

INSTALLATION MANUAL

STANDARD ECM SINGLE PIECE MULTI-POSITION AIR HANDLERS

MODELS: AE SERIES



LIST OF SECTIONS

GENERAL	1	LOW VOLTAGE CONTROL CONNECTIONS	12
SAFETY	1	BLOWER SPEED CONNECTIONS	12
UNIT INSTALLATION	4	UNIT DATA	12
DUCT WORK AND CONNECTIONS	6	MAINTENANCE	19
COIL METERING DEVICES	8	AIR SYSTEM ADJUSTMENT	19
REFRIGERANT LINE CONNECTION	10	INSTALLATION VERIFICATION	20
CONDENSATE DRAIN CONNECTIONS	10	WIRING DIAGRAM	21
ELECTRIC HEATER INSTALLATION	11	TYPICAL THERMOSTAT CONNECTIONS	23
LINE POWER CONNECTIONS	11	START UP SHEET	25

LIST OF FIGURES

Return Air Duct Attachment & Component Location	2	Proper Bulb Location	9
Pressure Check	3	Vertical Temperature Bulb Orientation	9
Dimensions & Duct Connection Dimensions	3	Vapor Line Grommet	10
Typical Installation	4	Line Power Connections	11
Horizontal Pan Adjustment Strap Hole Reference	5	Blower Speed Connections	12
Coil Blow Off Wing Installation	6	Duct Static Measurements	20
Horizontal Suspension	7	Drain Traps	20
Duct Attachment	7	Location of Coil Trapped and Plugged Drain Connections	20
Duct Work Transition	7	Wiring Diagram - Standard ECM - Single Phase Heat Kits	21
Recommended Distributor Adjustment	8	Wiring Diagram - Three Phase Heat Kits 208-230V	22
Piston Installation	8	Typical Thermostat Wiring Diagram - ECM	23
TXV Installation	9	Typical Thermostat Wiring Diagram - 2 Stage Heat Pump with ECM Blower Motor	24
TXV Bulb and Equalizer line Installations	9		

LIST OF TABLES

Dimensions	3	Electric Heat Performance Data: 208/230-1-60 & 208/230-3-60	13
Horizontal Pan Strap Settings for Horizontal Left	5	Electrical Data For Single Source Power Supply: 208/230-1-60	14
Physical and Electrical Data - Cooling Only	12	Electrical Data For Multi-source Power Supply: 208/230-1-60	16
Electrical Data - Cooling Only	12	Electrical Data For Single Source Power Supply: 208/230-3-60	17
Electrical Heat: Minimum Fan Speed	13	Electrical Data For Multi-source Power Supply: 208/230-3-60	18
KW & MBH Conversions - For Total Power Input Requirement	13	Air Flow Data (CFM)	18

SECTION I: GENERAL

The 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 or side power and control wiring, color coded leads for control wiring, 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 kits are available from 2.5 kW to 25 kW. 208-230 volt three phase kits are available from 10kW to 25kW.

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

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.

WARNING

The air handler area must not be used as a broom closet or for any other storage purposes, as a fire hazard may be created. Never store items such as the following on, near or in contact with the furnace.

1. Spray or aerosol cans, rags, brooms, dust mops, vacuum cleaners or other cleaning tools.
2. Soap powders, bleaches, waxes or other Cleaning compounds; plastic items or containers; gasoline, kerosene, cigarette lighter fluid, dry cleaning fluids or other volatile fluid.
3. Paint thinners and other painting compounds.
4. Paper bags, boxes or other paper products

Never operate the air handler with the blower door removed. To do so could result in serious personal injury and/or equipment 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.

SAFETY REQUIREMENTS

1. Failure to carefully read and follow all instructions in this manual can result in air handler malfunction, death, personal injury and/or property damage.
2. 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.
3. This air handler should be installed only in a location and position specified in the "Unit Installation" section of this Instruction Manual.
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. The unit rating plate displays the air handler model number. The unit dimensions for the supply air plenum are provided in Figure 3 and Table 1 of this Instruction Manual. The plenum must be installed according to the instructions.
7. Clearance from combustible material is provided under "Clearances" in the "Unit Installation" section.

⚠ CAUTION

DO NOT lift air handler by the cabinet braces. The cabinet braces are held in place by the coil channels. The cabinet braces could become disengaged from the cabinet causing the air handler to fall, potentially causing injury or damaging property. See Figure 1 for location of cabinet braces. Lift the air handler by tightly gripping the casing.

8. It is necessary to maintain clearances for servicing. Access must be allowed for electric heaters and blower.
9. The unit rating plate and power supply must be verified to ensure that the electrical characteristics match.
10. Air handler shall be installed so the electrical components are protected from water.
11. Installing and servicing heating/cooling equipment can be hazardous due to the electrical components. Only trained and licensed personnel should install, repair, or service heating/cooling equipment. Unlicensed service personnel can perform basic maintenance functions such as cleaning and replacing the air filters. When working on heating/cooling equipment, the precautions in the manuals and on the labels attached to the unit and other safety precautions must be observed as applicable.

⚠ 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.

12. 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.

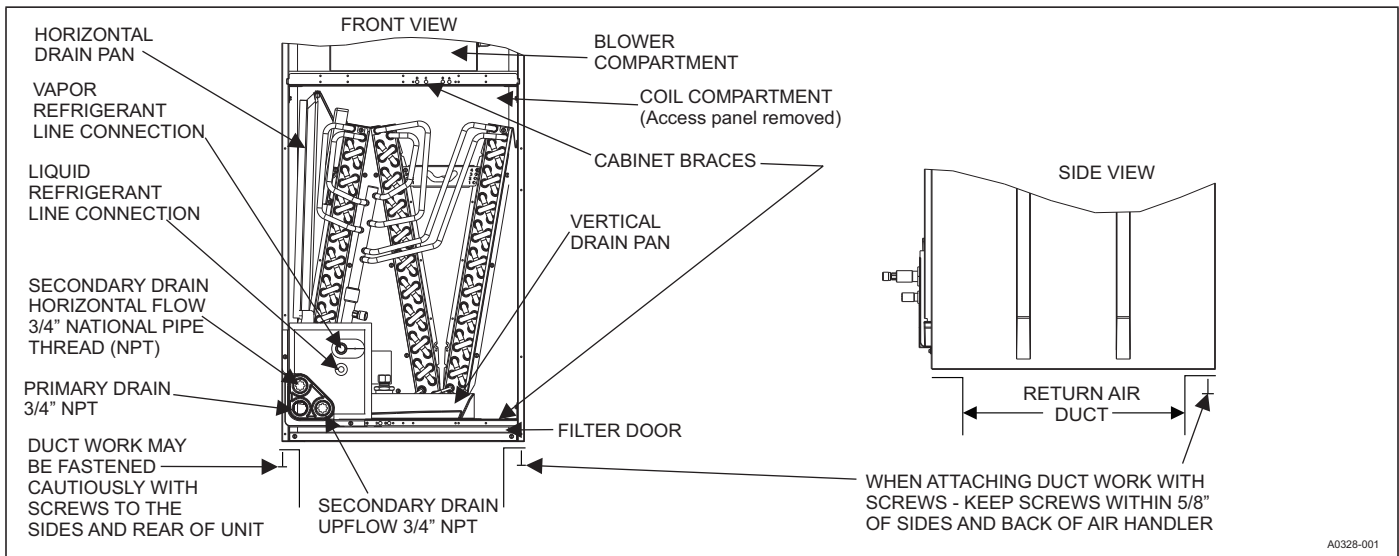


FIGURE 1: Return Air Duct Attachment & Component Location

INSPECTION

As soon as a coil is received, it should be checked to insure it is still under pressure per Figure 2. The coil 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. The Local Distributor should be consulted for more information. The drain pan should be checked for cracks or breakage. Before installation, the unit should be checked for screws or bolts which may have loosened in transit. There are no internal shipping or spacer brackets that need to be removed.

It should be verified that all accessories such as heater 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, duct work or piping.

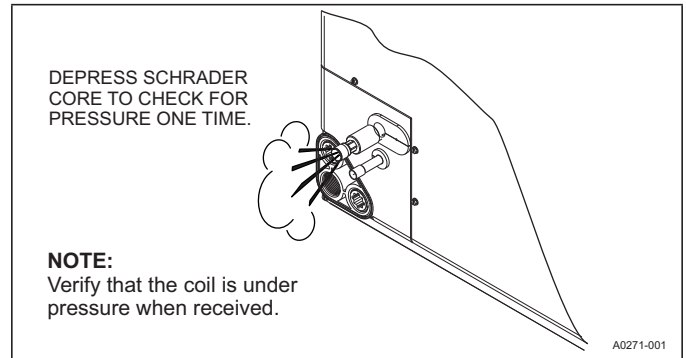


FIGURE 2: Pressure Check

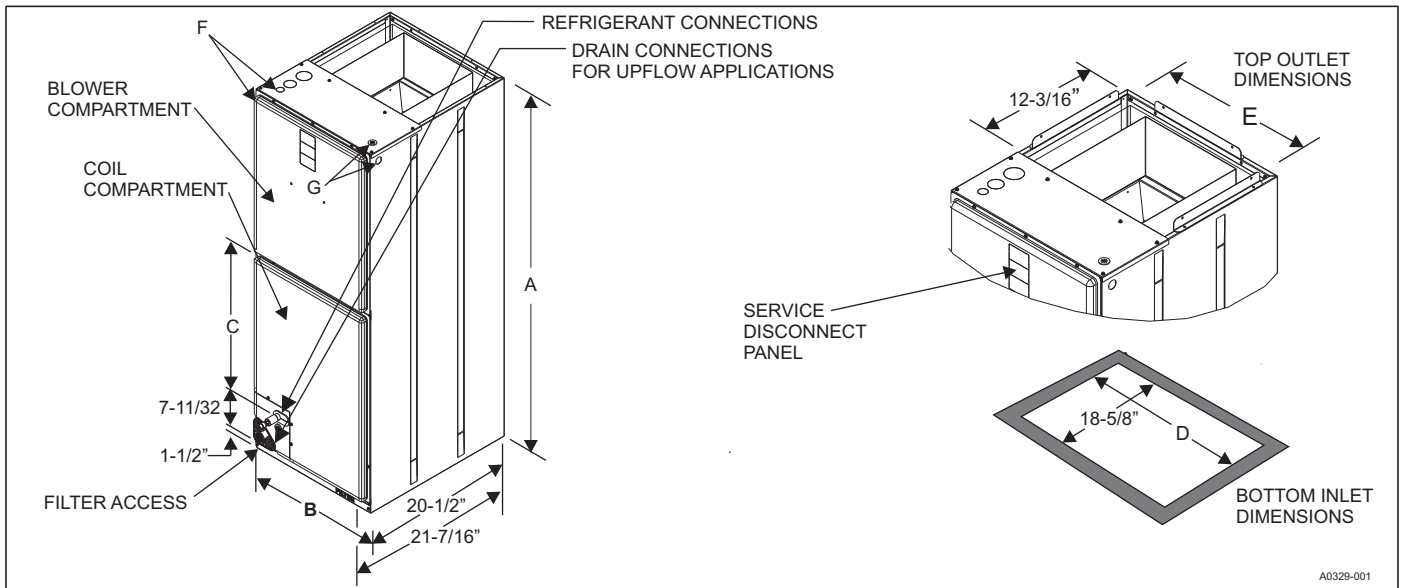


FIGURE 3: Dimensions & Duct Connection Dimensions

TABLE 1: Dimensions¹

Models	Dimensions					Wiring Knockouts ²		Refrigerant Connections Line Size	
	A	B	C	D	E	F	G	Liquid	Vapor
	Height	Width				Power (Conduit)	Control (Conduit)		
18B	41	17-1/2	12-7/8	14-1/4	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"
24B	41	17-1/2	12-7/8	14-1/4	16-1/2				
30B	47-1/2	17-1/2	19-1/2	14-1/4	16-1/2				
36B	47-1/2	17-1/2	19-1/2	14-1/4	16-1/2				
36C	51-1/2	21	22-5/8	17-3/4	20				
42C	51-1/2	21	22-5/8	17-3/4	20				
48C	51-1/2	21	22-5/8	17-3/4	20			7/8"	7/8"
48D	55-1/2	24-1/2	26-5/8	21-1/4	23-1/2				
60C	55-3/4	21	26-7/8	17-3/4	20				
60D	55-1/2	24-1/2	26-5/8	21-1/4	23-1/2				

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

SECTION III: UNIT INSTALLATION

NOTICE

Avoid handling aluminum coil components after handling the copper line set or other tubing without first cleaning hands.

