

INSTALLATION MANUAL

ELECTRIC FURNACE

MODELS: EBE*/EUE*
Downflow/Upflow

For Installation in:

1. Manufactured (Mobile) Homes
2. Recreational Vehicles and Park Models
3. Modular Homes and Buildings



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SECTION I: GENERAL

The following list includes important facts and information regarding the EBE/EUE furnace and its packaging inclusions:

- Furnace is rated at 240 V, 60 Hz, single phase.
- Filters are furnished with EBE model, and are the same for all EBE models - 16 x 20 x 1 in top and 20 x 20 x 1 in the louvered door. No filters are furnished with EUE models. External filter base and/or filter rack needed for field installation.
- Furnace size is the same for all models. See Figure 1.
- Four-wire thermostat operation for heating and cooling.
- Coil cavity built into furnace.
- All furnaces are equipped with an air conditioner blower and are A/C or Heat Pump ready.
- Holding strap furnished on top rear of furnace.
- The EBE furnace is designed for downflow application, and the EUE furnace is designed for upflow application.
- This furnace must not be operated without the front panel installed.

NOTICE

This furnace and its components listed on the A/C and Heat Pump equipment sticker are listed in combination as a system by Underwriter's Laboratories for the United States and Canada.

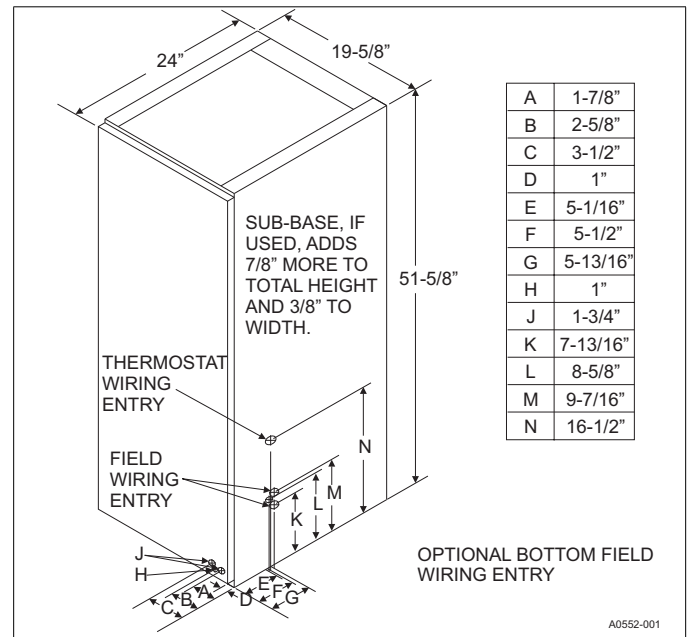


FIGURE 1: Furnace Dimensions

SECTION II: SAFETY



This is a safety alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.

Understand and pay particular attention to the signal words **DANGER**, **WARNING**, or **CAUTION**.

DANGER indicates an **imminently** hazardous situation, which, if not avoided, **will result in death or serious injury**.

WARNING indicates a **potentially** hazardous situation, which, if not avoided, **could result in death or serious injury**.

CAUTION indicates a potentially hazardous situation, which, if not avoided **may result in minor or moderate injury**. It is also used to alert against unsafe practices and hazards involving only property damage.

WARNING

Improper installation may create a condition where the operation of the product could cause personal injury or property damage. Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual for assistance or for additional information, consult a qualified contractor, installer or service agency.

CAUTION

This product must be installed in strict compliance with the installation instructions and any applicable local, state, and national codes including, but not limited to building, electrical, and mechanical codes.

WARNING**FIRE OR ELECTRICAL HAZARD**

Failure to follow the safety warnings exactly could result in serious injury, death or property damage. A fire or electrical hazard may result causing property damage, personal injury or loss of life.

- Install this electric furnace only in a location and position as specified in SECTION III of these instructions.
- Always install the electric furnace to operate within the electric furnace's intended maximum outlet air temperature. Only connect the air handler to a duct system that has an external static pressure within the allowable range, as specified on the EBE/EUE rating plate.
- When an electric furnace is installed so supply ducts carry air circulated by the air handler to areas outside the space containing the air handler, the return air must also be handled by ducts sealed to the air handler casing and terminating outside the space containing the air handler.
- The electric furnace is not to be used for temporary heating of buildings or structures under construction.
- The size of the unit must be based on an acceptable heat loss or gain calculation for the structure. ACCA, Manual J or other approved methods can be used.

SAFETY REQUIREMENTS

- This electric furnace must be installed in accordance with all national and local building/safety codes and requirements, local plumbing or wastewater codes, and other applicable codes.
- Refer to the unit rating plate for the EBE/EUE model number, and then see the dimensions page of this instruction for supply air plenum dimensions in Figure 3. The plenum must be installed according to the instructions.
- Provide clearances from combustible materials as listed under FURNACE CLEARANCE.
- Provide clearances for servicing, ensuring that service access is allowed for electric furnace elements and blower.
- Failure to carefully read and follow all instructions in this manual can result in electric furnace malfunction, death, personal injury, and/or property damage.
- Check the rating plate and power supply to ensure that the electrical characteristics match.
- Electric furnace must be installed so the electrical components are protected from water.
- Installing and servicing heating/cooling equipment can be hazardous due to the electrical components. Only trained and qualified personnel must install, repair, or service heating/cooling equipment. Untrained service personnel can perform basic maintenance functions such as cleaning and replacing the air filters. When working on heating/cooling equipment, observe precautions in the manuals and on the labels attached to the unit and other safety precautions that may apply.
- These instructions cover minimum requirements and conform to existing national standards and safety codes. In some instances, these instructions exceed certain local codes and ordinances, especially those that do not reflect changing residential and non-HUD modular home construction practices. These instructions are required as a minimum for safe installation.

INSPECTION

As soon as a unit is received, it must be inspected for possible damage during transit. If damage is evident, the extent of the damage must be noted on the carrier's freight bill. A separate request for inspection by the carrier's agent must be made in writing. Before installation, the unit must be checked for screws or bolts that may have loosened in transit. There are no shipping or spacer brackets to be removed.

Check to ensure all accessories such as heater kits, suspension kits, and coils are available. Installation of these accessories must be done before setting the unit in place or connecting any wiring, electric heat, ducts, or piping.

CODES

The electric furnace must be installed in accordance with the following codes:

- Standard for the Installation of Air Conditioning and Ventilating Systems (NFPA 90A)
- Standard for the Installation of Warm Air Heating and Air Conditioning Systems (NFPA 90B)
- National Electrical Code (NFPA 70)
- Canadian Electrical Code, Part I (CSA C22.1)
- All local codes (state/county/township)

NOTICE

All applicable codes take precedence over any recommendation made in these instructions.

SECTION III: UNIT INSTALLATION

LOCATION

Access for servicing is an important factor in the location of any furnace. Provide a minimum of 24 in. (61 cm) in front of the furnace for access to the heating elements and controls. This access can be provided by a closet door or by locating the furnace 24 in. (61 cm) from a facing wall or partition.

FURNACE CLEARANCE

This furnace is approved for 0 in. clearance to combustible material on all or any part of the furnace exterior and the inlet or outlet duct work except as stated below.

For furnaces installed in upflow application, there must be a minimum of 1 in. (2.54 cm) clearance from the bare surface of the outlet duct work for a distance of 3 ft (91.4 cm) from the supply air opening. This requirement is met if the duct is wrapped with an insulating material at least 1 in. thick that has an R-value of at least R-4.

RETURN AIR

In order for the furnace to work properly, a closet or alcove must have a certain total free area opening for return air.

For Heating Only Furnace

A minimum of 200 sq in. (1290 sq cm) free area opening. Use any return grille with a minimum of 200 sq in. free opening.

For Up to 4 Ton AC and HP Applications (Standard Blower)

A minimum of 250 sq in. (1613 sq cm) free area opening. The standard blower assembly supplied with the furnace is capable of handling up to 4 ton AC applications. Use any return grille with a minimum of 250 sq in. (1613 sq cm) free area opening.

For 5 Ton AC Applications (Accessory Blower)

A minimum of 350 sq in. (2129 sq cm) free area opening. Use 5 ton AC blower accessory 3500-7911. Use any return grille with a minimum of 350 sq in. (2129 sq cm) free area opening with 5 ton AC blower accessory 3500-7911. The upflow return air box accessory 3500-8982 can also be used with 5 ton AC blower accessory 3500-7911.

Location

For downflow applications, the return air opening can be located in a closet front door, sidewall above the furnace casing, or louvered door on the furnace. If the opening for the return air is located in the floor, sidewalls, or closet door anywhere below the furnace casing height, 6 in. minimum clearance must be provided on the furnace side where return is located to provide for proper airflow.

For upflow installations, a closet that is 32 in. wide by 30 in. deep with a 30-inch wide door is necessary. This is not required if there is a return grille installed below furnace.

