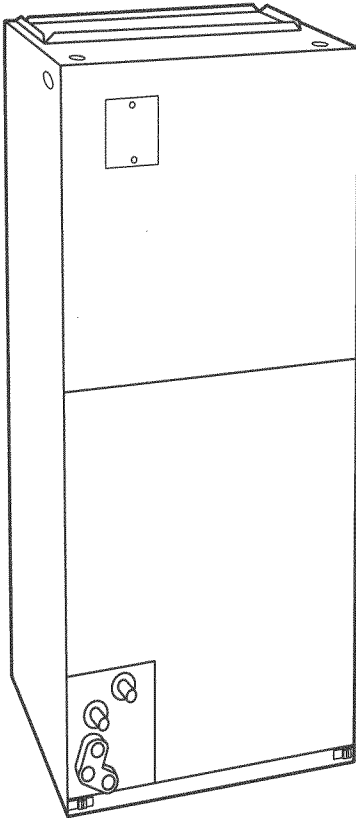


INSTALLATION INSTRUCTIONS



EBP series

Use **ONLY** factory listed electric heaters.

Fan Coils

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Safety Labeling and Signal Words

Danger, Warning and Caution

The signal words **DANGER**, **WARNING** and **CAUTION** are used to identify levels of hazard seriousness. The signal word **DANGER** is only used on product labels to signify an immediate hazard. The signal words **WARNING** and **CAUTION** will be used on product labels and throughout this manual and other manuals that may apply to the product.

DANGER - Immediate hazards which **WILL** result in severe personal injury or death.

WARNING - Hazards or unsafe practices which **COULD** result in severe personal injury or death.

CAUTION - Hazards or unsafe practices which **MAY** result in minor personal injury or product or property damage.

Signal Words in Manuals

The signal word **WARNING** is used throughout this manual in the following manner:



The signal word **CAUTION** is used throughout this manual in the following manner:

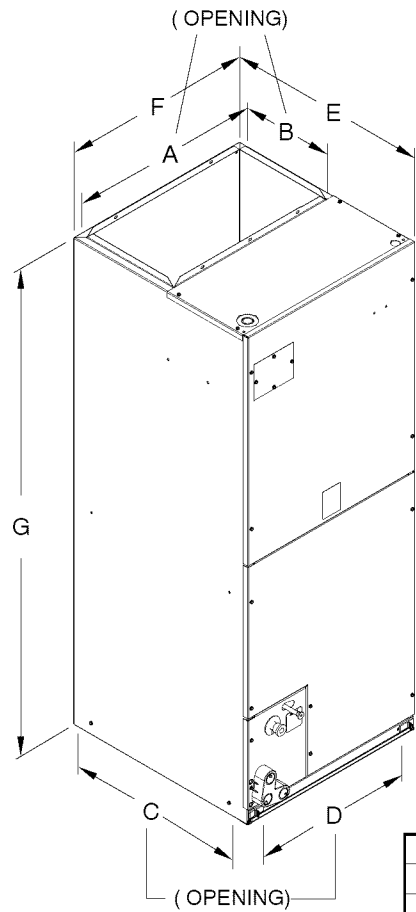


Product Labeling

Signal words are used in combination with colors and/or pictures on product labels.

Figure 1

Dimensions and Clearances



⚠ WARNING

Fire Hazard
Failure to do so can result in fire, property damage, personal injury or death.

When heaters are installed maintain clearances from combustible materials as specified on unit rating plate. Do not use plastic lined or combustible flexible ducting within 36 inches of the supply end of the air handler.

CLEARANCES	
NO HEATERS	
All Sides	0"
From Supply Duct	0"
Recommended Service From Front	20"
(Service for blower, filter if installed)	
WITH HEATERS	
All Sides	0"
From First Three Feet of Supply Duct to Combustibles	1"
From Duct after Three Feet	0"
Recommended Service From Front	20"

Model Size	A	B	C	D	E	F	G
2400	12-7/16"	11"	19 - 13/16"	12-5/16"	22 - 1/16"	14-5/16"	42 -11/16"
3600	15-3/4"	11"	19 - 13/16"	15-5/8"	22 - 1/16"	17 - 5/8"	49-5/8"
4800	19 - 1/4"	11"	19 - 13/16"	19 - 1/8"	22 - 1/16"	21 - 1/8"	49-5/8"
6000	19 - 1/4"	11"	19 - 13/16"	19 - 1/8"	22 - 1/16"	21 - 1/8"	53 - 7/16"

General Information

⚠ WARNING

DEATH, PERSONAL INJURY AND/OR PROPERTY DAMAGE HAZARD

Failure to carefully read and follow all instructions in this manual could result in equipment malfunction, property damage, personal injury and/or death.

Installation or repairs made by unqualified persons can result in hazards to you and others. Installation **MUST** conform with local building codes and with the National Electrical Code NFPA70 current edition.

The information contained in this manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments.

The fan coil may be used for cooling or heat pump operation with or without electric heat. Installations without electric heat require a No Heat Kit (factory installed on all models). The cabinet can be installed in an up-flow or horizontal position (refer to **Figure 2 & Figure 3**). Fan coils are not shipped with air filters installed. Filter must be field installed. Washable filters are available as an accessory.

Location

Select the best position which suits the installation site conditions. The location should provide adequate structural support, space in the front of the unit for service access, clearance for return air and supply duct connections, space for refrigerant piping connections and condensate drain line connections. If heaters are being installed make sure adequate clearance is maintained from supply ductwork, **See Clearances and Warning in Figure 1**.

Nuisance sweating may occur if the unit is installed in a high humidity environment with low airflow. On these installations a wrap of 2" (51 mm) fiberglass insulation with a vapor barrier is recommended.

NOTE: Internal filter is accessed from separate filter door. If the filter can **NOT** be easily accessed, a remote filter is recommended. Refer to ACCA Manual D for remote filter sizing.

INTRODUCTION

EBP fan coils are designed for flexibility and can be used for upflow, horizontal, or downflow (kit required) applications. These units are available for systems of 24,000 through 60,000 Btuh nominal cooling capacity. Factory authorized electric heater packages are available in sizes 5 through 30kw. See Product Specification Literature for available accessory kits.

HEATER PACKAGES

A factory approved, field installed UL listed heater package is available from your equipment supplier. See unit rating plate for a list of factory approved heaters. Heaters that are not factory approved could cause damage which would not be covered under the equipment warranty.

