

Installation Manual: JSC Premium Variable Speed ECM Single Piece Upflow Air Handlers



**REFRIGERANT SAFETY
GROUP A2L**

 **CAUTION**

Risk of fire

This unit uses a mildly flammable (A2L) refrigerant. See [A2L refrigerant safety considerations](#) to ensure safe installation, operation, and servicing of this unit.

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About this unit

This single-piece air handler series is for upflow applications only.

The JSC unit can be used for upflow applications. The JSC unit is a shorter cabinet version of the JHC series air handlers.

These units can 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 kW to 25 kW and 208/230 V three-phase kits are available from 10 kW to 25 kW.

Certification



Assembled at a facility with
an ISO 9001:2015-certified
Quality Management
System

DS Solutions App

Johnson Controls believes in empowering our customers with unit-specific information at all times. Download the Ducted Systems Solutions Mobile App (DS Solutions App), which is available through the App Store for iOS and Google Play for Android. Users can use the DS Solutions App to scan the QR code located on the rating plate that is unique to each unit and provides information specific to the product. Take advantage of the features available for all units: Nomenclature, Literature (Technical Guide, Installation Manual and Wiring Diagrams), Parts list, Product Registration, Claims Tracking, and more.



iOS




Android

Safety

It is important to understand the safety symbols used in this manual. Read safety information carefully and follow all safety requirements to ensure correct installation.

Understanding safety symbols and instructions

 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**, as well as the **NOTICE**, **Important**, and **Note** alerts.

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.

NOTICE indicates information considered important, but not hazard-related, such as messages relating to property damage.

Important indicates information that is essential to complete a task or may result in damage to the device if not followed.

Note indicates something of special interest or importance. Notes can contain any type of information except safety information.

Safety requirements

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

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

⚠ 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.

NOTICE

To ensure a correct match for this indoor product, refer to the current *Tabular Data Sheet* for the outdoor equipment selected for the system application. If the indoor product model is not listed in the *Tabular Data Sheet* included with the outdoor unit, to access the current version of the *Tabular Data Sheet*, go to the *Residential Equipment & Supplies* section of the Offering Catalog at <http://www.simplygettingthejobdone.com> or scan the QR code provided on the outdoor unit nameplate.

- Only install this air handler in a location and position as specified in *Selecting a location for installation*.
- Do not use the air handler for temporary heating of buildings or structures under construction.
- Always install the air handler to operate within the air handler's intended maximum outlet air temperature.
- Clearance from combustible material is provided under *Selecting a location for installation*.

⚠ CAUTION

Do not lift the air handler by the cabinet braces. The cabinet braces could become disengaged from the cabinet causing the air handler to fall, potentially causing injury or damaging property. See *Becoming familiar with unit components* for the location of the cabinet braces. Lift the air handler by tightly gripping the casing.

- Verify the nameplate and power supply to ensure that the electrical characteristics match.
- When attaching ductwork with screws, carefully fasten the screws and keep them within 5/8 in. of the sides and back of the air handler.
- Install the air handler so the electrical components are protected from water.

- Installing and servicing heating and cooling equipment can be hazardous due to the electrical components. Only trained and licensed personnel must install, repair, or service heating and cooling equipment. Unlicensed service personnel can perform basic maintenance functions such as cleaning and replacing the air filters. When working on heating and cooling equipment, the safety requirements in the manuals and on the labels attached to each unit and other safety information must be observed as applicable.

 **CAUTION**

These air handlers must be transported and handled in an upright, upflow position. Failure to do so may result in unit damage and personal injury.

- 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 which 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.
- These models are not CSA listed or approved for installation into a HUD-approved modular home or a manufactured (mobile) home.

A2L refrigerant safety considerations



REFRIGERANT SAFETY GROUP A2L

CAUTION

For R454B applications, this unit uses a mildly flammable (A2L) refrigerant. You must read all of this section before installing this unit to ensure safe installation, operation, and servicing of this unit.

WARNING

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example, open flames, an operating gas appliance, or an operating electric heater.)

Do not pierce or burn

Be aware that refrigerants may not contain an odor.

WARNING

Any required ventilation openings must be kept clear of obstruction.

WARNING

Auxiliary devices which may be a potential ignition source shall not be installed in the duct work, unless they have been approved by the appliance manufacturer or are suitable for use with the refrigerant being used.

Examples of such potential ignition sources are hot surfaces with a temperature exceeding 700°C and electric switching devices.

WARNING

Any indoor field-made refrigerant joints shall be tightness tested with no leaks detected. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 25% of the maximum allowable pressure.

General

Table 1: Safety considerations

Item number	Safety consideration
1	Any room with an appliance containing more than 3.91 lb in a refrigerating circuit must be constructed such that any refrigerant leak cannot stagnate in a way that would create a fire or explosion hazard.
2	Before beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the refrigerating system, item 3 to item 7 below must be adhered to before conducting work on the system.
3	Work must be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
4	Instruct all maintenance staff and others working in the local area on the nature of work being carried out. Avoid work in confined spaces.
5	The area must be checked with an appropriate refrigerant detector before and during work to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants: non-sparking, adequately sealed, or intrinsically safe.
6	If conducting any hot work on the refrigerating equipment or any associated parts, you must have appropriate fire-extinguishing equipment on hand. Have a dry powder or CO ₂ fire extinguisher adjacent to the charging area.
7	If conducting work in relation to the refrigerating system that involves exposing any pipework, do not use any sources of ignition in such a manner that may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, must be kept sufficiently far away from the site of installation, repair, removal, and disposal, during which refrigerant might possibly be released to the surrounding space. Before conducting any work, survey the area around the equipment to ensure that there are no flammable hazards or ignition risks. Display “No Smoking” signs.
8	Ensure the area is in the open or that it is adequately ventilated before opening the system or while conducting any hot work. The ventilation must safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
9	Ensure that the sensor is not obstructed in any way.

Room size requirements

WARNING

If the unit must be installed in a residence with a minimum room area less than what is determined to be the minimum from [Table 2](#), then that room must also not have any continuously operating open flames or other potential ignition sources. A device with a continuous pilot light may be present if that device is provided with an effective flame arrest.

Note: Minimum installation height (X and W) is not applicable to this model series.

Table 2: Minimum room area

System charge (lb -oz)	Minimum total conditioned room area (ft ²) (Z)	Minimum total conditioned room area (m ²) (Y)	Minimum airflow (CFM)
4-0	120	11.14	216
4-4	127	11.84	230
4-8	135	12.54	244
4-12	142	13.23	257
5-0	150	13.93	271
5-4	157	14.63	284
5-8	165	15.32	298
5-12	172	16.02	311
6-0	180	16.72	325
6-4	187	17.41	338
6-8	195	18.11	352
6-12	202	18.81	365
7-0	210	19.50	379
7-4	217	20.20	392
7-8	225	20.90	406
7-12	232	21.59	419
8-0	240	22.29	433
8-4	247	22.99	446
8-8	255	23.68	460
8-12	262	24.38	474
9-0	270	25.08	487
9-4	277	25.77	501
9-8	285	26.47	514
9-12	292	27.17	528
10-0	300	27.86	541
10-4	307	28.56	555
10-8	315	29.25	568
10-12	322	29.95	582
11-0	330	30.65	595
11-4	337	31.34	609
11-8	345	32.04	622
11-12	352	32.74	636
12-0	360	33.43	649
12-4	367	34.13	663
12-8	375	34.83	676
12-12	382	35.52	690
13-0	390	36.22	704
13-4	397	36.92	717
13-8	405	37.61	731

Table 2: Minimum room area

System charge (lb -oz)	Minimum total conditioned room area (ft ²) (Z)	Minimum total conditioned room area (m ²) (Y)	Minimum airflow (CFM)
13-12	412	38.31	744
14-0	420	39.01	758
14-4	427	39.70	771
14-8	435	40.40	785
14-12	442	41.10	798
15-0	450	41.79	812
15-4	457	42.49	825
15-8	465	43.19	839
15-12	472	43.88	852
16-0	480	44.58	866
16-4	487	45.28	879
16-8	495	45.97	893
16-12	502	46.67	906
17-0	510	47.37	920
17-4	517	48.06	934
17-8	525	48.76	947
17-12	532	49.45	961
18-0	540	50.15	974
18-4	547	50.85	988
18-8	555	51.54	1001
18-12	562	52.24	1015
19-0	570	52.94	1028
19-4	577	53.63	1042
19-8	585	54.33	1055
19-12	592	55.03	1069
20-0	600	55.72	1082
20-4	607	56.42	1096
20-8	615	57.12	1109
20-12	622	57.81	1123
21-0	630	58.51	1136

Note:

- Minimum total conditioned room area refers to the combined area of all air conditioned rooms in the residence.

If the system charge is not listed in the above table, use the formulas below to calculate the respective values:

- Minimum conditioned room area (ft²) = system charge x 29.903
- Minimum conditioned room area (m²) = system charge x 2.786
- Minimum system airflow (CFM) = system charge x 54.117

Mechanical ventilation

Table 3: Mechanical ventilation

Item number	Safety consideration
1	If installing the unit in a residence below the determined total conditioned area from Room size requirements , then extra mechanical ventilation is required.

Refrigerant equipment checks

Table 4: Refrigerant equipment checks

Item number	Safety consideration
1	Where electrical components are being changed, they must be fit for the purpose and to the correct specification. At all times, the manufacturer's maintenance and service guidelines must be followed. If in doubt, consult the manufacturer's technical department for assistance.
2	Apply the following checks to installations using flammable refrigerants: <ul style="list-style-type: none"> • Ensure the actual refrigerant charge is in accordance with the room size within which the refrigerant-containing parts are installed. • Ensure the ventilation machinery and outlets are operating adequately and are not obstructed. • Ensure marking on the equipment continues to be visible and legible. Correct any markings and signs that are illegible. • Install refrigerating pipe or components in a position where they are unlikely to be exposed to any substance that may corrode refrigerant-containing components, unless the components are constructed of materials that are inherently resistant to being corroded or are suitably protected against being corroded.

Electrical devices checks

Table 5: Electrical devices checks

Item number	Safety consideration
1	Repair and maintenance to electrical components must include initial safety checks and component inspection procedures.
2	If a fault exists that could compromise safety, then do not connect any electrical supply to the circuit until the fault is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, use an adequate temporary solution. This must be reported to the owner of the equipment so all parties are advised.
3	Initial safety checks must include: <ul style="list-style-type: none"> • Ensure capacitors are discharged: take care to avoid the possibility of sparking. • Ensure no live electrical components and wiring are exposed while charging, recovering, or purging the system. • Ensure there is continuity of earth bonding.

Detection of refrigerant

Table 6: Detection of refrigerant

Item number	Safety consideration
1	Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. Do not use a halide torch or any other detector using a naked flame.
2	<p>The following leak detection methods are deemed acceptable for all refrigerant systems.</p> <ul style="list-style-type: none"> • Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate or may need re-calibration. Calibrate the detection equipment in a refrigerant-free area. Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Set leak detection equipment at a percentage of the LFL of the refrigerant and calibrate to the refrigerant employed. Ensure the appropriate percentage of gas with a maximum of 25% is confirmed. • Leak detection fluids are also suitable for use with most refrigerants but avoid the use of detergents containing chlorine as the chlorine may react with the refrigerant and corrode the copper pipework. Examples of leak detection fluids are bubble method and fluorescent method agents.
3	If a leakage of refrigerant is found that requires brazing, recover all of the refrigerant from the system or isolate the leakage by means of shut-off valves in a part of the system remote from the leak. Remove refrigerant according to the <i>Removal and evacuations</i> section of the outdoor unit's <i>Installation Manual</i> .

Decommissioning

Before you begin:

Before attempting the procedure, complete the following:

- Ensure that the technician is completely familiar with the equipment and all its detail.
- Ensure to safely recover all refrigerants.
- Take an oil and refrigerant sample, in case analysis is required before reusing the recovered refrigerant.
- Ensure that electrical power is available.
- Ensure that mechanical handling equipment is available, if required, for handling refrigerant cylinders.
- Ensure that all personal protective equipment is available and being used correctly.
- Ensure that the recovery process is supervised at all times by a competent person.
- Ensure that recovery equipment and cylinders conform to the appropriate standards.

Follow the steps below to ensure the unit is correctly and safely decommissioned:

1. Isolate the system electrically.
2. Connect a recovery machine to remove refrigerant from the system.
3. Ensure that the cylinder is situated on the scales before recovery takes place.
4. Start the recovery machine and operate in accordance with instructions provided with the machine.
 - ⓘ **Note:**
 - Do not overfill cylinders to more than 80% volume liquid charge.
 - Do not exceed the maximum working pressure of the cylinder, even temporarily.
5. When the cylinders have been filled correctly and the process completed, ensure that the cylinders and the equipment are removed from the site promptly and that all isolation valves on the equipment are closed off.
 - ⓘ **Note:** Do not charge recovered refrigerant into another refrigerating system unless it has been cleaned and checked.

Label the equipment stating that it has been decommissioned and emptied of refrigerant. Date and sign the label. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating that the equipment contains a flammable refrigerant.

Wiring installation

NOTICE

Cap unused wiring connections.

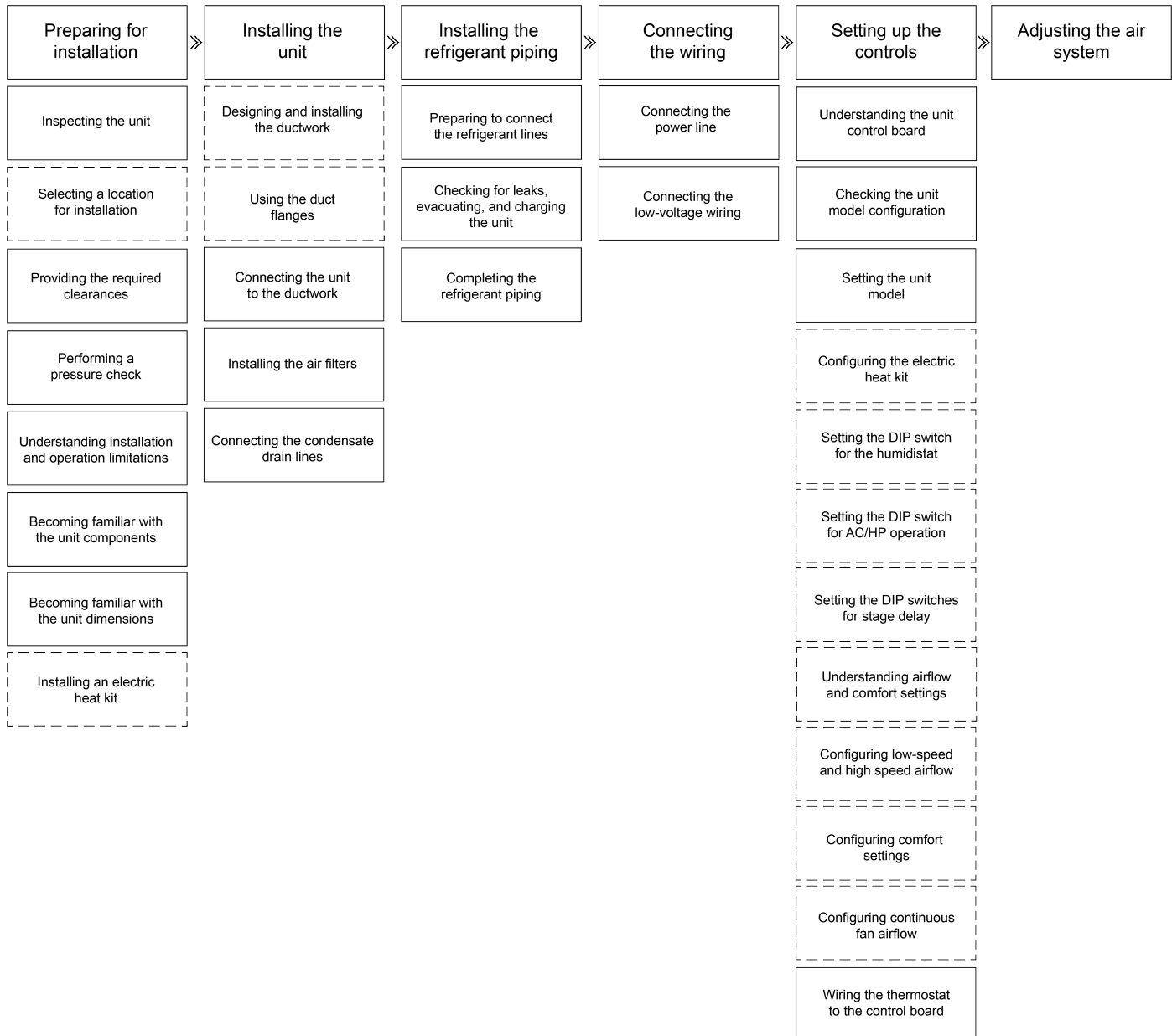
Field-testing the sensor

1. After wiring and configuring the system, provide a Y call for cooling.
2. Simulate an A2L leak by disconnecting the A2L sensor wire from the control board.
3. After 15 s, verify that the call for the compressor is removed.
4. Verify that the Y/Y2 OUT and Y1 OUT compressor outputs have no voltage, the circulating blower is operating, and that the control displays rC.
5. Reconnect the sensor, then wait 5 min and verify that the system returns to cooling mode.
6. When the system is in standby mode, repeat the test for a W call for heating.
7. When testing is complete, re-install the front cover on the control box.

Installation overview

Complete all of the stages outlined in [Figure 1](#). You may not need to perform tasks indicated with a dashed outline, depending on the specific installation.

