INSTALLATION MANUAL

SINGLE PIECE, 4 POSITION AIR HANDLERS

MODELS: AHE SERIES

AMERICAN QUALITY DESIGNED, ENGINEERED & ASSEMBLED IN THE USA

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C US

ISO 9001 Certified Quality Management System

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SECTION I: GENERAL INFORMATION

The AHE single piece air handler series provides the flexibility for installation in any position. This unit may be used for upflow, downflow, horizontal right, or horizontal left applications.

These units may be located in a closet, utility room, attic, crawl space, or basement. These versatile models may be used for cooling or heat pump operation with or without electric heat.

Top and side power wiring and control wiring, accessible screw terminals for control wiring, easy to install drain connections, and electric heaters all combine to make the installation easy and minimize installation cost.

Electric heat kits are available as field installed accessories. Single phase and 3 phase kits are available and range from nominal 2.5 kW to 25 kW sizes.

A Brand Label (available from Distribution) may be applied to the center of the blower access panel.

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, adjustment, alteration, or maintenance may create a condition where the operation of the product could cause personal 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.

SAFETY REQUIREMENTS

1. This air handler should be installed in accordance with all national and local building/safety codes and requirements, local plumbing or wastewater codes, and other applicable codes.
2. Read and follow all instructions in this manual. Failure to do so can result in air handler malfunction, death, personal injury and/or property damage.
3. Install this air handler only in a location and position as specified in the “Unit Installation” section of these instructions.
4. The air handler is not to be used for temporary heating of buildings or structures under construction.
5. Always install the air handler to operate within the air handler’s intended maximum outlet air temperature.
6. Provide clearances from combustible materials as listed in the “Clearances” section of this manual.
7. Provide clearances for servicing ensuring that service access is allowed for electric heaters and blower.
8. Check the unit's rating plate and power supply to be sure that the electrical characteristics match.
9. Air handler shall be installed so the electrical components are protected from water.
10. Installing and servicing heating/cooling equipment can be hazardous due to the electrical components. Only trained and qualified personnel should 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 the precautions in the manuals and on the labels attached to the unit and other safety precautions that may apply.
11. 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 who have not kept up with changing residential and non-HUD modular home construction practices. These instructions are required as a minimum for a safe installation.

⚠CAUTION

These air handlers should be transported & handled in an upright, upflow position. Failure to do so may result in unit damage and personal injury. Configuration conversions should be done at site of installation.

INSPECTION

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

Also check to be sure all accessories such as heater kits, suspension kits, and coils are available. Installation of these accessories or field conversion of the unit should be accomplished before setting the unit in place or connecting any wiring, electric heat, ducts or piping.

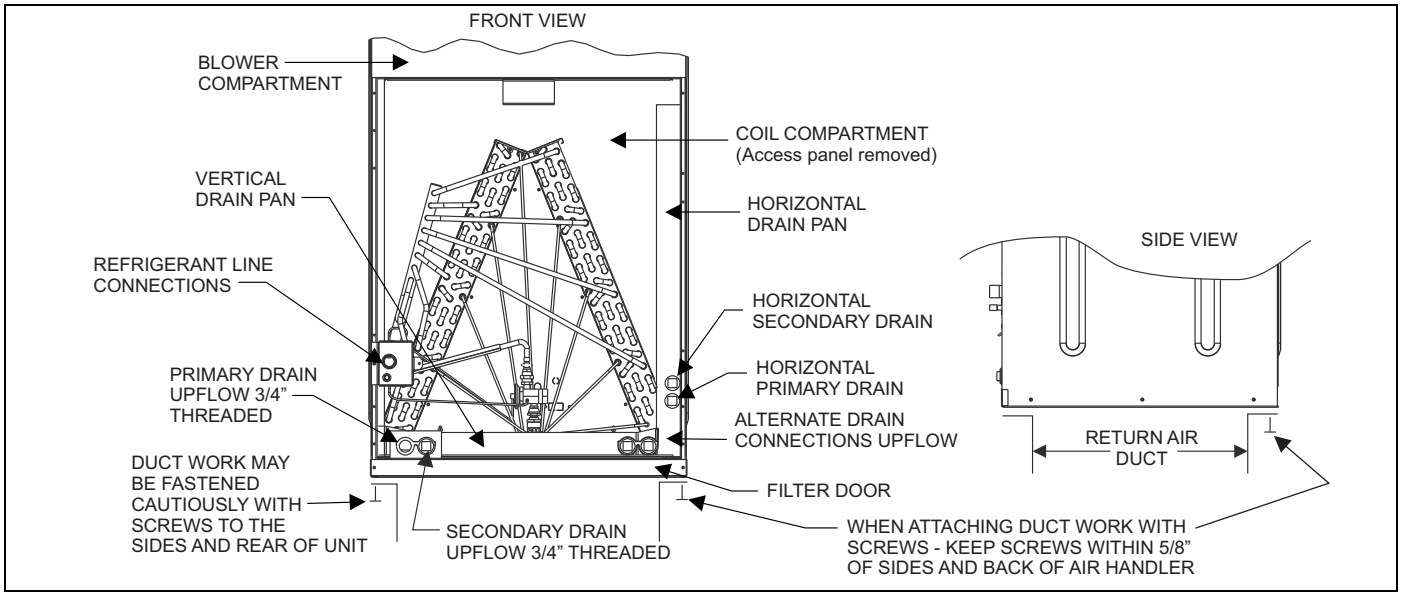


FIGURE 1: Return Duct Attachment & Component Location

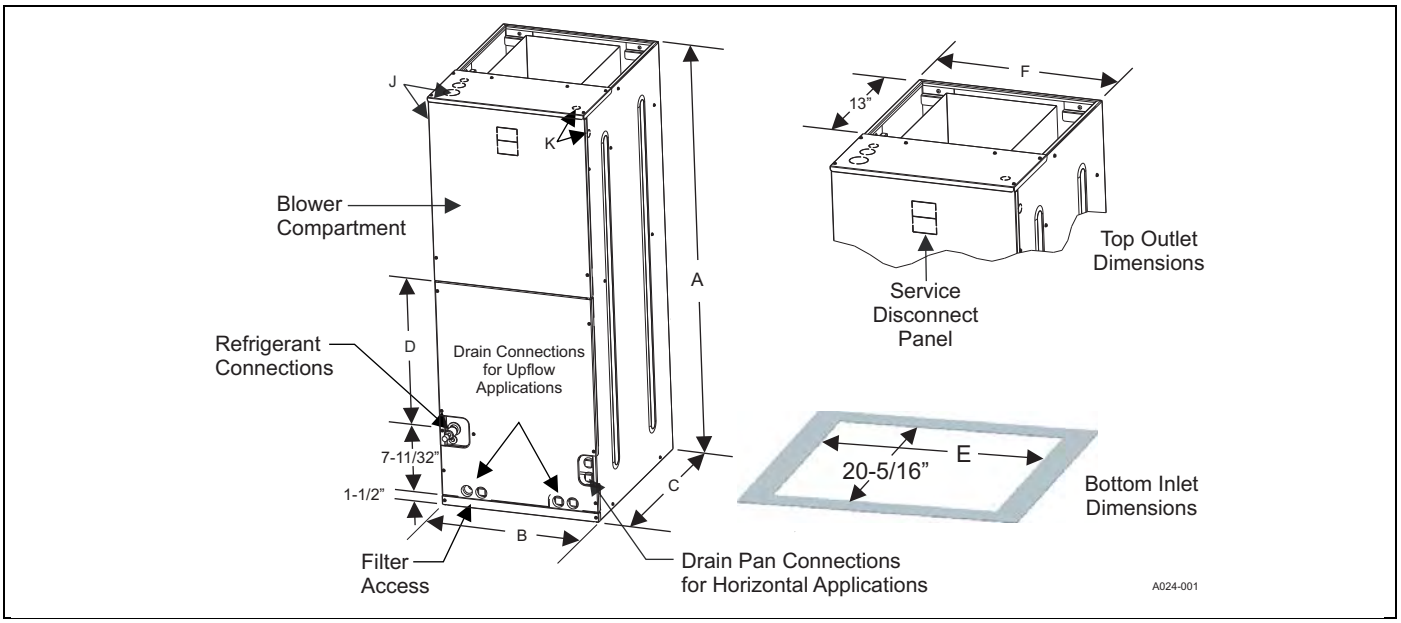


FIGURE 2: Dimensions & Duct Connection Dimensions

TABLE 1: Dimensions[1]

Models	Dimensions						Wiring Knockouts[2]		Refrigerant Connections Line Size	
	A	B	C	D	E	F	J	K		
	Height	Width	Depth				Power	Control	Liquid	Vapor
AHE18B/AHE22B/AHE24B/ AHE30B	46	17 1/2	21 1/2	16 1/2	13-29/32	16 1/2	7/8 (1/2) 1-3/8(1) 1-23/32 (1-1/4)	7/8 (1/2)	3/8	3/4
AHE34C/AHE36C	52	21		21 1/2	17-13/32	20				
AHE42D/AHE48D/AHE60D	57	24 1/2		26	20-29/32	23-1/2				7/8

1. All dimensions are in inches.
2. Actual size (conduit size).

SECTION III: UNIT INSTALLATION

UNIT SIZING

1. The size of the unit should be based on an acceptable heat loss or gain calculation for the structure. ACCA, Manual J or other approved methods may be used.
2. Only connect the air handler to a duct system which has an external static pressure within the allowable range.
3. Airflow must be within the minimum and maximum limits approved for electric heat and evaporator coils.
4. When an air handler is installed so that supply ducts carry air circulated by the air handler to areas outside the space containing the air handler, the return air shall also be handled by duct(s) sealed to the air handler casing and terminating in the space to be cooled/ heated.
5. Refer to the unit rating plate for the air handler model number, and then see the dimensions page of this instruction for supply air plenum dimensions. The plenum must be installed according to the instructions.
6. The installer must check available supply power and verify that it is within the normal operating voltage range for the unit. The acceptable voltage range for these units is as follows:

Air Handler Voltage	Normal Operating [1] Voltage Range
208/230-1-60	187-253

1. Rated in accordance with ARI Standard 110, utilization range “A”.

CLEARANCES

Clearances must be taken into consideration, and provided for as follows:

1. Refrigerant piping and connections - minimum 12” recommended.
2. Maintenance and servicing access - minimum 36” from front of unit recommended for blower motor / coil replacement.
3. Condensate drain lines routed to clear filter and panel access.
4. Filter removal - minimum 36” recommended.
5. The ductwork and plenum connected to this unit are designed for zero clearance to combustible materials.
6. A combustible floor base accessory is available for downflow applications of this unit, if required by local code.

