Installation Manual: JMC Series

Variable Speed ECM Modular Multi-Position Air Handlers 208/230 V - Single Phase and Three Phase

York International Corporation, 5005 York Drive, Norman, OK 73069

6412218-UIM-B-0424

Supersedes: 6412218-UIM-A-0324

B

2024-04-25

Contents

About the JMC unit

The JMC modular air handler series provides the flexibility for installation in any position. You can use JMC units for upflow, downflow, horizontal right, or horizontal left applications.

You can locate JMC units in a closet, utility room, attic, crawl space, or basement and use these versatile models for cooling or heat pump operation with or without electric heat. A fully cased indoor coil is required for add-on cooling or a heat pump.

Top or side power and control wiring, color-coded leads for control wiring, easy to install drain connections, and electric heaters all combine to make the installation easy and minimize installation cost.

Electric heat kits are available as field-installed accessories. Single-phase electric heat kits are available from 2 kW to 25 kW, and 208/230 V three-phase electric heat kits are available from 10 kW to 25 kW.

Certification

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

C SA ® US

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

Safety

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

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**, **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 indoor coil manual to ensure safe installation, operation, and servicing of this unit.

For minimum airflow (CFM) requirements, refer to the *Minimum room area* table in the *A2L refrigerant safety considerations* section of the indoor coil manual.

⚠ 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.

⚠ 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.

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:

- Failure to carefully read and follow all instructions in this manual can result in air handler malfunction, death, personal injury, or property damage.
- Always install this air handler in accordance with all national and local building and safety codes and requirements, local plumbing or wastewater codes, and other applicable codes.
- Only install this air handler in a location and position specified in Preparing 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 Providing the required clearances.
- The unit nameplate displays the air handler model number. The unit dimensions for the supply air plenum are provided in Figure 2 and Table 1. Always install the plenum according to the instructions.
- It is necessary to maintain clearances for servicing and to allow access to the electric heaters and blower.
- It is necessary to verify the unit 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 precautions in the manuals and on the labels attached to the unit and other safety precautions must be observed as applicable.
- These instructions cover minimum requirements and conform to existing national standards and safety codes. In some instances, these instructions exceed certain local codes and ordinances, especially those who have not kept up with changing residential and non-HUD modular home construction practices. These instructions are required as a minimum for a safe installation.
- These models are not CSA listed or approved for installation into a HUD-approved modular home or a manufactured (mobile) home.

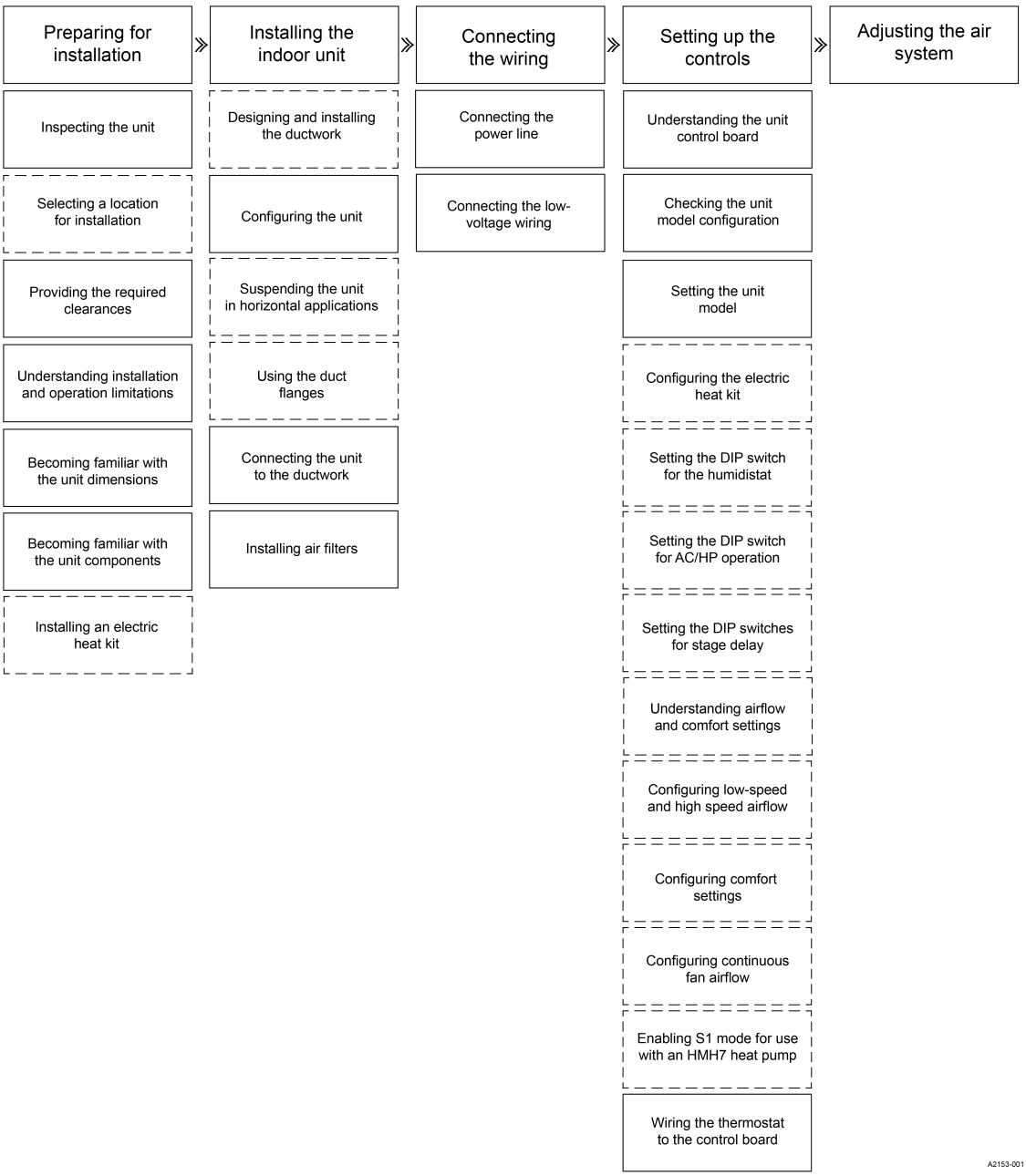
Installation overview

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. See Unit data for unit data as needed throughout the installation and see Troubleshooting if required.

Important:

- If you are using a communicating system, you must use the Hx™3 Touch Screen Thermostat (S1-THXU430W).
- Install accessories and configure the unit for the specific application before setting the unit in place, connecting the unit to the ductwork, or connecting any wiring or piping.

Figure 1: Installation overview



Preparing for installation

Complete the necessary preparation before you begin the installation:

1. Inspect the unit.
2. Visit the installation site to select a suitable location for the unit if it is not already predetermined, and make sure that you can provide the required clearances.
3. Make sure that you are aware of the installation and operation limitations.
4. Make sure that you are familiar with the unit dimensions and unit components.
5. 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

About this task:
There are no internal shipping or spacer brackets to remove.

To inspect the unit, do the following:

1. Inspect the air handler immediately after receiving it for possible damage during transit.
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 the unit for screws or bolts loosened in transit.
4. Verify that the coil and all accessories, such as an electric heat kit, are available.

Selecting a location for installation

About this task:
Location is usually predetermined. Check with the owner's or dealer's installation plans.

If the 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.
- Normal operating sound levels may be objectionable if the air handler is placed directly over some rooms such as bedrooms or a study.
- When installing an indoor coil in an attic or above a finished ceiling, provide 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:

- Ensure to leave a minimum of 36 in. from the front of the unit for blower motor maintenance and servicing access.
- The supply air ductwork connected to this unit is designed for 1 in. clearance for the first 18 in. of duct length to combustible materials.
- A combustible floor base accessory is available for downflow applications of this unit, if required by local code.

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 within 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 dimensions

- Make sure that you are familiar with the unit dimensions before you begin the installation. See Figure 2 and Table 1.

