

INSTALLATION MANUAL

VARIABLE SPEED ECM SINGLE PIECE MULTI-POSITION AIR HANDLERS

MODELS: AVC SERIES



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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, 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 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.

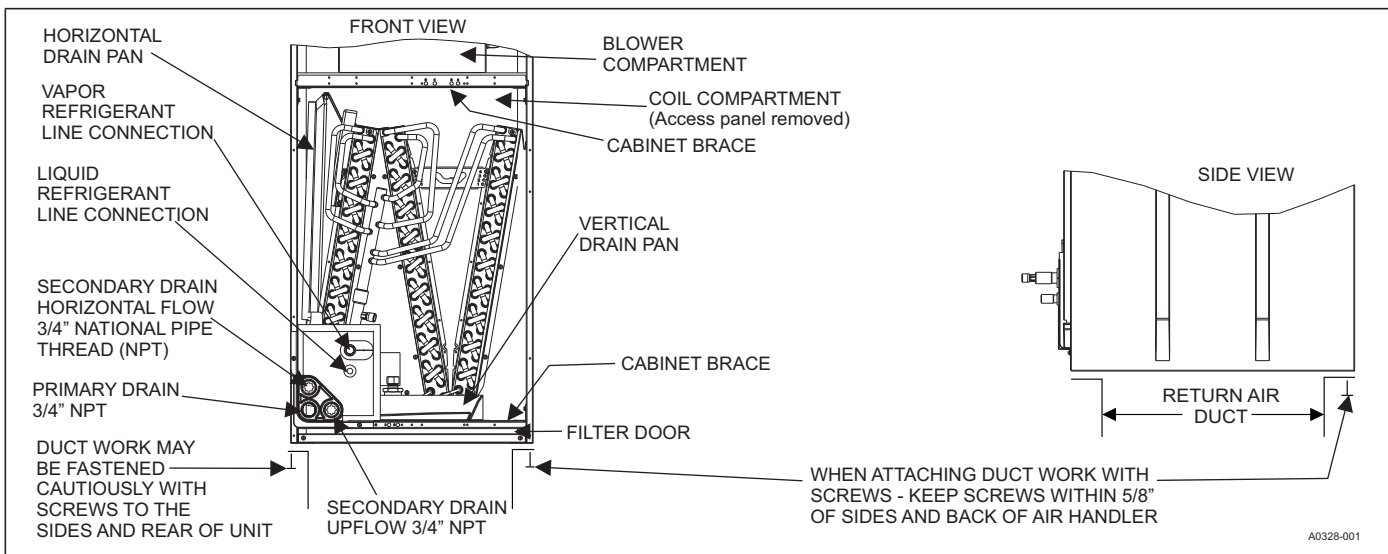


FIGURE 1: Return Air Duct Attachment & Component Location

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 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.

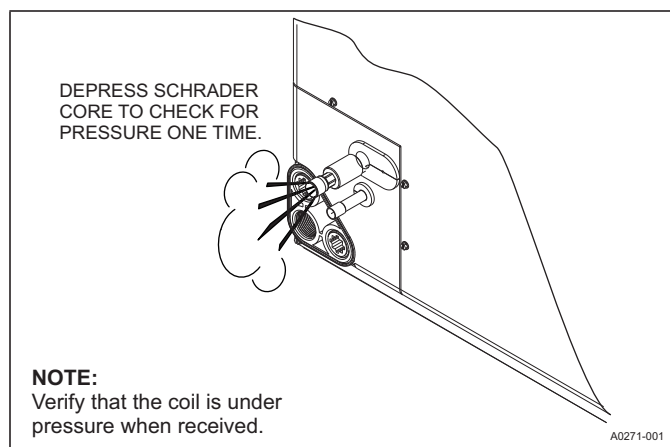


FIGURE 2: Pressure Check

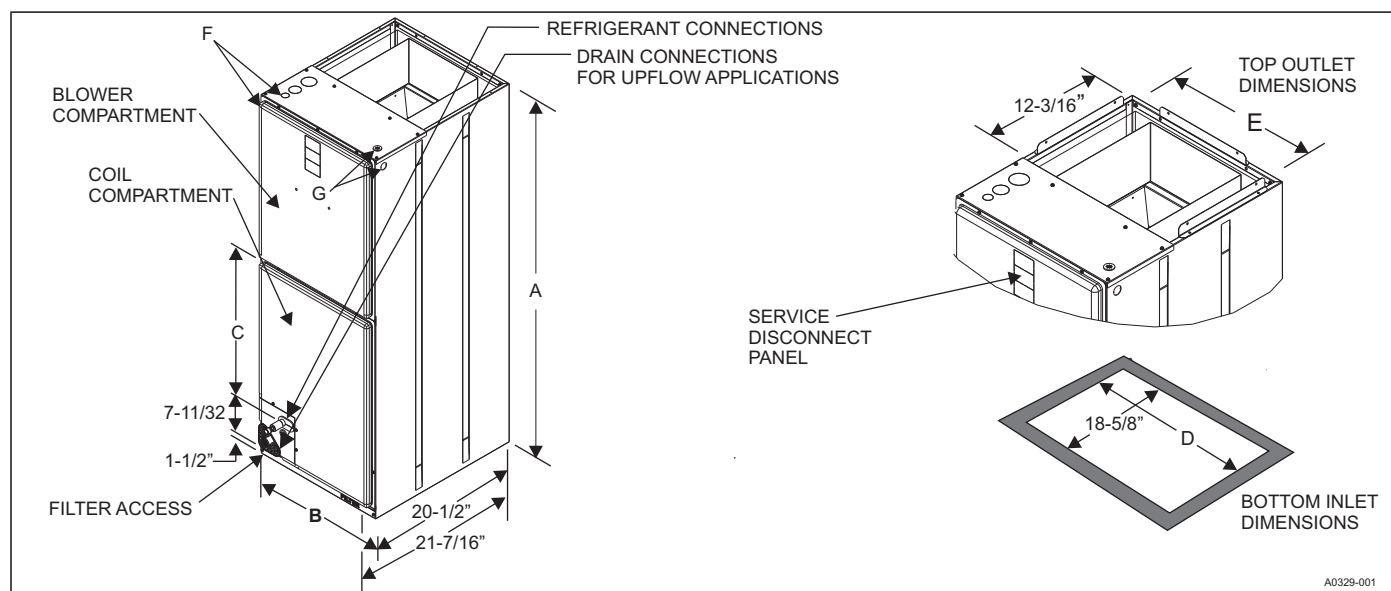


FIGURE 3: Dimensions & Duct Connection Dimensions

TABLE 1: Dimensions

Models	Dimensions ¹					Wiring Knockouts ²		Refrigerant Connections Line Size	
	A	B	C	D	E	F	G		
	Height	Width				Power	Control	Liquid	Vapor
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				7/8
42C	51-1/2	21	22-5/8	17-3/4	20				
48C	51-1/2	21	22-5/8	17-3/4	20				
48D	55-1/2	24-1/2	26-5/8	21-1/4	23-1/2				
49C	51-3/4	21	26-5/8	17-3/4	20				
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. Actual size (Conduit size in parenthesis).

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

1. 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 & Table 1.
2. Only connect the air handler to a duct system which has an external static pressure within the allowable range.
3. Airflow must be within the minimum and maximum limits approved for electric heat, indoor coils and outdoor units.

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

4. When an air handler is installed so that supply ducts carry air circulated by the air handler to areas outside the space containing the air handler, the return air shall also be handled by duct(s) sealed to the air handler casing and terminating in the space to be cooled/heated.
5. Refer to the unit rating plate for the air handler model number, and then see the dimensions page of this instruction for supply air plenum dimensions. The plenum must be installed according to the instructions.
6. The installer must check available supply power and verify that it is within the normal operating voltage range for the unit. The acceptable voltage range for these units is as follows:

Air Handler Voltage	Normal Operating ¹ Voltage Range
208V-230V-1-60	187V-253V

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

CLEARANCES

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

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

LOCATION

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

1. Select a location with adequate structural support, space for service access, and clearance for air return and supply duct connections.
2. Using hanging brackets to wall mount this single piece air handler unit is not recommended.

3. Normal operating sound levels may be objectionable if the air handler is placed directly over some rooms such as bedrooms, study, etc.
4. Select a location that will permit installation of condensate line to an open drain or outdoors allowing condensate to drain away from structure.

NOTICE

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

5. When an 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.
6. Proper electrical supply must be available.
7. If unit is located in an area of high humidity (i.e. an unconditioned garage or attic), nuisance sweating of casing may occur. On these installations, unit duct connections and other openings should be properly sealed, and a wrap of 2" fiberglass insulation with vinyl vapor barrier should be used.

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.

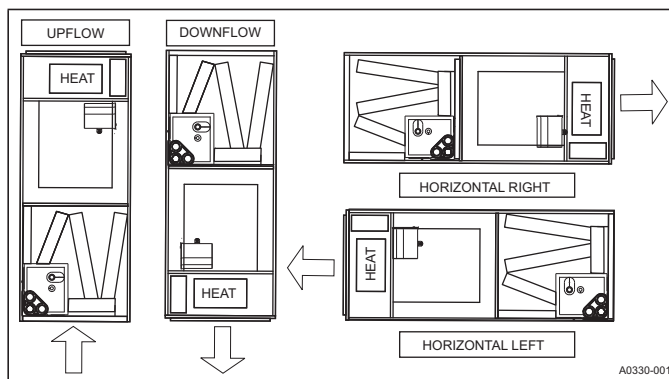


FIGURE 4: Typical Installation

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.

