

# INSTALLATION MANUAL

**SINGLE PIECE, 4 POSITION  
ECM AIR HANDLERS**  
**MODELS: AHV SERIES**



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## SECTION I: GENERAL

The AHV 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.

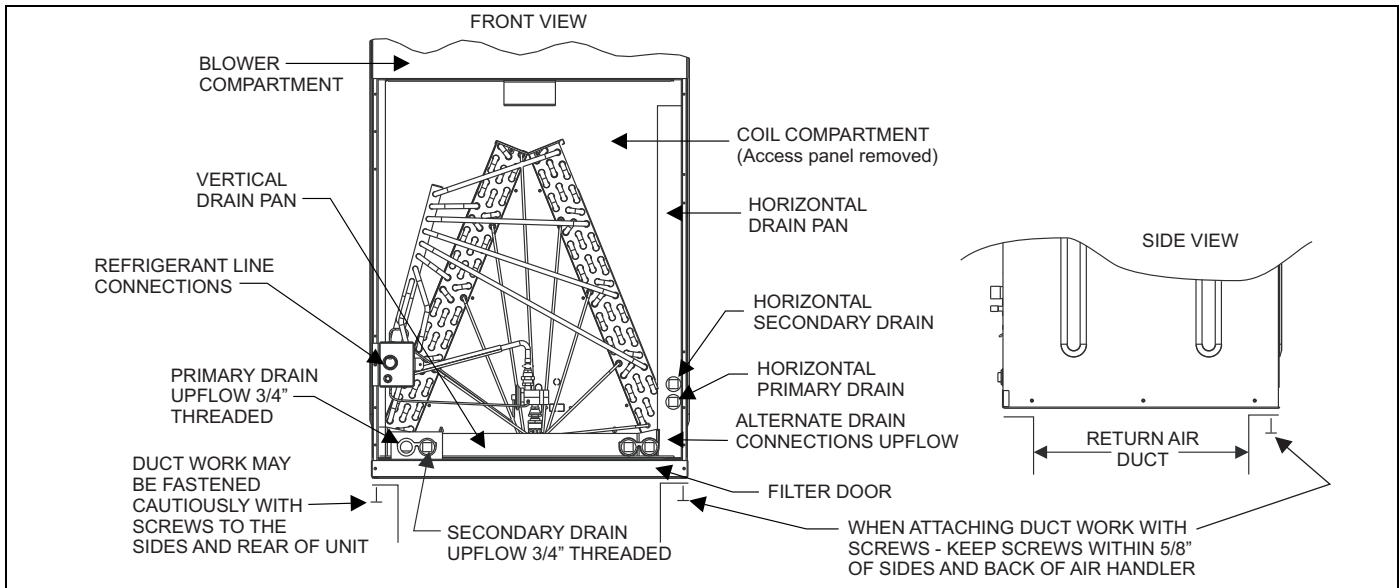
**CAUTION**

*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

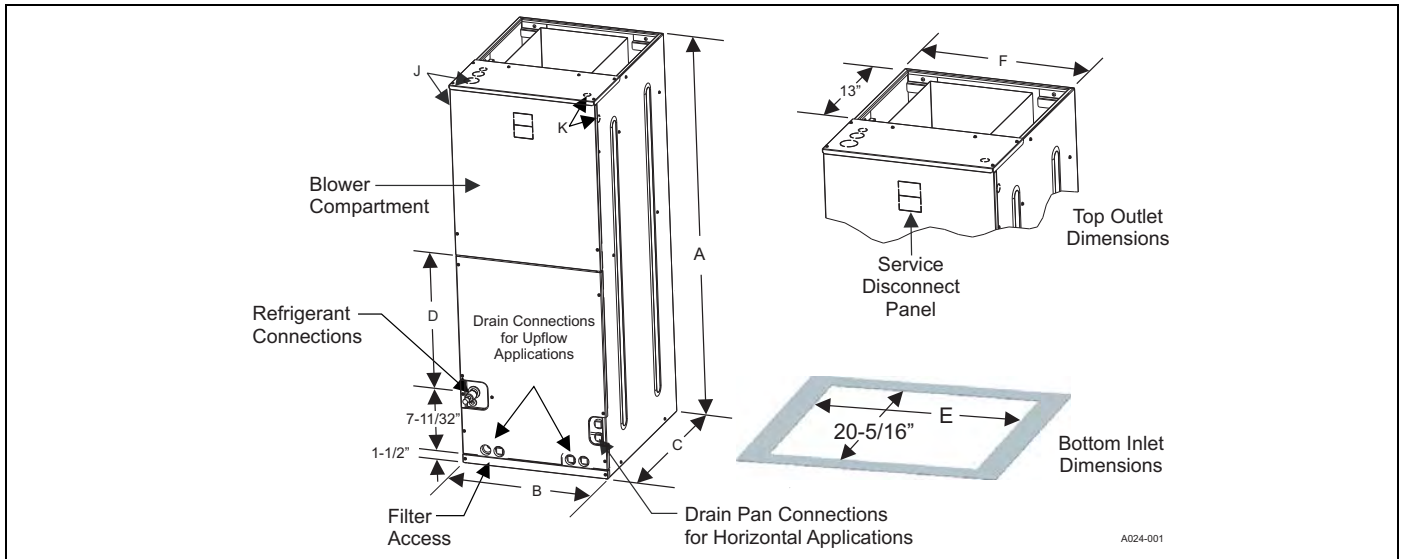


FIGURE 2: Dimensions & Duct Connection Dimensions

TABLE 1: Dimensions<sup>1</sup>

Models	Dimensions						Wiring Knockouts <sup>2</sup>		Refrigerant Connections Line Size	
	A	B	C	D	E	F	J	K	Liquid	Vapor
	Height	Width	Depth				Power	Control		
AHV18B3XH21	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"
AHV24B3XH21	46"	17-1/2"		16-1/2"	13-29/32"	16-1/2"				
AHV30B3XH21	46"	17-1/2"		16-1/2"	13-29/32"	16-1/2"				
AHV36C3XH21	52"	21"		21-1/2"	17-13/32"	20"				
AHV42D3XH21	57"	24-1/2"		26"	20-29/32"	23-1/2"				
AHV48D3XH21	57"	24-1/2"		26"	20-29/32"	23-1/2"				
AHV60D3XH21	57"	24-1/2"		26"	20-29/32"	23-1/2"				7/8"

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

### SECTION III: UNIT INSTALLATION

#### UNIT SIZING

- 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.
- Only connect the air handler to a duct system which has an external static pressure within the allowable range.
- Airflow must be within the minimum and maximum limits approved for electric heat and evaporator coils.
- 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.
- 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.
- 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 <sup>1</sup> 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:

- Refrigerant piping and connections - minimum 12" recommended.
- Maintenance and servicing access - minimum 36" from front of unit recommended for blower motor / coil replacement.
- Condensate drain lines routed to clear filter and panel access.
- Filter removal - minimum 36" recommended.
- The ductwork and plenum connected to this unit are designed for zero clearance to combustible materials.
- 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:

- Select a location with adequate structural support, space for service access, clearance for air return and supply duct connections.
- Using hanging brackets to wall mount this single piece air handler unit is not recommended.
- Normal operating sound levels may be objectionable if the air handler is placed directly over some rooms such as bedrooms, study, etc.

- 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.*

- 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.
- Proper electrical supply must be available.
- 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.