UNIT SIZING

- The size of the unit should be based on an acceptable heat loss or gain calculation for the structure. The ACCA – Manual J or other approved methods may be used. Reference Figure 3 and Table 1.
- 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, indoor coils and outdoor units.

Entering Air Temperature Limits			
Wet Bulb Temp. °F		Dry Bulb Temp. °F	
Min.	Max.	Min.	Max.
57	72	65	95

- 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 ¹ Voltage Range
208V-230V-1-60	187V-253V

- 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 duct work connected to this unit is 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, and 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 indoor 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.

AIR HANDLER CONFIGURATION

These air handler units are supplied ready to be installed in an upflow or horizontal left position. Refer to Figure 4. If the unit requires either downflow or horizontal right airflow configurations, the unit must have the coil assembly repositioned. Refer the Downflow or Horizontal Right Conversion procedures.

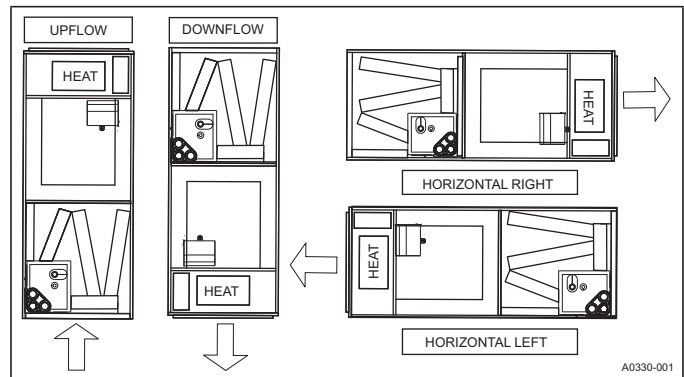


FIGURE 4: Typical Installation

HORIZONTAL LEFT CONVERSION

NOTICE

For horizontal left applications, high airflow can prevent the collected condensate from draining properly since the direction of the airflow opposes the direction of the draining condensate. The horizontal pan must be angled properly in order to ensure proper drainage in high airflow applications. Ensure that the pan is angled properly by checking that the correct hole is used on the pan straps per TABLE 2. Use FIGURE 5 to identify the "BACK" and "FRONT" straps since, in some cases, these settings are not the same.

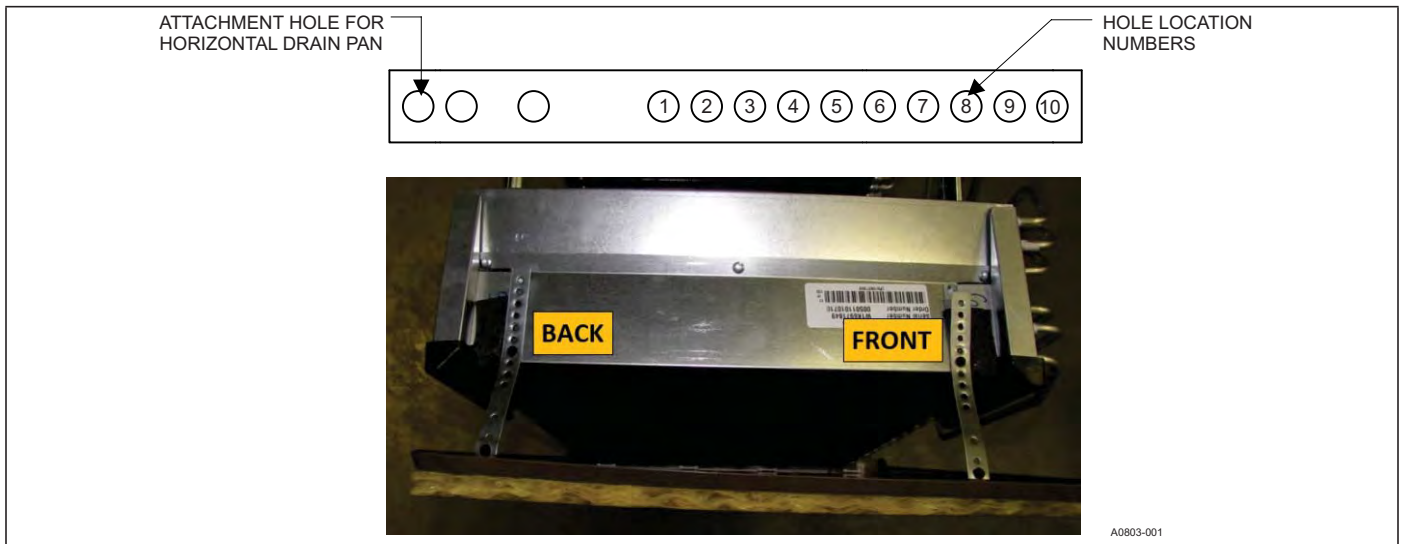


FIGURE 5: Horizontal Pan Adjustment Strap Hole Reference

TABLE 2: Horizontal Pan Strap Settings for Horizontal Left

AP	RFCX-P2	Model				Back	Front
		AE	RFCX-E2	AVC	CM		
AP24B AP30B AP36B	RFCX24BP RFCX30BP RFCX36BP	AE24B AE30B AE36B	RFCX24BE RFCX30BE RFCX36BE	AVC24B AVC30B AVC36B	CM24A CM24B CM25B CM30A CM30B CM36A CM36B	2	2
AP60C	RFCX60CP	AE60C	RFCX60CE	AVC60C	CM60C	3	4
AP36C AP37C AP42C AP48C	RFCX36CP RFCX37CP RFCX42CP RFCX48CP	AE42C AE48C	RFCX42CE RFCX48CE	AVC42C AVC48C	CM42C CM48C	4	4
-	-	AE60D	RFCX60DE	AVC60D	CM64D	4	5
-	-	AE36C	RFCX36CE	AVC36C	CM37C CM30C CM36C	5	5
-	-	-	-	-	CM24C	6	6
AP18B	RFCX18BP	AE18B	RFCX18BE	AVC18B	CM18B	7	7
AP48D AP60D	RFCX48DP RFCX60DP	AE48D	RFCX48DE	AVC48D	CM30D CM36D CM42D CM48D CM60D	8	8

DOWNFLOW OR HORIZONTAL RIGHT CONVERSION

NOTICE

Convert air handler to correct orientation prior to installation. Conversion must be made before brazing the refrigerant connections to the coil.

1. Remove coil access panel.
2. Slide coil/drain pan assembly out of air handler.

NOTICE

The center support bar for the coil/drain pan has a position identifier embossed into the cabinet structure between the two forward fingers of the support bar. There are four position identifiers: A, B, C, or D. The lettered hole location can differ from unit to unit due to the cabinet width of the air handler. After removal and reinstallation, the center support bar must be installed in the same lettered position that it was originally.

3. Note the lettered position of the center support bar for the coil/drain pan. Remove the center support bar by sliding the forward end of the support bar to the right or left until the lower finger clears the structure.

NOTICE

The position identifier for the coil slide rail is embossed into the back corner vertical angle of the cabinet structure. There are four position identifiers: 1, 2, 3, or 4. The numbered attachment location can differ from unit to unit due to the cabinet height of the air handler. After removal and reinstallation, the coil slide rail must be installed in the same numbered position that it was originally.

- Note the numbered position of the coil slide rail located at the upper right hand side of the indoor coil compartment. Remove slide rail from air handler cabinet by removing front screw and lowering bracket down to disengage hook on back of slide rail.
- Turn air handler cabinet upside down (downflow position).
- Install coil slide rail by hooking the aft end into holes at the numbered position the slide rail was originally in right rear corner post, and secure rail into right front edge of cabinet with screw in the pre-drilled hole.

NOTICE

The aft fingers of the center support bar are longer than the fingers on the forward end of the support bar.

- Install center support bar for the coil/drain pan onto the lettered position that it was originally mounted.
- For horizontal right applications, the front and back coil blow off wings must be installed (blow off wings are shipped with the unit). Locate 4 screws securing coil delta plates to coil drain pan. Loosen the screws. Slide each coil blow off wing between the drain pan and the coil delta plate. Tighten screws to secure coil blow off wings. Refer to Figure 6.
- Slide the coil back into the cabinet. Be sure to engage the side coil slide into the slide rail on the air handler cabinet.
- Install coil access panel. Conversion is now complete.

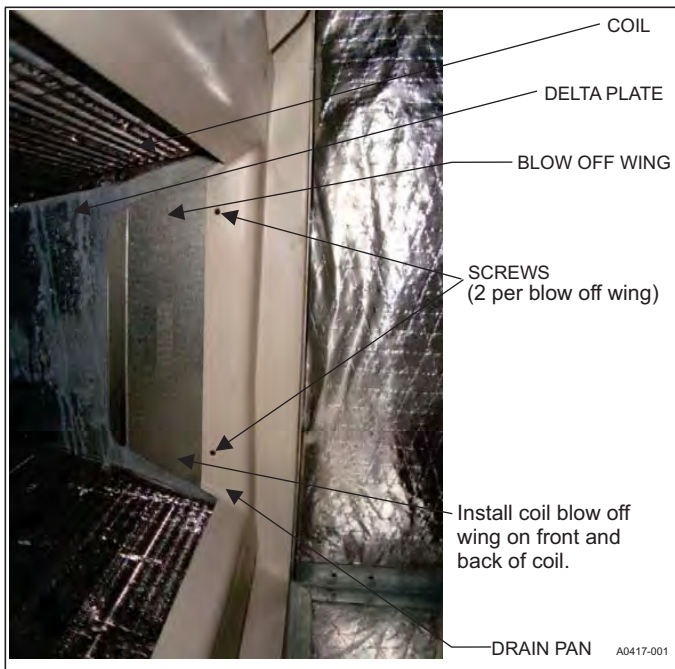


FIGURE 6: Coil Blow Off Wing Installation

SECTION IV: DUCT WORK AND CONNECTIONS

Air supply and return may be handled in one of several ways best suited to the installation. Upflow, horizontal or downflow applications may be used.

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 duct work so that the grille is not in direct line with the opening in the unit. One or two elbows and acoustical duct liner assures a quieter system. Operation where return air duct is short or where sound may be a problem, acoustical duct liner should be used inside the duct. Use flexible duct connectors to minimize the transmission of vibration/noise into the conditioned space.

⚠ WARNING

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

Use 1/2" screws to connect duct work to cabinet. If pilot holes are drilled, drill only through field duct and unit flange.

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.

The supply air duct should be properly sized by use of a transition to match unit opening. All ducts should be suspended using flexible hangers and never fastened directly to the structure.

⚠ CAUTION

This unit is not designed for non-ducted (freeflow) applications. Do not operate without duct work attached to unit. Equipment should never be operated without filters.

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. If electric heat is used, non-flammable material must be used. Duct systems should be designed in accordance with the Air Conditioning Contractors of America (ACCA) – Manual D.

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, leaving enough clearance between door and rod so that doors may be easily removed for service.

⚠ CAUTION

DO NOT lift air handler by the cabinet brace. The cabinet brace is held in place by the coil channel. The cabinet brace could become disengaged from the cabinet causing the air handler to fall, potentially causing injury or damaging property. See Figure 1 for location of cabinet braces.