LOCATION

Location is usually predetermined. Check with owner’s or dealer’s installation plans. If location has not been decided, consider the following in choosing a suitable location:

1. Select a location with adequate structural support, space for service access, clearance for air return and supply duct connections.
2. Using hanging brackets to wall mount this single piece air handler unit is not recommended.
3. Normal operating sound levels may be objectionable if the air handler is placed directly over some rooms such as bedrooms, study, etc.
4. Select a location that will permit installation of condensate line to an open drain or outdoors allowing condensate to drain away from structure.

NOTICE

The primary and secondary drain line must be trapped to allow proper drainage of condensate water. The secondary drain line should be piped to a location that will give the occupant a visual warning that the primary drain is clogged. If the secondary drain line is not used, it must be capped.

5. When an evaporator coil is installed in an attic or above a finished ceiling, an auxiliary drain pan should be provided under the air handler as is specified by most local building codes.
6. Proper electrical supply must be available.
7. If unit is located in an area of high humidity (i.e. an unconditioned garage or attic), nuisance sweating of casing may occur. On these installations, unit duct connections and other openings should be properly sealed, and a wrap of 2" fiberglass insulation with vinyl vapor barrier should be used.

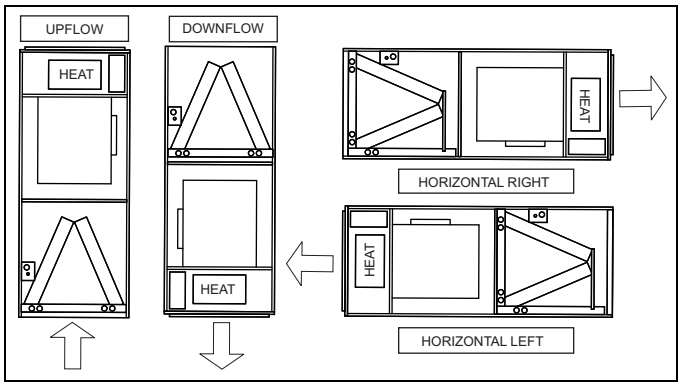


FIGURE 3: Typical Installation

CONDENSATE DEFLECTOR

The condensate deflector comes attached to the vertical, A-coil drain pan. If installing the unit in the upflow or downflow position, no modification is necessary.

For units to be installed in the horizontal position, the condensate deflector needs to be removed from the vertical drain pan and placed on the horizontal drain pan. Remove the condensate deflector and the S-clips that attach it to the vertical drain pan. Relocate the deflector and S-clips onto the horizontal drain pan. Line up with the coil support bracket. See Figure 5 for details. This positions the deflector below the feeder tubes to channel the condensate into the drain pan.

AIR HANDLER CONFIGURATION

These air handler units are supplied ready to be installed in an upflow and right horizontal position. If the unit requires either downflow or left airflow configurations, the unit must have the coil assembly repositioned.

NOTICE

For both right and left horizontal applications, the condensate deflector needs to be removed from the vertical drain pan and placed on the horizontal drain pan. See "Condensate Deflector" section for details.

NOTICE

Conversion must be made before brazing the refrigerant line connections to the coil.

HORIZONTAL LEFT CONVERSION

1. With air handler in vertical position remove all access panels and the tubing connection panel.
2. Slide the coil assembly out of the air handler.
3. It would be easiest to remove and reposition the condensate deflector now, while you have the coil assembly removed from the unit.
4. Rotate air handler 180° so the blower outlet is facing down.
5. Reinstall the coil assembly on the coil support brackets.
6. Reattach tubing connection panel.
7. Reposition the air handler into the left hand horizontal application.
8. Remove the drain pan plugs from the horizontal drain pan and screw them into the vertical, A-coil drain pan.
9. Reattach access panels.

DOWNFLOW CONVERSION

A downflow floor base is available for this air handler. Refer to instructions supplied with the kit for installation.

1. With air handler in vertical position remove all access panels and the tubing connection panel.
2. Slide the coil assembly out of the air handler.
3. Rotate air handler 180° so the blower outlet is facing down.
4. Reinstall the coil assembly on the coil support brackets.
5. Reattach tubing connection panel.
6. Reattach access panels.

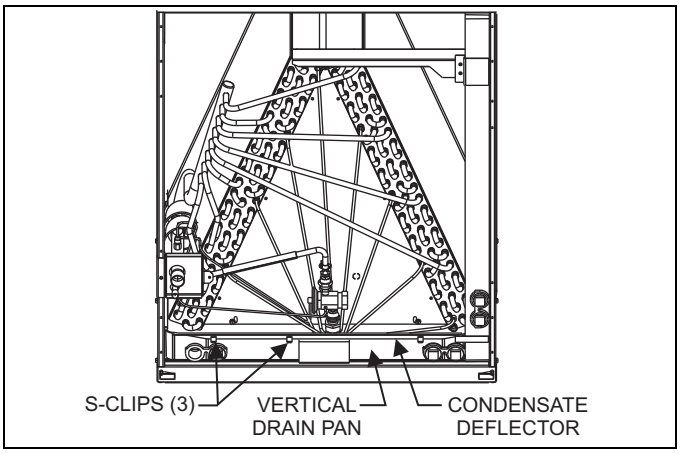


FIGURE 4: Condensate Deflector on Vertical Drain Pan

NOTICE

The condensate deflector should be installed in the s-clip section which is inside the drain pan edge. See Figure 6.

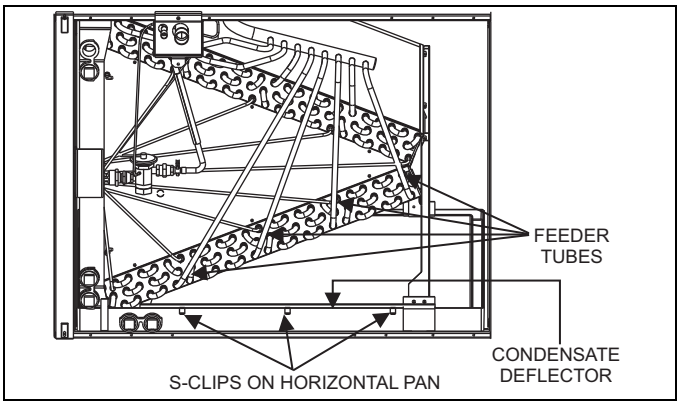


FIGURE 5: Condensate Deflector on Horizontal Drain Pan Edge

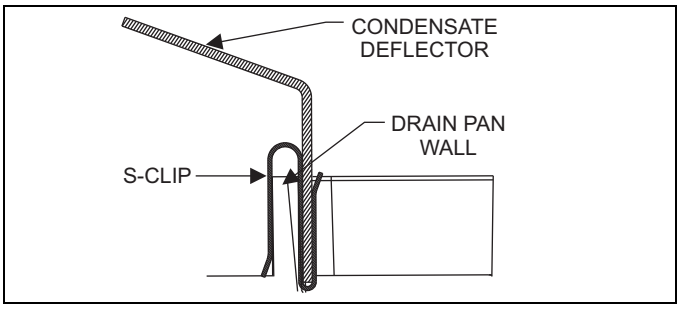


FIGURE 6: S-Clip Installation

SECTION IV: DUCTWORK AND CONNECTIONS

The vast majority of problems encountered with heating and cooling systems can be linked to improperly designed or installed duct systems. It is therefore highly important to the success of an installation that the duct system be properly designed and installed.

When installing a central air return grille in or near the living space, it is advisable to design the ductwork so that the grille is not in direct line with the opening in the unit. One or two elbows and acoustical duct liner will also assure a quieter installation and system. Where return air duct is short, or where sound may be a problem, sound absorbing glass fiber should be used inside the duct.

⚠WARNING

Do not bring in return air from a location which could introduce hazardous substances into the airflow.

Insulation of duct work is a must where it runs through an unheated space during the heating season or through an uncooled space during the cooling season. The use of a vapor barrier is recommended to prevent absorption of moisture from the surrounding air into the insulation.

Duct work should be fabricated and installed in accordance with local and/or national codes. This includes the standards of the National Fire Protection Association for Installation of Air-Conditioning and Ventilating Systems, NFPA No. 90B. They should be sized in accordance with National Environmental System Contractors Association Manual K, or whichever is applicable.

⚠CAUTION

This unit is not designed for non-ducted (freeblow) applications. Do not operate without ductwork attached to unit.

Use flexible duct collars to minimize the transmission of vibration/noise into the conditioned space. If electric heat is used, non-flammable material must be used.