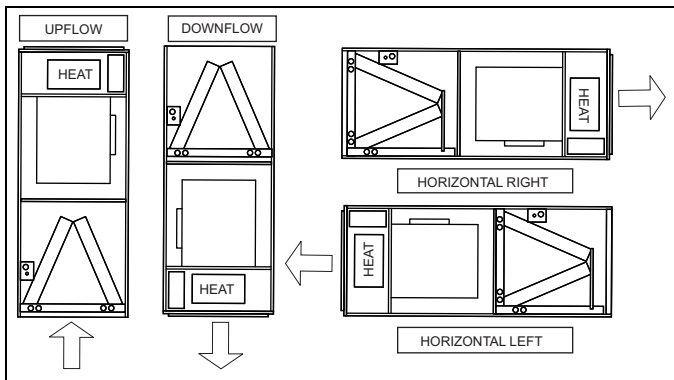


FIGURE 3: Typical Installation

**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 connections to the coil.*

**HORIZONTAL LEFT CONVERSION**

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

**DOWNFLOW CONVERSION**

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

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

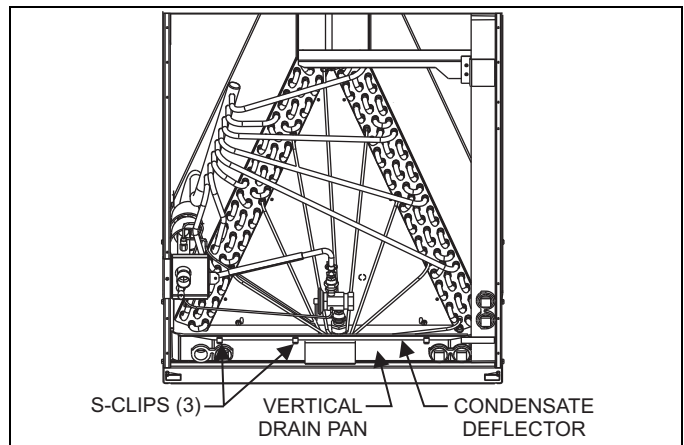


FIGURE 4: Condensate Deflector on Vertical Drain Pan

**NOTICE**

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

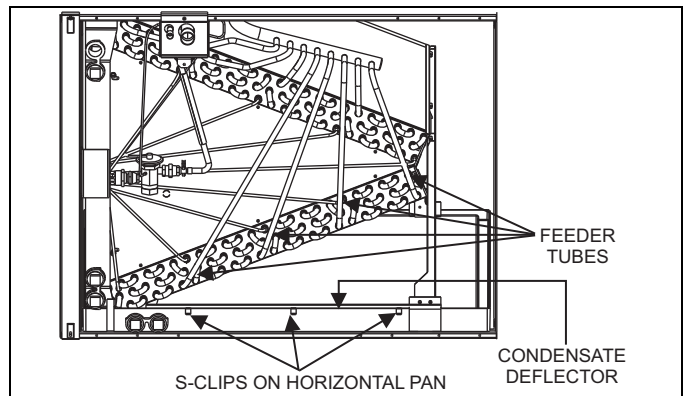
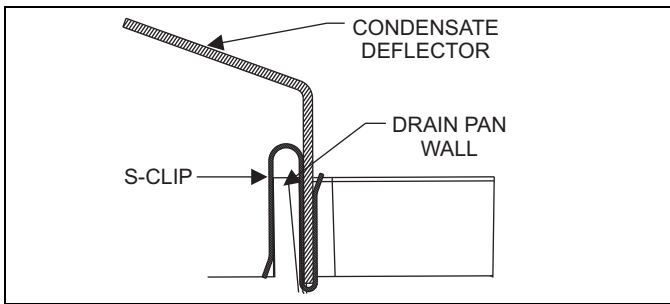


FIGURE 5: Condensate Deflector on Horizontal Drain Pan Edge



**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.

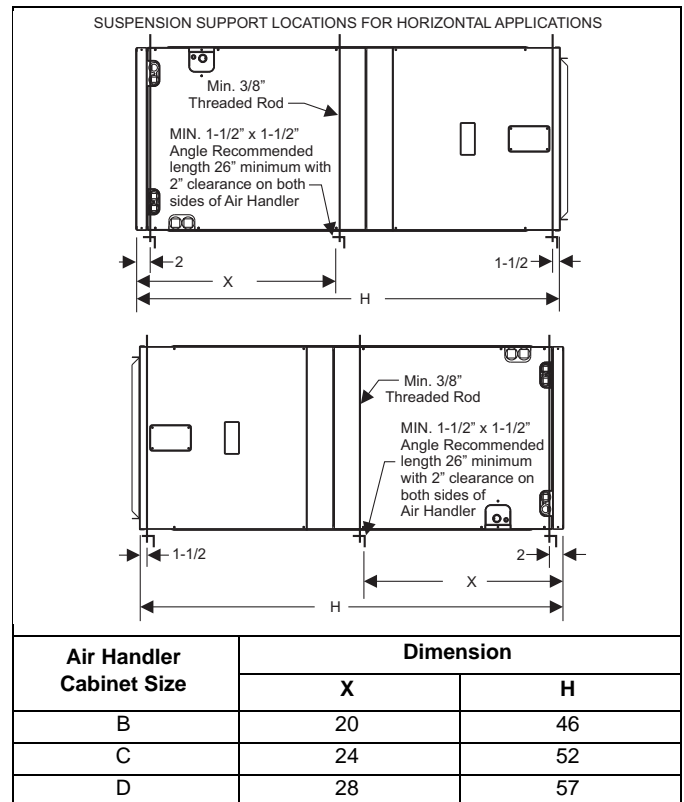
All ducts should be suspended using flexible hangers and never fastened directly to the structure.

## 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 7.

### **NOTICE**

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

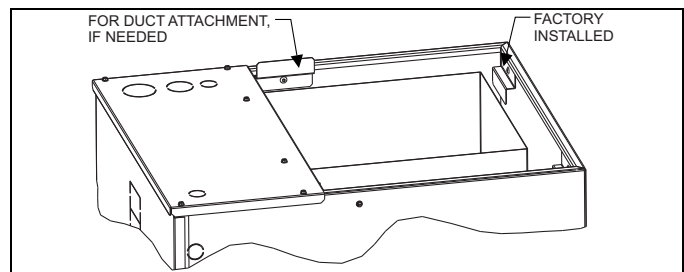


**FIGURE 7:** Horizontal Suspension

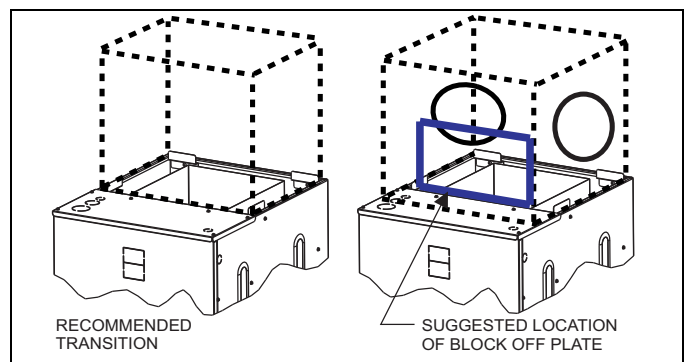
## DUCT FLANGES

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 through 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.

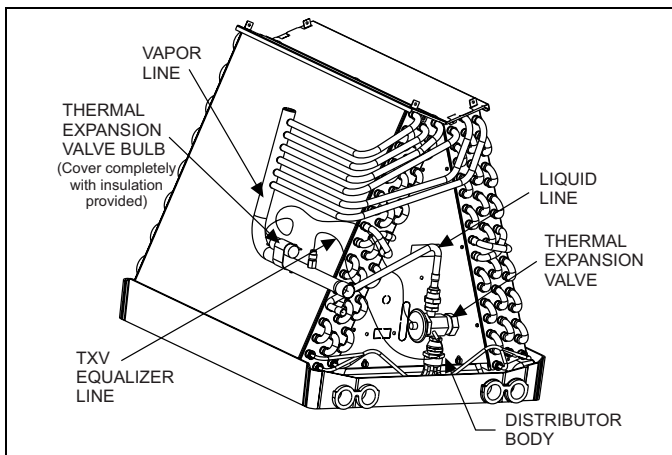


FIGURE 10: TXV

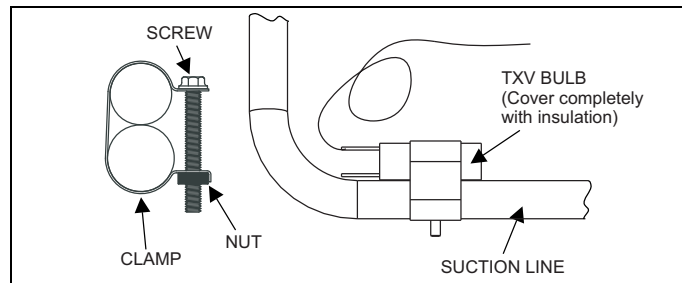


FIGURE 11: Proper Bulb Location

### 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 contaminants 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 swaged 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.