NOTICE

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

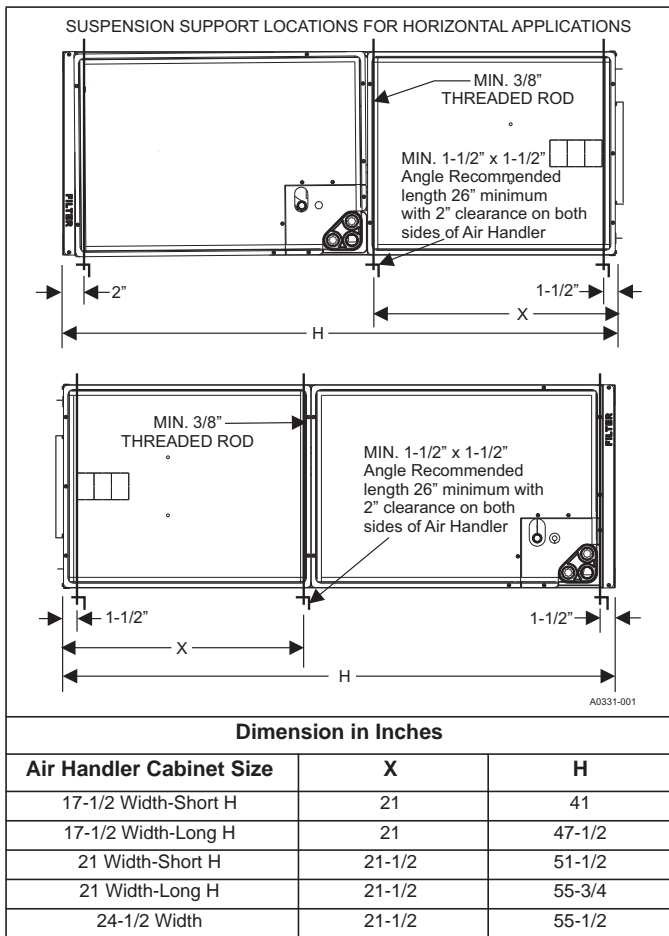


FIGURE 7: Horizontal Suspension

DUCT FLANGES

Three duct flanges are provided to assist in positioning and attaching duct work to the air handler. These flanges are included in the unit parts bag. With the screws from the parts bag, install one of the duct flanges. Duct flanges have holes on both legs with one leg longer than the other. The longer leg can be used to mate against the air handler so that different thicknesses of duct board can be made flush with the outer surface of the air handler. Repeat the procedure for the other two flanges. Refer to Figure 8. If the flanges are not used, they may be discarded.

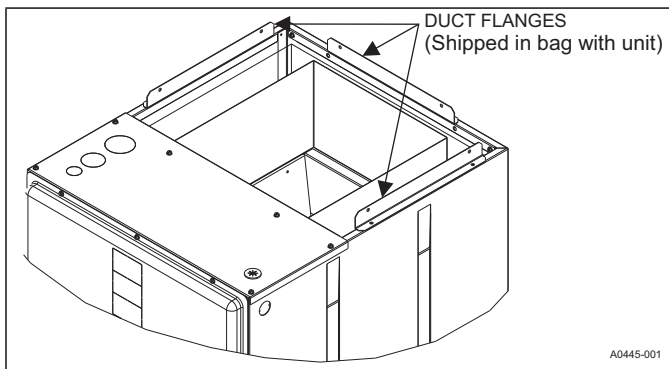


FIGURE 8: Duct Attachment

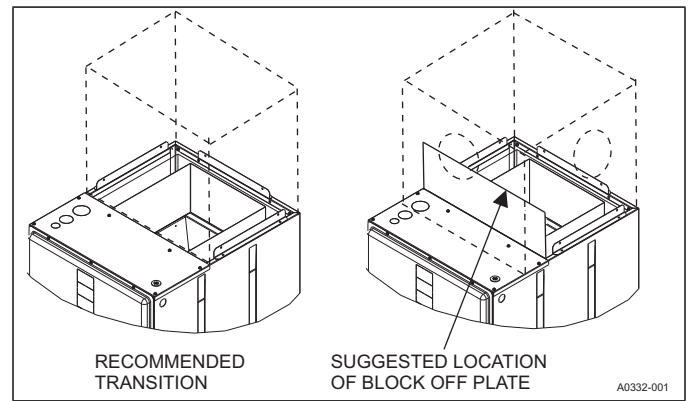


FIGURE 9: Duct Work Transition

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. Upflow, horizontal or downflow applications may be used.

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 duct work to unit. Longer screws will pierce the drain pan and cause leakage. If pilot holes are drilled, drill only through field duct and unit bottom duct flange.

Duct work 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

⚠ CAUTION

Equipment should never be operated without filters.

Return air filters are required and must be field supplied. Filtration can be accomplished external to the unit or the 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 603. See Table 3 for filter size.

SECTION V: COIL METERING DEVICES

A piston or a TXV is to be installed in the field. There is an installation manual that comes with the TXV kit. It is recommended to install the piston or TXV kit prior to installation of coil and brazing of line set. Until brazing is completed and cooled, the TXV sensing bulb must not be installed.

The outdoor technical guide for outdoor units should be consulted for required piston or TXV on the indoor coil. The piston and the Schrader core are supplied with the outdoor unit. When the piston is used instead of the TXV, the Schrader core is installed in the suction line equalizer connection port and is capped with the supplied plastic cap. The Schrader core must not be installed if the TXV is installed, because the TXV equalizer line attaches to the equalizer connection port.

⚠ CAUTION

COIL UNDER PRESSURE.

Verify that pressure has been released by depressing schrader valve core shown in Figure 2.

The coil requires a metering device to be added.

See outdoor unit documentation for correct TXV or piston to be used.

NOTICE

To prevent moisture and contaminants from entering the system, the coil should not be open to atmosphere for extended periods of time. If the coil cannot be brazed into the refrigeration system during a routine installation period, 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 from the air. For a longer term delay, use plugs or caps. There is no need to purge the coil if this procedure is followed.

PISTON INSTALLATION

⚠ WARNING

Failure to install Schrader Valve Core in the vapor line equalizer connection port for piston applications could result in total refrigerant loss of the system!

Install Schrader Valve Core and Piston as follows:

1. After holding charge is completely discharged, remove black plastic cap from equalizer connection port on the vertical part of the vapor line.
2. Distributor position must be adjusted to allow the preformed liquid line assembly to properly line up with the hole in the tubing access panel. Raise the distributor body approximately 2" toward the top of the coil or what would be the top of the coil if coil was in the upflow position. See Figure 10. Adjust as necessary.
3. Install Schrader valve core supplied with the outdoor unit into the equalizer fitting connection port using a valve core tool.
4. Loosen and remove the liquid line connection nut and the sealing disc from the distributor assembly. Note that the fitting has right hand threads.
5. Slide the nut over the liquid line to be installed, and discard the seal disc.
6. Install required size piston into the distributor. Refer to supplied Tabular Data Sheet for specific piston size and indoor coil match up. See Figure 11.
7. Verify that the Teflon washer is still in place in the distributor opening. See Figure 11.

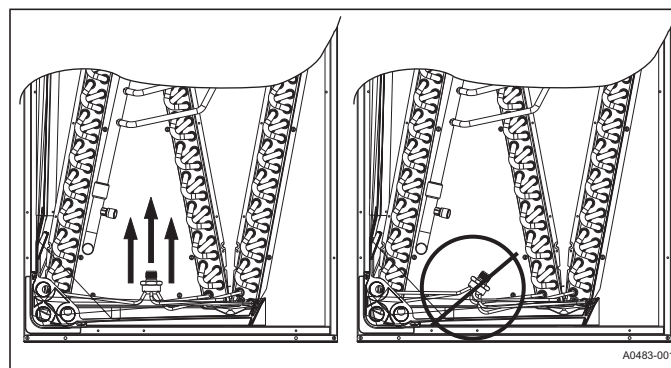


FIGURE 10: Recommended Distributor Adjustment

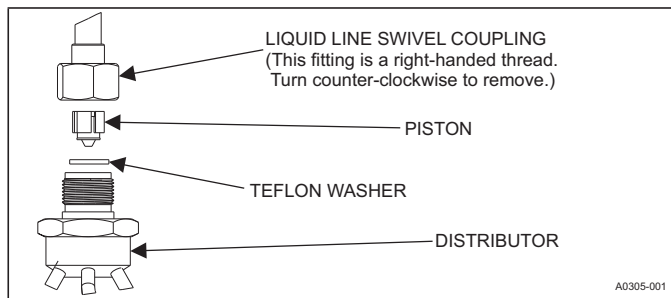


FIGURE 11: Piston Installation

⚠ CAUTION

Do not over torque. Do not use slip joint pliers. This will distort the aluminum distributor and the brass fitting (potentially causing leaks).

8. After piston is installed, install the liquid line to the top of the piston/distributor assembly. Hand tighten, and turn an additional 1/4 turn to seal. Do not over tighten fittings.
9. Replace black plastic cap on unused equalizer fitting connection port.
10. After line set is installed, leak test the system.

THERMOSTATIC EXPANSION VALVE (TXV) INSTALLATION

⚠ CAUTION

Outdoor unit model numbers ending with an "H" have a factory installed hard start kit which is required when a TXV is installed. Outdoor unit model numbers with no "H" ending do not require a hard start kit unless local regulations dictate it.

The following are basic steps for installation. For detailed instructions, refer to the Installation Instructions accompanying the TXV kit. Install TXV kit as follows:

IMPORTANT

Refer to the Technical Guide for the unit to determine the proper TXV kit to be used on this product.

1. Relieve the holding charge by depressing Schrader core on the suction manifold stub out.
2. After holding charge is completely discharged, loosen and remove the Schrader core.
3. Place a backup wrench on distributor, loosen and remove brass distributor nut. Retain brass nut for use on liquid line. Keep Teflon washer in place and discard clear disk.

4. Install the thermal expansion valve to the distributor assembly with supplied fittings. Ensure Teflon washer is seated in distributor. Hand tighten and turn an additional 1/4 turn to seal. Do not over-tighten fittings. See Figure 12.

⚠ CAUTION

Do not over-torque. Do not use slip joint pliers. This will distort the aluminum distributor and the brass fitting (potentially causing leaks).

5. Slide the nut removed in step 3 over the supplied liquid line. Place supplied Teflon washer from TXV kit in place on TXV, and install liquid line to the top of the thermal expansion valve. Adjust assembly so liquid line aligns with hole in access panel. See Figure 10. Hand tighten the liquid line, and apply an additional 1/4 turn to seal.

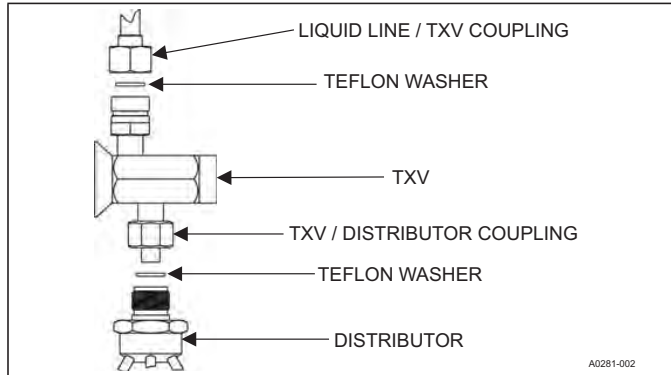


FIGURE 12: TXV Installation

⚠ WARNING

*Schrader valve core **MUST NOT** be installed with TXV installation. Poor system performance or system failure could result.*

6. Install the TXV equalizer line onto the vapor line by hand tightening the 1/4" SAE coupling nut to the equalizer fitting, and apply an additional 1/3 turn to seal. See Figure 13.

⚠ CAUTION

In all cases, mount the TXV temperature sensing bulb after vapor line is brazed and sufficiently cooled. Failure to use suction line split grommet may result in TXV failure.

7. Pass the temperature sensing bulb tube for the TXV through the tube opening in the split grommet of the access panel.
8. Install the TXV bulb to the vapor line near the cabinet, using the bulb clamp(s) furnished with the TXV assembly. Ensure the bulb is making maximum contact. See Figures 13 & 14, and accomplish the following:
- If possible, install the temperature bulb on a horizontal run of the vapor line. Ensure that the bulb is installed at a 10 o'clock or 2 o'clock position.
 - If bulb installation is made on a vertical run, ensure that the bulb is a minimum of 8 inches (20.3 cm) away from elbow coming out of the coil. Position the bulb with the tail of the bulb at the top, so that the bulb acts as a reservoir. See Figure 15.
 - Insulate the bulb using thermal insulation provided to protect it from the effect of the surrounding ambient temperature. Cover completely to insulate.