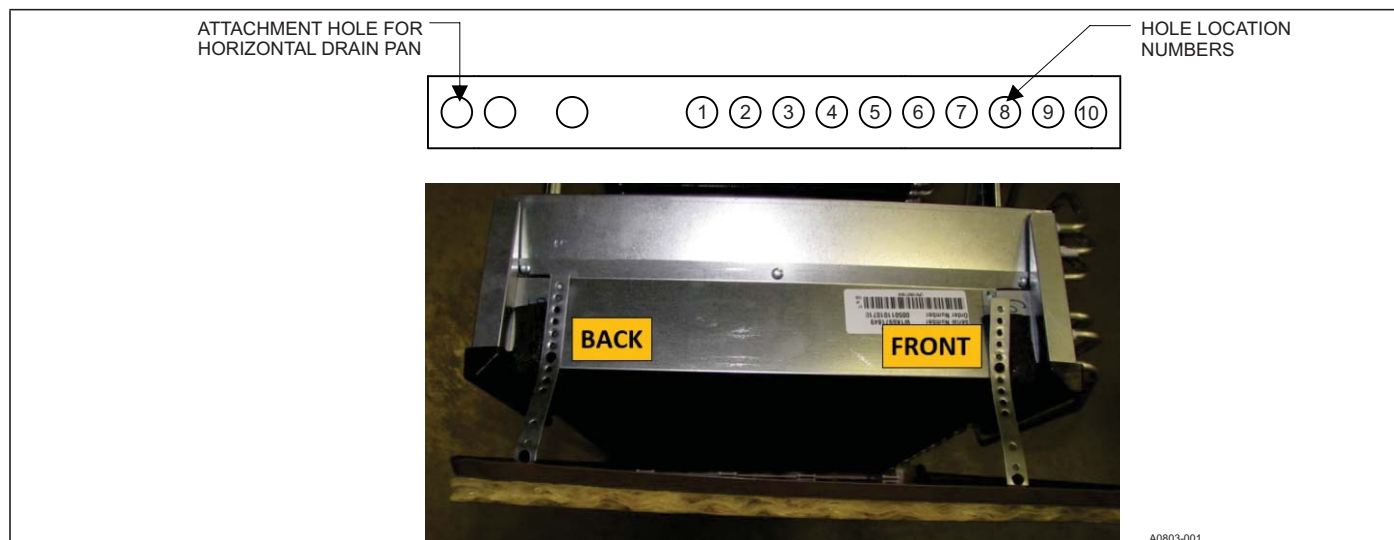


FIGURE 5: Horizontal Pan Adjustment Strap Hole Reference

TABLE 2: Horizontal Pan Strap Settings for Horizontal Left

Model						Back	Front
AP	RFCX-P2	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 the desired 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 re-installation, 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 re-installation, the coil slide rail must be installed in the same numbered position that it was originally.

4. 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.
5. Turn air handler cabinet upside down (downflow position).
6. Install coil slide rail by hooking the hook 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 rear of the center support bar are longer than the fingers on the forward end of the support bar.

7. Install center support bar for the coil/drain pan onto the lettered position that it was originally mounted.

NOTICE

When installing a coil condensate deflector, make sure that each notch in the coil condensate deflector slides around the anchor screw with the bottom of the notch fully set against the screw. Ensure that the coil condensate deflector is installed with the flange bending away from the coil delta plate.

8. For horizontal right applications, install front and back coil condensate deflectors (condensate deflectors shipped as loose parts with the unit). Locate 4 screws securing coil delta plates to coil drain pan. Loosen the screws. Slide each coil condensate deflector between the drain pan and the coil delta plate. Tighten screws to securely anchor coil condensate deflectors. Refer to Figure 6.

NOTICE

Some models contain condensate deflectors that are not symmetrical and must be installed in the correct orientation. If this air handling unit is a **60C model, refer to the horizontal right conversion section on the next page.

9. Slide the coil back into the cabinet. Be sure to engage the side coil slide into the slide rail on the air handler cabinet.
10. Install coil access panel. Conversion is now complete.

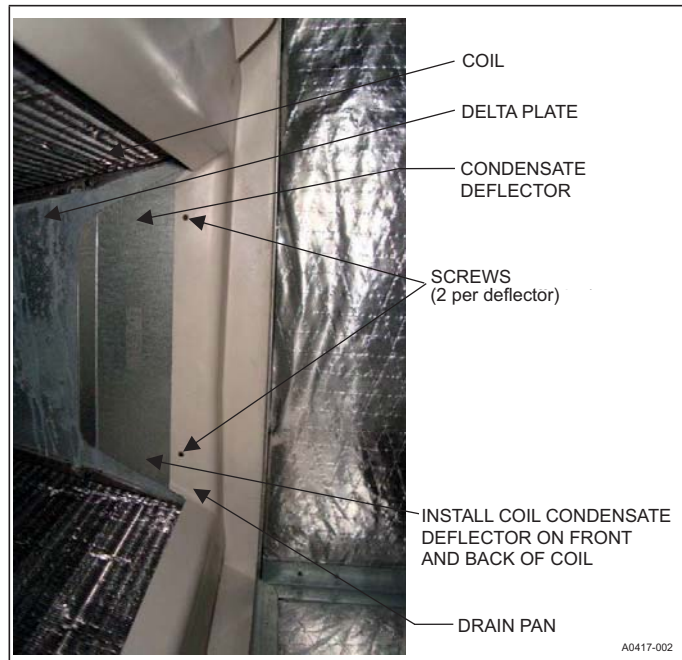


FIGURE 6: Coil Condensate Deflector Installation

Handling Coil Assemblies when Removed from Casing

When the coil assembly is removed from its casing, it must be handled in such a manner that does not compromise the foam gasket that seals the attachment point of the horizontal drain pan and primary drain pan. DO NOT position the coil so that the coil weight rests on the horizontal drain pan. By doing so, the horizontal drain pan straps could deform or become damaged which will not allow the pan to be positioned/angled correctly when the unit is horizontally installed, and if the foam gasket that seals the attachment point becomes compromised by the movement of the horizontal drain pan, condensate may leak at this point and cause damage to the unit/property.

Positioning the Unit in Horizontal Applications

Set unit so that it is sloped 1/4" towards the drain plug.

AVC60C Downflow or Horizontal Right

The AVC60C model contains a unique coil assembly in that additional pieces are required to be installed in horizontal right and downflow applications to reduce the potential for condensate blow-off. The large cooling capacity and high volumetric airflow (1800 CFM and above) required for these coils put them more at risk of condensate blow-off. The installation of additional shields should mitigate condensate management issues while allowing the coil to perform adequately for proper cooling/heating.

When installing any of the shield provisions, it is advised to position the coil such that the primary drain pan opening can be easily accessed to attach the shields. See Figure 7.

IMPORTANT: DO NOT position the loose coil so that it rests on the horizontal drain pan. The weight of the coil will deform the horizontal pan straps, and the movement of the horizontal pan could potentially compromise the foam gasket that seals the horizontal drain pan to the primary drain pan. This could lead to water leaking at this attachment point and damaging the insulation/cabinet/property.



FIGURE 7: Recommended Position of Coil to Install Downflow/Horizontal Right Condensate Components

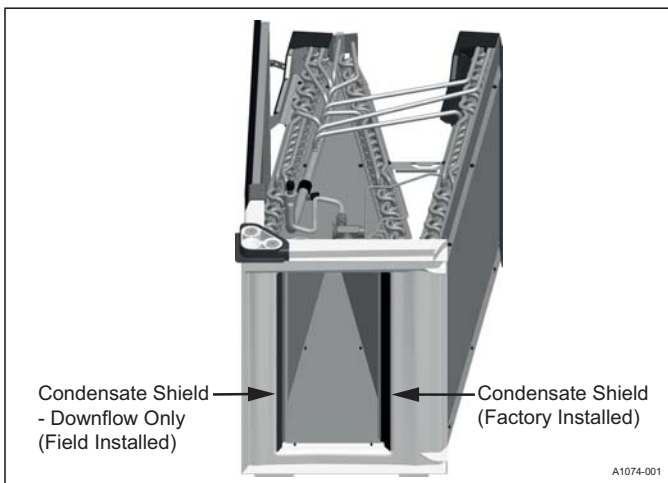


FIGURE 8: Installation of Downflow Condensate Diverter Shields

AVC60C Horizontal Right

1. Attach the additional condensate deflectors that were included in the loose parts kit to the coil assembly by loosening the screws that secure the front and rear delta plates to the primary drain pan. DO NOT remove the screws completely. Loosen them enough so that you can insert the deflectors between the drain pan and the delta plate.

IMPORTANT: FOR 60C (21.0") COIL ASSEMBLIES: While the shields may appear similar, they are actually different in that there is a front and rear shield. Due to their asymmetry, these shields will not fit correctly if they are oriented incorrectly. See Figure 9 for details.

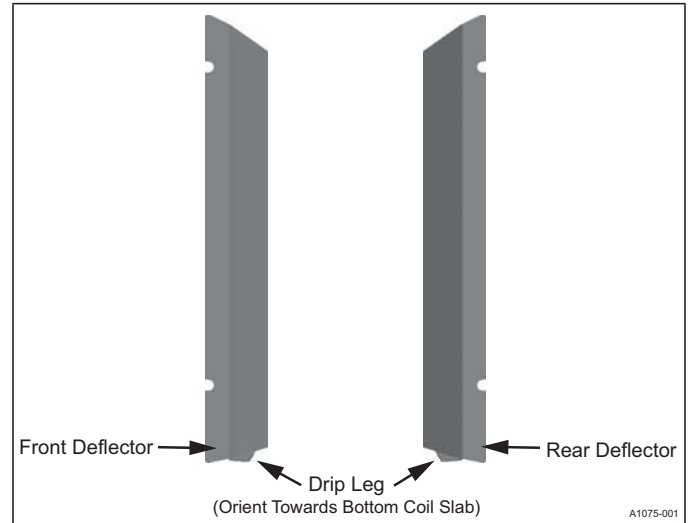


FIGURE 9: 60C Horizontal Right Condensate Deflectors

2. Insert the deflectors between the primary drain pan and the delta plates. Make sure that the slots in the deflectors nest firmly against the loosened screws between the primary drain pan and delta plates.
3. Tighten the screws that secure the delta plates to the primary drain pan. The interactive fit of the delta plate, primary drain pan, and screws will hold the shields firmly in place during operation. Figure 10 shows the final assembly.

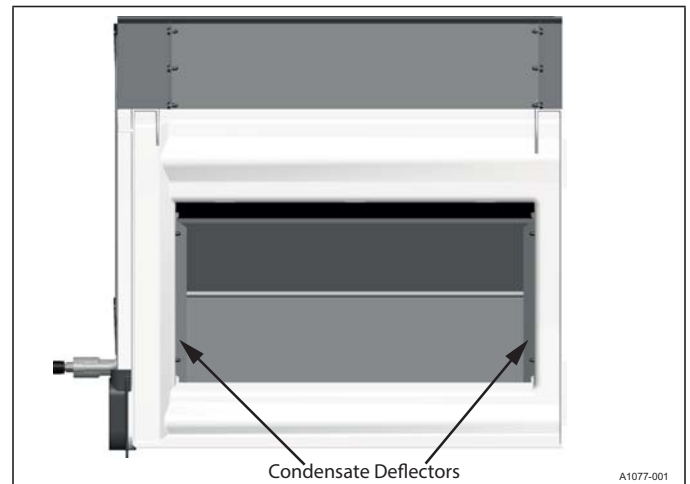


FIGURE 10: 60C Horizontal Right Coil Condensate Final Assembly

Upflow or Downflow Applications (All Models)

NOTICE

For maximum performance, if an air handling unit is being installed in Upflow or Downflow orientation, it is recommended that the horizontal drain be removed from the assembly. This can be achieved by removing the horizontal drain pan support straps, cutting the foam gasket that seals the attachment point of the horizontal drain pan and primary drain pan, and removing the entire horizontal drain pan assembly.

