

Please read this manual carefully before installation and keep it for future reference.

# Installation & Owner's Manual



**MRCOOL®**

COMFORT MADE SIMPLE

## Hyper-Heat Single-Zone 24K-60K Ducted Air Handler & Condenser

Due to updates and constantly improving performance, the information and instructions within this manual are subject to change without notice. Please visit [www.mrcool.com/documentation](http://www.mrcool.com/documentation) to ensure you have the latest version of this manual.

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\*Pat. <https://mrcool.com/mrcool-patents/>

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## **! IMPORTANT INSTALLATION INFORMATION!**

### Refrigerant Line Set Connection Options, Requirements, and Stipulations

24K/36K/48K/60K Capacity Units are designed to be installed using either a traditional flare nut configuration of refrigerant piping or the optional MRCOOL® No-Vac® Quick Connect® Pre-Charged Line Set. If the optional No-Vac® Quick Connect® Pre-Charged Line Set is used, you ***DO NOT*** have to retain the services of a professional HVAC installer. If the traditional flare nut configuration is selected, you ***ARE REQUIRED*** to retain the services of a professional HVAC installer. Stub pipes and copper nuts are included with these capacity units to complete this type of installation. If any other form of installation is attempted, or these stipulations are not followed, the ***WARRANTY WILL BE VOIDED***.

**DISCLAIMER:** You are assuming risk by handling materials containing refrigerants under pressure, that if not handled properly, can cause bodily injury. If you do not feel comfortable conducting this installation process, we recommend you retain the services of a qualified HVAC professional.  
**\*\*\*\*Electrical work must be completed by a qualified electrical technician.\*\*\*\***

# Safety Precautions



## Read Before Using

**Incorrect usage may cause serious damage or injury.**

The symbols below are used throughout this manual to indicate instructions that should be followed closely or actions that should be avoided to prevent death, injury, and/or property damage.



**WARNING**

**This symbol indicates ignoring instructions may cause death or serious injury.**



**CAUTION**

**This symbol indicates ignoring instructions may cause bodily injury, damage to the unit, or other surrounding property.**



**This symbol indicates that you should NEVER perform the indicated action.**



## **WARNING FOR PRODUCT INSTALLATION**

**DISCLAIMER:** You are assuming risk by handling materials containing refrigerants under pressure, that if not handled properly can cause bodily injury. If you do not feel comfortable performing this installation process, we recommend you retain the services of a qualified HVAC professional.

**\*\*\*\*ELECTRICAL WORK MUST BE COMPLETED BY A QUALIFIED ELECTRICAL TECHNICIAN\*\*\*\***

- ⊘ **DO NOT** install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it could cause fire.
  - ⊘ **DO NOT** turn on the power until the installation and all work has been completed.
  - ⊘ **DO NOT** install a unit equipped with an auxiliary electric heater within 3 ft (1 m) of any combustible materials.
1. Installation must be performed according to the installation instructions. Improper installation could cause water leakage, electrical shock, fire, and could void the warranty. (In North America, all wiring/electrical work must be performed in accordance with the requirements of NEC and CEC by authorized personnel only.)
  2. Contact an authorized service technician for repair or maintenance of this unit. This appliance should be installed in accordance with national wiring regulations.
  3. Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and/or failure of the unit.
  4. Install the unit in a firm location that can support the unit's weight. If the location cannot support the unit's weight, or the installation is not done properly, the unit may drop and cause serious injury and damage.
  5. Install the drainage piping according to the instructions in this manual. Improper drainage could cause water damage to your home and/or property.
  6. When moving or relocating the air conditioner, consult experienced service technicians for disconnection and re-installation of the unit.
  7. For detailed information of how to install the indoor and outdoor units to their respective supports, please refer to the indoor unit installation and outdoor unit installation sections of this manual.
  8. Excessive Weight Hazard: Use two or more people when moving and installing the unit. Failure to do this could result in personal injury.

## **WARNING FOR PRODUCT USE**

- ⑦ ***DO NOT*** insert fingers, rods, or other objects into the air inlet or outlet. This could cause injury, since the fan may be rotating at high speeds.
  - ⑦ ***DO NOT*** use flammable sprays such as hair spray, lacquer or paint near the unit, as this could cause fire and/or an explosion.
  - ⑦ ***DO NOT*** operate the unit in places near or around combustible gases. Emitted gas may collect around the unit and cause an explosion.
  - ⑦ ***DO NOT*** allow children to play with the appliance. Children must be supervised around the unit at all times.
  - ⑦ ***DO NOT*** operate the unit in a room where it could be exposed to excessive amounts of water, such as a bathroom or laundry room. Exposure to excessive water amounts can cause the electrical components to short circuit.
  - ⑦ ***DO NOT*** expose your body directly to focused cool airflow from the unit for a prolonged period of time.
1. If the unit operates abnormally (emits strange noises or a burning smell), immediately turn off the unit and disconnect the power in order to avoid electric shock, fire, and/or injury. Call your local dealer, or MRCOOL® tech support at (270) 366-0457, for further assistance.
  2. If the air conditioner is used together with burners or other heating devices, thoroughly ventilate the room in order to avoid an oxygen deficiency.
  3. In certain functional environments (such as kitchens and server rooms etc.), the use of specially designed air-conditioning units is highly recommended.
  4. This appliance can be used by children (8 years and older) and persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge if they have been given instruction concerning the use of the appliance and understand the hazards involved.
  5. This unit is not designed for non-ducted (freeblow) applications. Electric heat kits and the blower are easily accessible without ducting. Operating this unit without ducting would create a major safety hazard and the potential for electric shock and/or personal injury.

## **ELECTRICAL WARNINGS**

**\*\*\*\*ELECTRICAL WORK MUST BE COMPLETED BY A QUALIFIED ELECTRICAL TECHNICIAN\*\*\*\***

- ⑦ ***DO NOT*** share the power supply with other appliances. An improper or insufficient power supply could cause fire and/or electrical shock.
1. The product must be properly grounded during installation or electrical shock could occur.
  2. Appropriate wiring standards, regulations, and the installation manual must be followed for all electrical work.
  3. If connecting power to fixed wiring, the following must be incorporated within it, in accordance with the wiring rules; an all-pole disconnection device (which has at least 3 mm of clearances in all poles), and have a leakage current that may exceed 10 mA, the residual current device (RCD) having a rated residual operating current not exceeding 30 mA, all must be present.
  4. For all electrical work, fuse the specified cables. Connect cables tightly and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections could overheat, causing fire and/or electrical shock.
  5. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.
  6. All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not properly closed, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.



## WARNING FOR CLEANING & MAINTENANCE

- ⊘ **DO NOT** clean the unit with excessive amounts of water.
  - ⊘ **DO NOT** clean unit with combustibile cleaning agents, as these could cause deformation and/or fire.
1. Turn off the device and disconnect the power before cleaning. Failure to do this could result in electrical shock.
  2. Children should not be allowed to play with the appliance or perform cleaning and user maintenance.

## CAUTION

- ⊘ **DO NOT** allow the unit to operate for extended periods of time with the doors or windows open, or in very high humidity.
  - ⊘ **DO NOT** operate the unit with wet hands, as this could cause electric shock.
  - ⊘ **DO NOT** use device for any other purpose than its intended use.
  - ⊘ **DO NOT** climb onto or place objects on top of the outdoor unit.
1. Make sure that water condensation can drain smoothly and unhindered from the unit.
  2. Turn off the unit and disconnect the power if the unit will not be used for an extended period of time.
  3. As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Ensure care is taken when handling the unit and any of its accessories by wearing gloves and protective clothing.

## NOTE ON FLUORINATED GASES:

1. This unit contains fluorinated greenhouse gases.
2. For specific information on the type of gas and the amount, please refer to the relevant label on the unit itself.
3. Service, maintenance, and repair of this unit must be performed by a certified technician.
4. Product un-installation and recycling must be performed by a certified technician.
5. When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

## NOTE ON STATIC PRESSURE

The allowed static pressure range of the air handler on site 0.00-0.80 in H<sub>2</sub>O (0-200 Pa).

The data below represents the static pressures at the full required airflow used for AHRI testing.

Model	24-60K
Pressure	0.50 in H <sub>2</sub> O (125 Pa)

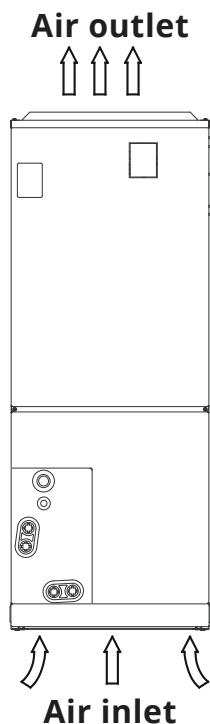
Units: Inch of Water Column (Pascals)

**NOTE:** The maximum functional total external static pressure cannot exceed 0.80 in WC (200 Pa). The airflow reduces significantly at pressures above and beyond 0.80 in WC (200 Pa). The system design should allow for the increased resistance of filters as they become dirty.

## NOTE ABOUT FUSE SPECIFICATIONS:

1. The unit's circuit board (PCB) may be designed with a fuse to provide overcurrent protection. This fuse must be replaced with an identical component.
2. The specifications of the fuse, if equipped, are printed on the circuit board. Examples of such as T5A/250VAC and T10/250VAC.

## Indoor Unit Overview



## Operating Temperature Ranges

	COOL Mode	HEAT Mode	DRY Mode
Room Temperature	61°F - 90°F (16°C - 32°C)	32°F - 86°F (0°C - 30°C)	50°F - 90°F (10°C - 32°C)
Outdoor Temperature	5°F - 122°F (-15°C - 50°C)	-22°F - 75°F (-30°C - 24°C)	32°F - 122°F (0°C - 50°C)

**NOTE:** The unit is designed to be operated in the temperatures in the above chart for safe and effective operation. If the unit is operated outside of these temperatures, it could become less efficient and/or malfunction.

## Features

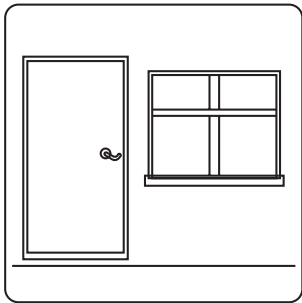
### Refrigerant Leak Detection System (some models)

In the event of a refrigerant leak, the LCD screen will display "ELOC" and the LED indicator light will flash.

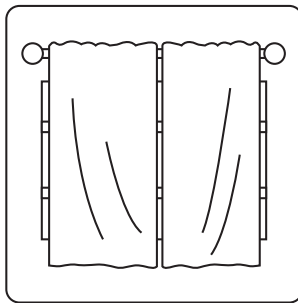
## NOTE

1. Requirements of wired controller: Control AXU function for live heating.
2. The default temperature of the unit during the first start up is 60.8°F (16°C) during cooling mode and 86°F (30°C) during heating mode. When the unit stops running it is at the current room temperature.

## Optimal Operation



Doors and windows should be kept closed.



Closing the curtains while heating also helps keep the heat in

To achieve optimal performance, please note the following:

- ⊘ **DO NOT** put any objects near the air inlets & outlets. Doing this would impair performance.
- ⊘ **DO NOT** set the unit to excessive or extreme temperature levels.
  - While cooling, close curtains to avoid direct sunlight.
  - Keep windows and doors closed, as this will keep cool or warm air in the room.
  - Limit energy usage by using scheduling functions.
  - Clean the air filter every two weeks.
  - Replace the air filter every 30 to 90 days depending on thickness and the filter's MERV rating (minimum efficiency reporting value).
  - Adjust louvers properly and avoid direct airflow.

### Additional Line Sets & Coupler Kit




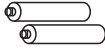
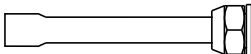



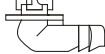




If you find the default line set lengths are not sufficient for your application, additional line sets are available for purchase. You will also need a coupler kit (pictured below), which allows line sets to be connected together. The coupler kit is installed and checked for leaks by following the same steps described in this manual for connecting the line set to the indoor air handler (Refer to Section 6: Refrigerant Piping Connections for these steps).





# Accessories

The listing below shows the accessories and parts (these may vary depending on purchase & options). Use all of the installation parts and accessories to install the system. Improper installation may result in water leakage, electrical shock, fire, and/or equipment failure.