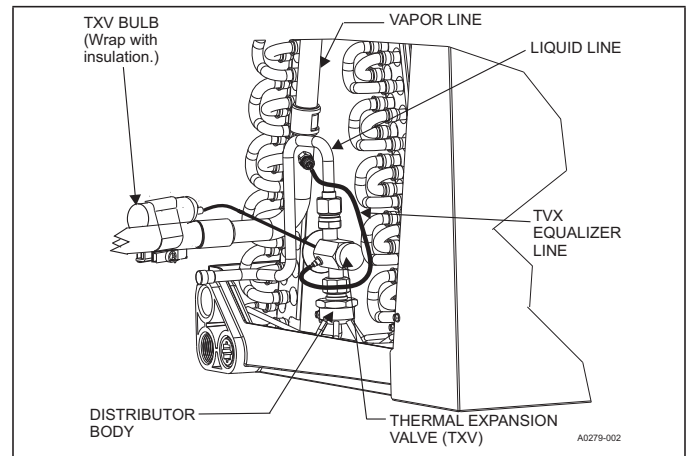


FIGURE 13: TXV Bulb and Equalizer line Installations

9. After line set is installed, leak test the system.

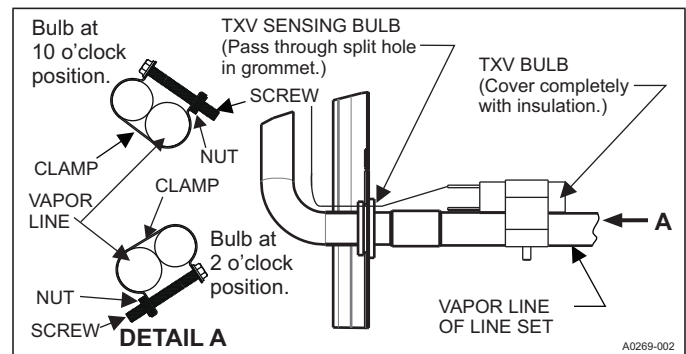


FIGURE 14: Proper Bulb Location

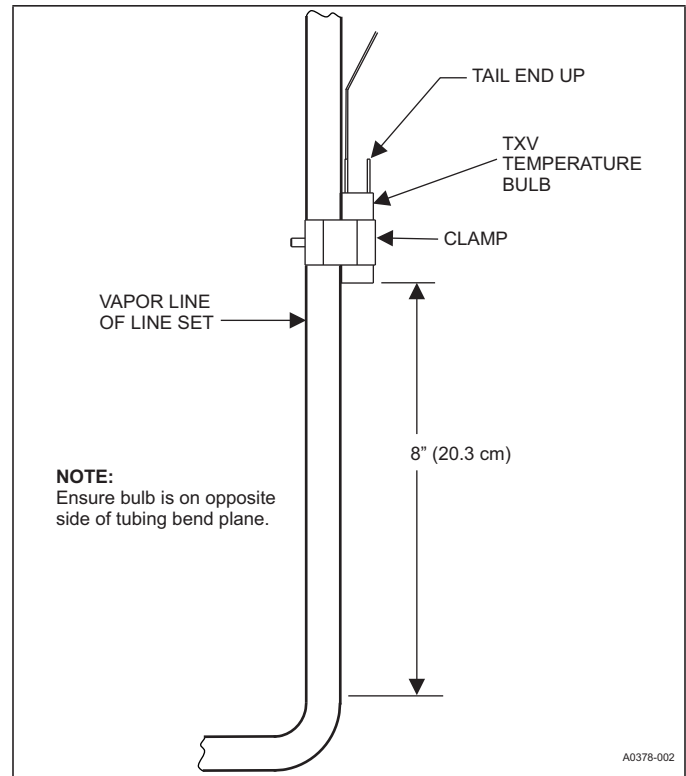


FIGURE 15: Vertical Temperature Bulb Orientation

SECTION VI: REFRIGERANT LINE CONNECTION

⚠ CAUTION

Coil is under inert gas pressure. Relieve pressure from coil by depressing Schrader core at end of suction manifold stub out.

⚠ 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

Avoid handling aluminum coil components after handling the copper line set or other tubing without first cleaning hands.

Connect lines as follows:

NOTICE

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

- Suction and liquid line connections are made outside the cabinet. Leave the tubing connection panel attached to the cabinet. Coil access panel should be removed for brazing. The lines are expanded to receive the field line set tubes for most outdoor unit matches.
- Remove grommets where tubes exit the cabinet to prevent burning them during brazing. In some units, the vapor line grommet may be shipped as a loose part with the unit. Refer to Figure 16.
- Cut the end of the suction tube using a tube cutter. Place the tube cutter as close as possible to the end of the tube to allow as much depth as possible for the connection and brazing of the suction line. To ensure suction line fits into connection, deburr the stub out (including inner pressure protrusion from cutting).
- If coil does not have a factory installed TXV, install the required size piston or TXV kit. See coil metering devices section for detailed instructions.
- If the coil does have a factory installed TXV, remove the liquid line copper cap which is soft soldered onto the outside of the 3/8" stub protruding from front of the coil cabinet tubing panel as follows:
 - Screw a sheet metal screw into the center of the cap.
 - Apply a small amount of heat to the cap while pulling on the screw using slip joint pliers.
- Insert liquid and suction lines into the coil connections at the coil cabinet tubing panel.
- Wrap a water soaked rag around the coil connection tubes inside the cabinet to avoid transferring excess heat to the coil or TXV.
- Purge refrigerant lines with dry nitrogen.

NOTICE

All indoor 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.

- Braze the suction and liquid lines, and allow the joints to cool.
- Route the TXV sensing bulb through suction line opening.

- Secure sensing bulb and equalizer line capillary tubes with nylon cable ties to prevent leaks from tubes rubbing.
- If piston is used, install Schrader core into suction header, and reinstall cap.
- Re-attach the grommets to the lines carefully to prevent air leakage. In some units, the vapor line grommet may be shipped as a loose part with the unit. Refer to Figure 16.
- Attach the coil access panel to the cabinet.
- Refer to Outdoor unit Installation Manual, and accomplish evacuation, leak check and charging instructions. Check all field brazed joints and metering device connections.
- Ensure lines are sound isolated by using appropriate hangers or strapping.

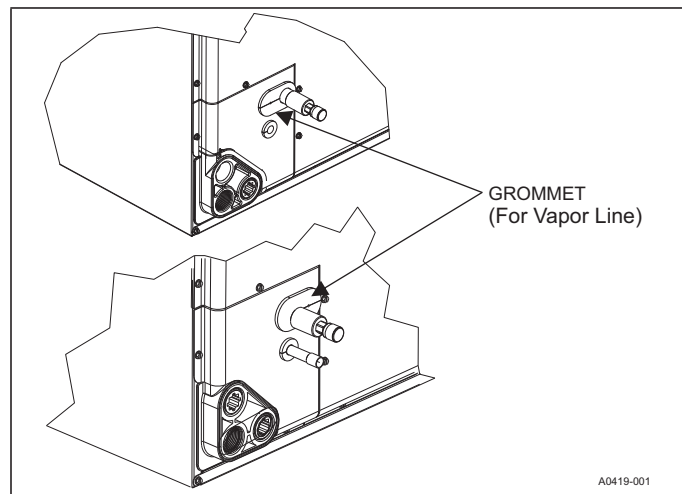


FIGURE 16: Vapor Line Grommet

SECTION VII: CONDENSATE 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

DO NOT use Teflon™ tape, pipe thread compound, or other sealants. The use of a sealant may cause damage and premature failure of the drain pan.

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

Avoid Double Trapping of a single drain line.

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 Figures 20 & 21 for drain connection locations.

⚠ CAUTION

When the unit is installed in an attic or above a finished ceiling, an auxiliary drain pan should be provided under the coil as specified by most 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.

If the coil is provided with a secondary drain it should be piped to a location that will give the occupant a visual warning that the primary drain is clogged. If a secondary drain is not used it must be plugged.

Instruct the owner that the evaporator coil drain pan should be inspected and cleaned regularly to prevent odors and assure proper drainage. If a secondary drain is not used it must be plugged. See Figures 20 & 21.

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 VIII: 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 Revision C or later heater kits, as listed on air handler name plate and in these instructions. Use data from Tables 5 - 11 for information on required minimum motor speed tap to be used for heating operation and maximum over-current protection device required as listed for combination of air handler and heater kit.

For Upflow, Downflow and Horizontal left-hand applications, the kits can be installed without modification.

Field modification is required for Horizontal right-hand airflow application only. Follow instructions with heater for modification.

NOTICE

In some horizontal applications, the service disconnects on the electric heat kits must be rotated 180° so the up position of the disconnect is the ON position. This service disconnect orientation change is required by UL1995, Article 26.19 (in reference to all circuit breakers).

SECTION IX: LINE POWER CONNECTIONS

Power may be brought into the unit through the supply air end of the unit (top left 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. To determine proper wire sizing, refer to Tables 7 - 11 and the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct 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.

The chosen conductor and connections all must meet or exceed the amperage rating of the overcurrent protector (service disconnect or fuse) in the circuit.

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.

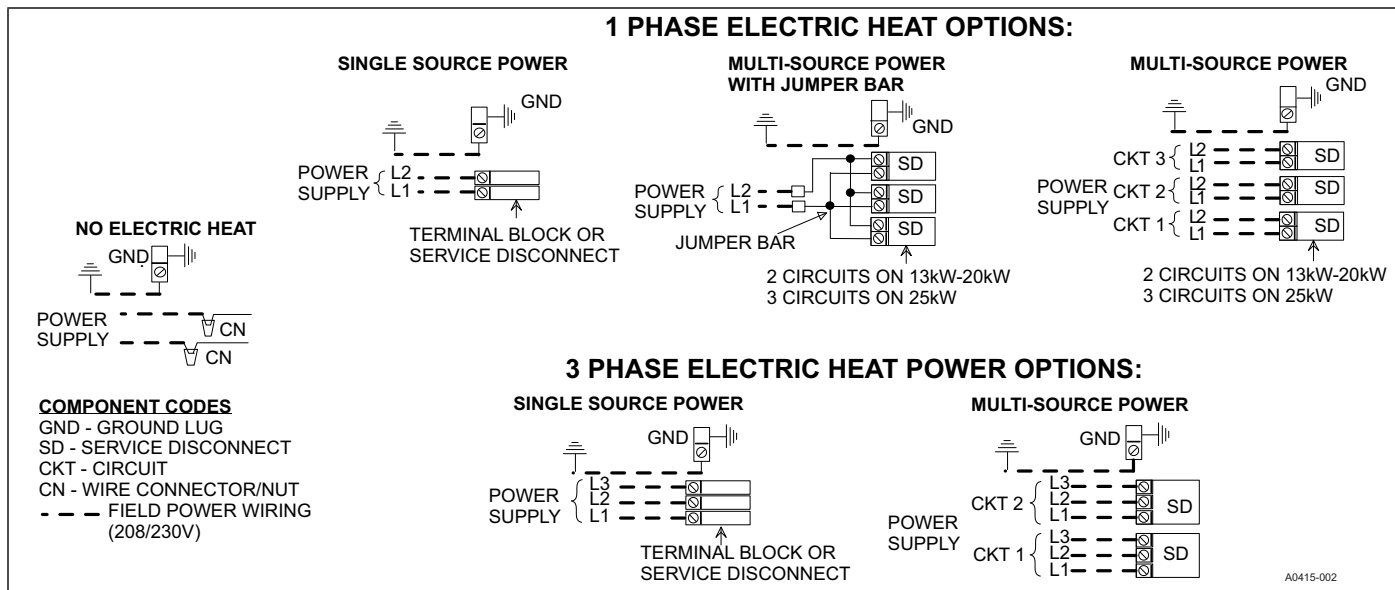


FIGURE 17: Line Power Connections

SECTION X: LOW VOLTAGE CONTROL CONNECTIONS

The 24 volt power supply is provided by an internally wired low voltage transformer which is standard on all models. 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 diagram.

Field supplied low voltage wiring can exit the unit through the top right (when unit is vertical upflow) or the right side panel. Refer to Figure 3.

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 air handler. Refer to Figures 22 & 25 for system wiring.

NOTICE

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

SECTION XI: BLOWER SPEED CONNECTIONS

Adjust blower motor speed to provide airflow within the minimum and maximum limits approved for indoor coil, electric heat and outdoor unit. Make speed tap adjustments at the motor terminal block. Refer to airflow data listed in Table 12. Connect motor wires to motor speed tap receptacle for speed desired.

The standard ECM motor operates when a 24 VAC signal is sent to any of its 5-speed taps. If simultaneous 24 VAC inputs are present, the motor operates at the highest speed tap that is energized. The lowest speed is 1, and the highest speed is 5. The air handler comes factory wired with the electric heat kit connected to tap 5 for the heating speed, and the cooling/heat pump connected to tap 4 for the heating speed. The cooling / heat pump indicating speed is supplied by the thermostat "G" signal.

The electric heat kit wire for the heating speed should be moved from 5 to the appropriate speed tap according to Table 5. If electric heat requires speed tap 5, the highest speed tap available for cooling / heat pump heating is tap 4.

If a lower circulating speed is desired for fan only operation (lower than a heating or cooling fan speed), connect the factory "red" wire shipped on tap #4 into the lowest setting desired. Field install a wire from low voltage "YEL," and connect it to the motor speed tap desired for cooling / heat pump heating fan speed.

