Installation Manual: JHE Standard ECM Single-Piece Multi-Position Air Handlers

⚠ 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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Contents

About this unit

This single-piece air handler series provides the flexibility for installation in any position.

The JHE unit can be used for upflow, downflow, horizontal right, or horizontal left applications.

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

AHRI CERTIFIED™ www.ahridirectory.org Residential Furnaces DOE 10 CFR Part 430

UL CERTIFIED SAFETY US-CA SA11777

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

GoTemp Pro app (Formerly DS Solutions app)

BHC Group Heating & Cooling believes in empowering our customers with up-to-date, unit-specific information. Download GoTemp Pro app, a powerful, comprehensive app designed for contractors on the jobsite, available now in the App Store for iOS and Google Play for Android. Use the app to scan the unique QR code on the unit rating plate for easy access to product information and resources such as nomenclature, technical guide, installation manual, wiring diagrams, parts list, product registration, warranty, and much more. Simplify your tasks, save time, and stay ahead with the most comprehensive app built for professionals.

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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

Understand and pay particular attention to the signal words **DANGER**, **WARNING**, **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

If using this unit in a system with R454B, a mildly flammable (A2L) refrigerant, refer to the A2L refrigerant safety considerations to ensure safe installation, operation, and servicing of this unit.

For minimum airflow (CFM) requirements, refer to Table 2 in A2L refrigerant safety considerations.

⚠ 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.

Adhere to the following:

- Install this air handler in a location and position as specified in the *Selecting a location for installation* section.
- 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 in the *Selecting a location for installation* section.

⚠ 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 the 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 that 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. Configuration conversions must be done at the site of installation.

- 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

⚠ 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.

Note to the Inspector

The *A2L refrigerant safety considerations* section contains considerations unique to R-454B refrigerant installations and includes field-testing the refrigerant detection system (RDS).

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 room area (ft^2)	Minimum total conditioned room area (ft^2) (Z)	Minimum total conditioned room area (m^2) (Y)	Minimum airflow (CFM)
4-0	200	120	11.14	216
5-0	250	150	13.93	271
6-0	300	180	16.72	325
7-0	350	210	19.50	379
8-0	400	240	22.29	433
9-0	450	270	25.08	487
10-0	499	300	27.86	541
11-0	549	330	30.65	595
12-0	599	360	33.43	649
13-0	649	390	36.22	704
14-0	699	420	39.01	758
15-0	749	450	41.79	812
16-0	799	480	44.58	866
17-0	849	510	47.37	920
18-0	899	540	50.15	974
19-0	949	570	52.94	1028
20-0	999	600	55.72	1082
21-0	1049	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 (ft^2) = system charge x 29.9903
- Minimum conditioned room area (m^2) = system charge x 2.786
- Minimum system airflow (CFM) = system charge x 54.117

Altitude adjustment factors

If the unit is being installed at an elevation or altitude of 2600 ft (800 m) or higher, adjust the total conditioned room area (TA_{min}) in the minimum room area table by multiplying it by the altitude adjustment factor in Table 3 below:

Table 3: Altitude adjustment factor (feet and meters)

H_{alt}(ft)	H_{alt}(m)	Altitude adjustment factor
0-2600	0-800	1.00
2600	800	1.02
3300	1000	1.05
4000	1200	1.07
4600	1400	1.10
5200	1600	1.12
5900	1800	1.15
6600	2000	1.18
7200	2200	1.21
7900	2400	1.25
8500	2600	1.28
9200	2800	1.32
9800	3000	1.36
10500+	3200+	1.40

Mechanical ventilation

Table 4: 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 5: 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: • 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 6: 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: • 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 7: 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	The following leak detection methods are deemed acceptable for all refrigerant systems. • 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 *Removal and evacuations* section of the outdoor unit's *Installation Manual*.

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.

Understanding RDS status codes and fault codes

It is important to understand the RDS status codes and fault codes.

LED1 is located behind the sensor. The fault code can be viewed from the reflection on the delta plate.

- Status codes that indicate the state of the RDS
- Fault codes

Figure 1: Danfoss sensor LED backlight location

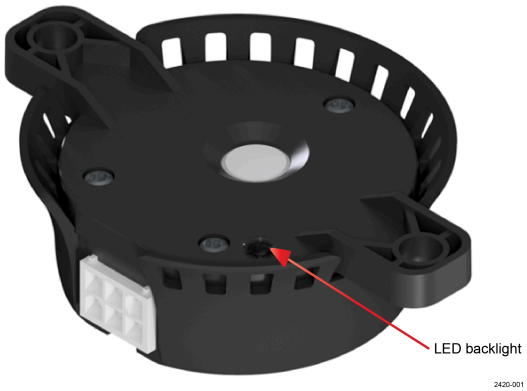


Table 8 gives an overview of the RDS status codes and fault codes and how they display.

Table 8: RDS status codes and fault codes

LED1 display	Description	Condition	Solution
Off	No power to A2L sensor	No power to A2L sensor	Supply power to unit.
Green steady ON	A2L sensor powered	Power up - warmup	No action needed.
Heartbeat green	A2L sensor powered	Normal operation	No action needed.
Amber steady ON	Power up fail	A2L sensor failure has occurred and can be detected	Ensure that the A2L sensor is properly plugged in. Ensure that the A2L sensor harness is not damaged.

Table 8: RDS status codes and fault codes

LED1 display	Description	Condition	Solution
Red steady ON	Leak detected above 15% low flammable limit (LFL)	Sensor detects refrigerant above alarm level	1. The owner is to notify service personnel as soon as possible. 2. Maintain power to the unit and try to keep the house ventilated by opening windows if possible. ⓘ **Note:** There is potential for the A2L sensor to detect gas or propane leakage. If the service person cannot find a refrigerant leakage, check on the gas pipe for leaks, check on the other gas heat components for leaks, and make any necessary repairs.
Green and amber blinking	Near end of life	No active faults, normal operation	No immediate action needed, but be sure to replace the sensor with the same part number of the current A2L sensor.
Blinking red resettable	Internal diagnostic fail	Sensor communicates failure	If this fault code occurs during normal operation, cycle the power of the unit. If the fault code remains, then replace the sensor with a new correct A2L sensor. The sensor may have this fault code if the unit is out of temperature range, humidity range,or is at its end of life.
Blinking red **not** resettable	End of life - replace sensor	Sensor communicates failure	If this fault code occurs during normal operation, then replace the sensor with the same part number of the current A2L sensor.
Green and heartbeat amber	WARNING - Out of operating range	Loss of communications with sensor	Ensure that the A2L sensor is properly plugged in. Ensure that the A2L sensor harness is not damaged.

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 the coil and 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. 48C5CG and 60C5CH models are shipped with a horizontal baffle plate. For more information, see Installing a horizontal baffle plate. Remove and retain this plate for horizontal right application. Discard for all other applications.

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.

ⓘ **Note:** A combustible floor base accessory is available for downflow applications of this unit, if required by local code.

Providing the required clearances

It is essential to provide the following clearances:

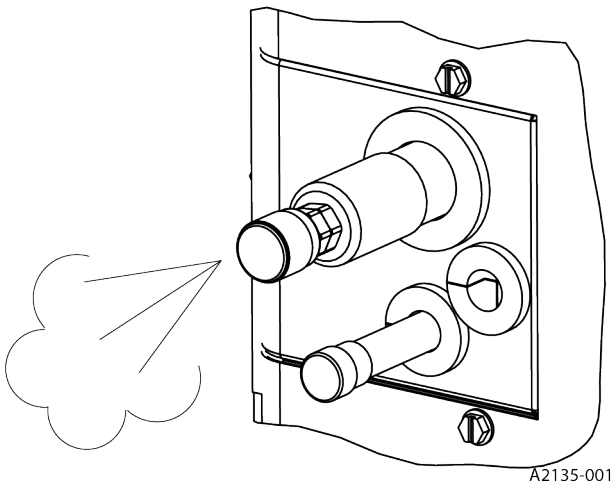
- Refrigerant piping and connections - minimum 12 in.
- Maintenance and servicing access - minimum 36 in. from the front of the unit for blower motor or coil replacement
- Condensate drain lines routed to clear filter and panel access
- Filter removal - minimum 36 in.
- The supply air ductwork connected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

ⓘ **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



- 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 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 shown in the following table.

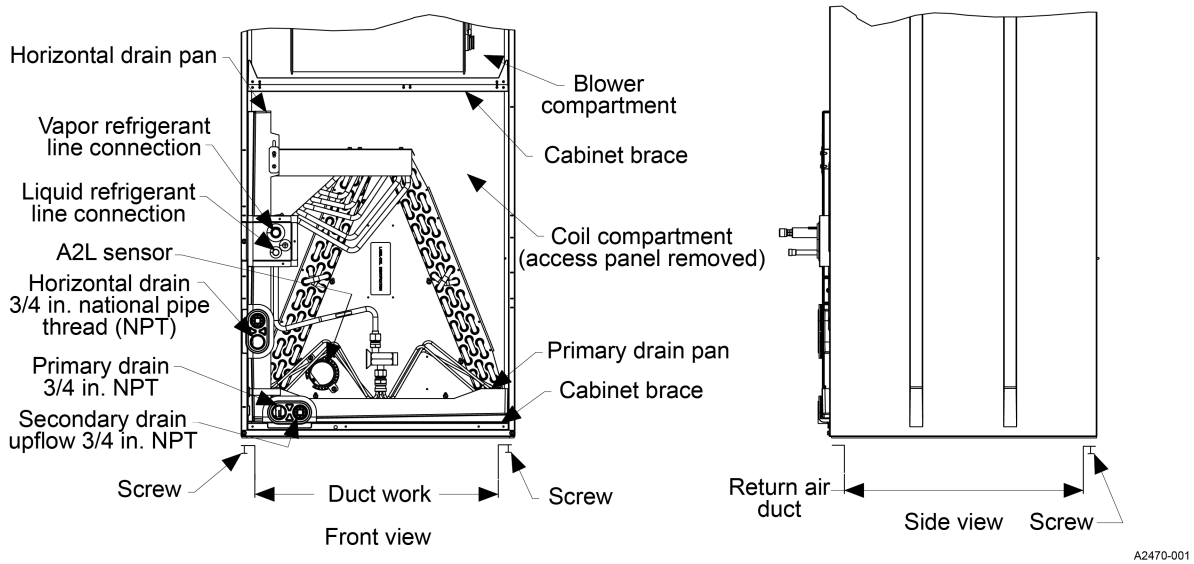
Air handler voltage	**Normal operating voltage range**[1]
208/230-1-60	187 V to 253 V

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



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 9.