INSTALLATION

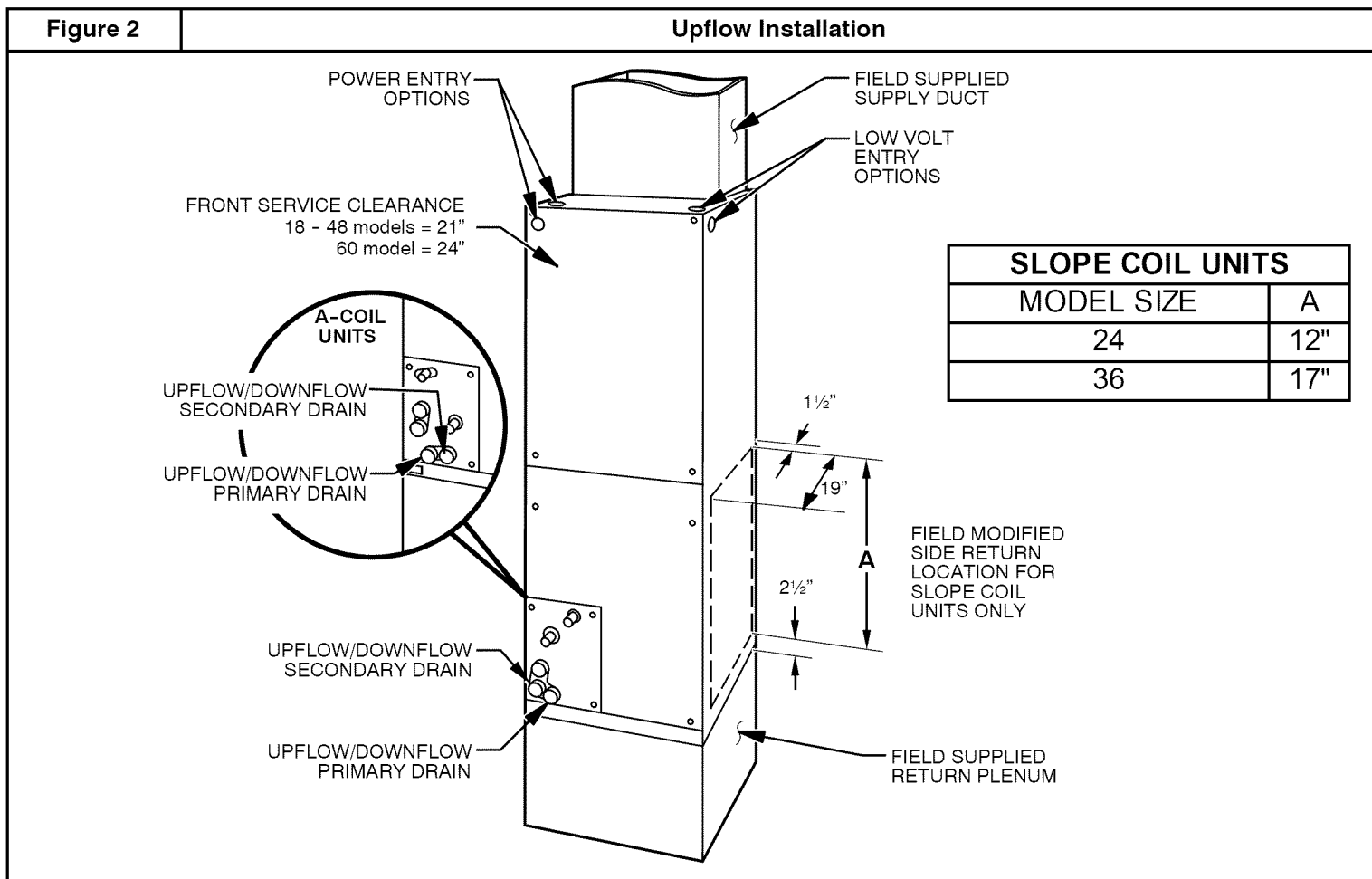
PROCEDURE 1-MOUNT UNIT

Unit can stand or lie on floor, or hang from ceiling or wall. Allow space for wiring, piping, and servicing unit.

A. Upflow Installation

If return air is to be ducted through a floor, set unit on floor over opening and use 1/8" to 1/4" thick fireproof resilient gasket between duct, unit, and floor.

Side return is a field option on slope coil models. Cut opening per dimensions. (Refer to **Figure 2**) A field-supplied bottom closure is required.



B. Downflow Installation

In this application, field conversion of the evaporator coil is required using accessory downflow kit along with an accessory base kit. See installation instructions packaged with accessory kit. See Product Specification for kit part numbers.

C. Horizontal Installation

CAUTION

UNIT or PROPERTY DAMAGE HAZARD

Failure to follow this caution may result in property damage.

A field fabricated auxiliary drain pan, with a separate drain is **REQUIRED** for all installations over a finished living space or in any area that may be damaged by overflow from a restricted main drain pan. In some localities, local codes require an auxiliary drain pan for **ANY** horizontal installation.

Units must not be installed with access panels facing up or down. All units are factory built for horizontal left installation which can be field converted to horizontal right. (Refer to **Figure 3** and **Figure 6**) When suspending unit from ceiling, dimples in casing indicate suitable location of screws for mounting metal support straps. (Refer to **Figure 3**)

NOTE: For optimum condensate drainage performance in horizontal installations, unit should be leveled along its length and width.

HORIZONTAL RIGHT CONVERSION OF UNITS WITH SLOPE COILS

1. Remove blower and coil access panel and fitting panel. (Refer to **Figure 4**)
2. Remove coil mounting screw securing coil assembly to right side casing flange.
3. Remove coil assembly.
4. Lay fan coil unit on its right side and reinstall coil assembly with condensate pan down. (Refer to **Figure 4**)
5. Attach coil to casing flange using coil mounting screw previously removed.
6. Align holes with tubing connections and condensate pan connections, and reinstall access panels and fitting panel. Make sure liquid and suction tube grommets are in place to prevent air leaks and cabinet sweating. Install after brazing.

HORIZONTAL RIGHT CONVERSION OF UNITS WITH A-COILS

1. Remove blower and coil access panel and fitting panel.
2. Remove coil mounting screw securing coil assembly to right side casing flange.
3. Remove coil assembly.
4. Lay fan coil unit on its right side and reinstall coil assembly with condensate pan down. (Refer to **Figure 5**)
5. Remove horizontal drain pan support bracket from coil support rail on left side of unit and reinstall on coil support rail on right side of unit.
6. Convert air-seal assembly for horizontal right. (Refer to **Figure 5**)
 - A. Remove air-seal assembly from coil by removing 4 screws.
 - B. Remove coil drip flanges from A-coil and reinstall on right side of coil (same side as horizontal drain pan).
 - C. Remove filler plate (A) and install air splitter (B) in place of filler plate.
 - D. Install filler plate (A) as shown in horizontal right application.
 - E. Remove condensate troughs (C) and install on opposite tube sheets.
 - F. Install hose onto plastic spout.
7. Install horizontal pan on right side of coil assembly.
8. Slide coil assembly into casing. Be sure coil bracket on each corner of vertical pan engages coil support rails.

9. Reinstall 2 snap-in clips to correctly position and secure coil assembly in unit. Be sure clip with large offsets is used on right side of unit to secure horizontal pan.
10. Remove 2 oval coil access panel plugs and reinstall into holes on left side of coil access panel and fitting panel.
11. Remove insulation knockouts on right side of coil access panel
12. Reinstall access fitting panels, aligning holes with tubing connections and condensate pan connections. Be sure to reinstall metal clip between fitting panel and vertical condensate pan.

Make sure liquid and suction tube grommets are in place to prevent air leaks and cabinet sweating.

D. Manufactured and Mobile Home Housing Applications

1. Fan coil unit must be secured to the structure using field-supplied hardware.
2. Allow a minimum of 24" clearance from access panels.
3. Recommended method of securing for typical applications
 - a. If fan coil is away from wall, attach pipe strap to top of fan coil using No. 10 self tapping screws. Angle strap down and away from back of fan coil, remove all slack, and fasten to wall stud of structure using 5/16" lag screws. Typical both sides of fan coil.
 - b. If fan coil is against wall, secure fan coil to wall stud using 1/8" thick right-angle brackets. Attach brackets to fan coil using No. 10 self tapping screws and to wall stud using 5/16" lag screws. (Refer to **Figure 7**)

PROCEDURE 2-AIR DUCTS

Connect supply-air duct over the outside of 3/4" flanges provided on supply-air opening. Secure duct to flange, using proper fasteners for type of duct used, and seal duct-to-unit joint. If return-air flanges are required, install factory authorized accessory kit.

It is a recommendation, but not a requirement, to use flexible connectors between ductwork and unit to prevent transmission of vibration. When electric heater is installed, use heat-resistant material for flexible connector between ductwork and unit at discharge connection. Ductwork passing through unconditioned space must be insulated and covered with vapor barrier.

Ductwork Acoustical Treatment

Metal duct systems that do not have a 90 degree elbow and 10 ft. of main duct to first branch takeoff may require internal acoustical insulation lining. As an alternative, fibrous ductwork may be used if constructed and installed in accordance with the latest edition of SMACNA construction standard on fibrous glass ducts. Both acoustical lining and fibrous ductwork shall comply with National Fire Protection Association as tested by UL Standard 181 for Class 1 air ducts.