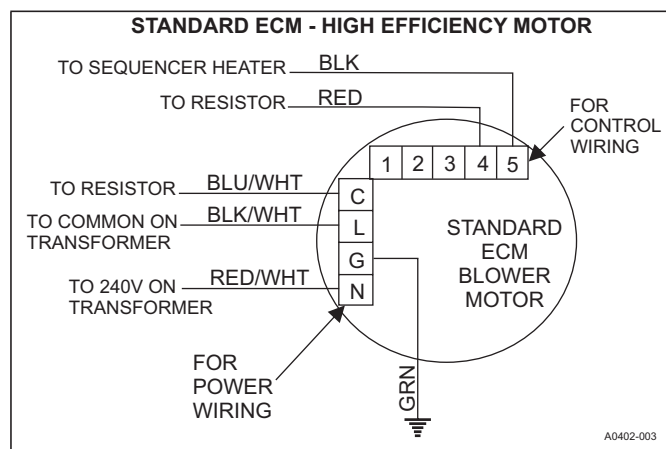


FIGURE 18: Blower Speed Connections

SECTION XII: UNIT DATA

TABLE 3: Physical and Electrical Data - Cooling Only

Models	18B	24B	30B	36B	36C	42C	48C	48D	60C	60D	
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	11 x 10	
Motor	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	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	208/230	
Full Load Amps @230V	2.6	2.6	2.6	3.8	3.8	3.8	5.4	5.4	5.4	5.4	
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	20 x 20 x 1	22 x 20 x 1	20 x 20 x 1	22 x 20 x 1
	Permanent Type Kit	1PF0601	1PF0601	1PF0601	1PF0601	1PF0602	1PF0602	1PF0602	1PF0603	1PF0602	1PF0603
Shipping / Operating Weight (lbs.)	91/85	93/87	119/113	119/113	120/114	144/136	158/150	163/153	156/146	180/170	

1. Field supplied.

TABLE 4: Electrical Data - Cooling Only

Models	Motor FLA ¹	Minimum Circuit Ampacity	MOP ²
18B/24B/30B	2.6	3.3	15
36B/36C/42C	3.8	4.8	15
48C/48D/60C/60D	5.4	6.8	15

1. FLA = Full Load Amps

2. MOP = Maximum Overcurrent Protection device; must be HACR type service disconnect or time delay fuse. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing.

TABLE 5: Electrical Heat: Minimum Fan Speed

Heater Kit Models ^{1,2,3}	Nom. kW @240V	Air Handler Models									
		18B	24B	30B	36B	36C	42C	48C	48D	60C	60D
6HK(0,1)6500206	2.4kW	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)
6HK(0,1)6500506	4.8kW	Med Lo (#2)	Med (#3)	Med (#3)	Med Lo (#2)	Med (#3)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)
6HK(0,1)6500806	7.7kW	Med (#3)	Med Hi (#4)	Med Hi (#4)	Med Lo (#2)	Med Hi (#4)	Med (#3)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)
6HK(0,1)6501006 6HK36501025	9.6kW	Med (#3)	Med Hi (#4)	Med Hi (#4)	Med Lo (#2)	Med Hi (#4)	Med (#3)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)
6HK(1,2)6501306	12.5kW	–	Med Hi (#4)	Med Hi (#4)	Med (#3)	Med Hi (#4)	Med (#3)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)	Med Lo (#2)
6HK(1,2)6501506 6HK36501525	14.4kW	–	–	Med Hi (#4)	Med Hi (#4)	Med Hi (#4)	Hi (#5)	Med (#3)	Med (#3)	Med Lo (#2)	Med Lo (#2)
6HK(1,2)6501806 6HK36501825	17.3kW	–	–	–	Med Hi (#4)	Med Hi (#4)	Hi (#5)	Med (#3)	Med Hi (#4)	Med (#3)	Med (#3)
6HK(1,2)6502006 6HK46502025	19.2kW	–	–	–	Med Hi (#4)	Hi (#5)	Hi (#5)	Med Hi (#4)	Hi (#5)	Med Hi (#4)	Med Hi (#4)
6HK(1,2)6502506 6HK46502525	24kW	–	–	–	–	–	–	–	Hi (#5)	–	Med Hi (#4)

- (0,1) - 0 = no service disconnect OR 1 = with service disconnect.
- (1,2) - 1 = with service disconnect, no breaker jumper bar OR 2 = with service disconnect & breaker jumper bar.
- 6HK3 = 3-Phase with terminal block connectors only, 6HK4 = 3-Phase with service disconnect.

TABLE 6: KW & MBH Conversions - For Total Power Input Requirement

For a power distribution voltage that is different than the provided nominal voltage, multiply the kW and MBH data from the table by the conversion factor in the following table.

DISTRIBUTION POWER	NOMINAL VOLTAGE	CONVERSION FACTOR
208V	240V	0.75
220V	240V	0.84
230V	240V	0.92

TABLE 7: Electric Heat Performance Data: 208/230-1-60 & 208/230-3-60

Heater Models ^{1,2,3}	Nominal kW @240V	Total Heat ⁴				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	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	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	15.9	44.3	54.2	6.5	7.9	13	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	18	22	61.5	75.2	7.2	8.8	18	22
3PH	6HK36501025	9.6	7.2	8.8	24.6	30.1	7.2	8.8	7.2	8.8
	6HK36501525	14.4	10.8	13.2	36.9	45.1	10.8	13.2	10.8	13.2
	6HK36501825	17.3	13	15.9	44.3	54.2	13	15.9	13	15.9
	6HK46502025	19.2	14.4	17.6	49.2	60.2	7.2	8.8	14.4	17.6
	6HK46502525	24	18	22	61.5	75.2	9	11	18	22

- (0,1) - 0 = no service disconnect OR 1 = with service disconnect.
- (1,2) - 1 = with service disconnect, no breaker jumper bar OR 2 = with service disconnect & breaker jumper bar.
- 6HK3 = 3-Phase with terminal block connectors only, 6HK4 = 3-Phase with service disconnect.
- For different power distributions, see conversion table above.

TABLE 8: 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	
			208V	230V	208V	230V
18B	6HK(0,1)6500206	10	14.9	16.1	15	20
	6HK(0,1)6500506	20	25.8	28.0	30	30
	6HK(0,1)6500806	32	39.0	42.7	40	45
	6HK(0,1)6501006	40	47.4	52.0	50	60
24B	6HK(0,1)6500206	10	14.9	16.1	15	20
	6HK(0,1)6500506	20	25.8	28.0	30	30
	6HK(0,1)6500806	32	39.0	42.7	40	45
	6HK(0,1)6501006	40	47.4	52.0	50	60
	6HK(1,2)6501306	52	60.6	66.6	70	70
30B	6HK(0,1)6500206	10	14.9	16.1	15	20
	6HK(0,1)6500506	20	25.8	28.0	30	30
	6HK(0,1)6500806	32	39.0	42.7	40	45
	6HK(0,1)6501006	40	47.4	52.0	50	60
	6HK(1,2)6501306	52	60.6	66.6	70	70
	6HK(1,2)6501506	60	69.0	75.9	70	80
36B	6HK(0,1)6500206	10	16.8	18.0	20	20
	6HK(0,1)6500506	20	27.6	29.9	30	30
	6HK(0,1)6500806	32	40.9	44.6	45	45
	6HK(0,1)6501006	40	49.3	53.8	50	60
	6HK(1,2)6501306	52	62.5	68.5	70	70
	6HK(1,2)6501506	60	70.9	77.7	80	80
	6HK(1,2)6501806	72	84.1	92.4	90	100
	6HK(1,2)6502006	80	92.5	101.7	100	110
36C	6HK(0,1)6500206	10	16.8	18.0	20	20
	6HK(0,1)6500506	20	27.6	29.9	30	30
	6HK(0,1)6500806	32	40.9	44.6	45	45
	6HK(0,1)6501006	40	49.3	53.8	50	60
	6HK(1,2)6501306	52	62.5	68.5	70	70
	6HK(1,2)6501506	60	70.9	77.7	80	80
	6HK(1,2)6501806	72	84.1	92.4	90	100
	6HK(1,2)6502006	80	92.5	101.7	100	110
42C	6HK(0,1)6500206	10	16.8	18.0	20	20
	6HK(0,1)6500506	20	27.6	29.9	30	30
	6HK(0,1)6500806	32	40.9	44.6	45	45
	6HK(0,1)6501006	40	49.3	53.8	50	60
	6HK(1,2)6501306	52	62.5	68.5	70	70
	6HK(1,2)6501506	60	70.9	77.7	80	80
	6HK(1,2)6501806	72	84.1	92.4	90	100
	6HK(1,2)6502006	80	92.5	101.7	100	110
48C	6HK(0,1)6500206	10	19.3	20.5	20	25
	6HK(0,1)6500506	20	30.1	32.4	35	35
	6HK(0,1)6500806	32	43.4	47.1	45	50
	6HK(0,1)6501006	40	51.8	56.3	60	60
	6HK(1,2)6501306	52	65.0	71.0	70	80
	6HK(1,2)6501506	60	73.4	80.2	80	90
	6HK(1,2)6501806	72	86.6	94.9	90	100
	6HK(1,2)6502006	80	95.0	104.2	100	110

For notes, see Page 14.

TABLE 8: 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	
			208V	230V	208V	230V
48D	6HK(0,1)6500206	10	19.3	20.5	20	25
	6HK(0,1)6500506	20	30.1	32.4	35	35
	6HK(0,1)6500806	32	43.4	47.1	45	50
	6HK(0,1)6501006	40	51.8	56.3	60	60
	6HK(1,2)6501306	52	65.0	71.0	70	80
	6HK(1,2)6501506	60	73.4	80.2	80	90
	6HK(1,2)6501806	72	86.6	94.9	90	100
	6HK(1,2)6502006	80	95.0	104.2	100	110
6HK(1,2)6502506	100	116.7	128.1	125	150	
60C	6HK(0,1)6500206	10	19.3	20.5	20	25
	6HK(0,1)6500506	20	30.1	32.4	35	35
	6HK(0,1)6500806	32	43.4	47.1	45	50
	6HK(0,1)6501006	40	51.8	56.3	60	60
	6HK(1,2)6501306	52	65.0	71.0	70	80
	6HK(1,2)6501506	60	73.4	80.2	80	90
	6HK(1,2)6501806	72	86.6	94.9	90	100
	6HK(1,2)6502006	80	95.0	104.2	100	110
6HK(1,2)6502506	100	116.7	128.1	125	150	
60D	6HK(0,1)6500206	10	19.3	20.5	20	25
	6HK(0,1)6500506	20	30.1	32.4	35	35
	6HK(0,1)6500806	32	43.4	47.1	45	50
	6HK(0,1)6501006	40	51.8	56.3	60	60
	6HK(1,2)6501306	52	65.0	71.0	70	80
	6HK(1,2)6501506	60	73.4	80.2	80	90
	6HK(1,2)6501806	72	86.6	94.9	90	100
	6HK(1,2)6502006	80	95.0	104.2	100	110
6HK(1,2)6502506	100	116.7	128.1	125	150	

1. (0,1) - maybe 0 (no service disconnect) or 1 (with service disconnect).

2. (1,2) maybe 1 (with service disconnect, no breaker jumper bar) or 2 (with service disconnect & breaker jumper bar).

3. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing.