Figure 4: Dimensions and duct connection dimensions

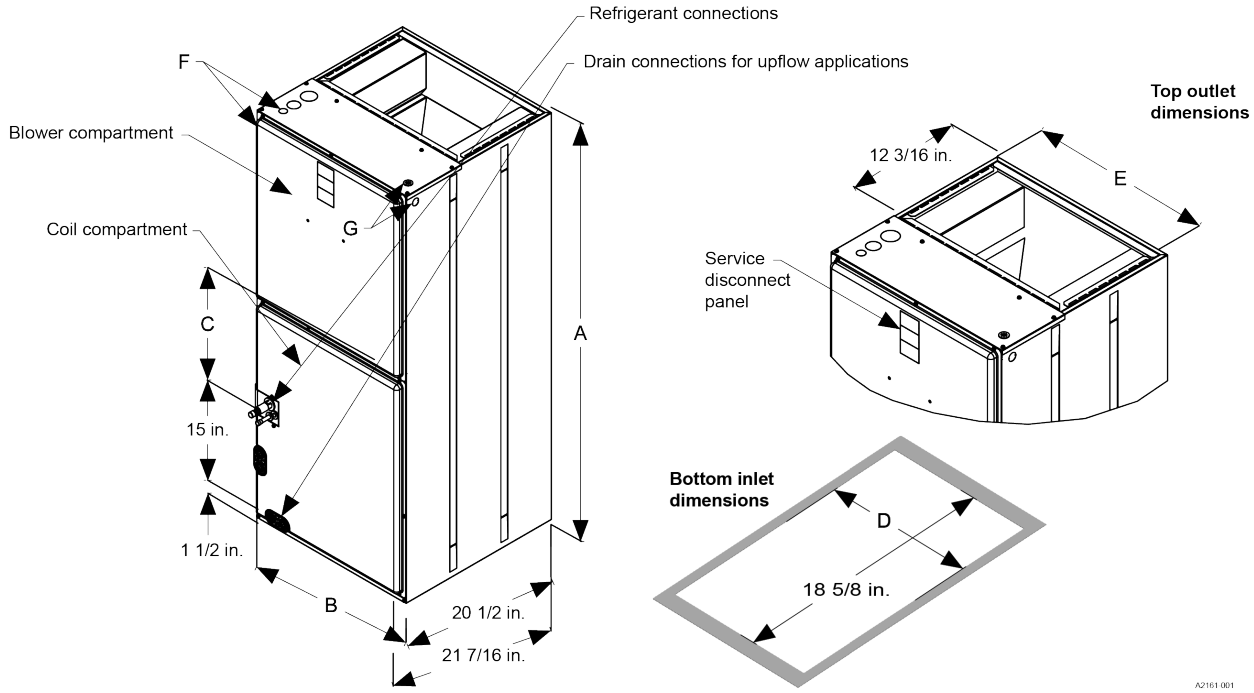


Table 9: Dimensions

Models	Dimensions					Wiring knockouts (actual conduit size)		Refrigerant connections line size	
	A	B	C	D	E	F	G		
	Height (in.)	Width (in.)	Opening widths (in.)			Power (in.)	Control (in.)	Liquid (in.)	Vapor (in.)
JHE18B5*B2SS	45 5/8	17 1/2	7 1/2	16 1/2	16 1/2	7/8 (1/2) 1 3/8 (1) 1 23/32 (1 1/4)	7/8 (1/2)	3/8	3/4
JHE24B5*C2SS	48 3/8	17 1/2	10	16 1/2	16 1/2				
JHE30B5*D2SS	48 3/8	17 1/2	10	16 1/2	16 1/2				
JHE30B5*Z2SS	45 5/8	17 1/2	7 1/2	16 1/2	16 1/2				
JHE36B5*D2SS	48 3/8	17 1/2	10	16 1/2	16 1/2				
JHE36C5*D2SS	49 5/8	21	11 1/2	20	20				
JHE42C5*F2SS	55 5/8	21	17 1/2	20	20				
JHE48C5*G2SS	60	21	21 3/4	20	20				7/8
JHE48D5*G2SS	60	24 1/2	21 3/4	23 1/2	23 1/2				
JHE60C5*H2SS	61 3/4	21	23 1/2	20	20				
JHE60D5*H2SS	61 3/4	24 1/2	23 1/2	23 1/2	23 1/2				
JHE60D5*J2SS	60	24 1/2	21 3/4	23 1/2	23 1/2				

Installing an electric heat kit

If the air handler requires electric heat, use only 8HK heater kits, as listed on the air handler nameplate and in these instructions.

Important:

- You connect the wiring for the electric heat kit as part of the procedures outlined in Connecting the wiring.
- If the air handler does not require electric heat, mark the nameplate to indicate that no electric heat kit is installed.

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

In some horizontal applications, the service disconnects on the electric heat kits must be rotated 180° so the up position of the disconnect is the ON position. This service disconnect orientation change is required by UL 60335-2-40 (in reference to all circuit breakers).

For all other applications, the kits can be installed without modification.

NOTICE

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

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. Consider air handler configuration options. Convert the unit for downflow or horizontal right use then install a horizontal baffle plate - if applicable.
3. Suspend the unit in a horizontal application - if applicable.
4. Set up the duct flanges.
5. Connect the supply and return air ductwork.
6. Install the air filters.
7. 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, horizontal, or downflow applications may 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.

ⓘ **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.

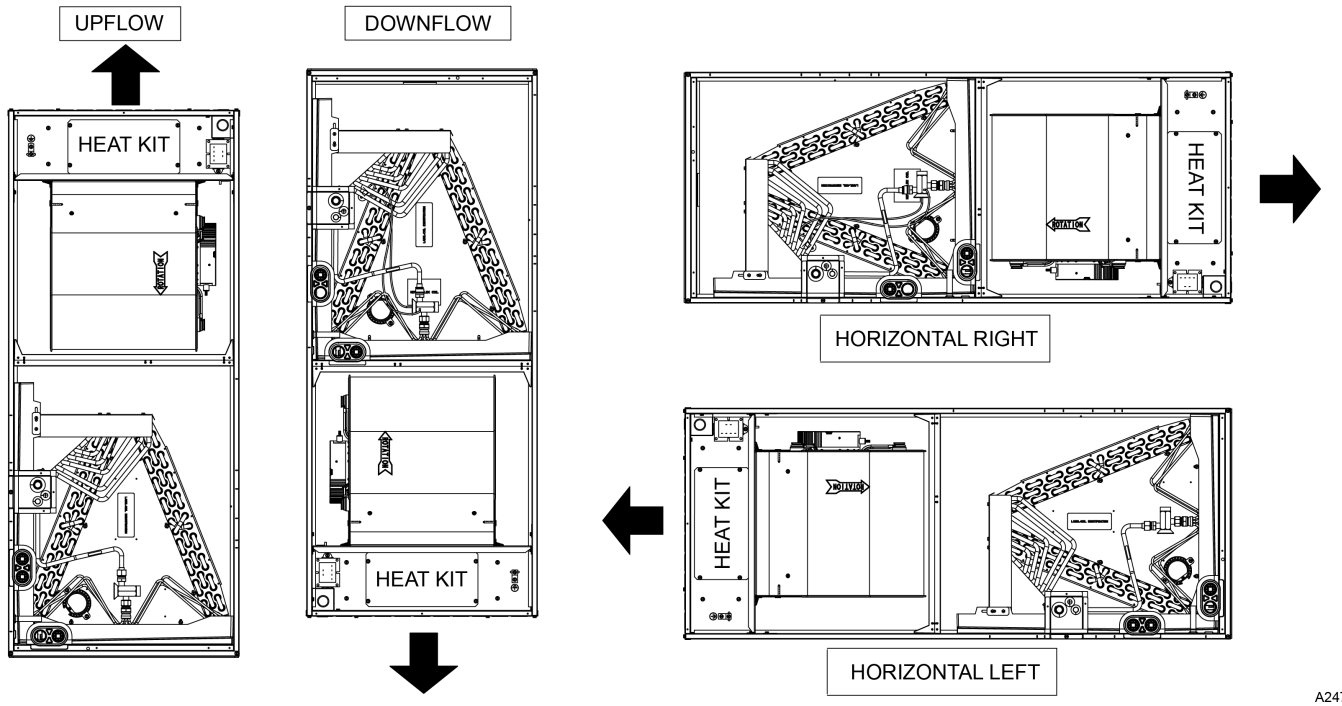
- You must insulate ductwork where it runs through an unheated space during the heating season or through an uncooled space during the cooling season. Use a vapor barrier to prevent absorption of moisture from the surrounding air into the insulation.
- Be aware that you must use a transition to securely 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.

Understanding unit configuration

These air handler units are supplied ready to install in an upflow or horizontal left position. A horizontal drain pan is factory installed.

1. See Figure 5 to determine what configuration option to choose.

Figure 5: Configuration options



2. If you require either a downflow or horizontal right airflow configuration, you must reposition the coil assembly. See Converting the unit for downflow or horizontal right use.

Converting the unit for downflow or horizontal right use

NOTICE

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

To convert the unit for downflow or horizontal right use, do the following:

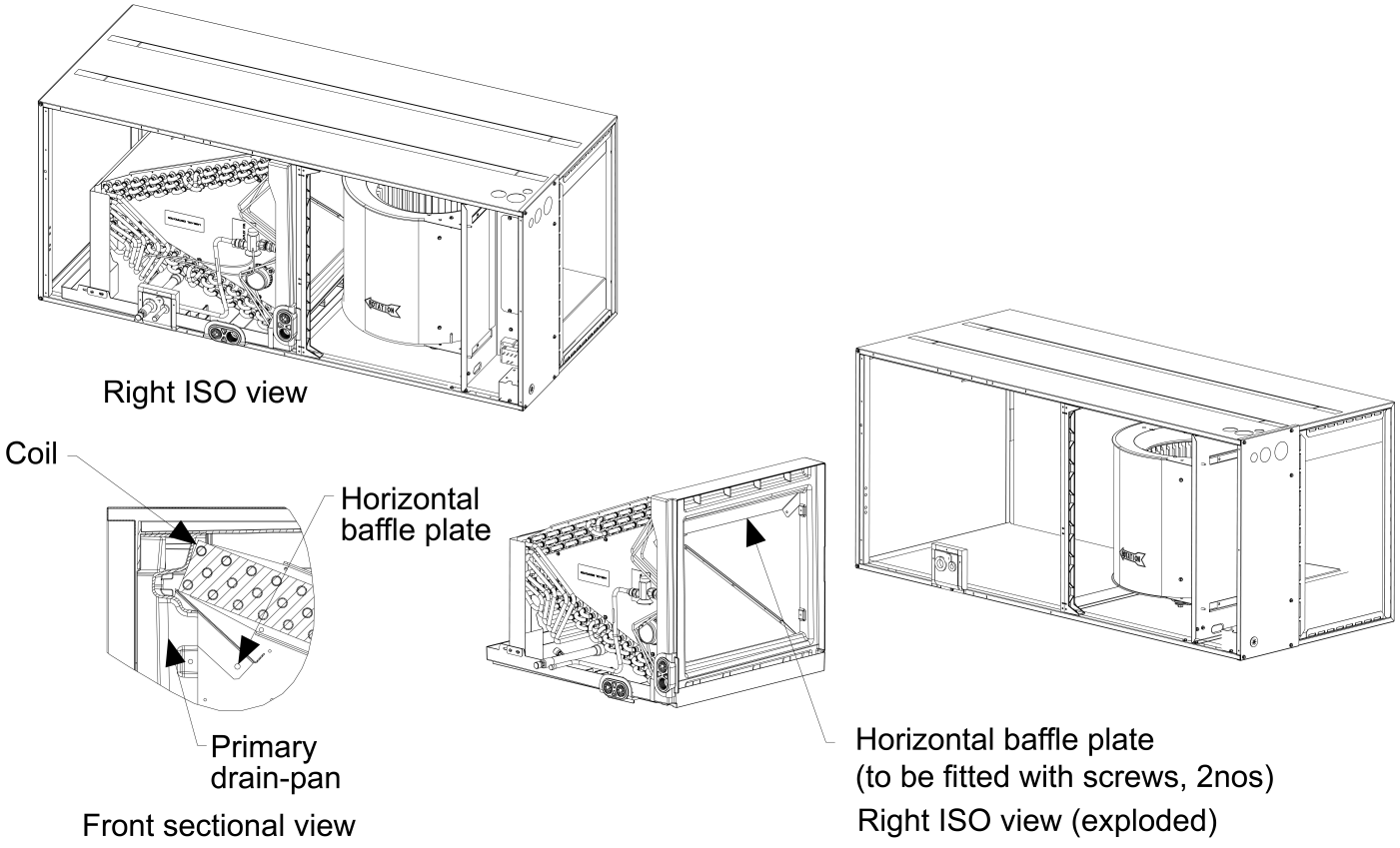
1. Remove the coil and blower access panel.
2. Remove the RDS control board cover and disconnect the A2L refrigerant sensor wire from the control board so that the sensor can be removed with the coil without detaching the sensor from the coil.
3. Slide the coil and drain pan assembly out of the air handler cabinet.
4. Turn the air handler cabinet upside down so that it is in the downflow position.
5. If installing a 48C5CG or 60C5CH model in a horizontal right position, install the horizontal baffle plate shipped with the unit. The horizontal baffle plate must be secured to the coil delta plates. See Installing a horizontal baffle plate.
6. After installing a horizontal baffle plate (if applicable), slide the coil and drain pan assembly back into the air handler cabinet.
7. Route the A2L refrigerant sensor wire out of the coil compartment by passing through the opening for it in the tubing access panel. See Figure 12. Install the included grommet to protect the sensor wire. Route the sensor wire into the air handler cabinet low voltage wiring opening and back into the RDS control box. Re-connect the sensor to the control.
8. Reattach the access panels.