AVC60C Downflow Conversion

1. Rotate equipment cabinet so that the bottom of the primary (plastic) drain pan can be accessed.
2. Locate the downflow condensate shield (as shown in Figure 11) and foam gasket strip shipped in the loose parts kit included with the coil.

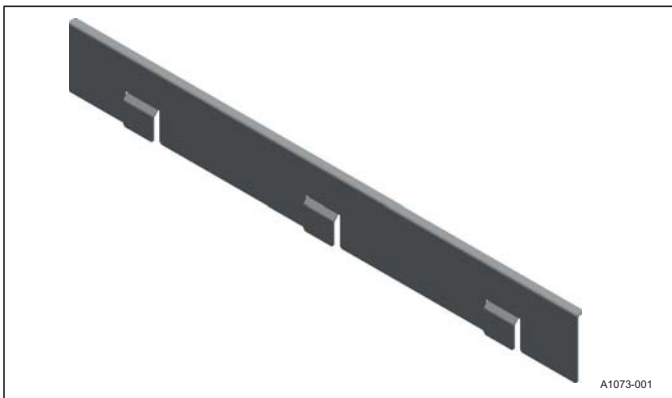


FIGURE 11: Condensate Shield

3. Install the condensate shield to the primary drain pan (as shown in Figure 8). There should be an identical condensate shield that was factory installed on the opposite side of the primary drain pan.
4. Apply the foam gasket strip to the condensate shield evenly so that it covers the condensate shield and primary drain pan.

Horizontal Left Applications (All Models)

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 FRONT and REAR straps since, in some cases, these settings are not the same.

Air handling units are supplied ready to be installed in a horizontal left position. A horizontal drain pan is factory installed. If horizontal right application, refer to the horizontal right conversion before proceeding.

See sections on "Refrigerant Line Connections" and "Condensate Drain Connections" for further installation instruction.

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.

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. Duct systems should be designed in accordance with the Air Conditioning Contractors of America (ACCA) – Manual D.

⚠ CAUTION

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

Equipment should never be operated without filters.

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 12, 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.

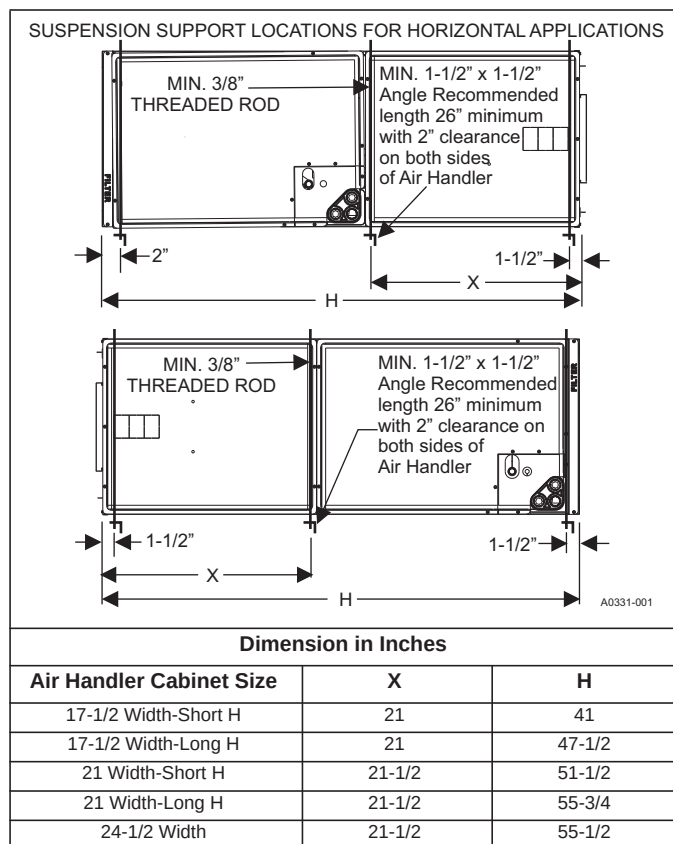


FIGURE 12: Horizontal Suspension

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 13. If the flanges are not used, they may be discarded.

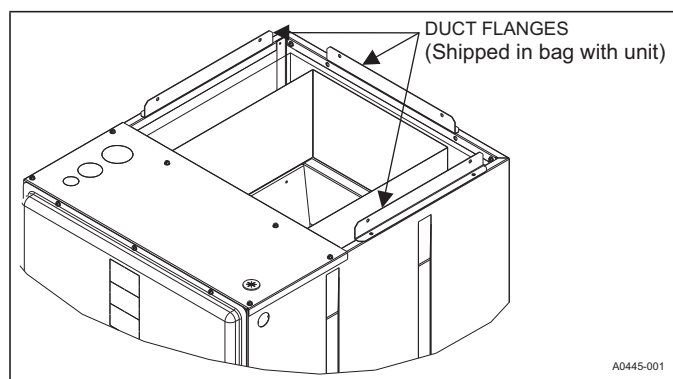


FIGURE 13: Duct Attachment

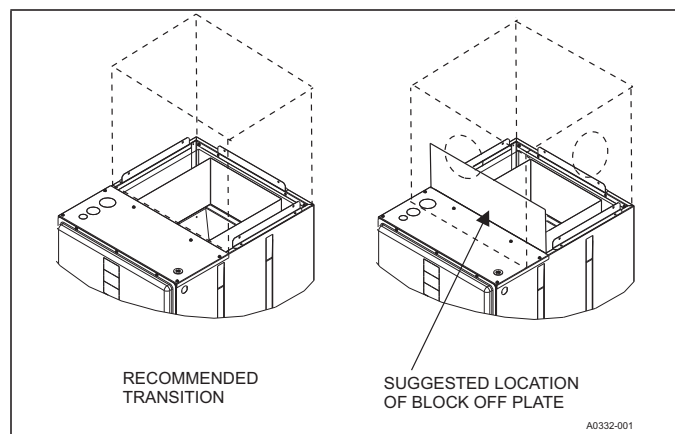


FIGURE 14: Duct Work Transition

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 14 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 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 7 for filter size.

CAUTION

Equipment should never be operated without filters.

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.

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 15. 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 16.
7. Verify that the Teflon washer is still in place in the distributor opening. See Figure 16.

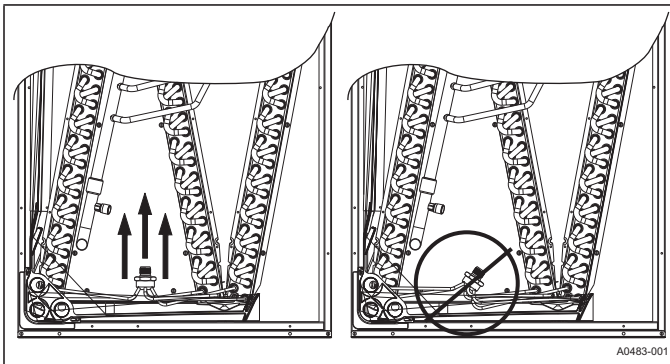


FIGURE 15: Recommended Distributor Adjustment

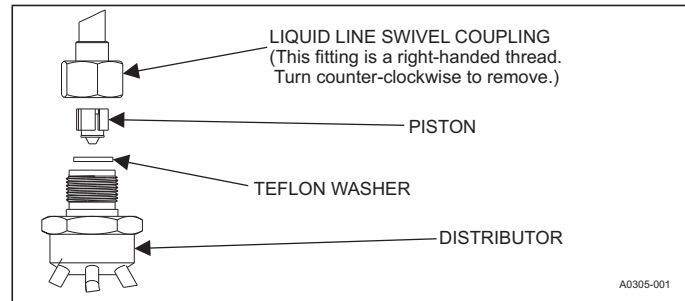


FIGURE 16: Piston Installation

⚠ CAUTION

Do not overtorque. 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 17.

⚠ 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 18. Hand tighten the liquid line, and apply an additional 1/4 turn to seal.

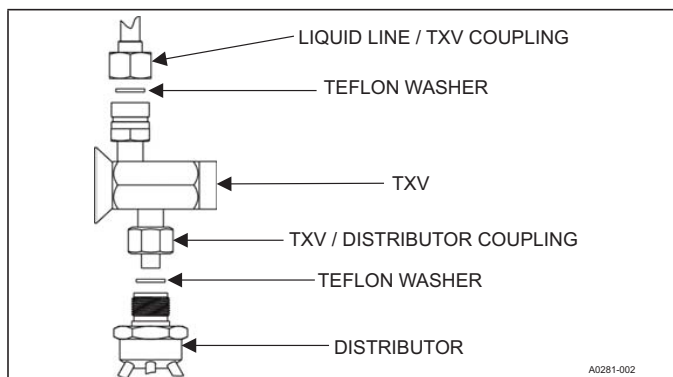


FIGURE 17: TXV Installation

⚠ 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 18.

⚠ 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 18 & 19, and accomplish the following:
 - a. 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.
 - b. 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 20.
 - c. Insulate the bulb using thermal insulation provided to protect it from the effect of the surrounding ambient temperature. Cover completely to insulate.