Figure 1: Installation overview



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Preparing for installation

Complete the necessary preparation before you begin the installation:

1. Inspect the unit for possible damage in transit.
2. Select a suitable location if it is not already predetermined. Take into consideration factors such as structural support, space for service access, and operating sound levels.
3. Provide the required clearances around the unit.
4. Perform a pressure check.
5. Understand any installation and operational limitations such as unit size.
6. Familiarize yourself with the unit components, dimensions, and make sure you have all necessary equipment.
7. Install an electric heat kit if required.

► **Important:** If you do not install an electric heat kit, you must mark the unit nameplate appropriately to indicate that no electric heat kit is installed.

Inspecting the unit

There are no internal shipping or spacer brackets to remove.

To inspect the unit, do the following:

1. Inspect the air handler, including the coil, immediately after receiving it for possible damage during transit. Ensure that you also check the drain pan for cracks or breakage.
2. If damage is evident, do the following:
 - a. Note the extent of the damage on the carrier's freight bill.
 - b. Make a separate written request for the carrier's agent to inspect the unit.
 - c. Contact the local distributor for more information.
3. Check to ensure that the air handler is still under pressure. See [Performing a pressure check](#).
4. Check the unit for screws or bolts loosened in transit.
5. Verify that all accessories, such as a heat kit, are available.

ⓘ **Note:** Complete the installation of these accessories or field conversion of the unit before setting the unit in place or connecting any wiring, ductwork, or piping.

Selecting a location for installation

Location is usually predetermined. Check with the 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.
- Do not use hanging brackets to wall mount this single-piece air handler unit.
- Normal operating sound levels may be objectionable if the air handler is placed directly over some rooms, such as bedrooms or a study.
- Select a location that permits installation of the condensate line to an open drain or outdoors, allowing condensate to drain away from the structure.

NOTICE

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

- When installing an indoor coil in an attic or above a finished ceiling, you must use an auxiliary drain pan under the air handler as is specified by most local building codes.
- A sufficient electrical supply must be available.
- If locating the unit in an area of high humidity, such as an unconditioned garage or attic, nuisance sweating of the casing may occur. On these installations, completely seal the unit duct connections and other openings, and use a wrap of 2 in. fiberglass insulation with vinyl vapor barrier.

Providing the required clearances

It is essential to provide the following clearances:

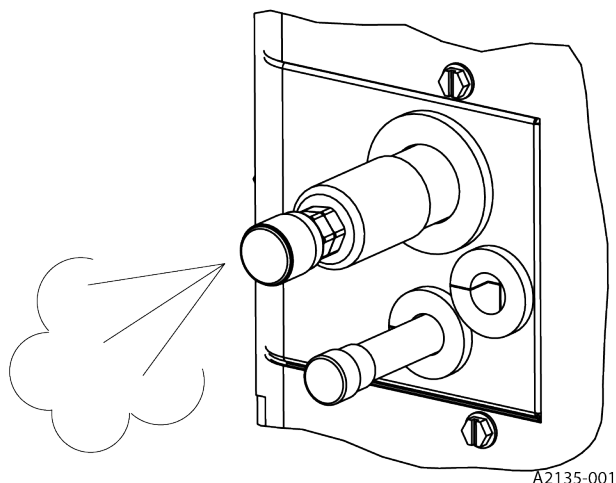
- Refrigerant piping and connections - minimum 12 in.
- Maintenance and servicing access - minimum 36 in. from the front of the unit for blower motor or coil replacement
- Condensate drain lines routed to clear filter and panel access
- Filter removal - minimum 36 in.
- The supply air ductwork connected to this unit is designed for 1 in. clearance for the first 18 in. of combustible materials if an electric heat kit is installed.

① **Note:** You must maintain clearances for servicing and allow access to the electric heaters and blower.

Performing a pressure check

It is important to perform a pressure check before you begin installing the unit.

Figure 2: Pressure check



1. Depress the Schrader valve core one time to check for pressure.

Understanding installation and operation limitations

Adhere to the following:

- The size of the unit must be based on an acceptable heat loss or gain calculation for the structure. Use Air Conditioning Contractors of America (ACCA) Manual J or another approved method.
- Only connect the air handler to a duct system that 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 temperature (°F)		Dry bulb temperature (°F)	
Minimum	Maximum	Minimum	Maximum
57	72	65	95

- When installing an air handler so that supply ducts carry air circulated by the air handler to areas outside the space containing the air handler, the return air is also handled by one or more ducts sealed to the air handler casing and terminating in the space to be cooled or heated.
- The nameplate displays the air handler model number. The unit dimensions for the supply air plenum are provided in [Becoming familiar with the unit dimensions](#). Always install the plenum according to the instructions.
- Check the available supply power and verify that it is in the normal operating voltage range for the unit. The acceptable voltage range for these units is as follows:

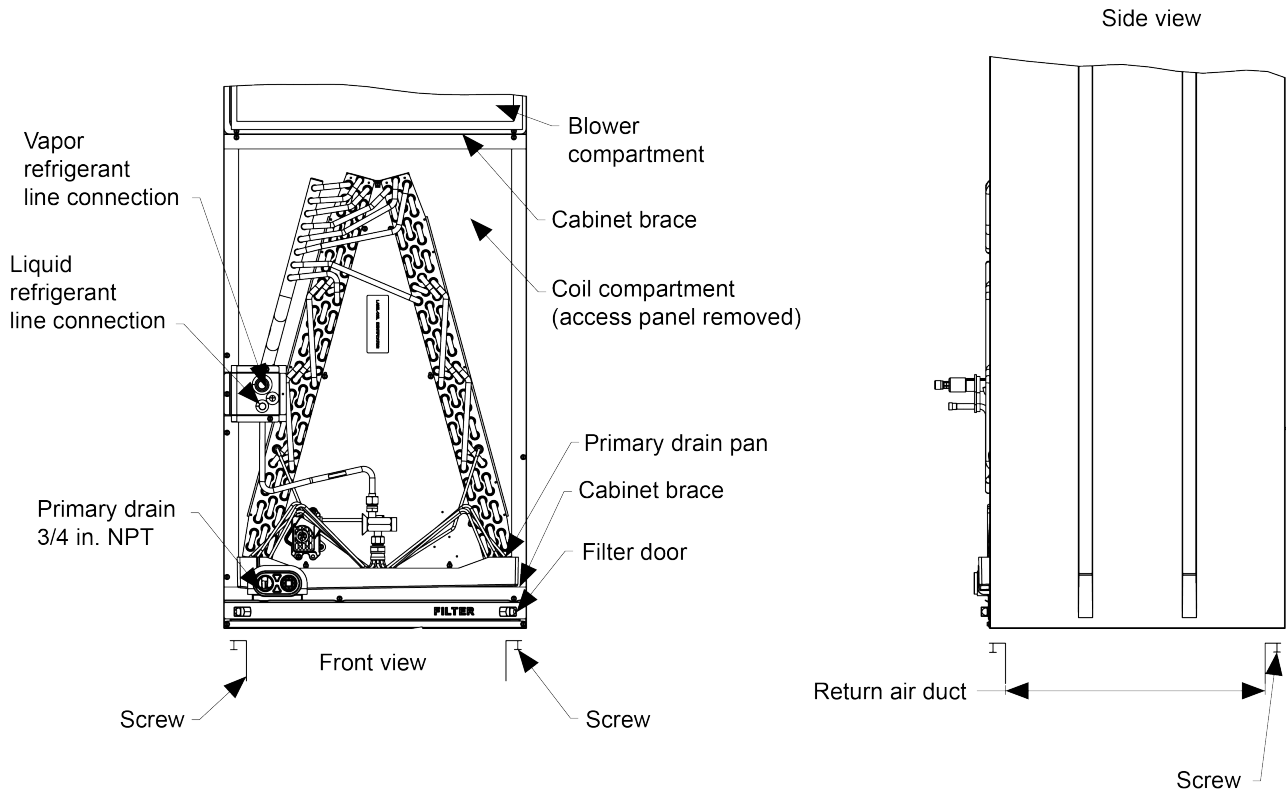
Air handler voltage	Normal operating voltage range ¹
208/230-1-60	187 V to 253 V

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

Becoming familiar with the unit components

Make sure that you are familiar with the unit components before you begin the installation. See [Figure 3](#).

Figure 3: Return air duct attachment and component location

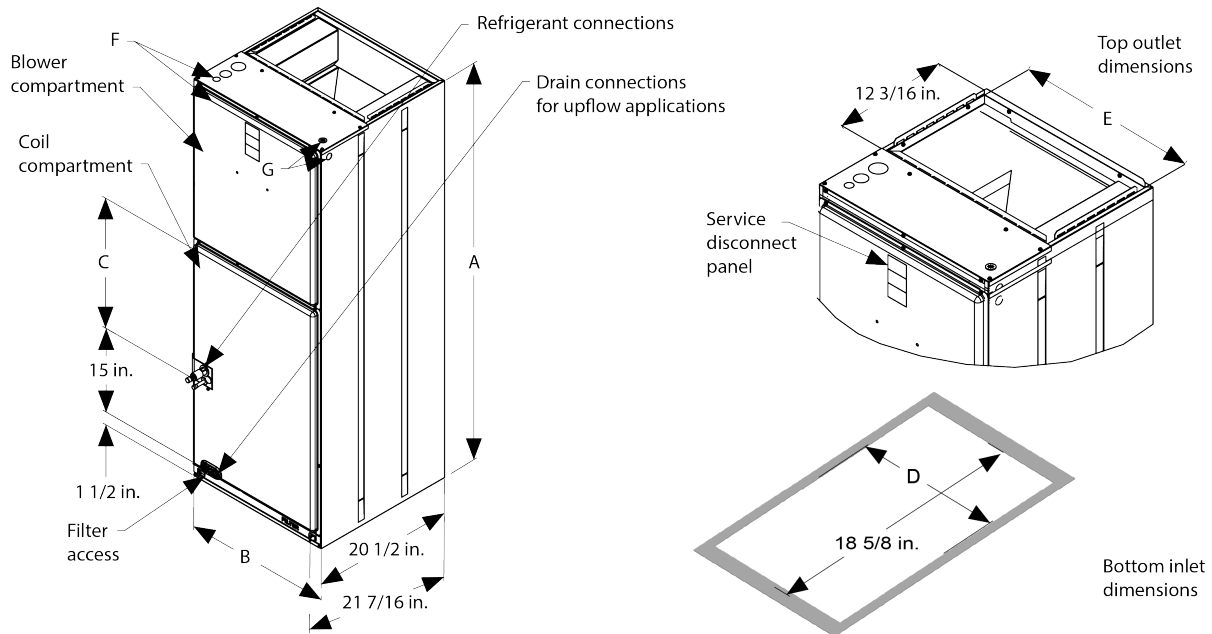


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Becoming familiar with the unit dimensions

- Make sure that you are familiar with the unit dimensions before you begin the installation. See [Figure 4](#) and [Table 7](#).

Figure 4: Dimensions and duct connection dimensions



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Table 7: Dimensions

Models	Dimensions					Wiring knockouts (actual conduit size)		Refrigerant connections line size	
	A	B	C	D	E	F	G	Liquid (in.)	Vapor (in.)
	Height (in.)	Width (in.)	Opening widths (in.)			Power (in.)	Control (in.)		
JSC48C5CG2SS	57	21	21 3/4	20	20	7/8 (1/2)	7/8 (1/2)	3/8	7/8
JSC48D5CG2SS	56 3/4	24 1/2	21 3/4	23 1/2	23 1/2	1 3/8 (1)			
JSC60D5CJ2SS	56 3/4	24 1/2	21 3/4	23 1/2	23 1/2	1 23/32 (1 1/4)			

Installing an electric heat kit

If the air handler requires electric heat, use only 8HK heater kits, as listed on the air handler name plate and in these instructions. Use data from [Unit data](#) for information on the required minimum motor speed tap to use for heating operation and the maximum overcurrent protection device required as listed for the air handler and electric heat kit combination.

NOTICE

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

- Important:** If the air handler does not require electric heat, mark the nameplate to indicate that no heat kit is installed.

To install an electric heat kit, do the following:

1. Install the electric heat kit according to the installation instructions included with the kit.
2. After installing the electric heat kit, mark the air handler name plate to designate the electric heat kit that was installed.

Installing the unit

NOTICE

Do not handle aluminum coil components after handling the copper refrigeration piping or other tubing without first cleaning your hands.

To install the unit correctly, you must do the following:

1. Design and install the ductwork if required.
2. Set up the duct flanges.
3. Connect the supply and return air ductwork.
4. Install the air filters.
5. Connect the condensate drain lines.

Designing and installing the ductwork

Air supply and return may be handled in one of several ways best suited to the installation. Upflow applications must be used. The vast majority of problems encountered with heating and cooling systems can be linked to incorrectly designed or installed duct systems. It is therefore highly important to the success of an installation that the duct system be correctly designed and installed.

- ① **Note:** Ductwork that is not designed to match the supply air opening can cause turbulence inside the plenum. This turbulence can change the airflow patterns across electric heater limit switches.

WARNING

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

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

CAUTION

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

Never operate the equipment without filters.

To design and install the ductwork, do the following:

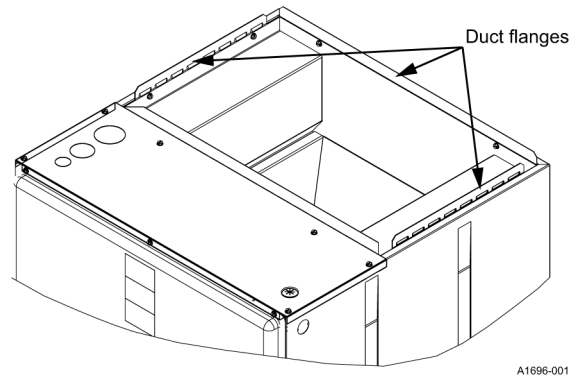
- When installing a central air return grille in or near the living space, design the ductwork so that the grille is not in direct line with the opening in the unit. One or two elbows and acoustical duct liner ensure a quieter system. For operation where the return air duct is short or where sound may be a problem, use acoustical duct liner inside the duct.
- You must insulate ductwork where it runs through an unheated space during the heating season or through an uncooled space during the cooling season. Use a vapor barrier to prevent absorption of moisture from the surrounding air into the insulation.
- Be aware that you must use a transition to securely connect the supply air duct to the unit opening.
- Suspend all ducts using flexible hangers and never fasten directly to the structure.
- You must fabricate and install ductwork in accordance with local and national codes. This includes the standards of the National Fire Protection Association for Installation of Air-Conditioning and Ventilating Systems, NFPA No. 90B. If using electric heat, you must use a non-flammable material. Duct systems must be designed in accordance with ACCA Manual D.

Using the duct flanges

To use the duct flanges that are integrated into the casing, do the following:

1. Fold the flanges open into position.
2. Anchor the flanges with screws.

Figure 5: Duct attachment



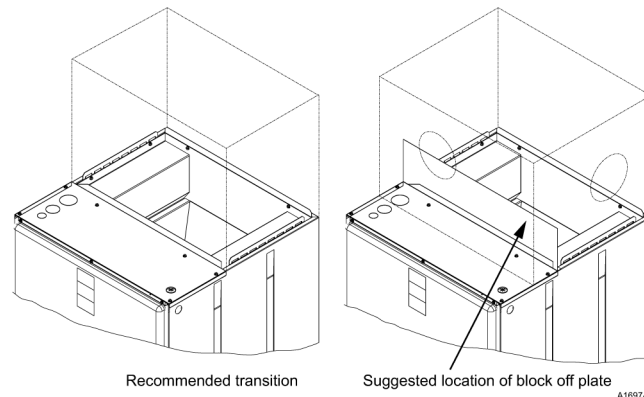
A1696-001

Connecting the unit to the ductwork

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 applications must be used. Use flexible duct connectors to minimize the transmission of vibration and noise into the conditioned space.

- ① **Note:** Ductwork that is not designed to match the supply air opening can cause turbulence inside the plenum. This turbulence can change the airflow patterns across electric heater limit switches.
1. Use a transition to securely connect the supply air duct to the unit opening. See [Becoming familiar with the unit dimensions](#) for air handler unit inlet and outlet dimensions.
 2. If you cannot fabricate the recommended transition, attach a block-off plate approximately 8 in. high and running the full width of the plenum to the supply opening. See [Figure 6](#). Using this block-off plate enables better air circulation across the limit switches.

Figure 6: Ductwork transition



Recommended transition

Suggested location of block off plate

A1697-001

CAUTION

Use 1/2 in. screws to connect ductwork to the unit. Longer screws may pierce the drain pan and cause leakage. If drilling pilot holes, drill only through the field duct and the unit bottom duct flange.

Installing the air filters



Never operate the equipment without filters.

You must install return air filters. Filters are field supplied and filtration must be accomplished external to the unit. To install air filters, do the following:

- Secure the air filters in the return air ductwork as required.

Connecting the condensate drain lines

Before you begin:

Adhere to the following when connecting the condensate drain lines:

- Pitch all drain lines 1/4 in./ft away from the unit drain pan and ensure that the drain lines are no smaller than the coil drain connection.
- Route the drain line so that it does not impede access to the coil, air handling system, or filter and it is not exposed to freezing temperatures.
- Instruct the homeowner that the indoor coil drain pan must be inspected and cleaned regularly to prevent odors and ensure sufficient drainage.
- Install the air handling unit pitched slightly toward the drain end.
- If the coil has a secondary drain, pipe it to a location that gives the occupant a visual warning that the primary drain is clogged. If not using a secondary drain, you must plug the secondary drain.