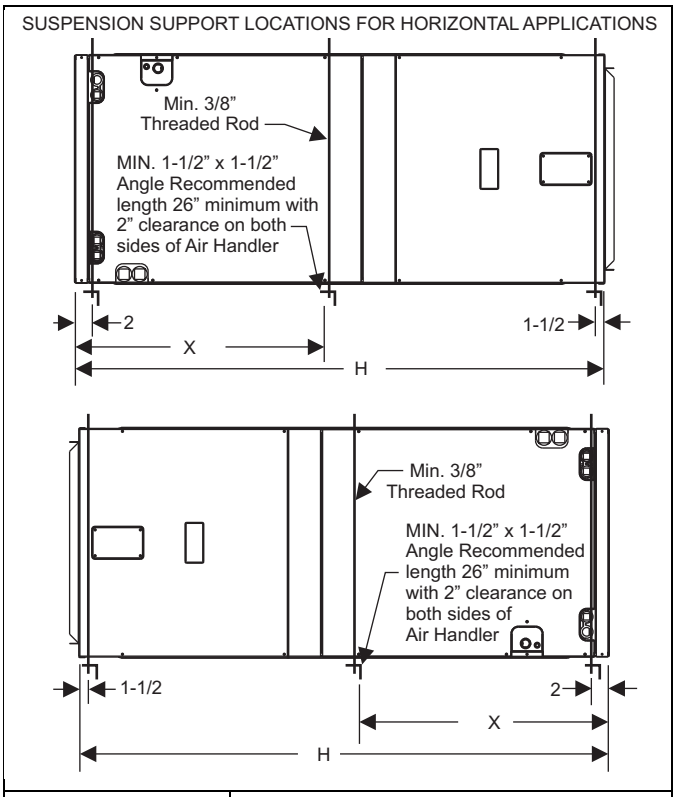
All ducts should be suspended using flexible hangers and never fastened directly to the structure.

HORIZONTAL SUSPENSION

These air handlers may be suspended in horizontal applications. It is recommended to use angle steel support brackets with minimum 3/8" threaded rods, supporting the unit from the bottom. Attach the threaded rods at the locations shown in the figure below.

NOTICE

When assembling the support structure, make sure to size to provide clearance for access door removal.



Air Handler Cabinet Size	Dimension	
	X	H
B	20	46
C	24	52
D	28	57

FIGURE 7: Horizontal Suspension

DUCT FLANGES

Four flanges are provided to assist in positioning and attaching ductwork to the air handler. These flanges are rotated down for shipment. In order to use the flanges, remove the screw holding an individual flange, rotate the flange so it is in the upward position, and reinstall the screw. Repeat this for all 4 flanges.

If the flanges are not used, they must remain in the down position as shipped.

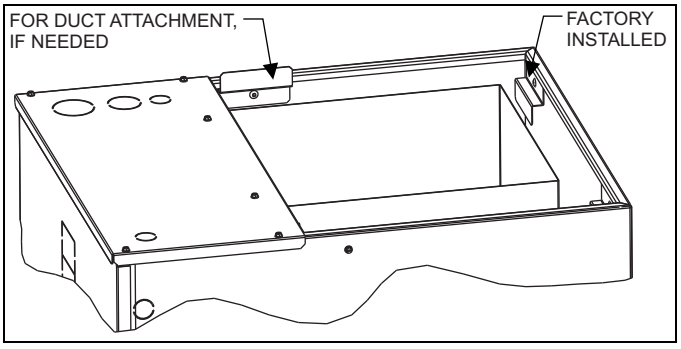


FIGURE 8: Duct Attachment

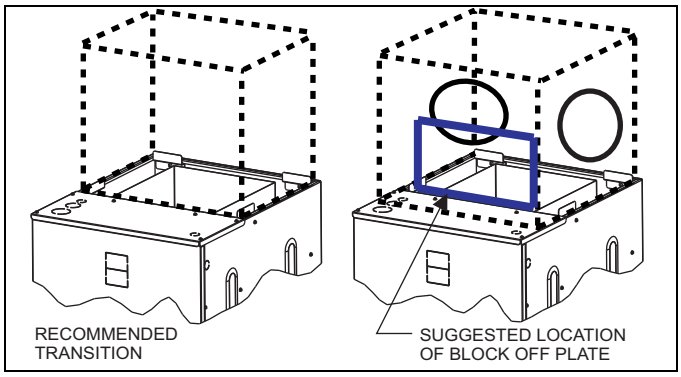


FIGURE 9: Ductwork Transition

UNIT CONNECTIONS

There are several ways to handle the supply and return air duct connections. The location and sizing of the connections depends on the situation and the method best suited to the installation.

The supply air duct should be properly sized by use of a transition to match unit opening. Refer to Table 1 for air handler unit inlet and outlet dimensions.

⚠CAUTION

Use 1/2" screws to connect ductwork to bottom of unit. Longer screws will pierce the drain pan and cause leakage. If pilot holes are drilled, drill only though field duct and unit bottom flange.

Ductwork that is not designed to match the supply air opening can cause turbulence inside the plenum. This turbulence can change the air flow patterns across the electric heater limit switches. If the factory suggested transition cannot be fabricated, it is recommended that a block off plate (approximately 8" high and running the full width of the plenum) be attached to the supply opening. Refer to Figure 9 as a visual aid. The use of this block off plate will enable better air circulation across the limit switches.

AIR FILTERS

Return air filters are required and must be field supplied. Filtration can be accomplished external to the unit or integral filter rack may be used. A 1" filter access rack has been built into the unit. Remove filter access cover shown. Install proper size filter. Standard 1" size permanent or throw away filter may be used, or, permanent washable filters are available using model numbers: 1PF0601, 602 or 603BK. See Table 2 for filter size.

⚠CAUTION

Equipment should never be operated without filters.

TXV OR ORIFICE METERING DEVICES

All air handlers are shipped with flex coils, meaning that the evaporator coil does not have a factory installed metering device, in order to accommodate a variety of application choices. An R-22 or R-410A TXV or orifice needs to be installed in the field. Refer to the "Outdoor Unit Technical Guide" to verify to correct TXV for the AC or HP unit installed. It is recommended to install the TXV kit prior to brazing line sets.

Refer to the instructions in the installation manuals provided with the TXV kit and outdoor unit for more information.

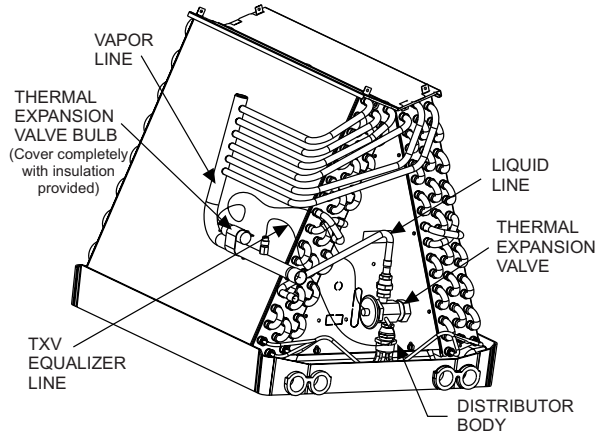


FIGURE 10: Thermal Expansion Valve (TXV)

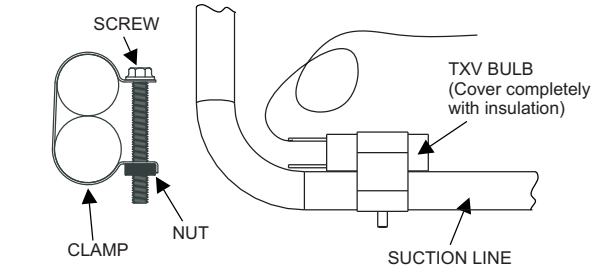


FIGURE 11: Proper Bulb Location

⚠CAUTION

COIL UNDER PRESSURE.
Relieve pressure by depressing schrader core.

NOTICE

The coil should be open to the air for no more than 2 minutes to keep moisture and contaminates from entering the system. If the coil cannot be brazed into the refrigeration system in that time, the ends should be temporarily closed or plugged. For a short term delay, use masking tape over the ends of the copper tubing to close the tube to the air. For a longer term delay, use plugs or caps. There is no need to purge the coil if this procedure is followed.

REFRIGERANT LINE CONNECTION

⚠CAUTION

Dry nitrogen should always be supplied through the tubing while it is being brazed, because the temperature required is high enough to cause oxidation of the copper unless an inert atmosphere is provided. The flow of dry nitrogen should continue until the joint has cooled. Always use a pressure regulator and safety valve to insure that only low pressure dry nitrogen is introduced into the tubing. Only a small flow is necessary to displace air and prevent oxidation.

NOTICE

Route the refrigerant lines to the coil in a manner that will not obstruct service access to the coil, air handling system, or filter.

Connect lines as follows:

1. Suction and liquid line connections are made outside the cabinet. Leave the tubing connection panel attached to the cabinet with the tubes protruding through it. Coil access panel should be removed for brazing. The lines are swedged to receive the field line set tubes.
2. Wrap a water soaked rag around the coil connection tubes inside the cabinet to avoid damaging the TXV bulb.
3. Remove grommets where tubes exit the cabinet to prevent burning them during brazing.
4. Purge refrigerant lines with dry nitrogen.
5. Braze the suction and liquid lines. Suction line must be insulated.
6. Re-attach the grommets to the lines carefully to prevent air leakage.
7. Attach the coil access panel to the cabinet.

NOTICE

ALWAYS *evacuate the coil and line. Set tubing to 500 microns before opening outdoor unit service valves.*

Refer to Outdoor unit Installation Manual for evacuation, leak check and charging instructions.

Lines should be sound isolated by using appropriate hangers or strapping.

All evaporator coil connections are copper-to-copper and should be brazed with a phosphorous-copper alloy material such as Silfos-5 or equivalent. DO NOT use soft solder.

DRAIN CONNECTIONS

All drain lines should be trapped a minimum of three inches, should be pitched away from unit drain pan and should be no smaller than the coil drain connection.

⚠CAUTION

Threaded drain connection should be hand-tightened, plus no more than 1/16 turn.

Route the drain line so that it does not interfere with accessibility to the coil, air handling system or filter and will not be exposed to freezing temperatures. See Figure 2 for drain connection locations.