TABLE 9: Electrical Data For Multi-source Power Supply: 208/230-1-60

Air Handlers Models	Heater Models	Heater Amps @240V	Min. Circuit Ampacity						MOP ¹					
			208V			230V			208V			230V		
			Circuit						Circuit					
			1st ³	2nd	3rd	1st ³	2nd	3rd	1st ³	2nd	3rd	1st ³	2nd	3rd
24B	6HK16501306	52	22.9	37.6	–	24.9	41.5	–	25	40	–	25	45	–
30B	6HK16501306	52	22.9	37.6	–	24.9	41.5	–	25	40	–	25	45	–
	6HK16501506	60	25.8	43.3	–	28.1	47.9	–	25	45	–	30	50	–
36B	6HK16501306	52	24.8	37.6	–	26.8	41.5	–	25	40	–	30	45	–
	6HK16501506	60	27.7	43.3	–	30.0	47.9	–	30	45	–	30	50	–
	6HK16501806	72	45.0	39.0	–	49.1	43.1	–	45	40	–	50	45	–
	6HK16502006	80	49.3	43.3	–	53.9	47.9	–	50	45	–	60	50	–
36C	6HK16501306	52	24.8	37.6	–	26.8	41.5	–	25	40	–	30	45	–
	6HK16501506	60	27.7	43.3	–	30.0	47.9	–	30	45	–	30	50	–
	6HK16501806	72	45.0	39.0	–	49.1	43.1	–	45	40	–	50	45	–
	6HK16502006	80	49.3	43.3	–	53.9	47.9	–	50	45	–	60	50	–
42C	6HK16501306	52	24.8	37.6	–	26.8	41.5	–	25	40	–	30	45	–
	6HK16501506	60	27.7	43.3	–	30.0	47.9	–	30	45	–	30	50	–
	6HK16501806	72	45.0	39.0	–	49.1	43.1	–	45	40	–	50	45	–
	6HK16502006	80	49.3	43.3	–	53.9	47.9	–	50	45	–	60	50	–
48C	6HK16501306	52	27.3	37.6	–	29.3	41.5	–	30	40	–	30	45	–
	6HK16501506	60	30.2	43.3	–	32.5	47.9	–	35	45	–	35	50	–
	6HK16501806	72	47.5	39.0	–	51.6	43.1	–	50	40	–	60	45	–
	6HK16502006	80	51.8	43.3	–	56.4	47.9	–	50	45	–	60	50	–
48D	6HK16501306	52	27.3	37.7	–	29.3	41.5	–	30	40	–	30	45	–
	6HK16501506	60	30.1	43.3	–	32.5	47.9	–	35	45	–	35	50	–
	6HK16501806	72	47.6	39.1	–	51.6	43.1	–	50	40	–	60	45	–
	6HK16502006	80	51.8	43.3	–	56.4	47.9	–	50	45	–	60	50	–
	6HK16502506	100	51.8	43.3	21.6	56.4	47.9	24.0	60	45	25	60	50	25
60C	6HK16501306	52	27.3	37.6	–	29.3	41.5	–	30	40	–	30	45	–
	6HK16501506	60	30.2	43.3	–	32.5	47.9	–	35	45	–	35	50	–
	6HK16501806	72	47.5	39.0	–	51.6	43.1	–	50	40	–	60	45	–
	6HK16502006	80	51.8	43.3	–	56.4	47.9	–	60	45	–	60	50	–
60D	6HK16501306	52	27.3	37.6	–	29.3	41.5	–	30	40	–	30	45	–
	6HK16501506	60	30.2	43.3	–	32.5	47.9	–	35	45	–	35	50	–
	6HK16501806	72	47.5	39.0	–	51.6	43.1	–	50	40	–	60	45	–
	6HK16502006	80	51.8	43.3	–	56.4	47.9	–	60	45	–	60	50	–
	6HK16502506	100	51.8	43.3	21.7	56.4	47.9	24.0	60	45	25	60	50	25

1. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse. The 1st circuit includes blower motor amps. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing.

TABLE 10: Electrical Data For Single Source Power Supply: 208/230-3-60

Air Handler Models	Heater Models ¹	Heater Amps @240V	Field Wiring			
			Min. Circuit Ampacity		MOP. ²	
			208V	230V	208V	230V
18B	6HK36501025	23.1	28.3	30.9	30	35
24B	6HK36501025	23.1	28.3	30.9	30	35
30B	6HK36501025	23.1	28.3	30.9	30	35
	6HK36501525	34.6	40.7	44.7	45	45
36B	6HK36501025	23.1	29.8	32.4	30	35
	6HK36501525	34.6	42.2	46.2	45	50
	6HK36501825	41.6	49.8	54.6	50	55
36B	6HK46502025*	46.2	54.8	60.1	55	70
	6HK36501025	23.1	29.8	32.4	30	35
	6HK36501525	34.6	42.2	46.2	45	50
	6HK36501825	41.6	49.8	54.6	50	55
36C	6HK46502025*	46.2	54.8	60.1	55	70
	6HK36501025	23.1	29.8	32.4	30	35
	6HK36501525	34.6	42.2	46.2	45	50
	6HK36501825	41.6	49.8	54.6	50	55
42C	6HK46502025*	46.2	54.8	60.1	55	70
	6HK36501025	23.1	29.8	32.4	30	35
	6HK36501525	34.6	42.2	46.2	45	50
	6HK36501825	41.6	49.8	54.6	50	55
48C	6HK46502025*	46.2	56.8	62.1	60	70
	6HK36501025	23.1	31.8	34.4	35	35
	6HK36501525	34.6	44.2	48.2	45	50
	6HK36501825	41.6	51.8	56.6	55	60
48D	6HK46502025*	46.2	56.8	62.1	60	70
	6HK46502525*	57.7	69.3	75.9	70	80
	6HK36501025	23.1	31.8	34.4	35	35
	6HK36501525	34.6	44.2	48.2	45	50
	6HK36501825	41.6	51.8	56.6	55	60
60C	6HK46502025*	46.2	56.8	62.1	60	70
	6HK36501025	23.1	31.8	34.4	35	35
	6HK36501525	34.6	44.2	48.2	45	50
	6HK36501825	41.6	51.8	56.6	55	60
60D	6HK46502025*	46.2	56.8	62.0	60	70
	6HK46502525*	57.7	69.3	75.9	70	80
	6HK36501025	23.1	31.8	34.4	35	35
	6HK36501525	34.6	44.3	48.2	45	50
	6HK36501825	41.6	51.9	56.7	55	60

1. Asterisk (*) denotes the 20kW and 25kW heater models (6HK46502025 and 6HK46502525) come with service disconnects standard. Single source power MCA and MOP requirements are given here only for reference if used with field installed single point power modification (S1-32436041000).

2. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse. The 1st circuit includes blower motor amps. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing.

TABLE 11: Electrical Data For Multi-source Power Supply: 208/230-3-60

Air Handlers Models	Heater Models ^{1,2}	Heater Amps @240V	Min. Circuit Ampacity				MOP ³			
			208V		230V		208V		230V	
			Circuit				Circuit			
			1st ³	2nd	1st ³	2nd	1st ³	2nd	1st ³	2nd
36B	6HK46502025	46.2	29.8	25.0	32.4	27.6	30	25	35	30
36C	6HK46502025	46.2	29.8	25.0	32.4	27.6	30	25	35	30
42C	6HK46502025	46.2	29.8	25.0	32.4	27.6	30	25	35	30
48C	6HK46502025	46.2	31.8	25.0	34.4	27.6	35	25	35	30
48D	6HK46502025	46.2	31.8	25.0	34.4	27.6	35	25	35	30
	6HK46502525	57.7	38.0	31.3	41.3	34.6	40	35	45	35
60C	6HK46502025	46.2	31.8	25.0	34.4	27.6	35	25	35	30
60D	6HK46502025	46.2	31.8	25.0	34.4	27.6	35	25	35	30
	6HK46502525	57.7	38.0	31.3	41.3	34.6	40	35	45	35

1. (0,1) - 0 = no service disconnect OR 1 = with service disconnect.

2. (1,2) - 1 = with service disconnect, no breaker jumper bar OR 2 = with service disconnect & breaker jumper bar.

3. MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse. The 1st circuit includes blower motor amps. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing.

TABLE 12: 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
18B	#5 HI	1132	1107	1074	1053	1023	990	955
	#4 MED-HI	1025	994	971	943	912	878	803
	#3 MED	821	798	764	727	657	599	536
	#2 MED-LO	661	632	572	491	414	335	279
	#1 LO	510	435	365	291	181	147	23
24B	#5 HI	1117	1078	1061	1034	1007	985	955
	#4 MED-HI	1032	1001	975	946	928	898	872
	#3 MED	838	799	768	742	698	634	582
	#2 MED-LO	644	620	582	521	440	378	284
	#1 LO	474	421	336	279	187	144	70
30B	#5 HI	1113	1083	1057	1034	1007	977	941
	#4 MED-HI	1057	1021	1000	977	947	914	881
	#3 MED	857	821	794	768	728	653	601
	#2 MED-LO	675	641	607	533	460	408	345
	#1 LO	489	457	386	324	261	209	158
36B	#5 HI	1323	1287	1264	1238	1210	1177	1149
	#4 MED-HI	1255	1222	1193	1170	1140	1113	1081
	#3 MED	1052	1025	992	967	927	857	811
	#2 MED-LO	855	823	799	739	691	637	572
	#1 LO	653	622	574	507	463	411	353
36C	#5 HI	1562	1531	1496	1453	1416	1381	1348
	#4 MED-HI	1277	1240	1206	1165	1133	1083	1025
	#3 MED	1078	1043	996	957	899	819	770
	#2 MED-LO	881	836	810	749	658	578	537
	#1 LO	707	677	595	524	451	405	346
42C	#5 HI	1594	1564	1530	1497	1459	1424	1382
	#4 MED-HI	1442	1408	1374	1338	1298	1251	1199
	#3 MED	1249	1215	1179	1135	1082	1016	956
	#2 MED-LO	1048	1008	962	905	840	761	683
	#1 LO	881	833	786	708	623	540	481

For notes, see Page 18.

TABLE 12: 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
48C	#5 HI	1759	1719	1685	1644	1611	1578	1540
	#4 MED-HI	1684	1639	1606	1569	1536	1489	1452
	#3 MED	1511	1460	1427	1388	1347	1308	1262
	#2 MED-LO	1305	1260	1212	1178	1121	1076	1027
	#1 LO	1123	1068	1029	985	909	793	769
48D	#5 HI	1774	1726	1684	1651	1614	1574	1529
	#4 MED-HI	1709	1668	1619	1580	1548	1499	1459
	#3 MED	1484	1436	1410	1372	1321	1284	1237
	#2 MED-LO	1295	1254	1218	1167	1114	1069	1005
	#1 LO	1102	1051	1011	962	890	831	766
60C	#5 HI	1964	1930	1897	1858	1823	1789	1752
	#4 MED-HI	1889	1855	1818	1791	1747	1716	1668
	#3 MED	1693	1652	1627	1584	1551	1510	1462
	#2 MED-LO	1486	1450	1411	1375	1335	1291	1252
	#1 LO	1292	1247	1207	1172	1123	1055	990
60D	#5 HI	1907	1871	1835	1796	1762	1723	1681
	#4 MED-HI	1851	1816	1774	1742	1699	1659	1616
	#3 MED	1648	1608	1569	1530	1492	1445	1404
	#2 MED-LO	1456	1416	1371	1333	1289	1227	1163
	#1 LO	1261	1221	1172	1120	1055	998	949

1. Air handler units have been tested to UL 1995 / CSA 22.2 No.236 standards up to 0.50" 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. Heating applications tested at 0.50" w.c. esp.

Airflow data shown is from testing performed at 230V. AE units use a standard ECM constant torque 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 XIII: 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

CAUTION

Ensure adequate precautions are taken to protect electrical components from liquid.

If the coil needs to be cleaned, it should be cleaned with water.

As an alternative to water, EVAP-Green by Nu-Calgon is the only pH neutral coil cleaner approved to be used when it is properly diluted. ENSURE THE CLEANED COILS ARE THOROUGHLY RINSED AFTER USE OF EVAP-GREEN.

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 XIV: AIR SYSTEM ADJUSTMENT

To check the Cubic Feet per Minute (CFM), measure the external duct static using a manometer and static pressure tips. To prepare coil for static pressure measurements run the fan only to assure a dry coil.

NOTICE

Refer to Table 12 for coil Air Flow Data of Cubic Feet Per Minute (CFM).

Drill 2 holes, one 12" away from the air handler in the supply air duct and on 12" away from the air handler in the return air duct (before any elbows in the duct work). Insert the pressure tips, and energize the blower motor. See Table 10 to determine the air flow, and make the necessary adjustments to keep the CFM within the airflow limitations of the coil.

EXTERNAL DUCT STATIC

Measure the supply air static pressure. Record this positive number. Measure the return air static pressure. Record this negative number. Treat the negative number as a positive, and add the two numbers together to determine the total external system static pressure. If a filter rack is installed on the return air end of the air handler or indoor coil section, make sure to measure the return air duct static between the filter and the indoor coil.