Note: You can remove drain plugs using a standard 3/8 in. drive socket ratchet.

CAUTION

Avoid double trapping.

CAUTION

Threaded drain connections must be hand tightened and by no more than one turn.

CAUTION

Do not use PTFE tape, pipe thread compound, or other sealants. Use of a sealant can cause damage and premature failure of the drain pan.

Figure 7: Location of coil trapped and plugged drain connections

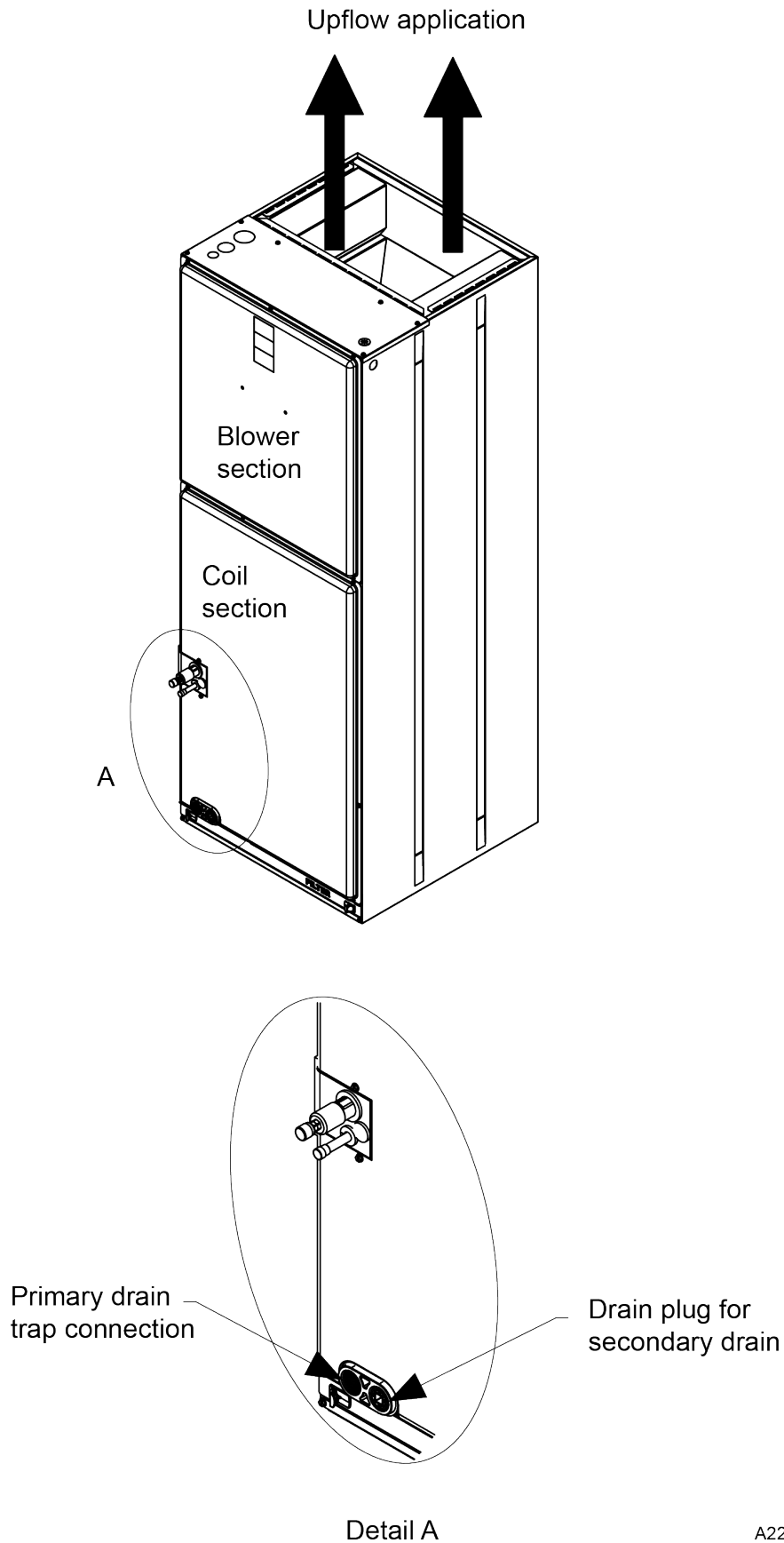
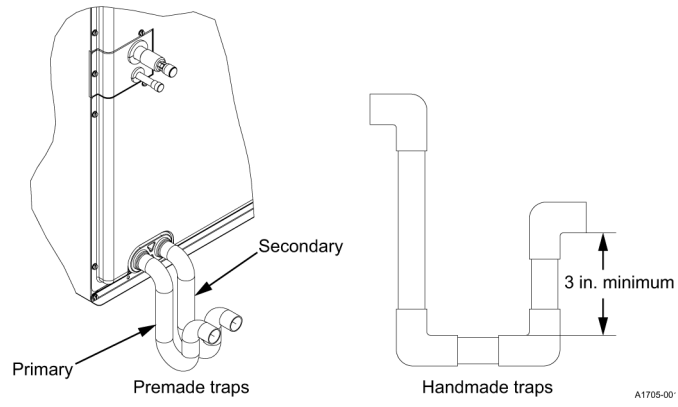


Figure 8: Drain traps



Installing the refrigerant piping

Perform the following steps to install the refrigerant piping:

1. Prepare to connect the refrigerant lines.
2. Choose either to braze the refrigerant lines or to use braze-free connections.
3. Check for leaks, then evacuate and charge the system.
4. Complete the refrigerant piping installation.

Preparing to connect the refrigerant lines

CAUTION

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

CAUTION

Dry nitrogen must 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 must continue until the joint has cooled. Always use a pressure regulator and safety valve to ensure that only low pressure dry nitrogen is introduced into the tubing. Only a small flow is necessary to displace air and prevent oxidation.

NOTICE

Do not handle aluminum coil components after handling the copper refrigeration piping or other tubing without first cleaning your hands.

Depending on the coil model and application, it is possible to connect the refrigerant lines in one of two ways: by brazing the connections or by using non-braze connections.

Some coil models have lines that are expanded to receive the field refrigeration piping, and some coil models have straight piping connections ready to accept braze-free connectors. You can still use these straight piping connections for brazing, but you need to expand the pipe in the field using a swage tool. Alternatively, you can use a sweat coupling. Make suction and liquid line connections outside of the cabinet. Leave the tubing connection panel attached to the cabinet. If you are brazing the connections, remove the coil access panel.

Choose between brazing the refrigerant lines, or using braze-free refrigerant line connections, then follow [Brazing the refrigerant lines](#) or [Using braze-free refrigerant line connections](#).

Brazing the refrigerant lines

The following steps explain how to braze the refrigerant lines. For braze-free connections, see [Using braze-free refrigerant line connections](#).

 **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 ensure that only low pressure dry nitrogen is introduced into the tubing. Only a small flow is necessary to displace air and prevent oxidation.

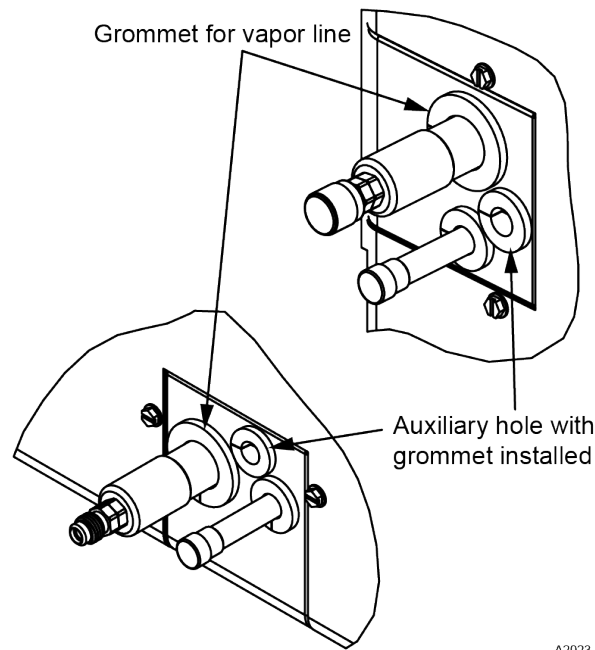
1. Remove the grommets where tubes exit the cabinet to prevent burning them during brazing. In some units, the vapor line grommet may be shipped as a loose part with the unit.
2. Cut the end of the suction tube using a tube cutter. Place the tube cutter as close as possible to the end of the tube to allow as much depth as possible for the connection and brazing of the suction line. To ensure that the suction line fits into the connection, deburr the stub-out, including inner pressure protrusion from cutting.
3. Remove the liquid line copper cap that is soft soldered onto the outside of the 3/8 in. stub protruding from the 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.
4. Insert the liquid line and the suction line into the coil connections at the coil cabinet tubing panel.
5. Wrap a water-soaked rag around the coil connection tubes inside the cabinet to avoid transferring excess heat to the coil and the TXV.
6. Purge the refrigerant lines with dry nitrogen during brazing.

NOTICE

All indoor coil connections are copper-to-copper and must be brazed with a phosphorous-copper alloy material such as Silfos-5 or equivalent. **Do not** use soft solder.

7. Braze the suction line and the liquid line, and allow the joints to cool.
8. Secure the sensing bulb and equalizer line capillary tubes with nylon cable ties to prevent leaks from the tubes rubbing.
9. Install 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. See [Figure 9](#).

Figure 9: Vapor line grommet



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Using braze-free refrigerant line connections

The following steps explain how to use braze-free refrigerant line connections. For brazed connections, see [Brazing the refrigerant lines](#).

1. Remove the grommets where suction tube exits the cabinet. In some units, the vapor line grommet may be shipped as a loose part with the unit.
2. Remove the coil door but leave the tubing access panel in place.
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 straight tubing as possible for the braze-free connector. Deburr the stub-out after cutting.
4. Push the liquid line back into the coil for better access to the suction line if the liquid line is already installed.
5. Fit a braze-free connector and the field suction line into the coil suction line connection at the coil cabinet tubing panel. Complete the suction line connection.
6. Install the liquid line on the TXV if not factory installed. Bring the liquid line back out towards the front of the coil and removed the closed end using a tubing cutter. De-burr the stub-out after cutting. Fit a braze-free connector and the field liquid line into the coil liquid line connection at the coil cabinet tubing panel. Complete the liquid line connection.
7. Secure the TXV sensing bulb and equalizer line capillary tubes with nylon cable ties to prevent leaks from the tubes rubbing.
8. Install 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. See [Figure 9](#).

Checking for leaks, evacuating, and charging the unit

Refer to the *Installation Manual* for the outdoor unit and complete the leak check, evacuation, and charging according to the instructions provided. Check all field-brazed joints and metering device connections.

Completing the refrigerant piping

Before you begin:

Make sure that you have connected the refrigerant lines using the brazing or non-braze method before you complete the final refrigerant piping installation steps.

1. Attach the coil access panel to the cabinet.
2. Ensure that the lines are sound isolated by using the appropriate hangers or strapping.

Connecting the wiring

See [Wiring diagrams](#) for relevant wiring diagrams.

NOTICE

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

To connect the wiring correctly, you must do the following:

1. Connect the power line.
2. Connect the low-voltage transformer.
3. Connect the low-voltage wiring.

Connecting the power line

WARNING

Before obtaining access to terminals, all supply circuits must be disconnected.

WARNING

A fused disconnect switch must be field provided for the unit to be in compliance with UL 60335-2-40 Clause 7.12.2.

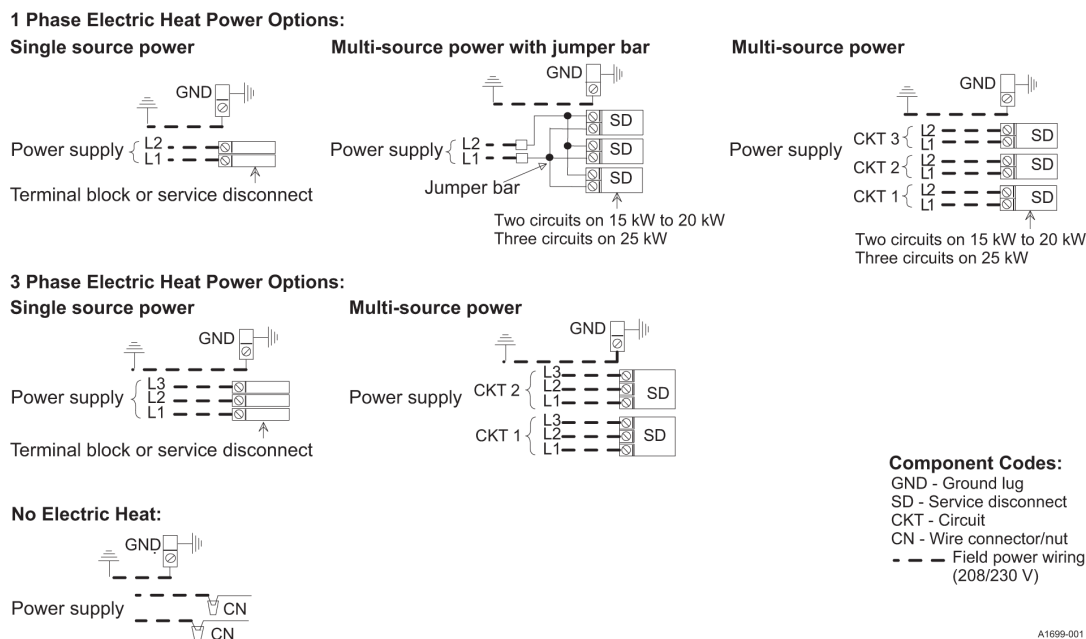
► **Important:**

- 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, follow all applicable local and national codes when converting from aluminum to copper conductors before connecting to the air handler.
- The chosen conductor and connections 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 the National Electric Code in the United States or the Canadian Electrical Code in Canada and local codes. Use caution when sizing aluminum rather than copper conductors, as aluminum conductors are rated for less current than copper conductors of the same size.

- **Important:** Refer to the installation instructions for the electric heat kit for additional information about connecting the wiring for the electric heat kit as needed.

See [Figure 10](#) for line power connections.

Figure 10: Line power connections



To connect the power line, do the following:

1. See [Figure 10](#).
2. Bring power 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 the conduit from the disconnect.
3. Terminate the power lead conduit at the electrical control box. See [Table 23](#) to [Table 26](#) and refer to the latest edition of the National Electric Code in the United States or the Canadian Electrical Code in Canada and local codes to determine correct wire sizing.
4. Seal the wiring entry point on the outside of the unit to minimize air leakage.

Connecting the low-voltage wiring

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 only brings on the first stage of electric heat during defrost. See [Configuring the electric heat kit](#) for additional information on heat during the defrost cycle.

► Important:

- For conventional thermostat control, connect the field wiring at the pigtailed supplied with the control board harness. For communicating thermostat control, a field-supplied wire must be routed into the control box and connect wiring to the ARCB terminal strip.

► Important:

Refer to the installation instructions for the electric heat kit for additional information about connecting the wiring for the electric heat kit as needed.

To connect the low-voltage wiring, do the following:

1. See [Table 8](#) to familiarize yourself with the low-voltage connections.

Table 8: Low-voltage connections

Wire	Colors	Signals	Comment
R	Red	24 VAC power (fused)	Applies only for conventional systems
G	Green	Continuous fan operation	Applies only for conventional systems. Fan speed. Adjust using settings configuration DIP switches 2 and 3 for continuous fan airflow in the SW5 switch bank
TSAT Y/Y2	Yellow	Second-stage or full-stage compressor operation	Room thermostat INPUT to air handling unit
TSAT Y1	Yellow and Black	First-stage compressor operation	Room thermostat INPUT to air handling unit. Not used with outdoor units with single-stage compressors
Y1 OUT	Yellow and Black	Air handling unit output to outdoor section Y1	Not used with outdoor units with single-stage compressors
Y/Y2 OUT	Yellow	Air handling unit output to outdoor section Y	Y if single stage compressor Y2 if multi-stage compressor
Y2C	Field-supplied wiring	Field-supplied wiring	Screw terminal on control for connection to outdoor section Y2OUT
W2	Brown	Second-stage heat operation	Applies only for conventional systems
W1	White	First-stage heat operation	Applies only for conventional systems
O/B	Orange	Reversing valve operation	Applies only for conventional systems
EAC	Field-supplied wiring	Electric air cleaner	Applies for conventional and communicating systems. Located on P4 connector. There is 24 VAC output during indoor blower operation to energize a pilot duty relay for an electronic air cleaner
HUM	Purple	Humidity switch input	Applies only for conventional systems
C (COM)	Blue	24 VAC common	Applies only for conventional systems
HUM OUT	Field-supplied wiring	Humidifier relay	Applies for conventional and communicating systems. Located on P4 connector. There is 24 VAC output during heating with indoor blower operation to energize a pilot duty relay for a humidifier

2. Connect the low-voltage transformer. Follow the procedure in [Connecting the low-voltage transformer](#).
3. Connect the controls as required for the type of system you are using:
 - For conventional systems, do the following:
 - If you are using a single-stage thermostat, see [Using a single-stage thermostat](#).
 - Connect the system controls. Follow the procedure in [Connecting conventional controls](#).
 - For communicating systems, do the following:
 - Connect the communicating components in the communicating system. Follow the procedure in [Connecting communicating controls](#).
 - Connect a float switch if required. Follow the procedure in [Connecting a float switch for communicating systems](#).

Connecting the low-voltage transformer

The 24 V power supply is provided by an internally wired low-voltage transformer that is standard on all models.