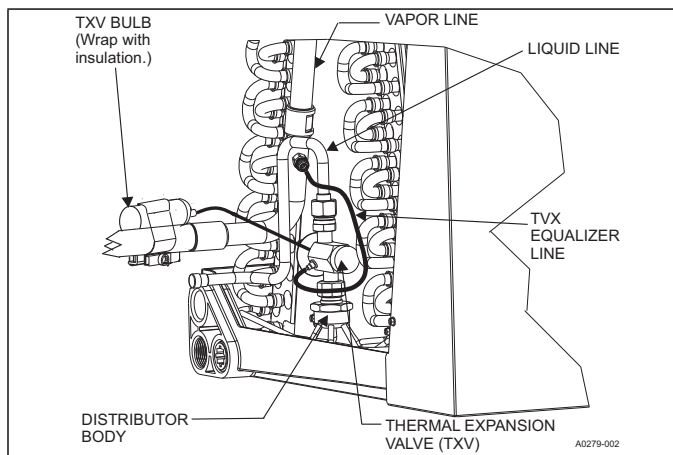


FIGURE 18: TXV Bulb and Equalizer line Installations

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

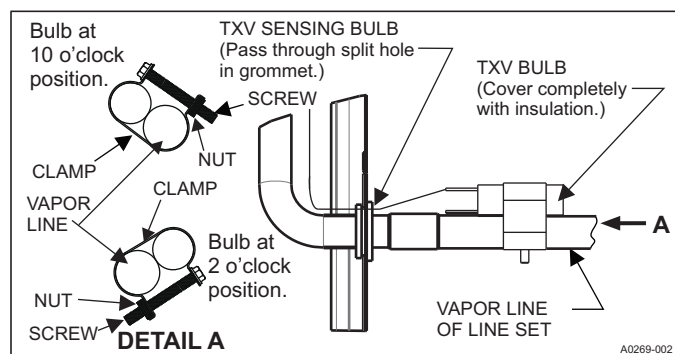


FIGURE 19: Proper Bulb Location

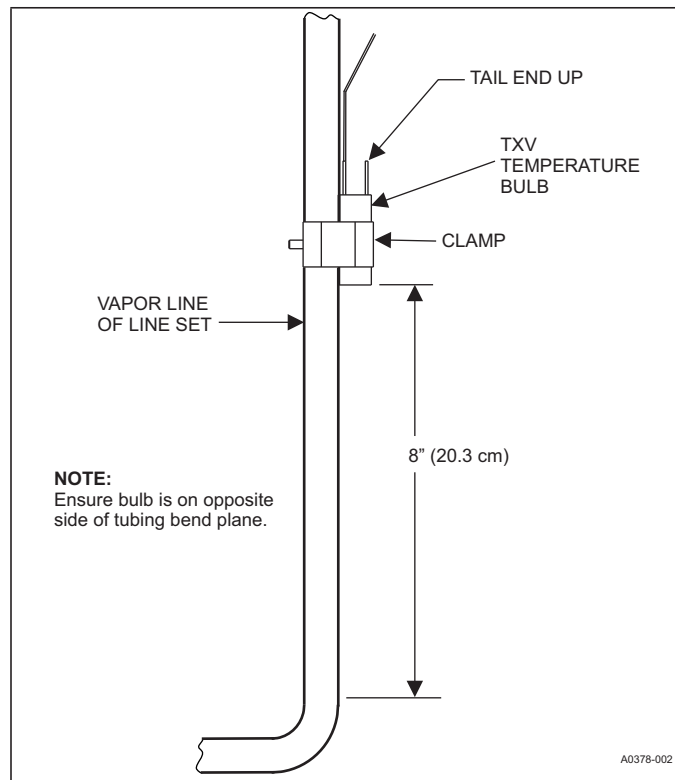


FIGURE 20: Vertical Temperature Bulb Orientation

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.

1. 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.
2. 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 21.
3. 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).
4. 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.
5. 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:
 - a. Screw a sheet metal screw into the center of the cap.
 - b. Apply a small amount of heat to the cap while pulling on the screw using slip joint pliers.
6. Insert liquid and suction lines into the coil connections at the coil cabinet tubing panel.
7. Wrap a water soaked rag around the coil connection tubes inside the cabinet to avoid transferring excess heat to the coil or TXV.
8. 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.

9. Braze the suction and liquid lines, and allow the joints to cool.
10. Route the TXV sensing bulb through suction line opening.
11. Secure sensing bulb and equalizer line capillary tubes with nylon cable ties to prevent leaks from tubes rubbing.
12. If piston is used, install Schrader core into suction header, and reinstall cap.
13. 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 21.
14. Attach the coil access panel to the cabinet.
15. Refer to Outdoor unit Installation Manual, and accomplish evacuation, leak check and charging instructions. Check all field brazed joints and metering device connections.
16. Ensure lines are sound isolated by using appropriate hangers or strapping.

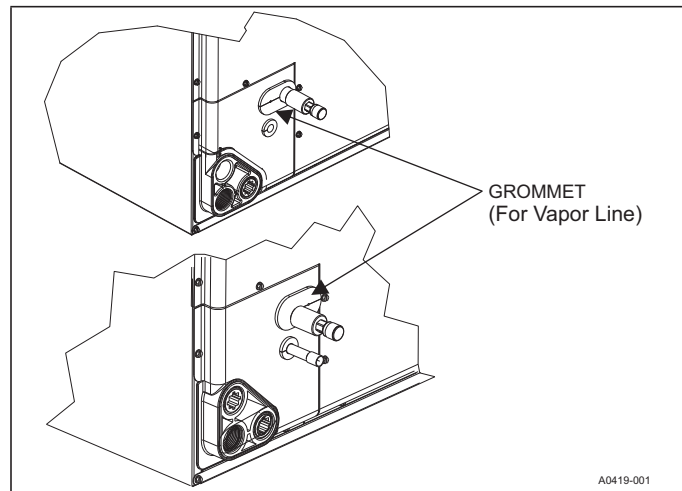


FIGURE 21: Vapor Line Grommet

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 29 & 30 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 indoor 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 29 & 30.

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 9 & 16 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 - 10 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.

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 (service disconnect 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.

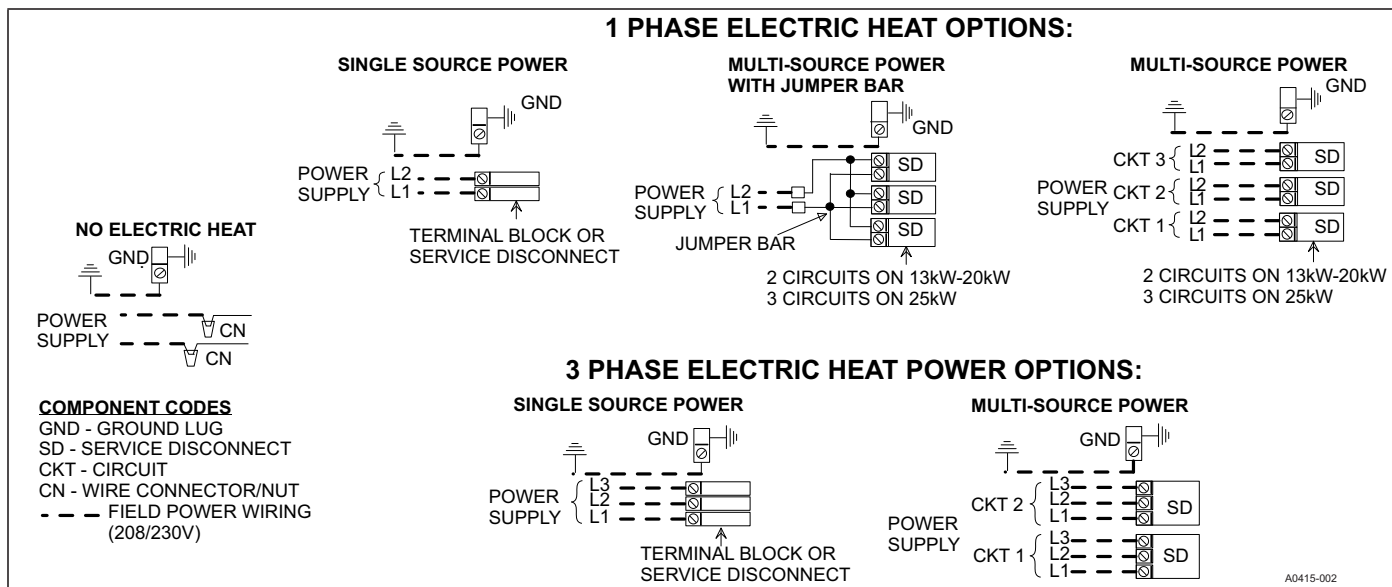


FIGURE 22: Line Power Connections

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. 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 connectors to the wires provided. Refer to Figures 24 & 25.

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.

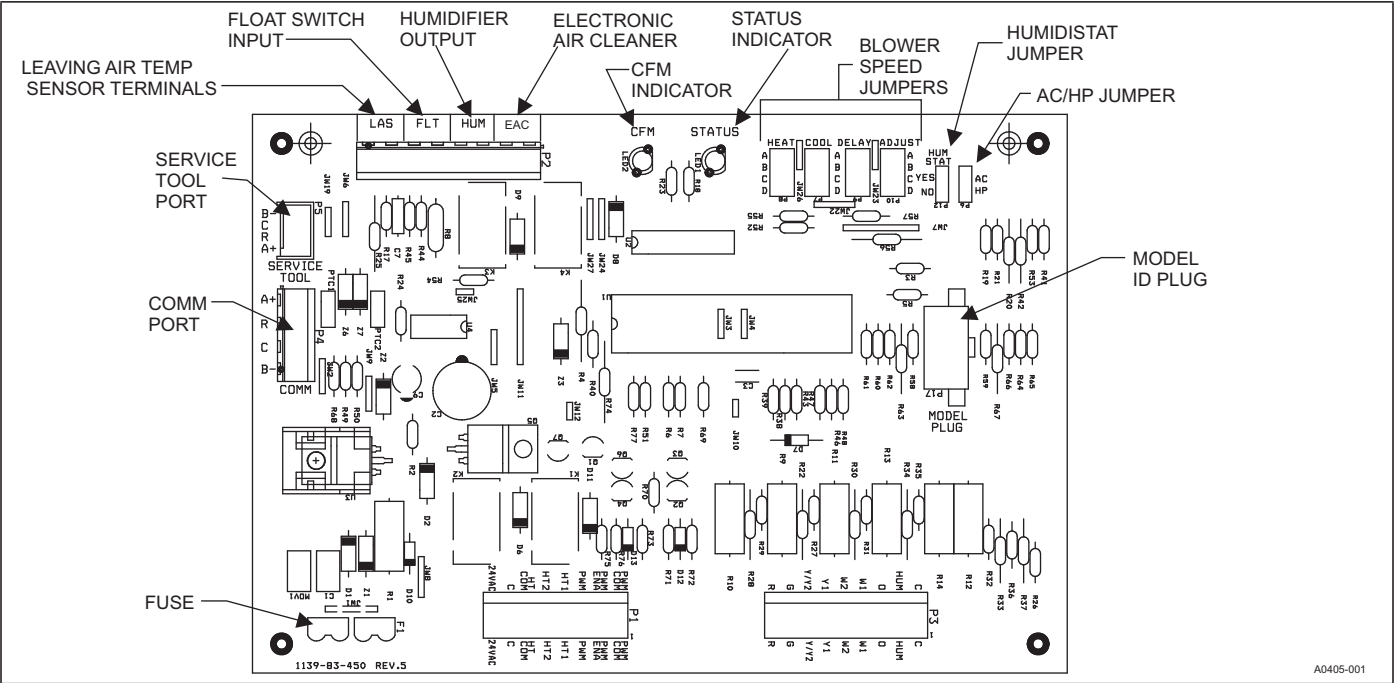


FIGURE 23: Control Board

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 de-humidification operation of the control during cooling operation. The humidity switch should be connected to HUM wire of the control. See Figures 23 & 24.