## 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.

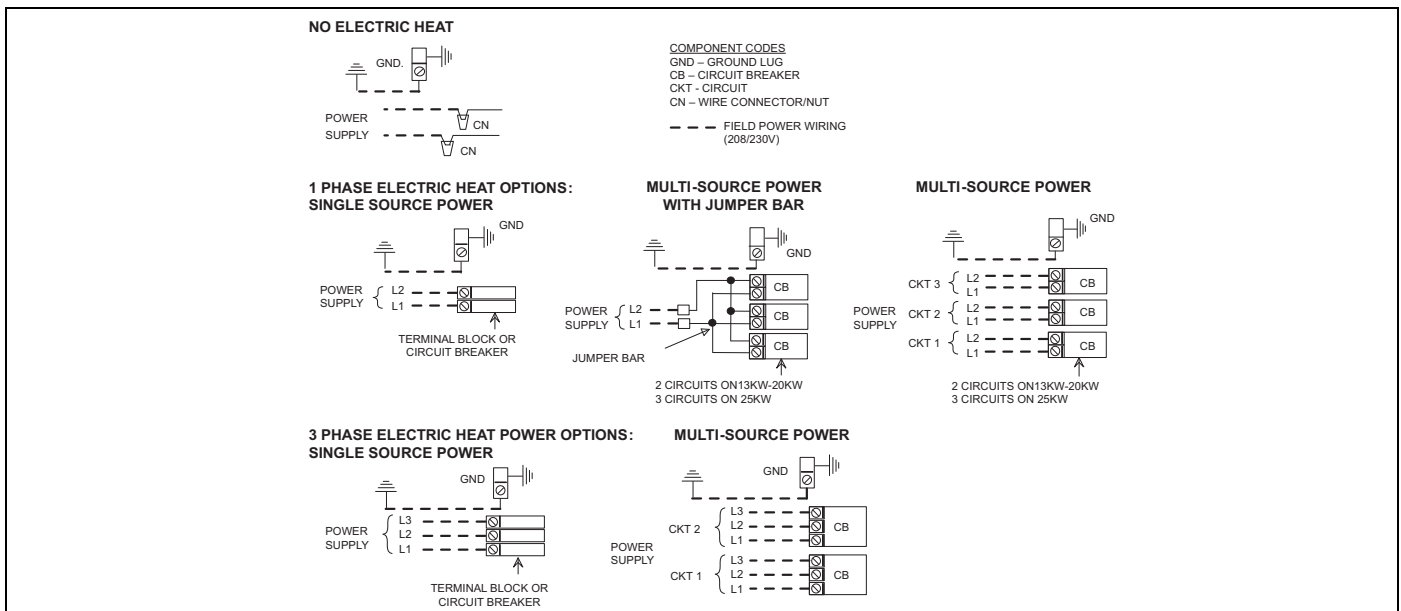


FIGURE 12: Line Power Connections

## 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.

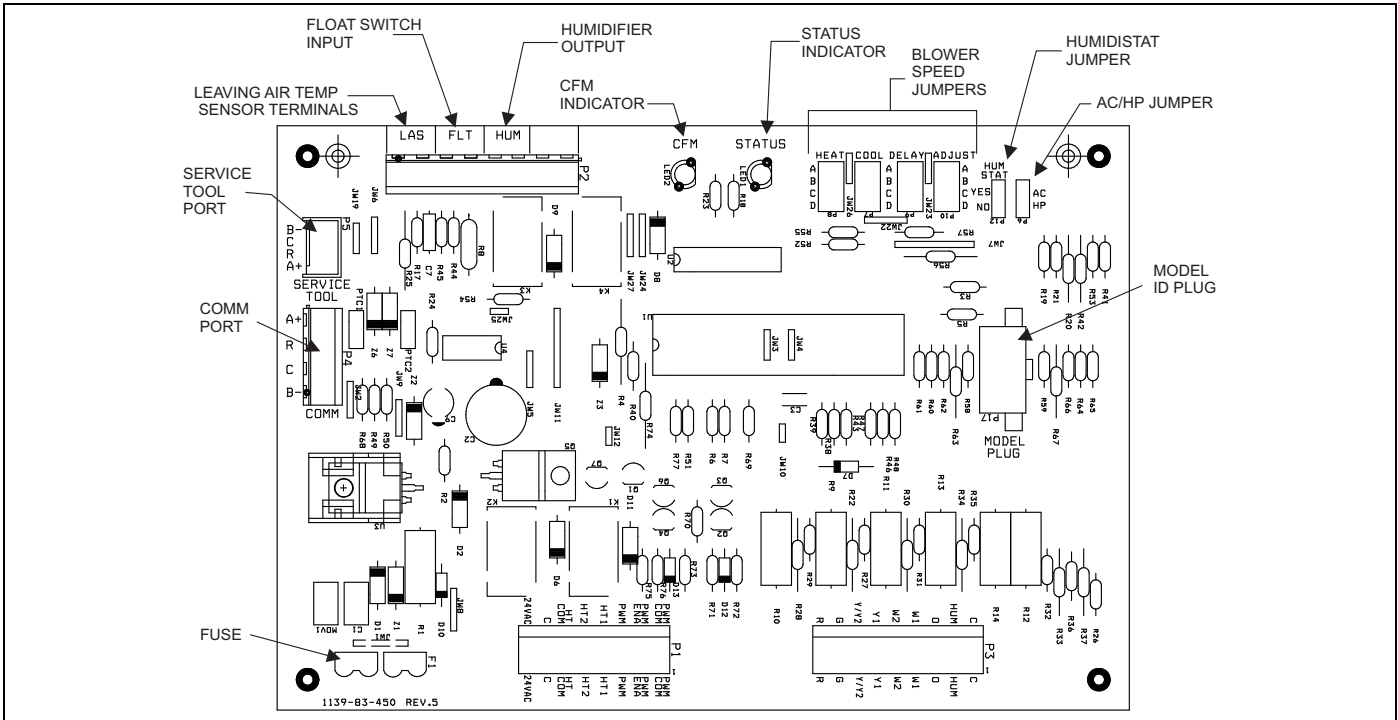


FIGURE 13: Control Board

### CONVENTIONAL LOW VOLTAGE CONTROL WIRING (24 VAC)

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.

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.

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

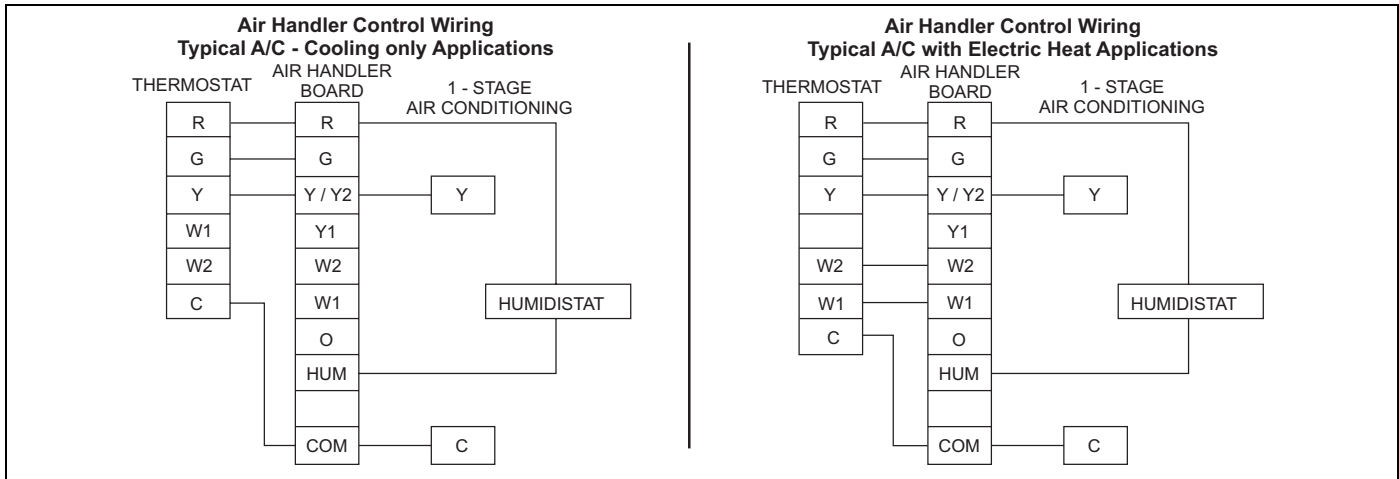
The field wiring is to be connected with wire nuts to the wires provided. Refer to Figure 14 and 15.

TABLE 2: Low Voltage Connections

Wire	Colors	Signal	Comment
R	Red	24 VAC power (fused)	
G	Green	Continuous Fan operation	
Y/Y2	Yellow	Second or full stage compressor operation	
Y1	Yellow & Black	First stage compressor operation	Not used with outdoor units having one stage compressors.
W2	Brown	Second stage heat operation	
W1	White	First stage heat operation	
O	Orange	Reversing valve operation	24 VAC will be present at this terminal when the MODE jumper is in the AC position. This is normal.
HUM	Purple	Humidity switch input	24 VAC will be present at this terminal when the HUM STAT jumper is in the NO position. This is normal.
COM	Blue	24 VAC common	

The field wiring is to be connected at the pigtails supplied with the control board harness.