PART	LOOKS LIKE...	QUANTITY	
Owner's & Installation Manual		1	
Remote Controller		1	
Remote Controller User Manual		1	
Batteries		2	
Stub Pipes (2 packed with indoor unit, 2 packed outdoor unit)		4	3/8" (1 with indoor / 1 with outdoor) 3/4" (1 with indoor / 1 with outdoor)
Thermostat		1	
Thermostat Manual		1	
Fastening Belts		2	
Drain Joint (Packed with outdoor unit)		1	
Seal (Packed with outdoor unit)		1	
Foam Insulator		4	
Copper Nut 3/8" (1) 3/4" (1)		2	
No-Vac® Quick Connect® Line Set*		Not Included	Optional Parts

\*Pat. <https://mrcool.com/mrcool-patents/>

## NOTICE

The wired system control functions as an IR receiver for the handheld remote. If the remote is not used, it must be retained with the indoor unit to adjust parameters and for troubleshooting purposes.

Note: Illustrations are for explanatory purposes only - The actual shape and size may vary.

## INDOOR UNIT INSTALLATION

### Indoor Unit Parts

#### Coil Compartment (Access panel Removed)

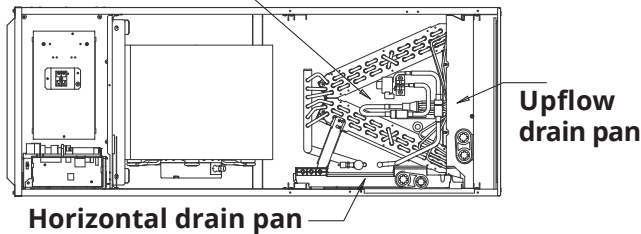


Fig. 2.1

### Safety Precautions

#### **WARNING**

- ⊘ **DO NOT** install the indoor unit in a bathroom, laundry room, or any location where it could be exposed to excessive amounts of moisture. This could cause the wiring of the unit to short or corrode.
- Securely install the indoor unit on a structure that can sustain the weight of the unit. If the structure is too weak, the unit could fall and cause personal injury, unit or property damage, and/or death.
- Keep flammable materials and vapors (such as gasoline) away from the air handler. Also, ensure that any heating elements are at least 18 in (46 cm) above the floor if the air handler is being installed in a garage. Failure to follow these instructions could result in death, fire, and/or explosion.

#### **CAUTION**

- Install the indoor and outdoor units, cables, and wires at least 3.2 ft (1 m) away from televisions or radios to prevent static or image distortion. Depending on the appliances, a 3.2 ft (1 m) distance may not be sufficient.
- If the indoor unit is installed on metal, it must be electrically grounded.

### Indoor Unit Installation Instructions

The indoor unit should be installed in a location that meets the following requirements:

- ☑ Enough room for the installation and maintenance to be performed.
- ☑ Enough room for the refrigerant piping and drain pipe.
- ☑ The ceiling is horizontal and its structure can sustain the weight of the indoor unit.
- ☑ The air inlet and outlet are not impeded.
- ☑ Room for properly sized return and supply ducts must be maintained.
- ☑ There is no direct radiation from heaters.

#### **CAUTION**

**DO NOT** install the indoor unit in any of the following locations:

- ⊘ Areas where oil drilling or fracking is being performed.
- ⊘ Coastal areas with high salt content in the air.
- ⊘ Areas with caustic gases in the air, such as near laundry vents.
- ⊘ Areas where power fluctuations can occur, such as near a factory.
- ⊘ Enclosed spaces, such as cabinets.
- ⊘ Areas with strong electromagnetic waves.
- ⊘ Areas where flammable materials or gas are stored.
- ⊘ Rooms with high humidity, such as bathrooms or laundry rooms.

#### **IMPORTANT**

- Be sure to apply sealant around any places where wires, refrigerant piping, and condensate piping enter the air handler cabinet.
- Use duct tape and/or sealing compound to seal any space around the holes where condensate piping exits the cabinet. Warm air must not be allowed to enter through any gaps or holes in the cabinet.

# Indoor Unit Installation

## Indoor Unit Dimensions and Clearance Requirements

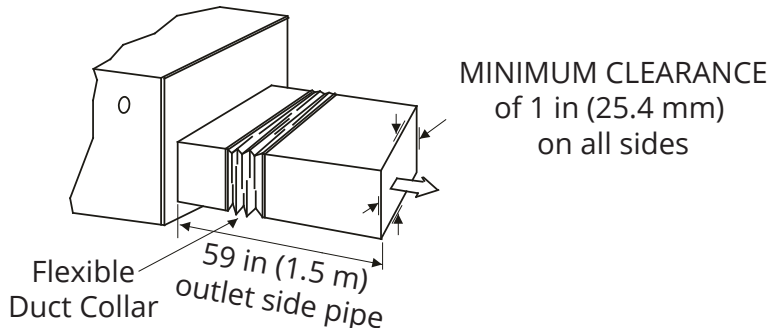
### **! WARNING**

- There must be an airtight seal between the bottom of the air handler and the return air plenum. In order to achieve this, use fiberglass sealing strips, foil duct tape, caulking, or an equivalent sealing method to ensure a tight seal.
- Return air must not be drawn from a room where the air handler or any gas-fueled appliance (ex: water heater), or carbon monoxide-producing device (ex: wood fireplace) is installed.

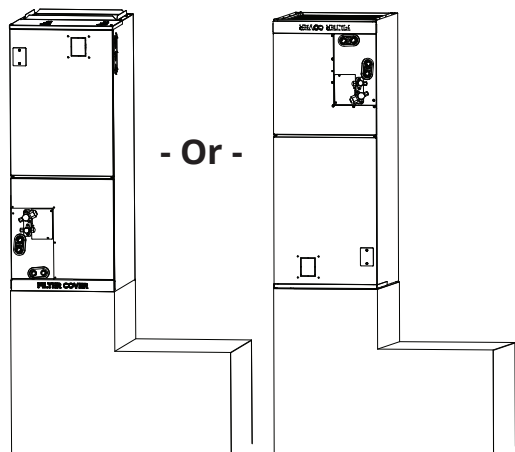
### Indoor Unit Clearance Requirements

The distance between the mounted indoor unit should meet the specifications illustrated in the following diagram.

#### Horizontal Installations Plenum Clearances



#### Vertical Installations



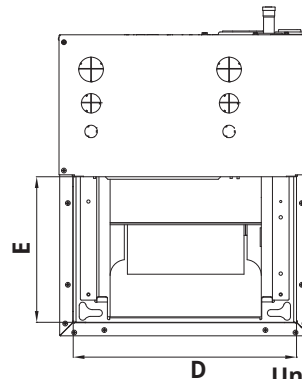
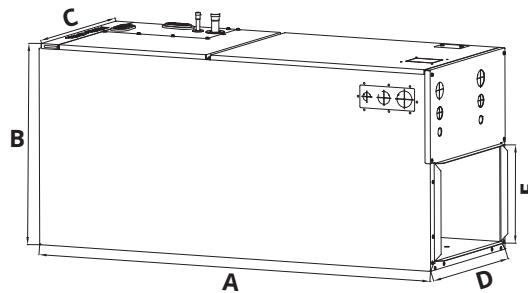
Mounting instructions: When installed vertically (upflow or downflow), the lower end of the air outlet needs to be connected to the L-shaped metal air duct and fastened by screws.



### **NOTICE**

Remove all accessories and packing in the air outlet before installation.

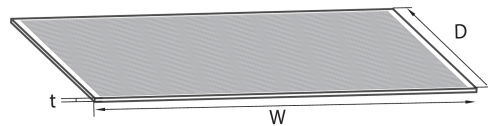
### Indoor Unit Dimensions



Unit: inch (millimeter)

Dimensions	60K		
Length of A	45 in (1143 mm)	49 in (1245 mm)	53 in (1346 mm)
Length of B	21 in (533 mm)	21 in (533 mm)	21 in (533 mm)
Length of C	17.5 in (445 mm)	21 in (533 mm)	24.5 in (622 mm)
Length of D	15.75 in (400 mm)	19.3 in (490 mm)	22.85 in (580 mm)
Length of E	10.25 in (260 mm)	10.25 in (260 mm)	10.25 in (260 mm)

### Filter Dimensions



Unit: inch (millimeter)

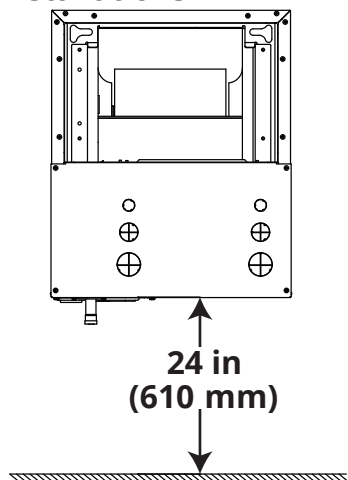
NOTE: The user needs to use a standard filter that meets the requirements of UL900.

Model Capacity (Btu/h)	Width	Depth	Thickness
24K	16 in (406.4 mm)	20 in (508 mm)	1 in (25.4 mm)
36K-48K	20 in (508 mm)	20 in (508 mm)	1 in (25.4 mm)
60K	23 in (584.2 mm)	20 in (508 mm)	1 in (25.4 mm)

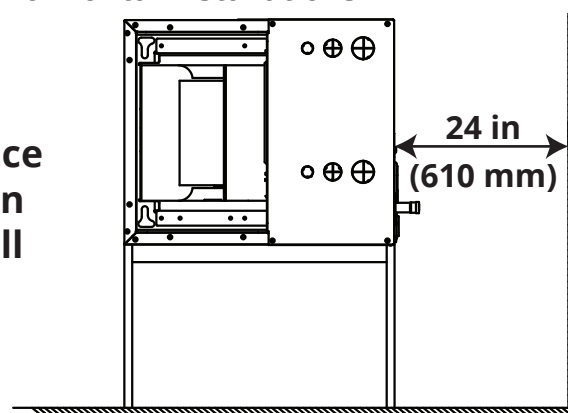
# Indoor Unit Installation

## Indoor Unit Dimensions and Clearance Requirements (continued)

### Vertical installations



### Horizontal installations



**Minimum clearance  
required between  
air handler & wall**

## Note on Ductwork & Connections

Air supply and return can be handled in one of several ways depending on which is best suited for the type of installation. Please see the dimensions on the previous page to determine duct inlet and outlet connection sizes to match the air handler. The vast majority of problems encountered with combination cooling systems can be linked to improperly designed or installed ductwork. For this reason, it is highly important that the duct system be properly designed and installed.

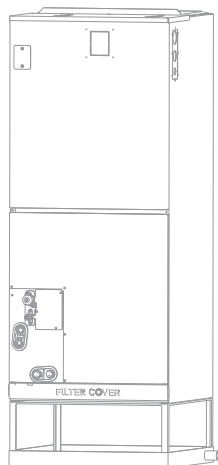
The use of flexible duct collars will minimize the transmission of vibration and noise into the conditioned space. In an installation where the return air duct is short, or where sound is likely to be a problem, a sound absorbing liner should be used inside the duct.

Insulation of the ductwork is a requirement anywhere it runs through an uncooled space during the cooling season. The use of a vapor barrier is recommended to prevent absorption of moisture from the surrounding air into the insulation. The supply air duct should utilize a properly sized transition in order to match the unit opening. All ducts should be suspended using flexible hangers and never fastened directly to the structure. This unit is not designed for non-ducted (free-blow) applications. Ductwork should be fabricated and installed in accordance with local and/or national codes.

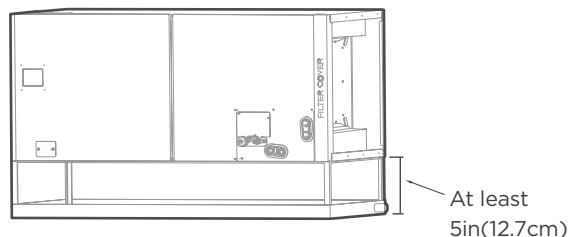
## Installation Mounting Positions

The unit can be installed in a vertical (downflow or upflow) or a horizontal (right or left) configuration.