Figure 3

Slope Coil In Horizontal Left Application

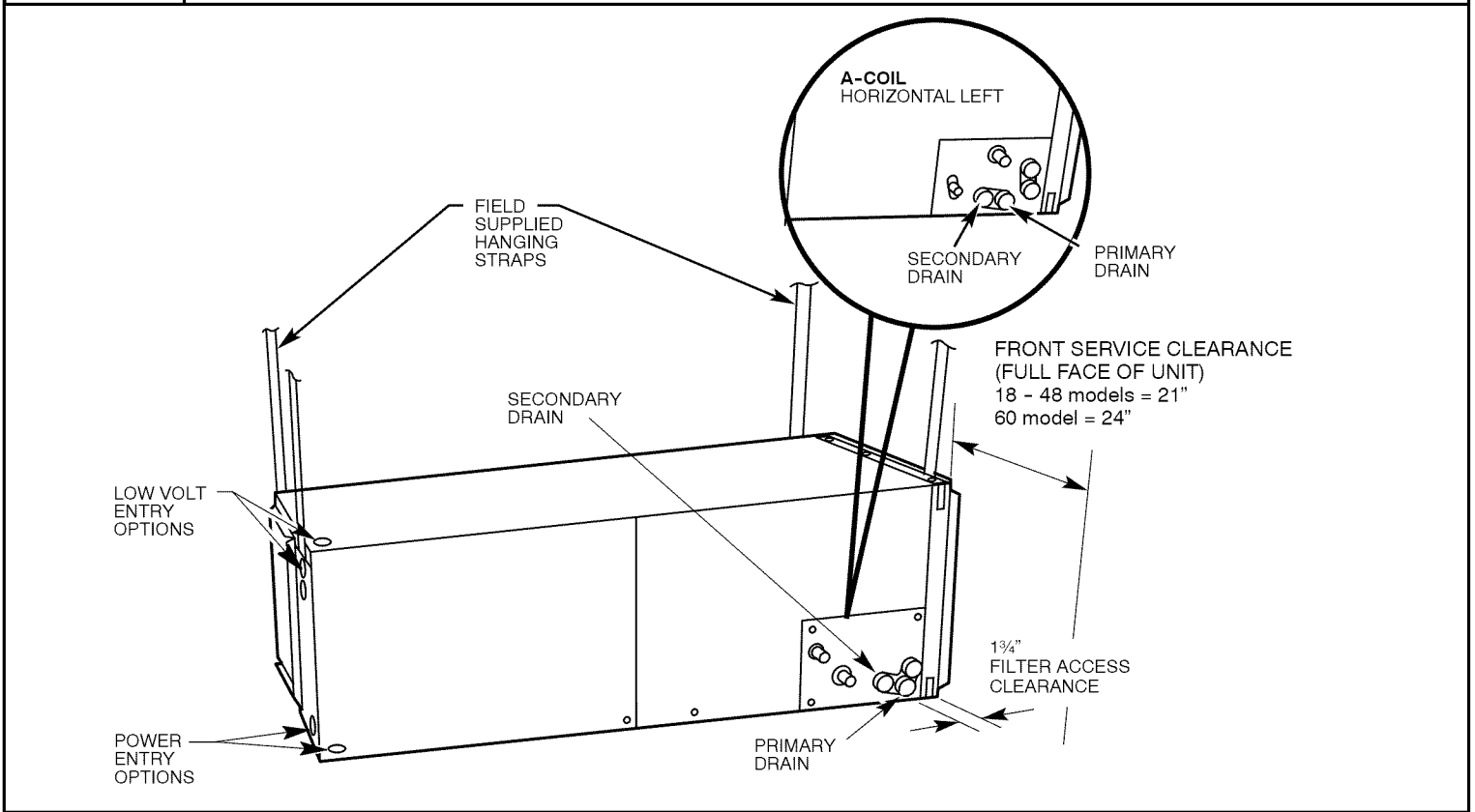


Figure 4

Conversion for Horizontal Right Applications Using a Slope Coil

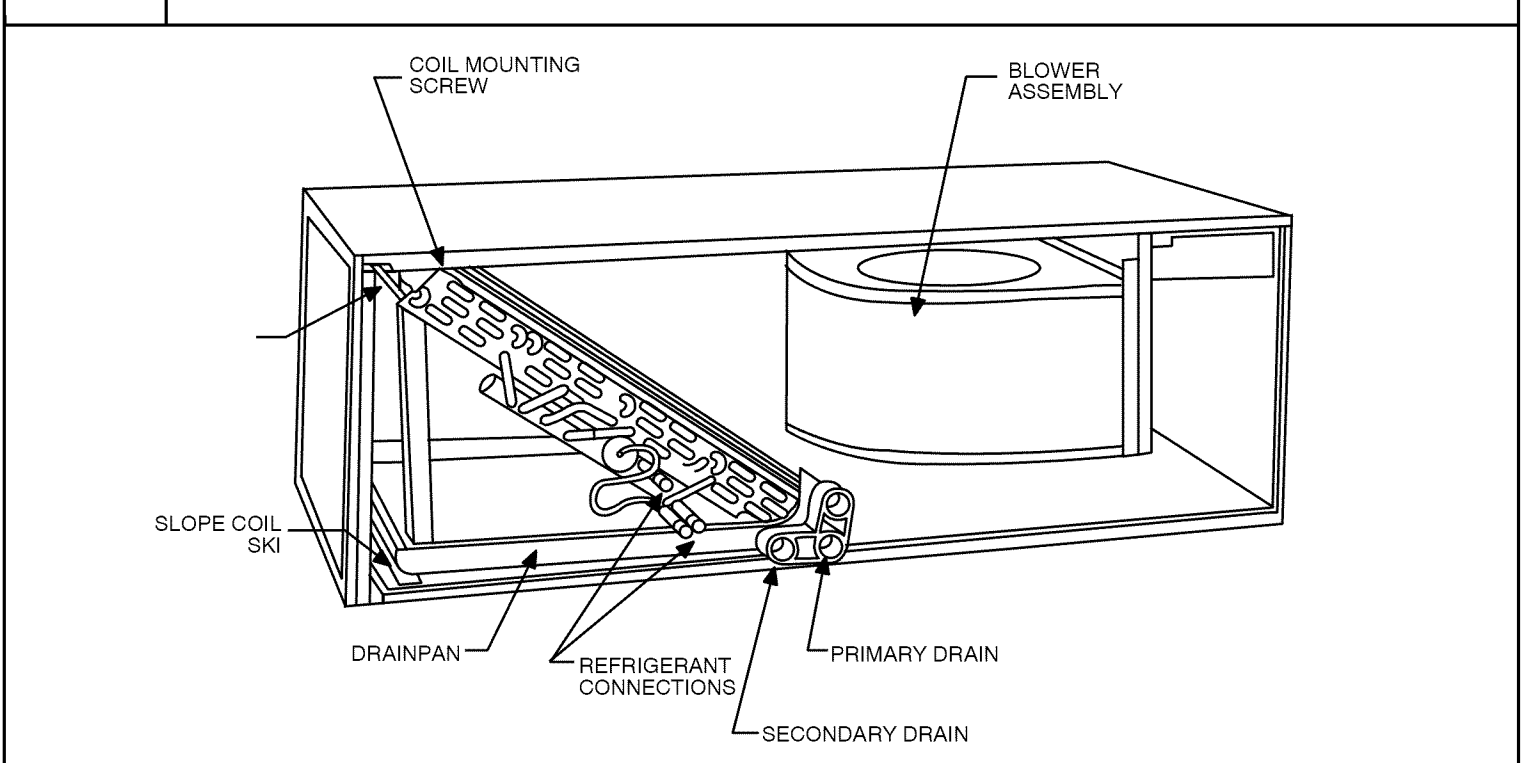


Figure 5

Conversion for Horizontal Right Applications Using A-Coil

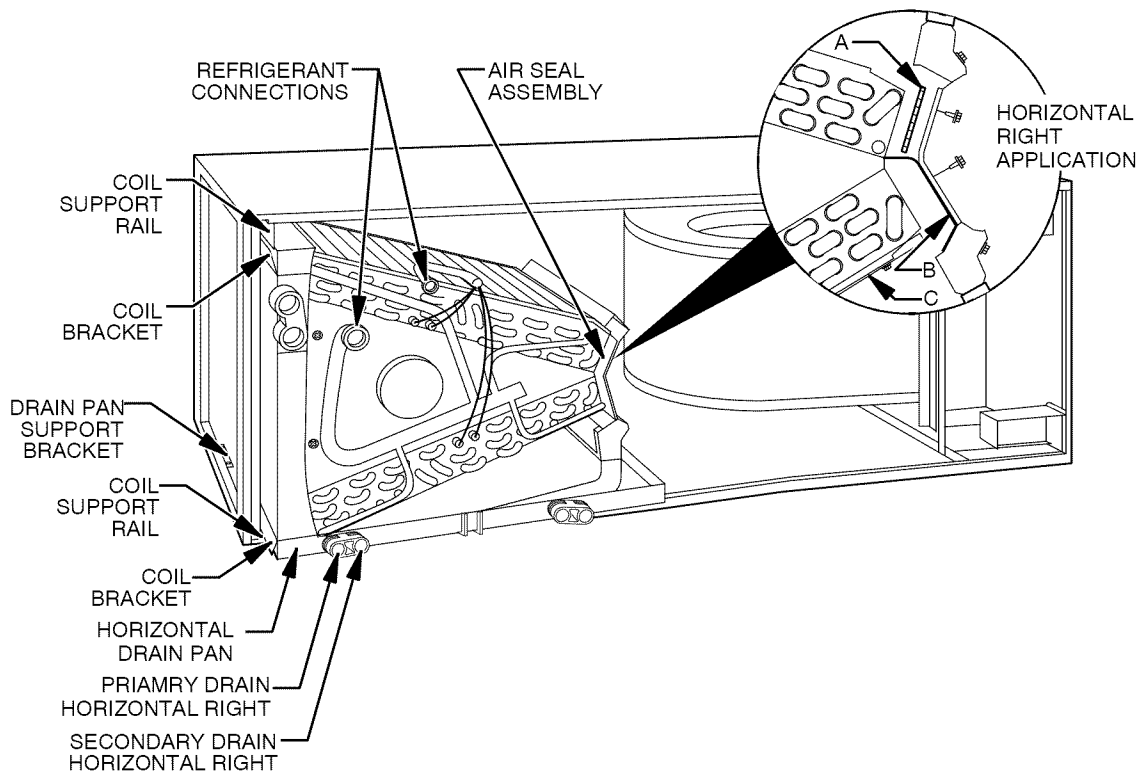


Figure 6

A-Coil in Horizontal Left Application

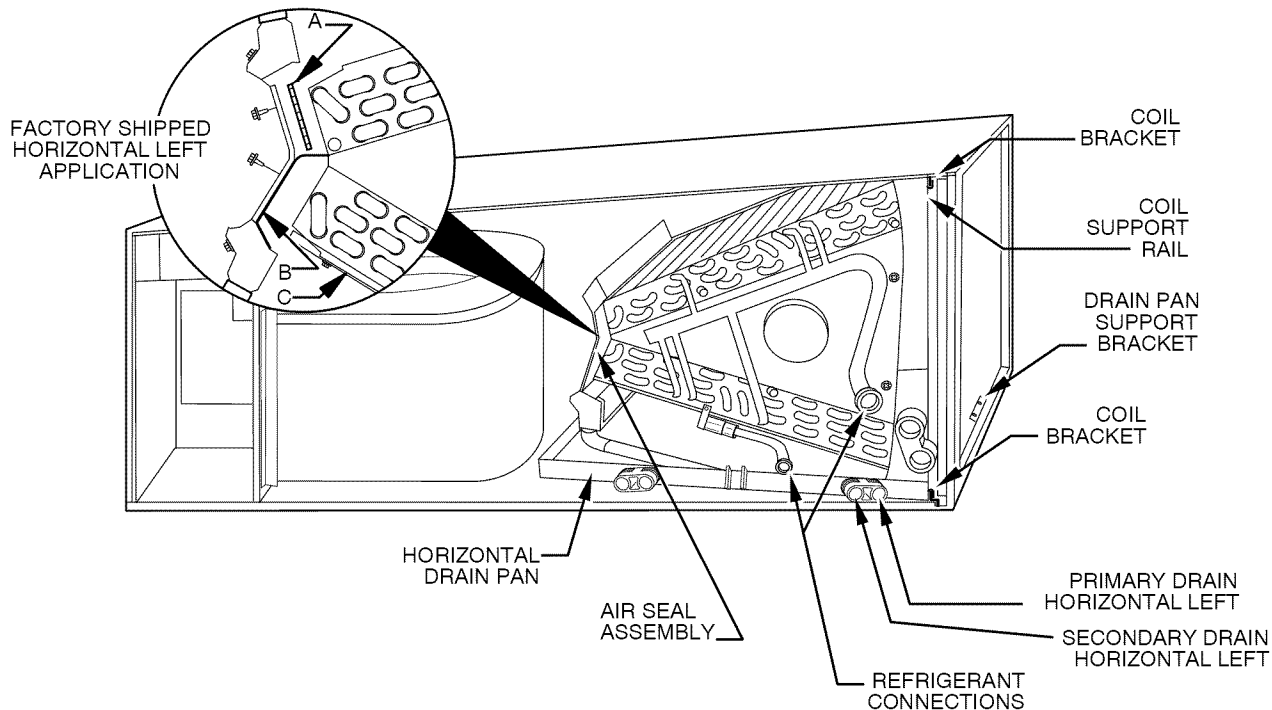


Figure 7 Mobile Home or Manufactured Housing Applications

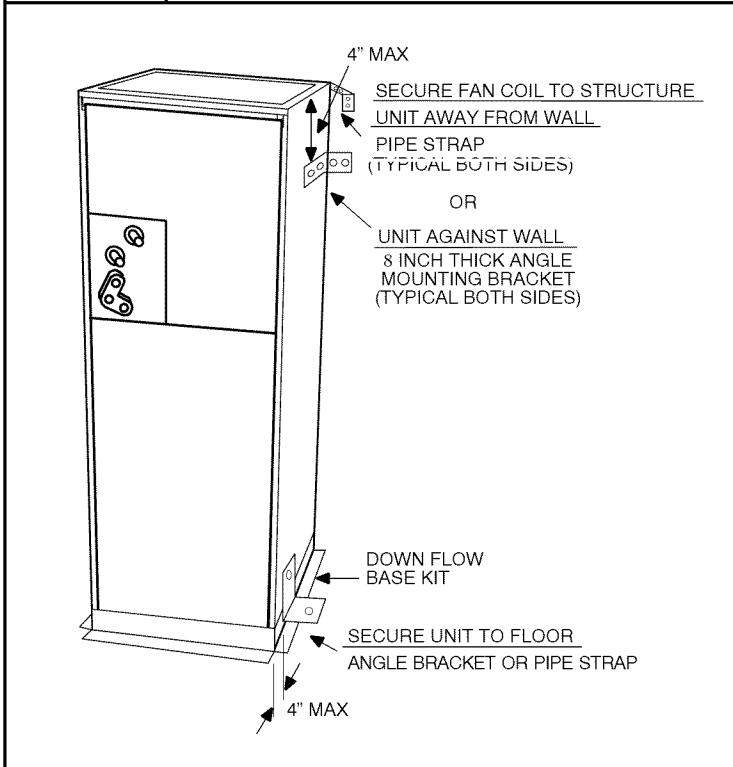
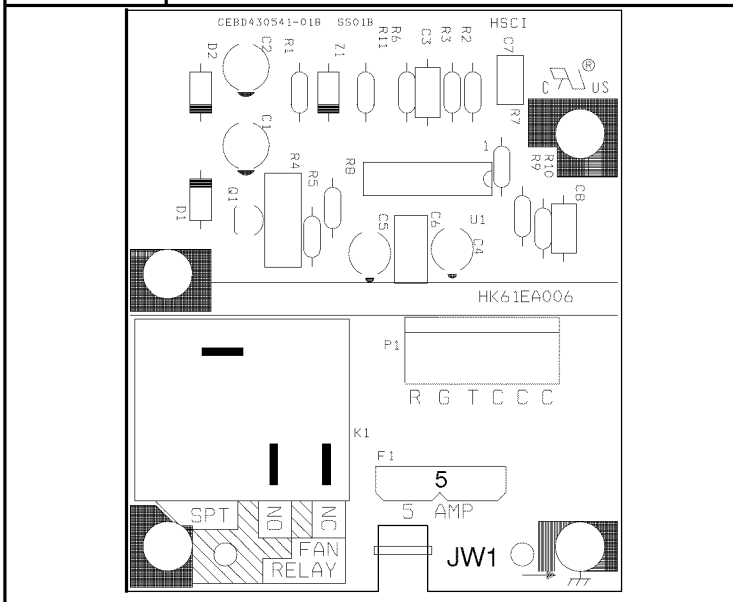


Figure 8 Fan Coil Printed Circuit Board



PROCEDURE 3-ELECTRICAL CONNECTIONS

All products from the factory utilize an electronic fan board which has a low voltage circuit protective fuse (5 amp.), fan motor speed tap selection terminal (SPT), and time delay relay (TDR) jumper. To disable the TDR feature, sever the jumper wire JW1. (Refer to **Figure 8**)

A restrictor orifice is located in a fitting at the distributor. The factory installed restrictor orifice is identified on the unit rating plate.

The restrictor orifice may require changing to obtain best performance. Refer to the restrictor charts furnished with the outdoor unit.

⚠ WARNING

SHOCK and UNIT DAMAGE HAZARD

Failure to follow this warning could result in personal injury or death and unit damage.

If a disconnect switch is to be mounted on unit, select a location where drill or fastener will not contact electrical or refrigerant components.