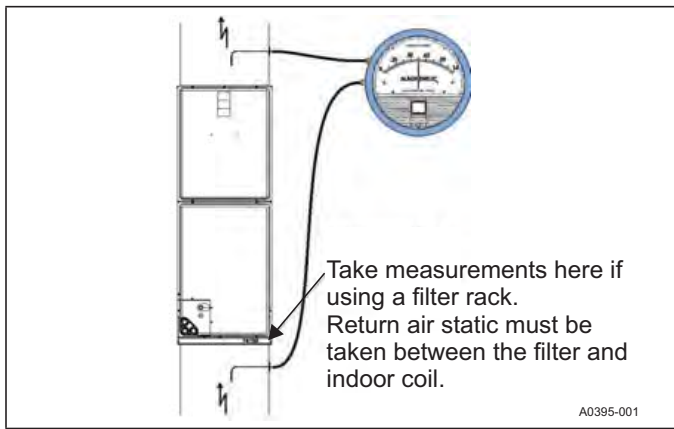


FIGURE 19: Duct Static Measurements

SECTION XV: INSTALLATION VERIFICATION

Prior to and during the accomplishment of the installation procedures, verify all tasks are accomplished as indicated in this installation manual.

- THERMAL EXPANSION VALVE (TXV) CHECK LIST**
- Is coil metering device installed correctly?
 - Was the correct TXV installed per the outdoor unit Technical Guide?
 - Is the TXV bulb positioned correctly?
 - Is temperature bulb insulated?
 - Is equalizer line connected?

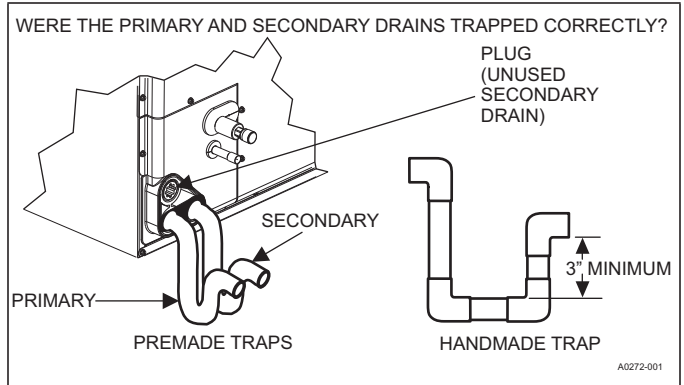


FIGURE 20: Drain Traps

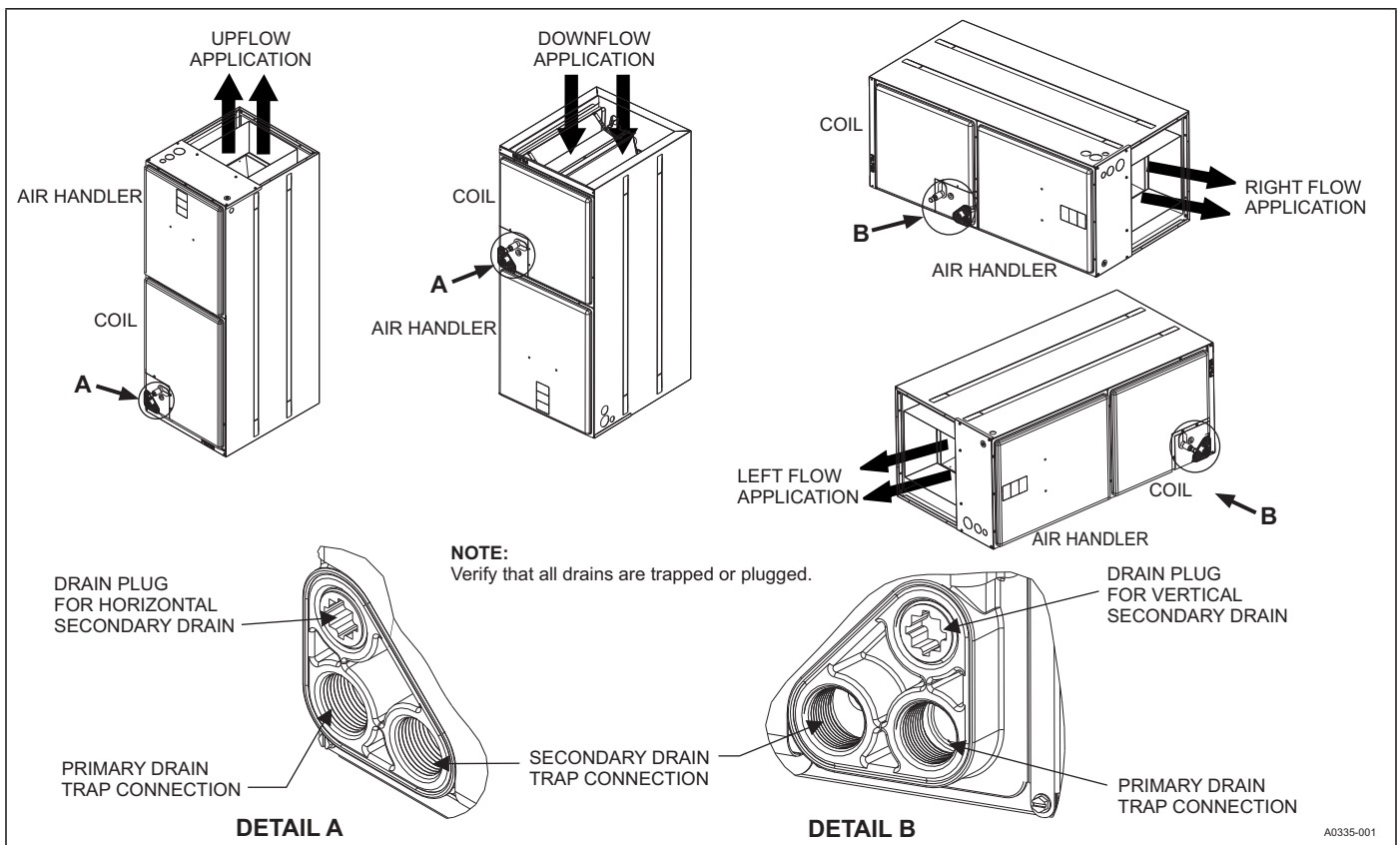


FIGURE 21: Location of Coil Trapped and Plugged Drain Connections

SECTION XVI: WIRING DIAGRAM

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.