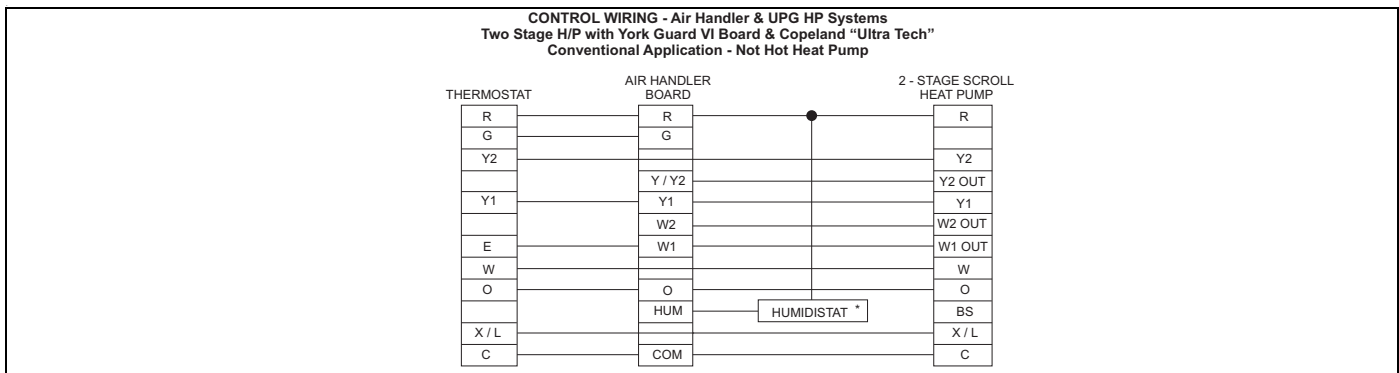


**FIGURE 14:** Cooling Models with and without Electric Heat Wiring

\* Optional dehumidification humidistat switch contacts open on humidity rise.

**NOTES:**

1. "Y/Y2" Thermostat wire must be connected for full CFM and applications requiring 60 second blower off delay for SEER enhancement.
2. Remove humidistat jumper on air handler control board.
3. For heat pump applications - set AC/HP jumper on air handler control board to the HP position.



**FIGURE 15:** Two-Stage Heat Pump Wiring

\* Optional dehumidification humidistat switch contacts open on humidity rise.

**NOTES:**

1. "Y/Y2" Thermostat wire must be connected for full CFM and applications requiring 60 second blower off delay for SEER enhancement.
2. Remove humidistat jumper on air handler control board.
3. For heat pump applications - set AC/HP jumper on air handler control board to the HP position.

## CONTROL WIRING USING COMMUNICATING CONTROLS

The Communicating System consists of several intelligent communicating components including the Communicating Thermostat Control (touch-screen wall thermostat), variable speed air handler, air conditioner (15 and 18 SEER premium air conditioners) or heat pump (13, 15 and 18 SEER premium heat pumps), which continually communicate with each other via a four-wire connection called the A-R-C-B bus. Commands, operating conditions, and other data are passed continually between components over the A-R-C-B bus. See Figure 16. The result is a new level of comfort, versatility, and simplicity.

In order to use this air handler in full communications (COMM) mode, it MUST be installed with the matching touch-screen Communicating Control (wall thermostat) and an outdoor air conditioner or heat pump with a fully communicating control.

This air handler may also be used along with the touch-screen Communicating Control and a non-communicating outdoor air conditioner through the addition of a communicating AC Control board to the outdoor unit. This system allows full communication between the air handler, outdoor unit, and touch-screen Handler Communication Control.

Use the wiring diagram below to connect the air handler control, touch-screen Communicating Control (wall thermostat) and communicating outdoor unit. Be sure that all of the "A+" terminals are connected together, all of the "B-" terminals are connected together, all of the "C" terminals are connected together and all of the "R" terminals are connected together. See Figure 16. When using a fully communicating system, removal of the low voltage signal connector at P3 is recommended (C, G, R, etc.). The four small screw terminals in the terminal block on the end of the air handler control should be used.

### CAUTION

*If any field-supplied wiring is to be connected to the control board, such as will be the case if the Communicating Control is used or if a humidistat, float switch or leaving air temperature switch are used, the additional wires MUST be routed through the hole at the lower left of the control box. DO NOT add any additional holes to the control box. After attaching the additional wires to the board, the remaining hole around the wires must be plugged with the sealant putty supplied or with a suitable waterproof sealant. FAILURE TO SEAL THIS HOLE MAY ALLOW WATER TO ENTER THE CONTROL BOX AND DAMAGE THE CONTROL BOARD.*

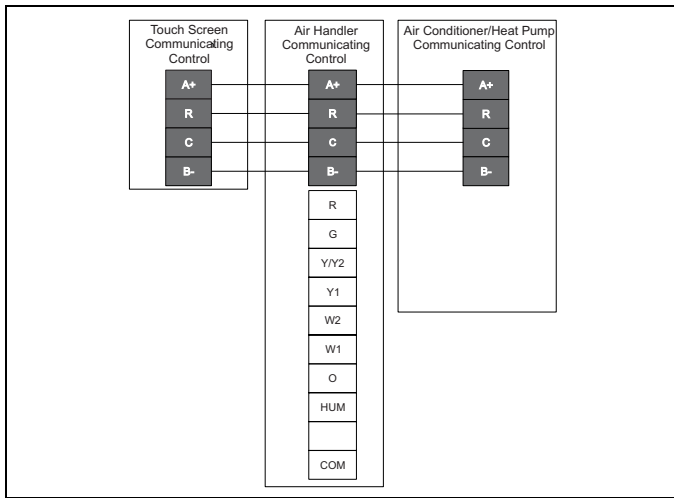


FIGURE 16: Air Handler with Communicating AC or HP

**IMPORTANT**

*Do not place more than one wire under any single communication terminal screw (there are four communication terminal screws). If more than one wire must be connected to a terminal screw, attach only the terminal end of a one wire pigtail no longer than 6", and use a wire connector to connect the other end of the pigtail to the other wires. Failure to do this will result in nuisance communication error faults. See Figure 17*

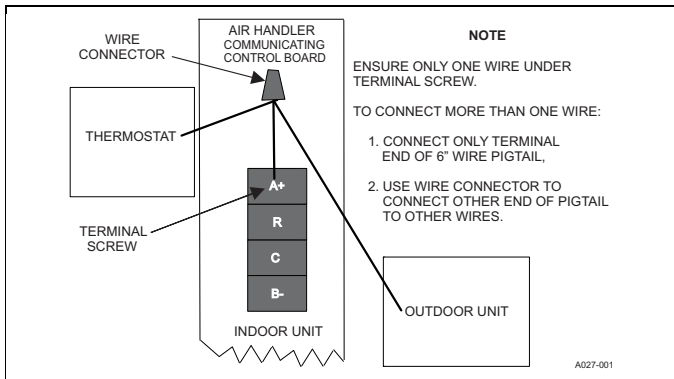


FIGURE 17: Multi-wire Terminal Connection

**HUMIDITY SWITCH INPUT**

The air handler control is designed to work with a humidity control that closes when the humidity is below the set-point. The control is open when the humidity is above the set-point. This humidity control may be referred to as a humidistat or a dehumidistat.

The humidity switch controls both humidification and de-humidification operation of the control. The control provides humidification using the HUM OUT relay output and de-humidification by lowering the blower speed. This is accomplished using the de-humidification input of the motor for variable speed models. The humidity switch should be connected to HUM terminals of the control. See Figure 13.

**FLOAT SWITCH INPUT**

An optional switch may be connected to the FLT terminals on the control board. This feature is only functional when used with the Communicating Control. It is intended for use with a water overflow switch.

**LEAVING AIR TEMP SENSOR INPUT**

A plenum air temperature sensor (thermistor) can be connected to the LAS terminals on the control board. The Communicating Control can monitor the temperature of the supply air in the plenum.

**SECTION VIII: REQUIRED CONTROL SET-UP**

**IMPORTANT**

*The following steps must be taken at the time of installation to insure proper system operation.*

1. Consult system wiring diagram to determine proper thermostat wiring for your system.
2. If a humidistat is installed, change HUM STAT jumper from NO to YES.
3. Set the MODE jumper to A/C (Air Conditioner) or HP (Heat Pump) position depending on the outdoor unit included with the system.
4. Set airflow and comfort setting jumper to proper positions.

**FUNCTIONALITY AND OPERATION**

**Jumper Positions**

**Hum Stat Jumper**

The HUM STAT jumper configures the control to monitor the humidity switch input. With the jumper in the NO position, the control will ignore the HUM input. With the jumper in the YES position, the control will monitor the HUM input to control the HUM OUT output to control an external humidifier.

If the jumper is not present, the control will operate as if the jumper is in the NO position.

**AC/HP Jumper**

The AC/HP jumper configures the control to operate properly with an air conditioner (AC position) or heat pump (HP position). With the jumper in the AC position, the control will treat any "Y" call as a cooling call. With the jumper in the HP position, the O input signal is received from the room thermostat.