Installing a horizontal baffle plate

Follow these steps to install a horizontal baffle plate, if applicable.

1. With the coil removed from the air handling unit and laying on its horizontal drain pan, locate the pre-drilled holes in the front and rear coil delta plates.
2. Insert the horizontal baffle plate into the end of the coil. Insert one end of the horizontal baffle plate into the top side of the primary drain pan as shown in Suspending the unit in horizontal applications.
3. Secure the horizontal baffle plate in place with two screws, one in the front delta plate and one in the rear delta plate. See Suspending the unit in horizontal applications.

Figure 6: Horizontal baffle plate installation



Note: For horizontal applications, set the unit so that it is sloped 1/4 in. towards the drain line connection.

Return to Converting the unit for downflow or horizontal right use and complete the task from Step 5.

Suspending the unit in horizontal applications

These air handlers may be suspended in horizontal applications. Use angle steel support brackets with minimum 3/8 in. threaded rods, supporting the unit from the bottom.

⚠ 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 the unit components for the location of the cabinet braces. Lift the air handler by tightly gripping the casing.

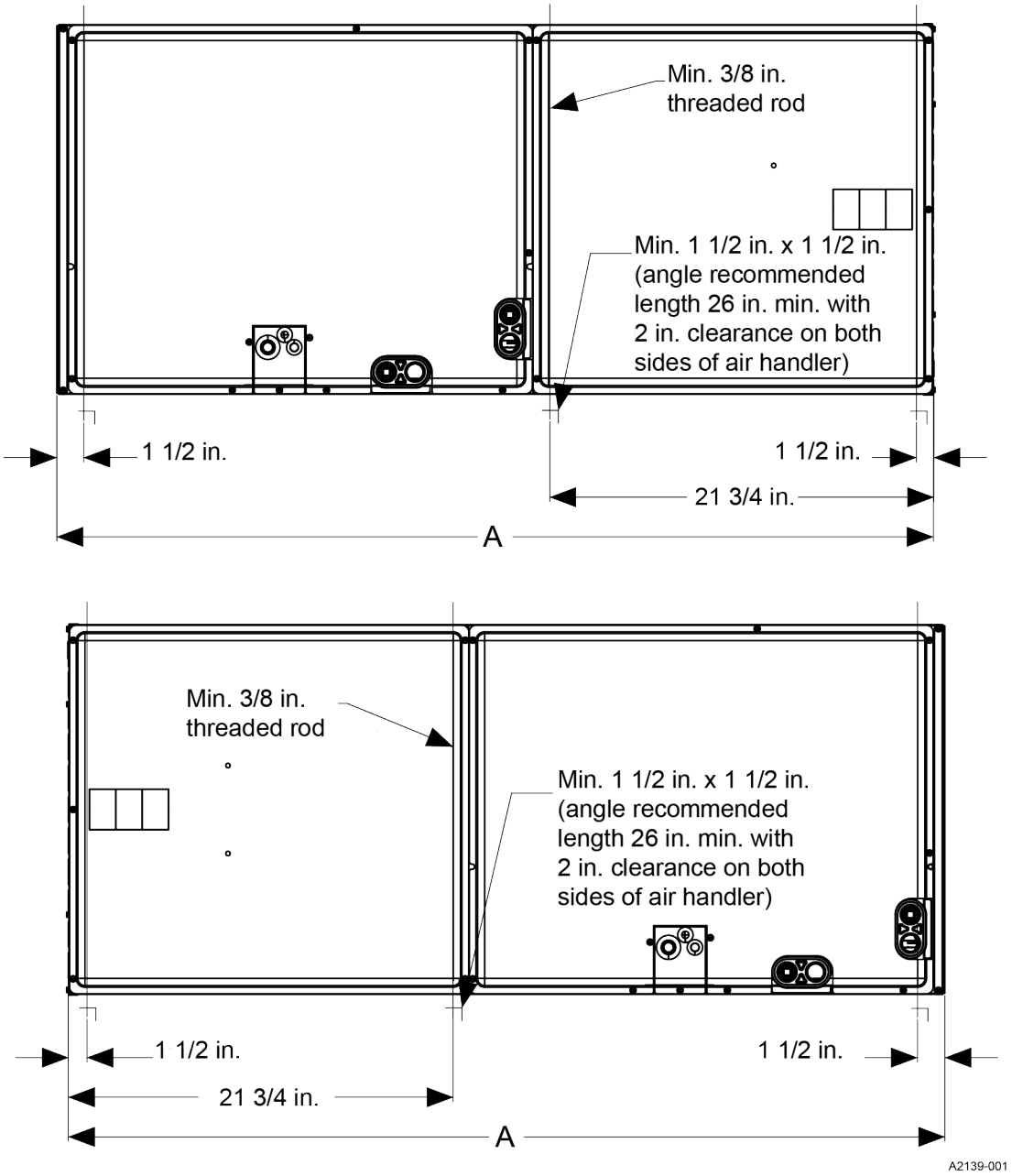
NOTICE

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

To suspend the unit in a horizontal application, complete the following steps:

1. Install angle steel support brackets in your chosen installation location.
2. Attach the threaded rods at the locations shown in Figure 7, leaving enough clearance between the door and the rod so that doors can be easily removed for service. See Table 9 for the dimensions for the specific model.

Figure 7: Suspension support locations for horizontal applications

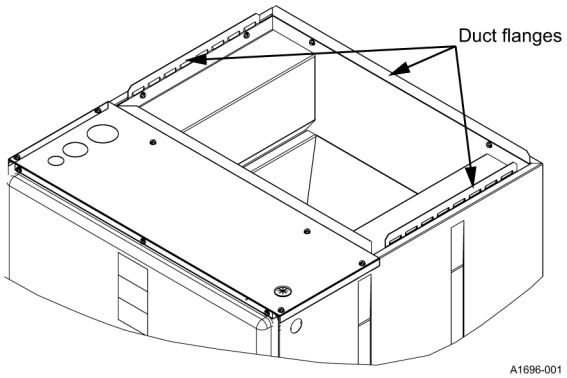


Using the duct flanges

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 8: Duct attachment



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, horizontal, or downflow applications may be used. Use flexible duct connectors to minimize the transmission of vibration and noise into the conditioned space.

⚠ CAUTION

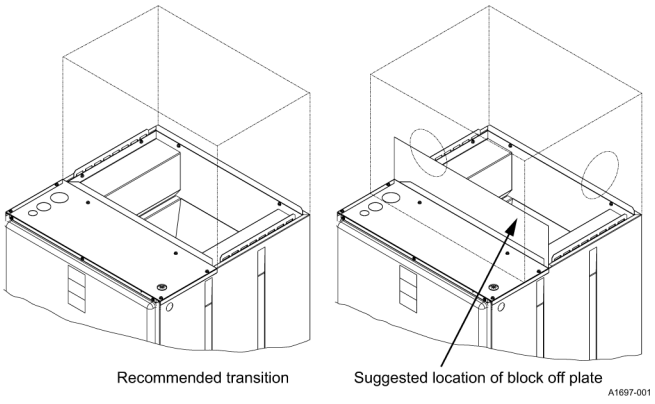
Use 1/2 in. screws to connect ductwork to the unit. Longer screws may pierce the drain pan and cause leakage. If drilling pilot holes, drill only though the field duct and the unit bottom duct flange.

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.

To connect the unit to the ductwork, do the following:

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 9. Using this block-off plate enables better air circulation across the limit switches.

Figure 9: Ductwork transition



Installing the air filters

⚠ CAUTION

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

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 10: Location of coil trapped and plugged drain connections