The return air opening can be located in a closet front door, sidewall above the furnace casing, or louvered door on the furnace. If the opening for the return air is located in the floor, sidewalls, or closet door anywhere below the furnace casing height, 6 in. (15.2 cm) minimum clearance must be provided on the furnace side where return is located to provide for proper airflow. See Figure 2. The 6 in. (15.2 cm) minimum clearance is not required if there is a return grille installed above the furnace height. This return grille cannot start more than 3 ft above the furnace height. If the louvers in the closet door have as much airflow area as the EB louvered furnace door, only 1 in. clearance is required.

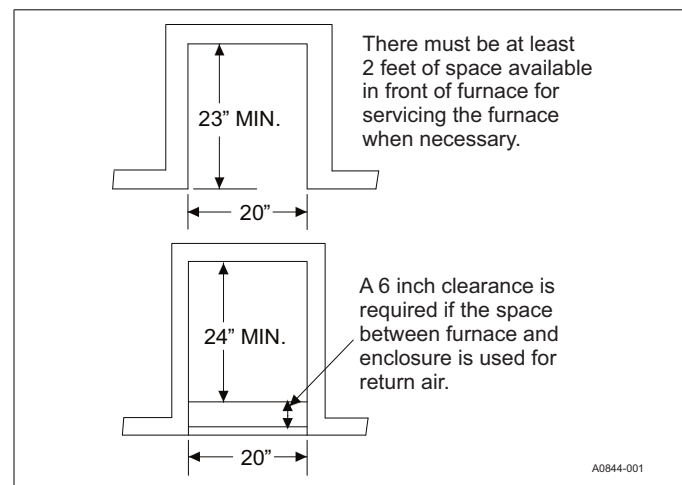


FIGURE 2: Alcove and Closet Clearances

When installing the furnace in a separate closet or room that is accessible only through an outside door, a minimum of 200 sq in. (1290 sq cm) free opening for return air must be provided. The supply and return air must be ducted, securely attached, and sealed to the furnace casing if there are grilles in the outside door to the closet. Openings where ducts pass through walls, the floor, or the ceiling must be sealed to prevent air leakage into or from the closet and the living area.

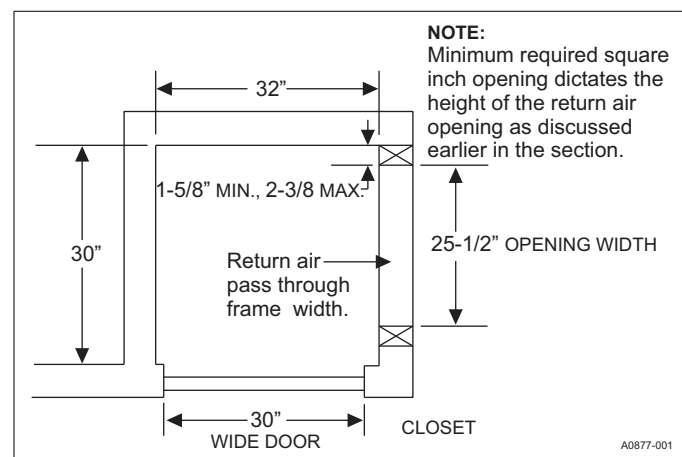


FIGURE 3: Upflow Closet Clearances

Provisions must be made to permit the return of circulating air from all rooms and living spaces, except the bathroom(s), to the circulating air supply inlet of the furnace. Failure to comply may cause improper heating and may cause the furnace to cycle on the limit.

DUCT SYSTEM DESIGN

An electric furnace is designed to operate at a given static pressure.

To ensure proper airflow through the furnace, the distribution system must be designed so the static pressure external to the furnace does not exceed the static pressure rating shown on the furnace rating plate.

The number, size, and placement of registers must be such that even distribution of heat is provided throughout the home.

SECTION IV: ELECTRIC FURNACE INSTALLATION

7900 SERIES DUCT CONNECTOR FOR EBE DOWN-FLOW

The duct connector is designed to eliminate a sub-base requirement. Table 1 provides the part number of the duct connector needed.

Provide adequate clearance for servicing:

- Locate the furnace conveniently away from wall facing or partitions to permit easy removal of components.
- Maintain a minimum space of 6 in. between the furnace and closet door when the door is used for return air.
- Ensure 2 ft of space is available in front of the furnace for future servicing (for example, blower, element, or furnace removal).

TABLE 1: Duct Connector for Electric Furnaces

FLOOR TO DUCT DIMENSIONS	FINGERED STYLE	SCREW TAB STYLE
1 in. (2.54 cm)	7990-6211	N/A
2 in. (5.1 cm)	7990-6221	N/A
3 in. (7.6 cm)	↑↓	N/A
4 in. (10.2 cm)	7990-6241	N/A
5 in. (12.7 cm)	↑↓	↓↓
6 in. (15.2 cm)	7990-6261	7990-6061
7 in. (17.8 cm)	7990-6271	7990-6071
8 in. (20.3 cm)	7990-6281	7990-6081
9 in. (22.8 cm)	↑↓	↑↑
10 in. (25.4 cm)	7990-6301	N/A
11 in. (28.2 cm)	↑↑	N/A
12 in. (30.5 cm)	N/A	N/A
13 in. (33 cm)	N/A	N/A

NOTE: The duct adapter in the next size up or next size down is to be used, depending on tolerance in floor to duct dimension.

↑↓ - Indicates connector above or below could be used, depending on tolerance in floor to duct dimension.

↑↑ - Indicates connector above could be used, depending on tolerance in floor to duct dimension.

↓↓ - Indicates connector below could be used, depending on tolerance in floor to duct dimension.

DUCT CONNECTORS (7990 SERIES)

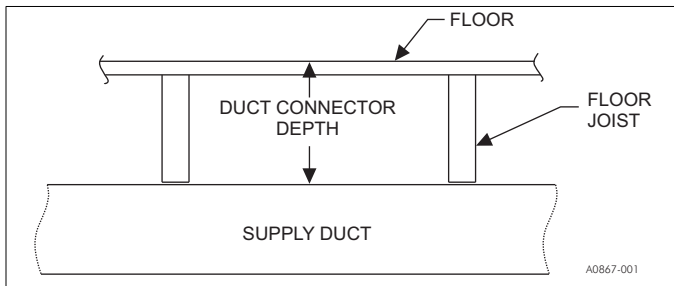


FIGURE 4: Duct Connector Depth (7990 Series)

These duct connectors connect the furnace to an under the floor supply duct system. The furnace can be installed on combustible flooring without a separate sub-base.

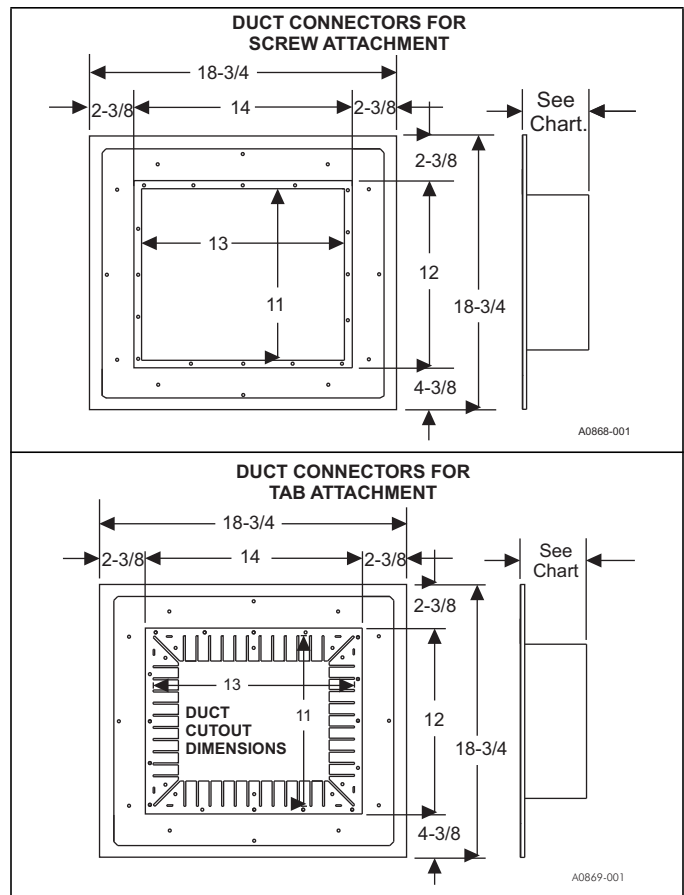


FIGURE 5: Duct Connector Dimensions (7990 Series)

