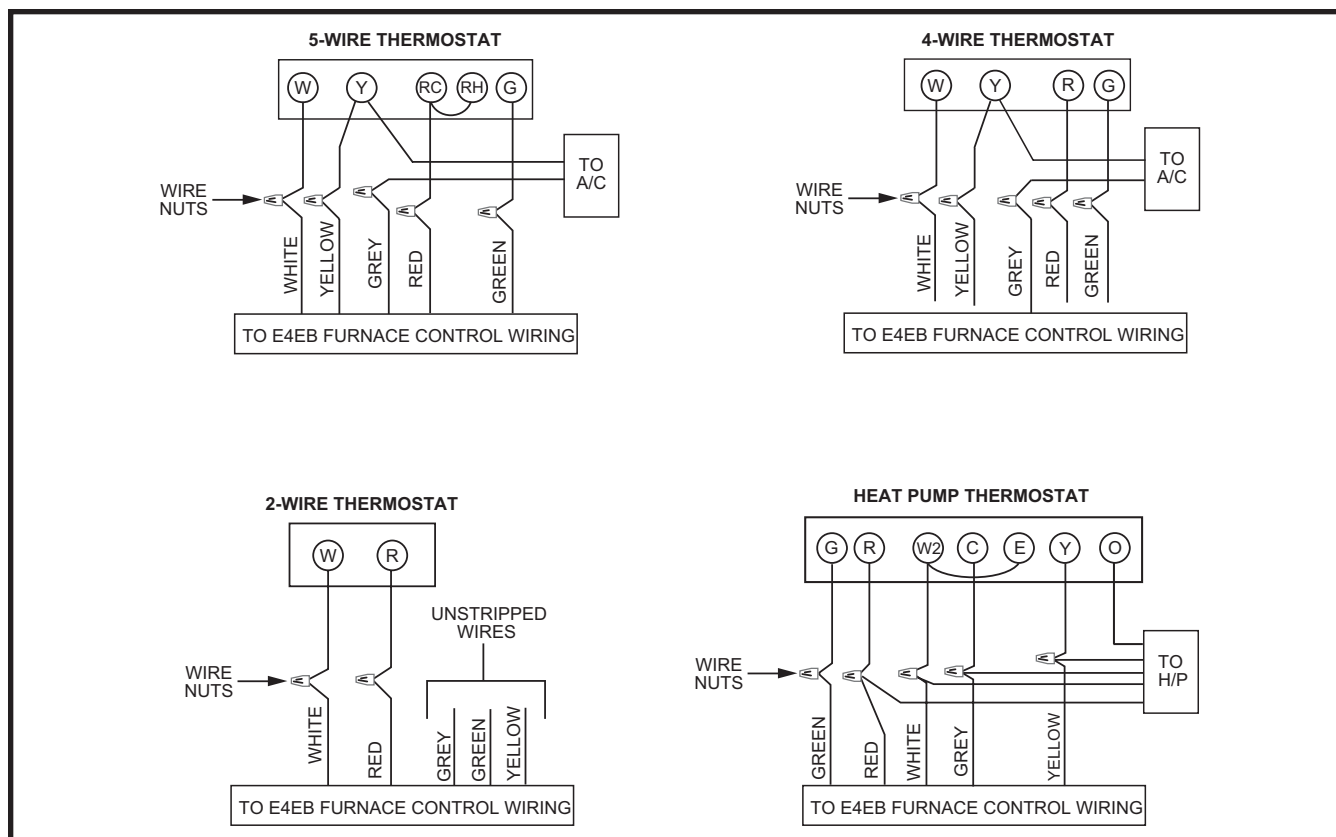


Figure 21. E6EB Thermostat Connection

FURNACE MODELS E6EB-	010H	012H	015H	017H	020H	023H	023H 5-TON
RATED HEATING OUTPUT, BTUH (SEE NOTE 1)	35,000	41,000	53,000	57,000	70,000	75,000	75,000
WATTS (TOTAL KW, HEATING ELEMENTS & BLOWER)	10.4	12.0	15.4	16.6	20.4	22.0	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)	4 (21.6)
BLOWER WHEEL SIZE	10.5" Dia, 8" W	10.5" Dia, 8" W	10.5" Dia, 8" W	10.5" Dia, 8" W	10.5" Dia, 8" W	10.5" Dia, 8" W	11" Dia., 8" W
MOTOR SPEED, H.P. RATING, AMPS	4 Speed, 1/3 HP, 2.9						4 Spd, 3/4HP, 3.8 Amps
TEST ESP, IN. W.C. MAX	0.3						
OPTIONAL COOLING AVAILABLE WITH FACTORY INSTALLED BLOWER	2.0 - 4.0 Ton (See Note 3)						2.0 - 5.0 Ton
OPTIONAL HEAT PUMP AVAILABLE WITH FACTORY INSTALLED BLOWER	2.0 - 4.0 Ton						
AIR FILTER (STANDARD)	18" x 20" x 1" (nominal)						
FURNACE DIMENSIONS	Width-20" (508mm), Height-29" (737mm) (see note 2), Depth-24 1/2" (623mm)						