### Vertical up installations



### Horizontal installations

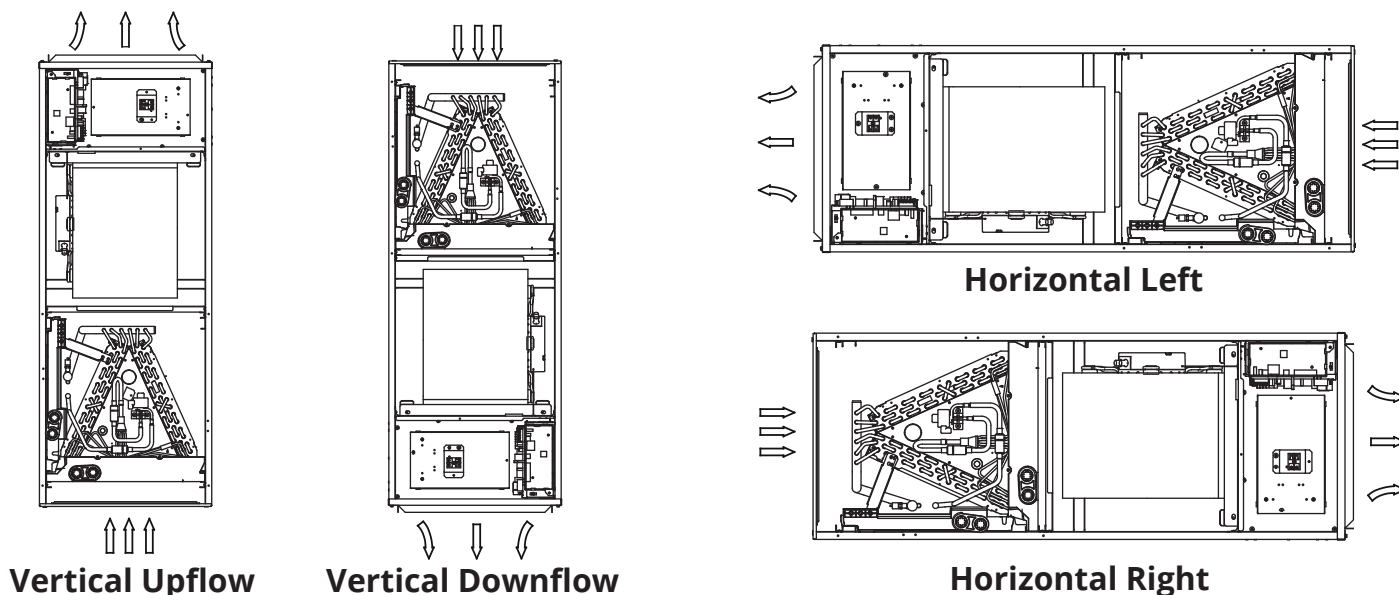


## IMPORTANT

- A field-fabricated secondary drain pan (not included), with a drain pipe to the outside of the building is required in all installations over a finished living space or in any area that may be damaged by overflow from the main drain pan. **NOTE: A secondary drain pan is required for horizontal installations.**
- This unit is not designed for non-ducted (free-blow) applications. Electric heat kit elements and/or blower is easily accessible without ductwork and creates a safety hazard that could result in electric shock and/or personal injury.

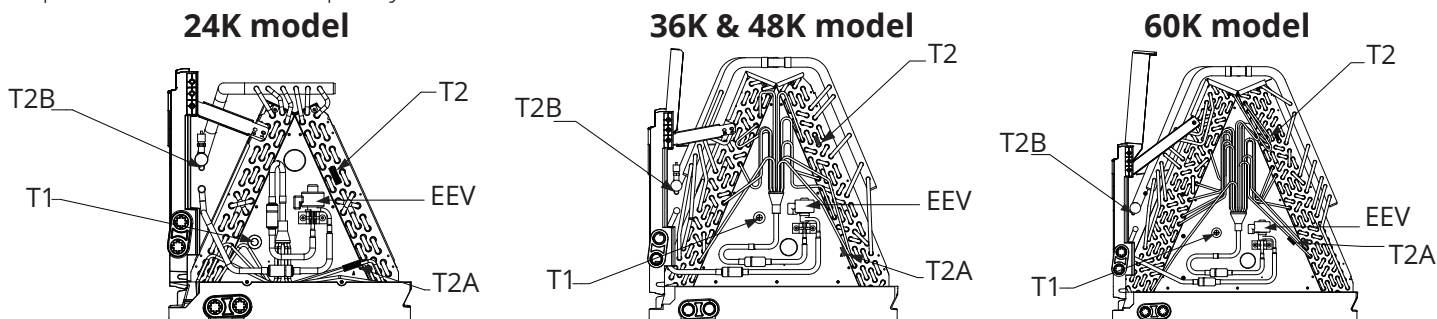
# Indoor Unit Installation

## Installation Mounting Positions (continued)



## Temperature Sensor Locations

The illustrations below represent the position of each temperature sensor of the evaporator coils. Location dependent on model/capacity.



**NOTE:** T2A & T2B sensors are only available on some units.

## Installation Overview For Horizontal Left or Vertical Upflow

The steps below represent an overview of completing the installation of a horizontal left or vertical upflow indoor unit once it has been securely mounted in place. Please refer to the sections further in this manual for more detailed information of each step.

- 1.) Open the upper cover.
- 2.) Open the cover of the electronic control box.
- 3.) Connect the wiring according to the appropriate wiring diagram (connect wiring to outdoor condenser first). Please refer to the **Electrical Connections** section.
- 4.) Replace cover of electronic control box & reinstall upper cover.
- 5.) Connect the refrigerant piping.
- 6.) Install the drainage pipes.

## NOTE ON INSTALLATION CONFIGURATIONS:

If you're planning to install the indoor unit in a horizontal right or vertical downflow configuration, additional steps are required for the unit to be installed in these positions. The evaporator and drain pan will need to be removed from the cabinet and rotated 180° then reinstalled. For more detailed instructions on how to complete these steps, please refer to the next page.

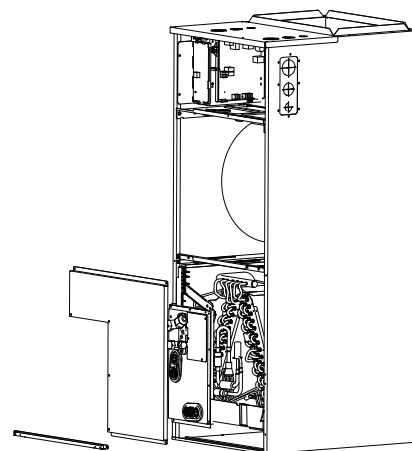
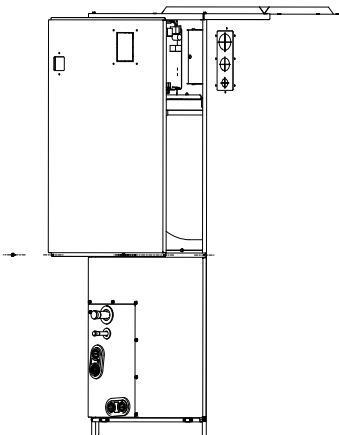
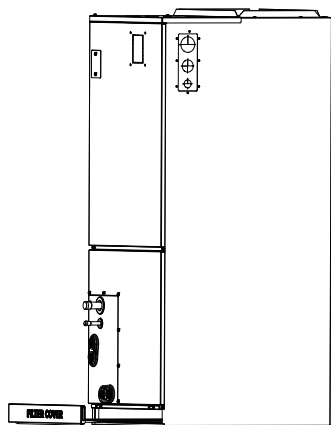
Vertical up and horizontal left installation does not need to change the direction of evaporator.

# Indoor Unit Installation

## Horizontal Right & Vertical Downflow Conversion & Installation Overview

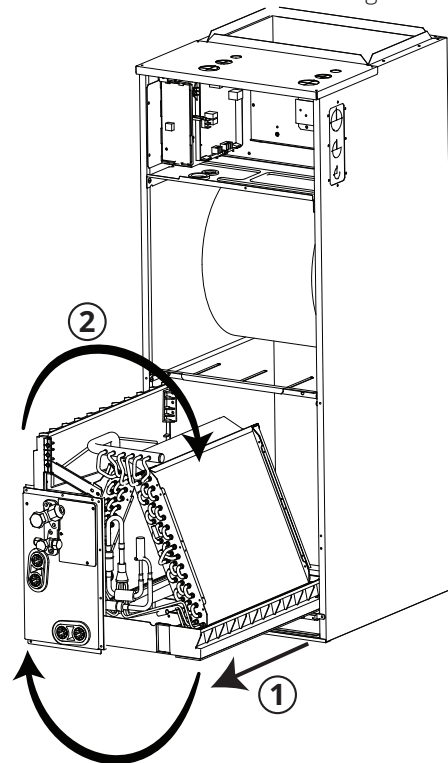
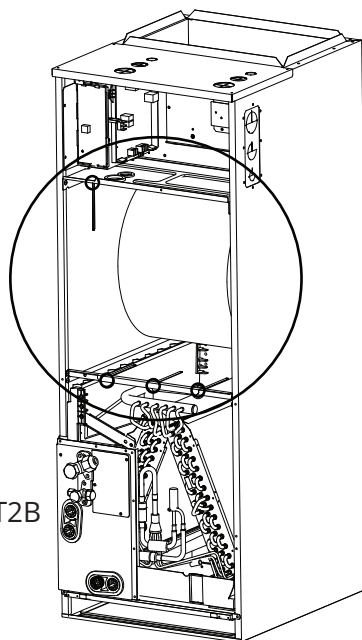
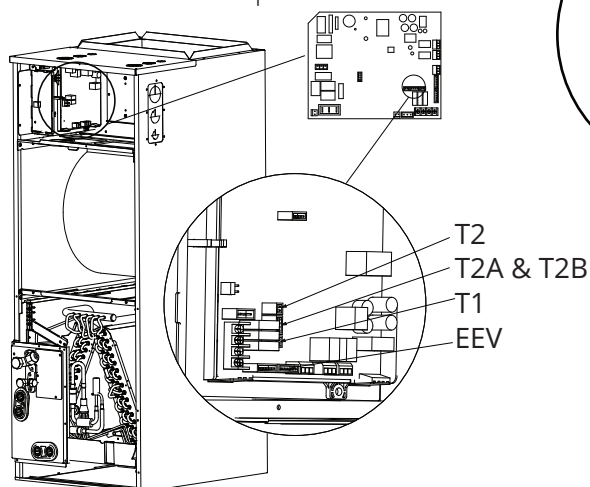
In order to install the air handler in a horizontal right or vertical downflow position the following steps must be completed. If these steps are not followed, the unit may not operate correctly and it could cause damage to the unit, personal property, and/or cause personal injury.

1. Remove the filter door, then remove the filter.
2. Remove the upper cover assembly.
3. Remove evaporator cover plate.



4. Remove T1, T2, T2A, T2B sensor plug, and EEV valve wiring. Disassemble T1, T2, T2A, T2B temperature sensor and EEV.
5. Remove T1, T2, T2A, T2B temperature sensor, & EEV wire ties.
6. Remove the evaporator and drain pan. Then, rotate them 180° (if your equipment needs to be in a vertical downward configuration)

T2: Evaporator central sensor plug  
T2A: Evaporator input sensor plug  
T2B: Evaporator output sensor plug  
T1: Room temperature sensor  
EEV: Electronic expansion valve

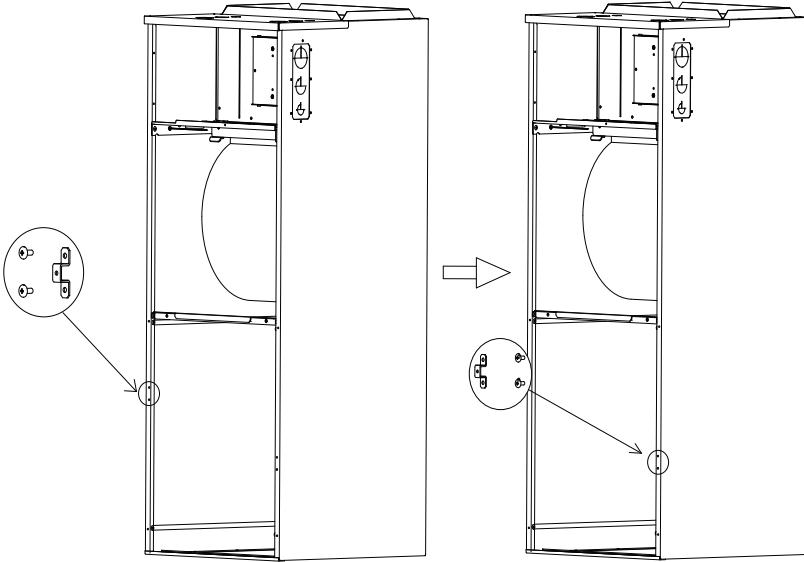


### NOTE

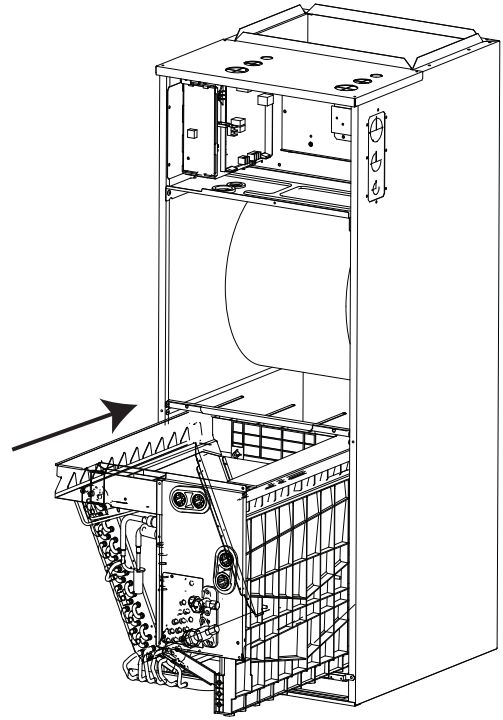
The T2A and T2B sensors are only available on some units.