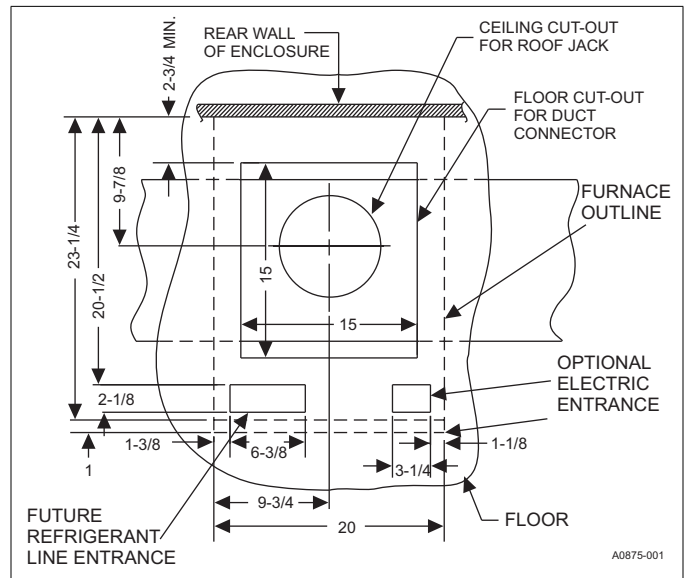


FIGURE 6: Recommended Floor Cut-Out (7990 Series)

INSTALLATION OF SCREW ATTACHMENT DUCT CONNECTOR (7990 SERIES)

1. Make floor cut out as shown in Figure 6.
2. Determine the depth of the floor cavity from the surface of the floor to the top of the supply air duct and select the appropriate duct connector from the chart.
3. Place locating bracket (supplied with the duct connector) to the back edge of the floor opening. See Figure 7.

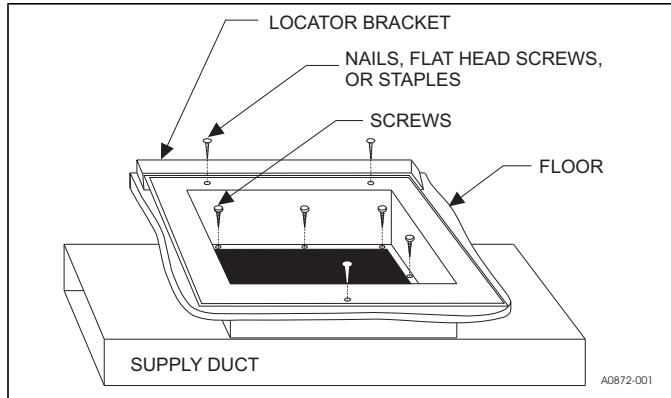


FIGURE 7: Duct Connector Screw Attachment (7990 Series)

4. Apply a water based duct sealant to the 1/2 in. supply duct attachment flange of the duct connector.
5. Determine which of the four positions the duct connector best centers over the supply duct and insert it through the floor cutout.
6. When properly aligned with the supply duct, secure the duct connector to the floor with nails, flat head screws, or staples.
7. Use screws as required to secure duct connector to supply duct.
8. Cut out the opening to the supply duct. If sealant has not been used, tape the mating flanges to provide a good air seal.

NOTICE

Duct sealant and tape must be classified as meeting HUD Standard 3280.715, U.L. Standard 181A.

INSTALLATION OF TAB ATTACHMENT DUCT CONNECTOR (7990 SERIES)

1. Make floor cut out as shown in Figure 6.
2. Determine the depth of the floor cavity from the surface of the floor to the top of the supply air duct and select the appropriate duct connector from the chart.
3. Place locating bracket (supplied with the duct connector) to the rear of the floor area for the furnace. See Figure 8.

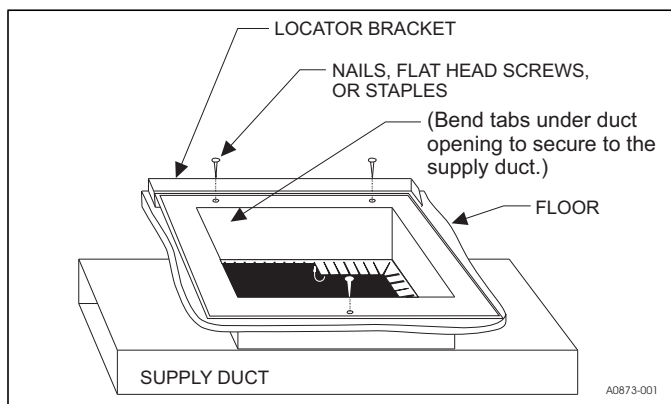


FIGURE 8: Duct Connector Tab Attachment (7990 Series)

4. Determine which of the four positions the duct connector best centers over the supply duct and insert it through the floor cutout.
5. Mark cut-out location on the supply duct and remove the duct connector.
6. Cut out the opening to the supply duct.
7. Bend tabs down through and back up under the supply duct.
8. Secure the duct connector to the floor with nails, flat head screws, or staples.

The duct connector is designed for use on ducts down to 12 in. in width. When using the connector on smaller width ducts, there is insufficient clearance to bend the tabs on two sides of the duct connector.

In such cases, the tabs can be attached to the sides of the duct by using sheet metal screws or other suitable fasteners. Holes for sheet metal screws are provided in three tabs on each side of the duct connector. If more than three tabs need to be used to provide a more secure and air tight connection, the remaining tabs can also be fastened to the duct with screws after drilling the required screw holes.

INSTALLATION OF THE FURNACE

1. Remove the front panels and set the furnace onto the duct connector. Slide it back until the rear of the unit engages the locator bracket.
2. Secure the front of the furnace with two screws at the provided mounting holes. See Figure 9.

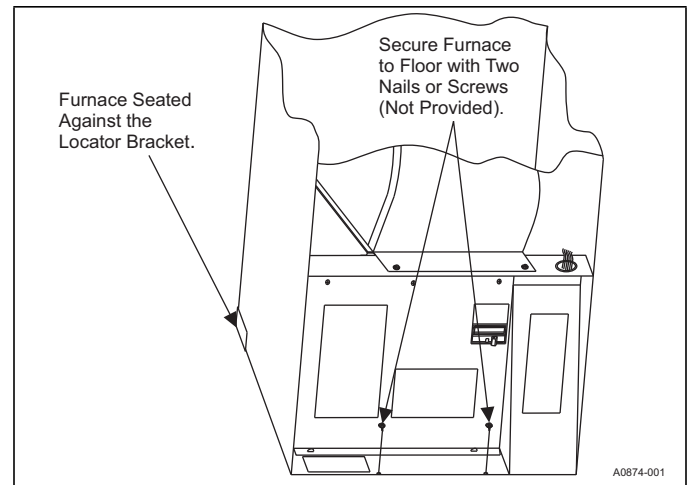


FIGURE 9: Installation of Furnace

3. Secure the top of the furnace to a structural member by screwing through the strap at the top of the furnace. The strap can be moved to any of the holes located along the top back of the furnace. The installer may provide an equivalent method, such as screws through the casing side.

WIRING

Furnace wiring is complete except for the power supply and the thermostat wires. See wiring diagrams (Figures 14 to 19) for wire and fuse size. See Table 2 for ground wire sizes. Thermostat wires connect through the side of the furnace and must be no smaller than 22 gauge. Power wires can enter through the side of the unit or through the auxiliary entrance located in the bottom of the unit. (See Figure 1). When bringing wiring through the bottom of the furnace, cable connectors must be installed to hold wiring in place and relieve any strain on the wiring. These connectors also serve as a seal between the furnace and the floor, so additional sealing is not required.

NOTICE

The furnaces are equipped with either one or two 60 amp circuit breakers. These circuit breakers protect the wiring inside of the furnace in the event of a short circuit. Additionally, these breakers provide a means of disconnecting the power to the unit. The circuit breakers in the furnace are not meant to protect the branch circuit wiring between the furnace and the home's breaker panel. General wire and breaker sizes are shown in Table 2. If sheathed cable is used, refer to National Electrical Code, Canadian Electrical Code and local codes for additional requirements concerning supply circuit wiring. Electrical Data can be found in Table 4.

IMPORTANT: All installation on field wiring must be rated at 60°C or higher.

Models for EBE/EUE15*, EBE/EUE17*, EBE/EUE20*, and EBE/EUE23* can be connected to a single or dual branch circuit.

These units are shipped from the factory set up for dual power supply connections. For single power supply connections, jumper bars (P/N 3500-378P*) are required and are available from the factory. See Figures 11 and 12.

Refer to the National Electrical Code, Canadian Electrical Code, and local codes for wiring material requirements.