Dimensions

Figure 2: Dimensions and duct connection dimensions

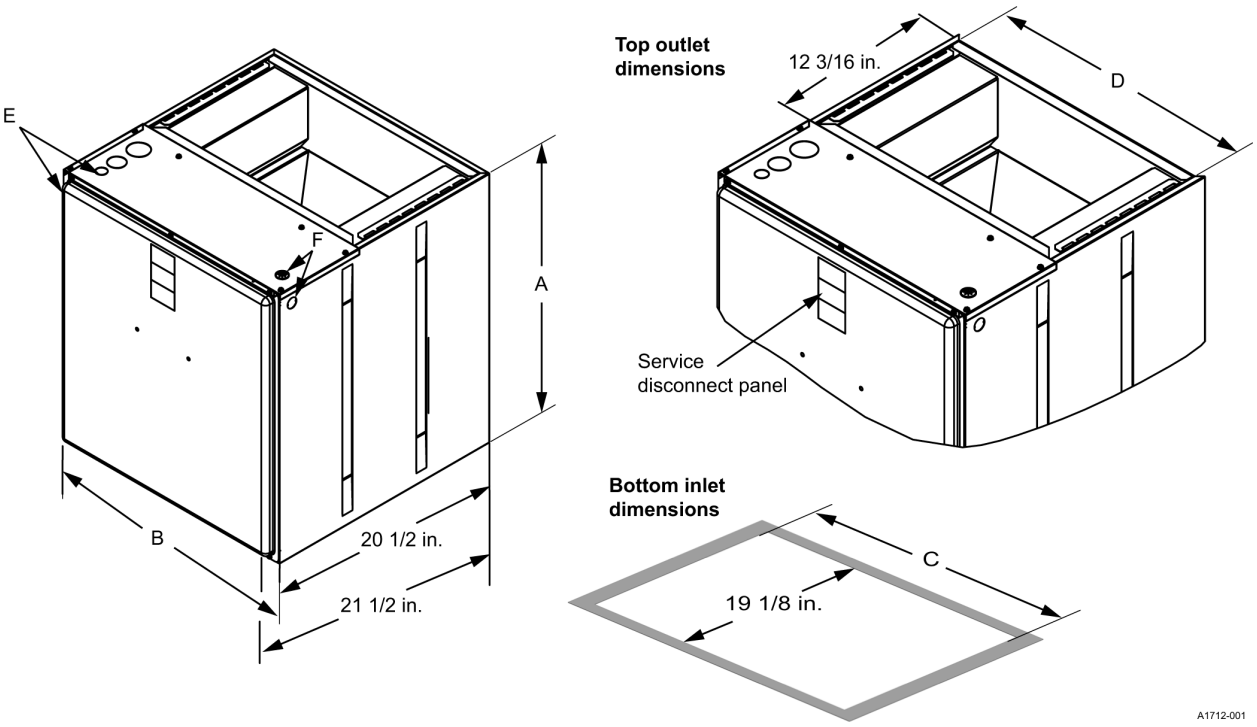


Table 1: Dimensions [1]

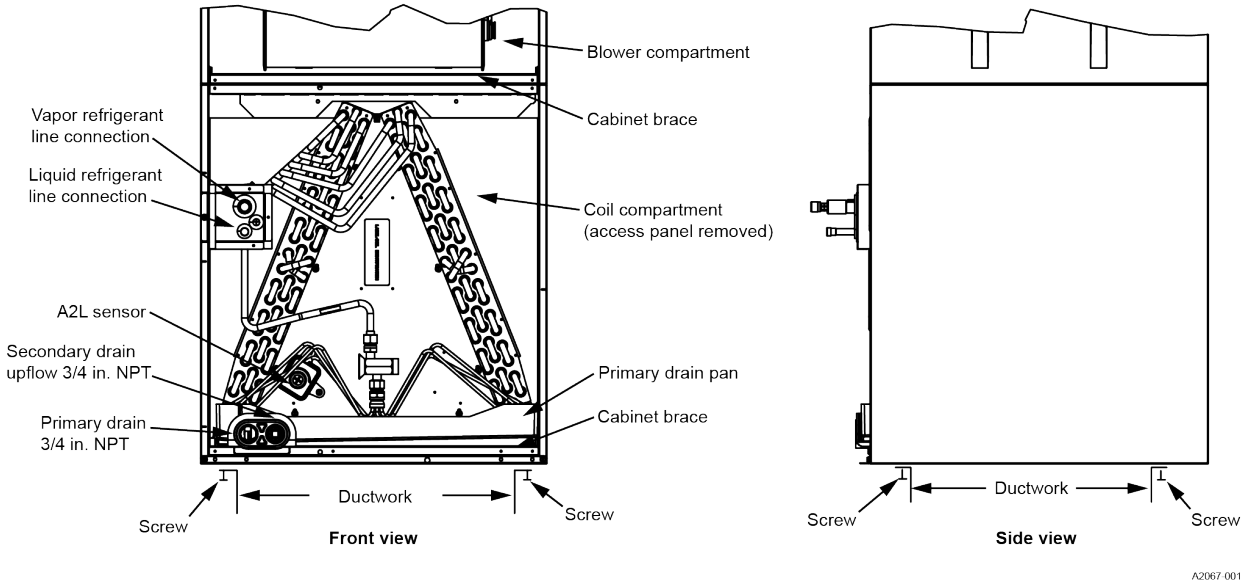
Models	Dimensions				Wiring knockouts [2]	
	A	B	C	D	E	F
	Height (in.)	Width (in.)	Opening widths (in.)		Power (in.)	Control (in.)
JMC12B2SN	22 3/4	17 1/2	16 1/2	16 1/2	7/8 (1/2) 1 3/8 (1) 1 23/32 (1 1/4)	7/8 (1/2)
JMC16C2SN	22 3/4	21	20	20		
JMC17C2SN	22 3/4	21	20	20		
JMC20D2SN	22 3/4	24 1/2	23 1/2	23 1/2		

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

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, shown with an add-on indoor coil



Installing an electric heat kit

About this task:
If the air handler requires electric heat, you can install an 8HK electric heat kit, as listed on the air handler nameplate and in this manual.

Important:

- You connect the wiring for the electric heat kit as part of the procedures outlined in Connecting the wiring.
- 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.

See Table 11 to Table 21 for information on the required minimum motor speed tap to use for heating operation and the maximum over-current 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).

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 nameplate to designate the electric heat kit that is installed.

What to do next:
Install the unit.

Installing the unit

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

1. Design and install the ductwork if required.
2. Configure the unit and suspend the unit for a horizontal application if needed.
3. Use the duct flanges if required and connect the unit to the ductwork.
4. Install air filters.

Designing and installing the ductwork

About this task:
Air supply and return may be handled in one of several ways best suited to the installation. Upflow, horizontal or downflow applications can be used. The vast majority of problems encountered with heating and cooling systems are linked to incorrectly designed or installed duct systems. It is crucial to the success of an installation that the duct system is 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.

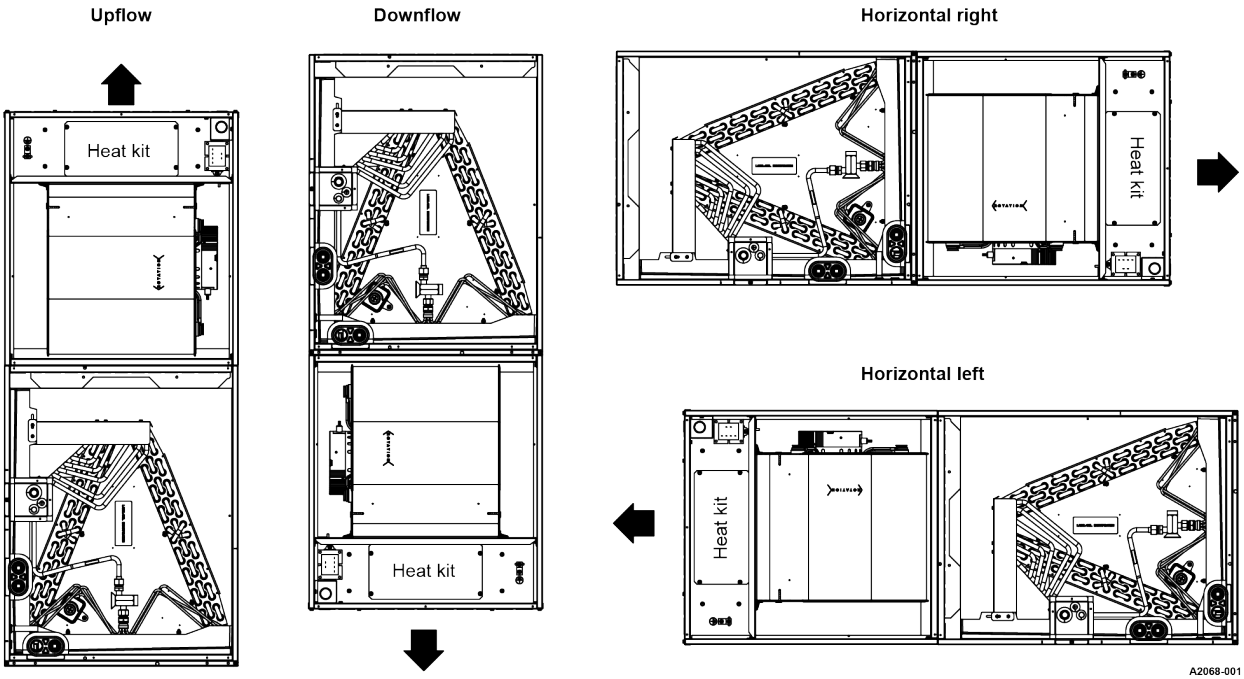
To design and install the ductwork, do the following:

- 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/ or national codes. This includes the standards of the National Fire Protection Association for Installation of Air-Conditioning and Ventilating Systems, NFPA No. 90B. If using electric heat, you must use non-flammable material. Duct systems must be designed in accordance with ACCA Manual D.

Configuring the unit

About this task:
You can install the unit in any position shown in Figure 4. You must configure the air handler and coil for upflow, downflow, or horizontal applications.