NOTICE

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

To connect the low-voltage transformer, do the following:

- If connecting the unit to a 208 V power supply, rewire the low-voltage transformer to the 208 V tap. See [Wiring diagrams](#).
- Note that field-supplied low voltage wiring can exit the unit through the top right (when the unit is in vertical upflow) or the right side panel. See [Figure 4](#). Remove the knockout and pierce the 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 in. 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. Connect the field wiring at the pigtailed supplied with the air handler. See [Wiring diagrams](#) for system wiring.

Using a single-stage thermostat

This topic applies only for conventional systems. For conventional systems, you can use a single-stage thermostat even if the air handler is equipped with a multi-stage accessory electric heat kit. You must adjust the stage delay DIP switch settings when you are setting up the controls to allow a W2 heat kit output when a W1 input is present after a 10 min, 15 min, or 20 min delay. See [Setting the DIP switches for stage delay](#).

Connecting conventional controls

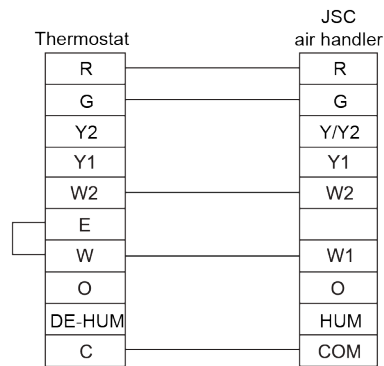
This task applies only for conventional systems. For conventional systems, you can use the following if required:

- Humidity switch: The air handler control is designed to work with a humidity control that closes when the humidity is below the setpoint. The control is open when the humidity is above the setpoint. This humidity control may be referred to as a humidistat or a dehumidistat. The humidity switch controls dehumidification operation of the control during cooling operation. To enable dehumidification operation, you must set the DIP switch for the humidistat to the on position when you are setting up the controls. See [Setting the DIP switch for the humidistat](#).
- HUM OUT output: The HUM OUT output drives an external relay or solenoid (24 VAC coil) to control a humidifier. The output energizes when the control has a thermostat call for heating (heat pump or electric heat) and the indoor blower is operating.

To connect conventional controls, do the following:

- Connect the controls in the conventional system as shown in [Figure 11](#).

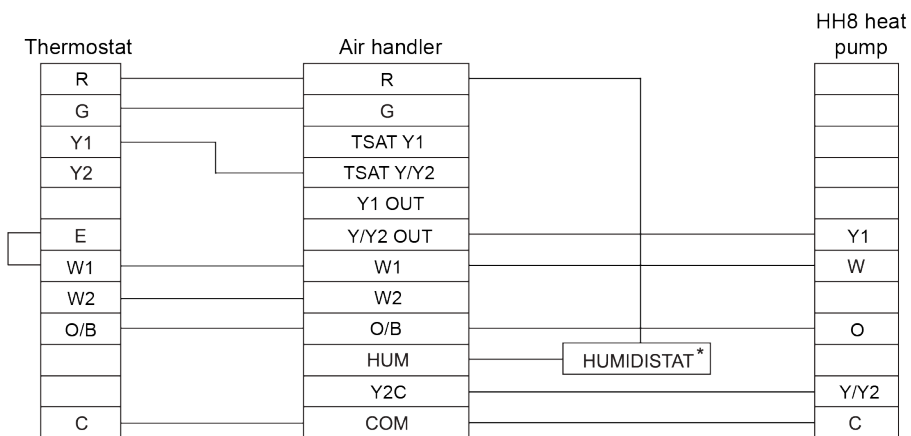
Figure 11: Control wiring - variable ECM air handler - electric heat only - conventional wiring



A2213-001

- Use the HUM OUT output to control a humidifier if required.

Figure 12: Control wiring - premium ECM air handler and HH8 heat pump - conventional wiring



A2169-001

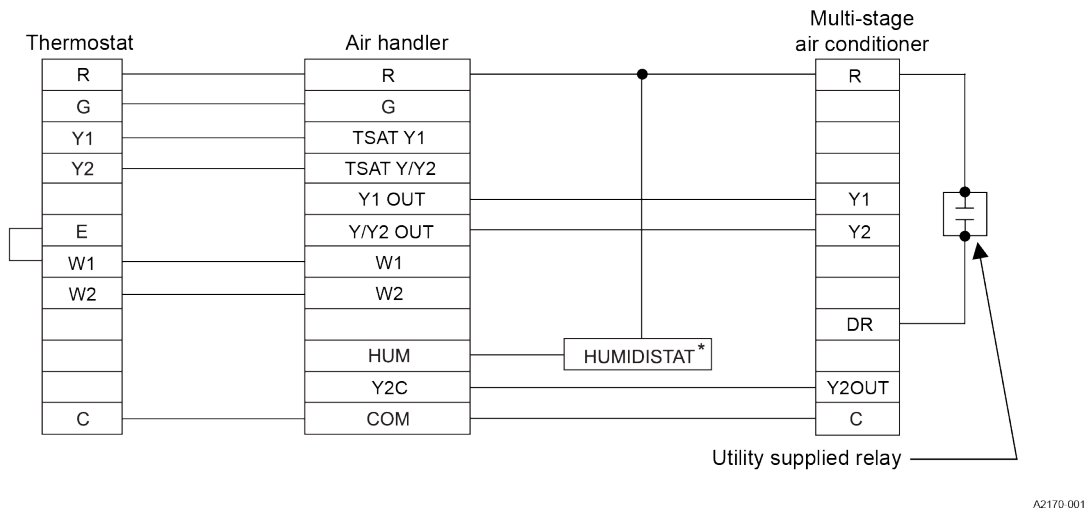
NOTICE

Room thermostat reversing valve operation **must** be set to "O" - energize during cooling operation.

Y/Y2 on HH8 heat pump is an output for a high speed indoor blower. Connect a field-provided thermostat wire to Y2C terminal located on the air handling unit control board. The air handling unit also has a wire labeled Y2C that must be connected to the same terminal.

*HUMIDISTAT is optional

Figure 13: Control wiring - premium ECM air handler and premium multi-stage air conditioner - conventional wiring demand response

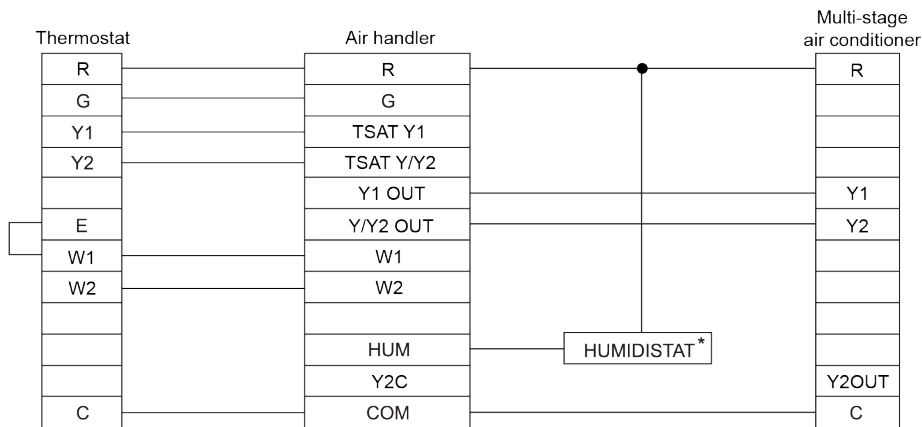


NOTICE

Y2 OUT on premium multi-stage air conditioners is an output for a high speed indoor blower. This connection is required **only** if using the demand response feature built into the outdoor unit control board. If using demand response, connect a field-provided thermostat wire to the Y2C terminal located on the air handling unit control board. The air handling unit also has a wire labeled Y2C that must be connected to the same terminal.

*HUMIDISTAT is optional

Figure 14: Control wiring - premium ECM air handler and premium multi-stage air conditioner - conventional wiring



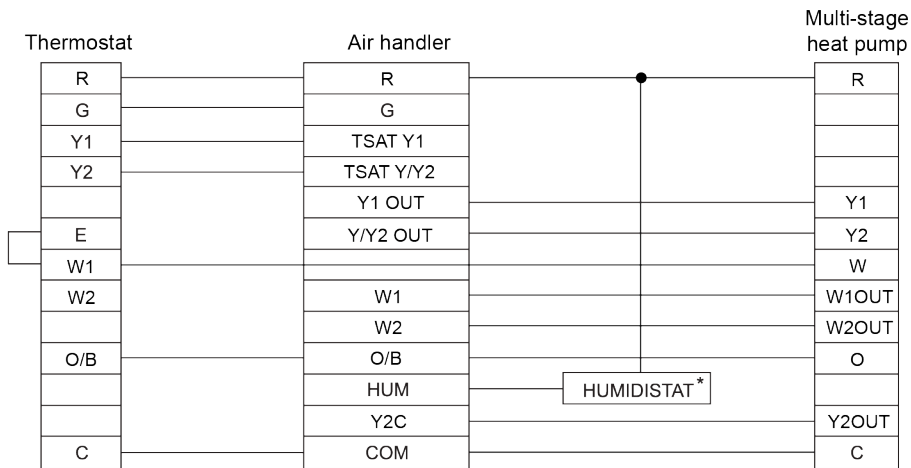
A2171-001

NOTICE

Y2 OUT on the outdoor unit control board is not used unless the demand response feature is used. See alternate wiring diagram for details.

*HUMIDISTAT is optional

Figure 15: Control wiring - premium ECM air handler and premium multi-stage heat pump - conventional wiring



A2172-001

NOTICE

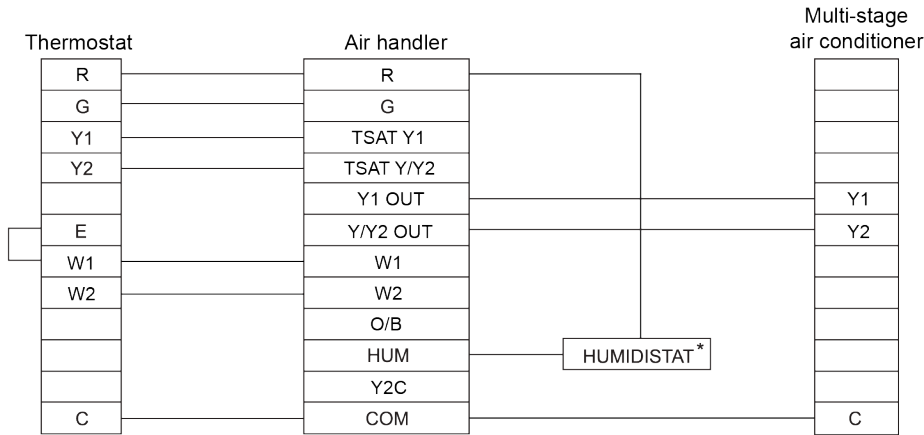
Room thermostat reversing valve operation **must** be set to "O" - energize during cooling operation.

Y2 OUT on a multi-stage heat pump is an output for a high-speed indoor blower. This connection is required. Connect a field-provided thermostat wire to the Y2C terminal located on the air handling unit control board. The air handling unit also has a wire labeled Y2C that must be connected to the same terminal.

Do not bond any of the outdoor unit "W" wires together.

*HUMIDISTAT is optional

Figure 16: Control wiring - premium ECM air handler and standard multi-stage air conditioner - conventional wiring

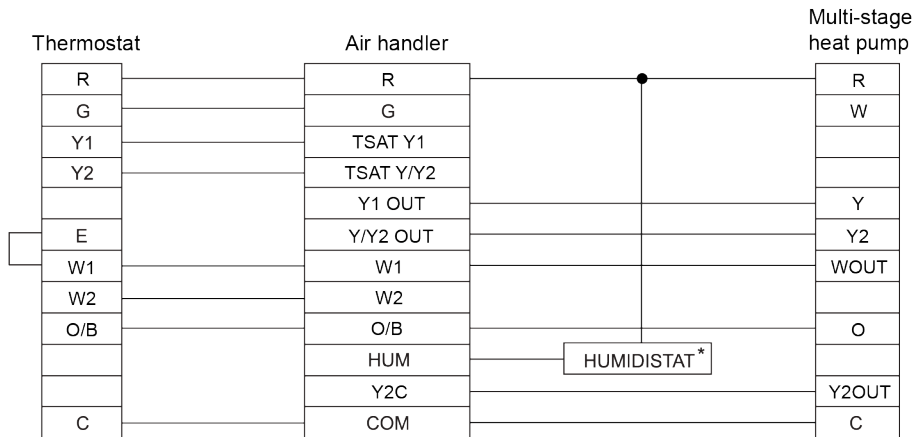


A2173-001

NOTICE

*HUMIDISTAT is optional

Figure 17: Control wiring - premium ECM air handler and standard multi-stage heat pump - conventional wiring



A2174-001

NOTICE

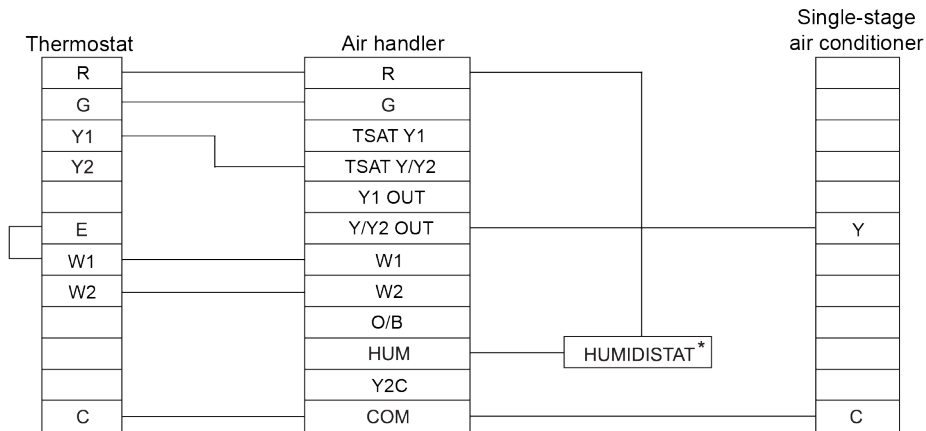
Room thermostat reversing valve operation **must** be set to "O" - energize during cooling operation.

Y2 OUT on a multi-stage heat pump is an output for a high speed indoor blower. This connection is required. Connect a field-provided thermostat wire to Y2C terminal located on the air handling unit control board. The air handling unit also has a wire labeled Y2C that must be connected to the same terminal.

Do not bond any of the outdoor unit "W" wires together.

*HUMIDISTAT is optional

Figure 18: Control wiring - premium ECM air handler and standard single-stage air conditioner - conventional wiring

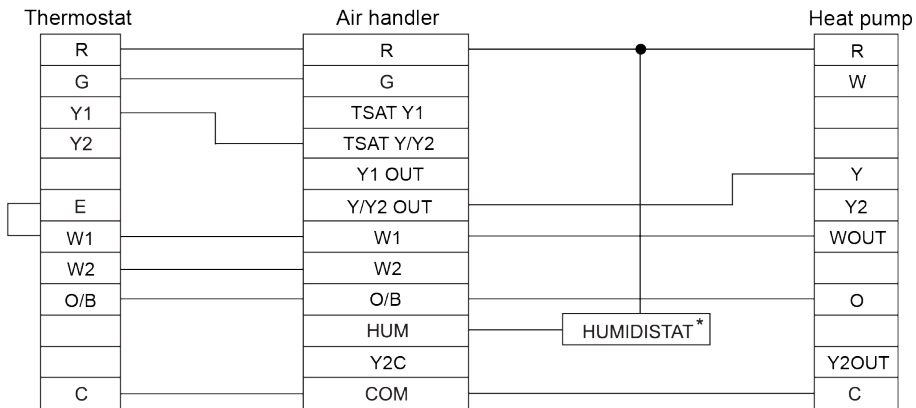


A2175-001

NOTICE

*HUMIDISTAT is optional

Figure 19: Control wiring - premium ECM air handler and standard single-stage heat pump - conventional wiring



A2176-001

NOTICE

Room thermostat reversing valve operation **must** be set to "O" - energize during cooling operation.

Do not bond any of the outdoor unit "W" wires together.

*HUMIDISTAT is optional

Connecting communicating controls

This section applies only for communicating systems.

► Important:

- If you are using a communicating system, you must use the Hx 3 Touch Screen Thermostat (S1-THXU430W).
- If you are using a fully communicating system with an outdoor unit containing A2L refrigerants, a refrigerant detection system (RDS) is required.

The communicating system consists of several intelligent communicating components, including the following:

- Hx 3 Touch Screen Thermostat, a communicating wall thermostat
- Variable speed air handler
- Communicating capable outdoor units that continually communicate with each other using a four-wire connection called the A-R-C-B bus

Commands, operating conditions, and other data pass continually between components over the A-R-C-B bus. See [Figure 20](#). The result is a new level of comfort, versatility, and simplicity. To use the air handler in full communications (COMM) mode, it is essential to install it with the matching Hx 3 Touch Screen Thermostat and an outdoor air conditioner or heat pump with a fully communicating control. For communicating systems, you can use the following if required:

- HUM OUT output: The HUM OUT output drives an external relay or solenoid (24 VAC coil) to control a humidifier. The output energizes when the control has a thermostat call for heating (heat pump or electric heat) and the indoor blower is operating.
- Leaving air temperature sensor: The leaving air temperature sensor allows the communicating control to monitor the temperature of the supply air in the plenum.