TABLE 2: Wiring Requirements

MODELS	¹ EBE10A EUE10A	² EBE12A EUE12A	³ EBE15A EUE15A	³ EBE17A EUE17A	³ EBE20A EUE20A	³ EBE23A EUE23A				
Single Branch Circuit Service	2 Leads + 1 Ground CKT #1									
Nominal Circuit Load - Amps	43.8	50.5	63.8	70.4	83.8	93.8				
Minimum Wire Size (90°C)	#8	#6	#4	#4	#3	#2				
Minimum Wire Size (75°C)	#6	#6	#4	#3	#2	#1				
Minimum Wire Size (60°C)	#6	#4	#3	#2	#1	#0				
Ground Wire Size +	#10	#8	#8	#8	#6	#6				
Max. Fuse (or C.B.) - Amps	60	70	80	90	110	125				
Dual Branch Circuit Service	NOT APPROVED		CKT #1	CKT #2	CKT #1	CKT #2	CKT #1	CKT #2	CKT #1	CKT #2
Branch Circuit Load - Amps			43.8	20.0	47.1	23.3	43.8	40.0	47.1	46.7
Branch Circuit Min. - Amps			54.8	25.0	58.9	29.1	54.8	50.0	58.9	58.4
Minimum Wire Size (90°C)			#8	#10	#6	#10	#8	#8	#6	#6
Minimum Wire Size (75°C)			#6	#10	#6	#10	#6	#8	#6	#6
Minimum Wire Size (60°C)			#6	#10	#4	#10	#6	#6	#4	#4
Ground Wire Size ⁴			#10	#10	#10	#10	#10	#10	#10	#10
Max. Fuse (or C.B.) - Amps			60	30	60	30	60	50	60	60

NOTES:

1. Does not require a jumper.
2. Jumper provided for single branch circuit only.
3. Jumper bar is required for single branch circuit connection (P/N 3500-378P).
4. Refer to National Electrical Code (NEC). Table 250-122 for Non-Sheathed Conductor Ground Wire.

TABLE 3: EBE/EUE Series Blower Performance

Static Pressure (in. W.C.)	Speed	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
CFM (STD. Air) for all EBE/EUE Models	High (5)	1607	1563	1515	1477	1434	1406	1377	1345
	Medium High (4)	1390	1346	1298	1286	1253	1224	1201	1160
	Medium (3)	1241	1192	1151	1115	1097	1074	1032	1000
	Medium Low (2)	1099	1051	1002	979	949	912	872	855
	Low (1)	1006	950	923	896	860	826	800	728

NOTES:

Applications with static pressures higher than 0.3 in. are not recommended.

A blower off delay of 60 seconds is built into the motor.

For up to E(B,U)E15* models heating, use Low speed (1) for compliance with Fan Efficiency Rating test.

For E(B,U)E17*, E(B,U)E20*, and E(B,U)E23* models heating, use Medium Low speed (2) for compliance with Fan Efficiency Rating test.

For all models constant fan operation, use Low speed (1) for compliance with Fan Efficiency Rating test.

TABLE 4: Physical and Electrical Data

¹ MODEL NUMBER			^{2,3} EBE10A EUE10A	^{3,4} EBE12A EUE12A	⁵ EBE15A EUE15A	⁵ EBE17A EUE17A	⁵ EBE20A EUE20A	⁵ EBE23A EUE23A
D.O.E. Output	240 VAC 60 Hz, 1 Phase	BTU	34,000	39,000	51,000	56,000	67,000	77,000
		kW	10.0	11.4	15.0	16.4	19.6	22.6
OUTPUT CAPACITY	230 VAC 60 Hz, 1 Phase	BTU	31,000	36,000	47,000	52,000	61,000	71,000
		kW	9.1	10.6	13.8	15.2	17.9	20.8
	220 VAC 60 Hz, 1 Phase	BTU	29,000	33,000	43,000	48,000	57,000	65,000
		kW	8.5	9.7	12.6	14.1	16.7	19.1
Element Capacity @ 240 VAC		kW	9.6	11.2	14.4	16.0	19.2	21.6
		Amps	40.0	46.7	60.0	66.7	80.0	90.0
Motor Amps @ 240 V			4.0 Maximum					
Circuit Load Amps @ 240 V		CKT 1	43.8	50.5 ⁵	43.8	47.1	43.8	47.1
		CKT 2	NA	NA	20.0	23.3	40.0	46.7
Filter Size for EBE in top of unit only			16 x 20 x 1					
Filter Size for EBE in louvered door only			20 x 20 x 1					
Shipping Weights			83	84	85	86	84	86

NOTES:

1. Casing or cabinet must be permanently grounded in accordance with NEC or other applicable codes.
2. Does not require a jumper.
3. Approved for single branch circuit service only.
4. Jumper provided for single branch circuit only.
5. Jumper bar is required for single branch circuit connection (P/N 3500-378P).

⚠ WARNING

For personal safety be sure to turn the electrical power OFF at the household service box and at the furnace circuit breakers before attempting any service or maintenance operations. Homeowners should never perform any maintenance which requires opening electric box door.

Furnace is equipped with a protective shield over field wiring connection. When field wiring is completed, shield must be replaced to prevent hazard of electrical shock when using furnace disconnect. (See Figure 10.)

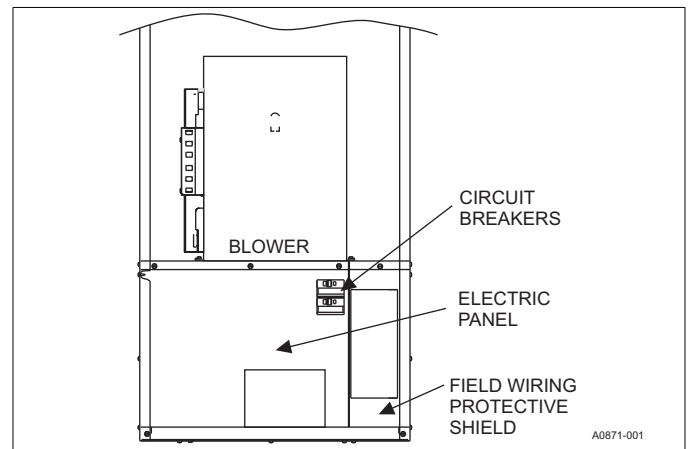


FIGURE 10: Field Wiring Shield

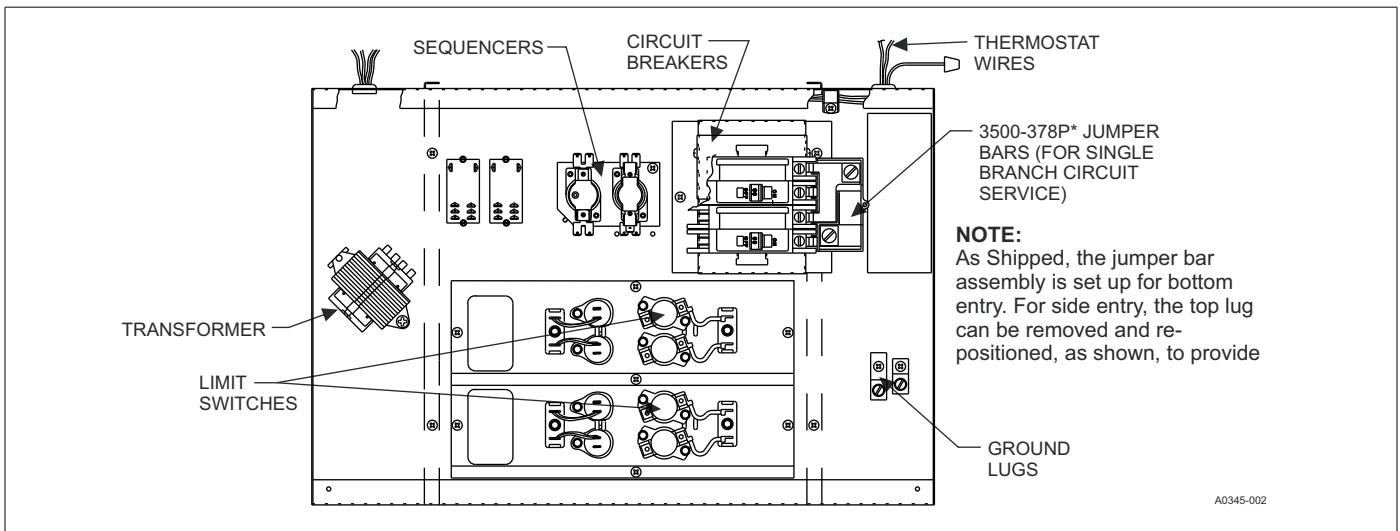


FIGURE 11: Control Box

SECTION V: THERMOSTAT INSTALLATION

The adjustable heat anticipator in the thermostat is pre-set at 0.4 amps. This setting must be checked at the time of installation.

In some cases the thermostat may be a self-setting type, in which case there is no amp setting on the thermostat, eliminating the need for any field adjustment.

The thermostat must be located on an inside wall in an open area to more closely regulate average room air, preferably, where there is air movement back to furnace. Care must be used to locate the thermostat away from hot air discharge openings and lights, for example. The height of the thermostat location is important. The thermostat must be located 52 in. to 66 in. (132 cm to 167.6 cm) above the floor. This is sometimes called the comfort zone.