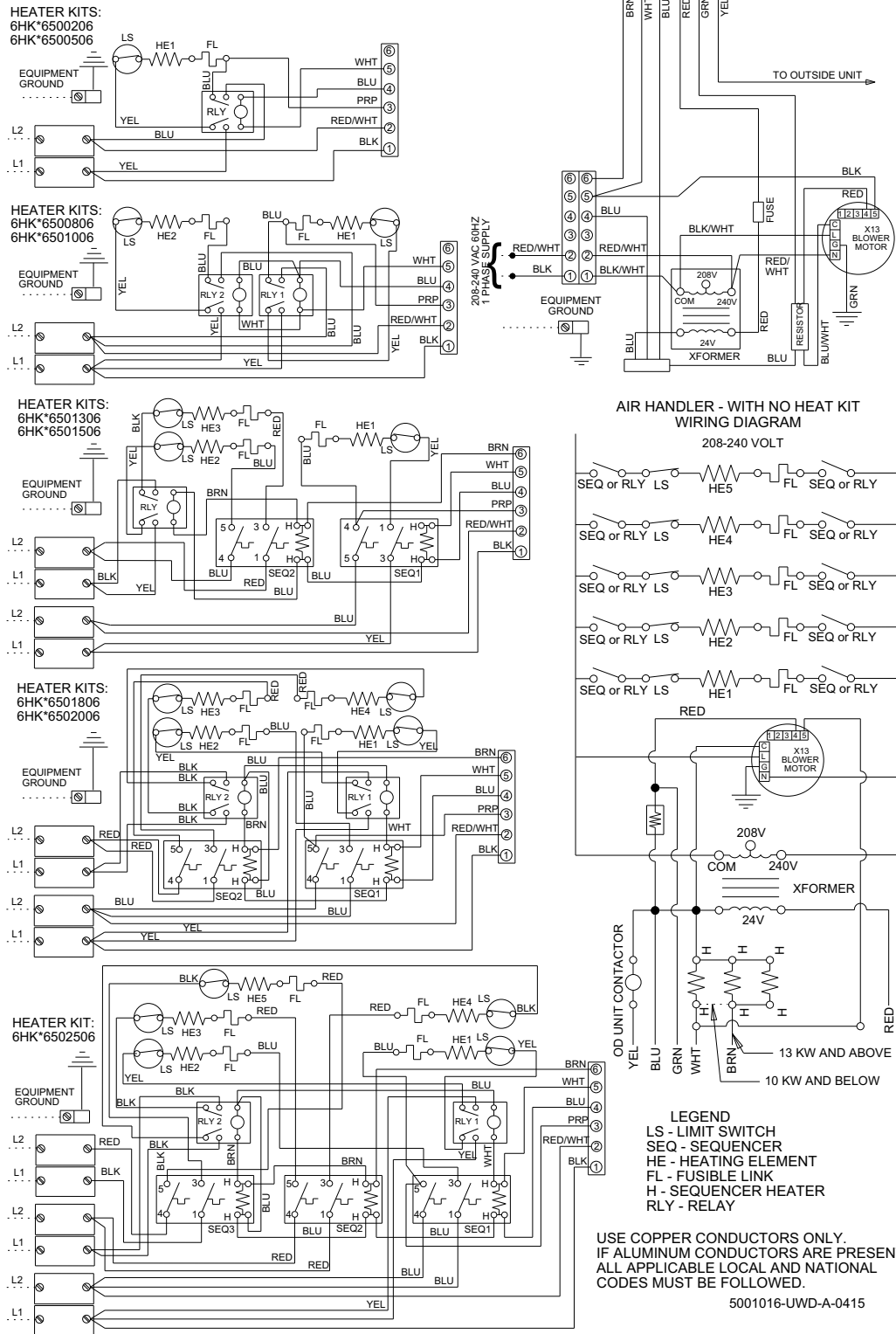


FIGURE 22: Wiring Diagram - Standard ECM - Single Phase Heat Kits

3 PHASE ELECTRIC HEAT KITS

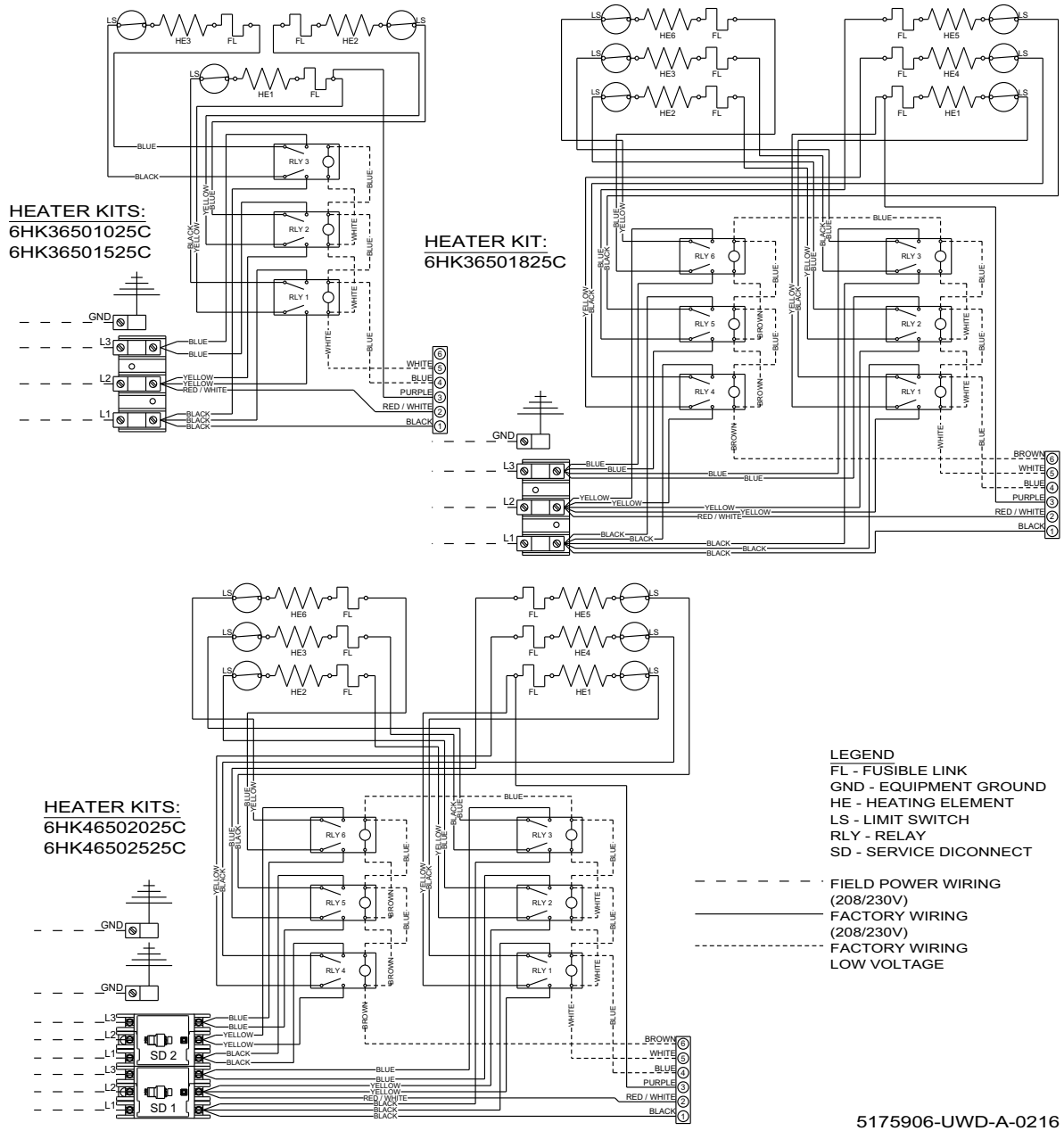


FIGURE 23: Wiring Diagram - Three Phase Heat Kits 208-230V

SECTION XVII: TYPICAL THERMOSTAT CONNECTIONS

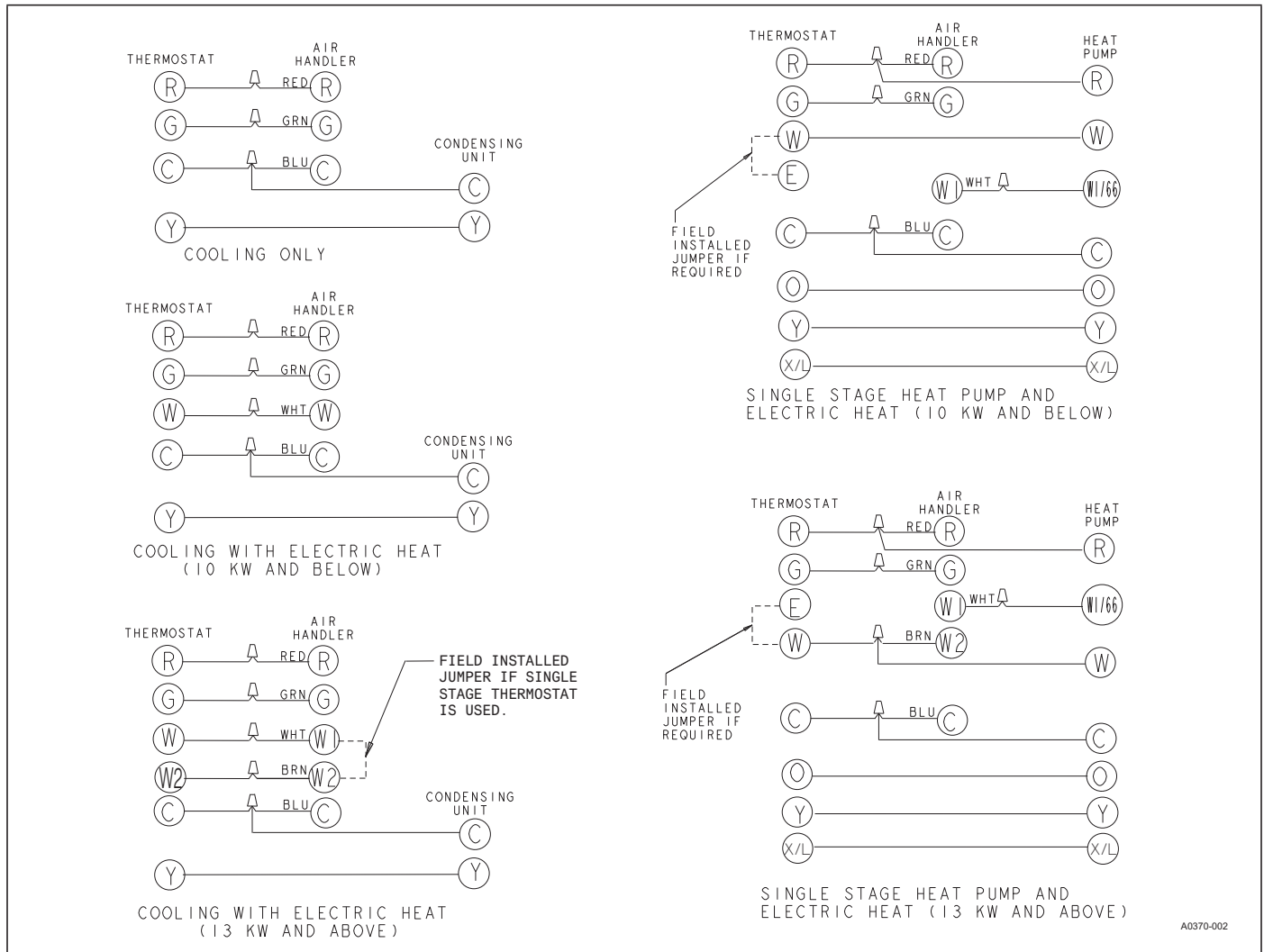


FIGURE 24: Typical Thermostat Wiring Diagram - ECM

A0370-002

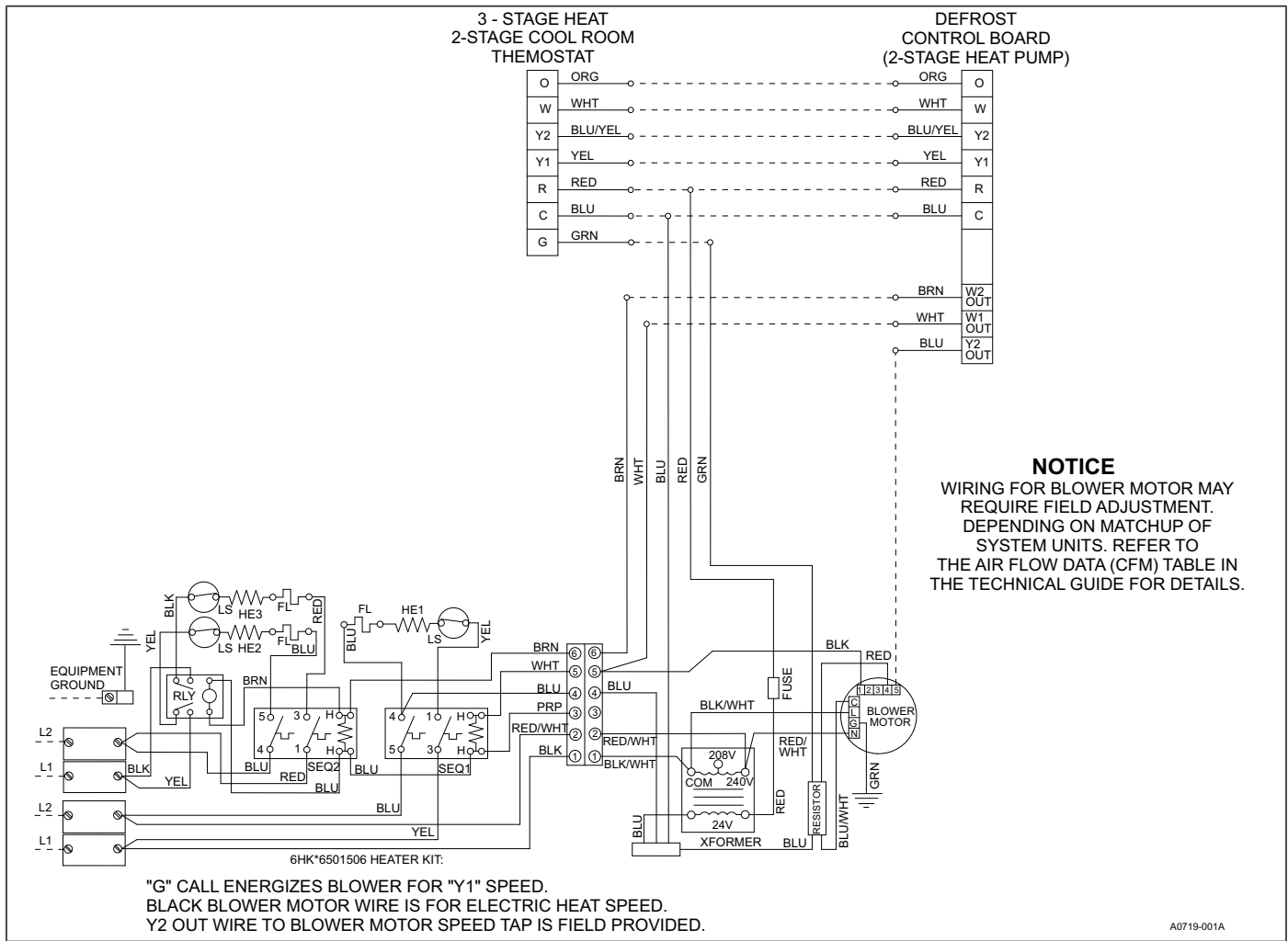


FIGURE 25: Typical Thermostat Wiring Diagram - 2 Stage Heat Pump with ECM Blower Motor

SECTION XVIII: START UP SHEET

<input type="button" value="Print Form"/>	Residential Air Handler with Electric Heat Start-Up Sheet	<input type="button" value="Reset Form"/>
Proper start-up is critical to customer comfort and equipment longevity		
Start-Up Date <input style="width: 100px;" type="text"/>	Company Name <input style="width: 200px;" type="text"/>	Start-Up Technician <input style="width: 200px;" type="text"/>
Owner Information		
Name <input style="width: 150px;" type="text"/>	Address <input style="width: 250px;" type="text"/>	Daytime Phone <input style="width: 100px;" type="text"/>
City <input style="width: 100px;" type="text"/>	State or Province <input style="width: 100px;" type="text"/>	Zip or Postal Code <input style="width: 100px;" type="text"/>
Equipment Data		
Unit Model # <input style="width: 150px;" type="text"/>	Unit Serial # <input style="width: 200px;" type="text"/>	
General Information (Check all that apply)		
<input type="radio"/> New Construction	<input type="radio"/> Up flow	<input type="radio"/> Horizontal Left
<input type="radio"/> Retrofit	<input type="radio"/> Down flow	<input type="radio"/> Horizontal Right
Unit Location and Connections (Check all that apply)		
<input type="checkbox"/> Unit is level	<input type="checkbox"/> Duct connections are complete:	<input type="checkbox"/> Supply <input type="checkbox"/> Return
<input type="checkbox"/> Condensate drain properly connected per the installation instructions	<input type="checkbox"/> Condensate trap has been primed with water	
Filters		
<input type="checkbox"/> Filters installed	Number of filters <input style="width: 50px;" type="text"/>	Filter size <input style="width: 50px;" type="text"/>
Electrical Connections & Inspection (Complete all that apply)		
<input type="radio"/> 208 volts AC	<input type="radio"/> 230 volt AC	
<input type="checkbox"/> Inspect wires and electrical connections	<input type="checkbox"/> Transformer wired properly for primary supply voltage	<input type="checkbox"/> Ground connected
Line Voltage Measured (Volts AC) <input style="width: 80px;" type="text"/>	Low voltage value between "R" and "C" at control board (Volts AC) <input style="width: 80px;" type="text"/>	
<input type="checkbox"/> Thermostat wiring is complete <input type="checkbox"/> Thermostat cycle rate or heat anticipator adjusted to Installation Manual specifications		
Air Flow Setup		
Blower Type & Set-Up	<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 style="width: 50px;" type="text"/>	Supply air dry bulb temperature <input style="width: 50px;" type="text"/>	Outside air dry bulb temperature <input style="width: 50px;" type="text"/>
Return static (inches of water column) <input style="width: 50px;" type="text"/>	Return air dry bulb temperature <input style="width: 50px;" type="text"/>	Return air wet bulb temperature <input style="width: 50px;" type="text"/>
Total external static pressure <input style="width: 50px;" type="text"/>	Temperature drop <input style="width: 50px;" type="text"/>	Supply air wet bulb temperature <input style="width: 50px;" type="text"/>
Other Jumpers (Check all that apply)		
HUM STAT <input type="radio"/> YES <input type="radio"/> NO	AC/HP <input type="radio"/> AC <input type="radio"/> HP	CONT FAN <input type="radio"/> L <input type="radio"/> M <input type="radio"/> 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