CAUTION

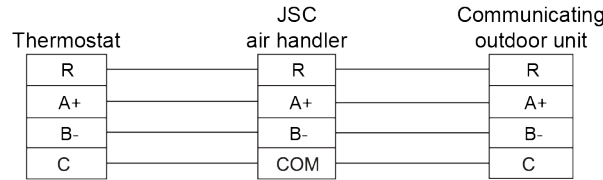
If connecting any field-supplied wiring to the control board, such as when using the communicating control, float switch, or leaving air temperature switch, you must route the additional wires through the hole at the lower right of the control box.

Do not add any additional holes to the control box. After attaching the additional wires to the board, it is essential to plug the remaining hole around the wires with the sealant putty supplied or with a suitable waterproof sealant. **Failure to seal this hole may allow moisture to enter the control box and damage the control board.**

To use communicating controls, do the following:

- Connect the air handler control, touch screen communicating control (Hx 3 Touch Screen Thermostat), and communicating outdoor unit as shown in [Figure 20](#). Ensure 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 20](#) and [Figure 21](#).

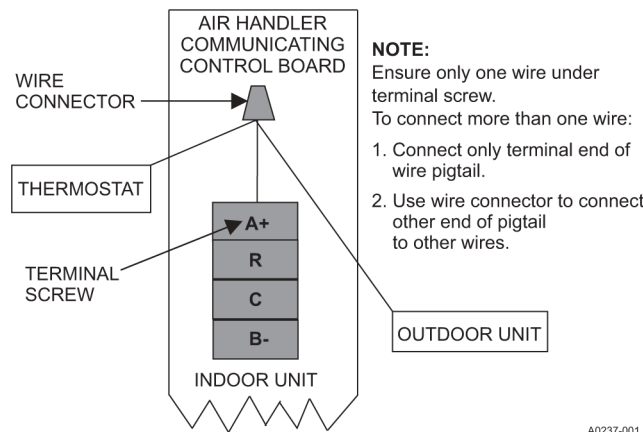
Figure 20: Control wiring - communicating indoor - communicating outdoor - communicating wiring



A2214-001

- **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 and use a wire connector to connect the other end of the pigtail to the other wires. Failure to do this may result in nuisance communication error faults. See [Figure 21](#).

Figure 21: Multi-wire terminal connection



A0237-001

- Use the HUM OUT output to control a humidifier if required.
- Connect a plenum air temperature sensor (thermistor) to the **LEAVING AIR TEMP SENSOR** terminals on the control board if required.

Connecting a float switch for communicating systems

This task applies only for communicating systems.

- **Important:** If you are using a communicating system, you must use the Hx 3 Touch Screen Thermostat (S1-THXU430W).

For communicating systems, you can connect a float switch if required. **The float switch feature is only functional when used with the Hx 3 Touch Screen Thermostat.** It is intended for use with a water overflow switch. When finished installing condensate overflow detection and on a regular basis after installation, test the detection equipment to ensure correct operation.

⚠ CAUTION

Failure to test condensate overflow detection equipment could lead to equipment failure and damage.

► Important:

- To enable the float switch feature, in the system settings for the Hx 3 Touch Screen Thermostat, you must change the default setting of disabled for the float switch. If using a normally closed switch, choose **Enabled (Open)**. If using a normally open switch, choose **Enabled (Closed)**.

ⓘ Note: Do not change settings configuration DIP switches 7 and 8 for the float switch in the SW5 switch bank.

To connect a float switch, do the following:

- Connect a float switch to the **FLOAT SWITCH INPUT** terminals on the control board.

Setting up the controls

► **Important:** You must set up the controls correctly at the time of installation to ensure correct system operation. **STOP and read all of the information and tasks relating to control board setup included in this manual before you start to set up the controls.** This is because it is vital to understand all aspects of setting up the controls before you make **any** changes to DIP switch settings. Otherwise, you may set DIP switches incorrectly and cause difficulties in the installation process.

① **Note:**

- Do not change the model configuration DIP switches for the air handler model in the SW2 switch bank unless the model ID programmed in the control board has been changed to an incorrect model.
- Do not change settings configuration DIP switches 7 and 8 for the float switch in the SW5 switch bank.

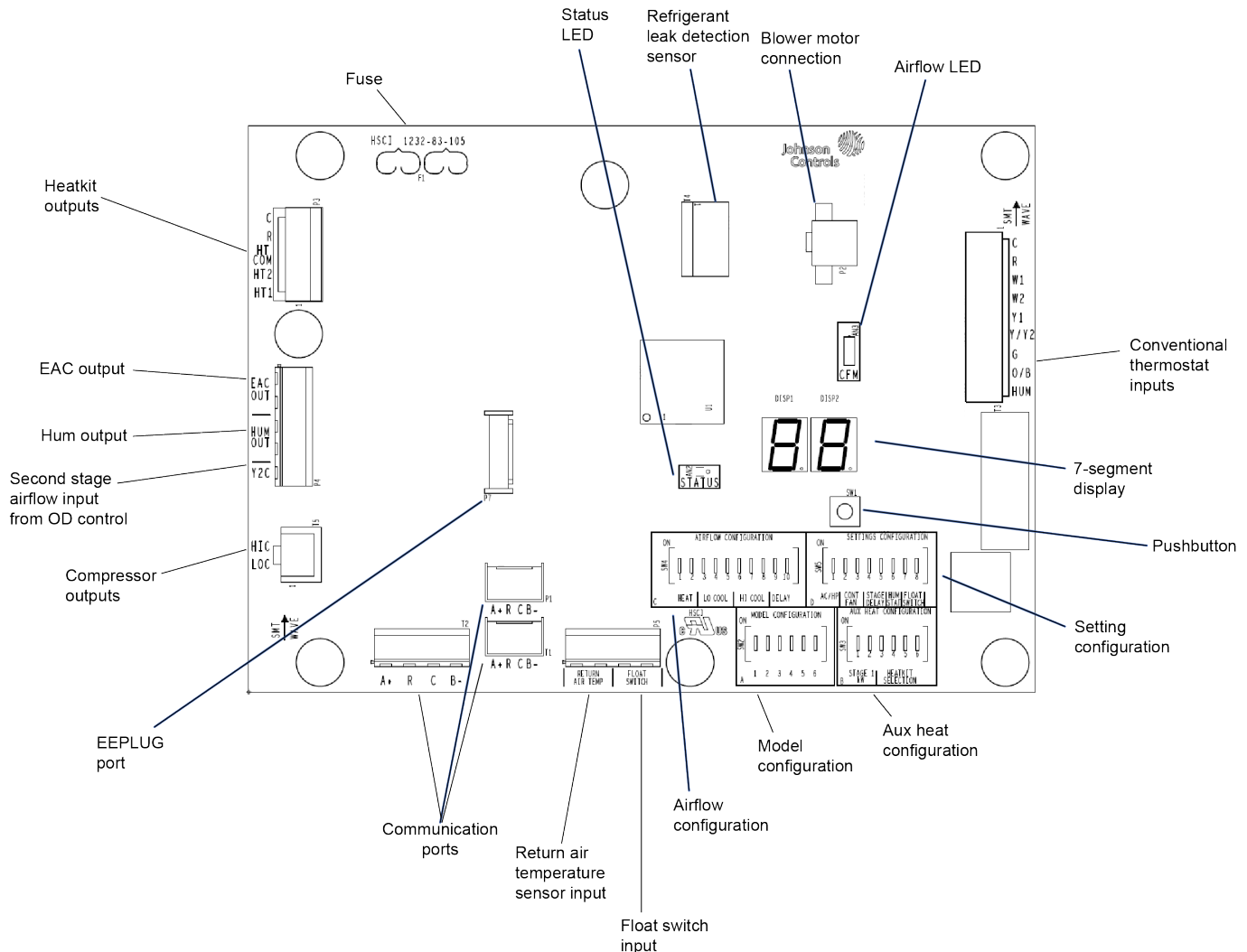
To set up the controls correctly, you must do the following:

1. For conventional or communicating systems, familiarize yourself with how the air handler control board works.
2. For conventional or communicating systems, check the air handler model programmed in the air handler control board and set the model configuration DIP switches for the specific JSC air handler model if required. The air handler model ID is programmed into the control board at the factory, so all of the model configuration DIP switches are set in the off or 0 position. **Do not** change any of the 6 model configuration DIP switches unless the DIP switches have been changed inadvertently and model configuration fault 01 is displayed.
3. For conventional systems, if an electric heat kit is installed, set the aux heat configuration DIP switches to select the specific electric heat kit model and adjust the electric heat kit stage settings and the electric heat kit airflow if required. For communicating systems, you use the Hx 3 Touch Screen Thermostat for electric heat kit configuration.
4. For conventional systems, set the DIP switch for the humidistat if required. For communicating systems, you use the Hx 3 Touch Screen Thermostat to enable the dehumidification feature.
5. For conventional or communicating systems, set the DIP switch for AC/HP operation as required for the type of outdoor unit being used. The DIP switch is factory set for HP operation.
6. For conventional systems, set the DIP switches for stage delay if required. For communicating systems, you use the Hx 3 Touch Screen Thermostat to configure stage delay settings.
7. For conventional systems, familiarize yourself with the airflow and comfort settings and configure them if required. For communicating systems, you use the Hx 3 Touch Screen Thermostat to configure airflow and comfort settings.
8. For conventional or communicating systems, wire the thermostat to the control board. For conventional systems, the room thermostat and outdoor section wire to a factory-supplied harness located in the low voltage control wiring compartment. For communicating systems, a field supplied pig-tail must be connected to the control board ARCB connection.

Understanding the unit control board

It is important to become familiar with how the air handler control board works before you set up the controls. See [Figure 22](#) for an illustration of the control board.

Figure 22: JSC control board



A2160-002

The control board in JSC air handlers contains a variety of new features including two 7-segment LED displays that can be used to aid in unit setup, unit diagnostics, and viewing the unit mode or status. The constant CFM indoor blower motor communicates with the control board using the ClimateTalk communications protocol. Motor program data and unit model and parameter information are stored on a removable electrically erasable programmable read-only memory (EEPROM) storage device. The EEPROM storage device is inserted to the EE plug location marked as P7 on the control board.

The control board has a refrigerant leak detection sensor port that is connected to a refrigerant leak sensor located on the front of the indoor coil. The control monitors LFL (lower flammable limit) percentage from the leak detection sensor. If the refrigerant LFL reaches 15%, the control shall de-energize the auxiliary heat kit outputs, compressor outputs, energize the blower motor to high heat speed, and display the appropriate fault code.

JSC air handlers use field-installed electric heat kits from the 8HK series. The 8HK electric heat kit does not communicate with the control board. The control board has no way of knowing which electric heat kit, if any, is physically connected to it.

The control board can interface with the following:

- Conventional room thermostat
- Hx 3 Touch Screen Thermostat (S1-THXU430W), which is a communicating room thermostat. You can use Hx 3 Touch Screen Thermostats in an air handler only application or with a fully communicating outdoor unit. When using an Hx 3 Touch Screen Thermostat, the air handler does not control a non-communicating outdoor unit.
 - **Important:** If an Hx 3 Touch Screen Thermostat is used and wired using communications, it must have software version 3.00zn or later.

The control board has a float switch input that you can use only if controlling the air handler with a Hx 3 Touch Screen Thermostat. The float switch input is ignored unless you activate it during installer setup of the Hx 3 Touch Screen Thermostat. The air handler can use either a normally open or normally closed float switch, selectable during installer setup.

ⓘ Note: Do not change settings configuration DIP switches 7 and 8 for the float switch in the SW5 switch bank.

There are 4 banks of DIP switches in the lower right-hand corner of the control board:

- SW2: The SW2 switch bank is located in quadrant A. You use this for air handler model configuration for conventional and communicating systems if required. The air handler model ID is programmed into the control board at the factory, so all of the model configuration DIP switches are set in the off or 0 position. Typically, no change is necessary.
- SW3: The SW3 switch bank is located in quadrant B. You use this for aux heat configuration for an electric heat kit for conventional systems. For communicating systems, you use the Hx 3 Touch Screen Thermostat for configuration.
- SW4: The SW4 switch bank is located in quadrant C. You use this for airflow configuration for conventional systems. For communicating systems, you use the Hx 3 Touch Screen Thermostat for configuration.
- SW5: The SW5 switch bank is located in quadrant D. You use this for settings configuration for heating and cooling operation, continuous fan speed, stage delay, and the humidistat for conventional systems. For communicating systems, you use the Hx 3 Touch Screen Thermostat for configuration.

Each DIP switch has an on or off position. Every individual DIP switch comes from the factory in the off position. The off position is also referred to as the number 0. The on position is also referred to as the number 1. This is binary code where there are only two states: off and on. Each individual setting on the air handler has an address made up of binary code. For example, the address of the JSC48C air handler model is 010111, so the 1, 2, 3, 4, 5, and 6 DIP switches in the SW2 switch bank in quadrant A are set to off, on, off, on, on, on, respectively. See [Figure 22](#).

It is important to be aware of the following:

- You must apply power to the JSC air handler before making any changes to DIP switch settings.
- There must be **no** active thermostat calls (inputs) during control board setup. If there is an active call when you are making changes to DIP switch settings, the change does not save.
- You must set the model configuration DIP switches if applicable and the aux heat configuration DIP switch settings as required before making any changes to the airflow configuration or settings configuration DIP switch settings.
- When you change the model configuration and aux heat configuration DIP switch settings in the SW2 or SW3 switch banks, the control board displays a fault until you press and hold the push button on the control board for 6 s to 9 s to reset the control board. When you change the airflow configuration or settings configuration DIP switch settings in the SW4 or SW5 switch banks, the control board does not display a fault, so you do not need to press and hold the push button to reset the control board.

Checking the unit model configuration

The six model configuration DIP switches in the SW2 switch bank in quadrant A come factory set in the 0 or off position. The air handler model ID is programmed into the control board at the factory. [Table 9](#) shows the model ID for each JSC air handler.

Table 9: JSC air handler model IDs

Model	Model ID
JSC48C5CG2SS	7C
JSC48D5CG2SS	8C
JSC60D5CJ2SS	2d

It is important to check that the air handler model ID is correct in case the model configuration switches have been changed inadvertently. If the stored air handler model ID is not correct, you must set the model configuration. See [Setting the unit model](#).

To check the unit model configuration, do the following:

1. Apply power to the air handler. The control board should display **d1**, which is a start-up delay.
2. Wait approximately 20 s for the air handler to go into standby mode.
If the status LED blinks green 2s ON/2s OFF, this indicates that the air handler model ID is correct. If the DIP switches have been changed inadvertently, model configuration fault code **01** is displayed, and blower match error fault code **02** is also typically displayed because the stored program on the blower motor does not match the air handler model.
3. Press and release the push button on the control board once to display the air handler model ID.
4. Check the air handler model ID using [Table 9](#) and proceed as follows:
 - If the air handler model ID is correct, do not change the **MODEL CONFIGURATION** DIP switches from the factory setting of 000000.
 - If the air handler model ID is not correct, follow the procedure in [Setting the unit model](#).

Setting the unit model

Before you begin:

Check the air handler model configuration.

The six model configuration DIP switches in the SW2 switch bank in quadrant A come factory set in the 0 or off position. The air handler model is programmed into the control board at the factory. If the model configuration switches get changed inadvertently from the off position to a different position, you must set the air handler model.

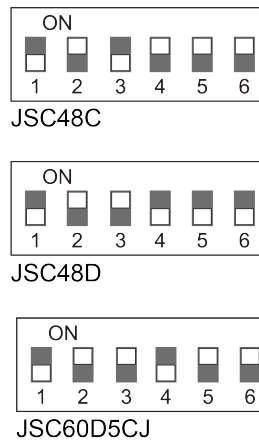
► Important:

- There must be **no** active thermostat calls (inputs) during control board setup. If there is an active call when you are making changes to DIP switch settings, the change does not save.
- Be aware that when you change the DIP switch settings in the SW2 switch bank, the control board displays a fault until you press and hold the push button on the control board for 6s to 9s to reset the control board.

To set the unit model, do the following:

1. Make sure that power is applied to the air handler and the air handler is in standby mode.
2. Check the air handler model shown on the unit nameplate. In the SW2 switch bank in quadrant A, change **MODEL CONFIGURATION** DIP switches **1, 2, 3, 4, 5,** and **6** to the positions shown for the specific air handler model in [Figure 23](#). Fault code **01** displays.

Figure 23: DIP switch settings by JSC model



A2212-001

- Press and hold the push button on the control board for 6 s to 9 s and wait for the air handler to go into standby mode.

Note: If the air handler does not go into standby mode and fault code **01** continues to display, check to make sure the DIP switch settings are the correct ones for the specific air handler model and press and hold the push button again for 6s to 9s.

Configuring the electric heat kit

Before you begin:

Check the air handler model configuration and set the air handler model if required.

This task applies only for conventional systems.

Important: If you are using a communicating system, you use the Hx 3 Touch Screen Thermostat for electric heat kit configuration.