NOTE: Heating output rated at listed voltage. For outputs at voltages other than 240V, multiply Btuh rating by the following factors: x 0.92 (230V), x 0.84 (220V), x 0.75 (208V).

Table 4. Unit Specifications

MODEL NUMBER E6EB-	SUPPLY CIRCUIT	TOTAL AMPERES	MAXIMUM OVER- CURRENT RATING	MINIMUM CIRCUIT AMPACITY	LOW VOLTAGE THERMOSTAT WIRE SIZE
010H	Single	44.6	60	56	2-Wire system maximum wire lengths: 24 Ga. = 55' 22 Ga. = 90' 20 Ga. = 140' 18 Ga. = 225'
012H	Single	51.2	70	64	
	Dual "A"	27.1	40	34	
	Dual "B"	24.2	30	30	
015H	Single	65.4	90	82	
	Dual "A"	44.6	60	56	
	Dual "B"	20.8	30	26	
017H	Single	70.4	90	88	4 or more wire systems maximum wire lengths: 24 Ga. = 25' 22 Ga. = 45' 20 Ga. = 70' 18 Ga. = 110'
	Dual "A"	47.9	60	60	
	Dual "B"	22.5	30	28	
020H	Single	86.2	125	108	
	Dual "A"	44.6	60	56	
	Dual "B"	41.7	60	52	
023H	Single	93.8	125	117	
	Dual "A"	45.5	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 5. E6 Electrical Specifications