⚠CAUTION

When the coil is installed in an attic or above a finished ceiling, an auxiliary drain pan should be provided under the coil if specified by local building codes. When this exterior secondary drain pan is used that drain should be piped to a location that will give the occupant a visual warning that the primary drain is clogged.

Coils should be installed level or pitched slightly toward the drain end. Suggested pitch should not exceed 1/4 inch per foot of coil.

The drain pan connections are designed to ASTM Standard D 2466 Schedule 40. Use 3/4" PVC or steel threaded pipe. Since the drains are not subject to any pressure it is not necessary to use Schedule 40 pipe for drain lines.

SECTION V: ELECTRIC HEATER INSTALLATION

If the air handler requires electric heat, install the electric heat kit according to the installation instructions included with the kit. After installing the kit, mark the air handler nameplate to designate the heater kit that was installed. If no heater is installed, mark the name plate appropriately to indicate that no heat kit is installed.

Use only 6HK heater kits, as listed on air handler name plate and in these instructions. Use data from Tables 4 through 9 for information on required minimum motor speed tap to be used for heating operation, maximum over-current protection device required and minimum electrical supply wiring size required – for listed combination of Air Handler and Heater Kit.

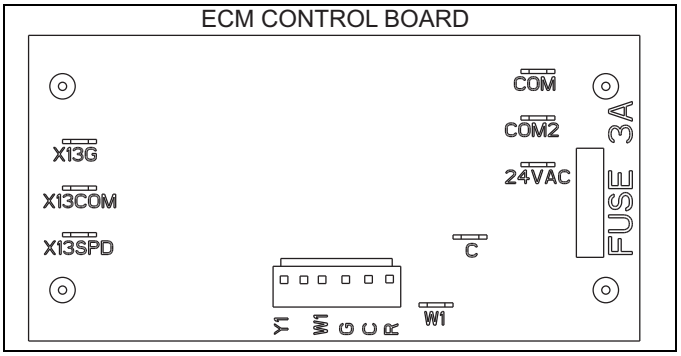


FIGURE 12: Blower Delay Control Board

SECTION VI: LINE POWER CONNECTIONS

Power may be brought into the unit through the supply air end of the unit (top when unit is vertical) or the left side panel. Use the hole appropriate to the unit's orientation in each installation to bring conduit from the disconnect. The power lead conduit should be terminated at the electrical control box. Refer to Tables 6 through 9 to determine proper wire sizing. To minimize air leakage, seal the wiring entry point at the outside of the unit.

All electrical connections to air handlers must be made with copper conductors. **Direct connection of aluminum wiring to air handlers is not approved.**

If aluminum conductors are present, all applicable local and national codes must be followed when converting from aluminum to copper conductors prior to connection to the air handler.

If wire other than uncoated (non-plated), 75° C ambient, copper wire is used, consult applicable tables of the National Electric Code (ANSI/NFPA 70). The chosen conductor and connections all must meet or exceed the amperage rating of the overcurrent protector (circuit breaker or fuse) in the circuit.

Additionally, existing aluminum wire within the structure must be sized correctly for the application according to National Electric Code and local codes. Caution must be used when sizing aluminum rather than copper conductors, as aluminum conductors are rated for less current than copper conductors of the same size.

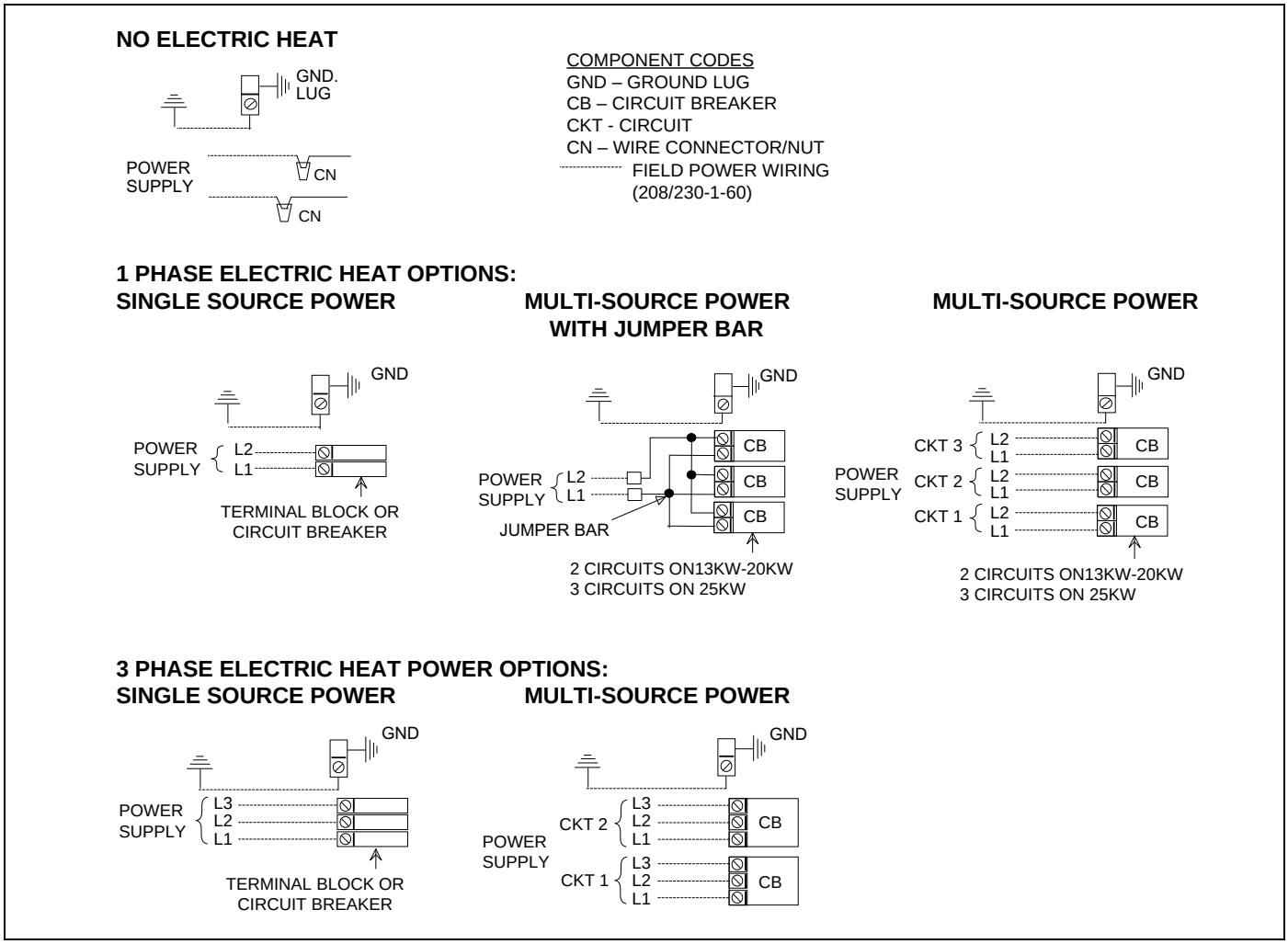


FIGURE 13: Line Power Connections

SECTION VII: LOW VOLTAGE CONTROL CONNECTIONS

The 24 volt power supply is provided by an internally wired low voltage transformer which is standard on all models, However, if the unit is connected to a 208 volt power supply, the low voltage transformer must be rewired to the 208 volt tap. See the unit wiring label.

Field supplied low voltage wiring can exit the unit on the top right hand corner or the right hand side panel. Refer to Figure 2.

Remove desired knockout and pierce foil faced insulation to allow wiring to pass through. Use as small of a hole as possible to minimize air leakage. Install a 7/8" plastic bushing in the selected hole and keep low voltage wiring as short as possible inside the control box.

To further minimize air leakage, seal the wiring entry point at the outside of the unit.

The field wiring is to be connected at the pigtails supplied with the control board harness. Refer to SECTIONS X and XI for system wiring.

NOTICE

All wiring must comply with local and national electrical code requirements. Read and heed all unit caution labels.

NOTICE

It is possible to vary the amount of electric heat turned on during the defrost cycle of a heat pump. Standard wiring will only bring on the first stage of electric heat during defrost. See Table 5 for additional information on heat during defrost cycle.

SECTION VIII: BLOWER SPEED CONNECTIONS

Adjust blower motor speed to provide airflow within the minimum and maximum limits approved for evaporator coil, electric heat and outdoor unit. Speed tap adjustments are made at the motor terminal block. Airflow data is shown in Table 10.

Connect motor wires to motor speed tap receptacle for speed desired. See unit wiring label for motor wiring details.