If the jumper is not present, the control will operate as if the jumper is in the HP position.

**Airflow and Comfort Setting Jumpers**

See separate section.

**Status and Fault Codes**

The control includes an LED that displays status and fault codes. These codes are shown in Table 3. The control will display the fault codes until power is removed from the control or the fault condition is no longer present.

TABLE 3: Fault Codes

Fault or Status Condition	LED1 (RED) Flash Code
<b>Status</b>	
No power to control	OFF
Internal control fault	ON
2 sec on 2 sec off heartbeat	Normal
0.1 sec on, 0.1 sec off	Test mode
Call for heat and cool at the same time	7
Model Plug Not inserted	8
Internal fault self-corrected, attempting normal operation	9

**HUM OUT Output**

The HUM OUT output can be used to drive an external relay or solenoid (24 VAC coil) to control a humidifier. The output is energized when the HUM input is energized, the HUM STAT is in the YES position, and the control has a thermostat call for heating (heat pump or electric heat).

**Heat Output**

The control is connected to the heater relays using pins 4,5, and 6 of connector P1. The relay outputs and the limit switch signal are 24 VAC. The control energizes the heat relays as shown in Table 4.

**TABLE 4:** Heat Relays

Input	Heat Relay Output
W1	HT1
W2	HT2
W1 and W2	HT1 and HT2

Depending on the heat kit installed in the air handler, the control provides the flexibility to configure the amount of heat delivered with the first stage heating call. As an example, when the control's W1 input is connected to the room thermostat's first stage heat signal, a call for first stage heat will energize one heating element (HT1). If the control's W2 input is connected to the room thermostat's first stage heat signal, a call for first stage heat will energize one heating element (HT2). With either configuration, the control will energize two heating elements (HT1, and HT2) when it receives a first and second stage heat input from the thermostat.

**Wiring Related Faults**

If the control receives a simultaneous call for heating and cooling (fault code 7), the control will perform both heating and cooling operations.

## SECTION IX: AIRFLOW AND COMFORT SETTING SELECTION

### AIRFLOW SELECTION

When not using communicating functionality, the airflow and comfort setting selection jumpers must be set properly at the time of installation for proper system operation. Place jumpers in the proper locations based on the information shown in Table 14 or 15 and Figure 13.

Inputs to air handler control board are passed to the motor which determines the target CFM to be delivered. The following inputs will produce the CFM per the appropriate table and selected tap settings.

### NOTICE

*Incorrect airflow and comfort settings may result in decreased system efficiency and performance.*

These variable speed air handlers are designed to deliver constant airflow (CFM) regardless of the external static pressure (ESP) in the ductwork. Therefore, if too many supply registers are closed, a filter becomes clogged, or there is a restriction in the ductwork, the motor will automatically operate at a higher speed to compensate for the higher ESP. This may result in a higher operating sound level.

**To Set Cooling Airflow:**

Refer to the outdoor unit technical guide for the recommended airflow with the matching evaporator coil. Refer to Table 14 or 15 for the possible high speed cooling and heat pump airflow selections.

Find the recommended system airflow in Table 14 or 15 for the installed air handler model.

Select the COOL airflow you need from Table 14 or 15. Set the COOL and ADJUST Jumpers on the control as indicated in Table 14 or 15.

**To Set Heat Pump Airflow:**

The heat pump airflow setting is the same as the cooling airflow setting. No additional airflow setting is required. However, you must set the AC/HP jumper to the HP position for proper system operation (See Figure 13).

**To Set Electric W1 Heat Airflow:**

The blower speed required for 1st stage electric heat is different than cooling. Refer to Table 14 or 15 for the possible CFM selections. Refer to Table 10 for the minimum required airflow for the electric heater installed. Find the desired airflow in Table 14 or 15 for low heat. Set the HEAT jumper on the control as indicated in Table 14 or 15.

**To Set W2 Electric Heat Airflow:**

Airflow for any W2 input, which is for Stages 2 & 3 of electric heat, is the indicated CFM for high heat tap selection on Table 14 or 15.

### CAUTION

*DO NOT change the ADJUST tap position on the control as this will change your cooling airflow previously selected.*

**Blower Ramp-Up /Ramp-Down:**

To minimize the sound made by the blower when it speeds up or slows down, the blower will slowly ramp up or down from one speed to another. Changes in blower speed during A/C or heat pump heating can take up to 30 seconds. Changes in blower speed during electric strip heating can take up to 15 seconds.

### COMFORT SETTINGS

**TABLE 5:** Comfort Setting Selection

DELAY TAP	COMFORT SETTING
A	Normal
B	Humid
C	Dry
D	Temperate

**Normal**

The normal setting provides a ramp-up from zero airflow to full capacity and a ramp-down from full capacity back to zero airflow.

**Humid**

The humid setting is best-suited for installations where the humidity is frequently very high during cooling season, such as in the southern part of the country. On a call for cooling, the blower will ramp up to 50% of full capacity and will stay there for two minutes, then will ramp up to 82% of full capacity and will stay there for five minutes, and then will ramp up to full capacity, where it will stay until the wall thermostat is satisfied.

**Dry**

The dry setting is best suited to parts of the country where excessive humidity is not generally a problem, where the summer months are usually dry. On a call for cooling the motor will ramp up to full capacity and will stay there until the thermostat is satisfied. At the end of the cooling cycle, the blower will ramp down to 50% of full capacity where it will stay for 60 seconds. Then it will ramp down to zero.

**Temperate**

The temperate setting is best suited for most of the country, where neither excessive humidity nor extremely dry conditions are the norm. On a call for cooling, the motor will ramp up to 63% of full capacity and will stay there for 90 seconds, then will ramp up to full capacity. At the end of the cooling cycle, the motor will ramp down to 63% of full capacity and will stay there for 30 seconds, then will ramp down to zero.

## SECTION X: UNIT DATA

TABLE 6: Unit Data

AHV MODELS								
Models		18B	24B	30B	36C	42D	48D	60D
Blower - Diameter x Width		10 x 8	10 x 8	10 x 8	11 x 10	11 x 10	11 x 10	11 x 10
Motor	HP	1/3 HP	1/3 HP	1/3 HP	1/2 HP	1/2 HP	3/4 HP	3/4 HP
	Nominal RPM	1050	1050	1050	1050	1050	1050	1050
Voltage		208/230	208/230	208/230	208/230	208/230	208/230	208/230
Full Load Amps @230V		2.3	2.3	2.3	3.2	3.2	4.9	4.9
Filter <sup>1</sup>	Type	DISPOSABLE OR PERMANENT						
	Size	16 x 20 x 1	16 x 20 x 1	16 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	1PF0602BK	1PF0603BK	1PF0603BK	1PF0603BK
Shipping / Operating Weight (lbs.)		116/104	121/106	121/106	153/138	169/151	172/154	175/157

1. Field supplied.

TABLE 7: Electrical Data - Cooling Only

Models	Motor FLA <sup>1</sup>		Minimum Circuit Ampacity		MOP <sup>2</sup>	Minimum Wire Size (AWG) <sup>3</sup>
	208V	230V	208V	230V		
AHV MODELS						
AHV18B AHV24B AHV30B	2.7	2.3	3.4	2.9	15	14
AHV36C AHV42D	3.6	3.2	4.5	4.0	15	14
AHV48D AHV60D	5.3	4.9	6.6	6.1	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 8: Electrical Heat: Minimum Fan Speed<sup>1</sup>

Heater Kit Models <sup>1,2</sup>	Nom. kW @240V	Air Handler Models						
		AHV18B	AHV24B	AHV30B	AHV36C	AHV42D	AHV48D	AHV60D
6HK(0,1)6500206	2.4kW	Low (D)	Low (D)	Low (D)	Low (D)	Low (D)	Low (D)	Low (D)
6HK(0,1)6500506	4.8kW	Low (D)	Low (D)	Low (D)	Low (D)	Low (D)	Low (D)	Low (D)
6HK(0,1)6500806	7.7kW	Med-Low (C)	Low (D)	Low (D)	Low (D)	Low (D)	Low (D)	Low (D)
6HK(0,1)6501006 6HK06501025	9.6kW	Med-Low (C)	Low (D)	Low (D)	Low (D)	Low (D)	Low (D)	Low (D)
6HK(1,2)6501306	12.5kW	-	Med-Low (C)	Med-Low (C)	Low (D)	Low (D)	Low (D)	Low (D)
6HK(1,2)6501506 6HK06501525	14.4kW	-	Med-Low (C)	Med-Low (C)	Med-Low (C)	Low (D)	Low (D)	Low (D)
6HK(1,2)6501806 6HK06501825	17.3kW	-	-	-	Med-Low (C)	Med-Low (C)	Low (D)	Low (D)
6HK(1,2)6502006 6HK16502025	19.2kW	-	-	-	Med-High (B)	Med-High (B)	Low (D)	Low (D)
6HK(1,2)6502506 6HK16502525	24kW	-	-	-	-	-	-	Low (D)