Wiring Diagrams

WIRING DIAGRAM

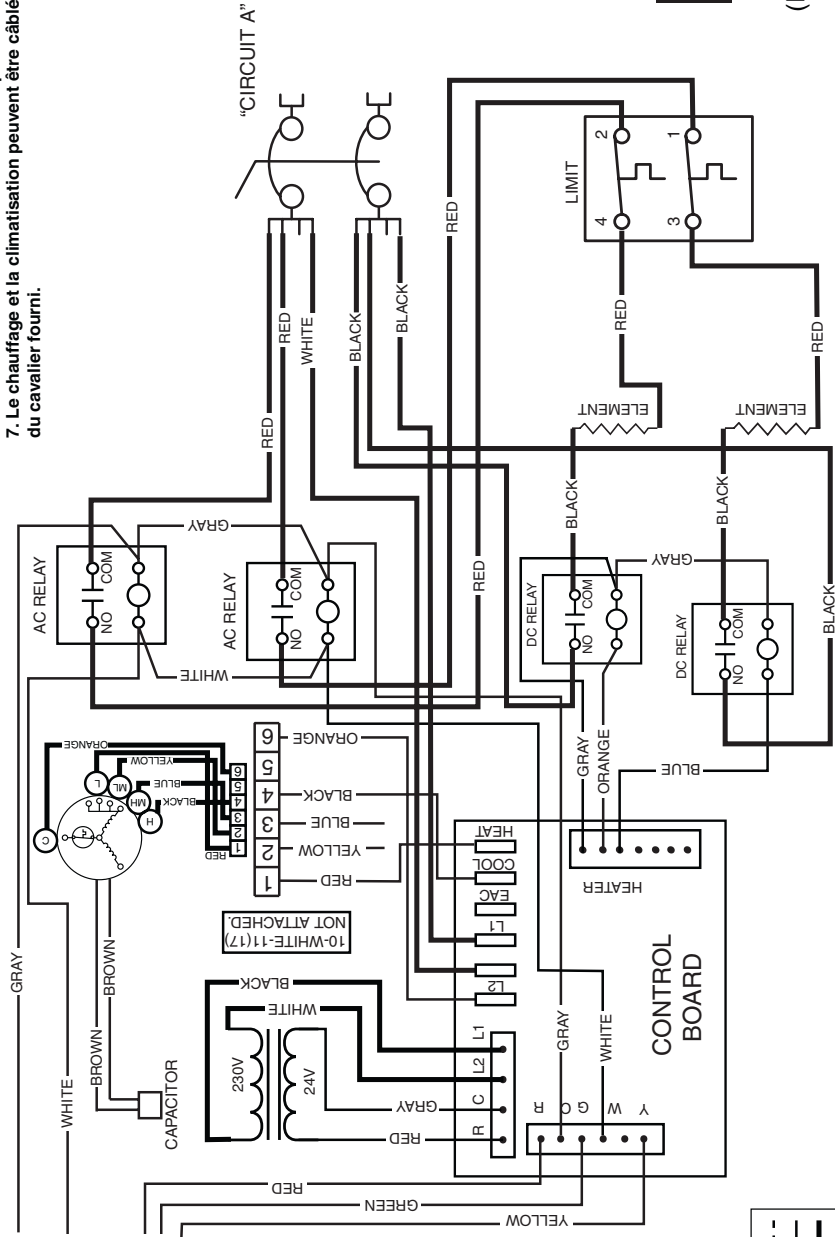
Model: 10 KW Electric Furnace

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.
7. Heating and cooling may be wired on the same speed using the provided jumper wire.



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.
7. Le chauffage et la climatisation peuvent être câblés sur la même vitesse à l'aide du cavalier fourni.



LEGEND:

- FIELD WIRING
- LOW VOLTAGE
- HIGH VOLTAGE



1013941A
(Replaces 10139410)
11/17

Figure 22. E6EB-010H Models

WIRING DIAGRAM

Model: 12 KW Electric Furnace

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.
7. Heating and cooling may be wired on the same speed using the provided jumper wire.