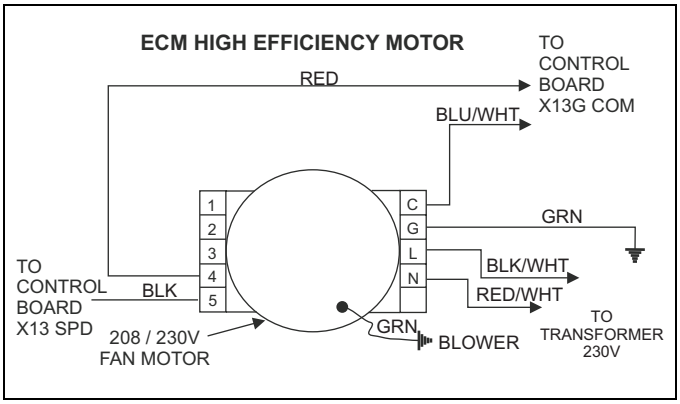


FIGURE 14: Blower Speed Connections

SECTION IX: UNIT DATA

TABLE 2: Physical and Electrical Data

Models		AHE18B	AHE22B	AHE24B	AHE30B	AHE34C	AHE36C	AHE42D	AHE48D	AHE60D
Blower - Diameter x Width		10 x 8	10 x 8	10 x 8	10 x 8	11 x 10	11 x 10	11 x 10	11 x 10	11 x 10
Motor	HP	1/3 HP	1/3 HP	1/3 HP	1/3 HP	1/2 HP	1/2 HP	1/2 HP	3/4 HP	3/4 HP
	Nominal RPM	1050	1050	1050	1050	1050	1050	1050	1050	1050
Voltage		208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230
Full Load Amps @230V		2.8	2.8	2.8	2.8	4.1	4.1	4.1	6.0	6.0
Filter[1]	Type	DISPOSABLE OR PERMANENT								
	Size	16 x 20 x 1	16 x 20 x 1	16 x 20 x 1	16 x 20 x 1	20 x 20 x 1	20 x 20 x 1	22 x 20 x 1	22 x 20 x 1	22 x 20 x 1
	Permanent Type Kit	1PF0601BK	1PF0601BK	1PF0601BK	1PF0601BK	1PF0602BK	1PF0602BK	1PF0603BK	1PF0603BK	1PF0603BK
Shipping / Operating Weight (lbs.)		115/103	120/105	120/105	120/105	152/137	152/137	168/150	171/153	174/156

1. Field supplied.

TABLE 3: Electrical Data - Cooling Only

Models	Motor FLA[1]	Minimum Circuit Ampacity	MOP[2]	Minimum Wire Size (AWG)[3]
AHE18B / AHE22B / AHE24B / AHE30B	2.8	3.5	15	14
AHE34C / AHE36C / AHE42D	4.1	5.1	15	14
AHE48D / AHE60D	6.0	7.5	15	14

1. FLA = Full Load Amps
2. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse.
3. 75°C, copper wire only. If wire other than non-plated, 75°C ambient, copper wire is used, consult applicable tables of the NEC and local codes.

TABLE 4: Electric Heat: Minimum Fan Speed

Heater Kit Models[1,2]	Nom. kW @240V	Air Handler Models						
		AHE18B	AHE22B AHE24B	AHE30B	AHE34C AHE36C	AHE42D	AHE48D	AHE60D
6HK(0,1)6500206	2.4kW	Med Low #2	Med Low #2	Low #1	Med #3	Low #1	Med Low #2	Med Low #2
6HK(0,1)6500506	4.8kW	Med Low #2	Med Low #2	Med Low #2	Med Low #2	Med #3	Med #3	Med Low #2
6HK(0,1)6500806	7.7kW	Med High #4	Med High #4	Med #3	Med #3	Med #3	Med #3	Med Low #2
6HK(0,1)6501006 6HK06501025	9.6kW	Med High #4	Med High #4	Med High #4	Med High #4	Med High #4	Med High #4	Med #3
6HK(1,2)6501306	12.5kW	-	Med High #4	Med High #4	Med High #4	Med High #4	Med High #4	Med #3
6HK(1,2)6501506 6HK06501525	14.4kW	-	High #5	High #5	Med High #4	Med High #4	Med High #4	Med #3
6HK(1,2)6501806 6HK06501825	17.3kW	-	-	-	High #5	High #5	High #5	Med High #4
6HK(1,2)6502006 6HK16502025	19.2kW	-	-	-	High #5	High #5	High #5	High #5
6HK(1,2)6502506 6HK16502525	24kW	-	-	-	-	-	-	High #5

1. (0,1) - 0 = no circuit breaker OR 1 = with circuit breaker
2. (1,2) - 1 = with circuit breaker, no breaker jumper bar OR 2 = with circuit breaker & breaker jumper bar

TABLE 5: ELECTRIC HEAT PERFORMANCE DATA: 208/230-1-60 & 208/230-3-60

Heater Models[1,2]		Nominal kW @240V	Total Heat				kW Staging			
			kW		MBH		W1 Only		W1 + W2	
			208V	230V	208V	230V	208V	230V	208V	230V
1PH	6HK(0,1)6500206	2.4	1.8	2.2	6.2	7.5	1.8	2.2	1.8	2.2
	6HK(0,1)6500506	4.8	3.6	4.4	12.3	15.0	3.6	4.4	3.6	4.4
	6HK(0,1)6500806	7.7	5.8	7.1	19.7	24.1	5.8	7.1	5.8	7.1
	6HK(0,1)6501006	9.6	7.2	8.8	24.6	30.1	7.2	8.8	7.2	8.8
	6HK(1,2)6501306	12.5	9.4	11.5	32.0	39.2	3.1	3.8	9.4	11.5
	6HK(1,2)6501506	14.4	10.8	13.2	36.9	45.1	3.6	4.4	10.8	13.2
	6HK(1,2)6501806	17.3	13.0	15.9	44.3	54.2	6.5	7.9	13.0	15.9
	6HK(1,2)6502006	19.2	14.4	17.6	49.2	60.2	7.2	8.8	14.4	17.6
	6HK(1,2)6502506	24.0	18.0	22.0	61.5	75.2	7.2	8.8	18.0	22.0
3PH	6HK06501025	9.6	7.2	8.8	24.6	30.1	7.2	8.8	7.2	8.8
	6HK06501525	14.4	10.8	13.2	36.9	45.1	10.8	13.2	10.8	13.2
	6HK06501825	17.3	13.0	15.9	44.3	54.2	13.0	15.9	13.0	15.9
	6HK16502025	19.2	14.4	17.6	49.2	60.2	7.2	8.8	14.4	17.6
	6HK16502525	24.0	18.0	22.0	61.5	75.2	9.0	11.0	18.0	22.0

1. (0,1) - 0 = no circuit breaker OR 1 = with circuit breaker.
2. (1,2) - 1 = with circuit breaker, no breaker jumper bar OR 2 = with circuit breaker & breaker jumper bar.

TABLE 6: ELECTRICAL DATA FOR SINGLE SOURCE POWER SUPPLY: 208/230-1-60

Air Handler Models	Heater Models[1,2]	Heater Amps @240V	Field Wiring					
			Min. Circuit Ampacity		MOP.[3]		Min Wire Size (AWG)[4]	
			208V	230V	208V	230V	208V	230V
AHE18B	6HK(0,1)6500206	10.0	14.3	16.0	15	20	12	12
	6HK(0,1)6500506	20.0	25.2	28.5	30	30	10	10
	6HK(0,1)6500806	32.0	38.2	43.5	40	45	8	8
	6HK(0,1)6501006	40.0	46.8	53.5	50	60	8	6
AHE22B AHE24B AHE30B	6HK(0,1)6500206	10.0	14.3	16.0	15	20	12	12
	6HK(0,1)6500506	20.0	25.2	28.5	30	30	10	10
	6HK(0,1)6500806	32.0	38.2	43.5	40	45	8	8
	6HK(0,1)6501006	40.0	46.8	53.5	50	60	8	6
	6HK(1,2)6501306	52.0	59.8	68.5	60	70	6	4
	6HK(1,2)6501506	60.0	68.5	78.5	70	80	4	4
AHE34C AHE36C AHE42D	6HK(0,1)6500206	10.0	16.0	17.6	20	20	12	12
	6HK(0,1)6500506	20.0	26.8	30.1	30	35	10	10
	6HK(0,1)6500806	32.0	39.8	45.1	40	50	8	8
	6HK(0,1)6501006	40.0	48.5	55.1	50	60	8	6
	6HK(1,2)6501306	52.0	61.5	70.1	70	80	6	4
	6HK(1,2)6501506	60.0	70.1	80.1	80	90	4	4
	6HK(1,2)6501806	72.0	83.1	95.1	90	100	4	3
	6HK(1,2)6502006	80.0	91.8	105.1	100	110	3	2
AHE48D	6HK(0,1)6500206	10.0	18.3	20.0	20	20	12	12
	6HK(0,1)6500506	20.0	29.2	32.5	30	35	10	8
	6HK(0,1)6500806	32.0	42.2	47.5	45	50	8	8
	6HK(0,1)6501006	40.0	50.8	57.5	60	60	6	6
	6HK(1,2)6501306	52.0	63.8	72.5	70	80	6	4
	6HK(1,2)6501506	60.0	72.5	82.5	80	90	4	4
	6HK(1,2)6501806	72.0	85.5	97.5	90	100	3	3
	6HK(1,2)6502006	80.0	94.2	107.5	100	110	3	2

Continuation on Page 11.

TABLE 6: ELECTRICAL DATA FOR SINGLE SOURCE POWER SUPPLY: 208/230-1-60 (Continued)

Air Handler Models	Heater Models[1,2]	Heater Amps @240V	Field Wiring					
			Min. Circuit Ampacity		MOP.[3]		Min Wire Size (AWG)[4]	
			208V	230V	208V	230V	208V	230V
AHE60D	6HK(0,1)6500206	10.0	18.3	20.0	20	20	12	12
	6HK(0,1)6500506	20.0	29.2	32.5	30	35	10	8
	6HK(0,1)6500806	32.0	42.2	47.5	45	50	8	8
	6HK(0,1)6501006	40.0	50.8	57.5	60	60	6	6
	6HK(1,2)6501306	52.0	63.8	72.5	70	80	6	4
	6HK(1,2)6501506	60.0	72.5	82.5	80	90	4	4
	6HK(1,2)6501806	72.0	85.5	97.5	90	100	3	3
	6HK(1,2)6502006	80.0	94.2	107.5	100	110	3	2
	6HK(1,2)6502506	100.0	115.8	132.5	125	150	1	1/0

1. (0,1) - maybe 0 (no circuit breaker) or 1 (with circuit breaker).
2. (1,2) maybe 1 (with circuit breaker, no breaker jumper bar) or 2 (with circuit breaker & breaker jumper bar).
3. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse.
4. Stated sizes are for 75°C, copper wire only. If wire other than non-plated, 75°C ambient, copper wire is used, consult applicable tables of the NEC and local codes.