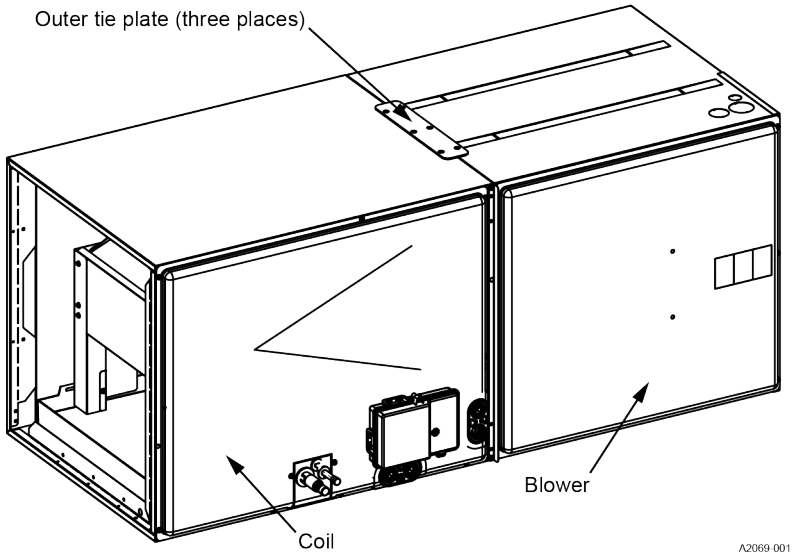
Figure 4: Typical installation



To configure the unit, do the following:

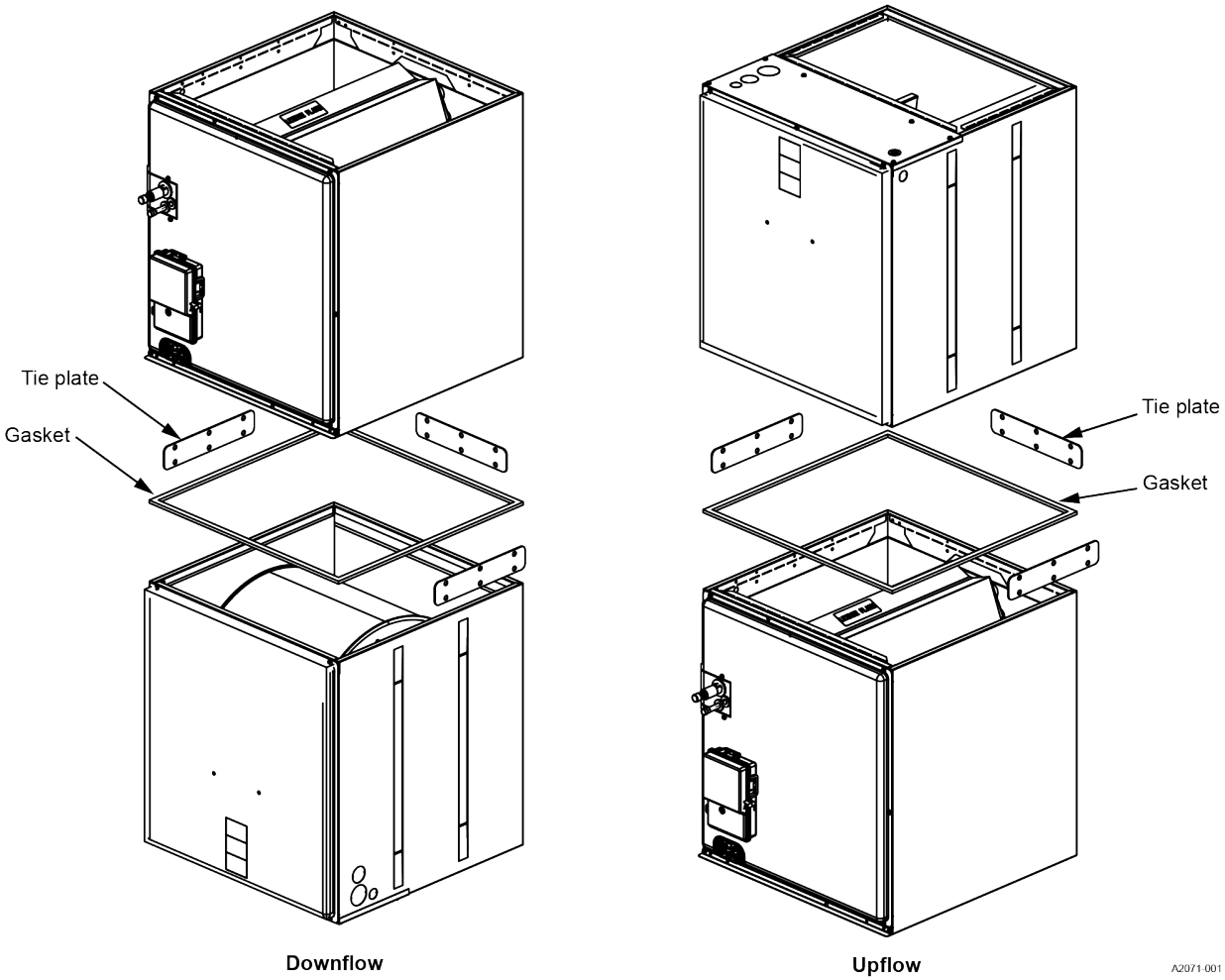
1. Apply the neoprene foam gasket to the return air end of the air handler.
2. Attach three tie plates to the external sides and back of the air handler casing using screws. See Figure 5.

Figure 5: Coil and air handler attachment details



3. Position the air handler casing over the appropriate coil opening, depending on configuration. See Figure 4.
4. Attach the three tie plates to the coil casing using screws. See Figure 5.
5. Remove the coil access panel.
6. Slide the coil out of the coil cabinet and set the coil to the side.
7. Locate the 2 in. wide foam gasket.
8. Apply the foam gasket over the air handler and coil mating seams on the interior of both unit sides and back. See Figure 6.

Figure 6: Gasket location



9. Slide the coil into the housing and install the coil access panel and coil filter door.

Suspending the unit in horizontal applications

About this task:
It is possible to suspend the air handler 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 brace. The cabinet brace is held in place by the coil channel. The cabinet brace could become disengaged from the cabinet causing the air handler to fall, potentially causing injury or damaging property. See Figure 3 for the location of the cabinet braces.

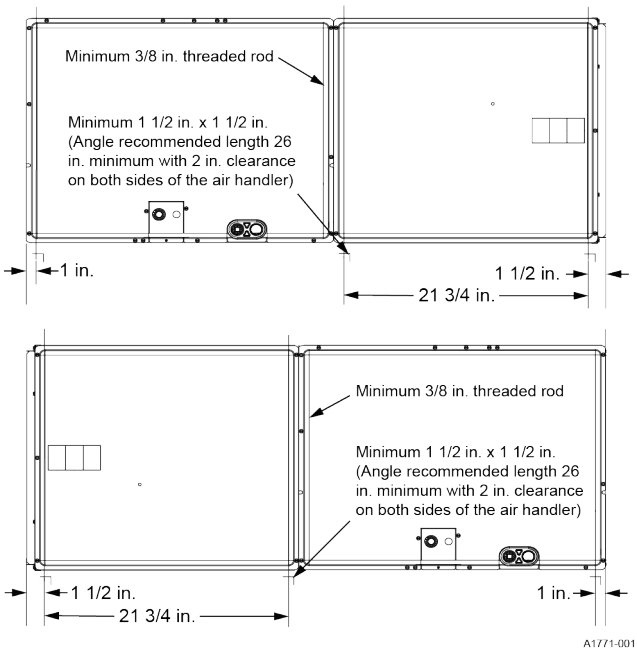
NOTICE

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

To suspend the unit in a horizontal application, do the following:

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.

Figure 7: Suspension support locations for horizontal applications



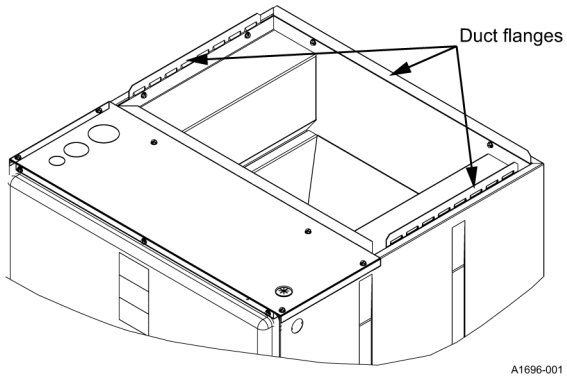
Using the duct flanges

About this task:
You can use the duct flanges that are integrated into the casing if required.

To use the duct flanges, do the following:

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

Figure 8: Duct attachment



Connecting the unit to the ductwork

About this task:
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. You can use upflow, horizontal, or downflow applications. Use flexible duct connectors to minimize the transmission of vibration and noise into the conditioned space.

ⓘ **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.

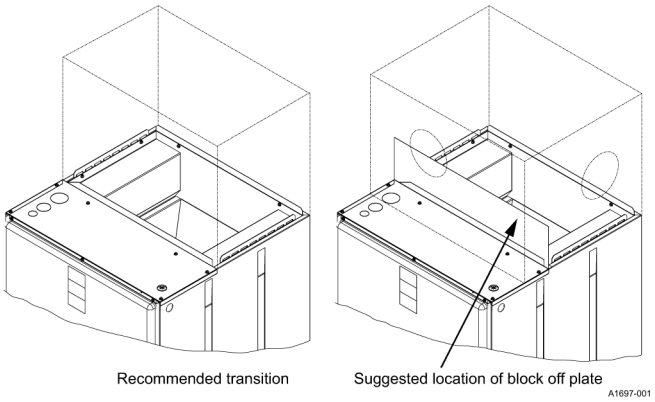
⚠ CAUTION

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.