# Indoor Unit Installation

7. Adjust the position of the two mounting brackets .



8. Reinstall the evaporator and drain pan.

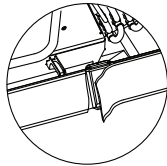


9. Reinstall T1, T2, T2A, T2B sensor plug, EEV, and tie up the temperature sensor wires.

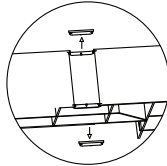
10. Evaporator assembled in place.

## NOTE

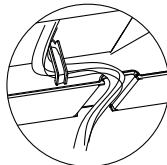
The wiring harness needs to be routed so it passes through the groove of the water receiving tray and is then placed on the hook of the water receiving tray as shown below. Follow the directions in Fig. 2.2 for step-by-step instructions of how to complete this step.



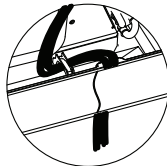
Cut the foam gasket.



Remove knockouts as shown.

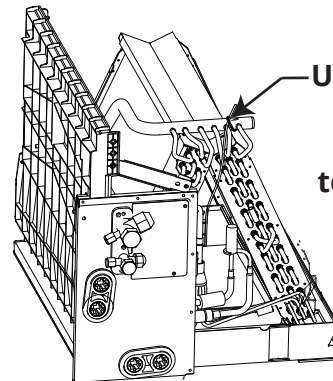


Hook the wire into the buckle and feed it down through the wire slot.

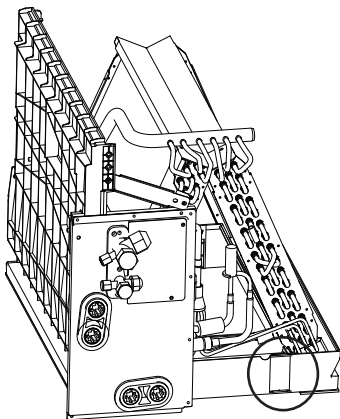


Paste the foam gasket back into place.

Fig. 2.2

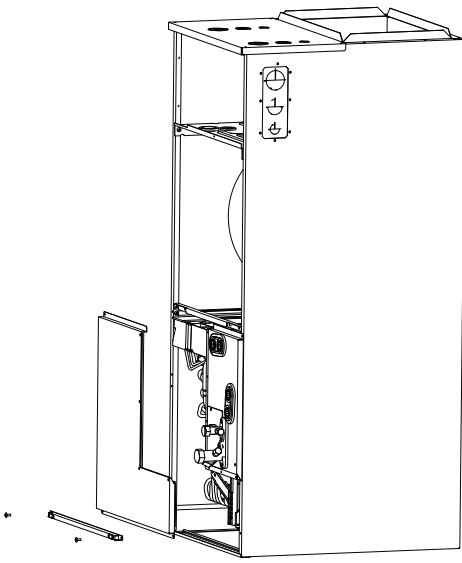


Use cable ties to secure the room temperature sensor as shown.

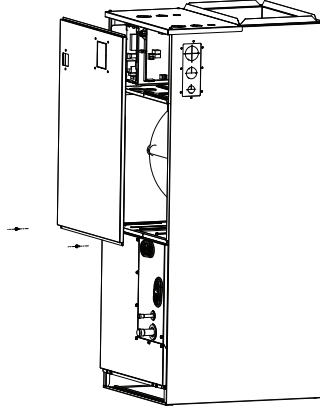


# Indoor Unit Installation

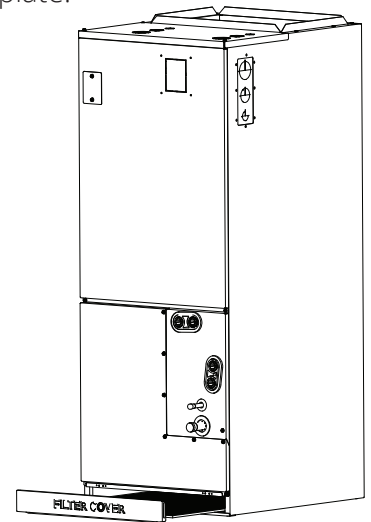
11. Reinstall the evaporator cover plate.



12. Open the cover of the electronic control box.
13. Connect the wiring according to the appropriate wiring diagram (connect wiring to outdoor condenser first). Please refer to the **Electrical Connections** section.
14. Close the cover of the electronic control box.
15. Reinstall the upper cover assembly.



16. Reinstall the filter and filter plate.









17. Connect refrigerant piping.
18. Install drainage pipes.



# Installation of Air Handler Heat Kit (Optional, not included)

# 3

## Accessories Included with Heat Kit

PART	LOOKS LIKE.....	QUANTITY
Owner's and Installation Manual		1
Foam Gasket		1
Screws		7
Silicone Breaker Cover		1
Electric Auxiliary Heating Wiring Diagram		1
Air Switch/Circuit Breaker Label		1

### NOTE

Installation of heat kit must be performed by an authorized dealer or specialist. Please make sure to wear protective gear and follow all necessary rules and regulations when installing the heat kit.

The heat kits available for the central ducted unit are to be only installed internally within the unit in accordance with the installation instructions on the following pages. The sizes available are 5kw, 8kw, 10kw, 15kw, & 20kw. Only certain capacities of the heat kits are compatible with each capacity of the air handler.

**NOTE: If the incorrect capacity heat kit is used it could cause damage to your unit, property, and/or personal injury. Please use the table below to determine which heat kit capacities are compatible with the capacity of unit being installed and will best suit the needs of the application.**

AHU Capacity (BTU/hr)	MRCOOL Heat Kit Compatibility Chart Heat Kit Capacity (Kilowatts)				
	CENTRALHK05 (5kW)	CENTRALHK08 (8kW)	CENTRALHK10 (10kW)	CENTRALHK15 (15kW)	CENTRALHK20 (20kW)
24K	Y	Y	Y	Y	/
36K	Y	Y	Y	Y	Y
48K	/	Y	Y	Y	Y
60K	/	/	Y	Y	Y

# Installation of Air Handler Heat Kit

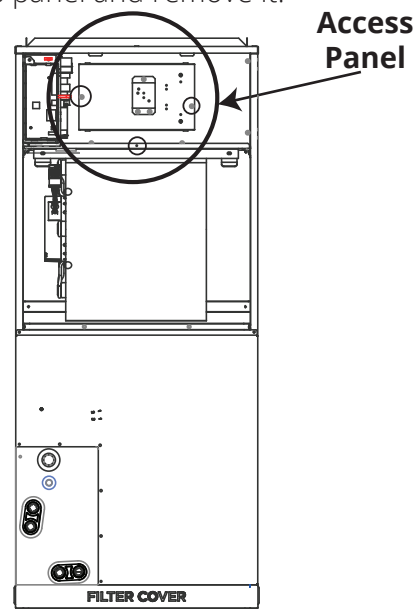
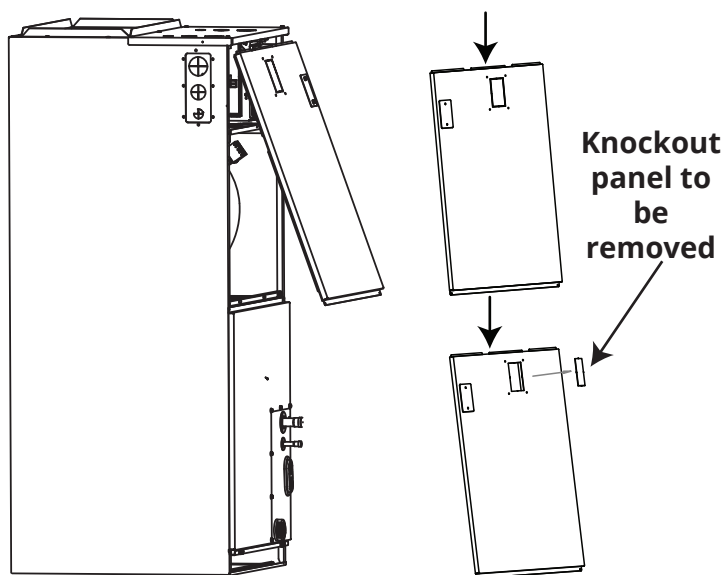
## Installation Requirements

Before performing installation of the heat kit, ensure that the heat kit and accessories have not been damaged in shipping. If any damage is found, please contact the MRCOOL® tech department or your local dealer immediately. Also, confirm that all of the included accessories required for the installation are present and accounted for.

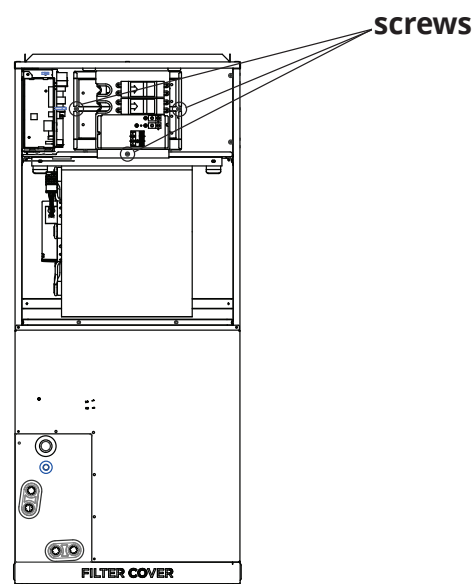
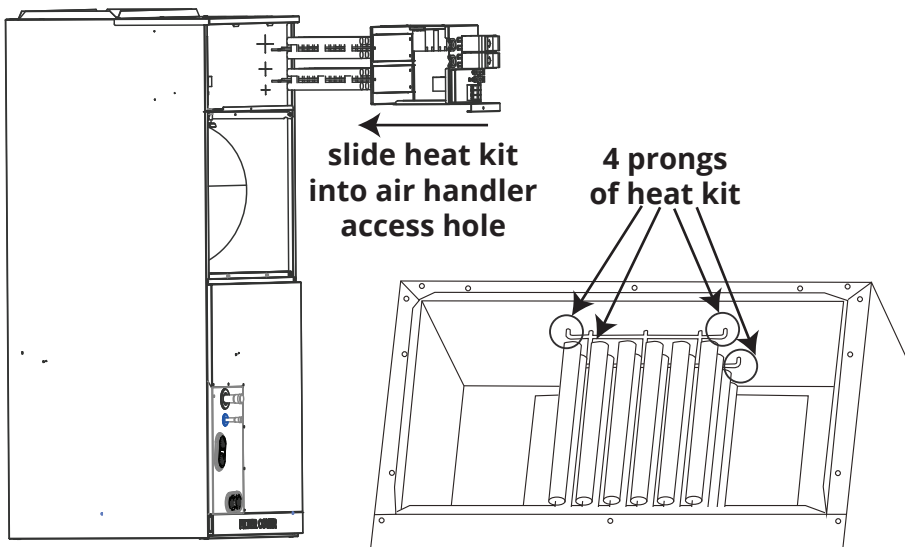
**NOTE: Please check the table on the previous page and ensure the capacity of the heat kit you have is compatible with the capacity of the air handler being installed.**

## Heat Kit Installation Instructions

1. Remove the upper cover and use tools to completely remove the knockout panels from the cover.
2. Remove the terminal block and power cord. Then, loosen the screws that are securing the access panel and remove it.