NOTICE

All wiring must comply with local and national electrical code requirements. Read and heed all unit caution labels. 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 Heat Output and Limit Connections and Table 5 for additional information on heat during defrost cycle.

TABLE 3: Low Voltage Connections

Wire	Colors	Signals	Comment
R	Red	24 VAC power (fused)	
G	Green	Continuous Fan operation	Fan Speed, 63% of high cool speed.
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	
EAC	Field Supplied Wiring	Electric Air Cleaner	Located on P2 connector. There is 24VAC output during indoor blower operation to energize a pilot duty relay for an electronic air cleaner.
X/L	Field Supplied Wiring	Connection point for heat pump fault indicator	This terminal is a connection point only and does not affect air handler control operation.
HUM	Purple	Humidity switch input	
C (COM)	Blue	24 VAC common	

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

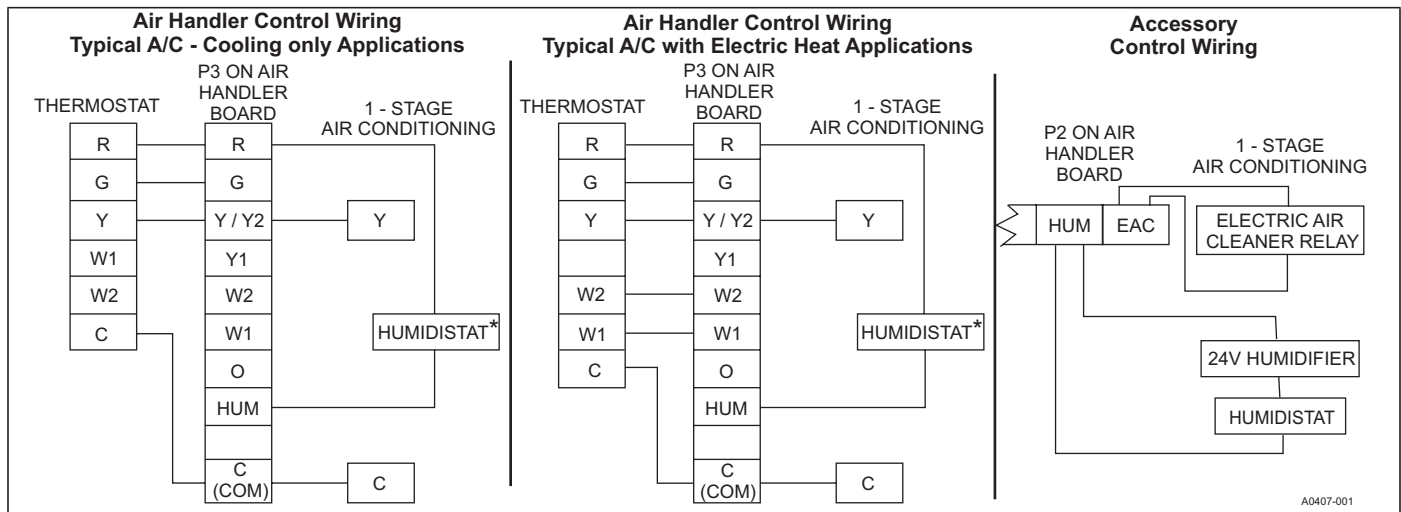


FIGURE 24: Cooling Models with and without Electric Heat Wiring

* 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. Move HUM STAT jumper on air handler control board to YES position if humidistat is used.
3. For heat pump applications - set AC/HP jumper on air handler control board to the HP position.

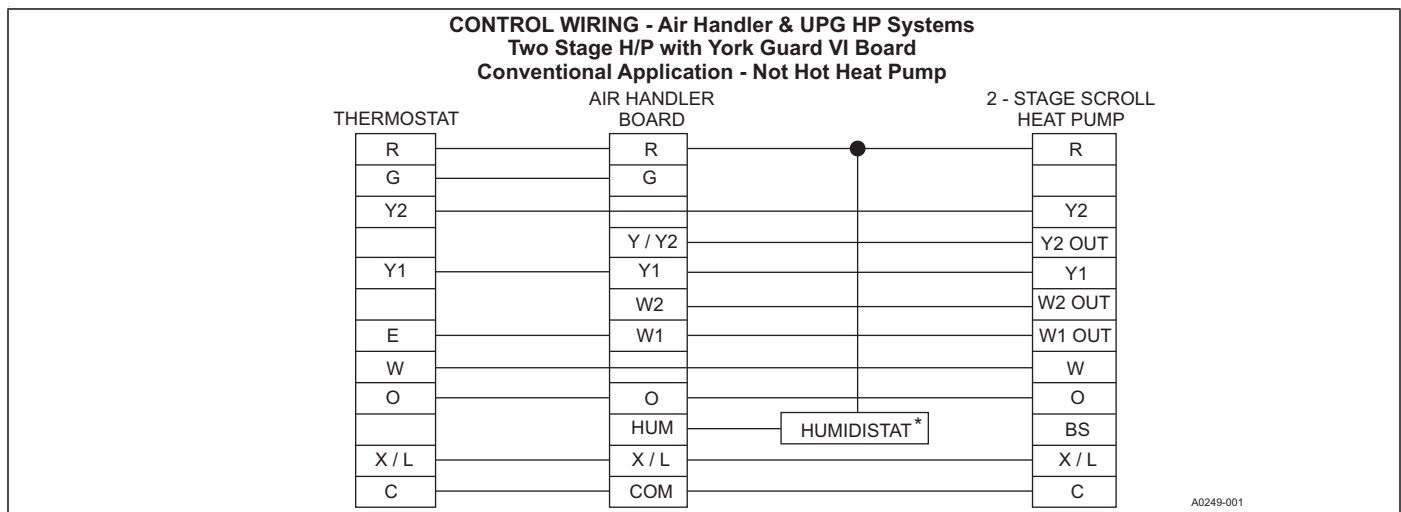


FIGURE 25: Two-Stage Heat Pump Wiring

* 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 26. 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 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 26 & 27. 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.

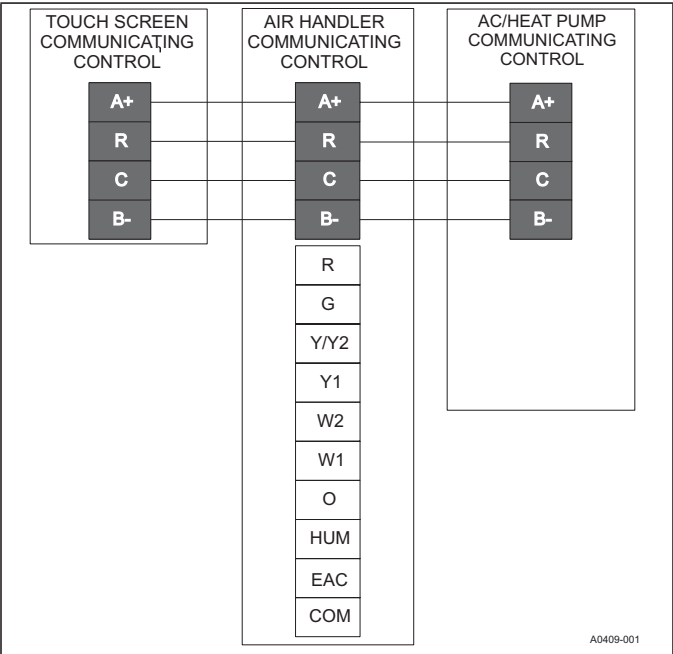


FIGURE 26: Air Handler with Communicating AC or HP

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 27.

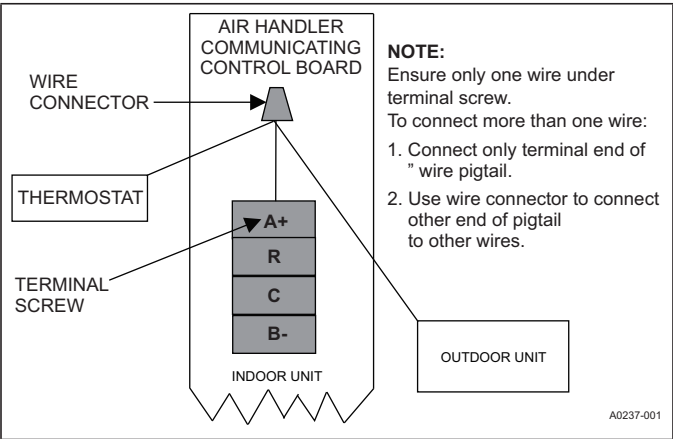


FIGURE 27: Multi-wire Terminal Connection

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 XI: 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 using a communicating control and 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 blower speed for de-humidification during cooling operation.

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. This allows the control to recognize whether in the heating or cooling mode and energizes the 24 VAC HUM output when blower is on and a first stage heating call is present.

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 4. The control will display the fault codes until power is removed from the control or the fault condition is no longer present.

TABLE 4: Fault Codes

Fault or Status Condition	LED1 (RED) Flash Code
Status	
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 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 are 24 VAC.

The control energizes the heat relays as shown in Table 5.

TABLE 5: 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 XII: 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 16 & Figure 18.

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 and motor damage.

To Set Cooling Airflow:

Refer to the outdoor unit technical guide for the recommended airflow with the matching indoor coil. Refer to Table 16 for the possible high speed cooling and heat pump airflow selections.

Find the recommended system airflow in Table 16 for the installed air handler model and outdoor unit.

Select the COOL airflow needed from Table 15. Set the COOL and ADJUST Jumpers on the control as indicated in Table 16.

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 23).

To Set Electric W1 Heat Airflow:

The blower speed required for 1st stage electric heat is different than cooling. Refer to Table 16 for the possible CFM selections. Refer to Table 8 for the minimum required airflow for the electric heater installed. Find the desired airflow in Table 16 for low heat. Set the HEAT jumper on the control as indicated in Table 16.

To Set W2 Electric Heat Airflow:

Airflow for any W2 input, which is for second stage of electric heat, is the indicated CFM for high heat tap selection on Table 16.

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 resistance heating can take up to 15 seconds.