If a condenser with its own transformer shares a Heat/Cool thermostat with this furnace, use a thermostat with isolating contacts to prevent interconnection of Class II 24 V Systems.

Cycle the furnace using the thermostat to make sure it operates correctly.

Maintenance and operating instructions are in the customer envelope accompanying the furnace. Give the customer envelope to the home owner.

SECTION VI: AIR CONDITIONING ACCESSORIES

EBE/EUE FURNACE MODELS

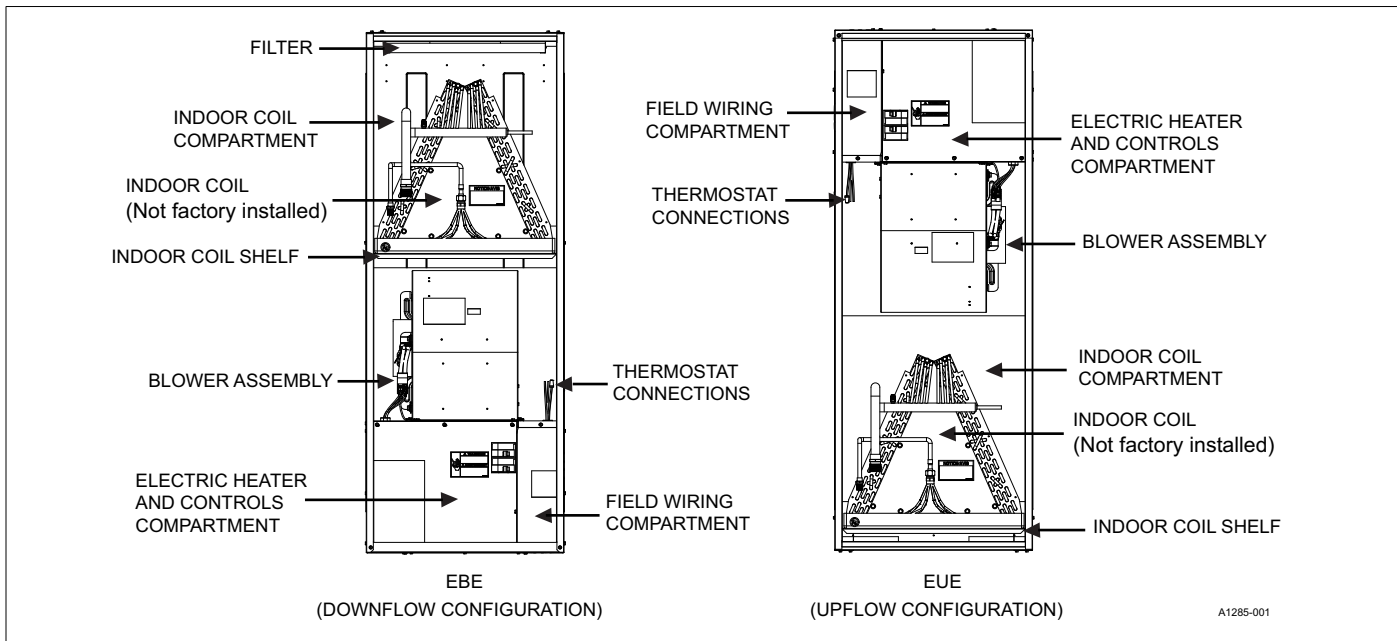


FIGURE 13: EBE/EUE Furnace - Location of Components

NOTICE
EUE furnaces are shipped with the coil shelf in the top orientation. This is not a defect. For application, turn the unit 180° vertically so the coil shelf is in the bottom orientation.

EBE and EUE furnaces are factory equipped with a blower, coil shelf, and control system for add-on air conditioning and heat pump. The coil shelf accessory 3500-8981 can be used to replace current and older EBE and EUE coil shelves.

CAUTION
 When using separate thermostats, a thermostat interlock system must be provided to prevent simultaneous operation of the furnace and air conditioner. Simultaneous operation can result in coach overheating, equipment damage and energy waste. (See Figures 14 to 19.)
 Do not connect Yellow wire to thermostat until an outdoor unit is installed.

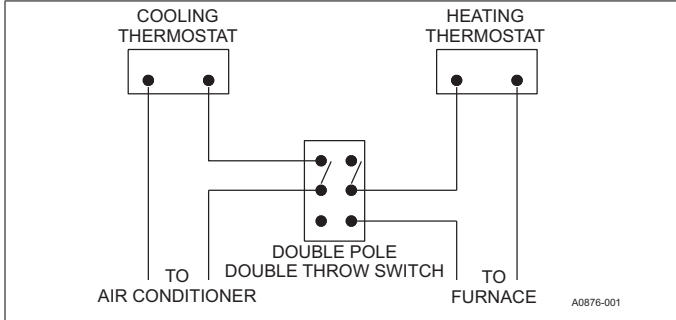


FIGURE 12: Thermostat Wiring

With the factory-installed coil shelf, the coil cavity accepts coils as follows:

- Up to 19-1/2 in. in height
- Up to 18-1/4 in. in width
- Up to 20-1/2 in. in depth

For coil applications with a height above 19-1/2 in., use extension cabinet accessory 3500-8602.

NOTICE
 If the controls are located at the top of the unit, the furnace is an upflow furnace and the airflow is forced up through the furnace and into the airways.

HIGH PERFORMANCE BLOWER
ACCESSORY PACKAGE

 **CAUTION**

All areas around the line sets, drain hoses and other openings in the coil shelf should be sealed air tight. Use some moldable compound or caulking to seal the area. Failure to do so may result in loss of performance and premature compressor failure.

All electric furnaces are equipped with a blower and control system to add on air conditioning and heat pumps to specified sizes. If the requirement is to achieve more airflow or cooling than specified, replace the blower inside the furnace with accessory blower package 3500-7911. This accessory blower package delivers air conditioning up to 5 tons. Apply accessory blower package 3500-7911 to EBE and EUE units to achieve higher airflow.