Before proceeding with electrical connections, make certain that supply voltage, frequency, phase, and ampacity are as specified on the unit rating plate. See unit wiring label for proper field high- and low-voltage wiring. Make all electrical connections in accordance with the NEC and any local codes or ordinances that may apply. Use copper wire only. The unit must have a separate branch electric circuit with a field-supplied disconnect switch located within sight from and readily accessible from the unit.

On units with a field installed disconnect with pull-out removed, service and maintenance can be safely performed on only the load side of the control package.

⚠ WARNING

ELECTRIC SHOCK HAZARD

Failure to follow this warning could result in personal injury or death and unit damage.

Field wires on the line side of the disconnect found in the fan coil unit remain live, even when the pull-out is removed. Service and maintenance to incoming wiring can not be performed until the main disconnect switch (remote to the unit) is turned off. Failure to do so will result in electrical shock causing personal injury or death.

A. Line Voltage Connections

Fan coils are shipped with No Heat Kit (EBAC01PLG1) factory installed. This kit provides the electrical connections necessary to supply the fan coil with 230-V power when electric heat is not present.

When electric heaters are installed:

1. Connect 208/230-V power leads from field disconnect to yellow and black stripped leads.
2. Connect ground wire to unit ground lug.
3. When installing an electric heater, remove and discard power plug from fan coil and connect male plug from heater to female plug from unit wiring harness. (Refer to Electric Heater Installation Instructions.)

B. 24-V Control System

CONNECTION TO UNIT

Wire low voltage in accordance with wiring label on the blower. (Refer to **Figure 9** through **Figure 13**). Use no. 18 AWG color-coded, insulated (35 °C minimum) wire to make the low-voltage connections between the thermostat, the unit, and the outdoor equipment. If the thermostat is located more than 100 ft. from the unit (as measured along the low-voltage wire), use No. 16 AWG color-coded, insulated (35 °C minimum) wire. All wiring must be NEC Class 1 and must be separated from incoming power leads. Refer to outdoor unit wiring instructions for any additional wiring procedure recommendations.

TRANSFORMER INFORMATION

Transformer is factory-wired for 230-V operation. For 208-V applications, disconnect the black wire from the 230-V terminal on transformer and connect it to the 208-V terminal. (Refer to **Figure 14**)

HEATER STAGING

⚠ CAUTION

If W2, W3, and E on any 3 stage heater (18, 20, 24, or 30kw), are individually connected as with outdoor thermostats or any other situation, emergency heat relay must be used.

The controls are factory circuited for single-stage operation. When 2 stages are desired, cut W3 at the W2 wire nut, strip and reconnect per the thermostat kit instruction. (Refer to **Figure 12**) When 3 stages are desired, cut the W2 wire nut off and discard. Strip W2, W3, and E and reconnect per thermostat kit instructions. (Refer to **Figure 13**)

C. Ground Connections

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in electric shock, fire, or death.

According to NEC, ANSI/NFPA 70, and local codes, the cabinet must have an uninterrupted or unbroken ground to minimize personal injury if an electrical fault should occur. The ground may consist of electrical wire or metal conduit when installed in accordance with existing electrical codes. If conduit connection uses reducing washers, a separate ground wire must be used.

NOTE: Use UL-listed conduit and conduit connector for connecting supply wire(s) to unit to obtain proper grounding. Grounding may also be accomplished by using grounding lugs provided in control box.

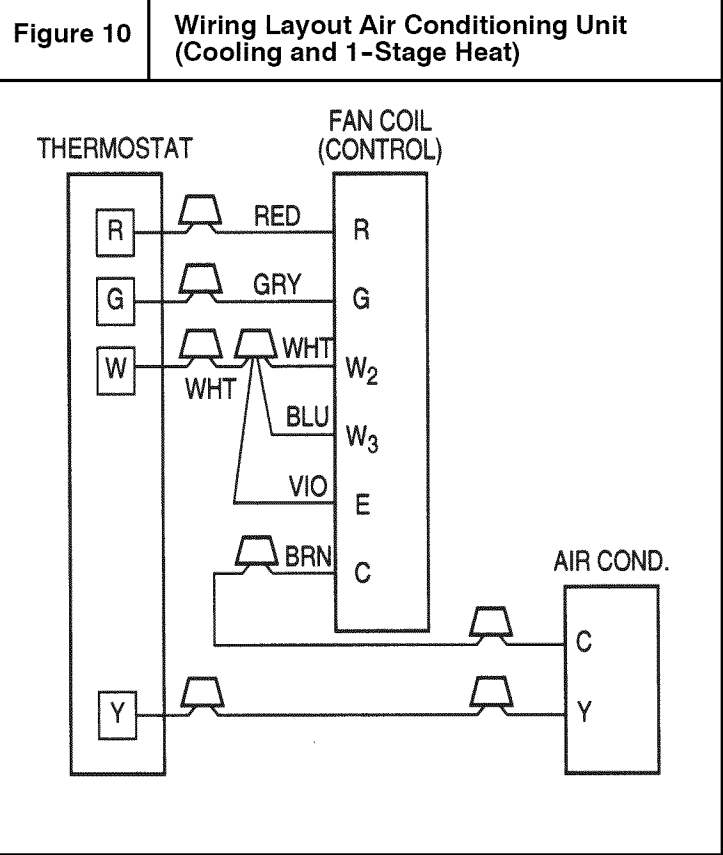
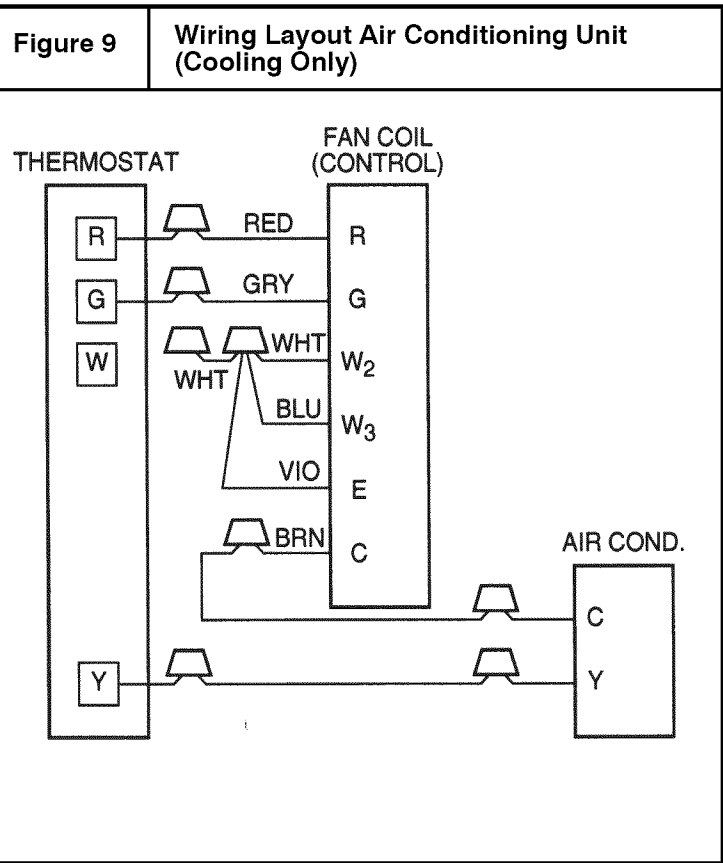


Figure 11 Wiring Layout Heat Pump Unit (Cooling and 2-Stage Heat with No Outdoor Thermostat)

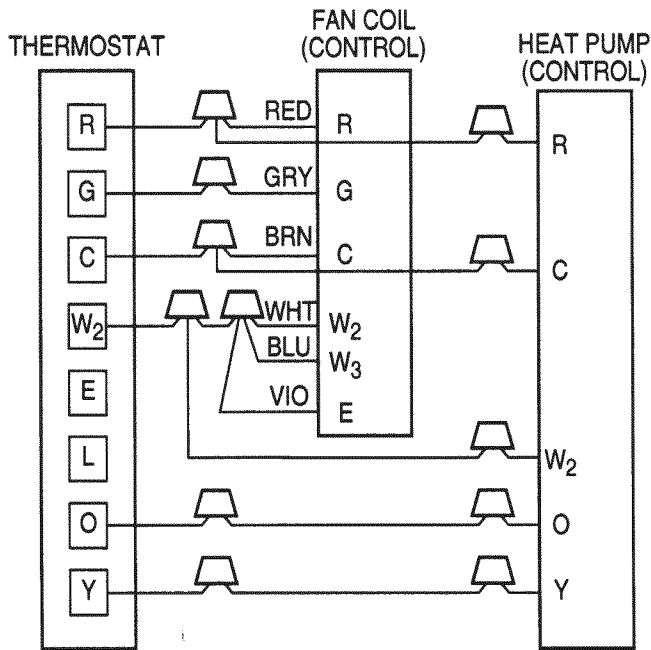


Figure 12 Wiring Layout Heat Pump Unit (Cooling and 2-Stage Heat with 1 Outdoor Thermostat)