If you are using a conventional system and an electric heat kit is installed, you must set aux heat configuration DIP switches 3, 4, 5, and 6 in the SW3 switch bank in quadrant B to select the specific electric heat kit model. See [Table 17](#) and [Table 18](#) for the DIP switch settings for single-phase and three-phase electric heat kits used with specific air handler and indoor coil models. The DIP switch setting for electric heat kit selection also sets the appropriate required airflow for the electric heat kit. For some air handler, indoor coil, and electric heat kit system combinations, you can reconfigure the airflow for the electric heat kit if required using airflow configuration DIP switches 1 and 2 for heat in the SW4 switch bank in quadrant C. If you change the DIP switches from 00 to 01, this increases the electric heat kit airflow by 20%. The blower speed required for first-stage and second-stage electric heat is different from cooling or heat pump heating. See [Table 17](#) and [Table 18](#) for the minimum required airflow based on the electric heat kit installed. If you are using a multi-stage electric heat kit, you can reconfigure the stage settings for the electric heat kit if required using aux heat configuration DIP switches 1 and 2 in the SW3 switch bank in quadrant B. Some 8HK heat kits have only one stage of heat and some have multiple stages of heat available. Single-phase electric heat kits that are 10 kW and below are single stage. Three-phase electric heat kits that are 15 kW and below are single stage. Single-stage heat kits require only one input referred to as W1. Multi-stage heat kits require two inputs referred to as W1 and W2. Five of the electric heat kits in the 8HK series are multi-stage electric heat kits. [Table 10](#) shows the amount of heat per stage for these multi-stage electric heat kits.

Table 10: Electric heat kit staging at 240 V

Multi-stage electric heat kit model	W1	W2	W1+W2
8HK*6501506	4.8 kW	9.6 kW	14.4 kW
8HK*6502006	9.6 kW	9.6 kW	19.2 kW
8HK*6502506	9.6 kW	14.4 kW	24 kW
8HK*6502025	9.6 kW	9.6 kW	19.2 kW
8HK*6502525	12 kW	12 kW	24 kW

The control connects to the heater relays using pins four, five, and six of connector P3. The relay outputs are 24 VAC. The control energizes the heat relays as shown in the following table.

Table 11: Heat relays

Input	Heat relay output
W1	HT1
W2	HT2
W1 and W2	HT1 and HT2

Depending on the electric 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. For example, when the control's W1 input is connected to the room thermostat's first-stage heat signal, a call for first-stage heat energizes 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 energizes one heating element (HT2). With either configuration, the control energizes two heating elements (HT1 and HT2) when it receives a first and second stage heat input from the thermostat. Heat kit outputs based on thermostat inputs can be configured differently if required. The air handler control board allows you to configure the W1 input to the control board itself to operate the W1 input of the electric heat kit, W2 input of the electric heat kit, or W1 and W2 inputs of the electric heat kit by adjusting the stage settings for the electric heat kit. See [Table 19](#) for the DIP switch setting options and note the following:

- When you set the stage DIP switches to 00 (off, off) or 01 (off, on), W1 input = HT1 output.
- When you set the stage DIP switches to 10 (on, off), W1 input = HT2 output.
- When you set the stage DIP switches to 11 (on, on), W1 input = HT1 and HT2 output.

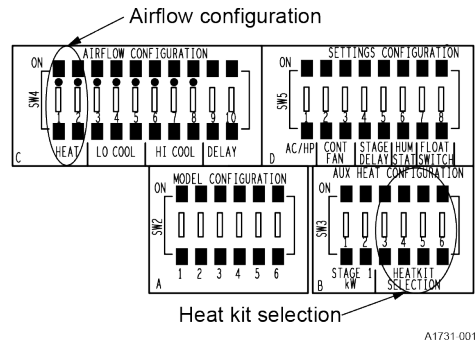
For heat pump applications, it is best practice to use only the least amount of electric heat necessary to correctly temper the indoor air during unit defrost. Heat pumps energize W1 on the air handler control board only during defrost. For a system combination that uses a JSC48 air handler, a 15 kW electric heat kit, and a 3-ton heat pump, for example, you would need to change the stage settings for the electric heat kit. The first stage of heat on a 15 kW heat kit is only 4.8 kW which is not sufficient for a 3-ton heat pump. It is much more appropriate to use only the second stage of the 15 kW heat kit by setting the stage DIP switches to 10, so when the heat pump goes into defrost, 9.6kW of electric heat is energized. If you reconfigure the stage settings for the electric heat kit, make sure that the DIP switch settings you use are correct for the specific electric heat kit model. For example, for the 8HK16501006 electric heat kit model, if you set the stage DIP switches to 10 or 11, fault code 04 displays. This is because this 10 kW electric heat kit model is only single-stage, meaning W1 always and only equals W1. There is no W2 with a 10 kW electric heat kit.

► **Important:**

- Be aware that when you change the DIP switch settings in the SW3 switch bank, the control board displays a fault until you press and hold the push button on the control board for 6 s to 9 s to reset the control board.
- There must be **no** active thermostat calls (inputs) during control board setup. If there is an active call when you are making changes to DIP switch settings, the change does not save.

[Figure 24](#) shows the DIP switches for selecting the electric heat kit model and adjusting the airflow for the electric heat kit.

Figure 24: Control board - DIP switches for electric heat kits



To configure the electric heat kit, do the following:

1. Make sure that power is applied to the air handler and the air handler is in standby mode.
2. Check the air handler model number and the electric heat kit model number for your specific installation.
3. Use [Table 17](#) or [Table 18](#) to identify the correct DIP switch setting for the electric heat kit. Then, in the **SW3** switch bank in quadrant **B**, set **AUX HEAT CONFIGURATION** DIP switches **3, 4, 5,** and **6** for electric heat kit selection accordingly. Fault code **03** displays.

For example, as shown in [Table 17](#), if you have a JSC48 air handler and you are using the 8HK(0,1)6500506 electric heat kit, the DIP switch setting is 0010. In this case, you would set **AUX HEAT CONFIGURATION** DIP switches **3, 4, 5,** and **6** for electric heat kit selection in the **SW3** switch bank to 0010.

4. Press and hold the push button on the control board for 6 s to 9s and wait for the air handler to go into standby mode.
 - ⓘ **Note:** If the air handler does not go into standby mode and fault code **03** continues to display, check to make sure the DIP switch settings are the correct ones for the specific air handler model and press and hold the push button again for 6 s to 9 s
5. If you are using a multi-stage electric heat kit and you need to reconfigure the stage settings for the electric heat kit, see the Aux heat configuration DIP switch settings section. Then, in the **SW3** switch bank in quadrant **B**, set **AUX HEAT CONFIGURATION** DIP switches **1** and **2** for stage as required. Fault code **04** displays.
6. Press and hold the push button on the control board for 6 s to 9s.
 - ⓘ **Note:** If the air handler does not go into standby mode and fault code **04** continues to display, check to make sure the DIP switch settings are the correct ones for the specific electric heat kit model and press and hold the push button again for 6 s to 9 s.
7. If you need to reconfigure the airflow for the electric heat kit, see [Table 17](#) or [Table 18](#). Then, in the **SW4** switch bank in quadrant **C**, set **AIRFLOW CONFIGURATION** DIP switches **1** and **2** for heat as required.

Setting the DIP switch for the humidistat

This task applies only for conventional systems.

- **Important:** If you are using a communicating system, on the Hx 3 Touch Screen Thermostat, to enable the dehumidification feature, choose **dehumidify with equipment** in the **service menu dehumidification** setting.

If you are using a conventional system, you must use the DIP switch for the humidistat in the SW5 switch bank in quadrant D to configure the control to monitor the humidity switch input. If you set the DIP switch for the humidistat to the off position, the control ignores the HUM input. If you set the DIP switch for the humidistat to the on position, the control monitors the HUM input to control the blower speed for dehumidification during cooling operation. For conventionally wired systems, an open-on-rise humidistat is wired between air handler board R and HUM input to use this feature. The HUM input is strictly for dehumidification during cooling operation and has no control over the HUM OUT humidifier connections.

- **Important:** There must be **no** active thermostat calls (inputs) during control board setup. If there is an active call when you are making changes to DIP switch settings, the change does not save.

To set the DIP switch for the humidistat, do the following:

1. Make sure that power is applied to the air handler and the air handler is in standby mode.
2. If using a communicating control or a humidistat for dehumidification control is installed, in the **SW5** switch bank in quadrant **D**, set **SETTINGS CONFIGURATION** DIP switch **6** for the humidistat to the on position.

Setting the DIP switch for AC/HP operation

For conventional or communicating systems, the DIP switch for AC/HP operation in the SW5 switch bank in quadrant D configures the control to operate correctly with an air conditioner (on position) or heat pump (off position). The DIP switch is factory set for HP operation. If you set the DIP switch for AC/HP operation to the on position, the control treats any Y call as a cooling call only. If you set the DIP switch for AC/HP operation to the off position, the control treats a Y call as a heat pump heating call unless accompanied by an O (reversing valve) call. However, if the control is in S1 mode, the control treats a Y call with an O/B call as a heat pump heating call. This tells the control whether the system is in heating or cooling mode and energizes the 24 VAC HUM output when the blower is on and a heating call is present.

- **Important:** There must be **no** active thermostat calls (inputs) during control board setup. If there is an active call when you are making changes to DIP switch settings, the change does not save.

To set the DIP switch for AC/HP operation, do the following:

1. Make sure that power is applied to the air handler and the air handler is in standby mode.
2. In the **SW5** switch bank in quadrant **D**, set **SETTINGS CONFIGURATION** DIP switch **1** for AC/HP operation as required for the type of outdoor unit being used:
 - Set the DIP switch to the on position for an air conditioner.
 - Set the DIP switch to the off position for a heat pump.

Setting the DIP switches for stage delay

This task applies only for conventional systems.

- **Important:** If you are using a communicating system, you use the Hx 3 Touch Screen Thermostat to configure stage delay settings.

For conventional systems, if you are using a single-stage thermostat with a multi-stage electric heat kit, you must adjust the stage delay settings to allow a W2 electric heat kit output when a W1 input is present after a 10 min, 15 min, or 20 min delay. You do this using settings configuration DIP switches 4 and 5 for stage delay in the SW5 switch bank in quadrant D. The factory setting is 00. [Table 12](#) shows the DIP switch setting options.

Table 12: Stage delay DIP switch settings

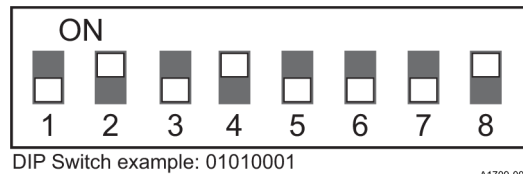
Stage delay DIP switch setting	Time (min)
00	disabled
01	10
10	15
11	20

- **Important:** There must be **no** active thermostat calls (inputs) during control board setup. If there is an active call when you are making changes to DIP switch settings, the change does not save.

To set the DIP switches for stage delay, do the following

1. Make sure that power is applied to the air handler and the air handler is in standby mode.
2. See [Table 12](#). Then, in the **SW5** switch bank in quadrant **D**, set **SETTINGS CONFIGURATION** DIP switches **4** and **5** for stage delay as required.

Figure 25: DIP-8



Understanding airflow and comfort settings

This topic applies only for conventional systems.

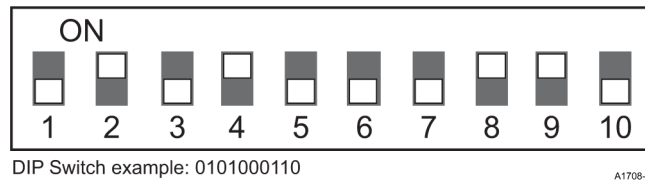
- **Important:** If you are using a communicating system, you use the Hx 3 Touch Screen Thermostat to configure airflow and comfort settings.

If you are using a conventional system, you must configure the following airflow and comfort settings using the control board at the time of installation for correct system operation:

- Airflow speed and comfort settings. You do this using the airflow configuration switches in the SW4 switch bank in quadrant C. See [Configuring low-speed and high-speed airflow](#) and [Configuring comfort settings](#) and use the information in [Table 27](#) to configure the DIP switches correctly.
- Continuous fan airflow: You do this using settings configuration DIP switches 2 and 3 in the SW5 switch bank in quadrant D. See [Configuring continuous fan airflow](#).

See [Figure 26](#) for an example of airflow configuration DIP switch settings. 0 indicates the off position and 1 indicates the on position.

Figure 26: DIP-10



Inputs to the air handler control board pass to the motor, which determines the target CFM to deliver.

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.

If too many supply registers are closed, a filter becomes clogged, or there is a restriction in the ductwork, the motor automatically operates at a higher speed to compensate for the higher ESP. This may result in a higher operating sound level and motor damage.

Configuring low-speed and high-speed airflow

This task applies only for conventional systems.

- **Important:** If you are using a communicating system, you use the Hx 3 Touch Screen Thermostat to configure low-speed and high-speed airflow settings.

If you are using a conventional system, you must configure low-speed and high-speed airflow settings using the control board at the time of installation for correct system operation. You do this using the airflow configuration DIP switches in the SW4 switch bank in quadrant C. You use airflow configuration DIP switches 3, 4, and 5 for the low-speed airflow setting, which is for the heat pump heating and air conditioner compressor airflow speed when the Y1 input for the air handler is energized. You use airflow configuration DIP switches 6, 7, and 8 for the high-speed airflow setting, which is for the heat pump heating and air conditioner compressor airflow speed when the Y/Y2 input for the air handler is energized. If you are using a multi-stage outdoor unit, you must adjust the DIP switch settings for low-speed airflow and high-speed airflow. If you are using a single-stage outdoor unit, you do not need to change the factory setting for low-speed airflow, but you must adjust the DIP switch settings for high-speed airflow. Refer to the outdoor unit *Technical Guide* for the appropriate airflow with the matching indoor coil. See [Airflow data](#) for high-speed and low-speed airflow options, and see [Figure 26](#) for an example of DIP switch settings.

- ① **Note:** The control board is factory set for heat pump applications. For air-conditioner applications, make sure that the DIP switch for AC/HP operation is set to the on or 1 position. See [Setting the DIP switch for AC/HP operation](#).
- **Important:** There must be **no** active thermostat calls (inputs) during control board setup. If there is an active call when you are making changes to DIP switch settings, the change does not save.

To configure low-speed and high-speed airflow, do the following:

1. Make sure that power is applied to the air handler and the air handler is in standby mode.
2. Refer to the outdoor unit *Technical Guide* and use [Airflow data](#) to check the appropriate system airflow for the specific air handler model and outdoor unit.
3. In the **SW4** switch bank in quadrant **C**, adjust **AIRFLOW CONFIGURATION** DIP switches **3**, **4**, and **5** for low-speed airflow if needed.
4. In the **SW4** switch bank in quadrant **C**, adjust **AIRFLOW CONFIGURATION** DIP switches **6**, **7**, and **8** for high-speed airflow as needed.

Configuring comfort settings

This task applies only for conventional systems.

► **Important:** If you are using a communicating system, you use the Hx 3 Touch Screen Thermostat to configure comfort settings.

If you are using a conventional system, you must configure comfort settings using the control board at the time of installation for correct system operation. JSC air handlers have four different blower motor delay profile settings or comfort settings:

- **Normal:** When you use the normal setting, this provides a blower motor ramp-up from zero airflow to full capacity and a blower motor ramp-down from full capacity back to zero airflow.
 - **Humid:** You can use the humid setting for installations where the humidity is frequently very high during cooling season. On a call for cooling, the blower motor ramps up to 50% of full capacity and remains at 50% of full capacity for 2 min, then ramps up to 82% of full capacity and remains at 82% of full capacity for 5 min, and then ramps up to full capacity, and remains at full capacity until the thermostat setpoint is reached.
 - **Dry:** You can use the dry setting for installations where excessive humidity is not generally a problem, where the summer months are usually dry. On a call for cooling, the blower motor ramps up to full capacity and remains at full capacity until the thermostat setpoint is reached. At the end of the cooling cycle, the blower motor ramps down to 50% of full capacity and remains at 50% of full capacity for 60 s, and then ramps down to zero.
 - **Temperate:** You can use the temperate setting for most installations, where neither excessive humidity nor extremely dry conditions are the norm. On a call for cooling, the blower motor ramps up to 63% of full capacity and remains at 63% of full capacity for 90 s, and then ramps up to full capacity. At the end of the cooling cycle, the blower motor ramps down to 63% of full capacity and stays at 63% of full capacity for 30 s, and then ramps down to zero.
- ① **Note:** To minimize the sound made by the blower when it speeds up or slows down, the blower slowly ramps up or down from one speed to another. Changes in blower speed during AC or heat pump heating can take up to 30 s. Changes in blower speed during electric resistance heating can take up to 15 s.

You configure the comfort settings using airflow configuration DIP switches 9 and 10 for blower motor delay in the SW4 switch bank in quadrant C. See [Table 13](#) for the DIP switch settings for each comfort setting.

Table 13: DIP switch settings for comfort settings

Delay tap	Comfort setting
A = 00	Normal
B = 01	Humid
C = 10	Dry
D = 11	Temperate

► **Important:** There must be **no** active thermostat calls (inputs) during control board setup. If there is an active call when you are making changes to DIP switch settings, the change does not save.

To configure comfort settings, do the following:

1. Make sure that power is applied to the air handler and the air handler is in standby mode.
2. Check the DIP switch settings for the required comfort setting in [Table 13](#). Then, in the SW4 switch bank in quadrant C, set AIRFLOW CONFIGURATION DIP switches 9 and 10 for blower motor delay accordingly.

Configuring continuous fan airflow

This task applies only for conventional systems.

- **Important:** If you are using a communicating system, you use the Hx 3 Touch Screen Thermostat to configure continuous fan airflow settings.

If you are using a conventional system, you must configure continuous fan airflow settings using the control board at the time of installation for correct system operation. You do this using settings configuration DIP switches 2 and 3 in SW5 switch bank in quadrant D. You can adjust the DIP switch settings to increase airflow during a fan-only call if required. There are four different settings. Each setting is a percentage of the maximum airflow of the air handler model. See [Table 14](#), which shows the DIP switch setting options as a percentage of maximum airflow. The factory setting is 00, which is 40% of maximum airflow.