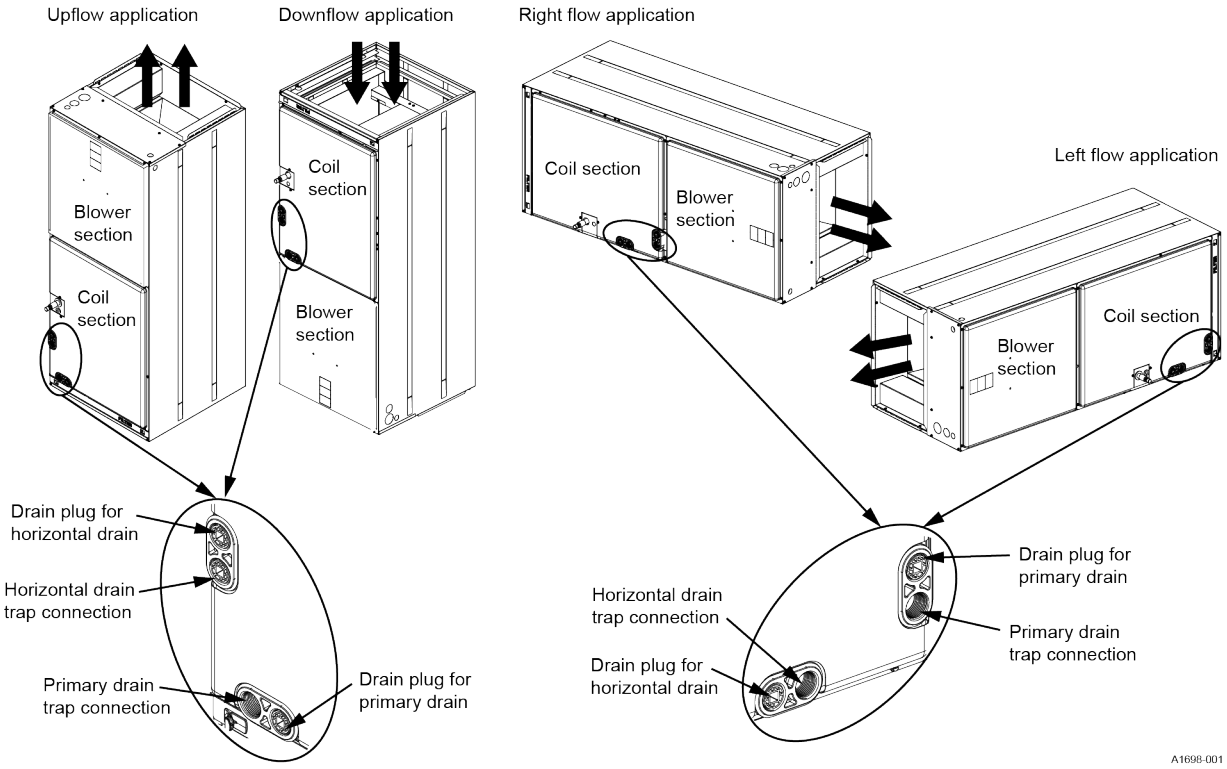
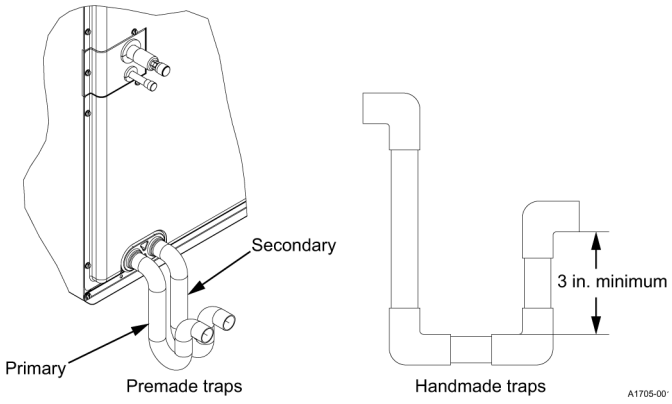


Figure 11: Drain traps



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.

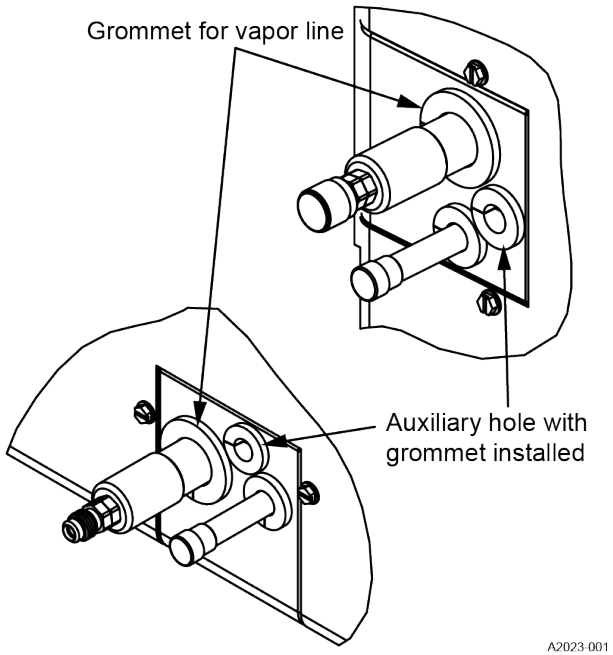
1. Remove the grommets where tubes exit the cabinet to prevent burning them during brazing. In some units, the vapor line grommet may be shipped as a loose part with the unit.
2. Cut the end of the suction tube using a tube cutter. Place the tube cutter as close as possible to the end of the tube to 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 12.

Figure 12: Vapor line grommet



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 12.

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

Before you begin:
See Wiring diagram 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 control wiring.
3. Familiarize yourself with the standard ECM nine-tap blower motor speed selection options.
4. Set the blower motor speed.

Connecting the power line

⚠ WARNING

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

⚠ WARNING

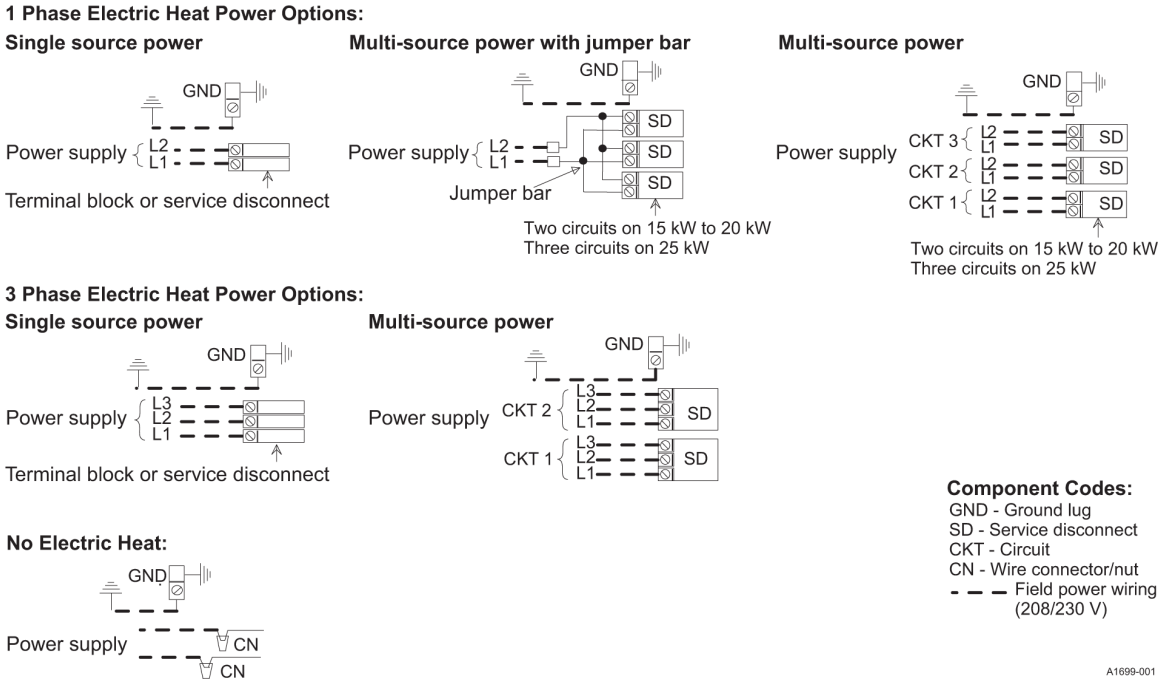
A fused disconnect switch must be field provided for the unit to be in compliance with UL 60335-1 Clause 7.12.2.

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.

- Power can be brought into the unit through the supply air end of the unit (top left when unit is vertical) or the left side panel.
- The power lead conduit must be terminated at the electrical control box.
- See the tables in Unit data and the latest edition of the National Electric Code, or in Canada the Canadian electrical Code, and local codes to determine correct wire sizing.

- All electrical connections to air handlers must be made with copper conductors. **Direct connection of aluminum wiring to air handlers is not approved. If aluminum conductors are present, all applicable local and national codes must be followed when converting from aluminum to copper conductors before connection to the air handler.**
- The chosen conductor and connections must all meet or exceed the amperage rating of the overcurrent protector (service disconnect or fuse) in the circuit.
- See Figure 13 for line connection information specific to this installation.

Figure 13: Line power connections



Complete the following steps to connect the power line to the unit:

1. Route the power lead conduit from the service disconnect to the electrical control box. Use the hole appropriate to the unit's orientation in each installation to bring the conduit from the disconnect.
2. Seal the wiring entry point on the outside of the unit to minimize air leakage.

Connecting the low-voltage control wiring

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.

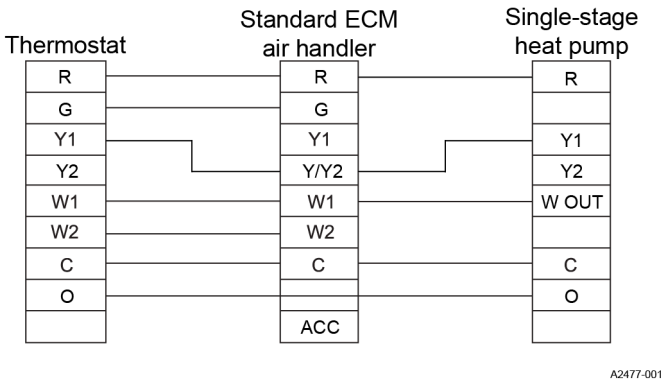
- The 24 V power supply is provided by an internally wired low voltage transformer that is standard on all models. If connecting the unit to a 208 V power supply, the low voltage transformer must be rewired to the 208 V tap. See Figure 22.
- Field supplied low voltage wiring can exit the unit through the top right (when the unit is vertical upflow) or the right side panel. See Becoming familiar with the unit dimensions. 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 room thermostat and the outdoor unit field wiring at the pigtails supplied with the air handler. See JHE thermostat wiring diagrams for low voltage system wiring.

NOTICE

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

JHE thermostat wiring diagrams

Figure 14: Control wiring - standard ECM air handler and standard single-stage heat pump - conventional wiring



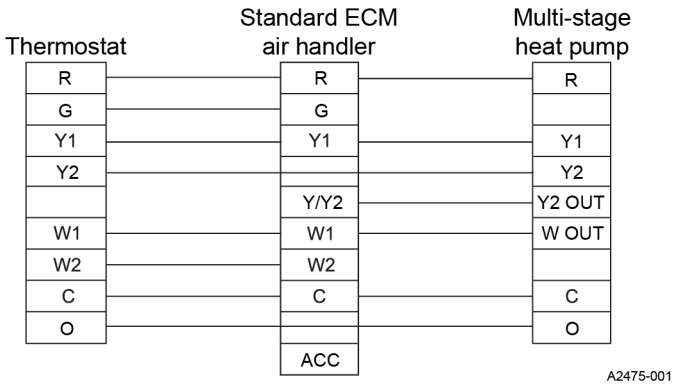
NOTICE

The air handling unit ACC terminal will be powered (24 V) any time the unit refrigerant detection system is in an alarm state.

The W2 input is not used with all heat kit models.

Cap any unused low voltage wires.

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



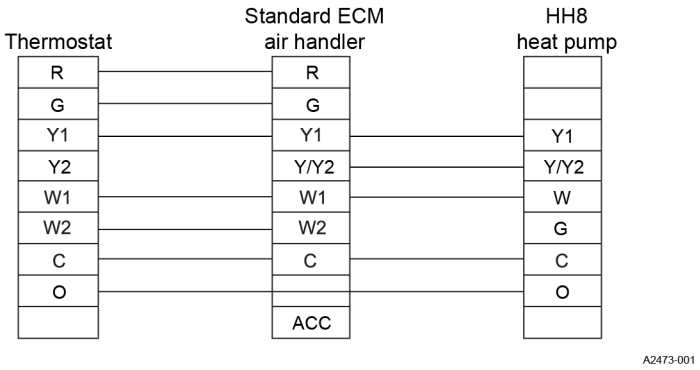
NOTICE

The air handling unit ACC terminal will be powered (24 V) any time the unit refrigerant detection system is in an alarm state.

The W2 input is not used with all heat kit models.