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 Table 1 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 a block-off plate enables better air circulation across the limit switches.

Figure 9: Ductwork transition



Installing air filters

About this task:

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.

What to do next:
Connect the wiring.

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 wiring.

Connecting the power line

About this task:

⚠ 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.

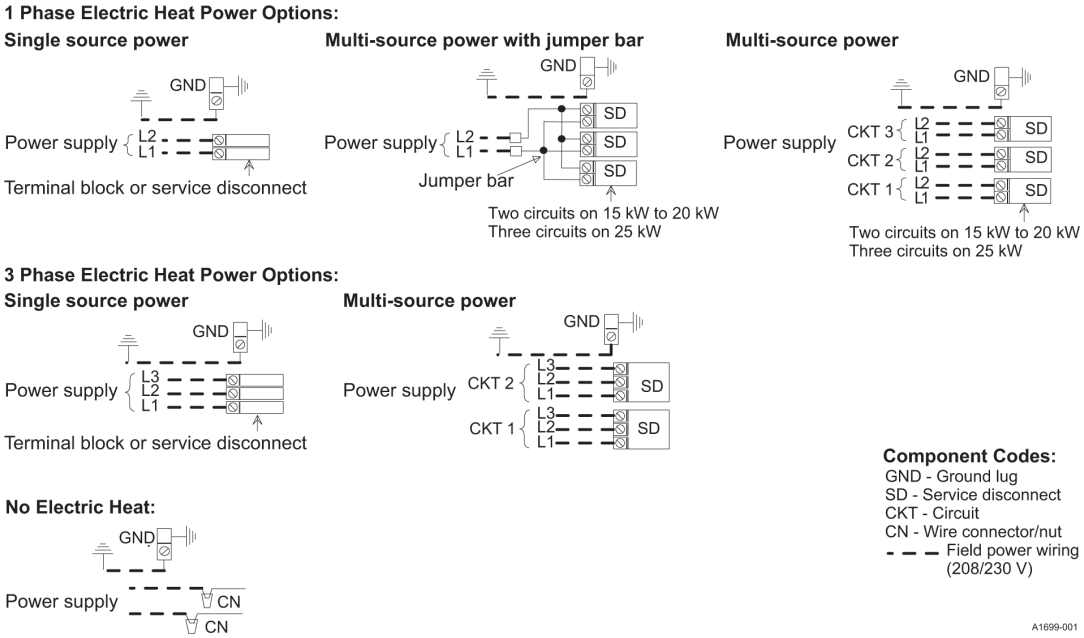
Important:

- 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 18 to Table 21 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

About this task:

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:

- Connect the field wiring at the pigtails supplied with the control board harness.
- If the air handler has an add-on indoor coil to be paired with an outdoor unit using an A2L refrigerant, you must use a refrigerant detection system (RDS). See the *Installation Manual* for the RDS or an indoor coil with a factory-installed RDS for low-voltage wiring instructions and diagrams.

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 2 to familiarize yourself with the low-voltage connections.

   Table 2: 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
Y/Y2	Yellow	Second-stage or full-stage compressor operation	Applies only for conventional systems
Y1	Yellow and Black	First-stage compressor operation	Applies only for conventional systems. Not used with outdoor units with single-stage compressors
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
S1	Field-supplied wiring	Reduce airflow and set S1 functionality	Applies only for conventional systems. Used only with outdoor units with an S1 out
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

About this task:
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 2. 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 pigtails 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

About this task:
This task applies only for conventional systems.

Important: If the air handler has an add-on indoor coil to be paired with an outdoor unit using an A2L refrigerant, you must use a refrigerant detection system (RDS).

For conventional systems, you can use the following if required:

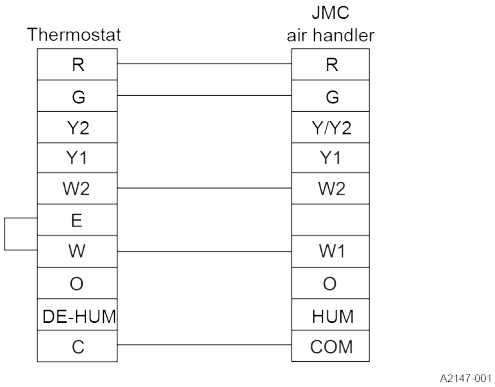
- Humidity switch: The air handler control is designed to work with a humidity control that closes when the humidity is below the setpoint. The control is open when the humidity is above the setpoint. This humidity control may be referred to as a humidistat or a dehumidistat. The humidity switch controls 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.
- S1 logic input: If you are using an HMH7 horizontal discharge heat pump, you must use the S1 logic input. This makes the air handler compatible with the HMH7 horizontal discharge heat pump without the need for any additional relays.

Important: If you use the S1 logic input, you must put the air handler control into S1 mode before wiring the field thermostat to the control board. See Setting up the controls and Enabling S1 mode for use with an HMH7 horizontal discharge heat pump.

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 modular air handler - electric heat only - conventional wiring



Note:

- The Y/Y2 thermostat wire must be connected for full CFM and applications requiring 60 s blower off delay for SEER enhancement.
- If a humidistat is connected to the HUM input, you must change the DIP switch for the humidistat to the on or 1 position as outlined in Setting the DIP switch for the humidistat.
- The control is factory set for HP applications. For AC applications, you must change the DIP switch for AC/HP operation to the on or 1 position as outlined in Setting the DIP switch for AC/HP operation.
- **Air handler control wiring only:** Optional dehumidification humidistat switch contacts open on humidity rise.

- Connect the humidity switch to the HUM wire of the control if required. See Figure 11.
- Use the HUM OUT output to control a humidifier if required.
- If you are using an HMH7 horizontal discharge heat pump, connect the S1 output from the HMH7 horizontal discharge heat pump to the S1 input terminal on the board.
- If you are using a conventional system with an outdoor unit containing A2L refrigerants, interface the RDS with the conventional system. See the *Installation Manual* for the RDS or an indoor coil with a factory-installed RDS for low-voltage wiring instructions and diagrams.

Connecting communicating controls

About this task:
This topic 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 Johnson Controls indoor coil and a refrigerant detection system (RDS) are 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 12. 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 tempeature sensor allows the communicating control to monitor the temperature of the supply air in the plenum.

If air circulation during communicating operation is required, you must supply 24 VAC to the conventional O input. This operates the fan during communicating operation.

⚠ CAUTION

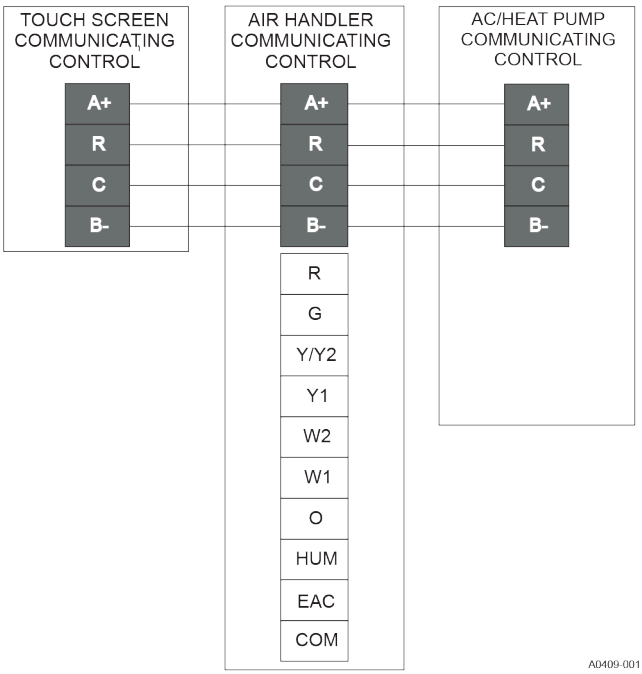
If connecting any field-supplied wiring to the control board, such as when using the communicating control, float switch, or leaving air temperature switch, you must route the additional wires through the hole at the lower right of the control box.

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 connect communicating controls, do the following:

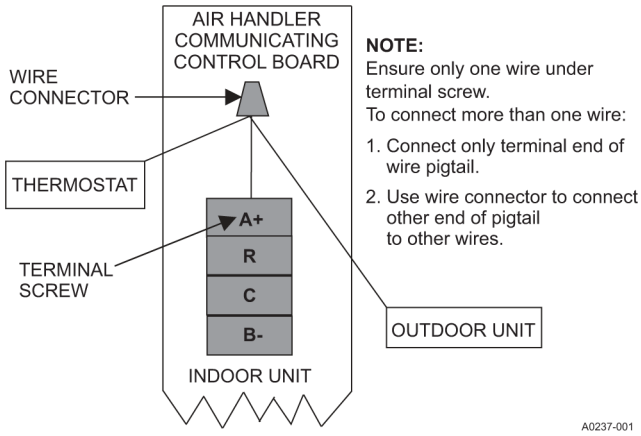
- Connect the air handler control, touch screen communicating control (Hx 3 Touch Screen Thermostat), and communicating outdoor unit as shown in Figure 12. Ensure all of the A+ terminals are connected together, all of the B- terminals are connected together, all of the C terminals are connected together, and all of the R terminals are connected together. See Figure 12 and Figure 13.