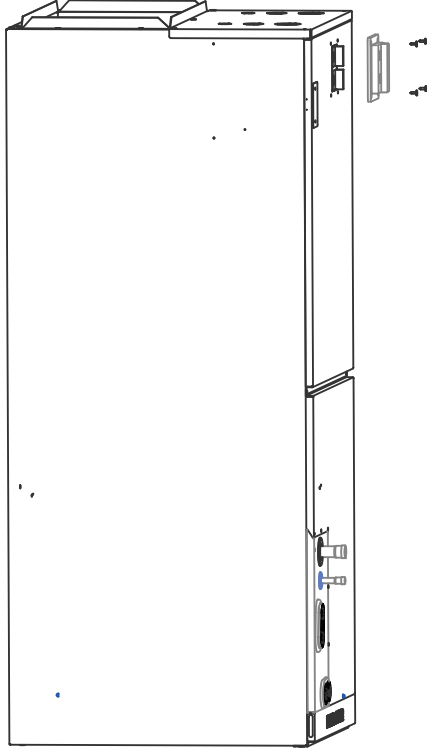


3. Now, slide the electric heat kit into the access hole of the air handler. There are four prongs on the front of the heat kit, ensure these line up and lock into the corresponding four support holes on the back of the cabinet.
4. Secure the heat kit in place with screws.



# Installation of Air Handler Heat Kit

5. Complete wiring of heat kit according to the wiring nameplate.
6. Reinstall the upper cover of the air handler.
7. Install silicone breaker cover to the upper cover.



Once the electric heat kit wiring is connected and the unit installation is completed, please perform the following checks before powering on the unit and heat kit.

- Check all wiring and ensure that all wiring is securely and properly connected.
- Ensure the screws used to mount the heat kit are securely fastened.
- Ensure the size of the power wire meets the power supply requirements and NEC/local codes using the information below and contained within the electrical connections section further in this manual.

Heat Kit Capacity (kilowatts)	Number of circuit breakers	Number of relays	Number of power cord groups	Number of power cord grounding screws
5kW	1	1	2	2
8kW	1	2	2	2
10kW	1	2	2	2
15kW	2	3	3	3
20kW	2	4	3	3

## NOTE

- The heat kit wiring diagram is with the included accessories.
- Please attach or paste the wiring diagram to the inside cover once the installation is complete for future reference.
- After installing the heat kit, affix the air switch label near the upper cover air switch.

## Heat Kit Electrical Data 208/230V



Heat Kit Capacity (kilowatt)	Internal Circuit Protection	Circuit 1			Circuit 2		
		Heat Kit Amps	MCA (1)	MOCP (2)	Heat Kit Amps	MCA (1)	MOCP (2)
5kW	Ckt Bkr	18.0/20.0	23.0/27.0	25.0/30.0			
8kW	Ckt Bkr	28.8/32.0	37.0/42.0	40.0/45.0			
10kW	Ckt Bkr	36.1/40.0	46.0/53.0	50.0/60.0			
15kW	Ckt Bkr	18.0/20.0	23.0/27.0	25.0/30.0	36.1/40	46.0/53.0	50.0/60.0
20kW	Ckt Bkr	36.1/40.0	46.0/53.0	50.0/60.0	36.1/40	46.0/53.0	50.0/60.0

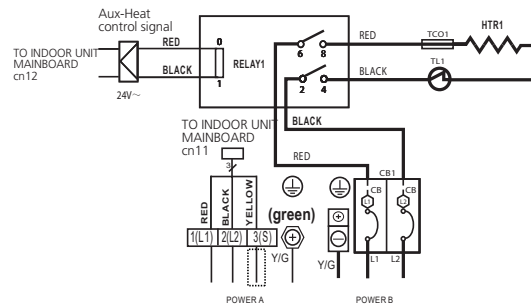
1. Minimum Circuit Ampacity (Heater Amps + Motor Amps) x 1.25
2. Maximum Overcurrent Protection = 2.25 x (Motor Amps + Heater Amps)

# Installation of Air Handler Heat Kit

## Heat Kit Wiring Diagrams

### 5KW HEAT KIT

-  : THERMAL CUT-OUT(Cut-o, t emperature 98°C, holding temperature 83°C, limiting temperature 410°C.)
-  : THERMAL LINK, SELF-RESETTING(Break-o, t emperature 60 ± 3°C, reset temperature 43 ± 6°C.)



**NOTE 1:**

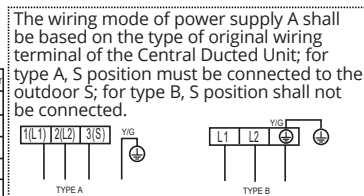
This symbol indicates the element is optional. The wiring type of the actual unit shall prevail.

**NOTE 2:** Please attach the nameplate to the cover of the electric control box. All the round holes located on the plate represent numbers. Please refer to the Installation Manual for details.



**NOTE 3: TO BE WIRED IN ACCORDANCE WITH NEC AND LOCAL CODES.**

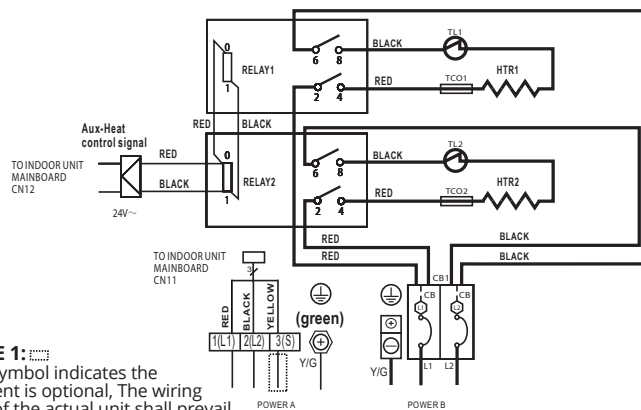
**NOTE 4: POWER A,B,C,D ARE DIFFERENT POWERS.**

Round hole number	Relay number	Round hole number	Circuit breaker number
○	RELAY 1	○	CB1
○○			
○○○			
○○○○			



### 8KW/10KW HEAT KIT

-  : THERMAL CUT-OUT(Cut-o, temperature 98°C, holding temperature 83°C, limiting temperature 410°C.)
-  : THERMAL LINK, SELF-RESETTING(Break-o, t emperature 60 ± 3°C, reset temperature 43 ± 6°C.)



**NOTE 1:**

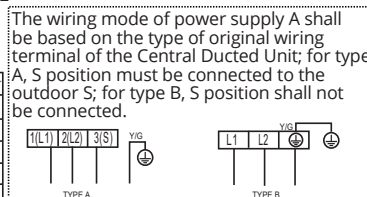
This symbol indicates the element is optional. The wiring type of the actual unit shall prevail.

**NOTE 2:** Please attach the nameplate to the cover of the electric control box. All the round holes located on the plate represent numbers. Please refer to the Installation Manual for details.

**NOTE 3: TO BE WIRED IN ACCORDANCE WITH NEC AND LOCAL CODES.**

**NOTE 4: POWER A,B,C,D ARE DIFFERENT POWERS.**

Round hole number	Relay number	Round hole number	Circuit breaker number
○	RELAY 1	○	CB1
○○	RELAY 2		
○○○			
○○○○			



## NOTE

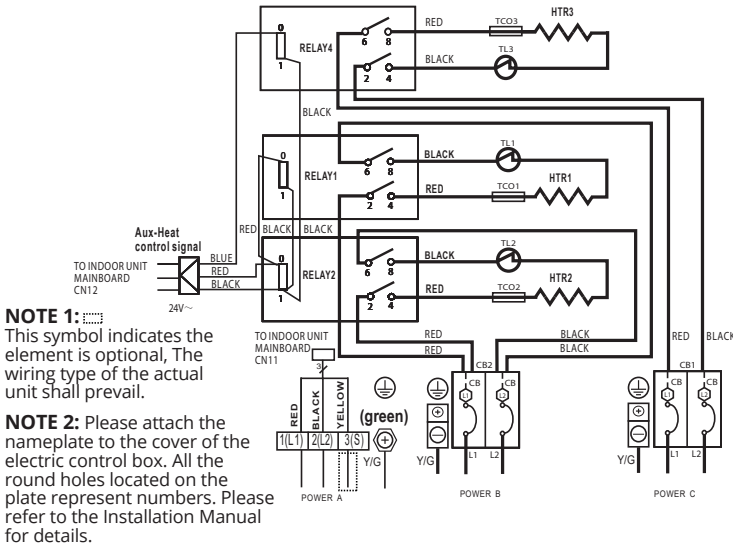
The optional heat kits use a power supply that is independent of the power supply of the air handler & blower. Please be aware of this when wiring the heat kit.

# Installation of Air Handler Heat Kit

## 15KW HEAT KIT

: THERMAL CUT-OUT(Cut-o, temperature 98°C, holding temperature 83°C, limiting temperature 410°C.)

: THERMAL LINK, SELF-RESETTING(Break-o, t emperature 60 ± 3°C, reset temperature 43 ± 6°C.)



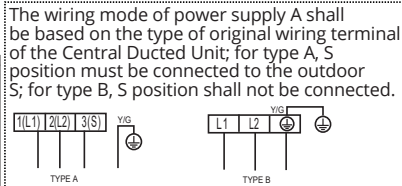
**NOTE 1:** This symbol indicates the element is optional, The wiring type of the actual unit shall prevail.

**NOTE 2:** Please attach the nameplate to the cover of the electric control box. All the round holes located on the plate represent numbers. Please refer to the Installation Manual for details.

**NOTE 3: TO BE WIRED IN ACCORDANCE WITH NEC AND LOCAL CODES.**

**NOTE 4: POWER A,B,C,D ARE DIFFERENT POWERS.**

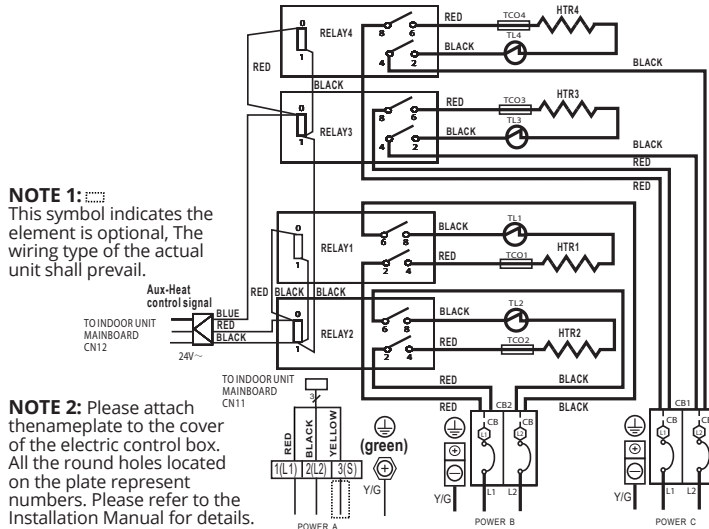
Round hole number	Relay number	Round hole number	Circuit breaker number
○	RELAY1	○	CB1
○○	RELAY2	○○	CB2
○○○	RELAY4		
○○○○			
○○○○○			



## 20KW HEAT KIT

: THERMAL CUT-OUT(Cut-o, t emperature 98°C, holding temperature 83°C, limiting temperature 410°C.)

: THERMAL LINK, SELF-RESETTING(Break-o, t emperature 60 ± 3°C, reset temperature 43 ± 6°C.)



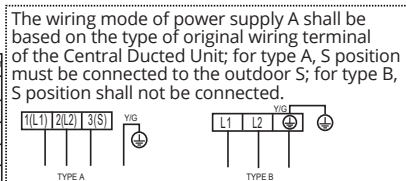
**NOTE 1:** This symbol indicates the element is optional, The wiring type of the actual unit shall prevail.

**NOTE 2:** Please attach the nameplate to the cover of the electric control box. All the round holes located on the plate represent numbers. Please refer to the Installation Manual for details.

**NOTE 3: TO BE WIRED IN ACCORDANCE WITH NEC AND LOCAL CODES.**

**NOTE 4: POWER A,B,C,D ARE DIFFERENT POWERS.**

Round hole number	Relay number	Round hole number	Circuit breaker number
○	RELAY1	○	CB1
○○	RELAY2	○○	CB2
○○○	RELAY3		
○○○○	RELAY4		
○○○○○			



### NOTE

The optional heat kits use a power supply that is independent of the power supply of the air handler & blower. Please be aware of this when wiring the heat kit.