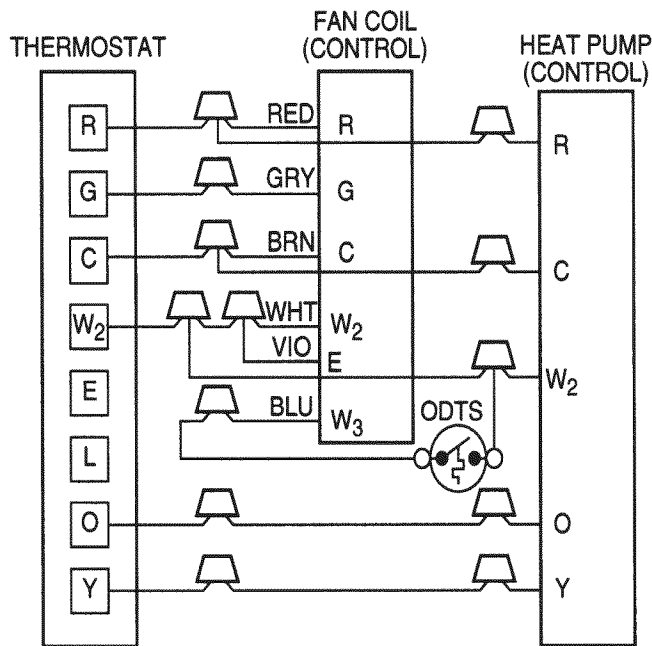


Figure 13 Wiring Layout Heat Pump Unit (Cooling and 2-Stage Heat with 2 Outdoor Thermostats)

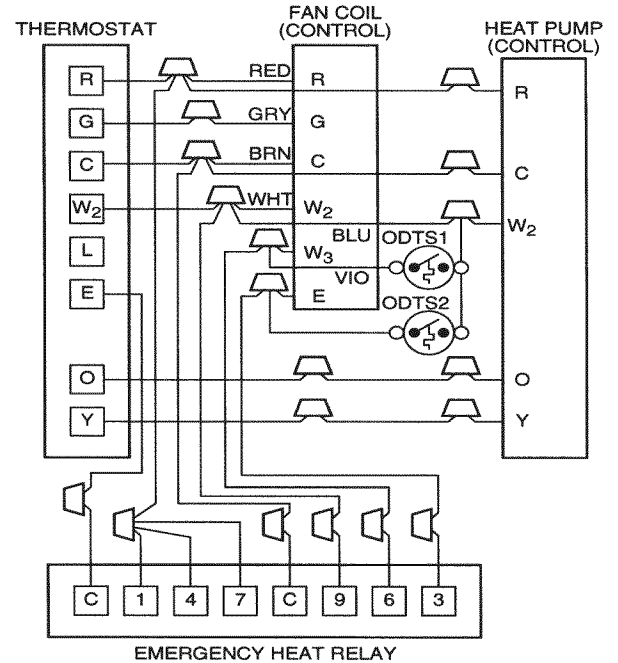


Figure 14 Transformer Connections

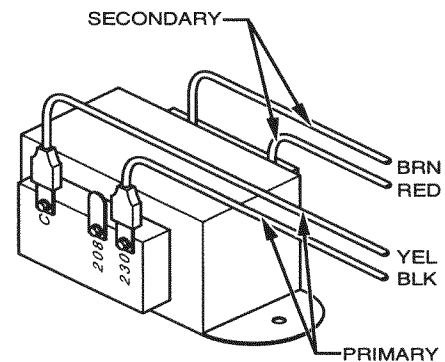
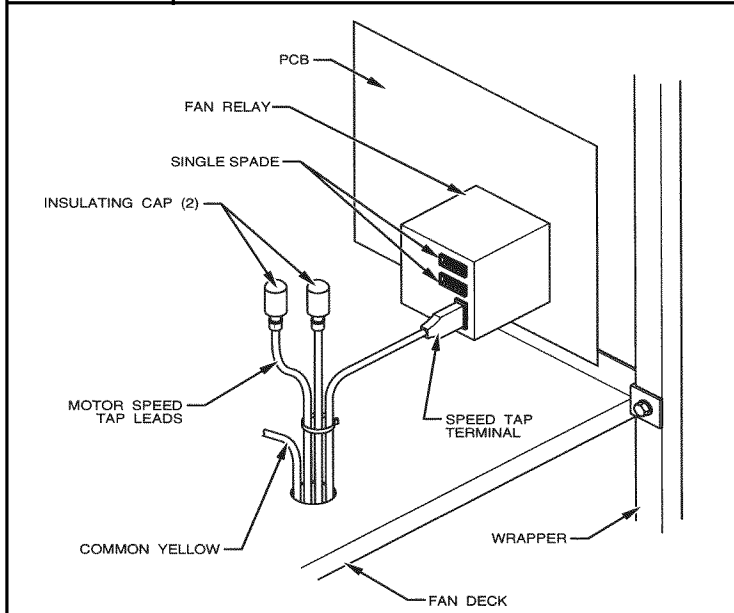


Figure 15 Fan Coil Relay and Speed Tap Terminal**D. Minimum CFM and Motor Speed Selection**

Units with or without electric heaters require a minimum CFM. Refer to the unit wiring label to ensure that the fan speed selected is not lower than the minimum fan speed indicated.

Fan speed selection is done at the fan relay electronic fan board. To change motor speeds, disconnect fan lead used on relay terminal (SPT) and replace with motor speed tap desired. (Refer to **Figure 15**) Save insulating cap and place on motor lead removed from relay.

NOTE: In low static applications, lower motor speed tap should be used to reduce possibility of water being blown off coil.

All units have 2 or 3 motor speed taps. Low speed (red) is designed for mismatch outdoor unit applications. Medium speed (blue) is designed for straight matched operations. High speed (black) is used with high external static duct systems of straight matched systems.

PROCEDURE 4-REFRIGERANT TUBING

Field-supplied tubing must be of refrigerant grade. Suction tube must be insulated. Do not use damaged, dirty, or contaminated tubing because it may plug refrigerant flow-control device. **ALWAYS** evacuate the coil and field-supplied tubing to 500 microns before opening outdoor unit service valves.

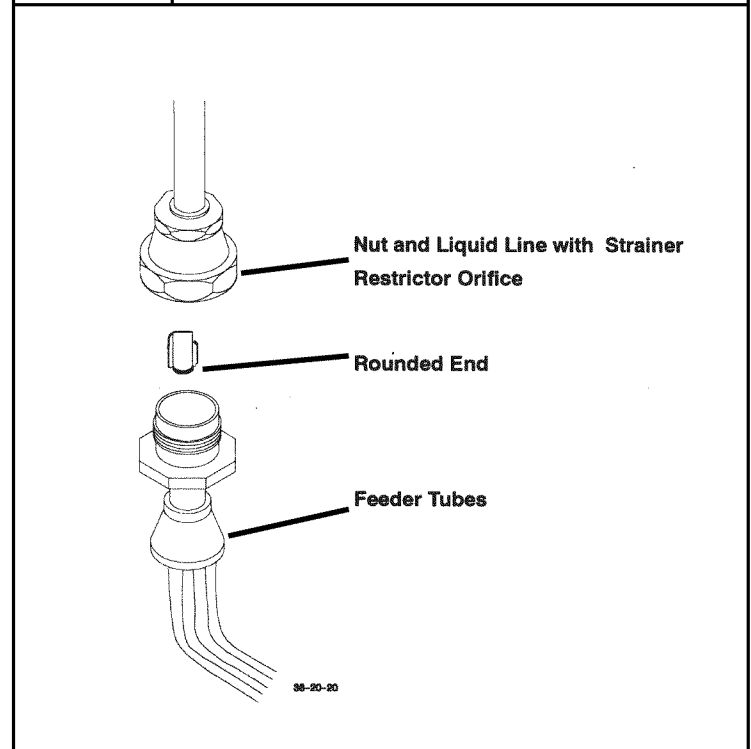
PROCEDURE 5-REFRIGERANT FLOW-CONTROL DEVICE**CAUTION****UNIT DAMAGE HAZARD**

Failure to follow this caution may result in unit damage.