Figure 12: Air handler with communicating AC or HP with no RDS connected



Important: Do not place more than one wire under any single communication terminal screw (there are four communication terminal screws). If more than one wire must be connected to a terminal screw, attach only the terminal end of a one wire pigtail no longer than 6 in. 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 13.

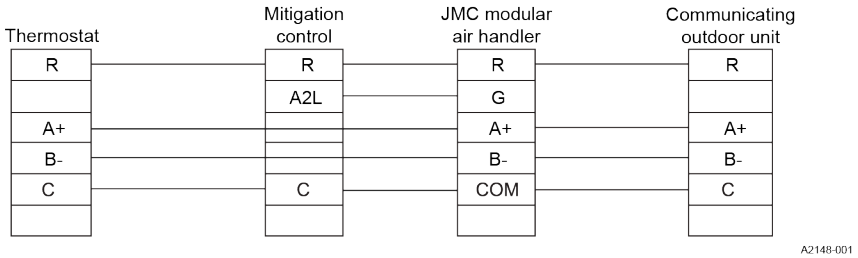
Figure 13: Multi-wire terminal connection



- 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.
- Supply 24 VAC to the conventional O input if air circulation during communicating operation is required.

- If you are using a fully communicating system with an outdoor unit containing A2L refrigerants, interface the RDS with the communicating system. See Figure 14 and see the *Installation Manual* for the RDS or an indoor coil with a factory-installed RDS for low-voltage wiring instructions and diagrams.

Figure 14: Control wiring - communicating indoor - communicating outdoor - communicating wiring



Connecting a float switch for communicating systems

About this task:
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.

What to do next:
Set up the controls.

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.

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.

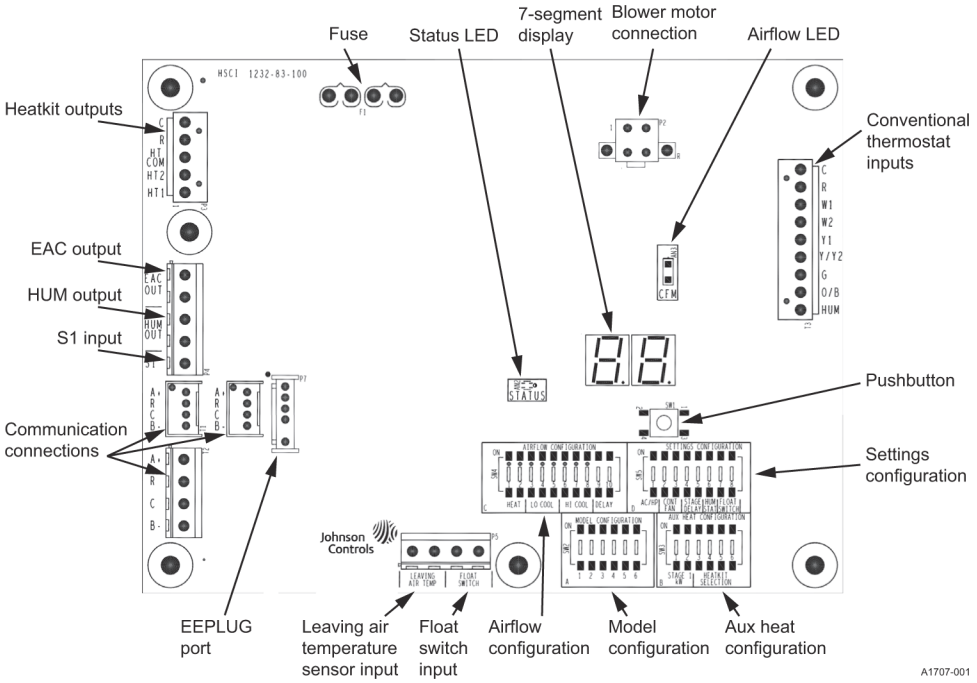
To set up the controls correctly, you must do the following:

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 JMC 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 systems, if using a HMH7 horizontal discharge heat pump, enable S1 mode so the air handler operates correctly with the HMH7 horizontal discharge heat pump. S1 mode does not apply for communicating systems.
9. For conventional or communicating systems, wire the thermostat to the control board.

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 15 for an illustration of the control board.

Figure 15: JMC control board



The control board in JMC 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.

JMC 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.

The control board has a built in S1 mode feature that allows the logic for reversing valve and dehumidification during cooling to be reversed if using a HMH7 heat pump. This is because HMH7 heat pump models use a reversing valve signal that is energized during heating mode instead of cooling mode as typical in all other Johnson Controls Ducted Systems residential outdoor heat pump models.

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 JMC12B air handler model is 100001, so the 1, 2, 3, 4, 5, and 6 DIP switches in the SW2 switch bank in quadrant A are set to on, off, off, off, off, on respectively. See Figure 16.

It is important to be aware of the following:

- You must apply power to the JMC 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

About this task:
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 3 shows the model ID for each JMC air handler.

Table 3: JMC air handler model IDs

Model	Model ID
JMC12B	1E
JMC16C	2E
JMC17C	3E
JMC20D	4E

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 3 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.

About this task:
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.

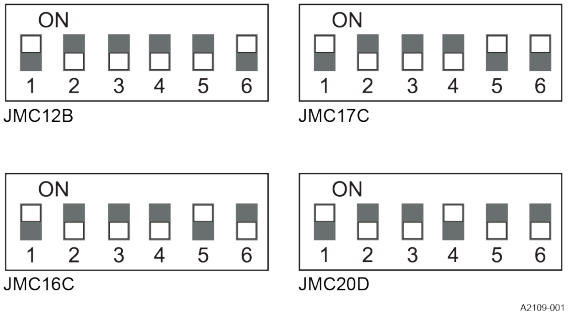
Important:

- 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 16. Fault code **01** displays.

Figure 16: DIP switch settings by JMC model



3. 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.

About this task:
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 11 and Table 12 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 11 and Table 12 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 4 shows the amount of heat per stage for these multi-stage electric heat kits.

Table 4: 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 5: 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 14 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.

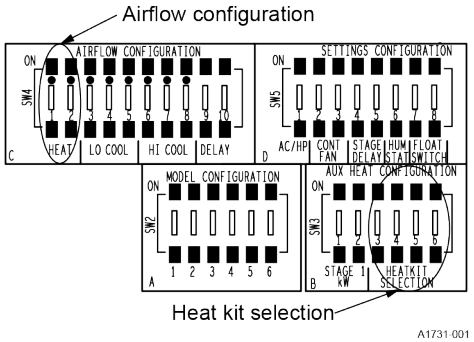
For heat pump applications, it is best practice to use only the least amount of electric heat necessary to correctly temper the indoor air during unit defrost. Heat pumps energize W1 on the air handler control board only during defrost. For a system combination that uses a JMC12B air handler, a 15 kW 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 17 shows the DIP switches for selecting the electric heat kit model and adjusting the airflow for the electric heat kit.

Figure 17: 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 11 or Table 12 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 11, if you have a JMC16C air handler paired with a CTF indoor coil and you are using the 8HK(0,1)6500506 electric heat kit, the DIP switch setting is 00-0010. In this case, you would leave **AIRFLOW CONFIGURATION** DIP switches **1** and **2** for heat in the **SW4** switch bank in the factory position of 00 and 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 Table 14. 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 11 or Table 12. 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

About this task:
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

About this task:
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

About this task:
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 6 shows the DIP switch setting options.

Table 6: 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 6. Then, in the **SW5** switch bank in quadrant **D**, set **SETTINGS CONFIGURATION** DIP switches **4** and **5** for stage delay as required.

Understanding airflow and comfort settings

This topic applies only for conventional systems.

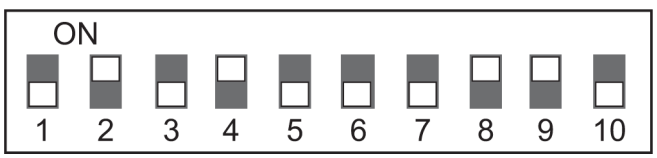
Important: If you are using a communicating system, you use the Hx 3 Touch Screen Thermostat to configure airflow and comfort settings.

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 23 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 18 for an example of airflow configuration DIP switch settings. 0 indicates the off position and 1 indicates the on position.

Figure 18: 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

About this task:
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 Table 23 for high-speed and low-speed airflow options, and see Figure 19 for an example of DIP switch settings.

Figure 19: DIP-8

- **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 Table 23 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

About this task:
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. JMC 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.

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 7 for the DIP switch settings for each comfort setting.

Table 7: 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 7. 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

About this task:
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. Table 8 shows the DIP switch setting options as a percentage of maximum airflow. The factory setting is 00, which is 40% of maximum airflow.

Table 8: 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 8. Then, in the **SW5** switch bank in quadrant **D**, set **SETTINGS CONFIGURATION** DIP switches **2** and **3** for continuous fan airflow accordingly.

Enabling S1 mode for use with an HMH7 horizontal discharge heat pump

Before you begin:
Use the S1 logic input and complete all other air handler control board setup for conventional systems except wiring the thermostat to the control board. See Connecting conventional controls and Setting up the controls.