**NOTE:** Install the unit by following local codes and regulations, these may slightly differ between regions.

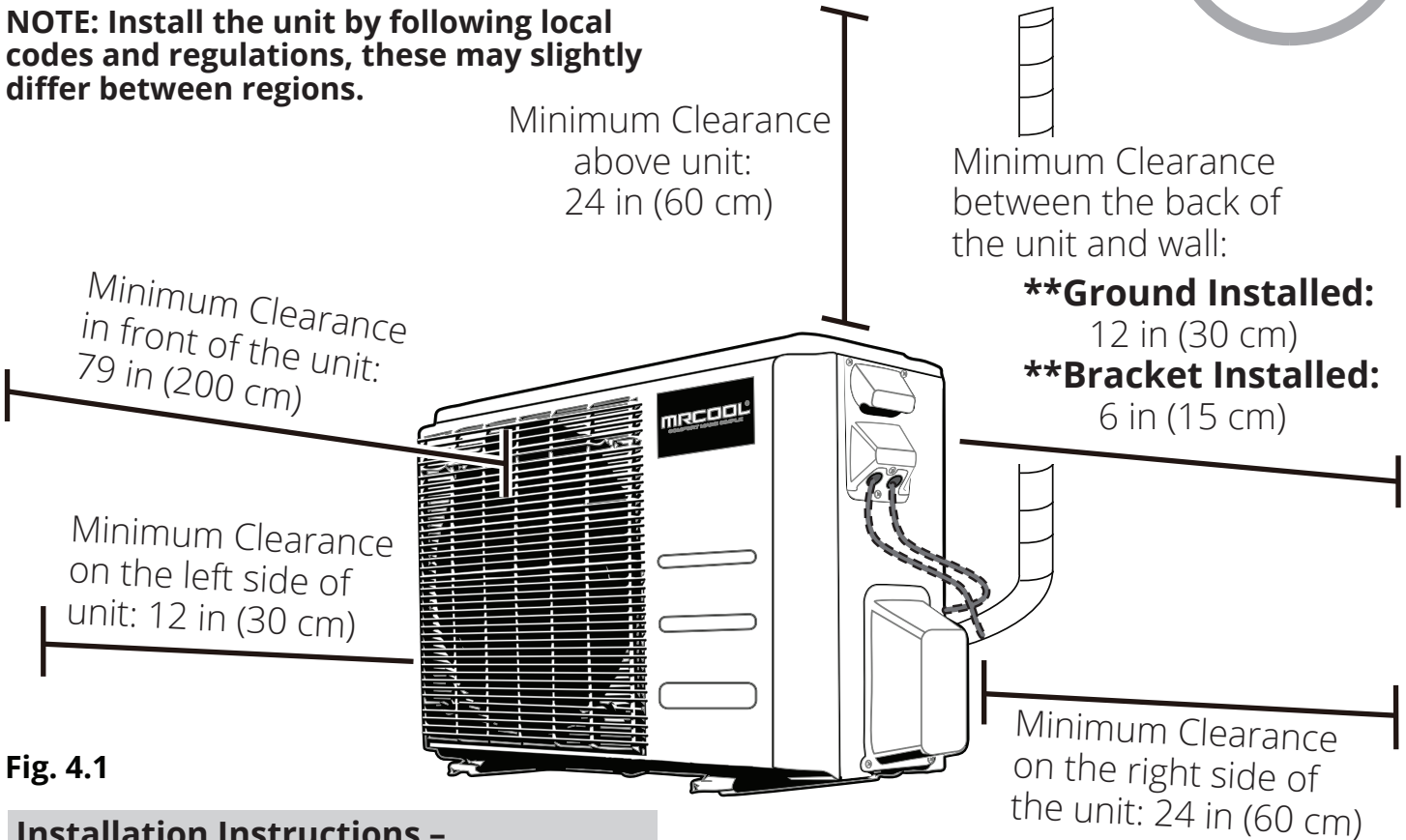


Fig. 4.1

## Installation Instructions - Outdoor Unit

### Step 1: Select an Installation Location

Before installing the outdoor unit, you must choose an appropriate location. Use the following guidelines to help you select an appropriate location.

Proper installation locations should meet following guidelines:

- ☑ Meets all spatial requirements shown in the illustration above (Fig. 4.1)
- ☑ Good air circulation and ventilation
- ☑ Firm and solid location that can support the unit and will not cause vibration
- ☑ Noise from the unit will not disturb others
- ☑ Protected from prolonged periods of exposure to direct sunlight or rain
- ☑ If installed in an area where snowfall is expected, take appropriate measures to prevent ice buildup and coil damage. If necessary, mount the unit on risers of at least 6 in (15 cm) or per local code to be above the average snowfall for the area.

**DO NOT** install unit in the following locations:

- ⊘ Near an obstacle that will block air inlets and outlets.
- ⊘ Near a public street, crowded areas, or where noise from the unit will disturb others.
- ⊘ Near animals or plants that could be harmed by hot air discharge.
- ⊘ Near any source of combustible gas.
- ⊘ In a location that is exposed to large amounts of dust.
- ⊘ In a location exposed to excessive amounts of salty air.
- ⊘ In a location that exposes the unit to large amounts of forced water.

## SPECIAL CONSIDERATIONS FOR EXTREME WEATHER

**If the unit is exposed to heavy wind:** Install the unit so the air outlet fan is at a 90° angle to the direction of the wind. If needed, build a barrier in front of the unit to protect it from extremely heavy winds. Ensure the wind barrier does not block necessary airflow. See Fig. 4.2 and Fig. 4.3 below.

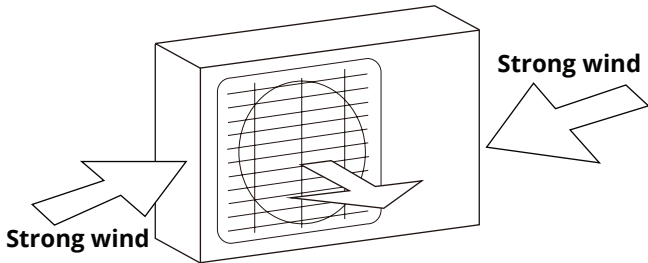


Fig. 4.2

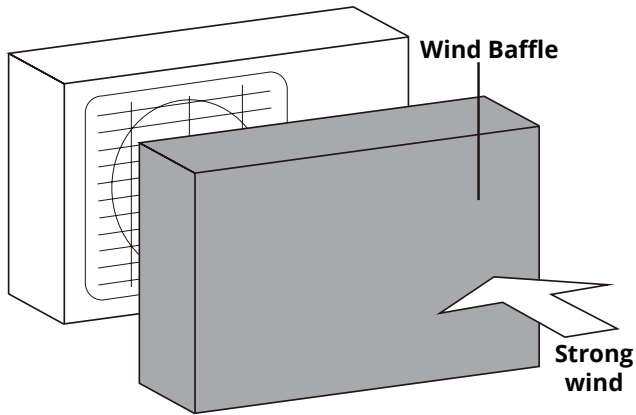


Fig. 4.3

**If the unit is frequently exposed to heavy rain or snow:** Build a shelter above the unit to protect it from the rain or snow. Be careful not to obstruct airflow around the unit.

**If the unit is frequently exposed to salty air (seaside):** Use an outdoor unit that is specially designed to resist corrosion.

## ! IMPORTANT

In areas where snowfall is prevalent, the use of risers or a stand to elevate the condenser above the snow line is required by local & national codes.

## Step 2: Install drain joint

Heat pump units require a drain joint if the unit is elevated. Before bolting the outdoor unit in place, you must install the drain joint at the bottom of the unit. **NOTE: there are two different types of drain joints depending on the type of outdoor unit.**

**If the drain joint comes with a rubber seal (see Fig. 4.4 - A), do the following:**

1. Fit the rubber seal on the end of the drain joint that will connect to the outdoor unit.
2. Insert the drain joint into the hole in the base pan of the unit.
3. Rotate the drain joint 90° until it clicks in place facing the front of the unit.
4. Connect a drain hose extension (not included) to the drain joint to redirect water from the unit during heating mode.

**If the drain joint does not come with a rubber seal (see Fig. 4.4 - B), do the following:**

1. Insert the drain joint into the hole in the base pan of the unit. The drain joint will click in place.
2. Connect a drain hose extension (not included) to the drain joint to redirect water from the unit during heating mode.

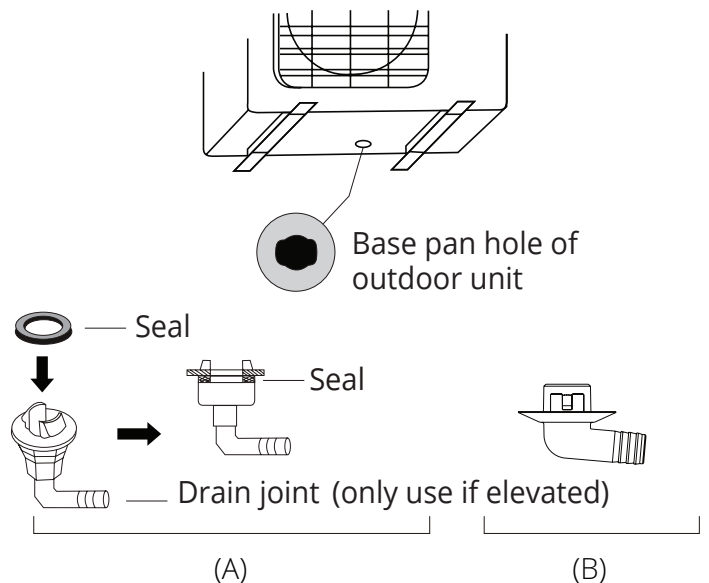


Fig. 4.4

## ! DRAINAGE IN COLD CLIMATES

In cold climates, make sure that the drain hose is as vertical as possible to ensure swift water drainage. If water drains too slowly, it can freeze in the hose and flood the unit.

# Outdoor Unit Installation

## Outdoor Unit Dimensions

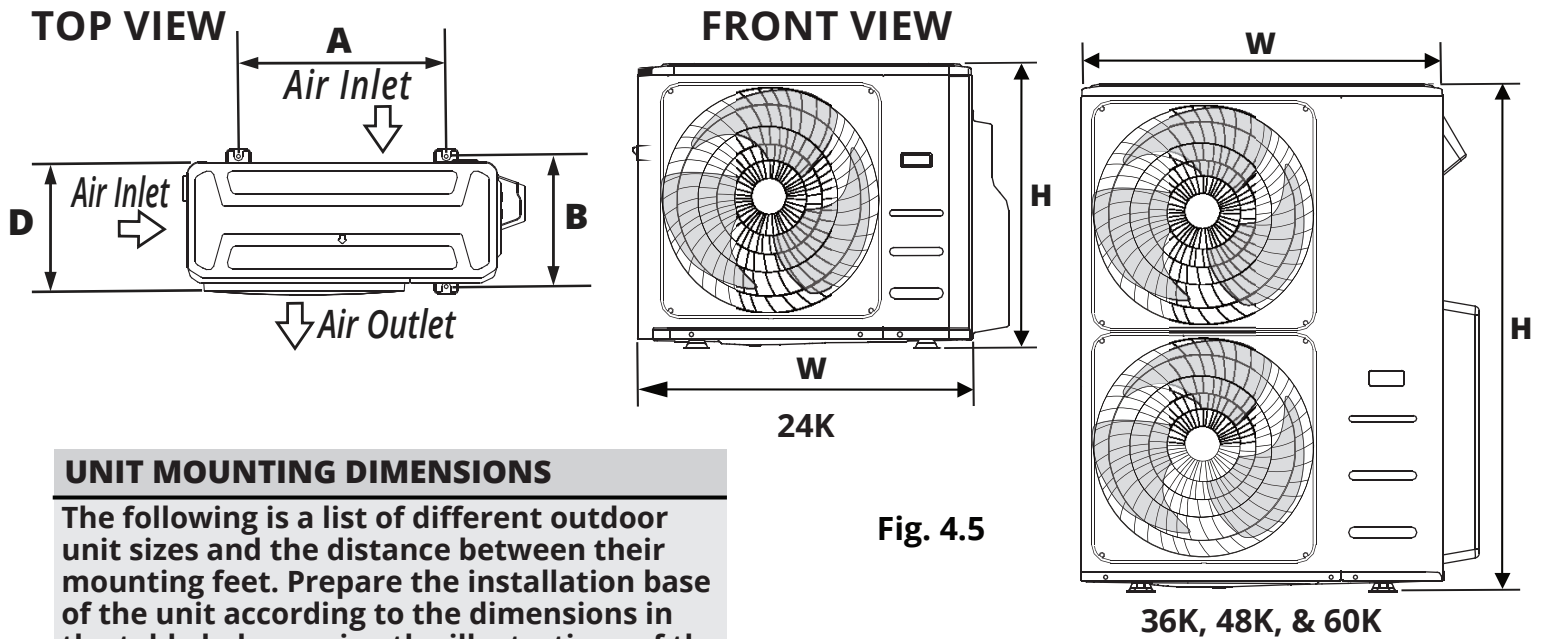
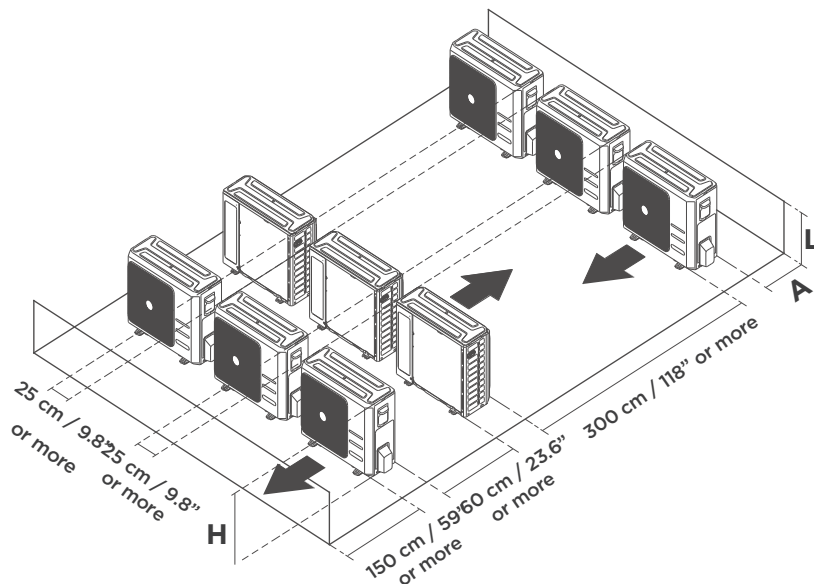


Fig. 4.5

### UNIT MOUNTING DIMENSIONS

The following is a list of different outdoor unit sizes and the distance between their mounting feet. Prepare the installation base of the unit according to the dimensions in the table below, using the illustrations of the units above (Fig 4.5) as a guide to correspond with the table.