TABLE 7: ELECTRICAL DATA FOR MULTI-SOURCE POWER SUPPLY: 208/230-1-60

Air Handlers Models	Heater Models	Total Heater Amps @240V	Min. Circuit Ampacity						MOP[1]						Min. Wire Size (AWG)[2]					
			208V			230V			208V			230V			208V			230V		
			Circuit						Circuit						Circuit					
			1st[3]	2nd	3rd	1st[3]	2nd	3rd	1st[3]	2nd	3rd	1st[3]	2nd	3rd	1st[3]	2nd	3rd	1st[3]	2nd	3rd
AHE22B AHE24B AHE30B	6HK16501306	52.0	22.2	37.6	–	24.6	43.3	–	25	40	–	25	45	–	10	8	–	10	8	–
	6HK16501506	60.0	25.1	43.3	–	27.9	50.0	–	30	45	–	30	50	–	10	8	–	10	8	–
AHE34C AHE36C AHE42D	6HK16501306	52.0	23.3	37.6	–	25.7	43.3	–	25	40	–	30	45	–	10	8	–	10	8	–
	6HK16501506	60.0	26.2	43.3	–	29.0	50.0	–	30	45	–	30	50	–	10	8	–	10	8	–
	6HK16501806	72.0	43.5	39.0	–	49.0	45.0	–	45	40	–	50	45	–	8	8	–	8	8	–
	6HK16502006	80.0	47.8	43.3	–	54.0	50.0	–	50	45	–	60	50	–	8	8	–	6	8	–
AHE48D	6HK16501306	52.0	25.4	37.6	–	27.8	43.3	–	30	40	–	30	45	–	10	8	–	10	8	–
	6HK16501506	60.0	28.3	43.3	–	31.1	50.0	–	30	45	–	35	50	–	10	8	–	8	8	–
	6HK16501806	72.0	45.6	39.0	–	51.1	45.0	–	50	40	–	60	45	–	8	8	–	6	8	–
	6HK16502006	80.0	49.9	43.3	–	56.1	50.0	–	50	45	–	60	50	–	8	8	–	6	8	–
AHE60D	6HK16501306	52.0	25.4	37.6	–	27.8	43.3	–	30	40	–	30	45	–	10	8	–	10	8	–
	6HK16501506	60.0	28.3	43.3	–	31.1	50.0	–	30	45	–	35	50	–	10	8	–	8	8	–
	6HK16501806	72.0	45.6	39.0	–	51.1	45.0	–	50	40	–	60	45	–	8	8	–	6	8	–
	6HK16502006	80.0	49.9	43.3	–	56.1	50.0	–	50	45	–	60	50	–	8	8	–	6	8	–
	6HK16502506	100.0	49.9	43.3	21.7	56.1	50.0	25.0	50	45	25	60	50	25	8	8	10	6	8	10

1. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse.
2. Stated sizes are for 75°C, copper wire only. If wire other than non-plated, 75°C ambient, copper wire is used, consult applicable tables of the NEC and local codes.
3. 1st Circuit includes the blower motor amps.

TABLE 8: ELECTRICAL DATA FOR SINGLE SOURCE POWER SUPPLY - 208/230-3-60

Air Handler Models	Heater Models	Heater Amps @ 240V	Field Wiring					
			Min. Circuit Ampacity		MOP[1]		Min. Wire Size (AWG)[2]	
			208V	230V	208V	230V	208V	230V
AHE18B	6HK06501025	23.1	28.5	32.4	30	35	10	8
AHE22B AHE24B AHE30B	6HK06501025	23.1	28.5	32.4	30	35	10	8
	6HK06501525	34.6	41.0	46.8	45	50	8	8
AHE34C AHE36C AHE42D	6HK06501025	23.1	30.2	34.0	30	35	10	8
	6HK06501525	34.6	42.6	48.4	45	50	8	8
	6HK06501825	41.6	50.2	57.1	60	60	6	6
	6HK16502025[3]	46.2	55.2	62.9	60	70	6	6
AHE48D	6HK06501025	23.1	32.5	36.4	35	40	8	8
	6HK06501525	34.6	45.0	50.8	45	60	8	6
	6HK06501825	41.6	52.6	59.5	60	60	6	6
	6HK16502025[3]	46.2	57.6	65.3	60	70	6	4
AHE60D	6HK06501025	23.1	32.5	36.4	35	40	8	8
	6HK06501525	34.6	45.0	50.8	45	60	8	6
	6HK06501825	41.6	52.6	59.5	60	60	6	6
	6HK16502025[3]	46.2	57.6	65.3	60	70	6	4
	6HK16502525[3]	57.7	70.0	79.6	70	80	4	4

1. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse.
2. Stated sizes are for 75°C, copper wire only. If wire other than non-plated, 75°C ambient, copper wire is used, consult applicable tables of the NEC and local codes.
3. The 20kW and 25kW heater models (6HK16502025 and 6HK16502525) come with circuit breakers standard. Single source power MCA and MOP requirements are given here only for reference if used with field installed single point power modification.

TABLE 9: ELECTRICAL DATA FOR MULTI-SOURCE POWER SUPPLY: 208/230-3-60

Air Handler Models	Heater Models	Total Heater Amps @ 240V	Min. Circuit Ampacity				MOP[1]				Min. Wire Size (AWG)[2]			
			208V		230V		208V		230V		208V		230V	
			Circuit				Circuit				Circuit			
			1st[3]	2nd	1st[3]	2nd	1st[3]	2nd	1st[3]	2nd	1st[3]	2nd	1st[3]	2nd
AHE34C AHE36C AHE42D	6HK16502025	46.2	30.2	25.0	34.0	28.9	35	25	35	30	8	10	8	10
AHE48D	6HK16502025	46.2	32.5	25.0	36.4	28.9	35	25	40	30	8	10	8	10
AHE60D	6HK16502025	46.2	32.5	25.0	36.4	28.9	35	25	40	30	8	10	8	10
	6HK16502525	57.7	38.8	31.3	43.6	36.1	40	35	45	40	8	8	8	8

1. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse.
2. Stated sizes are for 75°C, copper wire only. If wire other than non-plated, 75°C ambient, copper wire is used, consult applicable tables of the NEC and local codes.
3. 1st Circuit includes the fan motor.

TABLE 10: AIR FLOW DATA (CFM)[1]

Models	Blower Motor Speed	External Static Pressure (in. wc.)						
		0.10	0.20	0.30	0.40	0.50	0.60	0.70
AHE18B	High #5	1075	1041	1003	970	930	885	842
	Med High #4	895	845	808	767	709	647	561
	Med #3	663	618	557	490	348	267	192
	Med Low #2	629	468	356	197	175	68	23
	Low #1	629	468	356	197	175	68	23
AHE22B AHE24B AHE30B	High #5	1156	1120	1093	1056	1014	951	862
	Med High #4	1021	987	952	918	873	836	787
	Med #3	829	789	754	698	654	585	532
	Med Low #2	681	621	575	496	435	336	262
	Low #1	598	503	437	340	259	203	74

Continuation on Page 13.

TABLE 10: AIR FLOW DATA (CFM)[1]

Models	Blower Motor Speed	External Static Pressure (in. wc.)						
		0.10	0.20	0.30	0.40	0.50	0.60	0.70
AHE34C	High #5	1471	1429	1387	1337	1289	1233	1172
	Med High #4	1301	1248	1198	1147	1008	999	927
	Med #3	1097	1044	972	906	815	748	680
	Med Low #2	943	868	768	689	617	566	520
	Low #1	869	668	515	424	365	287	NA
AHE36C	High #5	1465	1415	1360	1307	1246	1183	1118
	Med High #4	1260	1204	1142	1075	1008	946	876
	Med #3	1088	1022	939	862	782	721	626
	Med Low #2	998	810	717	630	562	493	444
	Low #1	903	707	411	323	265	152	NA
AHE42D	High #5	1632	1589	1542	1494	1446	1391	1335
	Med High #4	1430	1390	1346	1294	1238	1168	960
	Med #3	1238	1198	1145	1082	993	908	805
	Med Low #2	1118	1020	947	851	734	666	563
	Low #1	998	772	477	418	349	NA	NA
AHE48D	High #5	1861	1823	1787	1750	1708	1666	1620
	Med High #4	1674	1640	1599	1562	1516	1472	1432
	Med #3	1442	1405	1358	1311	1262	1197	1108
	Med Low #2	1257	1220	1163	1103	1031	942	864
	Low #1	1153	1031	967	867	764	718	633
AHE60D	High #5	2091	2053	2016	1975	1937	1906	1869
	Med High #4	1903	1868	1832	1791	1748	1703	1660
	Med #3	1634	1598	1562	1516	1468	1422	1350
	Med Low #2	1447	1404	1361	1318	1257	1164	1092
	Low #1	1268	1203	1148	1073	978	907	839

1. Air handler units have been tested to UL 1995 / CSA 22.2 standards up to 0.30" wc. external static pressure.
Dry coil conditions only, tested without filters.
For optimal performance, external static pressures of 0.2" to 0.5" are recommended. Applications above 0.6" are not recommended.
Airflow data shown is from testing performed at 230V. AHE units use a X13 motor, and there is minimal variation of airflow at other distribution voltage values. The above data can be used for airflow at other distribution voltages.

SECTION X: MAINTENANCE

Filters must be cleaned or replaced when they become dirty. Inspect at least once per month. The frequency of cleaning depends upon the hours of operation and the local atmospheric conditions. Clean filters keep unit efficiency high.

COIL CLEANING

If the coil needs to be cleaned, it should be wash with a evaporator coil cleaner. Follow directions from coil cleaner.

LUBRICATION

The bearings of the blower motor are permanently lubricated.

CONDENSATE DRAINS

During the cooling season check the condensate drain lines to be sure that condensate is flowing from the primary drain but not from the secondary drain. If condensate ever flows from the secondary drain the unit should be promptly shut off and the condensate pan and drains cleaned to insure a free flowing primary drain.