If fan coil is installed with field installed TXV, in conjunction with a single-phase reciprocating compressor, a compressor hard start kit is required.

Check piston size shown on indoor unit rating plate to see if it matches required piston shown on outdoor unit rating plate. If it does not match, replace indoor piston with piston shipped with outdoor unit. The piston shipped with outdoor unit is correct for any approved indoor coil combination. (Refer to **Figure 16**) When changing piston, use a back-up

wrench. Hand tighten hex nut, then tighten with wrench 1/2 turn. Do not exceed 30 ft.-lbs.

Figure 16 Refrigerant Flow-Control Device (EBP Models)**PROCEDURE 6-CONDENSATE DRAINS**

Units are equipped with primary and secondary 3/4" FPT drain connections. For proper condensate line installations, refer to **Figure 2** through **Figure 6**. To prevent property damage and achieve optimum drainage performance, BOTH primary and secondary drain lines should be installed and include properly-sized condensate traps. (Refer to **Figure 17**) Factory-approved condensate traps are available (part no. EBAC01CTK1). Be sure to install plastic push-in plugs in unused condensate drain fittings. It is recommended that PVC fittings be used on the plastic condensate pan. Finger-tighten plus 1-1/2 turns. Do not over-tighten. Use pipe dope.

**CAUTION****UNIT or PROPERTY DAMAGE HAZARD**

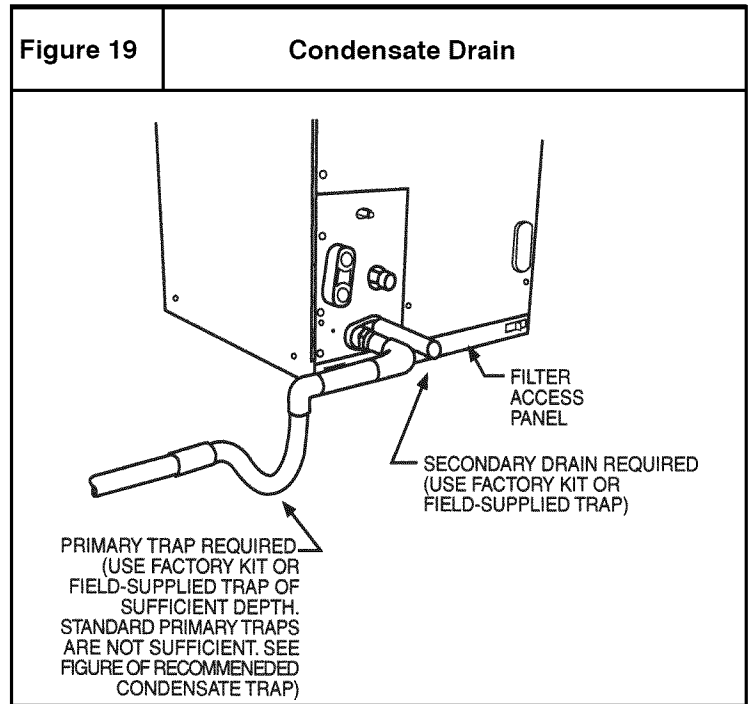
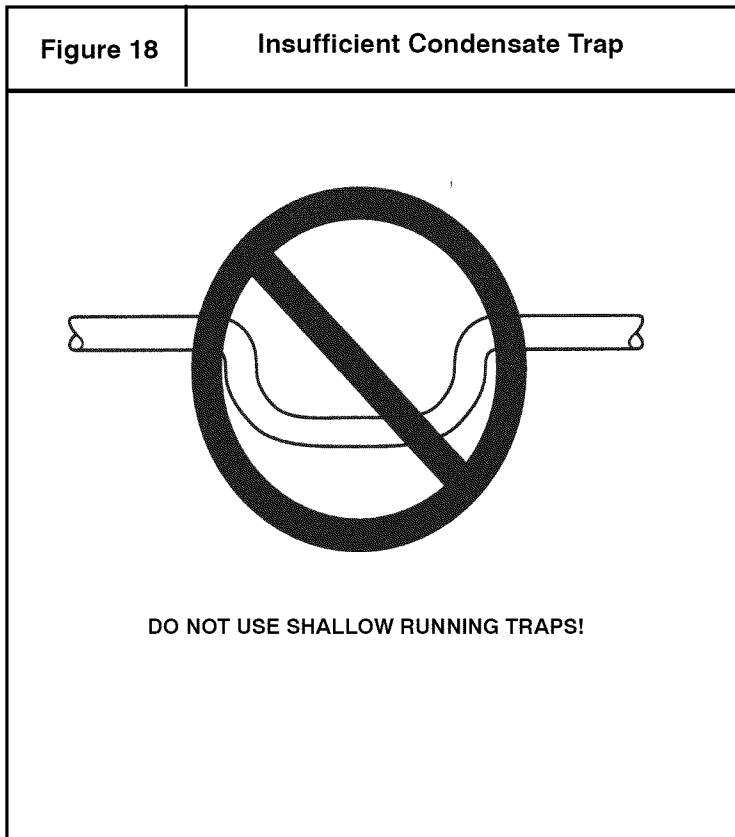
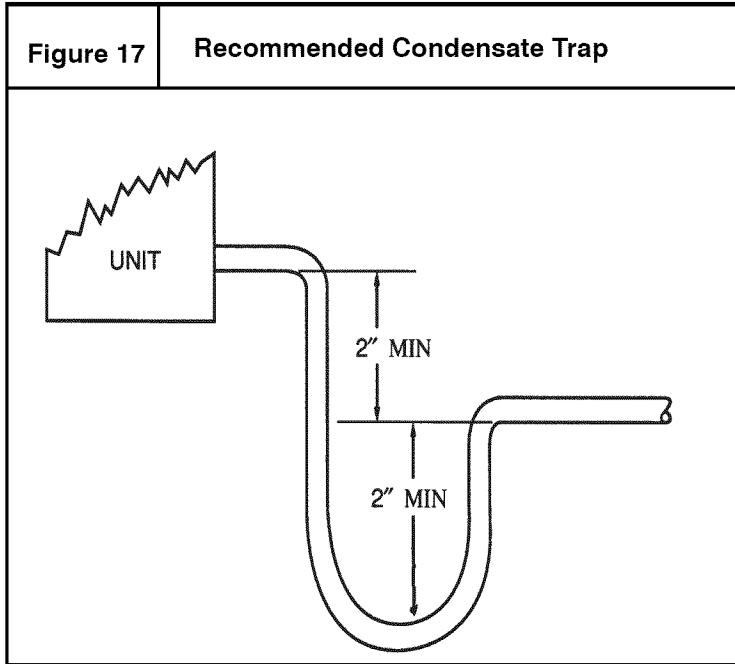
Failure to follow this caution may result in property damage

Do not use shallow, running traps. Shallow, running traps are inadequate and **DO NOT** allow proper condensate drainage. (Refer to **Figure 18**)

When connecting condensate drain lines, avoid blocking filter access panel, thus preventing filter removal. After connection, prime both primary and secondary condensate traps.

Install traps in the condensate lines as close to the coil as possible. (Refer to **Figure 19**). Make sure that the outlet of each trap is below its connection to the condensate pan to prevent condensate from overflowing the drain pan. **Prime all traps**, test for leaks, and insulate traps if located above a living area. Condensate drain lines should be pitched down-

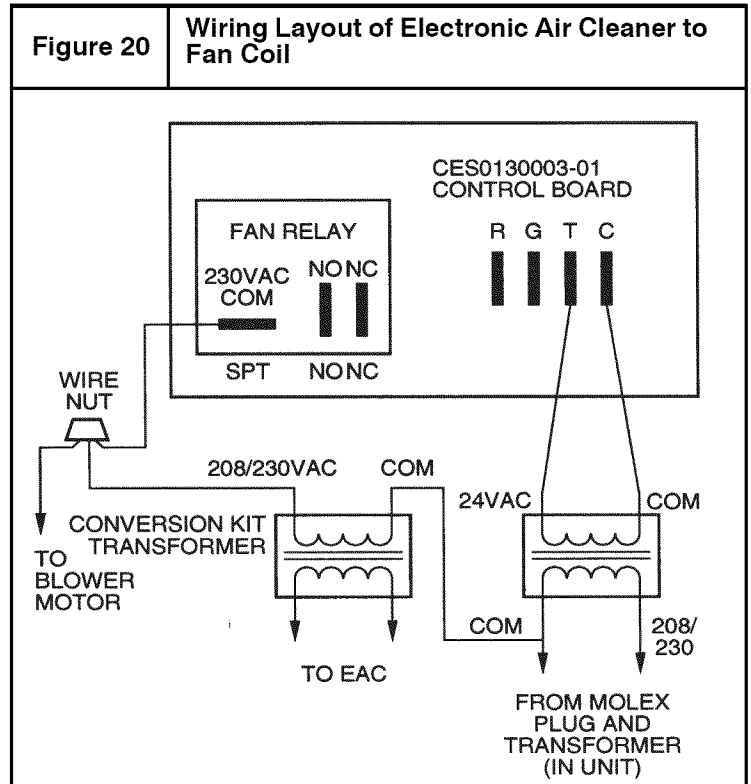
ward at a minimum slope of 1 in. for every 10 ft of length. Consult local codes for additional restrictions or precautions.