Outdoor Unit Model#	Outdoor Unit Dimensions: Inches (Millimeters) Width (W) x Height (H) x Depth (D)	Mounting Dimensions: Inches (Millimeters)	
		Width (A)	Depth (B)
CENTRAL-24-HP-C-230A00	37.24 in x 31.89 in x 16.14 in (946 mm x 810 mm x 410 mm)	26.50 in (673 mm)	15.87 in (403 mm)
CENTRAL-36-HP-C-230A00	37.48 in x 52.48 in x 16.34 in (952 mm x 1333 mm x 415 mm)	24.96 in (634 mm)	15.90 in (404 mm)
CENTRAL-48-HP-C-230A00	37.48 in x 52.48 in x 16.34 in (952 mm x 1333 mm x 415 mm)	24.96 in (634 mm)	15.90 in (404 mm)
CENTRAL-60-HP-C-230A00	37.48 in x 52.48 in x 16.34 in (952 mm x 1333 mm x 415 mm)	24.96 in (634 mm)	15.90 in (404 mm)



### Rows of series installation

The relations between H, A and L are as follows.

	L	A
L ≤ H	L ≤ 1/2H	25 cm / 9-13/16in or more
	1/2H < L ≤ H	30 cm / 11-13/16in or more
L > H	Can not be installed	



## Step 3: Anchor Outdoor Unit

The outdoor unit can be anchored to the ground or to a wall-mounted bracket using M-10 bolts. Prepare the installation base of the unit according to the dimensions in the table above. If you're installing the outdoor unit on the ground or on a concrete platform, refer to the set of instructions to the right. Instructions for installing the outdoor unit to a wall-mounted bracket are located on the next page.

### WARNING

**When drilling into concrete, it is recommended to wear safety goggles, or some form of eye protection, in order to guard against the dust that will be created.**

### **If you are installing the outdoor unit on the ground or a concrete mounting platform, use the following steps:**

1. Mark the positions for four expansion bolts based on dimensions in the **Mounting Dimensions** chart and illustrations on the previous page.
2. Pre-drill holes for expansion bolts.
3. Clean concrete dust away from the holes.
4. Place a nut on the end of each expansion bolt.
5. Hammer expansion bolts into the holes you pre-drilled.
6. Remove the nuts from the expansion bolts, and place outdoor unit on bolts.
7. Put a washer on each of the expansion bolts, then reinstall the nuts.
8. Using a wrench, tighten each nut until snug.

**If you are installing the unit on a wall-mounted bracket, follow these steps:**

### CAUTION

**Before installing a wall-mounted unit, make sure that the wall is made of solid brick, concrete, or a similarly strong material. The wall must be able to support at least 4 times the weight of the unit.**

1. Mark the position of the bracket holes based on the dimensions in the Mounting Dimensions chart on the previous page.
2. Pre-drill the holes for the expansion bolts.
3. Clean dust and debris away from the holes.
4. Place a washer and nut on the end of each expansion bolt.
5. Thread expansion bolts through the holes in the mounting brackets. Then, put the mounting brackets in position and hammer the expansion bolts into the wall.
6. Check that the mounting brackets are level.
7. If the feet of the outdoor unit have rubber pads already installed, and you're using a MRCOOL® wall-mounted bracket, remove them before attempting to mount the condenser to the bracket. The mounting bracket has rubber isolating pads on it that will take the place of these.
8. Carefully lift the unit and place its mounting feet on the brackets.
9. Then, bolt the unit firmly to the brackets.

### **TO REDUCE VIBRATION OF WALL-MOUNTED UNIT**

**If allowed, you can install the wall-mounted unit with rubber gaskets to reduce vibration and noise.**

The condensate drain pipe is used to drain condensate (water) away from the unit. Improper installation of the drain pipe could result in unit and/or property damage. A drain pipe is not included with this air handler and must be purchased separately.

## NOTE ON PURCHASING DRAIN PIPE

Drain pipe installation requires a polyethylene tube (internally threaded tube 3/4 inch), which can be obtained at your local hardware store or dealer.

## ! CAUTION

- ⚠ **DO NOT** pull the drain pipe forcefully as this could cause it to become disconnected. Insulate all piping to prevent condensation, which could lead to water damage.
- If the drain pipe is bent or installed incorrectly, water could leak and cause the water level switch to malfunction.
- In HEAT mode, the outdoor unit will discharge water. Ensure that the drain hose is placed in an appropriate area in order to avoid water damage and possibility of slipping.

## IMPORTANT

- After removing drain pan plug(s), check the drain hole(s) to verify that the drain opening is fully open and free of any debris. Also ensure that no debris has fallen into the drain pan during the installation that could impede flow through the drain opening.
- Be sure to seal around the exiting drain pipe, as well as around the liquid and suction lines to prevent infiltration of humid air.
- The blower within this unit draws air through the coil rather than blowing air through it. This can cause the blower to draw air in through the drainage piping and into the air supply. In order to prevent this, traps must be installed in the drainage piping (primary & auxiliary, if used).

## Indoor Unit Drain Pipe Installation

These units operate with a negative pressure at the drain connections and a drain trap is required. The trap needs to be installed as close to the unit as possible. Make sure the top of the trap is below the connection to the drain pan to allow complete drainage of the pan. Please refer to **Fig. 5.1** below as a guide.

1. Install the drain pipe into the main drain hole. Then, cover the drain pipe with heat insulation to prevent condensation from forming and leakage from occurring.

## VERTICAL DISCHARGE

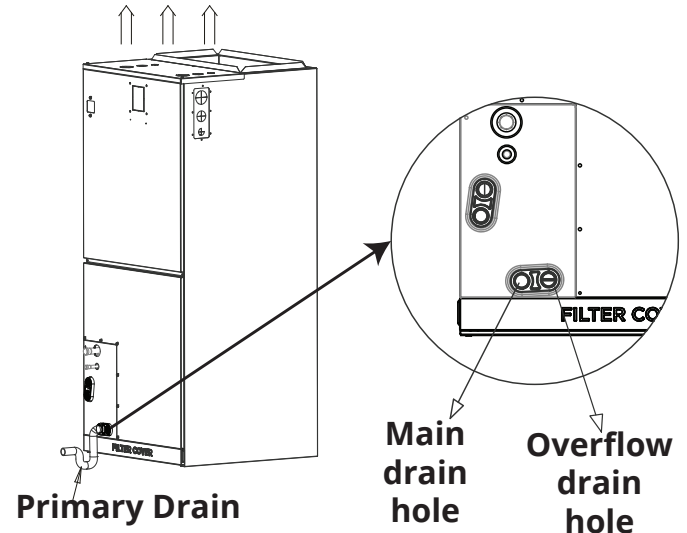


Fig. 5.1

## NOTE ON HORIZONTAL PIPE RUNS

Horizontal runs must also have an anti-siphon air vent (stand pipe) installed ahead of the horizontal run to eliminate any air trapping. Please see the Fig. 5.2 below.

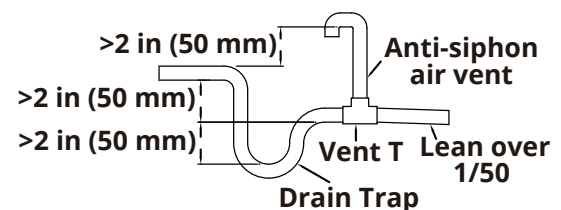


Fig. 5.2

## NOTE ON DRAIN PIPE INSTALLATION

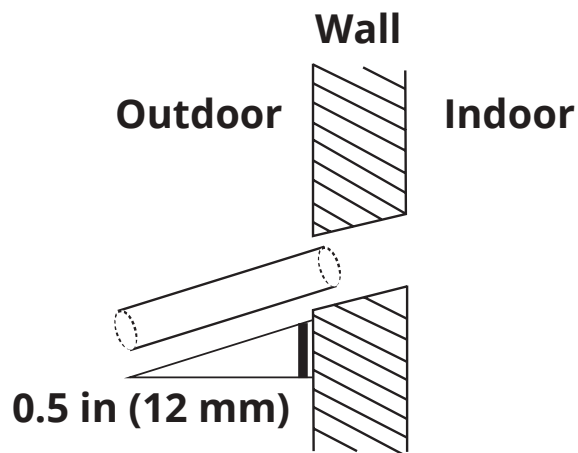
- When using an extended drain pipe, tighten the indoor connection with an additional protection tube to prevent it from pulling loose.
- The illustrations on the previous page show how to trap and plug all drains during vertical and right-hand discharge.
- The seal plug provided in the accessories should be screwed in and tightened by hand.
- Improper installation of the drain pipe could cause water to flow back into the unit and flood.

2. Next, using a 3.5 in (90 mm) core drill, drill a hole into the wall to allow the drain pipe to be routed to the exterior of the building. When drilling the hole, be sure to drill it at a slightly downward angle, so that the outdoor end of the hole is lower than the indoor end by roughly 0.5 in (12 mm). This will ensure proper drainage. Please refer to **Fig. 5.3** below as a guide.

**NOTE: The wall hole will also be used to run the refrigerant piping/line set and wiring through that will connect the air handler to the outdoor unit.**

## NOTE ON DRILLING THE WALL HOLE

When drilling the wall hole, be sure to avoid wires, plumbing, and other sensitive components.



**Fig. 5.3**

3. Pass the drain pipe through the wall hole to the exterior of the building. Ensure that it will drain to a safe location where it will not cause water damage or create a slipping hazard.
4. Once the entire installation is complete be sure to fill the remaining space of the hole with some sort of sealant (ex: spray foam).

## NOTE ON DRAIN PIPE OUTLET

- The drain pipe outlet should be at least 1.9 in (5 cm) above the ground. If the drain pipe outlet is allowed to touch the ground, it could become blocked and cause the unit to malfunction.
- If you discharge the water directly into a sewer, make sure that the drain has a U or S pipe to catch odors that could come back into the building.