SECTION XI: WIRING DIAGRAM

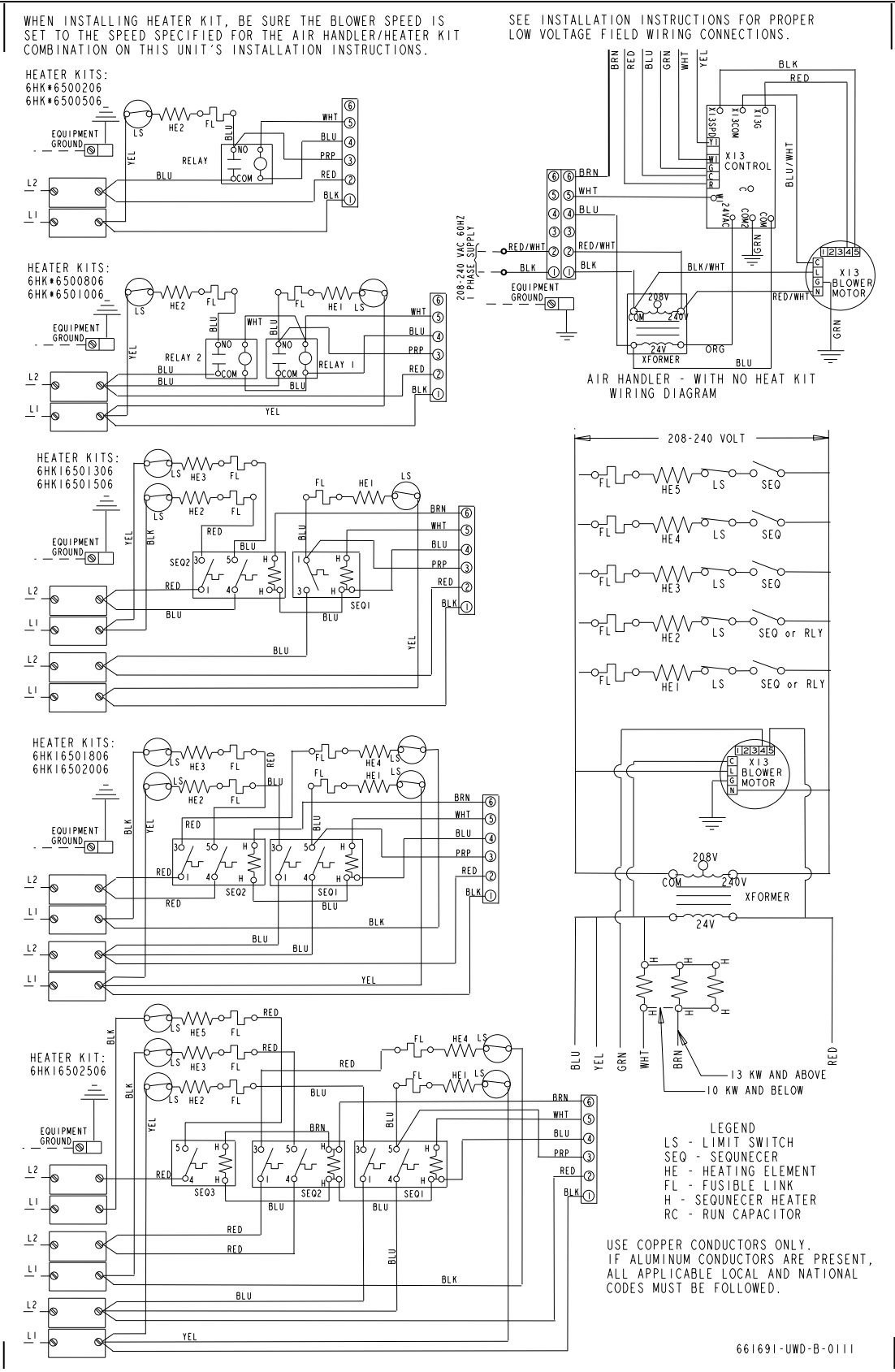


FIGURE 15: Wiring Diagram - ECM - Single Phase Heat Kits

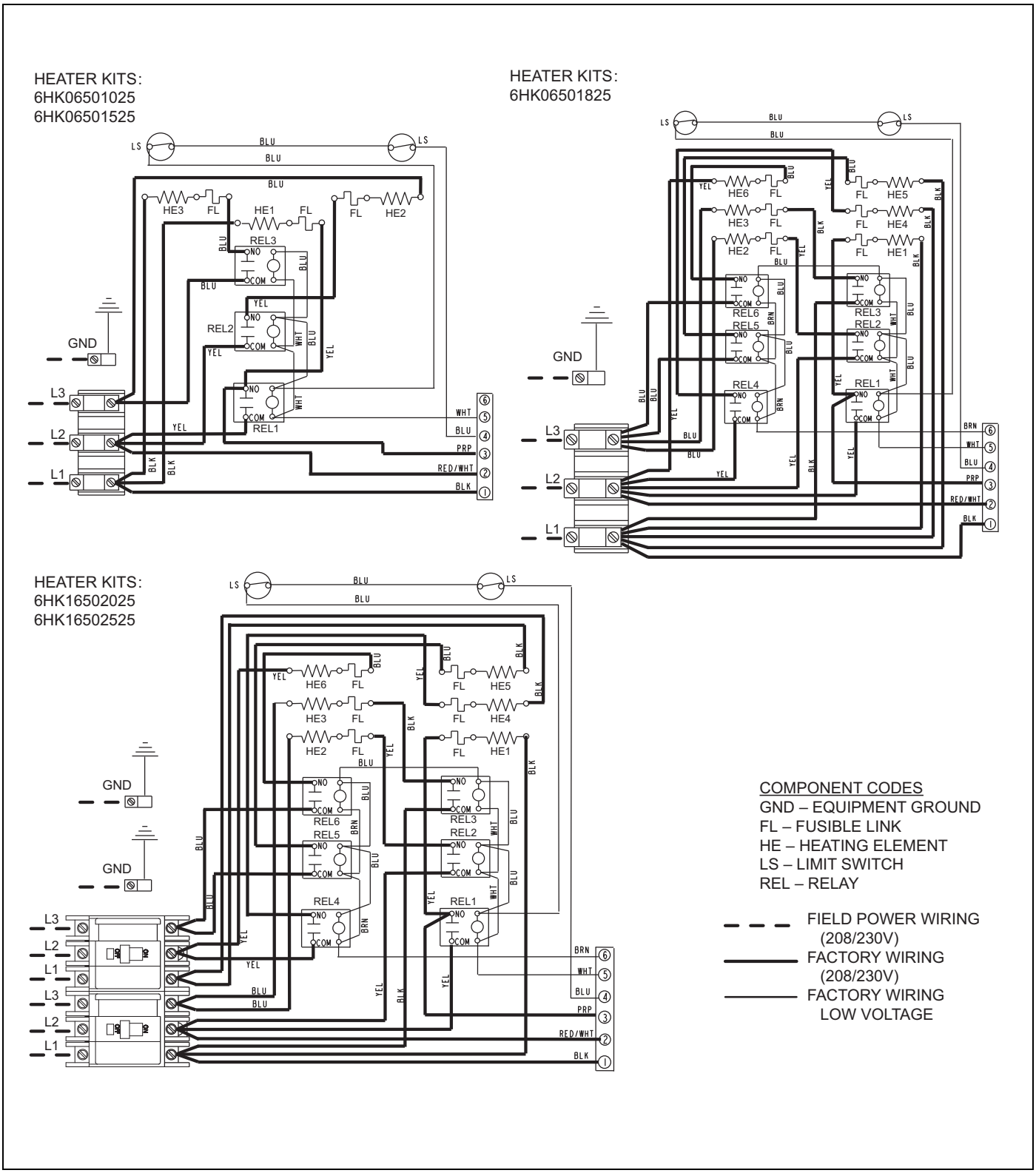


FIGURE 16: Wiring Diagram - 3 Phase Heat Kits

SECTION XII: TYPICAL THERMOSTAT CONNECTIONS

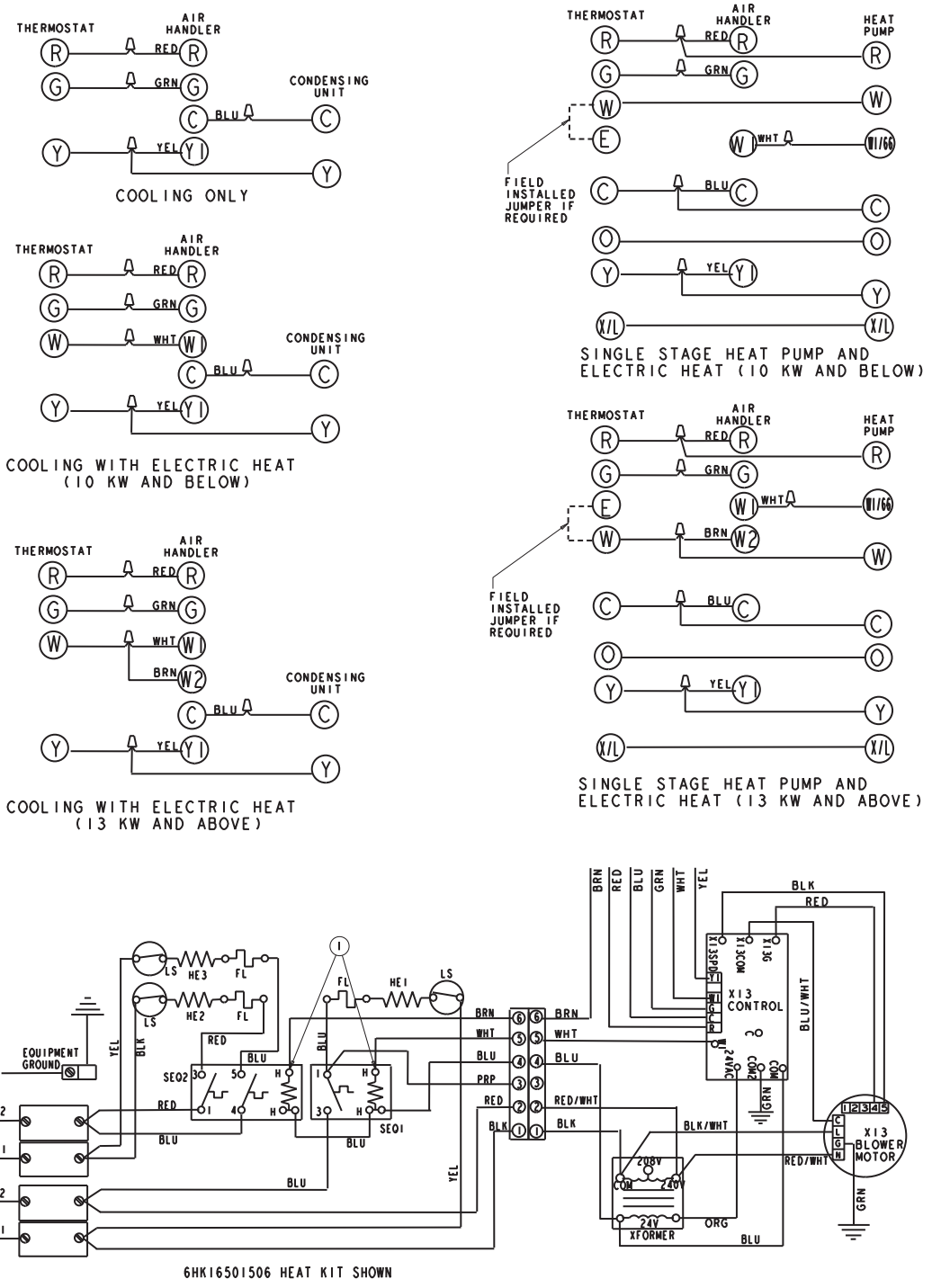


FIGURE 17: Typical Wiring Diagram - ECM

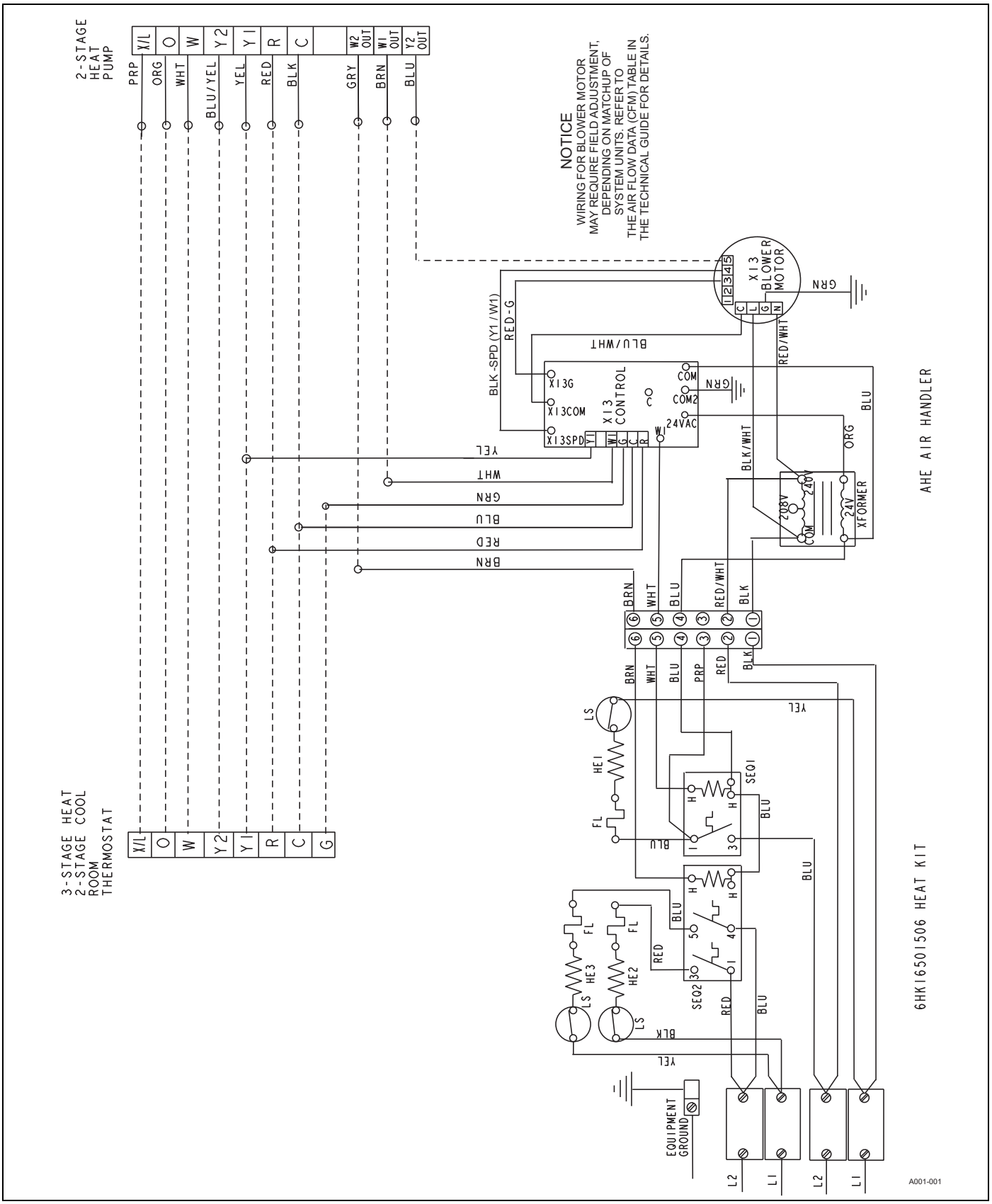


FIGURE 18: Typical Thermostat Wiring for 2-Stage Heat Pump with ECM Blower Motor

NOTES

SECTION XIII: START UP SHEET

Print Form

Residential Air Handler with Electric Heat Start-Up Sheet

Reset Form

Proper start-up is critical to customer comfort and equipment longevity

Start-Up Date		Company Name		Start-Up Technician	

Owner Information

Name		Address		Daytime Phone	
City		State or Province		Zip or Postal Code	

Equipment Data

Unit Model #		Unit Serial #	

General Information (Check all that apply)

◯ New Construction	◯ Up flow	◯ Horizontal Left
◯ Retrofit	◯ Down flow	◯ Horizontal Right

Unit Location and Connections (Check all that apply)

☐ Unit is level ☐ Duct connections are complete: ☐ Supply ☐ Return

☐ Condensate drain properly connected per the installation instructions ☐ Condensate trap has been primed with water

Filters

☐ Filters installed Number of filters Filter size

Electrical Connections & Inspection (Complete all that apply)

◯ 208 volts AC ◯ 230 volt AC

☐ Inspect wires and electrical connections ☐ Transformer wired properly for primary supply voltage ☐ Ground connected

Line Voltage Measured (Volts AC) Low voltage value between "R" and "C" at control board (Volts AC)

☐ Thermostat wiring is complete ☐ Thermostat cycle rate or heat anticipator adjusted to Installation Manual specifications

Air Flow Setup

Blower Type & Set-Up						
	◯ ECM	COOL	◯ A	◯ B	◯ C	◯ D
		ADJUST	◯ A	◯ B	◯ C	◯ D
		DELAY	◯ A	◯ B	◯ C	◯ D
		HEAT	◯ A	◯ B	◯ C	◯ D
	◯ X-13	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5