Cap any unused low voltage wires.

Figure 16: Control wiring - standard ECM air handler and HH8 modulating heat pump - conventional wiring



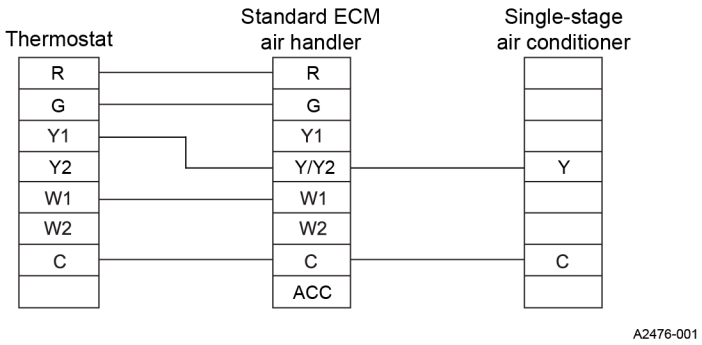
NOTICE

The air handling unit ACC terminal will be powered (24 V) any time the unit refrigerant detection system is in an alarm state.

The W2 input is not used with all heat kit models.

Cap any unused low voltage wires.

Figure 17: Control wiring - standard ECM air handler and standard single-stage air conditioner - conventional wiring



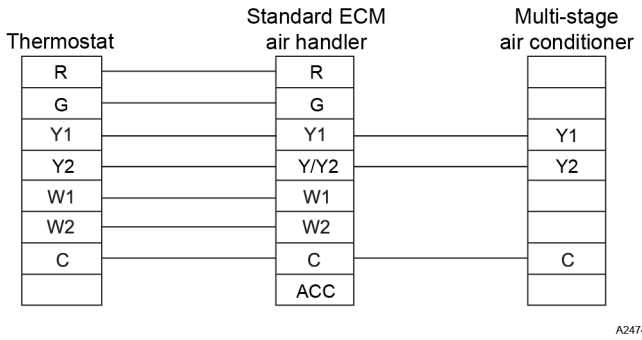
NOTICE

The air handling unit ACC terminal will be powered (24 V) any time the unit refrigerant detection system is in an alarm state.

The W2 input is not used with all heat kit models.

Cap any unused low voltage wires.

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



NOTICE

The air handling unit ACC terminal will be powered (24 V) any time the unit refrigerant detection system is in an alarm state.

The W2 input is not used with all heat kit models.

Cap any unused low voltage wires.

Understanding the standard ECM five-tap blower motor speed selections

Adjust the blower motor speed to provide airflow within the minimum and maximum limits approved for indoor coils, electric heat, and outdoor units. Make speed tap adjustments at the motor terminal block.

See Table 21 for airflow data. Connect the motor wires to the motor speed tap receptacle for the speed required.

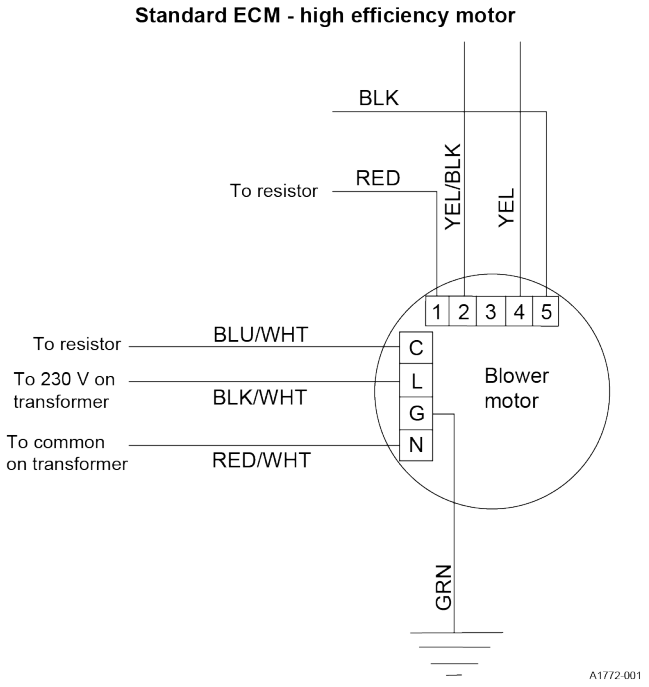
The standard ECM motor operates when a 24 VAC signal is sent to any of its five speed taps. If simultaneous 24 VAC inputs are present, the motor operates at the highest speed tap that is energized. The lowest speed is one and the highest speed is five.

The air handler comes factory-wired with the electric heat kit connected to tap five for the heating speed. There are two speed tap wires for cooling or heat pump blower speeds. The YEL/BLK wire is for first stage compressor speed and the YEL wire is for full compressor speed. The RED continuous fan speed wire is connected to speed tap one. If the lowest speed tap (tap one) is needed for first stage compressor speed, leave the continuous fan speed wire connected to speed tap one and let the room thermostat provide the signal (through its G output) for first stage compressor, as the room thermostat provides a fan output during a heat pump heating or cooling call. In this particular application, cap off the YEL/BLK wire and do not use it.

Move the electric heat kit wire for the heating speed from tap five to the appropriate speed tap according to Table 13. If electric heat requires speed tap five, the highest speed tap available for cooling or heat pump heating is tap four. Do not splice or combine multiple signals to a single blower motor tap. Each of the standard ECM blower motor speed taps have a built-in 60 s off delay.

The circulating blower (green) thermostat input is factory connected to speed tap one, which is the lowest speed. The circulating blower (yellow) thermostat input is used for the second-stage or full blower speed. See Wiring diagram for wiring details.

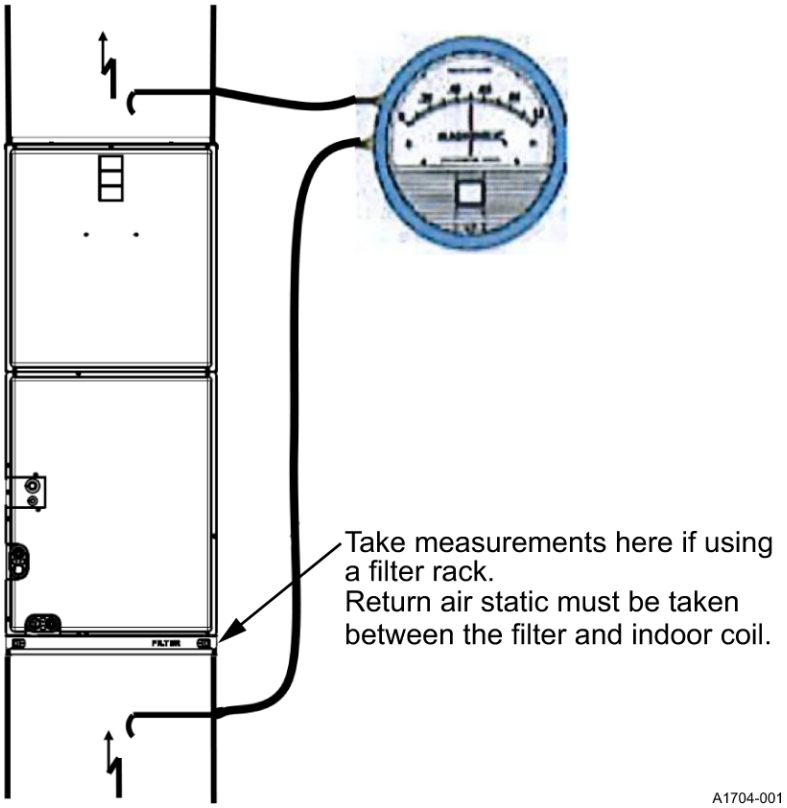
Figure 19: Blower speed connections A1772-001



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 20 shows how to use a manometer to measure external duct static pressure.

Figure 20: Duct static measurements



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 Unit data to determine the airflow and make the necessary adjustments to keep the CFM within the airflow limitations of the coil.

Verifying TXV installation

You can use the following checklist to verify TXV installation:

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?

Unit data

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

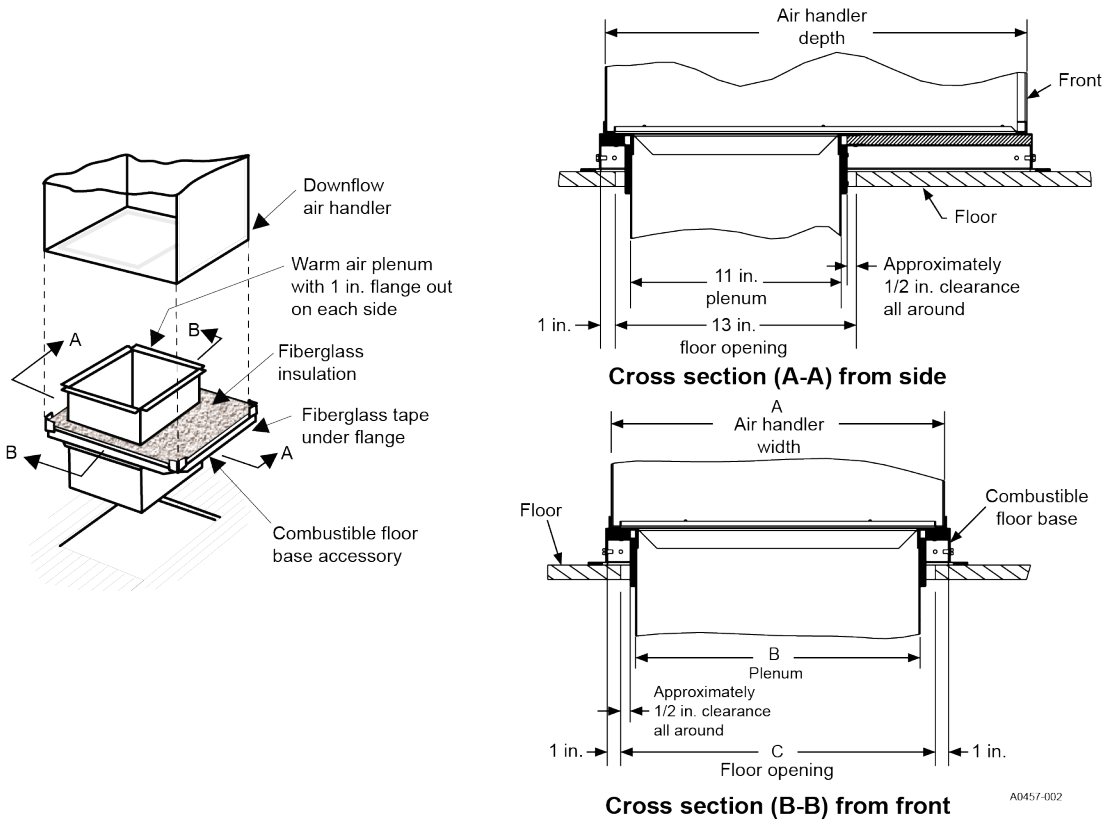
Combustible floor base accessory

See Table 10 and Figure 21 for information about floor base models.