COMFORT SETTINGS

TABLE 6: 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 XIII: UNIT DATA

TABLE 7: Physical and Electrical Data - Cooling Only

Models		18B	24B	30B	36B	36C	42C
Blower - Diameter x Width		10 x 8	10 x 8	10 x 8	10 x 8	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
	Nominal RPM	1050	1050	1050	1050	1050	1050
Voltage		208/230	208/230	208/230	208/230	208/230	208/230
Full Load Amps @230V		2.9	2.9	2.9	4.5	4.5	4.5
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
	Permanent Type Kit	1PF0601	1PF0601	1PF0601	1PF0601	1PF0602	1PF0602
Shipping Operating Weight (lbs.)		91/85	93/87	119/113	119/113	120/114	144/136

Models		48C	48D	49C	60C	60D	
Blower - Diameter x Width		11 x 10	11 x 10	11x10	11 x 10	11 x 10	
Motor	HP	3/4 HP	3/4 HP	3/4 HP	3/4 HP	3/4 HP	
	Nominal RPM	1050	1050	1050	1050	1050	
Voltage		208/230	208/230	208/230	208/230	208/230	
Full Load Amps @230V		7.0	7.0	7.0	7.0	7.0	
Filter ¹	Type	DISPOSABLE OR PERMANENT					
	Size	20 x 20 x 1	22 x 20 x 1	20x20 x1	20 x 20 x 1	22 x 20 x 1	
	Permanent Type Kit	1PF0602	1PF0603	1PF0602	1PF0602	1PF0603	
Shipping Operating Weight (lbs.)		158/150	163/153	158/150	156/146	180/170	

1. Field supplied.

TABLE 8: Electrical Data - Cooling Only

Models	Motor FLA ¹		Minimum Circuit Ampacity		MOP ²
	208V	230V	208V	230V	
18B/24B/30B	3.0	2.9	3.8	3.6	15
36B/36C/42C	5.0	4.5	6.3	5.6	15
48C/48D/49C/60C/60D	7.3	7.0	9.1	8.8	15

1. FLA = Full Load Amps

2. 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 Heat: Minimum Fan Speed

Heater Kit Models ^{1,2,3}	Nom. kW @240V	Air Handler Models										
		18B	24B	30B	36B	36C	42C	48C	48D	49C	60C	60D
6HK(0,1)6500206	2.4kW	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)
6HK(0,1)6500506	4.8kW	Med Lo (D)	Med (C)	Med (C)	Med Lo (D)	Med (C)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)
6HK(0,1)6500806	7.7kW	Med (C)	Med Hi (B)	Med Hi (B)	Med Lo (D)	Med Hi (B)	Med (C)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)
6HK(0,1)6501006 6HK36501025	9.6kW	Med (C)	Med Hi (B)	Med Hi (B)	Med Lo (D)	Med Hi (B)	Med (C)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)
6HK(1,2)6501306	12.5kW	—	Med Hi (B)	Med Hi (B)	Med (C)	Med Hi (B)	Med (C)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)	Med Lo (D)
6HK(1,2)6501506 6HK36501525	14.4kW	—	—	Med Hi (B)	Med Hi (B)	Med Hi (B)	Hi (A)	Med (C)	Med (C)	Med (C)	Med Lo (D)	Med Lo (D)
6HK(1,2)6501806 6HK36501825	17.3kW	—	—	—	Med Hi (B)	Med Hi (B)	Hi (A)	Med (C)	Med Hi (B)	Med (C)	Med (C)	Med (C)
6HK(1,2)6502006 6HK46502025	19.2kW	—	—	—	Med Hi (B)	Hi (A)	Hi (A)	Med Hi (B)	Hi (A)	Med Hi (B)	Med Hi (B)	Med Hi (B)
6HK(1,2)6502506 6HK46502525	24kW	—	—	—	—	—	—	—	Hi (A)	—	—	Med Hi (B)

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. 6HK3 = 3-Phase with terminal block connectors only, 6HK4 = 3-Phase with service disconnect.

TABLE 10: 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 11: 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

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. 6HK3 = 3-Phase with terminal block connectors only, 6HK4 = 3-Phase with service disconnect.

4. For different power distributions, see conversion table above.

TABLE 12: 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	14.6	15.6	15	20
	6HK(0,1)6500506	20	25.4	27.5	30	30
	6HK(0,1)6500806	32	38.6	42.2	40	45
	6HK(0,1)6501006	40	47.0	51.5	50	60
24B	6HK(0,1)6500206	10	14.6	15.6	15	20
	6HK(0,1)6500506	20	25.4	27.5	30	30
	6HK(0,1)6500806	32	38.6	42.2	40	45
	6HK(0,1)6501006	40	47.0	51.5	50	60
	6HK(1,2)6501306	52	60.2	66.1	70	70
30B	6HK(0,1)6500206	10	14.6	15.6	15	20
	6HK(0,1)6500506	20	25.4	27.5	30	30
	6HK(0,1)6500806	32	38.6	42.2	40	45
	6HK(0,1)6501006	40	47.0	51.5	50	60
	6HK(1,2)6501306	52	60.2	66.1	70	70
	6HK(1,2)6501506	60	68.7	75.4	70	80
36B	6HK(0,1)6500206	10	17.1	17.6	20	20
	6HK(0,1)6500506	20	27.9	29.5	30	30
	6HK(0,1)6500806	32	41.1	44.2	45	45
	6HK(0,1)6501006	40	49.5	53.5	50	60
	6HK(1,2)6501306	52	62.7	68.1	70	70
	6HK(1,2)6501506	60	71.2	77.4	80	80
	6HK(1,2)6501806	72	84.4	92.0	90	100
	6HK(1,2)6502006	80	92.8	101.3	100	110
36C	6HK(0,1)6500206	10	17.1	17.6	20	20
	6HK(0,1)6500506	20	27.9	29.5	30	30
	6HK(0,1)6500806	32	41.1	44.2	45	45
	6HK(0,1)6501006	40	49.5	53.5	50	60
	6HK(1,2)6501306	52	62.7	68.1	70	70
	6HK(1,2)6501506	60	71.2	77.4	80	80
	6HK(1,2)6501806	72	84.4	92.0	90	100
	6HK(1,2)6502006	80	92.8	101.3	100	110
42C	6HK(0,1)6500206	10	17.1	17.6	20	20
	6HK(0,1)6500506	20	27.9	29.5	30	30
	6HK(0,1)6500806	32	41.1	44.2	45	45
	6HK(0,1)6501006	40	49.5	53.5	50	60
	6HK(1,2)6501306	52	62.7	68.1	70	70
	6HK(1,2)6501506	60	71.2	77.4	80	80
	6HK(1,2)6501806	72	84.4	92.0	90	100
	6HK(1,2)6502006	80	92.8	101.3	100	110
48C	6HK(0,1)6500206	10	19.9	20.7	25	25
	6HK(0,1)6500506	20	30.8	32.7	35	35
	6HK(0,1)6500806	32	44.0	47.3	45	50
	6HK(0,1)6501006	40	52.4	56.6	60	60
	6HK(1,2)6501306	52	65.6	71.3	70	80
	6HK(1,2)6501506	60	74.0	80.5	80	90
	6HK(1,2)6501806	72	87.3	95.2	90	100
	6HK(1,2)6502006	80	95.7	104.4	100	110