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 9: Electric Heat Performance Data: 208/230-1-60 & 208/230-3-60**

Heater Models <sup>1,2</sup>		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

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

**TABLE 10: Electrical Data For Single Source Power Supply: 208/230-1-60**

Air Handler Models	Heater Models <sup>1,2</sup>	Heater Amps @240V	Field Wiring					
			Min. Circuit Ampacity		MOP. <sup>3</sup>		Min Wire Size (AWG) <sup>4</sup>	
			208V	230V	208V	230V	208V	230V
AHV18B	6HK(0,1)6500206	10.0	14.2	15.4	15	20	12	12
	6HK(0,1)6500506	20.0	25.0	27.9	30	30	10	10
	6HK(0,1)6500806	32.0	38.0	42.9	40	45	8	8
	6HK(0,1)6501006	40.0	46.7	52.9	50	60	8	6
AHV24B AHV30B	6HK(0,1)6500206	10.0	14.2	15.4	15	20	12	12
	6HK(0,1)6500506	20.0	25.0	27.9	30	30	10	10
	6HK(0,1)6500806	32.0	38.0	42.9	40	45	8	8
	6HK(0,1)6501006	40.0	46.7	52.9	50	60	8	6
	6HK(1,2)6501306	52.0	59.7	67.9	60	70	6	4
AHV36C AHV42D	6HK(1,2)6501506	60.0	68.4	77.9	70	80	4	4
	6HK(0,1)6500206	10.0	15.3	16.5	20	20	12	12
	6HK(0,1)6500506	20.0	26.2	29.0	30	30	10	10
	6HK(0,1)6500806	32.0	39.2	44.0	40	45	8	8
	6HK(0,1)6501006	40.0	47.8	54.0	50	60	8	6
	6HK(1,2)6501306	52.0	60.8	69.0	70	70	6	4
	6HK(1,2)6501506	60.0	69.5	79.0	70	80	4	4
	6HK(1,2)6501806	72.0	82.5	94.0	90	100	3	3
AHV48D	6HK(1,2)6502006	80.0	91.2	104.0	100	110	3	3
	6HK(0,1)6500206	10.0	17.5	18.6	20	20	12	12
	6HK(0,1)6500506	20.0	28.3	31.1	30	35	10	8
	6HK(0,1)6500806	32.0	41.3	46.1	45	50	8	8
	6HK(0,1)6501006	40.0	50.0	56.1	50	60	8	6
	6HK(1,2)6501306	52.0	63.0	71.1	70	80	6	4
	6HK(1,2)6501506	60.0	71.6	81.1	80	90	4	4
	6HK(1,2)6501806	72.0	84.6	96.1	90	100	4	3
	6HK(1,2)6502006	80.0	93.3	106.1	100	110	3	2
AHV60D	6HK(0,1)6500206	10.0	17.5	18.6	20	20	12	12
	6HK(0,1)6500506	20.0	28.3	31.1	30	35	10	8
	6HK(0,1)6500806	32.0	41.3	46.1	45	50	8	8
	6HK(0,1)6501006	40.0	50.0	56.1	50	60	8	6
	6HK(1,2)6501306	52.0	63.0	71.1	70	80	6	4
	6HK(1,2)6501506	60.0	71.6	81.1	80	90	4	4
	6HK(1,2)6501806	72.0	84.6	96.1	90	100	4	3
	6HK(1,2)6502006	80.0	93.3	106.1	100	110	3	2
6HK(1,2)6502506	100.0	115.0	131.1	125	150	2	1/0	

- (0,1) - 0 = no circuit breaker OR 1 = with circuit breaker.
- (1,2) - 1 = with circuit breaker, no breaker jumper bar OR 2 = with circuit breaker & breaker jumper bar.
- MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse.
- 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 11: Electrical Data For Multi-Source Power Supply: 208/230-1-60**

Air Handlers Models	Heater Models	Total Heater Amps @240V	Min. Circuit Ampacity						MOP <sup>1</sup>						Min. Wire Size (AWG) <sup>2</sup>					
			208V			230V			208V			230V			208V			230V		
			Circuit						Circuit						Circuit					
			1st <sup>3</sup>	2nd	3rd	1st <sup>3</sup>	2nd	3rd	1st <sup>3</sup>	2nd	3rd	1st <sup>3</sup>	2nd	3rd	1st <sup>3</sup>	2nd	3rd	1st <sup>3</sup>	2nd	3rd
AHV24B	6HK16501306	52.0	22.2	37.6	-	24.6	43.3	-	25	40	-	25	45	-	10	8	-	10	8	-
AHV30B	6HK16501506	60.0	25.1	43.3	-	27.9	50.0	-	30	45	-	30	50	-	10	8	-	10	8	-
AHV36C AHV42D	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	-
AHV48D	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	-
AHV60D	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 12: 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 <sup>1</sup>		Min. Wire Size (AWG) <sup>2</sup>	
			208V	230V	208V	230V	208V	230V	
AHV18B	6HK06501025	23.1	28.4	31.8	30	35	10	8	
AHV24B AHV30B	6HK06501025	23.1	28.4	31.8	30	35	10	8	
	6HK06501525	34.6	40.9	46.1	45	50	8	8	
AHV36C AHV42D	6HK06501025	23.1	29.5	32.9	30	35	10	8	
	6HK06501525	34.6	42.0	47.3	45	50	8	8	
	6HK06501825	41.6	49.6	56.0	50	60	8	6	
	6HK16502025 <sup>3</sup>	46.2	54.6	61.8	60	70	6	6	
AHV48D	6HK06501025	23.1	31.7	35.0	35	35	8	8	
	6HK06501525	34.6	44.1	49.4	45	50	8	8	
	6HK06501825	41.6	51.7	58.1	60	60	6	6	
	6HK16502025 <sup>3</sup>	46.2	56.7	63.9	60	70	6	6	
AHV60D	6HK06501025	23.1	31.7	35.0	35	35	8	8	
	6HK06501525	34.6	44.1	49.4	45	50	8	8	
	6HK06501825	41.6	51.7	58.1	60	60	6	6	
	6HK16502025 <sup>3</sup>	46.2	56.7	63.9	60	70	6	6	
	6HK16502525 <sup>3</sup>	57.7	69.1	78.3	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 13: Electrical Data For Multi-Source Power Supply: 208/230-3-60**

Air Handler Models	Heater Models	Total Heater Amps 240V	Min. Circuit Ampacity				MOP <sup>1</sup>				Min. Wire Size (AWG) <sup>2</sup>			
			208V		230V		208V		230V		208V		230V	
			Circuit				Circuit				Circuit			
			1st <sup>3</sup>	2nd	1st <sup>3</sup>	2nd	1s <sup>3</sup> t	2nd	1st	2nd	1st <sup>3</sup>	2nd	1st	2nd
AHV36C AHV42D	6HK16502025	46.2	29.5	25.0	32.9	28.9	30	25	35	30	10	10	8	10
AHV48D	6HK16502025	46.2	31.7	25.0	35.0	28.9	35	25	35	30	8	10	8	10
AHV60D	6HK16502025	46.2	31.7	25.0	35.0	28.9	35	25	35	30	8	10	8	10
	6HK16502525	57.7	37.9	31.3	42.2	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 14: Air Flow Data (CFM)<sup>1</sup>**

High/Low Speed Cooling and Heat Pump CFM									
Cool Tap	ADJ Tap <sup>2</sup>	AHV18		AHV24		AHV30		AHV36	
		High	Low	High	Low	High	Low	High	Low
A	B	805	523	1035	673	1150	748	1380	897
B	B	690	449	920	598	1035	673	1208	794
A	A	700	455	900	585	1000	650	1200	780
B	A	600	390	800	520	900	585	1050	690
A	C	630	410	810	527	900	585	1080	702
C	B	575	374	776	506	920	598	1035	673
B	C	540	351	720	468	810	527	945	621
D	B	460	299	633	414	805	523	863	564
C	A	500	325	675	440	800	520	900	585
D	A	400	260	550	360	700	455	750	490
C	C	450	293	608	396	720	468	810	527
D	C	360	234	495	324	630	410	675	441

Cool Tap	ADJ Tap <sup>2</sup>	AHV42		AHV48		AHV60	
		High	Low	High	Low	High	Low
A	B	1610	1047	1840	1196	2070	1346
B	B	1495	972	1668	1093	1811	1179
A	A	1400	910	1600	1040	1800	1170
B	A	1300	845	1450	950	1575	1025
A	C	1260	819	1440	936	1620	1053
C	B	1380	897	1495	972	1668	1081
B	C	1170	761	1305	855	1418	923
D	B	1265	822	1323	863	1570	1024
C	A	1200	780	1300	845	1450	940
D	A	1100	715	1150	750	1365	890
C	C	1080	702	1170	761	1305	846
D	C	990	644	1035	675	1229	801