Table 14: Continuous fan DIP switch settings

Continuous fan DIP switch setting	% of maximum airflow
00	40
01	60
10	80
11	100

- **Important:** There must be **no** active thermostat calls (inputs) during control board setup. If there is an active call when you are making changes to DIP switch settings, the change does not save.

To configure continuous fan airflow, do the following:

1. Make sure that power is applied to the air handler and the air handler is in standby mode.
2. Check the DIP switch settings for the required continuous fan setting in [Table 14](#). Then, in the **SW5** switch bank in quadrant **D**, set **SETTINGS CONFIGURATION** DIP switches **2** and **3** for continuous fan airflow accordingly.

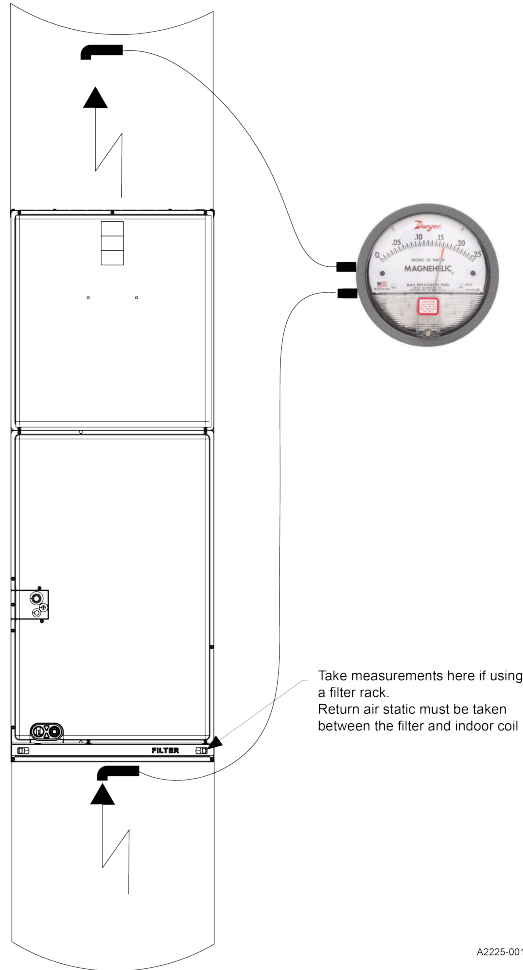
Wiring the thermostat to the control board

1. Consult the system wiring diagram to determine the correct thermostat wiring for the system.
2. Complete the thermostat wiring as required:
 - If you are using a communicating thermostat, wire the field thermostat wires to the control board.
 - If you are using a conventional thermostat, wire the field thermostat wires to the factory-supplied low-voltage leads in the low-voltage compartment.

Adjusting the air system

You must adjust the air system to keep the CFM within the airflow limitations of the indoor coil if needed. To check the cubic feet per minute (CFM), measure the external duct static pressure using a manometer and static pressure tips. [Figure 27](#) shows how to use a manometer to measure external duct static pressure.

Figure 27: Duct static measurements



A2225-001

To adjust the air system, do the following:

1. To prepare the coil for static pressure measurements, run only the fan to ensure a dry coil.
 2. Drill two holes, one 12 in. away from the air handler in the supply air duct and one 12 in. away from the air handler in the return air duct, before any elbows in the ductwork.
 3. Insert the static pressure tips and energize the blower motor.
 4. Measure the supply air static pressure. Record this positive number.
 5. Measure the return air static pressure. Record this negative number.
- Note:** Return air static pressure must be taken after the air filter but before the indoor coil.
6. Treat the negative number as a positive, and add the two numbers together to determine the total external system static pressure.
 7. See [Table 27](#) to determine the airflow and make the necessary adjustments to keep the CFM within the airflow limitations of the coil.

Unit data

See the following tables for physical, electrical and airflow data for the JSC unit.

Physical and electrical data cooling only

Table 15: Physical and electrical data cooling only

Models		JSC48C5*G	JSC48D5*G	JSC60D5*J
Blower - diameter x width		11 x 10	11 x 11	11 x 11
Motor	HP	1 HP	3/4 HP	1 HP
	Nominal RPM	1050	1050	1050
Voltage		208/230	208/230	208/230
Full load amps at 230V		7.0	5.4	7.0
Filter	Type	Disposable or cleanable		
	Size	20 x 20 x 1	23 x 20 x 1	23 x 20 x 1
Shipping/operating weight (lb)		129/126	135/132	142/139

Electrical data cooling only

Table 16: Electrical data cooling only

Models	Motor FLA	Minimum circuit ampacity	MOP
JSC48D5*G	5.4	6.8	15
JSC48C5*G/JSC60D5*J	7	8.8	15

Note:

- FLA = Full Load Amps.
- 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.

Electrical heat - minimum fan CFM for single-phase heat kits

Table 17: Electrical heat - minimum fan CFM for single-phase heat kits

Electric heat kit models	Nominal kW at 240 V	Airflow configuration DIP switch settings for heat	Aux heat configuration DIP switch settings for electric heat kit selection	Air handler models		
				JSC48C5*G	JSC48D5*G	JSC60D5*J
8HK(0,1)6500206	2.4kW	00	0001	825	825	825
8HK(0,1)6500506	4.8kW	00	0010	825	825	825
8HK(0,1)6500806	7.7kW	00	0011	1100	1150	1150
8HK(0,1)6501006	9.6kW	00	0100	1100	1500	1500
8HK(1,2)6501506	14.4kW	00	0101	825, 1100	825, 1575	825, 1700
8HK(1,2)6502006	19.2kW	00	0110	1100, 1300	1325, 1575	1500, 1700
8HK(1,2)6502506	24kW	00	0111	—	1325, 1650	1500, 1800

Note:

- For electric heat kit model numbers in this table that include (0,1), 0 indicates no service disconnect **or** 1 indicates with service disconnect.
- For electric heat kit model numbers in this table that include (1,2) - 1 indicates with service disconnect and no breaker jumper bar **or** 2 indicates with service disconnect and breaker jumper bar.
- For minimum CFM, if there are no values present, the first value is low-stage CFM (W1) and the second value is full stage CFM (W1+W2). If higher kW/CFM is needed for low-stage, refer to [Table 19](#).
- To increase airflow by approximately 20%, adjust airflow configuration DIP switches 1 and 2 for heat from 00 to 01.

Electrical heat - minimum fan CFM for three-phase heat kits

Table 18: Electrical heat - minimum fan CFM for three-phase heat kits

Electric heat kit models	Nominal kW at 240 V	Airflow configuration DIP switch settings for heat	Aux heat configuration DIP switch settings for electric heat kit selection	Air handler models		
				JSC48C5*G	JSC48D5*G	JSC60D5*J
8HK06501025	9.6kW	00	1000	1150	1500	1700
8HK06501525	14.4kW	00	1001	1150	1575	1700
8HK16502025	19.2kW	00	1010	1150, 1300	1500, 1575	1700
8HK16502525	24kW	00	1011	—	1575, 1650	1700, 1800

Note:

- For electric heat kit model numbers in this table that include (0,1), 0 indicates no service disconnect **or** 1 indicates with service disconnect.
- For electric heat kit model numbers in this table that include (1,2) - 1 indicates with service disconnect and no breaker jumper bar **or** 2 indicates with service disconnect and breaker jumper bar.
- For minimum CFM, if there are no values present, the first value is low-stage CFM (W1) and the second value is full stage CFM (W1+W2). If higher kW/CFM is needed for low-stage, refer to [Table 19](#).
- To increase airflow by approximately 20%, adjust airflow configuration DIP switches 1 and 2 for heat from 00 to 01.

Aux heat configuration - stage 1 kW DIP switch settings

Table 19: Aux heat configuration - stage 1 kW DIP switch settings

W1 = W1	00, 01
W1 = W2	10
W1 = W1 + W2	11

Application factors rated CFM versus actual CFM

Table 20: Application factors rated CFM versus actual CFM

% of rated airflow (CFM)	80%	90%	100%	110%	120%
Capacity factor	0.96	0.98	1	1.02	1.03

kW and 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.

Table 21: kW and MBH conversions for total power input requirement

Distribution power	Nominal voltage	Conversion factor
208V	240V	0.75
220V	240V	0.84
230V	240V	0.92

Electric heat performance data for single-phase and three-phase

Table 22: Electric heat performance data for single-phase and three-phase

Heater models		Nominal kW at 240V	Total heat				kW staging			
			kW		MBH		W1 only		W2 + W2	
			208V	230V	208V	230V	208V	230V	208V	230V
Single-phase	8HK(0,1)6500206	2.4	1.8	2.2	6.2	7.5	1.8	2.2	1.8	2.2
	8HK(0,1)6500506	4.8	3.6	4.4	12.3	15	3.6	4.4	3.6	4.4
	8HK(0,1)6500806	7.7	5.8	7.1	19.7	24.1	5.8	7.1	5.8	7.1
	8HK(0,1)6501006	9.6	7.2	8.8	24.6	30.1	7.2	8.8	7.2	8.8
	8HK(1,2)6501506	14.4	10.8	13.2	36.9	45.1	3.6	4.4	10.8	13.2
	8HK(1,2)6502006	19.2	14.4	17.6	49.2	60.2	7.2	8.8	14.4	17.6
Three-phase	8HK(1,2)6502506	24	18	22	61.5	75.2	7.2	8.8	18	22
	8HK06501025	9.6	7.2	8.8	24.6	30.1	7.2	8.8	7.2	8.8
	8HK06501525	14.4	10.8	13.2	36.9	45.1	10.8	13.2	10.8	13.2
	8HK16502025	19.2	14.4	17.6	49.2	60.2	7.2	8.8	14.4	17.6
	8HK16502525	24	18	22	61.5	75.2	9	11	18	22

Note:

- For electric heat kit model numbers in this table that include (0,1), 0 indicates no service disconnect **or** 1 indicates with service disconnect.
- For electric heat kit model numbers in this table that include (1,2) - 1 indicates with service disconnect and no breaker jumper bar **or** 2 indicates with service disconnect and breaker jumper bar.

Electrical data for single source power supply: single-phase

Table 23: Electrical data for single source power supply: single-phase

Air handler models	Heater models	Heater amps at 240 V	Field wiring			
			Minimum circuit ampacity		MOP	
			208V	230V	208V	230V
JSC48C5*G	8HK(0,1)6500206	10	19.6	20.7	20	25
	8HK(0,1)6500506	20	30.4	32.7	35	35
	8HK(0,1)6500806	32	43.6	47.3	45	50
	8HK(0,1)6501006	40	52.0	56.6	60	60
	8HK(1,2)6501506	60	73.7	80.5	80	90
	8HK(1,2)6502006	80	95.3	104.4	100	110
JSC48D5*G	8HK(0,1)6500206	10	17.6	18.7	20	20
	8HK(0,1)6500506	20	28.4	30.7	30	35
	8HK(0,1)6500806	32	41.6	45.3	45	50
	8HK(0,1)6501006	40	50.0	54.6	60	60
	8HK(1,2)6501506	60	71.7	78.5	80	80
	8HK(1,2)6502006	80	93.3	102.4	100	110
JSC60D5*J	8HK(1,2)6502506	100	114.9	126.3	125	150
	8HK(0,1)6500206	10	19.6	20.7	20	25
	8HK(0,1)6500506	20	30.4	32.7	35	35
	8HK(0,1)6500806	32	43.6	47.3	45	50
	8HK(0,1)6501006	40	52.0	56.6	60	60
	8HK(1,2)6501506	60	73.7	80.5	80	90
	8HK(1,2)6502006	80	95.3	104.4	100	110
	8HK(1,2)6502506	100	116.9	128.3	125	150

Note:

- For electric heat kit model numbers in this table that include (0,1), 0 indicates no service disconnect **or** 1 indicates with service disconnect.
- For electric heat kit model numbers in this table that include (1,2) - 1 indicates with service disconnect and no breaker jumper bar **or** 2 indicates with service disconnect and breaker jumper bar.
- (1,2) - 1 = with service disconnect, no breaker jumper bar **or** 2 = with service disconnect and breaker jumper bar.

- 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 wiring sizing.

Electrical data for multi-source power supply: single-phase

Table 24: Electrical data for multi-source power supply: single-phase

Air handler models	Heater models	Heater amps at 240 V	Minimum circuit ampacity						MOP					
			208V			230V			208V			230V		
			Circuit						Circuit					
			1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
JSC48C5*G	8HK16501506	60	30.2	43.5	—	32.4	48.1	—	35	45	—	35	50	—
	8HK16502006	80	52.0	43.3	—	56.6	47.8	—	60	45	—	60	50	—
JSC48D5*G	8HK16501506	60	28.2	43.5	—	30.4	48.1	—	30	45	—	35	50	—
	8HK16502006	80	50.0	43.3	—	54.6	47.8	—	50	45	—	60	50	—
	8HK16502506	100	50.0	43.3	21.6	54.6	47.8	23.9	60	45	25	60	50	25
JSC60D5*J	8HK16501506	60	30.2	43.5	—	32.4	48.1	—	35	45	—	35	50	—
	8HK16502006	80	52.0	43.3	—	56.6	47.8	—	60	45	—	60	50	—
	8HK16502506	100	52.0	43.3	21.6	56.6	47.8	23.9	60	45	25	60	50	25

Electrical data for single source power supply: three-phase

Table 25: Electrical data for single source power supply: three-phase

Air handler models	Heater models	Heater amps at 240 V	Field wiring			
			Minimum circuit ampacity		MOP	
			208V	230V	208V	230V
JSC48C5*G	8HK06501025	23.1	33.7	36.4	35	40
	8HK06501525	34.6	46.2	50.2	50	60
	8HK06502025 ³	46.2	58.7	64.0	60	70
JSC48D5*G	8HK06501025	23.1	31.7	34.4	35	35
	8HK06501525	34.6	44.2	48.2	45	50
	8HK06502025 ³	46.2	56.7	62.0	60	70
	8HK06502525 ³	57.7	69.2	75.8	70	80
JSC60D5*J	8HK06501025	23.1	33.7	36.4	35	40
	8HK06501525	34.6	46.2	50.2	50	60
	8HK06502025 ³	46.2	58.7	64.0	60	70
	8HK06502525 ³	57.7	71.2	77.8	80	80

ⓘ Note:

- MOP = Maximum overcurrent protection device; must be HACR type circuit breaker or time delay fuse. The first 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 wiring sizing.
- The 20kW and 25kW heater models (8HK16502025 and 8HK16502525) 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.

Electrical data for multi-source power supply: three-phase

Table 26: Electrical data for multi-source power supply: three-phase

Air handler models	Heater models	Heater amps at 240 V	Minimum circuit ampacity				MOP			
			208V		230V		208V		230V	
			Circuit				Circuit			
			1st	2nd	1st	2nd	1st	2nd	1st	2nd
JSC48C5*G	8HK16502025	46.2	33.7	25.0	36.4	27.6	35	25	40	30
JSC48D5*G	8HK16502025	46.2	31.7	25.0	34.4	27.6	35	25	35	30
	8HK16502525	57.7	38.0	31.2	41.3	34.5	40	35	45	35
JSC60D5*J	8HK16502025	46.2	33.7	25.0	36.4	27.6	35	25	40	30
	8HK16502525	57.7	40.0	31.2	43.3	34.5	40	35	45	35

Note:

- The 20 kW and 25 kW heater models (8HK16502025 and 8HK16502525) come with circuit breakers as standard.
- MOP = Maximum overcurrent protection device; must be HACR type circuit breaker or time delay fuse. The first 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 wiring sizing.

Airflow data

Table 27: Airflow data JSC48 models to JSC60 models

DIP switch	JSC48C5*G		JSC48D5*G		JSC60D5*J	
	HI COOL	LO COOL	HI COOL	LO COOL	HI COOL	LO COOL
000	1150	725	1125	700	1375	925
001	1250	775	1225	875	1475	1050
010	1350	850	1325	925	1750	1125
011	1450	900	1425	1000	1875	1225
100	1575	975	1550	1075	2000	1350
101	1675	1025	1675	1150	2000	1400
110	1775	1100	1800	1225	2000	1475
111	1875	1150	1900	1275	2000	1575

Note:

- Air handler units have been tested to UL 60335-2-40 / CSA 22.2 No. 236 standards up to 0.60 in. W.C. external static pressure.
- Dry coil conditions only, tested without filters.
- For optimal performance, external static pressures of 0.2 in. to 0.5 in. are recommended. Heating applications tested at 0.50 in. W.C. esp. Above 0.5 in. CFM is reduced by 2% per 0.1 in. increase in static.
- Low speed cooling used only with two stage outdoor units.
- Dehumidification speed is 85% of jumper selected COOL tap.
- When operating in both heat pump and electric heat modes, the airflow (CFM) will be whatever is greater.
- 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.

Troubleshooting

It is important to understand unit status and fault codes and be able to identify wiring-related faults.

Status and fault codes

The control includes an LED that displays status as well as two 7-segment displays to display fault codes. These codes are shown in [Table 28](#). The control displays the fault codes until power is removed from the control or the fault condition is no longer present.