Table 10: Floor base models

Floor base models	Used with	Dimensions		
		A	B	C
1FB1917	JHE18B5*B, JHE24B5*C, JHE30B5*D, JHE30B5*Z JHE36B5*D	17.5	14	16
1FB1921	JHE36C5*D, JHE42C5*F, JHE48C5*G, JHE60C5*H	21	17.5	19.5
1FB1924	JHE48D5*G, JHE60D5*H, JHE60D5*J	24.5	21	23

Figure 21: Combustible floor base accessory



Physical and electrical data cooling only

See Table 11 for information on physical and electrical cooling data.

Table 11: Physical and electrical data cooling only

Models		JHE18B5*B	JHE24B5*C	JHE30B5*D	JHE30B5*Z	JHE36B5*D	JHE36C5*D	JHE42C5*F	JHE48C5*G	JHE48D5*G	JHE60C5*H	JHE60D5*H	JHE60D5*J
Blower diameter x width (in.)		11 × 8	11 × 8	11 × 8	11 × 8	11 × 8	11 × 10	11 × 10	11 x 10	11 x 11	11 x 10	11 x 11	11 x 11
Motor	hp	1/3	1/3	1/2	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4
	Nominal RPM	1050											
Voltage (V)		208/230											
Full load amps at 230 V (A)		2.6	2.6	3.8	3.8	3.8	3.8	3.8	5.4	5.4	5.4	5.4	5.4
Filter	Type	Disposable or cleanable											
	Size	16 x 20 x 1	16 x 20 x 1	16 x 20 x 1	16 x 20 x 1	20 x 20 x 1	20 x 20 x 1	20 x 20 x 1	20 x 20 x 1	23 x 20 x 1	20 x 20 x 1	23 x 20 x 1	23 x 20 x 1
Shipping/operating weight (lb)		98/90	104/96	105/97	98/90	105/97	121/111	132/122	140/129	152/140	153/141	158/146	162/150

Electrical data cooling only

See Table 12 for information on electrical cooling data.

Table 12: Electrical data cooling only

Models	Motor FLA [1]	Minimum circuit ampacity (A)	MOP [2]
JHE18B5*B/JHE24B5*C	2.6	3.3	15
JHE30B5*D/JHE30B5*Z/JHE36B5*D/JHE36C5*D/ JHE42C5*F	3.8	4.8	15
JHE48C5*G/JHE48D5*G/JHE60C5*H/JHE60D5*H/ JHE60D5*J	5.4	6.8	15

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

Electrical heat with heat pump: minimum fan speed

Table 13: Electrical heat with heat pump: minimum fan speed

Heater kit models [1, 2]	Nom. kW at 240 V	Air handler models											
		JHE18B5*B	JHE24B5*C	JHE30B5*D	JHE30B5*Z	JHE36B5*D	JHE36C5*D	JHE42C5*F	JHE48C5*G	JHE48D5*G	JHE60C5*H	JHE60D5*H	JHE60D5*J
8HK(0,1)6500206	2.4	2	4	4	4	3	3	3	2	2	2	2	2
8HK(0,1)6500506	4.8	3	4	4	4	3	3	3	2	2	2	2	2
8HK(0,1)6500806	7.7	4	4	4	4	4	4	4	3	3	3	3	2
8HK(0,1)6501006 8HK06501025	9.6	4	4	4	4	4	4	4	3	4	3	3	2
8HK(1,2)6501506 8HK06501525	14.4	—	4	5	5	4	4	4	3	4	4	4	3
8HK(1,2)6502006 8HK16502025	19.2	—	—	5	5	4	4	4	4	4	4	4	3
8HK(1,2)6502506 8HK16502525	24	—	—	—	—	—	—	—	—	—	—	4	3

1 (0,1) - 0 = no service disconnect OR 1 = with service disconnect.
2 (1,2) - 1 = with service disconnect, no breaker jumper bar OR 2 = with service disconnect and breaker jumper bar.

Application factors rated CFM versus actual CFM

See Table 14 for information on electrical cooling data.

Table 14: Application factors rated CFM versus actual CFM

% of rated airflow (CFM)	80	90	100	110	120
Capacity factor	0.96	0.98	1.00	1.02	1.03

kW and MBH conversions for total power input requirement

See Table 15 for information on electrical cooling data.

Note: For a power distribution voltage that is different from the provided nominal voltage, multiply the kW and MBH data from Table 16 by the conversion factor in the following table:

Table 15: kW and MBH conversions for total power input requirement

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

Electric heat performance data for 1 phase and 3 phase

See Table 16 for information on electrical cooling data.

Table 16: Electric heat performance data: 208/230-1-60 and 208/230-3-60

Heater models [1, 2]		Nominal kW at 240 V	Total heat[3]				kW staging			
			kW		MBH		W1 only		W1 and W2	
			208 V	230 V	208 V	230 V	208 V	230 V	208 V	230 V
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
	8HK(1,2)6502506	24	18	22	61.5	75.2	7.2	8.8	18	22
Three phase	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

1 (0,1) - 0 = no service disconnect or 1 = with service disconnect.
2 (1,2) - 1 = with service disconnect, no breaker jumper bar or 2 = with service disconnect and breaker jumper bar.
3 For different power distributions, see Table 15.

Electrical data for single source power supply: 1 phase

See Table 17 for information about the electrical data for a one phase single source power supply.

Table 17: Electrical data for single source power supply: 208/230-1-60

Air handler models	Heater models [1, 2]	Heater amps (A) at 240 V	Field wiring			
			Minimum circuit ampacity (A)		MOP [3]	
			208 V	230 V	208 V	230 V
JHE18B5*B	8HK(0,1)6500206	10	14.7	15.8	15	20
	8HK(0,1)6500506	20	25.5	27.8	30	30
	8HK(0,1)6500806	32.1	38.7	42.5	40	45
	8HK(0,1)6501006	40	47.1	51.7	50	60
JHE24B5*C	8HK(0,1)6500206	10	14.7	15.8	15	20
	8HK(0,1)6500506	20	25.5	27.8	30	30
	8HK(0,1)6500806	32.1	38.7	42.5	40	45
	8HK(0,1)6501006	40	47.1	51.7	50	60
	8HK(1,2)6501506	60	68.8	75.6	70	80
JHE30B5*D	8HK(0,1)6500206	10	16.8	18.0	20	20
	8HK(0,1)6500506	20	27.6	29.9	30	30
	8HK(0,1)6500806	32.1	40.9	44.6	45	45
	8HK(0,1)6501006	40	49.3	53.8	50	60
	8HK(1,2)6501506	60	70.9	77.7	80	80
	8HK(1,2)6502006	80	92.5	101.7	100	110

Table 17: Electrical data for single source power supply: 208/230-1-60

Air handler models	Heater models [1, 2]	Heater amps (A) at 240 V	Field wiring			
			Minimum circuit ampacity (A)		MOP [3]	
			208 V	230 V	208 V	230 V
JHE30B5*Z	8HK(0,1)6500206	10.0	16.8	18.0	20	20
	8HK(0,1)6500506	20.0	27.6	29.9	30	30
	8HK(0,1)6500806	32.1	40.9	44.6	45	45
	8HK(0,1)6501006	40.0	49.3	53.8	50	60
	8HK(1,2)6501506	60.0	70.9	77.7	80	80
	8HK(1,2)6502006	80.0	92.5	101.7	100	110
JHE36B5*D	8HK(0,1)6500206	10	16.8	18	20	20
	8HK(0,1)6500506	20	27.6	29.9	30	30
	8HK(0,1)6500806	32.1	40.9	44.6	45	45
	8HK(0,1)6501006	40	49.3	53.8	50	60
	8HK(1,2)6501506	60	70.9	77.7	80	80
	8HK(1,2)6502006	80	92.5	101.7	100	110
JHE36C5*D	8HK(0,1)6500206	10	16.8	18	20	20
	8HK(0,1)6500506	20	27.6	29.9	30	30
	8HK(0,1)6500806	32.1	40.9	44.6	45	45
	8HK(0,1)6501006	40	49.3	53.8	50	60
	8HK(1,2)6501506	60	70.9	77.7	80	80
	8HK(1,2)6502006	80	92.5	101.7	100	110
JHE42C5*F	8HK(0,1)6500206	10	16.8	18	20	20
	8HK(0,1)6500506	20	27.6	29.9	30	30
	8HK(0,1)6500806	32.1	40.9	44.6	45	45
	8HK(0,1)6501006	40	49.3	53.8	50	60
	8HK(1,2)6501506	60	70.9	77.7	80	80
	8HK(1,2)6502006	80	92.5	101.7	100	110
JHE48C5*G	8HK(0,1)6500206	10	19.3	20.5	20	25
	8HK(0,1)6500506	20	30.1	32.4	35	35
	8HK(0,1)6500806	32.1	43.4	47.1	45	50
	8HK(0,1)6501006	40	51.8	56.3	60	60
	8HK(1,2)6501506	60	73.4	80.2	80	90
	8HK(1,2)6502006	80	95	104.2	100	110
JHE48D5*G	8HK(0,1)6500206	10	19.3	20.5	20	25
	8HK(0,1)6500506	20	30.1	32.4	35	35
	8HK(0,1)6500806	32.1	43.4	47.1	45	50
	8HK(0,1)6501006	40	51.8	56.3	60	60
	8HK(1,2)6501506	60	73.4	80.2	80	90
	8HK(1,2)6502006	80	95	104.2	100	110
JHE60C5*H	8HK(0,1)6500206	10	19.3	20.5	20	25
	8HK(0,1)6500506	20	30.1	32.4	35	35
	8HK(0,1)6500806	32.1	43.4	47.1	45	50
	8HK(0,1)6501006	40	51.8	56.3	60	60
	8HK(1,2)6501506	60	73.4	80.2	80	90
	8HK(1,2)6502006	80	95	104.2	100	110
JHE60D5*H	8HK(0,1)6500206	10	19.3	20.5	20	25
	8HK(0,1)6500506	20	30.1	32.4	35	35
	8HK(0,1)6500806	32.1	43.4	47.1	45	50
	8HK(0,1)6501006	40	51.8	56.3	60	60
	8HK(1,2)6501506	60	73.4	80.2	80	90
	8HK(1,2)6502006	80	95	104.2	100	110
	8HK(1,2)6502506	100	116.7	128.1	125	150
JHE60D5*J	8HK(0,1)6500206	10	19.3	20.5	20	25
	8HK(0,1)6500506	20	30.1	32.4	35	35
	8HK(0,1)6500806	32.1	43.4	47.1	45	50
	8HK(0,1)6501006	40	51.8	56.3	60	60
	8HK(1,2)6501506	60	73.4	80.2	80	90
	8HK(1,2)6502006	80	95	104.2	100	110
	8HK(1,2)6502506	100	116.7	128.1	125	150

1 0,1) - 0 = no service disconnect OR 1 = with service disconnect.
2 (1,2) - 1 = with service disconnect, no breaker jumper bar OR 2 = with service disconnect & breaker jumper bar.
3 MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse. 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 data for multi-source power supply: 1 phase

See Table 18 for information about electrical data for a one phase multi-source power supply.