High/Low Speed Heat CFM									
Heat Tap	ADJ Tap <sup>2</sup>	AHV18		AHV24		AHV30		AHV36	
		High	Low	High	Low	High	Low	High	Low
A	Any	850	650	1100	740	1100	740	1360	900
B	Any	700	600	960	650	960	650	1150	770
C	Any	550	550	830	600	830	600	1000	630
D	Any	400	400	580	550	580	550	720	550

Heat Tap	ADJ Tap <sup>2</sup>	AHV42		AHV48		AHV60	
		High	Low	High	Low	High	Low
A	Any	1550	950	1775	1000	2000	1150
B	Any	1350	800	1600	850	1840	1050
C	Any	1150	670	1360	750	1570	950
D	Any	900	550	1170	600	1370	830

- All CFMs are shown at 0.3" w.c. external static pressure. These units have variable-speed ECM motors that automatically adjust to provide constant CFM from 0.0" to 0.4" wc. external static pressure. From 0.4" to 0.8" external static pressure, CFM is reduced by 2% per 0.1" static pressure. Operation of these units on duct systems with external static pressure greater than 0.8" is not recommended. At some settings, airflow may be lower than what is required to operate an airflow switch on certain models of electronic air cleaners. Consult the instructions for the electronic air cleaner for further details. Data is for 208V or 230V.
- The ADJ "D" tap should not be used.

## SECTION XI: 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 washed with a evaporator coil cleaner. Follow directions from coil cleaner.

### LUBRICATION

The bearings of the blower motor are permanently lubricated.

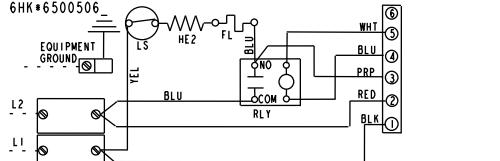
### CONDENSATE DRAINS

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.

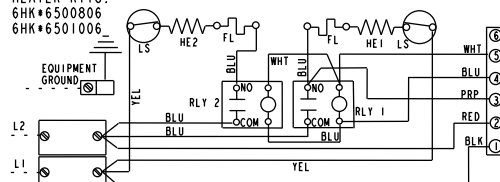
WHEN INSTALLING HEATER KIT, BE SURE THE BLOWER SPEED IS SET TO THE SPEED SPECIFIED FOR THE AIR HANDLER/HEATER KIT COMBINATION ON THIS UNIT'S INSTALLATION INSTRUCTIONS.

SEE INSTALLATION INSTRUCTIONS FOR PROPER LOW VOLTAGE FIELD WIRING CONNECTIONS.

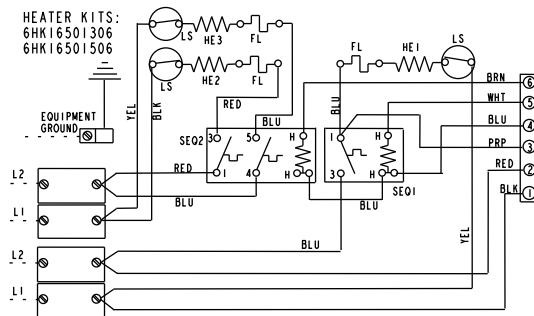
HEATER KITS:  
6HK#6500206  
6HK#6500506



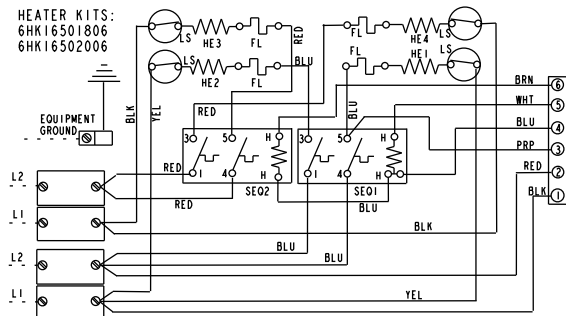
HEATER KITS:  
6HK#6500806  
6HK#6501006



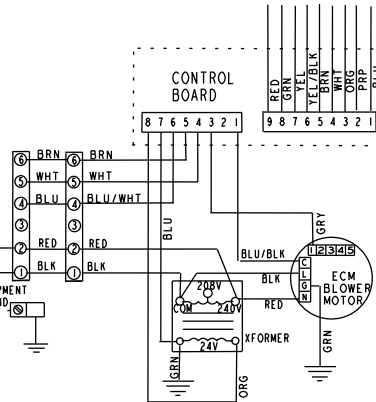
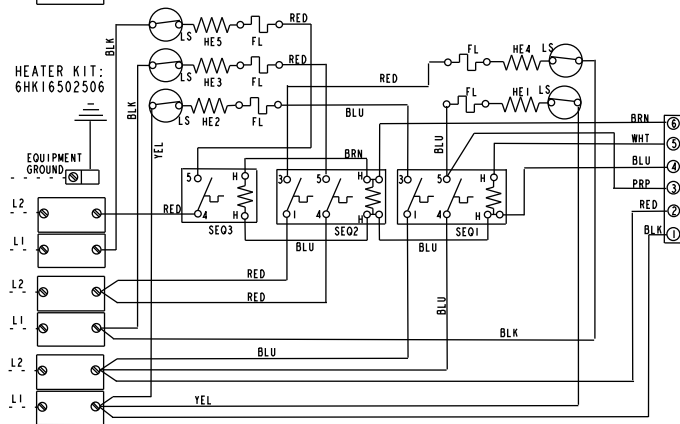
HEATER KITS:  
6HK16501306  
6HK16501506



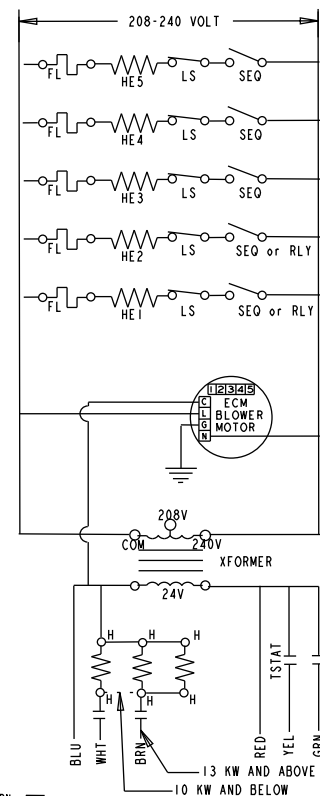
HEATER KITS:  
6HK16501806  
6HK16502006



HEATER KIT:  
6HK16502506



ECM AIR HANDLER WITH NO HEAT KIT WIRING DIAGRAM



- LEGEND
- LS - LIMIT SWITCH
  - SEQ - SEQUENCER
  - HE - HEATING ELEMENT
  - FL - FUSIBLE LINK
  - H - SEQUENCER HEATER
  - RLY - RELAY
  - TSTAT - WALL THERMOSTAT

USE COPPER CONDUCTORS ONLY.  
IF ALUMINUM CONDUCTORS ARE PRESENT,  
ALL APPLICABLE LOCAL AND NATIONAL  
CODES MUST BE FOLLOWED.

818695-UWD-A-1111

FIGURE 18: Wiring Diagram - Single Phase Heat Kits With AOS ECM Motor

WHEN INSTALLING HEATER KIT, BE SURE THE BLOWER SPEED IS SET TO THE SPEED SPECIFIED FOR THE AIR HANDLER/HEATER KIT COMBINATION ON THIS UNIT'S INSTALLATION INSTRUCTIONS. SEE INSTALLATION INSTRUCTIONS FOR PROPER LOW VOLTAGE FIELD WIRING CONNECTIONS.