Table 28: Fault codes

Fault description	Status LED (AN2)	7-segment display 1 (DISP1)	7-segment display 2 (DISP2)
No power to control	OFF	-	-
Control normal operation – no call for operation - standby mode	2 s ON/2 s OFF (heartbeat)	-	-
Control normal operation – in ASCD period	0.1 s ON/0.1 s OFF	d	5, 4, 3, 2, 1
Control normal operation – call for fan only and no active fault codes	ON	F	A
Control normal operation – call for first-stage cooling compressor and no active fault codes	ON	C	1
Control normal operation – call for second-stage cooling compressor and no active fault codes	ON	C	2
Max cool – no faults active	ON	C	3
Control normal operation – call for first-stage heating compressor and no active fault codes	ON	H	1
Control normal operation – call for second-stage heating compressor and no active fault codes	ON	H	2
Max heat – no faults active	ON	H	3
Auxiliary heat 1 – call for first-stage auxiliary heating and no active fault codes	ON	A	1
Auxiliary heat 2 – call for second-stage auxiliary heating and no active fault codes	ON	A	2
Stage 1 emergency heat (W without Y) – no faults active	ON	E	1
Stage 2 emergency heat (W without Y) – no faults active	ON	E	2
Float switch active – no faults active	ON	f	l
Software update – control board	ON	b	1
Software update – EE plug	ON	b	2
Software version – control board	ON	-	1 to 9
Software version – EE plug	ON	-	1 to 9
Any fault or event code that would prevent the equipment from running	See Table 29	-	-
No fault codes in memory	2 flashes	-	-
Fault code memory cleared	3 flashes	-	-

Table 29: Fault list

Fault or status	Display 1	Display 2	Simplified	Description
Internal control fault	0	A	Control failure	The control has failed and must be replaced.
Model configuration changed	0	1	Configuration faults	The model configuration DIP switch settings do not match the stored air handler model on the control. Press and hold the push button, with no calls to the control, for 6 s to 9 s, to clear and set the new model. If this error shows, 0 2 also usually shows. See Setting the unit model .
Blower match error	0	2		There is a mismatch between the motor and the stored air handler model on the control. A few different things could cause this: <ol style="list-style-type: none"> The motor is not compatible with the selected model. Change the model using the model configuration DIP switches. See Setting the unit model. The motor is not communicating with the control - accompanied by 0 6. Check your wiring, cycle power on the control, and the motor. The model configuration is not set - accompanied by 0 1. Press and hold the push button for 6 s to 9 s. Ensure there are no calls to the control or the model does not set. See Setting the unit model.
Heat kit configuration error	0	3		There is a mismatch between the aux heat configuration DIP switch settings for electric heat kit selection and the stored information on the control. A few different things could cause this: <ol style="list-style-type: none"> The aux heat configuration DIP switch settings for electric heat kit selection do not match the stored electric heat kit on the control. Press and hold the push button, with no calls to the control, for 6 s to 9 s, to clear and set the new model. See Configuring the electric heat kit. The aux heat configuration DIP switch settings for electric heat kit selection do not match the air handler model stored on the control. Check your model configuration and your electric heat kit selection. See Checking the unit model configuration and Configuring the electric heat kit.
Heat kit staging configuration changed	0	4		The aux heat configuration DIP switches for electric heat kit stage (stage 1 kW) do not match the stored information on the control. Hold the push button, with no calls to the control, for 6 s to 9 s, to clear and set the new model. See Configuring the electric heat kit .

Table 29: Fault list

Fault or status	Display 1	Display 2	Simplified	Description
Comm lost with HVAC system master	0	5	Comm lost	The control is no longer communicating with the HVAC system. If the system is conventional, cycle power. If the system is communication, ensure the main thermostat is powered, check the wiring, and check the main thermostat for faults.
Comm lost with motor	0	6	Motor connection lost	The control is no longer communicating with the ClimateTalk blower. Check the wiring between the motor and the control, and check that the motor is getting power.
Low voltage (<19 VAC)	0	7	Low-voltage error	The control is experiencing a low voltage condition. It continues with outputs already engaged, but does not engage new outputs. Check for damaged wiring and brown-out conditions.
Low voltage (<16 VAC)	0	8		The control is experiencing a very low-voltage condition. The control no longer keeps outputs engaged and shuts down the system. Check for damaged wiring and brown-out conditions. Lower voltage means the control does not turn on.
Refrigerant detection sensor (leak detected)	r	L	Refrigerant leak	The refrigerant detection sensor (RDS) control has sent a signal to the air handler control board indicating a refrigerant leak has been detected. The control energizes the indoor blower in high heat speed, de-energizes any electric heat signal, and de-energizes compressor output terminals HIC and LOC. The control returns to normal operation when the refrigerant LFL falls below 15% for a period of 5 minutes.
Refrigerant detection sensor (communications lost)	r	C	Refrigerant leak detection system	Communications have been lost between the control board and the refrigerant leak sensor. If communications are re-established, the control resumes normal operation.
Refrigerant detection sensor (sensor communicates internal sensor fault)	r	5	Refrigerant leak detection system	The refrigerant leak sensor has failed and should be replaced. If the sensor recovers from the internal failure, the control resumes normal operation.
Float switch fault activated	1	8	Float switch fault	The float switch tripped. Check there is not excess water in the drain pan, the drain pan is not clogged, and the float switch is operating correctly.
Call for reversing valve while in air conditioner mode	2	2	Incorrect wiring	The control senses 24 VAC on the O terminal. <ul style="list-style-type: none"> If the outdoor unit is not a heat pump, make sure that the settings configuration DIP switch for AC/HP operation is set correctly. If the outdoor unit is an air conditioner, check the wiring. If the outdoor unit is an HMM7 heat pump, ensure that the control is in S1 functionality.
Call for cooling and indoor heating at the same time	2	4		The control senses 24 VAC on the Y terminal and the W terminal while in air conditioner mode. <ul style="list-style-type: none"> If the outdoor unit is not a heat pump, adjust the settings configuration DIP switch for AC/HP operation to set it for AC operation. If the outdoor unit is an air conditioner, check the wiring to the conventional inputs. If the outdoor unit is an HMM7 heat pump, ensure that the control is in S1 functionality.
Call for reversing valve and heating at the same time	2	5		The control senses 24 VAC on the W terminal and the O terminal in heat pump mode. Check the wiring to the conventional inputs. <ul style="list-style-type: none"> If the outdoor unit is an HMM7 heat pump, ensure that the control is in S1 functionality.
Fan running without a call	3	0	Fan faults	The control senses the motor is moving without command. <ol style="list-style-type: none"> Check the wiring between the motor and the control. Cycle power on both the motor and the control. Verify there is nothing moving the blower besides the motor attached to this air handler control.
Fan failure	3	1		The control senses the motor is not moving with an active demand. <ol style="list-style-type: none"> Check the motor has sufficient power. Check the wiring between the motor and the control. Verify nothing is blocking the blower fan. Cycle power to both the motor and the control.

Table 29: Fault list

Fault or status	Display 1	Display 2	Simplified	Description
Fan - high voltage failure	3	2	Fan faults	The control senses the motor is receiving too high voltage. 1. Check the voltage going to the blower motor. 2. Check the wiring of power to the motor. 3. Cycle power to the motor and to the control. 4. Verify nothing is blocking the blower.
Fan - low voltage failure	3	3		The control senses the motor is receiving too low voltage. 1. Check the voltage going to the blower motor. 2. Check the wiring of power to the motor. 3. Cycle power to the motor and to the control.
Fan - high current failure	3	4		The control senses the motor is receiving too high current. 1. Check the power going to the blower motor. 2. Check the wiring of power to the motor. 3. Cycle power to the motor and to the control. 4. Verify nothing is blocking the blower.
Fan - low current failure	3	5		The control senses the motor is receiving too low current. 1. Check the power going to the blower motor. 2. Check the wiring of power to the motor. 3. Cycle power to the motor and to the control.
Fan - high temperature failure	3	6		The control senses the motor's internal temperature is too high. 1. Verify the airflow set on the air handler control is correct for the air handler model, heat kit, and staging. 2. Ensure nothing is blocking the blower. 3. Cycle power on the motor and the control.
Fan - low temperature failure	3	7		The control senses the motor's internal temperature is too low. 1. Verify the airflow set on the air handler control is correct for the air handler model, heat kit, and staging. 2. Ensure nothing is blocking the blower. 3. Cycle power on the motor and the control.
Fan - lost rotor	3	8		The control senses the motor has a lost rotor fault. 1. Ensure nothing is blocking the blower. 2. Cycle power on the motor and the control.
Fan - incomplete parameter	3	9		The control delivers incomplete data to the motor. 1. Check wiring between the control and the motor. 2. Check the EE plug is firmly seated into the control. 3. If the issue persists, cycle power to the control and the motor.
Fan - undesired parameter change	4	0		1. The control delivers a parameter change at the wrong time to the motor. Check wiring between the control and the motor. 2. Check the EE plug is firmly seated into the control. 3. If the issue persists, cycle power to the control and the motor.
Fan - fault limit lockout	4	1		The motor hits the fault limit and no longer runs. 1. Check the fault list on the control and troubleshoot those faults. 2. When these faults have been checked, cycle power to the motor and control.

Wiring-related faults

If the control receives a simultaneous call for electric heating and cooling (fault code 24), the control locks out and does not condition. See [Status and fault codes](#) for troubleshooting guidance.

Verifying TXV installation

Before continuing with the installation, ensure you have verified everything on the following checklist:

TXV checklist

- Is the coil metering device installed correctly?
- Is the correct TXV installed according to the *Technical Guide* or *Tabular Data Sheet* for the outdoor section?
- Is the TXV temperature bulb positioned correctly?
- Is the TXV temperature bulb insulated?
- Is the TXV equalizer line connected?

Maintenance

Inspect filters at least once per month, and clean or replace them when they become dirty. The frequency of cleaning depends upon the hours of operation and the local atmospheric conditions. Clean filters keep unit efficiency high.

Coil cleaning



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

If cleaning the coil is necessary, clean with water only.

As an alternative to water, Evap-Green by Nu-Calgon is the only pH neutral coil cleaner approved for use when it is correctly diluted. Ensure to thoroughly rinse the cleaned coils after using 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, shut off the unit immediately and clean the condensate pan and drains to ensure a free flowing primary drain.

Third-Party Trademarks Notice: For information about third-party trademarks, refer to the relevant company websites.

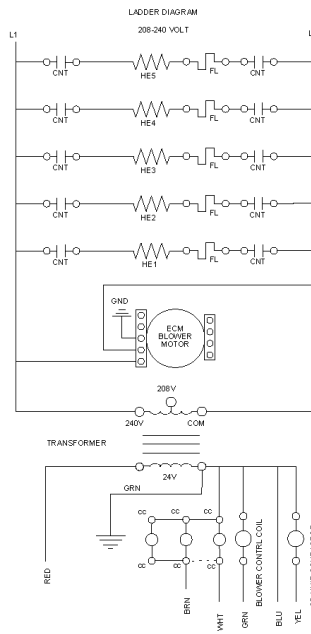
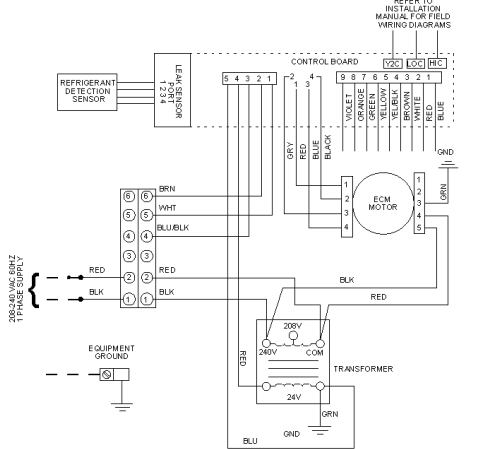
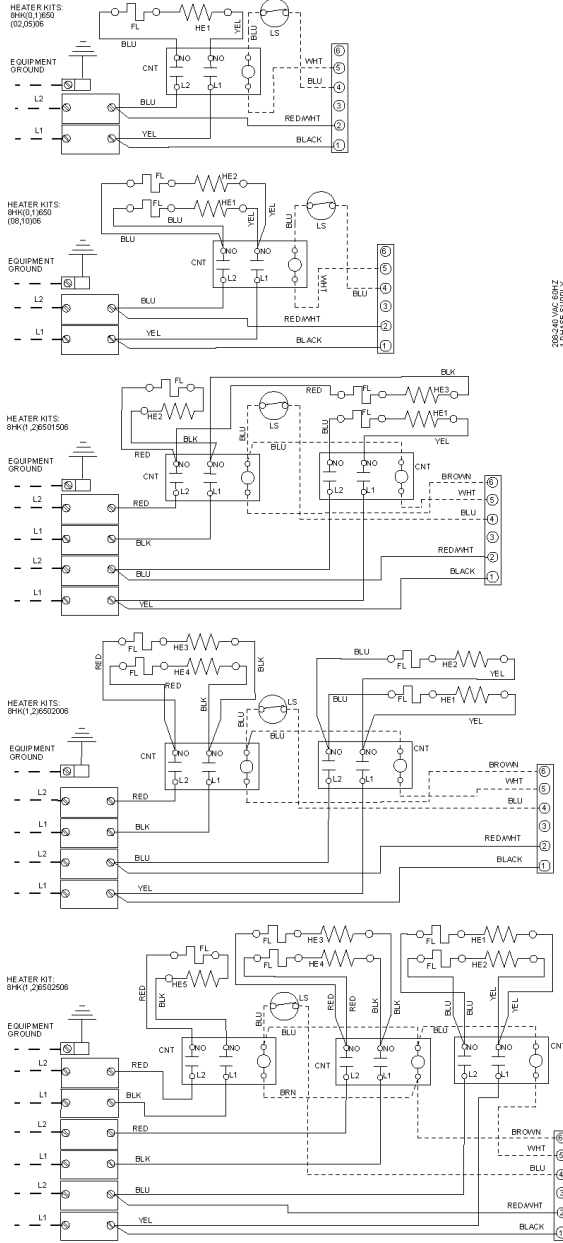
Wiring diagrams

Figure 28: Wiring diagram - standard single piece multi-position ECM

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.

AIR HANDLER - WITH NO HEAT KIT WIRING DIAGRAM



LEGEND:
 HE - HEATING ELEMENT
 FL - FUSIBLE LINK
 LS - LIMIT SWITCH
 CNT - CONTACTOR
 CC - CONTACTOR COIL
 CC - CONTACTOR COIL
 FIELD POWER WIRING - - - - -
 FACTORY WIRING - - - - -
 FACTORY WIRING LOW VOLTAGE - - - - -
 OPTIONAL OR MODEL SPECIFIC - - - - -

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

NOTES:
 COMPRESSOR (Y1 AND Y2) WIRES MUST BE ROUTED THROUGH THE INDOOR CONTROL BEFORE ROUTING TO THE OUTDOOR CONTROL/COMPRESSOR.
 FAILURE TO ROUTE COMPRESSOR CALLS THROUGH THE INDOOR CONTROL MAY POSE A DANGER IN THE EVENT OF A REFRIGERANT LEAK.

6412662-UWD-B-0324

Start-up sheet

Start-up Sheet

Residential Air Handler with Electric Heat

Correct 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 number Unit serial number

General information (check all that apply)

New construction Upflow Horizontal Left
 Retrofit Downflow Horizontal Right

Unit location and connections (check all that apply)

Unit is level Duct connections are complete: Supply Return
 Condensate drain is connected correctly (refer to installation manual) Condensate trap is primed with water

Filters

Filters installed Number of filters Filter size

Electrical connections and inspection (complete all that apply)

208 VAC 230 VAC 460 VAC
 Wires and electrical connections inspected Transformer wired correctly for primary supply voltage Ground connected
 Line voltage measured (VAC) Low voltage value between R and C at control board (VAC)
 Thermostat wiring is complete Thermostat cycle rate or heat anticipator adjusted to Installation Manual specifications

Airflow setup

Blower type and set-up	Variable speed ECM (circle 0 or 1)	Heat	0 / 1	0 / 1							
		Low cool	0 / 1	0 / 1	0 / 1						
		High cool	0 / 1	0 / 1	0 / 1						
		Delay	0 / 1	0 / 1							
		Stage 1 kW	0 / 1	0 / 1							
		Heat kit selection	0 / 1	0 / 1	0 / 1	0 / 1					
	Standard ECM	Compressor high	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
		Compressor low	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
		Continuous fan	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9
		Electric heat	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9

Supply static (in. W.C.) Supply air dry bulb temperature Outside air dry bulb temperature
 Return static (in. W.C.) Return air dry bulb temperature Return air wet bulb temperature
 Total external static pressure Temperature drop Supply air wet bulb temperature

Other switches (check all that apply)

HUMIDISTAT YES NO AC/HP AC HP CONT FAN L M H

Continued on next page

Electric heat (complete all that apply)

Electric heat kit:	Model number	<input type="text"/>	Serial number	<input type="text"/>	Rated kW	<input type="text"/>	
Number of elements	Measured amperage (A)	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 (V)	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"/>		

Job site clean-up

<input type="checkbox"/> Job site has been cleaned, and indoor and outdoor debris removed from job site. <input type="checkbox"/> Tools have been removed from unit. <input type="checkbox"/> All panels have been installed.

Unit operation and cycle test (complete all that apply)

<input type="checkbox"/> Operate the unit through continuous fan cycles from the thermostat, noting and correcting any problems. <input type="checkbox"/> Operate the unit through cooling cycles from the thermostat, noting and correcting any problems. <input type="checkbox"/> Operate the unit through mechanical heating cycles from the thermostat, noting and correcting any problems. <input type="checkbox"/> Operate the unit through emergency heating cycles from the thermostat, noting and correcting any problems.
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Owner education

<input type="checkbox"/> Provide the owner with the owner's manual. <input type="checkbox"/> Explain operation of system to the owner. <input type="checkbox"/> Explain thermostat use and programming (if applicable) to the owner. <input type="checkbox"/> Explain the importance of regular filter replacement and equipment maintenance.
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Comments and additional job details

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