TABLE 12: 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	19.9	20.7	25	25
	6HK(0,1)6500506	20	30.8	32.7	35	35
	6HK(0,1)6500806	32	44.0	47.3	45	50
	6HK(0,1)6501006	40	52.4	56.6	60	60
	6HK(1,2)6501306	52	65.6	71.3	70	80
	6HK(1,2)6501506	60	74.0	80.5	80	90
	6HK(1,2)6501806	72	87.3	95.2	90	100
	6HK(1,2)6502006	80	95.7	104.4	100	110
49C	6HK(1,2)6502506	100	117.3	128.3	125	150
	6HK(0,1)6500206	10	19.9	20.7	25	25
	6HK(0,1)6500506	20	30.8	32.7	35	35
	6HK(0,1)6500806	32	44.0	47.3	45	50
	6HK(0,1)6501006	40	52.4	56.6	60	60
	6HK(1,2)6501306	52	65.6	71.3	70	80
	6HK(1,2)6501506	60	74.0	80.5	80	90
	6HK(1,2)6501806	72	87.3	95.2	90	100
60C	6HK(1,2)6502006	80	95.7	104.4	100	110
	6HK(0,1)6500206	10	19.9	20.7	25	25
	6HK(0,1)6500506	20	30.8	32.7	35	35
	6HK(0,1)6500806	32	44.0	47.3	45	50
	6HK(0,1)6501006	40	52.4	56.6	60	60
	6HK(1,2)6501306	52	65.6	71.3	70	80
	6HK(1,2)6501506	60	74.0	80.5	80	90
	6HK(1,2)6501806	72	87.3	95.2	90	100
60D	6HK(1,2)6502006	80	95.7	104.4	100	110
	6HK(0,1)6500206	10	19.9	20.7	25	25
	6HK(0,1)6500506	20	30.8	32.7	35	35
	6HK(0,1)6500806	32	44.0	47.3	45	50
	6HK(0,1)6501006	40	52.4	56.6	60	60
	6HK(1,2)6501306	52	65.6	71.3	70	80
	6HK(1,2)6501506	60	74.0	80.5	80	90
	6HK(1,2)6501806	72	87.3	95.2	90	100
60D	6HK(1,2)6502006	80	95.7	104.4	100	110
	6HK(1,2)6502506	100	117.3	128.3	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 13: 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	22.5	37.6	—	24.4	41.5	—	25	40	—	25	45	—
30B	6HK16501306	52	22.5	37.6	—	24.4	41.5	—	25	40	—	25	45	—
	6HK16501506	60	25.4	43.3	—	27.6	47.9	—	30	45	—	30	50	—
36B	6HK16501306	52	25.0	37.6	—	26.4	41.5	—	25	40	—	30	45	—
	6HK16501506	60	27.9	43.3	—	29.6	47.9	—	30	45	—	30	50	—
	6HK16501806	72	45.3	39.0	—	48.8	43.1	—	50	40	—	50	45	—
	6HK16502006	80	49.6	43.3	—	53.5	47.9	—	50	45	—	60	50	—
36C	6HK16501306	52	25.0	37.6	—	26.4	41.5	—	25	40	—	30	45	—
	6HK16501506	60	27.9	43.3	—	29.6	47.9	—	30	45	—	30	50	—
	6HK16501806	72	45.3	39.0	—	48.8	43.1	—	50	40	—	50	45	—
	6HK16502006	80	49.6	43.3	—	53.5	47.9	—	50	45	—	60	50	—
42C	6HK16501306	52	25.0	37.6	—	26.4	41.5	—	25	40	—	30	45	—
	6HK16501506	60	27.9	43.3	—	29.6	47.9	—	30	45	—	30	50	—
	6HK16501806	72	45.3	39.0	—	48.8	43.1	—	50	40	—	50	45	—
	6HK16502006	80	49.6	43.3	—	53.5	47.9	—	50	45	—	60	50	—
48C	6HK16501306	52	27.9	37.6	—	29.5	41.5	—	30	40	—	30	45	—
	6HK16501506	60	30.8	43.3	—	32.7	47.9	—	35	45	—	35	50	—
	6HK16501806	72	48.1	39.0	—	51.9	43.1	—	50	40	—	60	45	—
	6HK16502006	80	52.5	43.3	—	56.7	47.9	—	60	45	—	60	50	—
48D	6HK16501306	52	27.9	37.6	—	29.5	41.5	—	30	40	—	30	45	—
	6HK16501506	60	30.8	43.3	—	32.7	47.9	—	35	45	—	35	50	—
	6HK16501806	72	48.1	39.0	—	51.9	43.1	—	50	40	—	60	45	—
	6HK16502006	80	52.5	43.3	—	56.7	47.9	—	60	45	—	60	50	—
	6HK16502506	100	52.5	43.3	21.7	56.7	47.9	24.0	60	45	25	60	50	25
49C	6HK16501306	52	27.9	37.6	—	29.5	41.5	—	30	40	—	30	45	—
	6HK16501506	60	30.8	43.3	—	32.7	47.9	—	35	45	—	35	50	—
	6HK16501806	72	48.1	39.0	—	51.9	43.1	—	50	40	—	60	45	—
	6HK16502006	80	52.5	43.3	—	56.7	47.9	—	60	45	—	60	50	—
60C	6HK16501306	52	27.9	37.6	—	29.5	41.5	—	30	40	—	30	45	—
	6HK16501506	60	30.8	43.3	—	32.7	47.9	—	35	45	—	35	50	—
	6HK16501806	72	48.1	39.0	—	51.9	43.1	—	50	40	—	60	45	—
	6HK16502006	80	52.5	43.3	—	56.7	47.9	—	60	45	—	60	50	—
60D	6HK16501306	52	27.9	37.6	—	29.5	41.5	—	30	40	—	30	45	—
	6HK16501506	60	30.8	43.3	—	32.7	47.9	—	35	45	—	35	50	—
	6HK16501806	72	48.1	39.0	—	51.9	43.1	—	50	40	—	60	45	—
	6HK16502006	80	52.5	43.3	—	56.7	47.9	—	60	45	—	60	50	—
	6HK16502506	100	52.5	43.3	21.7	56.7	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 14: 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	28.8	31.3	30	35
24B	6HK36501025	23.1	28.8	31.3	30	35
30B	6HK36501025	23.1	28.8	31.3	30	35
	6HK36501525	34.6	41.2	45.1	45	50
36B	6HK36501025	23.1	31.3	33.3	35	35
	6HK36501525	34.6	43.7	47.1	45	50
	6HK36501825	41.6	51.3	55.5	50	60
	6HK46502025 ³	46.2	56.3	61.0	60	70
36C	6HK36501025	23.1	31.3	33.3	35	35
	6HK36501525	34.6	43.7	47.1	45	50
	6HK36501825	41.6	51.3	55.5	55	60
	6HK46502025 ³	46.2	56.3	61.0	60	70
42C	6HK36501025	23.1	31.3	33.3	35	35
	6HK36501525	34.6	43.7	47.1	45	50
	6HK36501825	41.6	51.3	55.5	55	60
	6HK46502025 ³	46.2	56.3	61.0	60	70
48C	6HK36501025	23.1	34.2	36.4	35	40
	6HK36501525	34.6	46.6	50.2	50	55
	6HK36501825	41.6	54.2	58.6	55	60
	6HK46502025 ³	46.2	59.2	64.1	60	70
48D	6HK36501025	23.1	34.2	36.4	35	40
	6HK36501525	34.6	46.6	50.2	50	55
	6HK36501825	41.6	54.2	58.6	55	60
	6HK46502025 ³	46.2	59.2	64.1	60	70
	6HK46502525 ³	57.7	71.6	77.9	80	80
49C	6HK36501025	23.1	34.2	36.4	35	40
	6HK36501525	34.6	46.6	50.2	50	55
	6HK36501825	41.6	54.2	58.6	55	60
	6HK46502025 ³	46.2	59.2	64.1	60	70
60C	6HK36501025	23.1	34.2	36.4	35	40
	6HK36501525	34.6	46.6	50.2	50	55
	6HK36501825	41.6	54.2	58.6	55	60
	6HK46502025 ³	46.2	59.2	64.1	60	70
60D	6HK36501025	23.1	34.2	36.4	35	40
	6HK36501525	34.6	46.6	50.2	50	55
	6HK36501825	41.6	54.2	58.6	55	60
	6HK46502025 ³	46.2	59.2	64.1	60	70
	6HK46502525 ³	57.7	71.6	77.9	80	80

1. 6HK3 = 3-Phase with terminal block connections only, 6HK4 = 3-Phase with service disconnect.

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.

3. The 20kW and 25kW heater models (6HK46502025 and 6HK46502525) 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 15: Electrical Data For Multi-source Power Supply: 208/230-3-60

Air Handlers Models	Heater Models ¹	Heater Amps @240V	Min. Circuit Ampacity				MOP ²			
			208V		230V		208V		230V	
			Circuit				Circuit			
			1st ²	2nd	1st ²	2nd	1st ²	2nd	1st ²	2nd
36B	6HK46502025	46.2	31.3	25.0	33.3	27.6	35	25	35	30
36C	6HK46502025	46.2	31.3	25.0	33.3	27.6	35	25	35	30
42C	6HK46502025	46.2	31.3	25.0	33.3	27.6	35	25	35	30
48C	6HK46502025	46.2	34.1	25.0	36.4	27.6	35	25	40	30
48D	6HK46502025	46.2	34.1	25.0	36.4	27.6	35	25	40	30
	6HK46502525	57.7	40.4	31.3	43.3	34.6	45	35	45	35
49C	6HK46502025	46.2	34.1	25.0	36.4	27.6	35	25	40	30
60C	6HK46502025	46.2	34.1	25.0	36.4	27.6	35	25	40	30
60D	6HK46502025	46.2	34.1	25.0	36.4	27.6	35	25	40	30
	6HK46502525	57.7	40.4	31.3	43.3	34.6	45	35	45	35

1. The 20kW and 25kW heater models (6HK46502025 and 6HK46502525) come with service disconnects standard.

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 16: Air Flow Data (CFM)¹

High/Low Speed Cooling and Heat Pump CFM													
Cool Tap	ADJ Tap ²	AVC18B		AVC24B		AVC30B		AVC36B		AVC36C		AVC42C	
		High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
A	B	810	527	1022	562	1060	731	1350	878	1350	878	1596	1037
B	B	675	439	795	437	1013	658	1238	804	1238	804	1400	910
A	A	720	468	900	495	1000	650	1200	780	1200	780	1425	926
B	A	600	390	700	385	900	585	1100	715	1100	715	1250	813
A	C	630	410	783	431	875	569	1050	683	1050	683	1268	824
C	B	534	347	766	421	844	548	1125	731	1125	731	1344	874
B	C	525	341	609	335	788	512	963	626	963	626	1113	723
D	B	450	293	568	312	703	457	900	585	900	585	1120	728
C	A	475	309	675	371	750	488	1000	650	1000	650	1200	780
D	A	400	260	500	275	625	406	800	520	800	520	1000	650
C	C	416	270	587	323	656	427	875	569	875	569	1068	694
D	C	350	228	435	239	547	355	700	455	700	455	890	579

Cool Tap	ADJ Tap ²	AVC48C		AVC48D		AVC49C		AVC60C		AVC60D			
		High	Low	High	Low	High	Low	High	Low	High	Low		
A	B	1760	1144	1760	1144	1773	1127	1860	1308	1935	1316		
B	B	1540	1001	1540	1001	1564	964	1840	1196	1772	1152		
A	A	1600	1040	1600	1040	1617	1004	1750	1138	1800	1170		
B	A	1400	910	1400	910	1412	866	1600	1040	1575	1024		
A	C	1424	926	1424	926	1432	885	1531	995	1665	1082		
C	B	1320	858	1320	858	1332	809	1581	1028	1491	969		
B	C	1246	810	1246	810	1250	755	1400	910	1457	947		
D	B	1100	715	1100	715	1085	654	1323	860	1350	878		
C	A	1200	780	1200	780	1189	720	1375	894	1325	861		
D	A	1000	650	1000	650	964	580	1150	748	1200	780		
C	C	1068	694	1068	694	1044	638	1203	782	1226	797		
D	C	890	579	890	579	847	516	1006	654	1110	722		

Continued on next page.

TABLE 16: Air Flow Data (CFM)¹

High/Low Speed Heat CFM												
Heat Tap	AVC18B		AVC24B		AVC30B		AVC36B		AVC36C		AVC42C	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
A	850	850	1025	980	1025	850	1225	1020	1425	1150	1430	1200
B	750	750	960	960	960	775	1150	950	1150	1000	1375	1150
C	675	675	725	725	750	750	950	750	925	925	1150	1050
D	425	425	580	580	580	580	725	725	675	675	900	900

Heat Tap	AVC48C		AVC48D		AVC49C		AVC60C		AVC60D			
	High	Low	High	Low	High	Low	High	Low	High	Low		
A	1650	1200	1650	1150	1668	964	1850	1250	1825	1150		
B	1550	1150	1600	1050	1564	791	1775	1200	1775	1050		
C	1375	1050	1325	1000	1392	703	1570	1150	1570	1000		
D	1150	1000	1125	780	1127	540	1370	1050	1375	950		

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. Above 0.5" CFM is reduced by 2% per 0.1" increase in static.

The ADJ tap does not affect the HEAT tap setting.

Low speed cooling used only with two stage outdoor units. Speed is preset to 65% of high speed.

Dehumidification speed is 85% of jumper selected COOL tap and ADJUST tap.

When operating in both heat pump and electric heat modes, the airflow (CFM) will be per HEAT tap CFM values only.

At some settings, LOW COOL and/or LOW HEAT 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.

Airflow (CFM) indicator light (LED2) flashes once for every 100 CFM (i.e.: 12 flashes is 1200 CFM) - blinks are approximate +/- 10% of actual CFM.

SECTION XIV: 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 XV: 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 drop measurements run the fan only to assure a dry coil.

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 read the pressure drop from the manometer.

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.

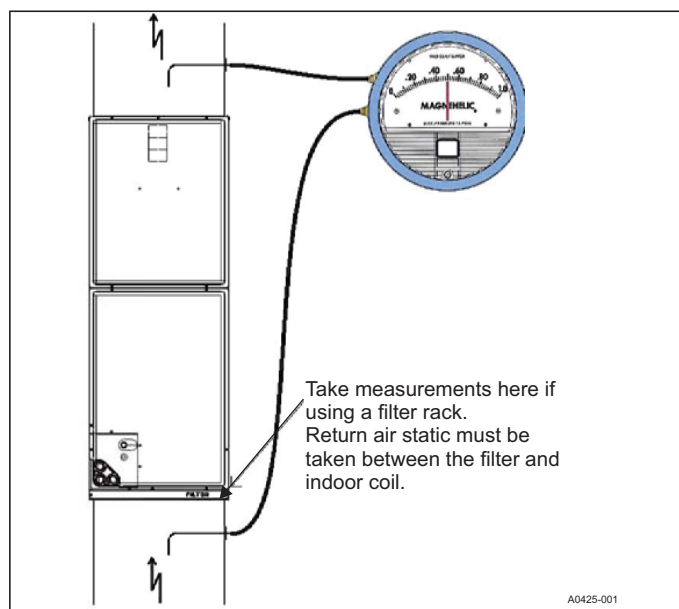


FIGURE 28: Duct Static Measurements

SECTION XVI: 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?