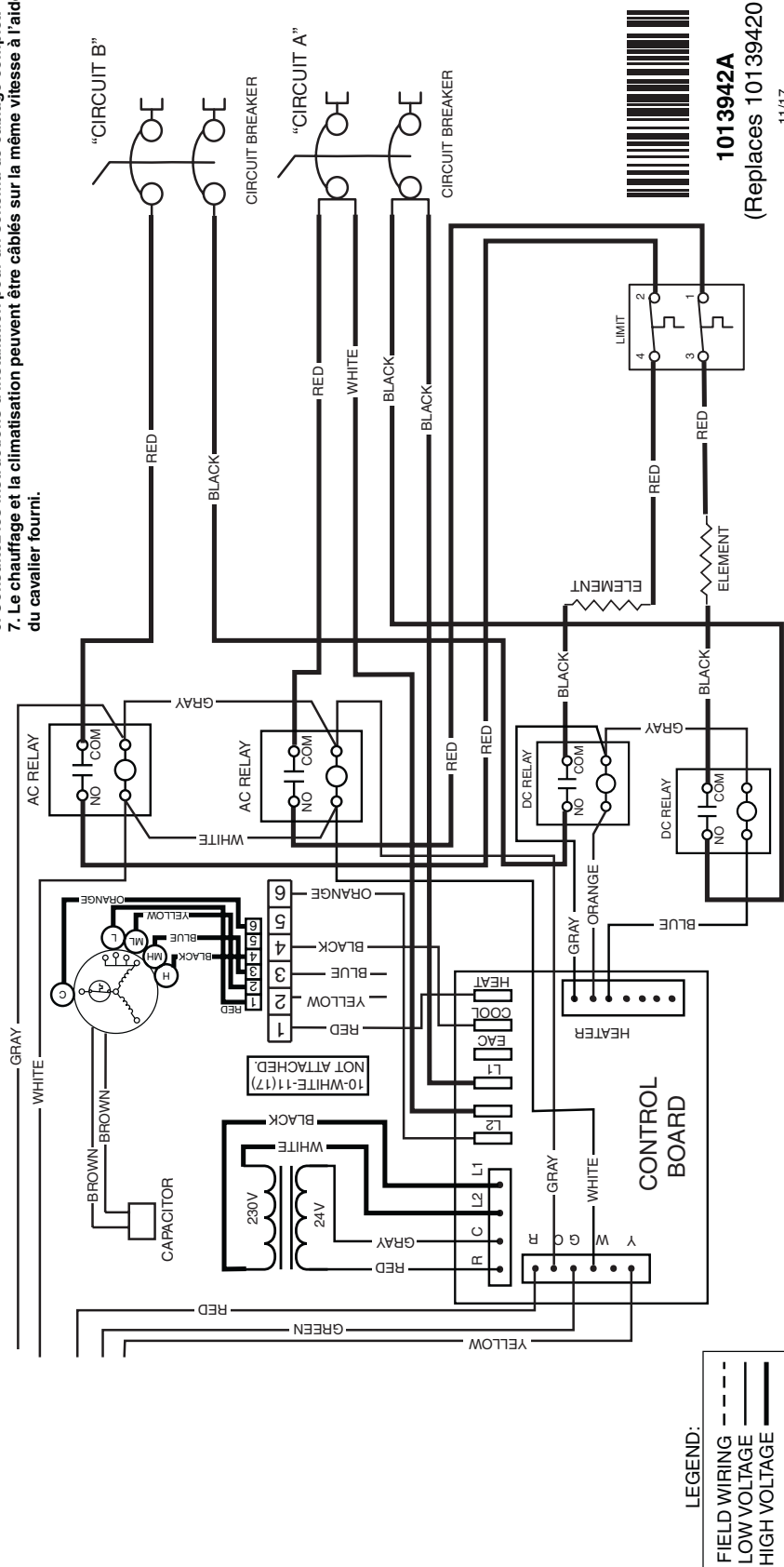
WARNING

Switch circuit breakers to the "off" position before servicing the furnace.

AVERTISSEMENT

Placez les disjoncteurs en position "off" avant d'entretenir la fournaise.

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.
7. Le chauffage et la climatisation peuvent être câblés sur la même vitesse à l'aide du cavalier fourni.



1013942A

(Replaces 10139420)

11/17

Figure 23. E6EB-012H Models

WIRING DIAGRAM

Model: 15 KW and 17 KW Electric Furnace

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.
7. Heating and cooling may be wired on the same speed using the provided jumper wire.