About this task:
This task applies only for conventional systems and if you are using an HMH7 horizontal discharge heat pump.

Important: S1 mode does not apply for communicating systems.

The S1 terminal connects the air handler and the HMH7 horizontal discharge heat pump. When you enable S1 functionality, the system operates the indoor blower to take better advantage of the modulating features of the HMH7 unit, and changes the reversing valve logic to operate with a call for heating. It is essential to enable S1 functionality for the air handler to operate correctly with an HMH7 horizontal discharge heat pump.

Important:

- Do not enable S1 mode until **all** control board setup except wiring the thermostat to the control board is complete.
- If you need to disable S1 mode, with no active faults present and no 24 VAC input on the S1 terminal, press and hold the push button on the control board for more than 6 s.

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 enable S1 mode for use with an HMH7 horizontal discharge heat pump, do the following:

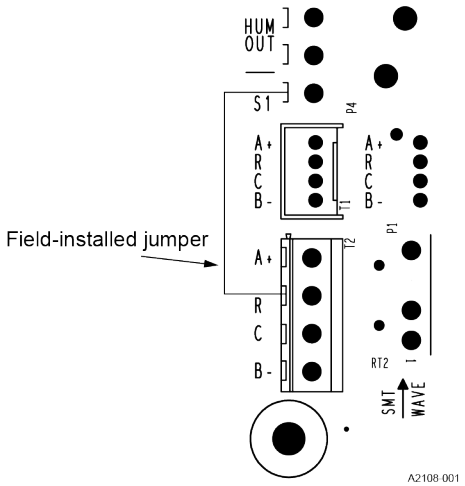
1. Make sure that no field thermostat wires are connected to the control board.
2. Make sure that you have set all DIP switches on the control board as required and outlined in these preceding tasks:
   a. Understanding the unit control board
   b. Checking the unit model configuration
   c. Setting the unit model

      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.

   d. Configuring the electric heat kit
   e. Setting the DIP switch for the humidistat
   f. Setting the DIP switch for AC/HP operation
   g. Setting the DIP switches for stage delay
   h. Understanding airflow and comfort settings
   i. Configuring low-speed and high-speed airflow
   j. Configuring comfort settings
   k. Configuring continuous fan airflow
3. Apply power to the air handler and confirm that the air handler goes into standby mode.
4. Remove power from air handler.

5. Place a wire jumper from the R terminal on the communicating wiring connection to the S1 input as shown in Figure 20.

Figure 20: Variable speed board S1 jumper



6. Apply power to the air handler.
7. When the air handler is in standby mode, press and hold the push button on the control board for more than 6 s. The 7-segment display should display **S1**.
8. Remove power from the air handler and field-installed jumper wire.

Wiring the thermostat to the control board

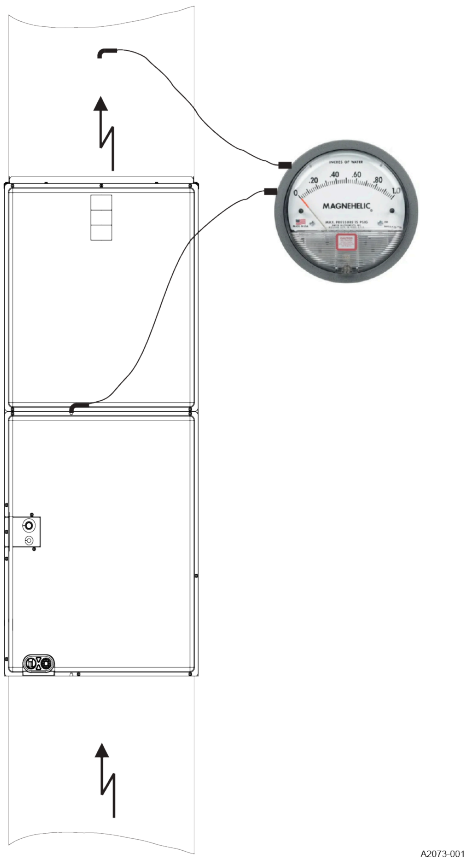
1. Consult the system wiring diagram to determine the correct thermostat wiring for the system.
2. Complete the thermostat wiring as required:
   - If you are using a communicating thermostat, wire the field thermostat wires to the control board.
   - If you are using a conventional thermostat, wire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

What to do next:
Adjust the air system.

Adjusting the air system

About this task:
You must adjust the air system to keep the CFM within the airflow limitations of the indoor coil if needed. To check the CFM, you measure the external duct static pressure using a manometer and static pressure tips. Figure 21 shows how to use a manometer to measure external duct static pressure.

Figure 21: 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 a hole 12 in. away from the air handler in the supply air duct.
3. Note that the leaving air side of the indoor coil has provisions for inserting a static pressure tip. See the indoor coil *Installation Manual* for more information before proceeding to Step 4.
4. Insert the static pressure tips and energize the blower motor.
5. Measure the supply air static pressure. Record this positive number.
6. Be aware that you must take the return air pressure reading between the indoor coil and the air handler. Measure the return air static pressure. Record this negative number.
7. Treat the negative number as a positive, and add the two numbers together to determine the total external system static pressure.
8. See Table 23 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 unit data as needed.

Table 9: Physical and electrical data - cooling only

Models		JMC12B	JMC16C	JMC17C	JMC20D
Blower - diameter x width (in.)		11 x 8	11 x 10	11 x 10	11 x 11
Motor	HP	1/2 HP	3/4 HP	1 HP	1 HP
	Nominal RPM	1050	1050	1050	1050
Voltage (V)		208/230	208/230	208/230	208/230
Full load amps at 230 V (A)		3.8	5.4	7.0	7.0
Filter (field supplied)	Type	Disposable or cleanable			
	Size (in.)	16 x 20 x 1	20 x 20 x 1	20 x 20 x 1	23 x 20 x 1
	Bottom rack	1BR01117	1BR01121	1BR01121	1BR01124
Shipping/operating weight (lb)		57/56	63/62	66/65	70/69

Table 10: Electrical data - cooling only

Models	Motor FLA[1]	Minimum circuit ampacity (A)	MOP [2]
JMC12B	3.8	4.8	15
JMC16C	5.4	6.8	15
JMC17C/JMC20D	7.0	8.8	15

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

Table 11: Electrical heat: minimum fan speed DIP settings for single-phase heat kits

Electric heat kit models [1], [2]	Nominal kW at 240 V	DIP switch settings by air handler model and coil matches							
		JMC12B		JMC16C		JMC17C		JMC20D	
		CTF	CTM	CTF	CTM	CTF	CTM	CTF	CTM
8HK(0,1)6500206	2.4	00-0001	00-0001	00-0001	00-0001	00-0001	00-0001	00-0001	00-0001
8HK(0,1)6500506	4.8	00-0010	01-0010	00-0010	00-0010	00-0010	00-0010	00-0010	00-0010
8HK(0,1)6500806	7.7	00-0011	01-0011	00-0011	00-0011	00-0011	00-0011	00-0011	00-0011
8HK(0,1)6501006	9.6	00-0100	00-0100	00-0100	00-0100	00-0100	00-0100	00-0100	00-0100
8HK(1,2)6501506	14.4	00-0101	01-0101	00-0101	00-0101	01-0101	01-0101	00-0101	01-0101
8HK(1,2)6502006	19.2	00-0110	00-0110	01-0110	01-0110[3]	00-0110	00-0110	00-0110	00-0110
8HK(1,2)6502506	24	—	—	—	—	—	—	00-0111	00-0111

Note:
- The DIP switch settings in the table are represented as two digits followed by a set of four digits. The first two digits represent the settings for airflow configuration DIP switches 1 and 2 for heat located in the SW4 switch bank in quadrant C: 00 = nominal, 01 = 20% CFM increase. The last four digits represent the settings for aux heat configuration DIP switches 3, 4, 5, and 6 for electric heat kit selection located in the SW3 switch bank in quadrant B.
- To increase any airflow by approximately 20%, adjust airflow configuration DIP switches 1 and 2 for heat from 00 to 01, if not already assigned as required for minimum CFM to satisfy the kW as given in the table.

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 Heat kit kW not approved for horizontal right with heat pump application

Table 12: Electrical heat: minimum fan speed DIP switch settings for three-phase heat kits

Electric heat kit models [1], [2]	Nominal kW at 240 V	DIP switch settings by air handler model and coil matches							
		JMC12B		JMC16C		JMC17C		JMC20D	
		CTF	CTM	CTF	CTM	CTF	CTM	CTF	CTM
8HK06501025	9.6	00-1000	00-1000	00-1000	00-1000	00-1000	00-1000	00-1000	00-1000
8HK06501525	14.4	00-1001	01-1001	00-1001	01-1001	01-1001	01-1001	00-1001	00-1001
8HK16502025	19.2	00-1010	00-1010	01-1010	01-1010	00-1010	00-1010	00-1010	00-1010
8HK16502525	24	—	—	—	—	—	—	00-1011	00-1011

Note:
- The DIP switch settings in the table are represented as two digits followed by a set of four digits. The first two digits represent the settings for airflow configuration DIP switches 1 and 2 for heat located in the SW4 switch bank in quadrant C: 00 = nominal, 01 = 20% CFM increase. The last four digits represent the settings for aux heat configuration DIP switches 3, 4, 5, and 6 for electric heat kit selection located in the SW3 switch bank in quadrant B.
- To increase any airflow by approximately 20%, adjust airflow configuration DIP switches 1 and 2 for heat from 00 to 01, if not already assigned as required for minimum CFM to satisfy the kW as given in the table.