Table 18: Electrical data for multi-source power supply: 208/230-1-60

Air handlers models	Heater models [1]	Heater amps (A) at 240 V	Minimum circuit ampacity (A)						MOP[2]					
			208 V			230 V			208 V			230 V		
			Circuit						Circuit					
			First	Second	Third	First	Second	Third	First	Second	Third	First	Second	Third
JHE24B5*C	8HK16501506	60	25.3	43.5		27.5	48.1		30	45		30	50	
JHE30B5*D	8HK16501506	60	27.4	43.5		29.7	48.1		30	45		30	50	
	8HK16502006	80	49.3	43.3		53.8	47.8		50	45		60	50	
JHE30B5*Z	8HK16501506	60	27.4	43.5		29.7	48.1		30	45		30	50	
	8HK16502006	80	49.3	43.3		53.8	47.8		50	45		60	50	
JHE36B5*D	8HK16501506	60	27.4	43.5		29.7	48.1		30	45		30	50	
	8HK16502006	80	49.3	43.3		53.8	47.8		50	45		60	50	
JHE36C5*D	8HK16501506	60	27.4	43.5		29.7	48.1		30	45		30	50	
	8HK16502006	80	49.3	43.3		53.8	47.8		50	45		60	50	
JHE42C5*F	8HK16501506	60	27.4	43.5		29.7	48.1		30	45		30	50	
	8HK16502006	80	49.3	43.3		53.8	47.8		50	45		60	50	
JHE48C5*G	8HK16501506	60	29.9	43.5		32.2	48.1		30	45		35	50	
	8HK16502006	80	51.8	43.3		56.3	47.8		60	45		60	50	
JHE48D5*G	8HK16501506	60	29.9	43.5		32.2	48.1		30	45		35	50	
	8HK16502006	80	51.8	43.3		56.3	47.8		60	45		60	50	
JHE60C5*H	8HK16501506	60	29.9	43.5		32.2	48.1		30	45		35	50	
	8HK16502006	80	51.8	43.3		56.3	47.8		60	45		60	50	
JHE60D5*H	8HK16501506	60	29.9	43.5		32.2	48.1		30	45		35	50	
	8HK16502006	80	51.8	43.3		56.3	47.8		60	45		60	50	
	8HK16502506	100	51.8	43.3	21.6	56.3	47.8	23.9	60	45	25	60	50	25
JHE60D5*J	8HK16501506	60	29.9	43.5		32.2	48.1		30	45		35	50	
	8HK16502006	80	51.8	43.3		56.3	47.8		60	45		60	50	
	8HK16502506	100	51.8	43.3	21.6	56.3	47.8	23.9	60	45	25	60	50	25

1 8HK1 = with service disconnect, no breaker jumper bar.
2 MOP = Maximum Overcurrent Protection device; must be HACR type circuit breaker or time delay fuse. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing.

Electrical data for single source power supply: 3 phase

See Table 19 for information about electrical data for a three phase single source power supply.

Table 19: Electrical data for single source power supply: 208/230-3-60

Air handler models	Heater models[1]	Heater amps (A) at 240 V	Field wiring			
			Minimum circuit ampacity (A)		MOP [2]	
			208 V	230 V	208 V	230 V
JHE18B5*B	8HK06501025	23.1	28.9	31.5	30.0	35.0
JHE24B5*C	8HK06501025	23.1	28.9	31.5	30.0	35.0
	8HK06501525	34.6	41.3	45.3	45.0	50.0
JHE30B5*D	8HK06501025	23.1	31.0	33.6	35.0	35.0
	8HK06501525	34.6	43.5	47.4	45.0	50.0
	8HK16502025[2]	46.2	56.0	61.2	60.0	70.0
JHE30B5*Z	8HK06501025	23.1	31.0	33.6	35.0	35.0
	8HK06501525	34.6	43.5	47.4	45.0	50.0
	8HK16502025	46.2	56.0	61.2	60.0	70.0
JHE36B5*D	8HK06501025	23.1	31.0	33.6	35.0	35.0
	8HK06501525	34.6	43.5	47.4	45.0	50.0
	8HK16502025[2]	46.2	56.0	61.2	60.0	70.0
JHE36C5*D	8HK06501025	23.1	31.0	33.6	35.0	35.0
	8HK06501525	34.6	43.5	47.4	45.0	50.0
	8HK16502025[2]	46.2	56.0	61.2	60.0	70.0
JHE42C5*F	8HK06501025	23.1	31.0	33.6	35.0	35.0
	8HK06501525	34.6	43.5	47.4	45.0	50.0
	8HK16502025[2]	46.2	56.0	61.2	60.0	70.0

Table 19: Electrical data for single source power supply: 208/230-3-60

Air handler models	Heater models[1]	Heater amps (A) at 240 V	Field wiring			
			Minimum circuit ampacity (A)		MOP [2]	
			208 V	230 V	208 V	230 V
JHE48C5*G	8HK06501025	23.1	33.5	36.1	35.0	40.0
	8HK06501525	34.6	46.0	49.9	50.0	50.0
	8HK16502025[2]	46.2	58.5	63.7	60.0	70.0
JHE48D5*G	8HK06501025	23.1	33.5	36.1	35.0	40.0
	8HK06501525	34.6	46.0	49.9	50.0	50.0
	8HK16502025[2]	46.2	58.5	63.7	60.0	70.0
JHE60C5*H	8HK06501025	23.1	33.5	36.1	35.0	40.0
	8HK06501525	34.6	46.0	49.9	50.0	50.0
	8HK16502025[2]	46.2	58.5	63.7	60.0	70.0
JHE60D5*H	8HK06501025	23.1	33.5	36.1	35.0	40.0
	8HK06501525	34.6	46.0	49.9	50.0	50.0
	8HK16502025[2]	46.2	58.5	63.7	60.0	70.0
	8HK16502525[2]	57.7	71.0	77.5	80.0	80.0
JHE60D5*J	8HK06501025	23.1	33.5	36.1	35.0	40.0
	8HK06501525	34.6	46.0	49.9	50.0	50.0
	8HK16502025[2]	46.2	58.5	63.7	60.0	70.0
	8HK16502525[2]	57.7	71.0	77.5	80.0	80.0

1 0 = no service disconnect OR 1 = with service disconnect. 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.

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

Electrical data for multi-source power supply: 3 phase

See Table 20 for information about electrical data for a three phase multi-source power supply.

Table 20: Electrical data for multi-source power supply: 208/230-3-60

Air handlers models	Heater models [1]	Heater amps (A) at 240V	Minimum circuit ampacity (A)				MOP [2]			
			208V		230V		208V		230V	
			Circuit				Circuit			
			First	Second	First	Second	First	Second	First	Second
JHE30B5*D	8HK16502025	46.2	31.0	25.0	33.6	27.6	35.0	25.0	35.0	30.0
JHE30B5*Z	8HK16502025	46.2	31.0	25.0	33.6	27.6	35.0	25.0	35.0	30.0
JHE36B5*D	8HK16502025	46.2	31.0	25.0	33.6	27.6	35.0	25.0	35.0	30.0
JHE36C5*D	8HK16502025	46.2	31.0	25.0	33.6	27.6	35.0	25.0	35.0	30.0
JHE42C5*F	8HK16502025	46.2	31.0	25.0	33.6	27.6	35.0	25.0	35.0	30.0
JHE48C5*G	8HK16502025	46.2	33.5	25.0	36.1	27.6	35.0	25.0	40.0	30.0
JHE48D5*G	8HK16502025	46.2	33.5	25.0	36.1	27.6	35.0	25.0	40.0	30.0
JHE60C5*H	8HK16502025	46.2	33.5	25.0	36.1	27.6	35.0	25.0	40.0	30.0
JHE60D5*H	8HK16502025	46.2	33.5	25.0	36.1	27.6	35.0	25.0	40.0	30.0
	8HK16502525	57.7	39.7	31.2	43.0	34.5	40.0	35.0	45.0	35.0
JHE60D5*J	8HK16502025	46.2	33.5	25.0	36.1	27.6	35.0	25.0	40.0	30.0
	8HK16502525	57.7	39.7	31.2	43.0	34.5	40.0	35.0	45.0	35.0

1 The 20kW and 25kW heater models (8HK16502025 and 8HK16502525) come with circuit breakers standard.

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

Airflow data

See Table 21 for information about airflow data.

Note: The following blower tables apply for revision B air handling units only. The revision letter can be found on the unit rating plate only. The revision letter is the last letter in the unit model number.

Table 21: Airflow data (CFM)

Models	Blower motor speed	Unit	External static pressure (in. wc.)									
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
JHE18B5*B	#5	CFM	1000	975	925	875	850	800	775	725	675	650
		Watts	152	160	167	175	182	189	197	204	212	219
	#4	CFM	925	875	825	775	750	700	650	600	550	525
		Watts	119	126	133	140	147	154	160	167	174	181
	#3	CFM	825	800	750	700	650	600	550	500	450	425
		Watts	98	104	111	117	123	130	136	142	148	155
	#2	CFM	600	550	475	425	350	300	250	175	125	—
		Watts	49	54	59	63	68	73	77	82	87	—
	#1	CFM	475	400	325	250	175	125	50	—	—	—
		Watts	33	37	41	44	48	53	57	—	—	—
JHE24B5*C	#5	CFM	1075	1025	1000	950	925	875	850	800	775	725
		WATTS	179	188	196	204	212	220	229	237	245	253
	#4	CFM	975	925	900	850	800	775	725	675	650	600
		WATTS	140	147	155	162	169	177	184	192	199	206
	#3	CFM	775	725	700	650	600	550	500	450	400	350
		WATTS	85	91	96	102	108	114	120	126	132	137
	#2	CFM	650	600	525	475	425	375	300	250	200	—
		WATTS	55	60	65	70	74	79	84	89	94	—
	#1	CFM	500	425	350	275	225	150	—	—	—	—
		WATTS	34	38	42	46	50	54	—	—	—	—
JHE30B5*D	#5	CFM	1325	1300	1275	1250	1225	1200	1175	1150	1125	1100
		WATTS	336	347	357	368	378	389	399	410	420	431
	#4	CFM	1125	1100	1075	1050	1025	1000	950	925	900	875
		WATTS	220	229	237	245	254	262	271	279	288	296
	#3	CFM	975	950	900	875	825	800	750	725	675	650
		WATTS	147	155	163	171	178	186	194	202	209	217
	#2	CFM	800	750	700	650	600	550	525	475	425	375
		WATTS	86	93	99	105	112	118	125	131	138	144
	#1	CFM	675	600	550	500	450	400	350	300	—	—
		WATTS	60	65	71	77	82	88	93	99	—	—
JHE30B5*Z	#5	CFM	1300	1275	1250	1225	1200	1175	1150	1125	1100	1075
		WATTS	319	325	333	341	349	359	369	380	392	404
	#4	CFM	1125	1100	1075	1025	1000	975	950	900	875	850
		WATTS	211	220	228	236	245	253	262	270	279	287
	#3	CFM	975	925	875	850	800	775	725	675	650	600
		WATTS	135	143	151	159	167	175	182	190	198	206
	#2	CFM	775	725	675	625	575	525	475	425	375	32
		WATTS	79	86	92	99	105	112	119	125	132	138
	#1	CFM	625	575	500	450	400	325	275	225	150	100
		WATTS	53	58	64	69	74	80	85	90	96	101
JHE36B5*D	#5	CFM	1500	1475	1450	1425	1400	1375	1350	1350	1325	1300
		WATTS	496	506	517	527	538	548	559	569	580	590
	#4	CFM	1325	1300	1275	1250	1225	1200	1175	1150	1125	1100
		WATTS	339	349	360	370	381	392	402	413	423	434
	#3	CFM	1125	1100	1075	1050	1025	975	950	925	900	875
		WATTS	218	226	235	243	252	260	269	277	286	294
	#2	CFM	925	875	850	800	750	725	675	625	600	550
		WATTS	124	131	138	146	153	160	167	175	182	189
	#1	CFM	775	725	675	625	575	550	500	450	400	350
		WATTS	82	89	95	101	107	113	119	125	132	138