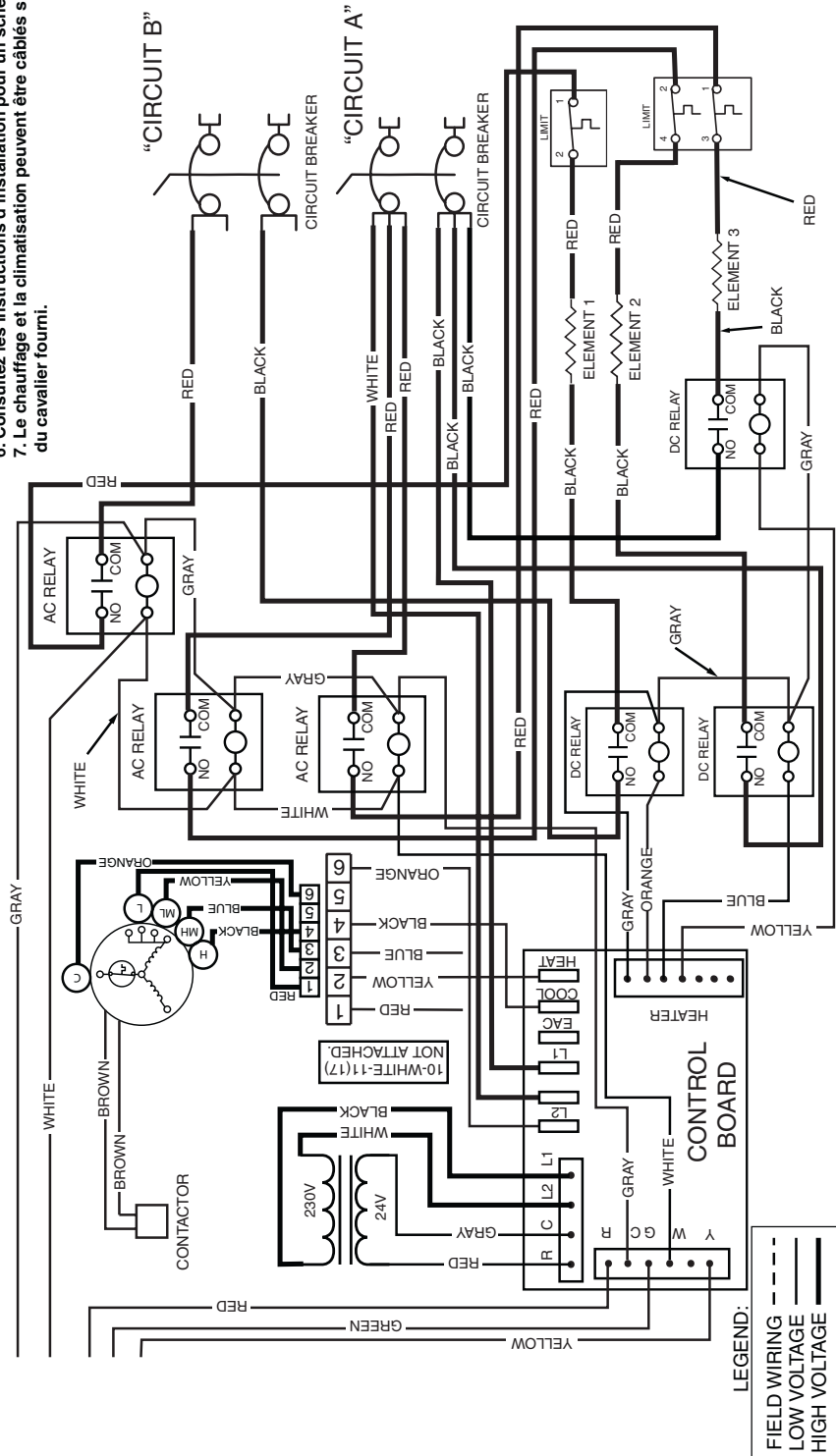
WARNING

Switch circuit breakers to the "off" position before servicing the furnace.

AVERTISSEMENT

Placez les disjoncteurs en position « off » avant d'entretenir la fournaise.

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.
7. Le chauffage et la climatisation peuvent être câblés sur la même vitesse à l'aide du cavalier fourni.



1013943A
(Replaces 10139430)
10/17

Figure 24. E6EB-015H & E6EB-017H Models

WIRING DIAGRAM

Model: 20 KW and 23 KW Electric Furnace

AVERTISSEMENT
Placez les disjoncteurs en position « off » avant d'entretenir la fournaise.

WARNING
Switch circuit breakers to the "off" position before servicing the furnace.

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.
 7. Heating and cooling may be wired on the same speed using the provided jumper wire.
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.
 7. Le chauffage et la climatisation peuvent être câblés sur la même vitesse à l'aide du cavalier fourni.