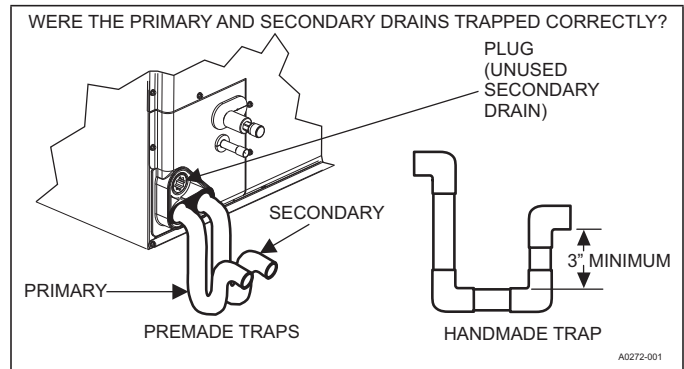


FIGURE 29: Drain Traps

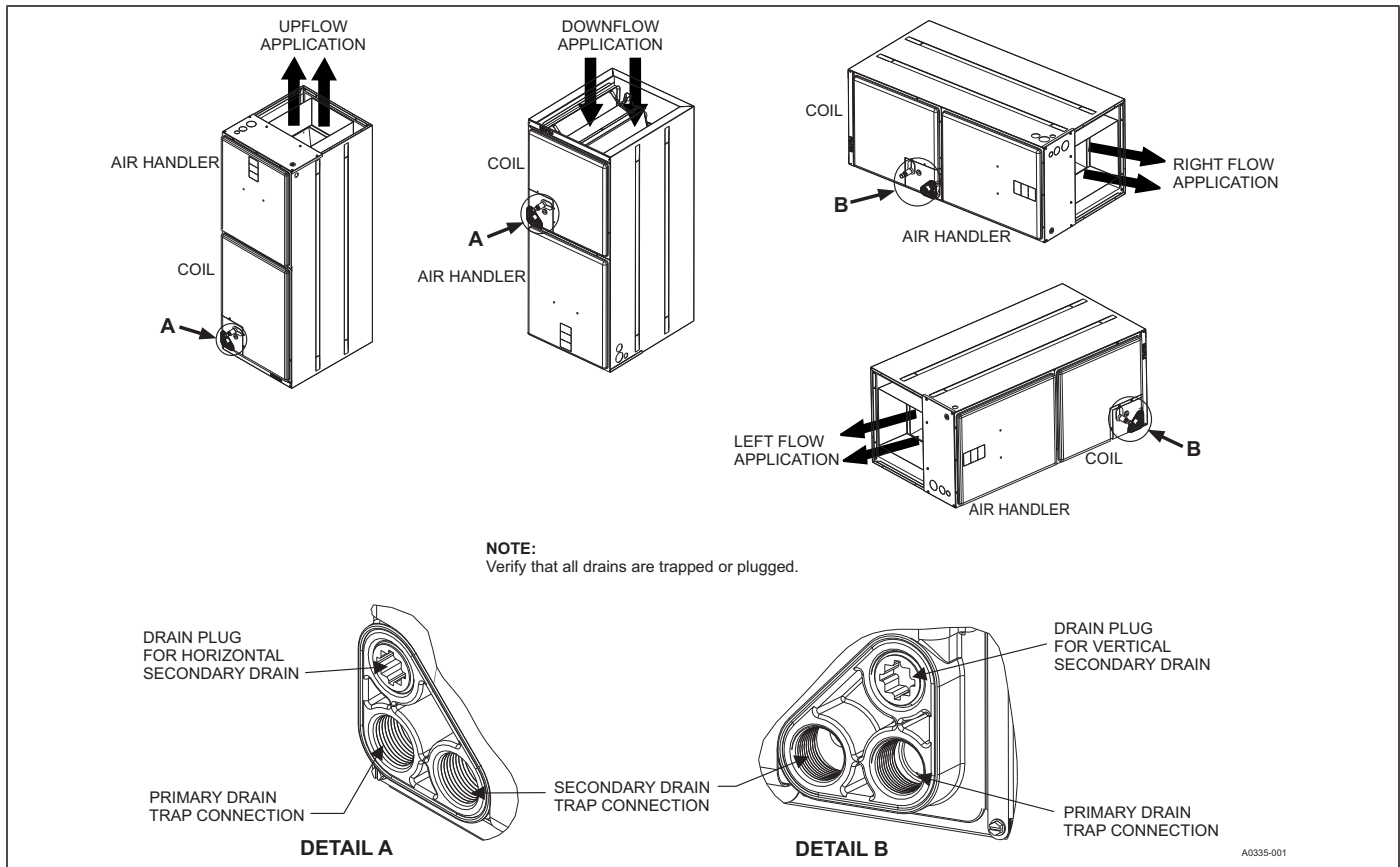


FIGURE 30: Location of Coil Trapped and Plugged Drain Connections



3 PHASE ELECTRIC HEAT KITS

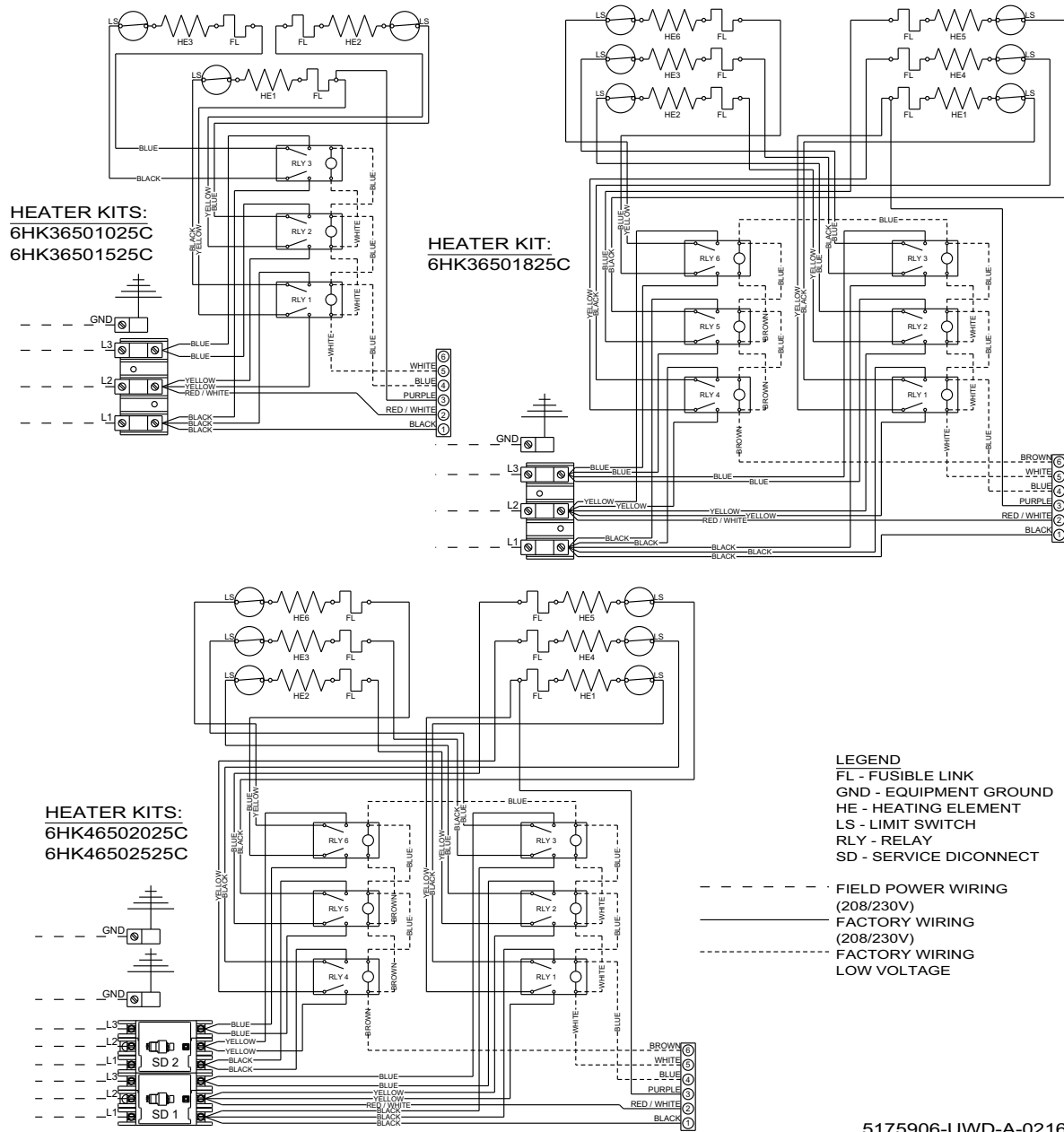


FIGURE 32: Wiring Diagram - Three Phase Heat Kits 208-230V

SECTION XVIII: START UP SHEET

Print Form

Residential Air Handler with Electric Heat Start-Up Sheet

Reset Form

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

Start-Up Date Company Name Start-Up Technician

Owner Information

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

Equipment Data

Unit Model # Unit Serial #

General Information (Check all that apply)

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

Unit Location and Connections (Check all that apply)

☐ Unit is level ☐ Duct connections are complete: ☐ Supply ☐ Return
☐ Condensate drain properly connected per the installation instructions ☐ Condensate trap has been primed with water

Filters

☐ Filters installed Number of filters Filter size

Electrical Connections & Inspection (Complete all that apply)

☐ 208 volts AC ☐ 230 volt AC
☐ Inspect wires and electrical connections ☐ Transformer wired properly for primary supply voltage ☐ Ground connected
 Line Voltage Measured (Volts AC) Low voltage value between "R" and "C" at control board (Volts AC)
☐ Thermostat wiring is complete ☐ Thermostat cycle rate or heat anticipator adjusted to Installation Manual specifications

Air Flow Setup

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

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

Other Jumpers (Check all that apply)

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

Continued on next Page

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

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

- ☐ 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

- ☐ 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

[illegible]