SECTION VII: WIRING DIAGRAMS

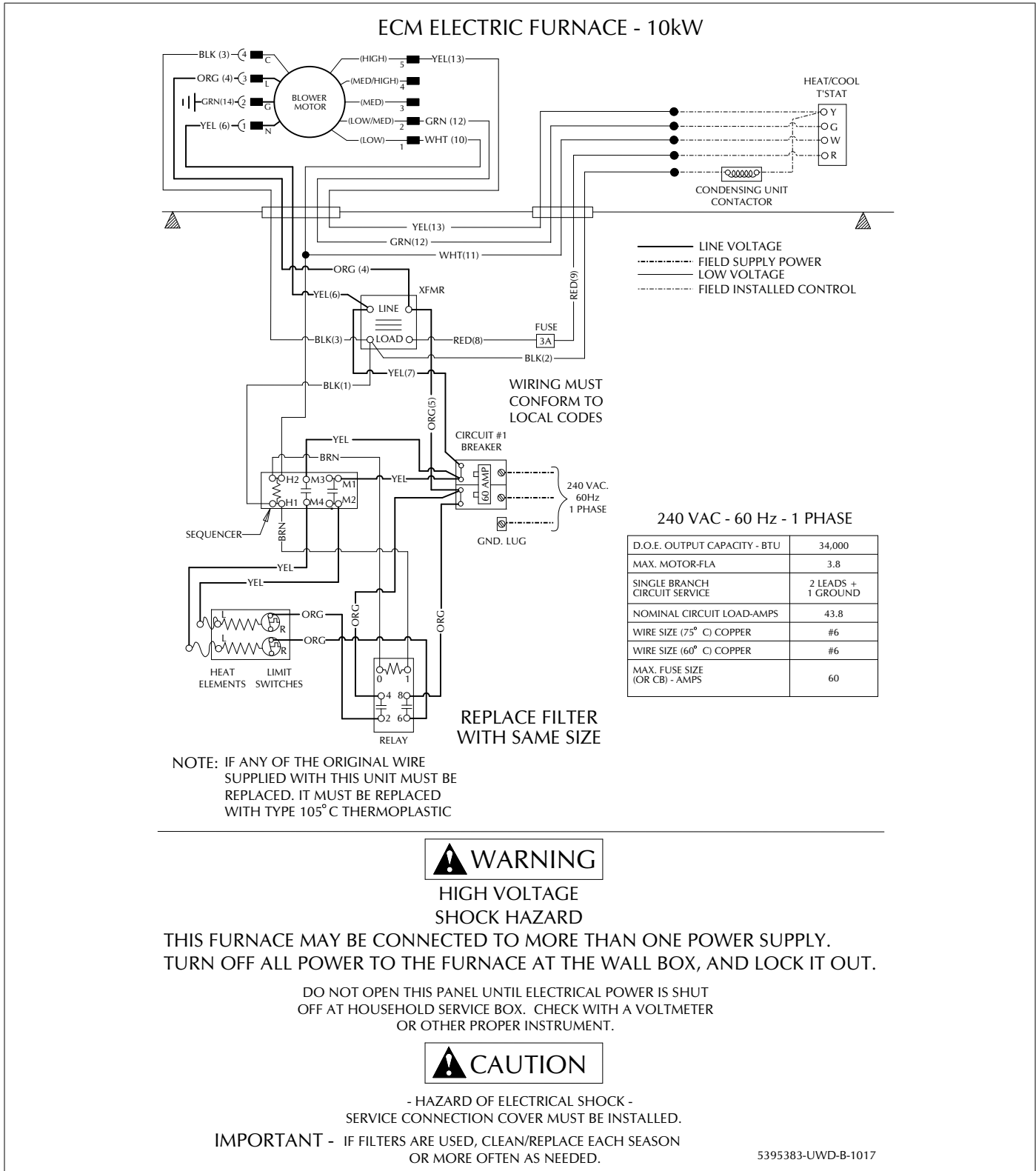


FIGURE 14: EBE10*/EUE10* Wiring Diagram

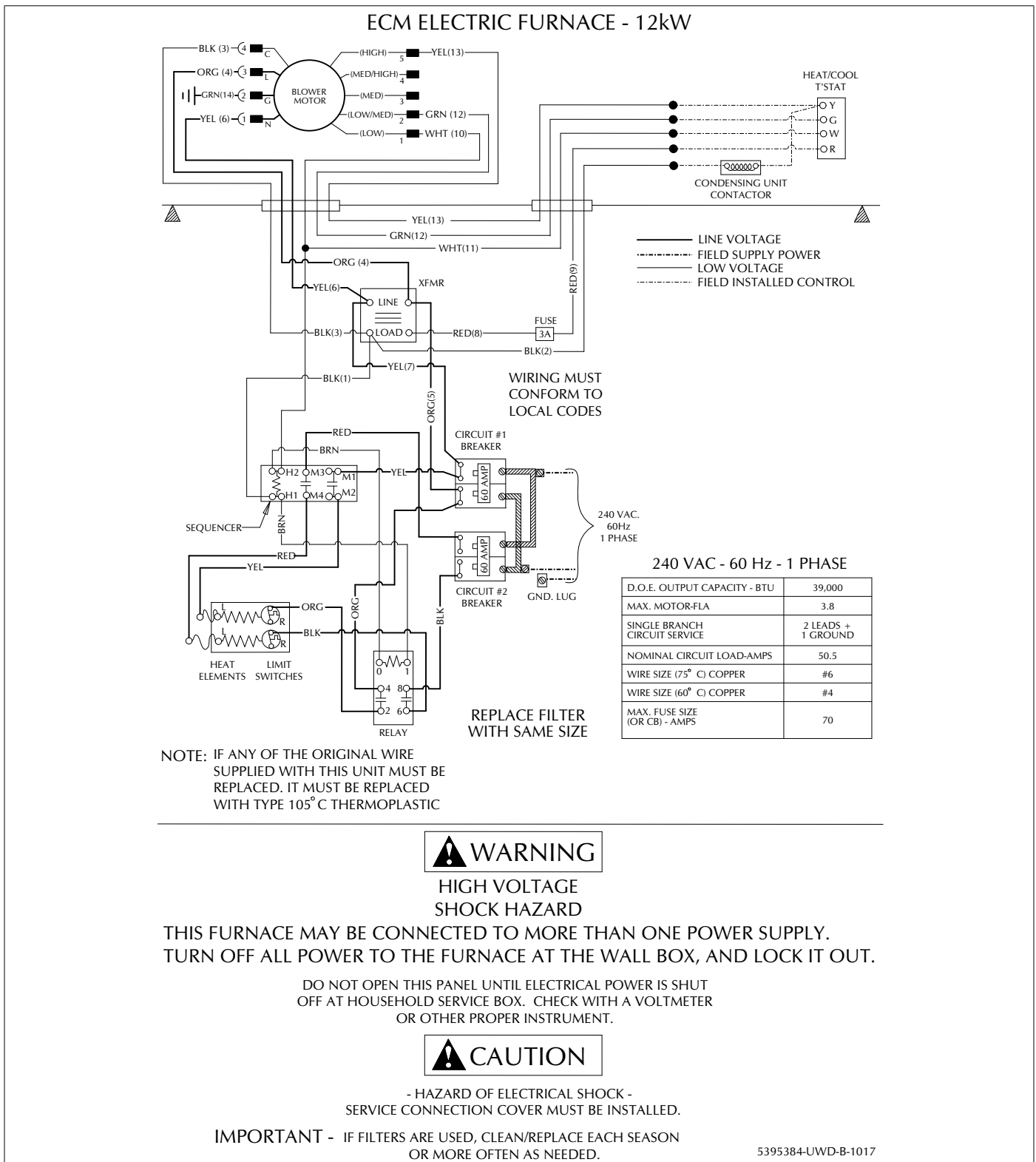
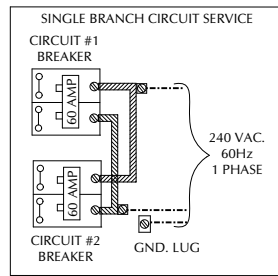
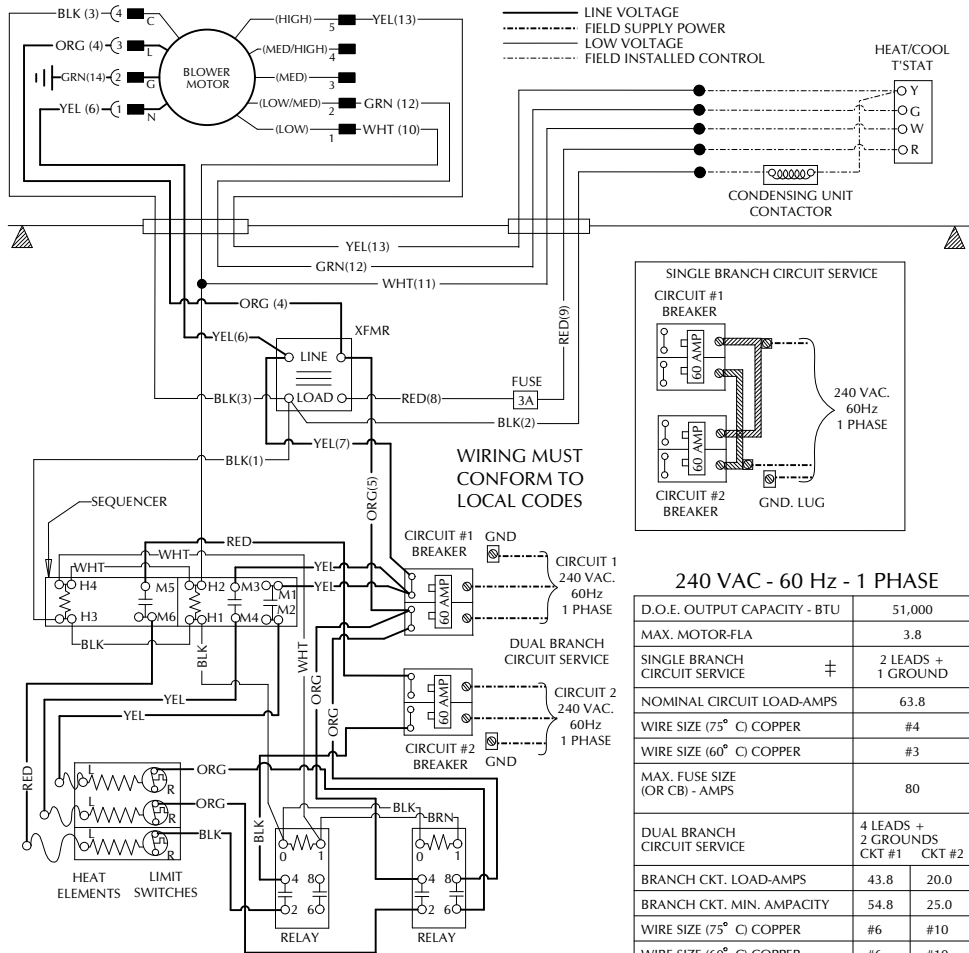


FIGURE 15: EBE12*/EUE12* Wiring Diagram

ECM ELECTRIC FURNACE - 15kW



240 VAC - 60 Hz - 1 PHASE

D.O.E. OUTPUT CAPACITY - BTU	51,000
MAX. MOTOR-FLA	3.8
SINGLE BRANCH CIRCUIT SERVICE	‡ 2 LEADS + 1 GROUND
NOMINAL CIRCUIT LOAD-AMPS	63.8
WIRE SIZE (75° C) COPPER	#4
WIRE SIZE (60° C) COPPER	#3
MAX. FUSE SIZE (OR CB) - AMPS	80
DUAL BRANCH CIRCUIT SERVICE	4 LEADS + 2 GROUNDS CKT #1 CKT #2
BRANCH CKT. LOAD-AMPS	43.8 20.0
BRANCH CKT. MIN. AMPACITY	54.8 25.0
WIRE SIZE (75° C) COPPER	#6 #10
WIRE SIZE (60° C) COPPER	#6 #10
MAX. FUSE SIZE (OR CB) - AMPS	60 30

NOTE: IF ANY OF THE ORIGINAL WIRE SUPPLIED WITH THIS UNIT MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 105° C THERMOPLASTIC

REPLACE FILTER WITH SAME SIZE

‡ REQUIRES JUMPER BARS (P/N 3500-378/*)



WARNING

**HIGH VOLTAGE
SHOCK HAZARD**

THIS FURNACE MAY BE CONNECTED TO MORE THAN ONE POWER SUPPLY. TURN OFF ALL POWER TO THE FURNACE AT THE WALL BOX, AND LOCK IT OUT.