PROCEDURE 7-ACCESSORIES

A. Electronic Air Cleaner

The Electronic Air Cleaner may be connected to fan coil as shown in **Figure 20**. This method requires a field supplied transformer. See Electronic Air Cleaner literature for kit requirements.



B. Humidifier

Connect humidifier and humidistat to fan coil unit as shown in **Figure 21** and **Figure 22**. The cooling lockout relay is optional (refer to **Figure 23**).

Figure 21 Wiring Layout of Humidifier to Heat Pump

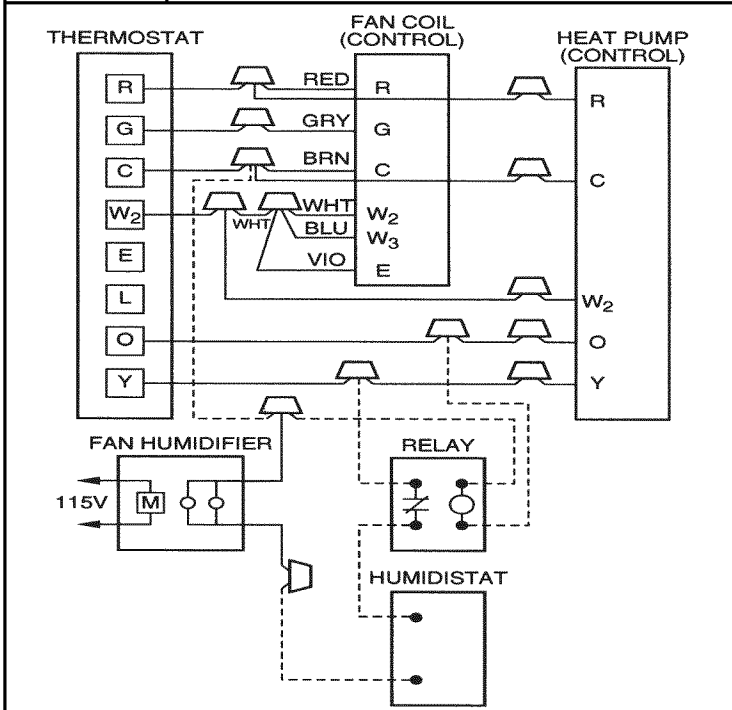
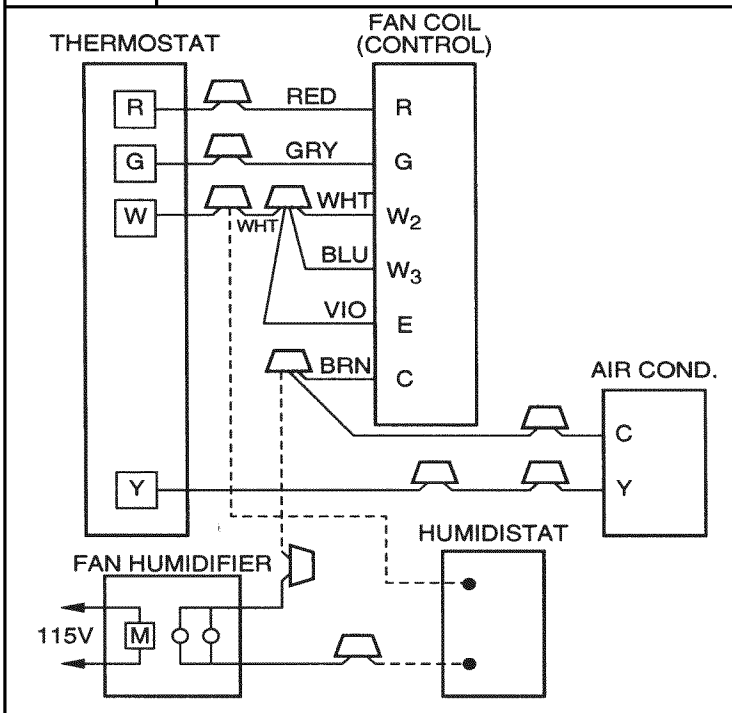


Figure 22 Wiring Layout of Humidifier to Fan Coil with Electric Heat

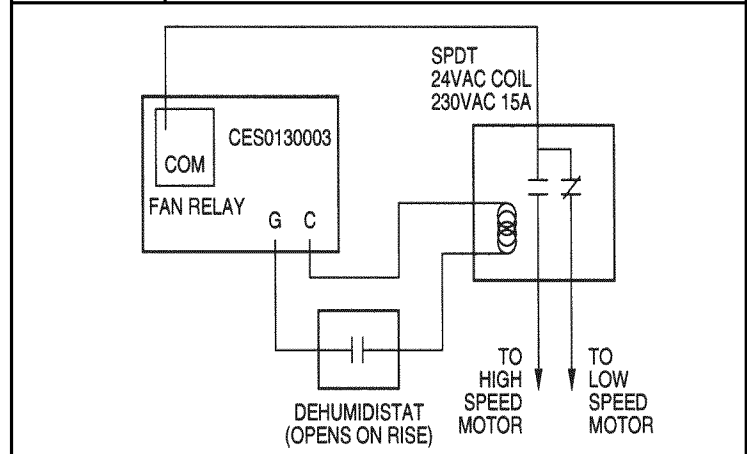


PROCEDURE 8-SEQUENCE OF OPERATION

A. Continuous Fan

Thermostat closes R to G. G energizes fan relay on electronic fan board which completes circuit to indoor blower motor. When G is de-energized, there is a 90 sec delay before relay opens.

Figure 23 Latent Capacity Control



B. Cooling Mode

Thermostat energizes R to G, R to Y, and R to O (heat pump only). G energizes fan relay on electronic fan board which completes circuit to indoor blower motor. When G is de-energized, there is a 90 sec delay before fan relay opens.

C. Heat Pump Heating Mode

Thermostat energizes R to G and R to Y. G energizes fan relay on electronic fan board which completes circuit to indoor blower motor. When G is de-energized, there is a 90 sec delay before fan relay opens.

D. Heat Pump Heating with Auxiliary Electric Heat

Thermostat energizes R to G, R to Y, and R to W. G energizes fan relay on control board which completes circuit to indoor blower motor. W energizes electric heat relay(s) which completes circuit to heater element(s). When W is de-energized, electric heat relay(s) open, turning off heater elements. When G is de-energized there is a 90 sec delay before fan relay opens.

E. Electric Heat or Emergency Heat Mode

Thermostat closes R to W. W energizes electric heat relay(s) which completes circuit to heater element(s). Blower motor is energized through normally closed contacts on fan relay. When W is de-energized, electric heat relay(s) opens.

START-UP PROCEDURES

Refer to outdoor unit Installation Instructions for system start-up instructions and refrigerant charging method details.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in poor unit operation, performance or unit damage.

Never operate unit without a filter. Damage to blower motor or coil may result. Factory authorized filter kits must be used when locating the filter inside the unit. For those applications where access to an internal filter is impractical, a field-supplied filter must be installed in the return duct system.

CARE AND MAINTENANCE

To continue high performance and minimize possible equipment failure, it is essential that periodic maintenance be performed on this equipment. Consult your local dealer as to the proper frequency of maintenance contract. The ability to properly perform maintenance on this equipment requires certain mechanical skills and tools. If you do not possess these, contact your dealer for maintenance. The only consumer service recommended or required if filter replacement or cleaning on a monthly basis.