Table 21: Airflow data (CFM)

Models	Blower motor speed	Unit	External static pressure (in. wc.)									
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
JHE36C5*D	#5	CFM	1525	1500	1475	1425	1400	1375	1350	1325	1300	1250
		WATTS	381	395	409	423	437	451	465	479	493	507
	#4	CFM	1350	1300	1275	1225	1200	1150	1125	1100	1050	1025
		WATTS	263	274	285	296	307	318	329	340	351	362
	#3	CFM	1075	1025	975	925	875	850	800	750	700	650
		WATTS	146	154	162	171	179	188	196	205	213	221
	#2	CFM	925	875	825	775	725	675	625	575	525	450
		WATTS	104	111	118	125	132	140	147	154	161	168
	#1	CFM	725	650	600	525	475	400	325	275	-	-
		WATTS	60	66	72	77	83	89	95	101	-	-
JHE42C5*F	#5	CFM	1525	1500	1450	1425	1375	1350	1325	1275	1250	1200
		WATTS	342	354	366	378	391	403	415	427	440	452
	#4	CFM	1375	1325	1300	1250	1200	1175	1125	1075	1025	1000
		WATTS	250	261	272	283	293	304	315	326	337	348
	#3	CFM	1050	1000	950	900	850	800	750	675	625	575
		WATTS	134	142	150	157	165	173	181	189	197	205
	#2	CFM	925	850	800	750	700	650	575	525	475	425
		WATTS	100	107	114	121	127	134	141	148	155	162
	#1	CFM	800	750	675	600	550	475	425	350	300	-
		WATTS	73	79	85	92	98	104	110	117	123	-
JHE48C5*G	#5	CFM	1925	1900	1875	1850	1825	1800	1750	1725	1700	1675
		WATTS	657	670	683	695	708	720	733	745	758	770
	#4	CFM	1750	1725	1700	1650	1625	1600	1575	1550	1525	1475
		WATTS	487	500	513	525	538	551	564	577	590	603
	#3	CFM	1400	1375	1325	1300	1250	1225	1175	1150	1100	1050
		WATTS	261	271	281	291	301	312	322	332	342	352
	#2	CFM	1225	1175	1125	1075	1025	975	925	900	850	800
		WATTS	175	184	193	201	210	219	227	236	245	254
	#1	CFM	975	900	850	800	750	700	625	575	525	475
		WATTS	102	109	116	123	130	137	143	150	157	164
JHE48D5*G	#5	CFM	2075	2050	2025	1975	1950	1925	1900	1850	1825	1800
		WATTS	595	611	627	643	659	675	691	706	722	738
	#4	CFM	1875	1850	1800	1775	1750	1700	1675	1650	1600	1575
		WATTS	442	457	471	485	500	514	529	543	557	572
	#3	CFM	1675	1625	1600	1550	1500	1475	1425	1375	1350	1300
		WATTS	311	324	337	350	363	376	389	402	415	428
	#2	CFM	1300	1250	1200	1150	1075	1025	975	925	850	800
		WATTS	161	171	181	191	201	211	221	232	242	252
	#1	CFM	1150	1100	1025	975	900	850	775	725	675	600
		WATTS	121	130	139	148	157	166	175	184	193	202
JHE60C5*H	#5	CFM	1950	1925	1875	1850	1825	1800	1750	1725	1700	1675
		WATTS	656	675	693	709	724	737	749	759	768	775
	#4	CFM	1750	1725	1675	1650	1625	1600	1575	1525	1500	1475
		WATTS	488	502	515	529	543	556	570	584	597	611
	#3	CFM	1375	1325	1275	1250	1200	1150	1125	1075	1050	1000
		WATTS	242	253	263	274	284	295	305	316	326	337
	#2	CFM	1200	1150	1100	1050	1000	950	900	850	800	750
		WATTS	166	175	184	193	203	212	221	230	239	248
	#1	CFM	925	875	825	775	700	650	600	550	475	425
		WATTS	97	104	111	118	125	132	139	146	153	159
JHE60D5*H	#5	CFM	1975	1950	1900	1875	1850	1800	1775	1750	1725	1675
		WATTS	523	537	551	565	579	593	607	620	634	648
	#4	CFM	1825	1800	1750	1725	1675	1650	1600	1575	1525	1500
		WATTS	413	426	439	452	465	479	492	505	518	531
	#3	CFM	1475	1425	1375	1325	1275	1225	1175	1125	1075	1025
		WATTS	222	234	245	256	267	278	289	300	311	322
	#2	CFM	1275	1225	1150	1100	1050	975	925	875	800	750
		WATTS	153	162	172	182	192	202	211	221	231	241
	#1	CFM	1000	950	875	800	750	675	600	550	475	400
		WATTS	90	98	107	115	123	131	139	147	155	163

Table 21: Airflow data (CFM)

Models	Blower motor speed	Unit	External static pressure (in. wc.)									
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
JHE60D5*J	#5	CFM	2150	2125	2100	2075	2050	2025	1975	1925	1900	1850
		WATTS	733	745	758	770	783	795	808	821	833	846
	#4	CFM	2000	1975	1925	1900	1875	1850	1800	1775	1750	1700
		WATTS	540	556	571	587	602	618	634	649	665	680
	#3	CFM	1800	1775	1750	1700	1675	1625	1600	1550	1525	1500
		WATTS	410	424	438	453	467	481	496	510	524	539
	#2	CFM	1400	1325	1275	1225	1175	1125	1075	1025	975	925
		WATTS	195	206	217	228	239	250	261	271	282	293
	#1	CFM	1250	1200	1125	1075	1025	950	900	850	775	725
		WATTS	153	162	171	180	189	198	208	217	226	235

Note:

- Air handler units have been tested to UL 60335—2—40 / CSA 22.2 No. 236 standards up to 0.6 in. W.C. external static pressure.
- Dry coil conditions only, tested without filters.
- For optimal performance, external static pressures of 0.2 in. W.C to 0.5 in. W.C are recommended. Heating applications tested at 0.5 in. W.C. external static pressure.
- 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.
- The airflow data shown is from testing performed at 230 V. JHE units use a standard ECM constant torque motor and there is minimal variation of airflow at other distribution voltage values. The above data can be used for airflow at other distribution voltages.

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

⚠ CAUTION

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.

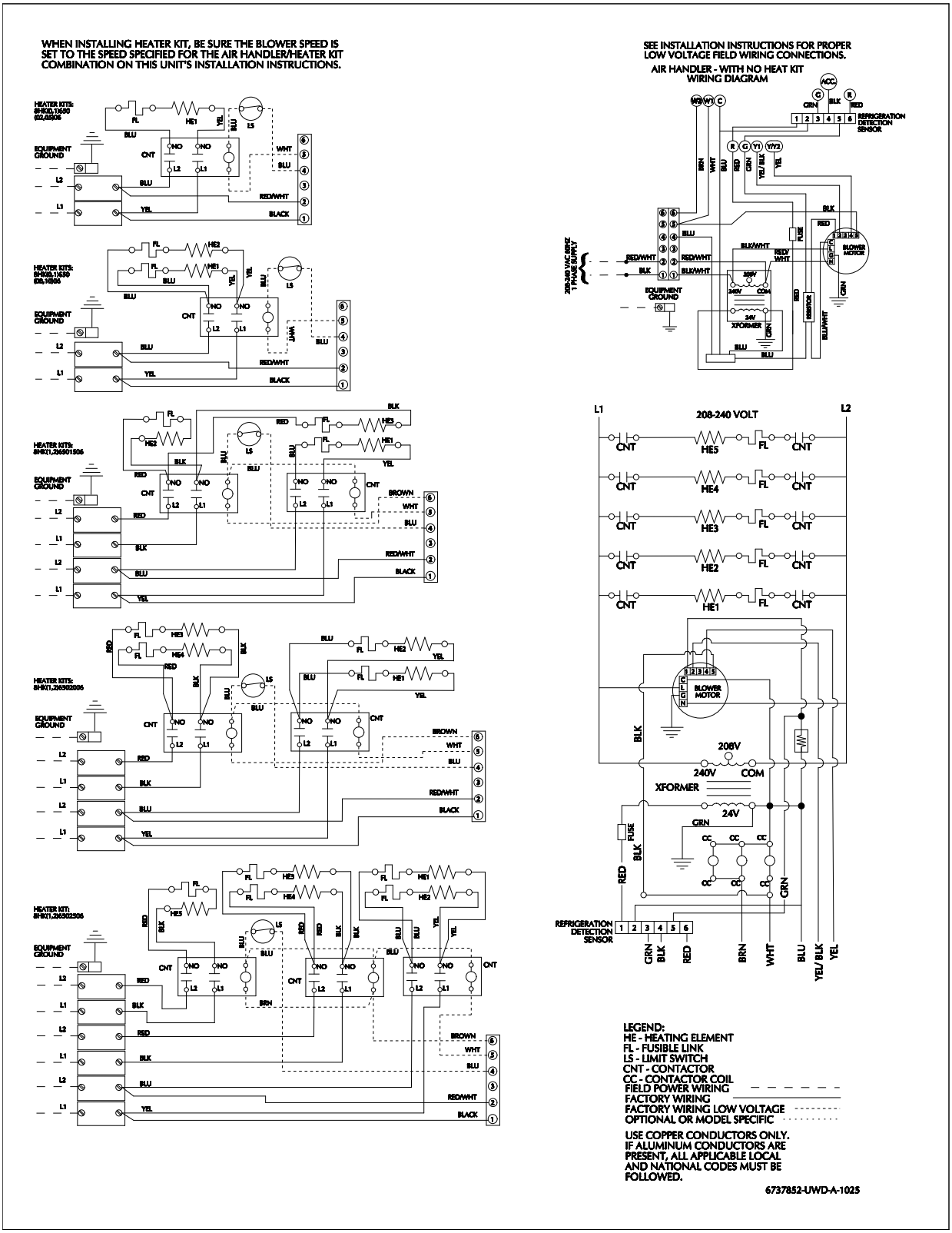
If condensate ever flows from the secondary drain, shut off the unit immediately and clean the condensate pan and drains to ensure a free flowing primary drain.

Third-party trademarks

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

Wiring diagram

Figure 22: Wiring diagram - standard single piece multi-position ECM



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
- ◯ Retrofit
- ◯ Upflow
- ◯ Downflow
- ◯ Horizontal Left
- ◯ 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	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5		
		Compressor low	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5		
		Continuous fan	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5		
		Electric heat	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5		

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		Serial number		Rated kW	
Number of elements		Measured amperage (A)	Heater 1	Heater 2	Heater 3	
			Heater 4	Heater 5	Heater 6	
		Measured voltage (V)	Heater 1	Heater 2	Heater 3	
			Heater 4	Heater 5	Heater 6	
Heating return air dry bulb temperature		Heating supply air dry bulb temperature		Air temperature rise		

Job site clean-up

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

Unit operation and cycle test (complete all that apply)

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

Owner education

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

Comments and additional job details