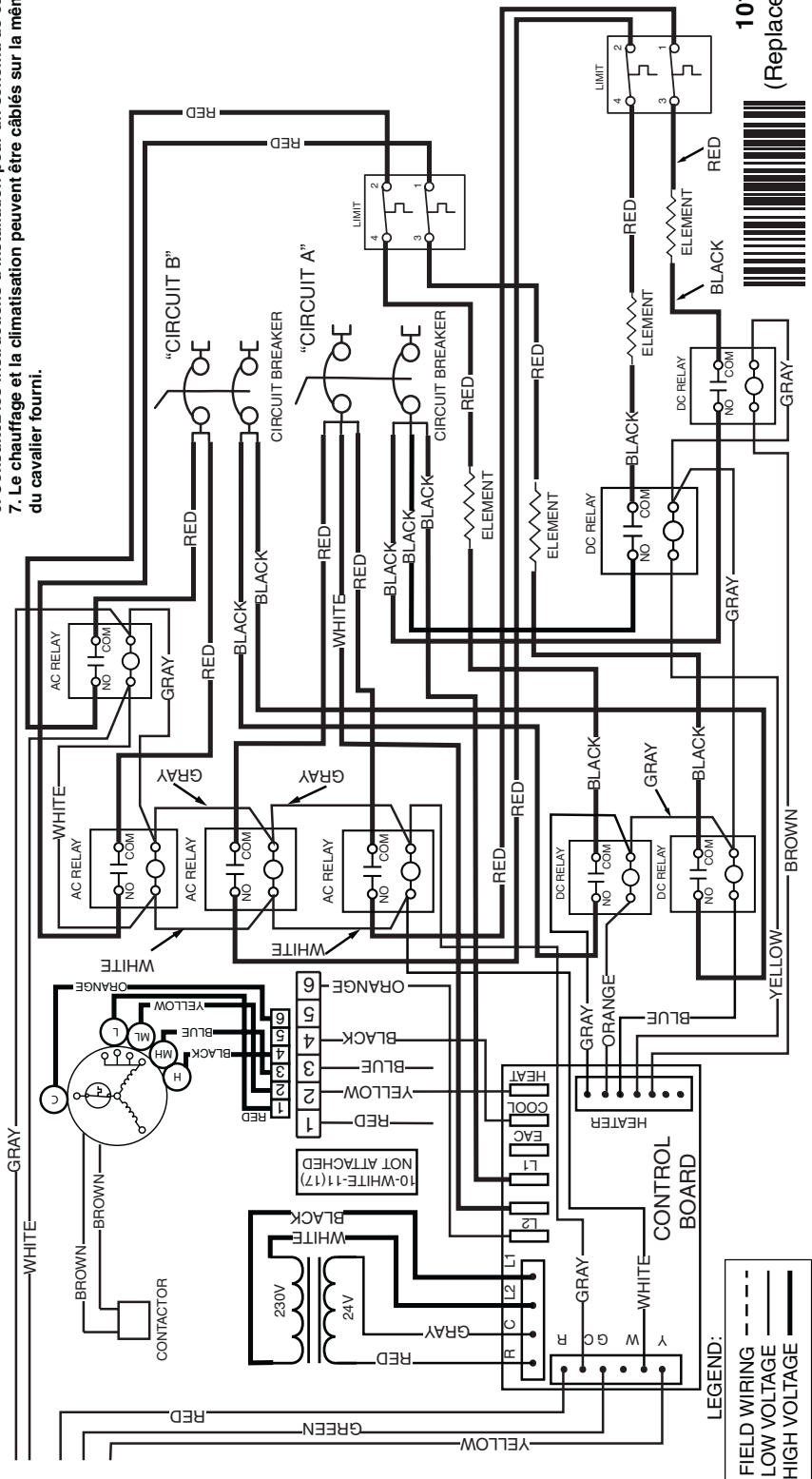


Figure 25. E6EB-020H & E6EB-023H Models

INSTALLATION CHECK LIST

INSTALLER NAME:		
CITY:	STATE:	
INSTALLATION ADDRESS:		
CITY:	STATE:	
UNIT MODEL #		
UNIT SERIAL #		
MINIMUM CLEARANCES AS SHOWN IN Table 1 (page 3)?	YES	NO
HAS THE OWNER'S INFORMATION BEEN REVIEWED WITH THE HOME-OWNER?	YES	NO
HAS THE LITERATURE PACKAGE BEEN LEFT NEAR THE FURNACE?	YES	NO

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.

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

PROPOSITION 65 WARNING:

WARNING: This product contains chemicals known to the state of California to cause cancer.

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



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