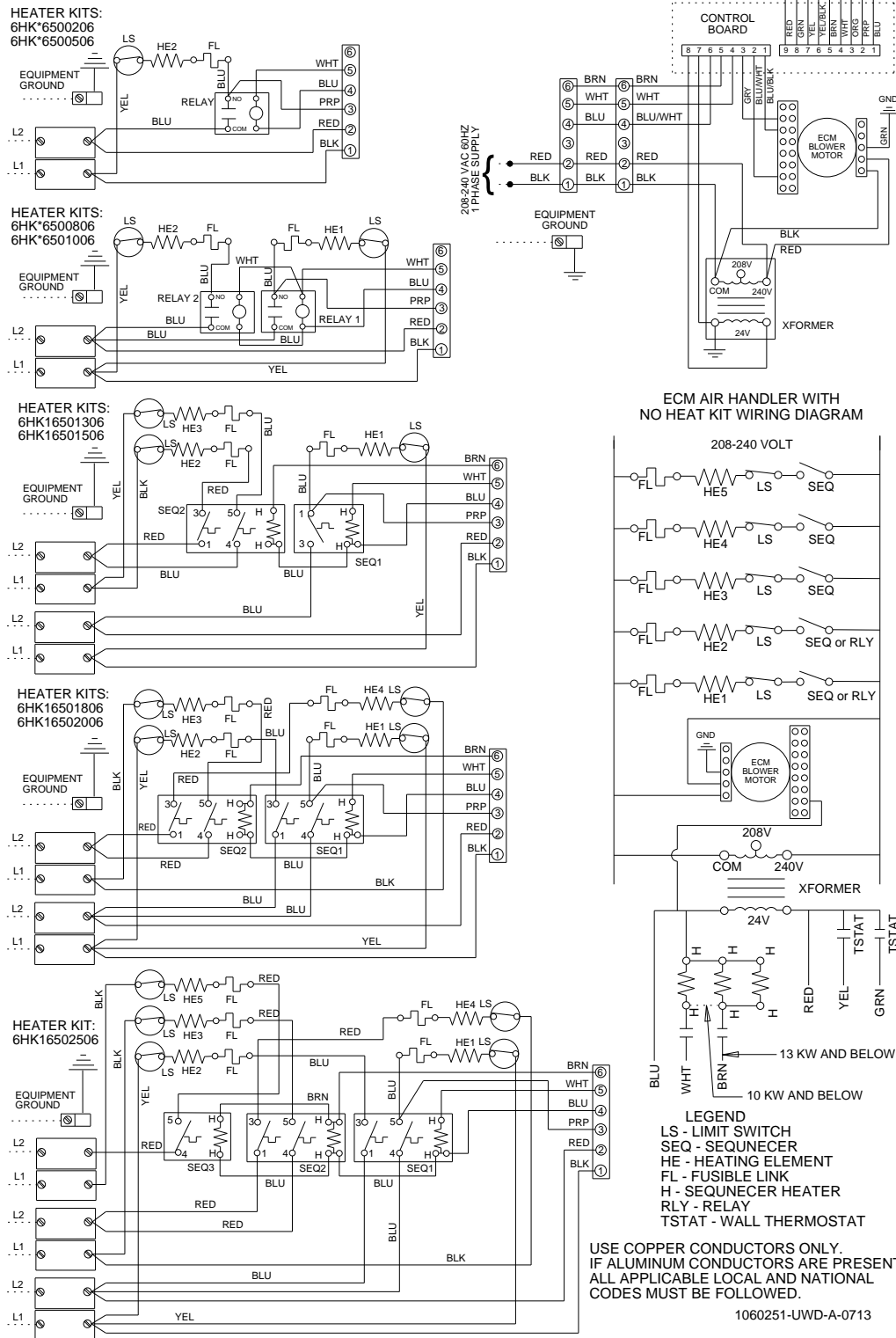


FIGURE 19: Wiring Diagram - Single Phase Heat Kits With EON ECM Motor

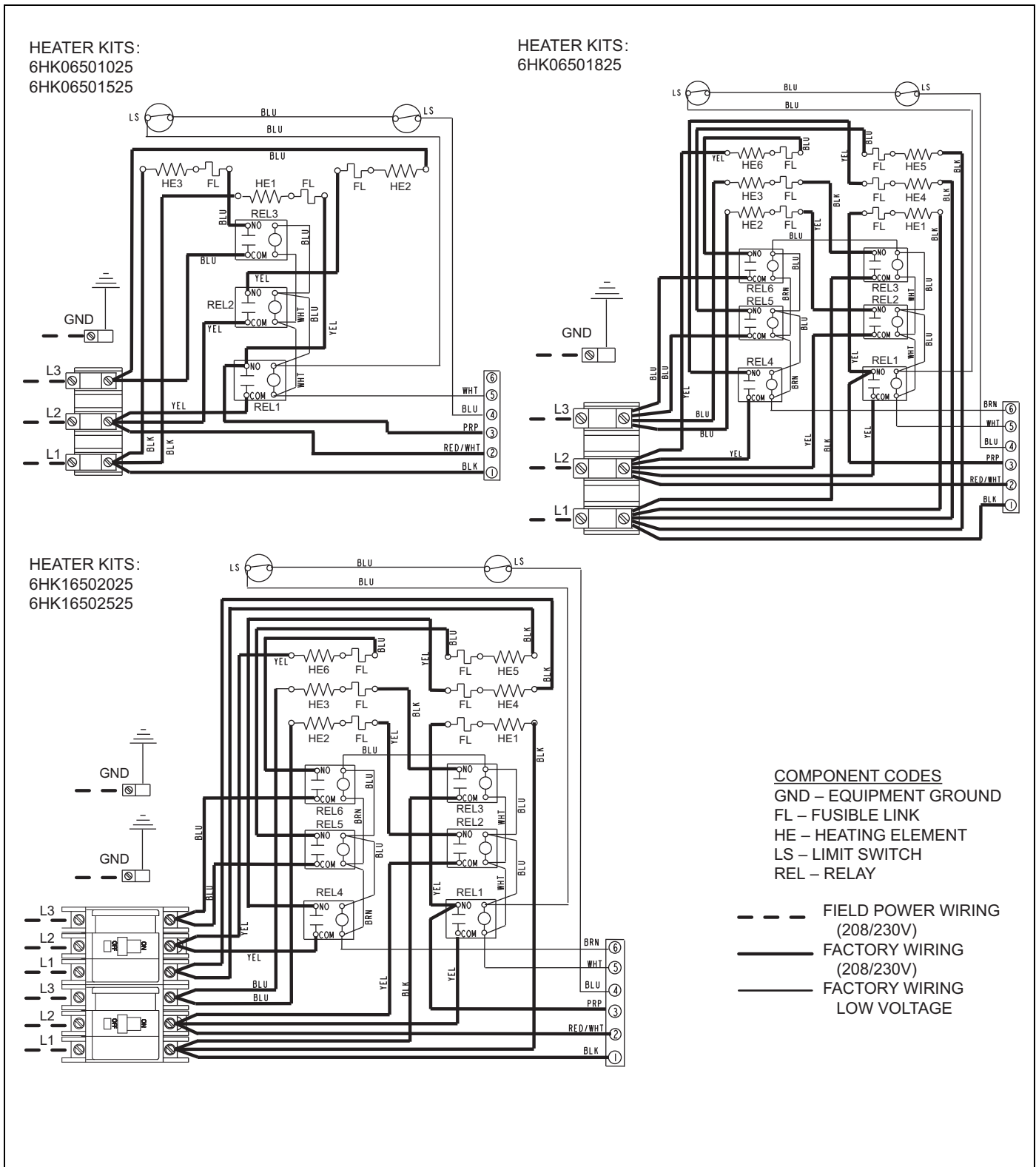


FIGURE 20: Wiring Diagram - 3 Phase Heat Kits



SECTION XII: 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**

<b>Blower Type &amp; Set-Up</b>	<input type="radio"/> ECM	COOL <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D
		ADJUST <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D
		DELAY <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D
		HEAT <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D
	<input type="radio"/> X-13	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5
<input type="radio"/> PSC	<input type="radio"/> Low <input type="radio"/> Medium Low <input type="radio"/> Medium <input type="radio"/> Medium High <input type="radio"/> High	

Supply static (inches of water column) <input type="text"/>	Supply air dry bulb temperature <input type="text"/>	Outside air dry bulb temperature <input type="text"/>
Return static (inches of water column) <input type="text"/>	Return air dry bulb temperature <input type="text"/>	Return air wet bulb temperature <input type="text"/>
Total external static pressure <input type="text"/>	Temperature drop <input type="text"/>	Supply air wet bulb temperature <input type="text"/>

**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 <input type="text"/>		Serial number <input type="text"/>		Rated KW <input type="text"/>	
Number of elements <input type="text"/>	Measured Amperage	Heater 1 <input type="text"/>	Heater 2 <input type="text"/>	Heater 3 <input type="text"/>	
		Heater 4 <input type="text"/>	Heater 5 <input type="text"/>	Heater 6 <input type="text"/>	
	Measured Voltage	Heater 1 <input type="text"/>	Heater 2 <input type="text"/>	Heater 3 <input type="text"/>	
		Heater 4 <input type="text"/>	Heater 5 <input type="text"/>	Heater 6 <input type="text"/>	
Heating return air dry bulb temperature <input type="text"/>	Heating supply air dry bulb temperature <input type="text"/>	Air temperature rise <input type="text"/>			

**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**