	◯ PSC	◯ Low	◯ Medium Low	◯ Medium	◯ Medium High	◯ High

Supply static (inches of water column)	Supply air dry bulb temperature	Outside air dry bulb temperature
Return static (inches of water column)	Return air dry bulb temperature	Return air wet bulb temperature
Total external static pressure	Temperature drop	Supply air wet bulb temperature

Other Jumpers (Check all that apply)

HUM STAT ◯ YES ◯ NO AC/HP ◯ AC ◯ HP CONT FAN ◯ L ◯ M ◯ H

Continued on next Page

Electric Heat (Complete all that apply)

Electric heat kit - Model number		Serial number		Rated KW		
Number of elements		Measured Amperage	Heater 1		Heater 2		Heater 3	
			Heater 4		Heater 5		Heater 6	
		Measured Voltage	Heater 1		Heater 2		Heater 3	
			Heater 4		Heater 5		Heater 6	
Heating return air dry bulb temperature		Heating supply air dry bulb temperature		Air temperature rise		

Clean Up Job Site

- ☐ Job site has been cleaned, indoor and outdoor debris removed from job site
- ☐ Tools have been removed from unit
- ☐ All panels have been installed

Unit Operation and Cycle Test (Complete all that apply)

- ☐ Operate the unit through continuous fan cycles from the thermostat, noting and correcting any problems
- ☐ Operate the unit through cooling cycles from the thermostat, noting and correcting any problems
- ☐ Operate the unit through mechanical heating cycles from the thermostat, noting and correcting any problems
- ☐ Operate the unit through emergency heating cycles from the thermostat, noting and correcting any problems

Owner Education

- ☐ Provide owner with the owner's manual
- ☐ Explain operation of system to equipment owner
- ☐ Explain thermostat use and programming (if applicable) to owner
- ☐ Explain the importance of regular filter replacement and equipment maintenance

Comments and Additional Job Details

925216-UIM-C-0514
Supersedes: 925216-UIM-B-0314

York International Corp.
5005 York Drive
Norman, OK 73069