DO NOT OPEN THIS PANEL UNTIL ELECTRICAL POWER IS SHUT OFF AT HOUSEHOLD SERVICE BOX. CHECK WITH A VOLTMETER OR OTHER PROPER INSTRUMENT.



CAUTION

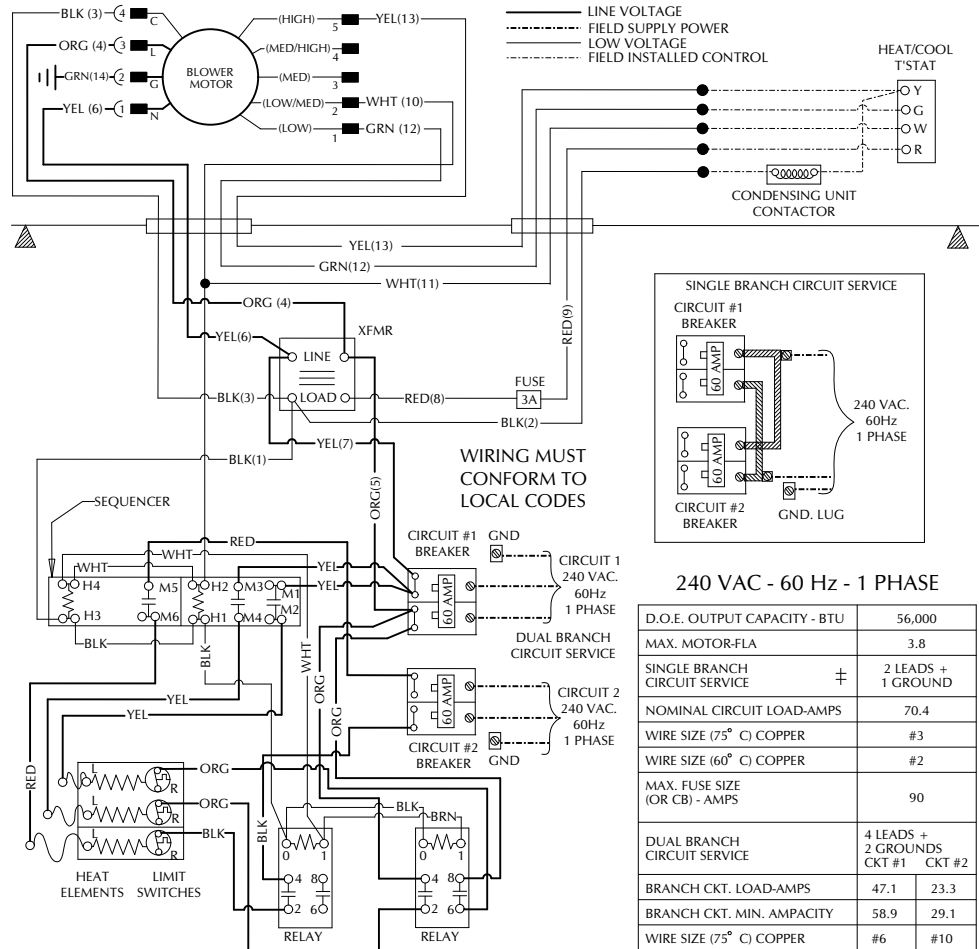
- HAZARD OF ELECTRICAL SHOCK -
SERVICE CONNECTION COVER MUST BE INSTALLED.

IMPORTANT - IF FILTERS ARE USED, CLEAN/REPLACE EACH SEASON OR MORE OFTEN AS NEEDED.

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FIGURE 16: EBE15*/EUE15* Wiring Diagram

ECM ELECTRIC FURNACE - 17kW



NOTE: IF ANY OF THE ORIGINAL WIRE SUPPLIED WITH THIS UNIT MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 105° C THERMOPLASTIC

REPLACE FILTER WITH SAME SIZE

240 VAC - 60 Hz - 1 PHASE

D.O.E. OUTPUT CAPACITY - BTU	56,000
MAX. MOTOR-FLA	3.8
SINGLE BRANCH CIRCUIT SERVICE	± 2 LEADS + 1 GROUND
NOMINAL CIRCUIT LOAD-AMPS	70.4
WIRE SIZE (75° C) COPPER	#3
WIRE SIZE (60° C) COPPER	#2
MAX. FUSE SIZE (OR CB) - AMPS	90
DUAL BRANCH CIRCUIT SERVICE	4 LEADS + 2 GROUNDS CKT #1 CKT #2
BRANCH CKT. LOAD-AMPS	47.1 23.3
BRANCH CKT. MIN. AMPACITY	58.9 29.1
WIRE SIZE (75° C) COPPER	#6 #10
WIRE SIZE (60° C) COPPER	#4 #10
MAX. FUSE SIZE (OR CB) - AMPS	60 30

± REQUIRES JUMPER BARS (P/N 3500-378/*)

WARNING

HIGH VOLTAGE SHOCK HAZARD

THIS FURNACE MAY BE CONNECTED TO MORE THAN ONE POWER SUPPLY. TURN OFF ALL POWER TO THE FURNACE AT THE WALL BOX, AND LOCK IT OUT.

DO NOT OPEN THIS PANEL UNTIL ELECTRICAL POWER IS SHUT OFF AT HOUSEHOLD SERVICE BOX. CHECK WITH A VOLTMETER OR OTHER PROPER INSTRUMENT.

CAUTION

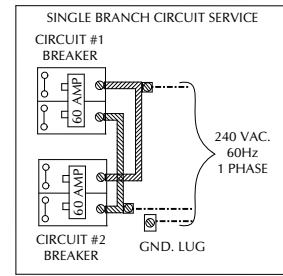
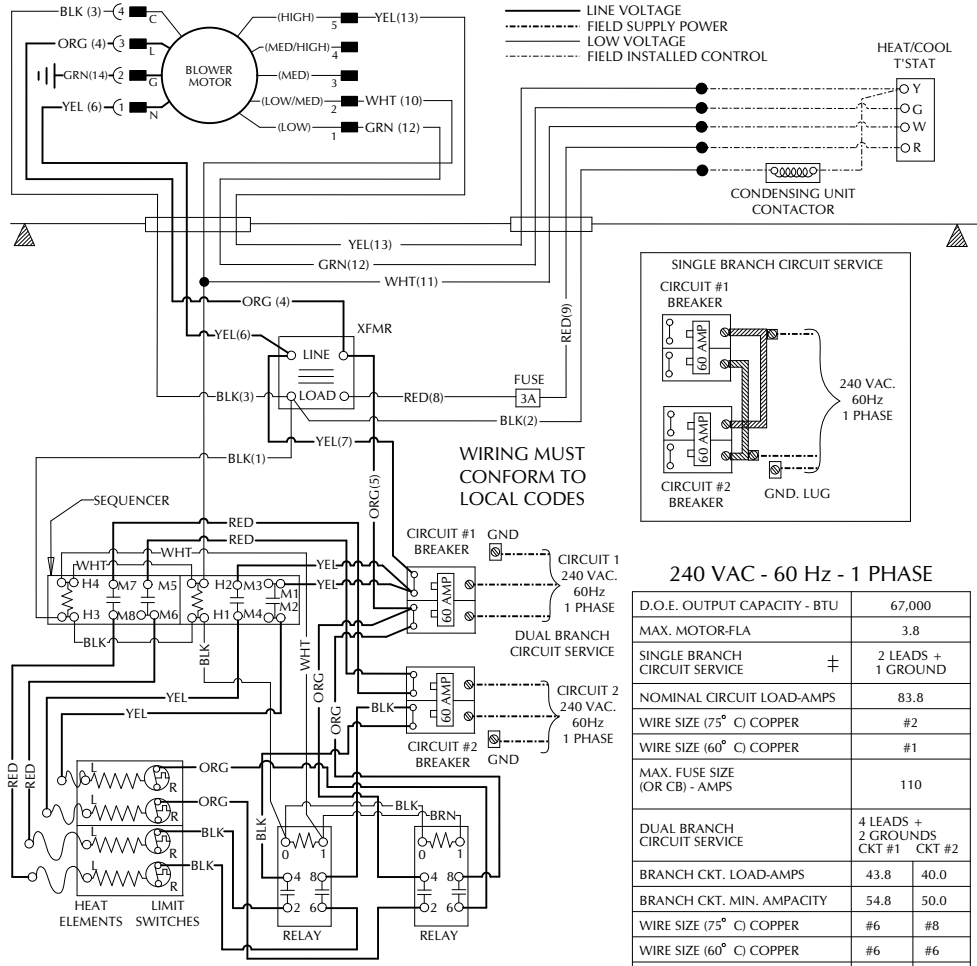
- HAZARD OF ELECTRICAL SHOCK - SERVICE CONNECTION COVER MUST BE INSTALLED.