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

Table 13: Default blower speeds for FER compliance - electrical heat only

Models	High sales volume heat kit [1], [2], [3]	Nominal kW at 240 V	Thermostat inputs	Default blower motor speeds		
			w1/[w1+w2]	Heat	Max air flow	Continuous fan
JMC12B	8HK(0,1)6500806	7.7	w1	01-0011	111 (high)	01
JMC16C[3]	8HK(1,2)6501506	14.4	w1+w2	01-0100	111 (high)	01
JMC17C[3]	8HK(1,2)6501506	14.4	w1+w2	01-0110	111 (high)	01
JMC20D[3]	8HK(1,2)6501506	14.4	w1+w2	00-0101	111 (high)	01

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 JMC16C, JMC17C and JMC20D models with 15 kW (8HK*65015**) heat kit, tie the AHU W1 and W2 thermostat inputs together for FER compliance.

Table 14: Aux heat configuration DIP switch settings for electric heat kit stage - stage 1 kW

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

Table 15: 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

Table 16: 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

Note: For a power distribution voltage that is different from the provided nominal voltage, multiply the kW and MBH data from Table 17 by the conversion.

Table 17: Electric heat performance data: 208/230-1-60 and 208/230-3-60

Electric heat kit 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 16.

Table 18: 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] (A)	
			208 V	230 V	208 V	230 V
JMC12B	8HK(0,1)6500206	10	15.6	16.7	20	20
	8HK(0,1)6500506	20	26.4	28.7	30	30
	8HK(0,1)6500806	32	39.6	43.3	40	45
	8HK(0,1)6501006	40	48.0	52.6	50	60
	8HK(1,2)6501506	60	69.7	76.5	70	80
	8HK(1,2)6502006	80	91.3	100.4	100	110
JMC16C	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	50	60
	8HK(1,2)6501506	60	71.7	78.5	80	80
	8HK(1,2)6502006	80	93.3	102.4	100	110
JMC17C	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
JMC20D	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

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

Table 19: 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] (A)					
			208 V			230 V			208 V			230 V		
			Circuit						Circuit					
			First [2]	Second	Third	First [2]	Second	Third	First [2]	Second	Third	First [2]	Second	Third
JMC12B	8HK16501506	60	26.2	43.5	—	28.4	48.1	—	30	45	—	30	50	—
	8HK16502006	80	48.0	43.3	—	52.6	47.8	—	50	45	—	60	50	—
JMC16C	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	—
JMC17C	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	—
JMC20D	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

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. 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 wire sizing.

Table 20: 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] (A)	
			208 V	230 V	208 V	230 V
JMC12B	8HK06501025	23.1	29.7	32.4	30	35
	8HK06501525	34.6	42.2	46.2	45	50
	8HK16502025[1]	46.2	54.7	60.0	60	60
JMC16C	8HK06501025	23.1	31.7	34.4	35	35
	8HK06501525	34.6	44.2	48.2	45	50
	8HK16502025[1]	46.2	56.7	62.0	60	70
JMC17C	8HK06501025	23.1	33.7	36.4	35	40
	8HK06501525	34.6	46.2	50.2	50	60
	8HK16502025[1]	46.2	58.7	64.0	60	70
JMC20D	8HK06501025	23.1	33.7	36.4	35	40
	8HK06501525	34.6	46.2	50.2	50	60
	8HK16502025[1]	46.2	58.7	64.0	60	70
	8HK16502525[1]	57.7	71.2	77.8	80	80

1 0 = no service disconnect or 1 = with service disconnect. The 20 kW and 25 kW heater models (8HK16502025 and 8HK16502525) come with service disconnects standard. Single source power MCA and MOP requirements are given here only for reference if used with field installed single point power modification.

2 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 wire sizing.

Table 21: Electrical data for multi-source power supply: 208/230-3-60

Air handlers models	Heater models [1]	Heater amps (A) at 240 V	Minimum circuit ampacity (A)				MOP [2] (A)			
			208 V		230 V		208 V		230 V	
			Circuit				Circuit			
			First[2]	Second	First[2]	Second	First[2]	Second	First[2]	Second
JMC12B	8HK16502025	46.2	29.7	25.0	32.4	27.6	30	25	35	30
JMC16C	8HK16502025	46.2	31.7	25.0	34.4	27.6	35	25	35	30
JMC17C	8HK16502025	46.2	33.7	25.0	36.4	27.6	35	25	40	30
JMC20D	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

1 The 20 kW and 25 kW 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 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 wire sizing.

Table 22: Airflow (CFM) - High/low speed cooling and heat pump - electric heat kit

Aux heat configuration DIP switch settings for electric heat kit selection	JMC12B		JMC16C		JMC17C		JMC20D	
	High	Low	High	Low	High	Low	High	Low
0001	625	625	825	825	825	825	825	825
0010	650	650	825	825	825	825	825	825
0011	750	750	1100	1100	1100	1100	1150	1150
0100	750	750	1100	1100	1100	1100	1500	1500
0101	975	650	1100	825	1100	825	1700	825
0110	975	750	1300	1100	1300	1100	1700	1500
0111	—	—	—	—	—	—	1800	1500

Table 23: Air flow (CFM) - High/low speed cooling and heat pump

Airflow configuration DIP switch settings for low-speed and high-speed airflow	JMC12B		JMC16C		JMC17C		JMC20D	
	High cool	Low cool	High cool	Low cool	High cool	Low cool	High cool	Low cool
000	800	550	1100	700	1150	725	1500	925
001	900	600	1200	750	1250	775	1475	1050
010	975	650	1300	800	1350	850	1750	1125
011	1075	700	1400	850	1450	900	1875	1225
100	1150	775	1500	925	1575	975	2000	1350
101	1250	825	1625	975	1675	1025	2000	1400
110	1325	900	1725	1050	1775	1100	2000	1475
111	1400	950	1825	1100	1875	1150	2000	1575

Note:

- Air handler units are tested to UL60335-2-40 standards up to 0.6 in. W.C. external static pressure.
- Airflow is tested with only dry coil conditions without filters.
- For optimal performance, external static pressures of 0.2 in. W.C. to 0.5 in. W.C. are recommended. Heating applications are tested at 0.5 in. W.C. external static pressure.
- Low-speed cooling is used only with two-stage outdoor units. The speed is preset to 65% of high speed.
- The dehumidification speed is 85% of jumper selected COOL tap and ADJUST tap.
- When operating in both heat pump and electric heat modes, the airflow (CFM) is only per HEAT tap CFM values.
- 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 (CFM) indicator flashes once for every 100 CFM, for example, 12 flashes is 1200 CFM. Flashes are approximately ±10% of actual CFM.

Troubleshooting

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

Status and fault codes

The control includes an LED that displays status and as well as two 7-segment displays to display fault codes. These codes are shown in Table 24. The control displays the fault codes until power is removed from the control or the fault condition is no longer present.

Table 24: 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 25	–	–
No fault codes in memory	2 flashes	–	–
Fault code memory cleared	3 flashes	–	–

Table 25: 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: 1. The motor is not compatible with the selected model. Change the model using the model configuration DIP switches. See Setting the unit model. 2. The motor is not communicating with the control - accompanied by 0 6. Check your wiring, cycle power on the control, and the motor. 3. 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: 1. 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. 2. 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.
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 system (leak detected)	r	L	Refrigerant leak	The refrigerant detection system (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 and de-energizes any electric heat signal. The control returns to normal operation when the RDS no longer senses a refrigerant leak.

Table 25: Fault list

Fault or status	Display 1	Display 2	Simplified	Description
Leaving air temperature sensor failure (open)	1	3	Leaving air temperature sensor error	The leaving air sensor is open. Check the wiring and check for a damaged sensor.
Leaving air temperature sensor failure (short)	1	4		The leaving air sensor is shorted. Check the wiring and check for a damaged sensor.
Low leaving air temperature in cooling	1	5		The leaving air temperature sensor is reporting lower temperatures that may cause condensate in the ductwork and cause damage to equipment. A few different things could cause this: 1. Check for a blockage in the ductwork. 2. Verify that the airflow for the size of the outdoor unit is correct. 3. Verify that the outdoor unit is the correct size for the application. 4. Verify there is nothing obstructing the fan.
High leaving air temperature in heating	1	6		The leaving air temperature sensor is reporting higher temperatures that may cause damage to equipment. A few different things could cause this: 1. Check for a blockage in the ductwork. 2. Verify that the airflow for the size of the outdoor unit is correct. 3. Verify that the heat kit is the correct size for the application. 4. Verify there is nothing obstructing the fan.
High leaving air temperature in heating (heat pump mode)	1	7	Leaving air temperature sensor error	The leaving air temperature sensor is reporting higher temperatures that may cause damage to equipment. A few different things could cause this: 1. Check for a blockage in the ductwork. 2. Verify that the airflow for the size of the outdoor unit is correct. 3. Verify that the outdoor unit is the correct size for the application. 4. Verify that the heat kit is the correct size for the application. 5. Verify there is nothing obstructing the fan.
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. • 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 HMH7 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. • 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 HMH7 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. • If the outdoor unit is an HMH7 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. 1. Check the wiring between the motor and the control. 2. Cycle power on both the motor and the control. 3. 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. 1. Check the motor has sufficient power. 2. Check the wiring between the motor and the control. 3. Verify nothing is blocking the blower fan. 4. Cycle power to both the motor and the control.

Table 25: 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.

Maintenance

Periodic maintenance involves the following:

- Replacing or cleaning filters
- Cleaning the indoor coil
- Checking the condensate drain lines

Important: The bearings of the blower motor are permanently lubricated and require no maintenance.

Replacing or cleaning filters

- Inspect filters at least once a month, and clean permanent filters or replace disposable filters 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.

Cleaning the indoor coil

About this task:
Clean the indoor coil with water if necessary. 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 indoor coil after using Evap-Green.

CAUTION

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

To clean the indoor coil, do the following:

1. Shut off all power to the unit.
2. Clean the indoor coil with water or a suitable coil cleaner.
3. Rinse the indoor coil after cleaning.

Checking the condensate drain lines

- During the cooling season, check the condensate drain lines to ensure 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 diagrams

Figure 22: Wiring diagram: standard ECM single phase heat kits

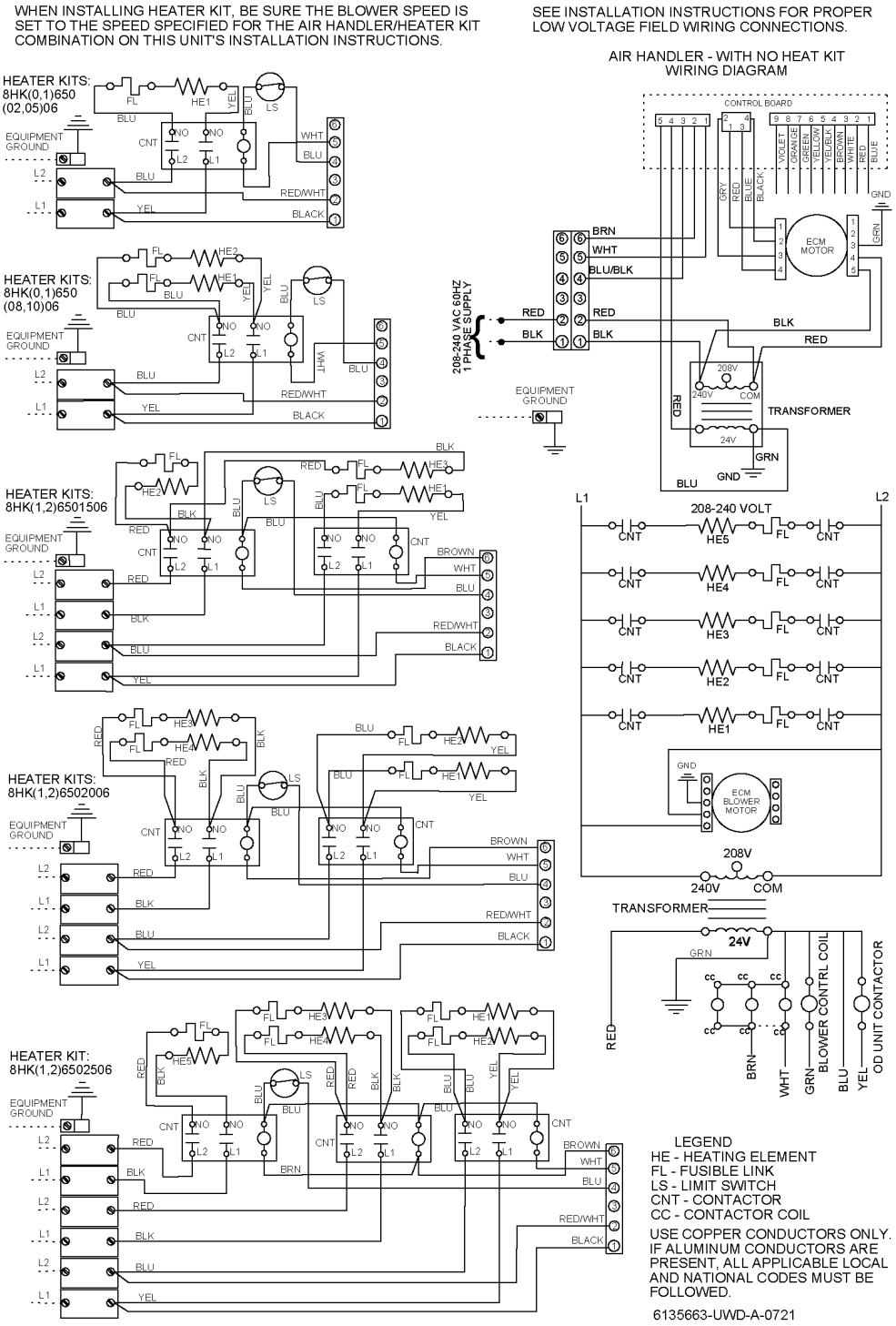
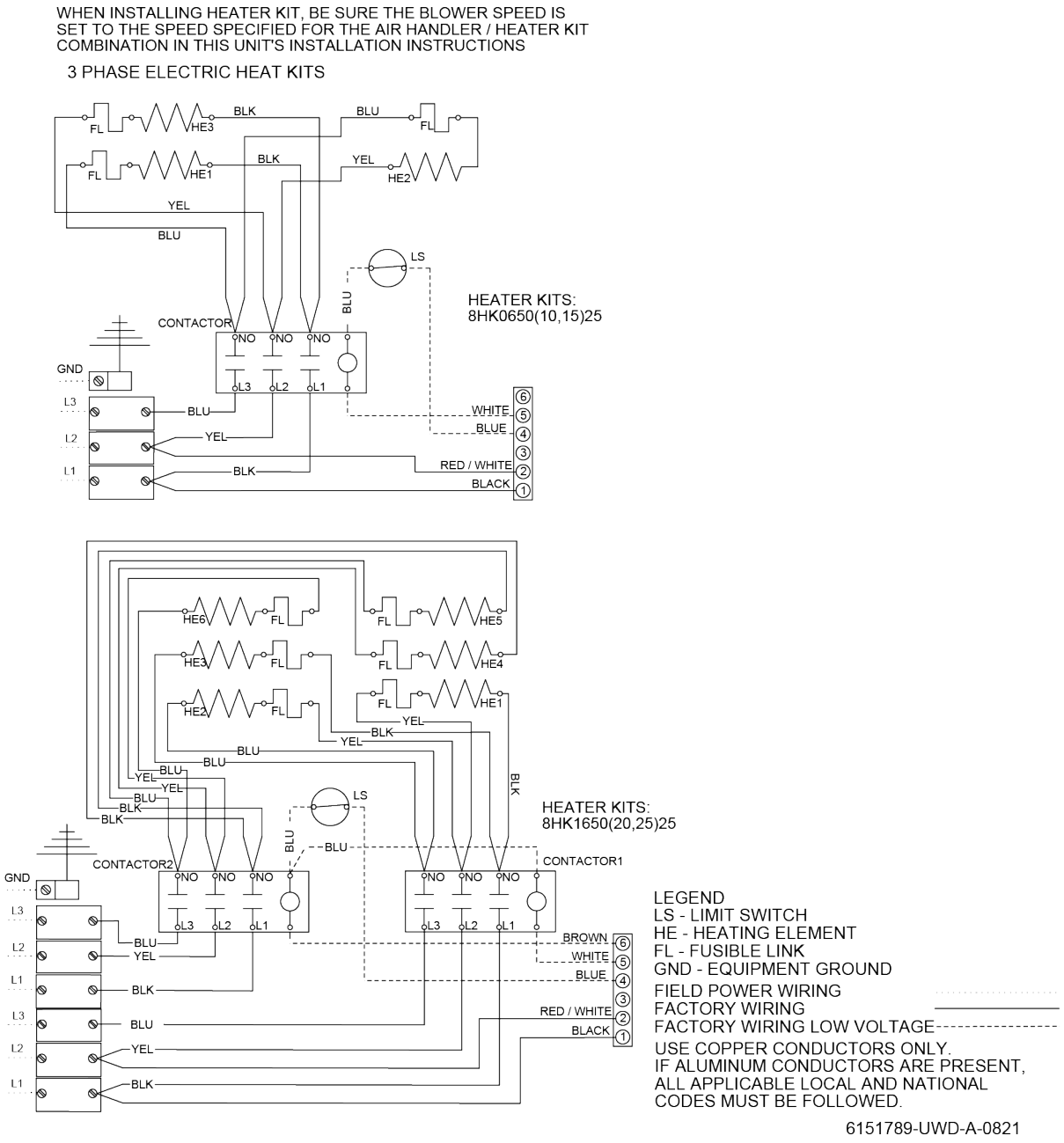


Figure 23: Wiring diagram: 208/230V three-phase heat kits



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	○ 6	○ 7	○ 8	○ 9
		Compressor low	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
		Continuous fan	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
		Electric heat	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 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		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