IMPORTANT - IF FILTERS ARE USED, CLEAN/REPLACE EACH SEASON OR MORE OFTEN AS NEEDED.

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FIGURE 17: EBE17*/EUE17* Wiring Diagram

ECM ELECTRIC FURNACE - 20kW



240 VAC - 60 Hz - 1 PHASE

D.O.E. OUTPUT CAPACITY - BTU	67,000	
MAX. MOTOR-FLA	3.8	
SINGLE BRANCH CIRCUIT SERVICE	‡ 2 LEADS + 1 GROUND	
NOMINAL CIRCUIT LOAD-AMPS	83.8	
WIRE SIZE (75° C) COPPER	#2	
WIRE SIZE (60° C) COPPER	#1	
MAX. FUSE SIZE (OR CB) - AMPS	110	
DUAL BRANCH CIRCUIT SERVICE	4 LEADS + 2 GROUNDS CKT #1 CKT #2	
BRANCH CKT. LOAD-AMPS	43.8	40.0
BRANCH CKT. MIN. AMPACITY	54.8	50.0
WIRE SIZE (75° C) COPPER	#6	#8
WIRE SIZE (60° C) COPPER	#6	#6
MAX. FUSE SIZE (OR CB) - AMPS	60	50

NOTE: IF ANY OF THE ORIGINAL WIRE SUPPLIED WITH THIS UNIT MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 105° C THERMOPLASTIC

REPLACE FILTER WITH SAME SIZE

‡ REQUIRES JUMPER BARS (P/N 3500-378/*)



WARNING
HIGH VOLTAGE
SHOCK HAZARD

THIS FURNACE MAY BE CONNECTED TO MORE THAN ONE POWER SUPPLY. TURN OFF ALL POWER TO THE FURNACE AT THE WALL BOX, AND LOCK IT OUT.

DO NOT OPEN THIS PANEL UNTIL ELECTRICAL POWER IS SHUT OFF AT HOUSEHOLD SERVICE BOX. CHECK WITH A VOLTMETER OR OTHER PROPER INSTRUMENT.



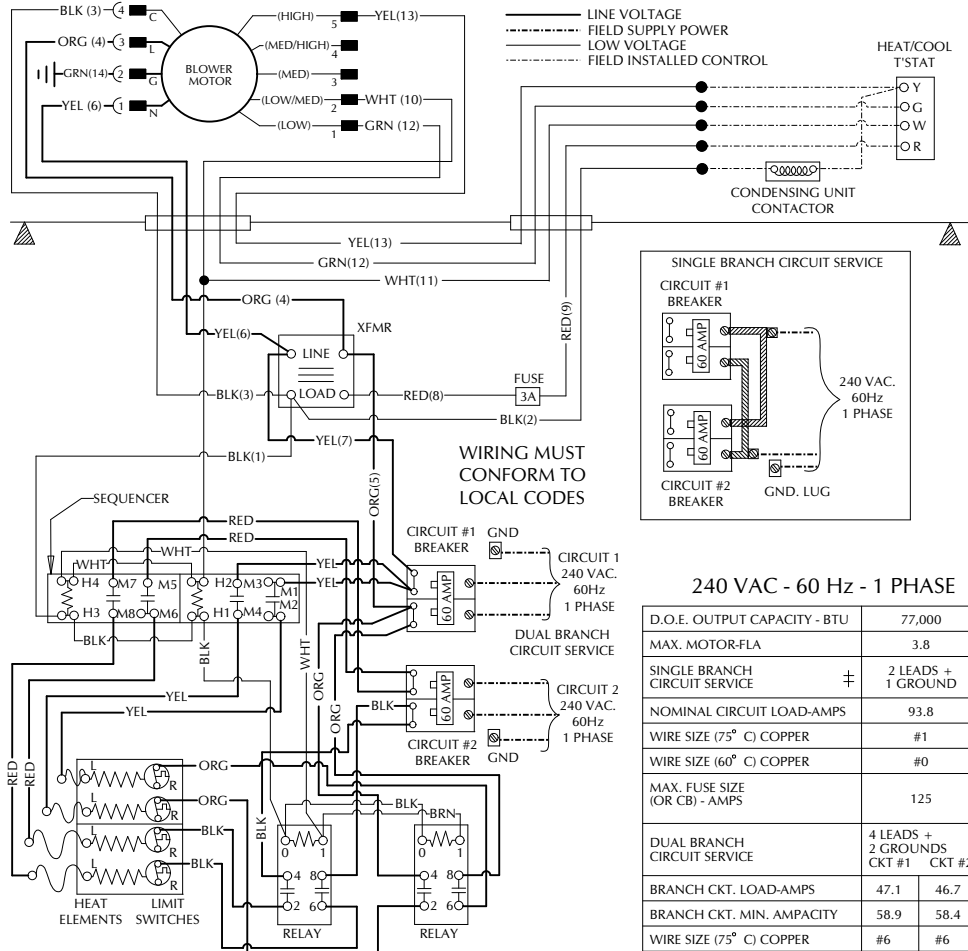
CAUTION
- HAZARD OF ELECTRICAL SHOCK -
SERVICE CONNECTION COVER MUST BE INSTALLED.

IMPORTANT - IF FILTERS ARE USED, CLEAN/REPLACE EACH SEASON OR MORE OFTEN AS NEEDED.

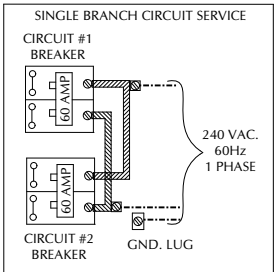
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FIGURE 18: EBE20*/EUE20* Wiring Diagram

ECM ELECTRIC FURNACE - 23kW



WIRING MUST CONFORM TO LOCAL CODES



240 VAC - 60 Hz - 1 PHASE

D.O.E. OUTPUT CAPACITY - BTU	77,000
MAX. MOTOR-FLA	3.8
SINGLE BRANCH CIRCUIT SERVICE	‡ 2 LEADS + 1 GROUND
NOMINAL CIRCUIT LOAD-AMPS	93.8
WIRE SIZE (75° C) COPPER	#1
WIRE SIZE (60° C) COPPER	#0
MAX. FUSE SIZE (OR CB) - AMPS	125
DUAL BRANCH CIRCUIT SERVICE	4 LEADS + 2 GROUNDS CKT #1 CKT #2
BRANCH CKT. LOAD-AMPS	47.1 46.7
BRANCH CKT. MIN. AMPACITY	58.9 58.4
WIRE SIZE (75° C) COPPER	#6 #6
WIRE SIZE (60° C) COPPER	#4 #4
MAX. FUSE SIZE (OR CB) - AMPS	60 60

NOTE: IF ANY OF THE ORIGINAL WIRE SUPPLIED WITH THIS UNIT MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 105° C THERMOPLASTIC

REPLACE FILTER WITH SAME SIZE

‡ REQUIRES JUMPER BARS (P/N 3500-378/*)

WARNING

HIGH VOLTAGE SHOCK HAZARD

THIS FURNACE MAY BE CONNECTED TO MORE THAN ONE POWER SUPPLY. TURN OFF ALL POWER TO THE FURNACE AT THE WALL BOX, AND LOCK IT OUT.

DO NOT OPEN THIS PANEL UNTIL ELECTRICAL POWER IS SHUT OFF AT HOUSEHOLD SERVICE BOX. CHECK WITH A VOLTMETER OR OTHER PROPER INSTRUMENT.

CAUTION

- HAZARD OF ELECTRICAL SHOCK - SERVICE CONNECTION COVER MUST BE INSTALLED.

IMPORTANT - IF FILTERS ARE USED, CLEAN/REPLACE EACH SEASON OR MORE OFTEN AS NEEDED.

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FIGURE 19: EBE23*/EUE23* Wiring Diagram

NOTES