## Line Set Length Specifications

Unit: feet (meters)

Air Handler Capacity (BTU/hr)	24K	36K	48K	60K
Max. refrigerant pipe length	164.04 ft (50 m)	213.25 ft (65 m)	213.25 ft (65 m)	213.25 ft (65 m)
Max. height difference between indoor and outdoor unit	82.02 ft (25 m)	98.42 ft (30 m)	98.42 ft (30 m)	98.42 ft (30 m)

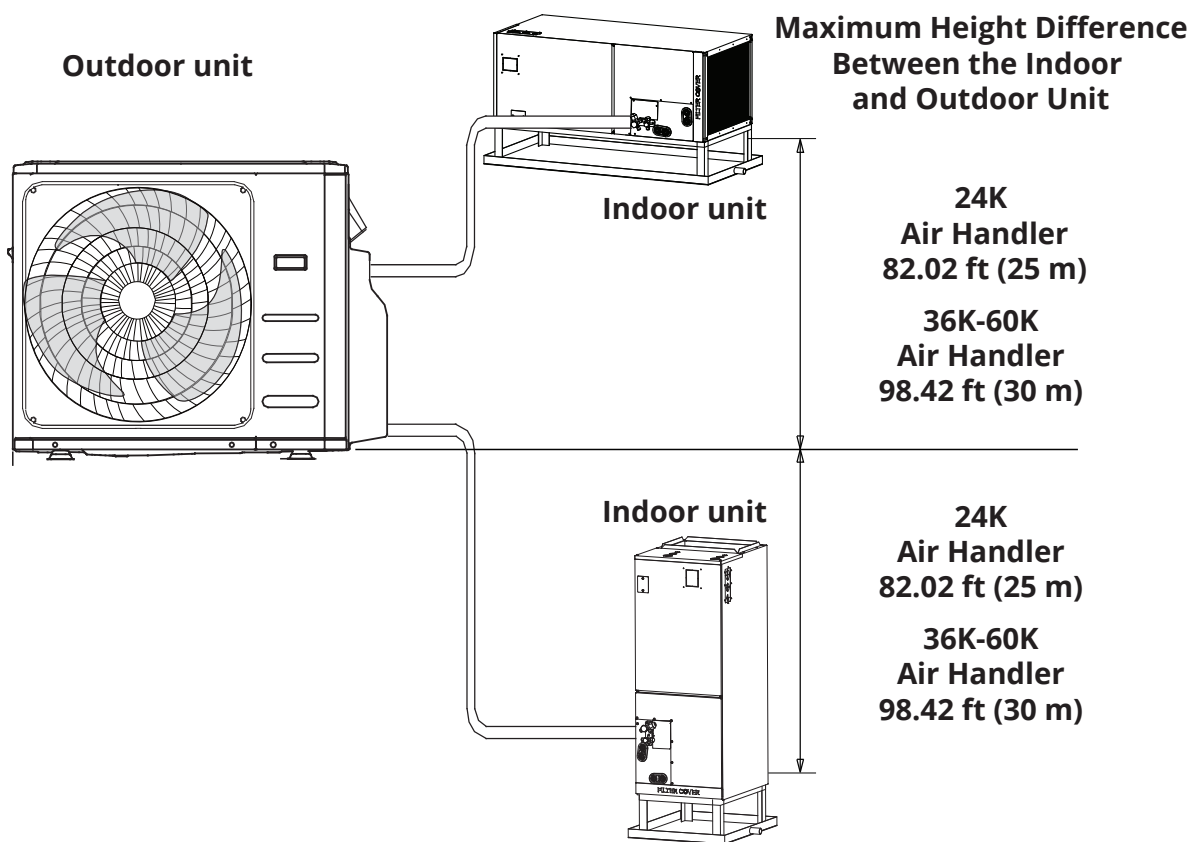


Fig. 6.1

### ⚠ IMPORTANT INSTALLATION INFORMATION!

#### Refrigerant Line Set Connection Options, Requirements, and Stipulations

24K/36K/48K/60K Capacity Units - These units are designed to be installed using either a traditional flare nut configuration of refrigerant piping or the optional MRCOOL® No-Vac® Quick Connect® Pre-Charged Line Set. If the optional No-Vac Quick Connect Line Set is used, you ***DO NOT*** have to retain the services of a professional HVAC installer. If the traditional flare nut configuration is selected, you ***ARE REQUIRED*** to retain the services of a professional HVAC installer. Stub pipes and copper nuts are included with these capacity units to complete this type of installation. If any other form of installation is attempted, or these stipulations are not followed, the ***WARRANTY WILL BE VOIDED.***

# Refrigerant Piping Connections

## Conventional Line Set Installation

### **! WARNING**

- All field piping must be completed by a licensed technician and must comply with the local and national regulations.
- When the unit is installed in a small room, measures must be taken in order to prevent the refrigerant concentration in the room from exceeding the safety limit should refrigerant leakage ever occur. If refrigerant should leak and its concentration exceeds the proper limit, it may create hazards due to a lack of oxygen.
- When installing the refrigeration system, ensure that air, dust, moisture, or any other foreign substances do not enter the refrigeration circuit. Contamination within the system could cause the operating capacity of the unit to become poor or create high pressure in the refrigeration cycle, which could cause an explosion and/or personal injury.
- If refrigerant leakage should occur during the installation, ventilate the room immediately. Refrigerant gas is both toxic and flammable. Ensure there is no refrigerant leakage after completing the installation.

### Note on Pipe Length and Elevation

Ensure that the length of the refrigerant piping, the number of bends, and the drop height between the outdoor and indoor units meet the requirements listed in the table below:

### The Maximum Length and Drop Height Based on Model Capacity

Units: feet (meters)

Type of Model	Capacity (Btu/h)	Length of Piping	Maximum Drop Height
North America, Australia and the EU frequency conversion Split Type	24K	164 ft (50 m)	82 ft (25 m)
	36K 48K 60K	213 ft (65 m)	98.4 ft (30 m)

### **! CAUTION**

#### Oil Traps

If oil flows back into the outdoor unit's compressor, this could cause liquid compression or deterioration of the oil return. Installing oil traps in the rising gas piping can prevent this. Please refer to Fig. 6.2 below as a guide.

- For 24,000 Btu/h units, an oil trap should be installed every 20 ft (6 m) of vertical suction line riser.
- For units 36,000 Btu/h or greater, an oil trap should be installed every 32.8 ft (10 m) of vertical suction line riser.

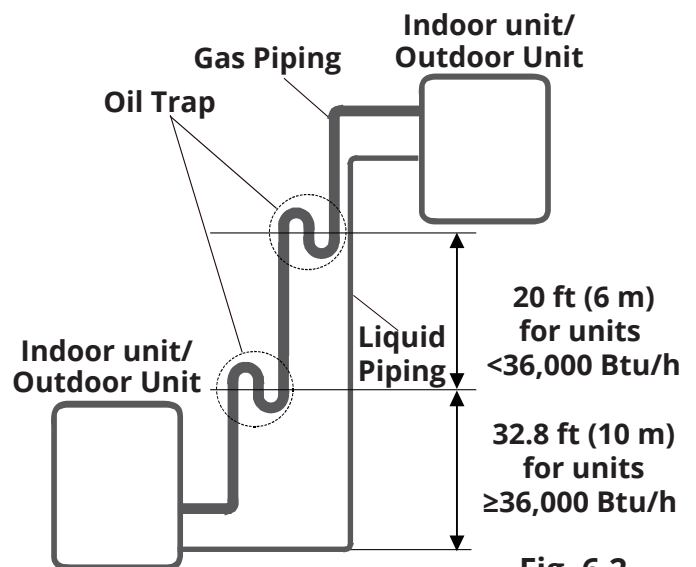


Fig. 6.2

## ! CAUTION

- ⊘ **DO NOT** install the connecting piping until the installation of the indoor and outdoor units have been completed.
- Insulate both the gas and liquid piping in order to prevent water leakage.

Air Handler Unit Model	Air Handler Unit Connection(in.flare)		Adapter Required at Air Handler Unit(in.flare to braze)	Outdoor Model	Outdoor Unit Connection (in.flare)		Adapter Required at Outdoor Unit(in.flare to flare or braze)
18K/24K	Liquid	3/8	3/8 flare→3/8 braze	18K/24K	Liquid	3/8	3/8 flare→3/8 braze
	Gas	3/4	3/4 flare→3/4 braze		Gas	5/8	5/8 flare→3/4 braze 5/8 flare→3/4 braze
24K/30K/ 36K/48K	Liquid	3/8	3/8 flare→3/8 braze	24K(Hyper Heat)/30K/ 36K/48K	Liquid	3/8	3/8 flare→3/8 braze
	Gas	3/4	3/4 flare→3/4 braze		Gas	3/4	3/4 flare→3/4 braze
60K	Liquid	3/8	3/8 flare→3/8 braze	60K	Liquid	3/8	3/8 flare→3/8 braze
	Gas	7/8	7/8 flare→7/8 braze		Gas	7/8	7/8 flare→7/8 braze

## Connecting Refrigerant Piping

### Step 1: Cut Pipes

When preparing refrigerant pipes, take extra care to cut and flare them properly. This will ensure an airtight seal, efficient operation, and, minimize the need for future maintenance.

1. Measure the distance between the indoor and outdoor units.
2. Using a pipe cutter, cut the pipe a little longer than the measured distance.
3. Ensure the pipe is cut at a perfect 90° angle. Please refer to **Fig 6.3** below for cut examples.

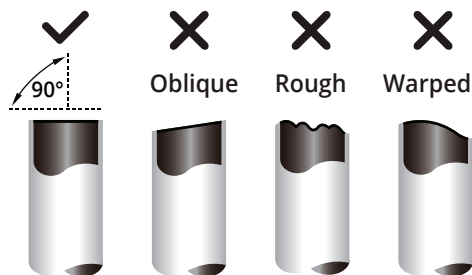


Fig. 6.3

## ! CAUTION

- ⊘ **DO NOT** deform pipe while cutting. Be extra careful not to damage, dent, or deform the pipe while cutting. This will drastically reduce the heating efficiency of the unit.

### Step 2: Remove Burrs

Burrs can affect the airtight seal of the refrigerant piping connection. They must be completely removed by following these steps:

1. Hold the pipe at a downward angle to prevent burrs from falling into the pipe.
2. Using a reamer or deburring tool, remove all burrs from the cut section of pipe. Refer to **Fig. 6.4** above.

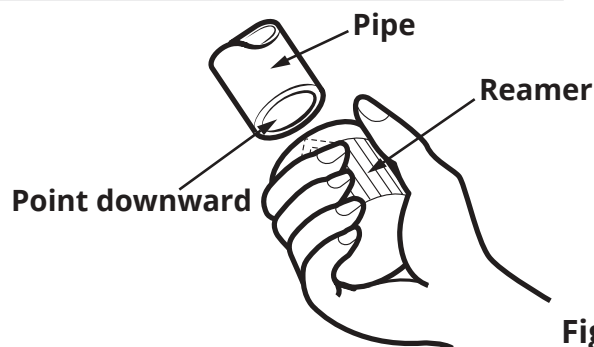
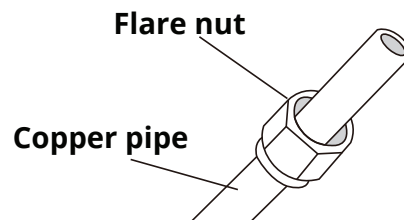


Fig. 6.4

### Step 3: Flare Pipe Ends

Proper flaring is essential to achieve an airtight seal.

1. After removing burrs from the cut pipe, seal the ends with PVC tape to prevent foreign materials from entering the pipe.
2. Sheath the pipe with insulating material.
3. Place flare nuts on both ends of the pipe. Ensure they are facing the correct direction because once the pipe is flared you will be unable to change their direction.



4. Remove the PVC tape from the ends of the pipe right before performing flaring work.
5. Clamp the flare form on the end of the pipe to be flared. The end of the pipe must extend beyond the flare form. Please refer to **Fig. 6.5** below.

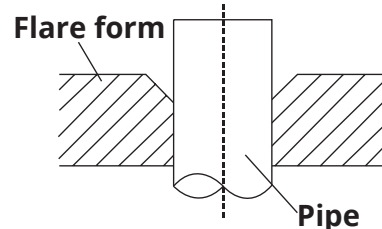


Fig. 6.5

# Refrigerant Piping Connections

- Place flaring tool onto the form.
- Turn the handle of the flaring tool clockwise until the pipe is fully flared. Flare the pipe in accordance with the dimensions in the table and **Fig. 6.6** below.

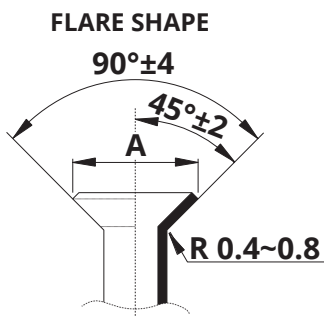


Fig. 6.6

- While firmly gripping the nut on the unit tubing with the spanner, use an HVAC torque wrench to tighten the flare nut (**Fig 6.7** below). Continue to tighten the flare nut with the torque wrench until specified torque rating listed in the table to the left is reached.

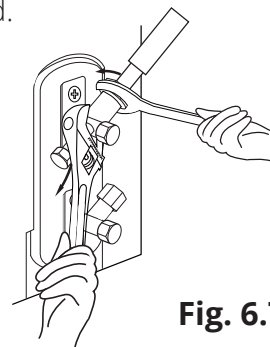


Fig. 6.7

## PIPING EXTENSION BEYOND FLARE FORM

Pipe gauge	Tightening Torque lb-ft (Nm)	Flare dimension (A) Inch (millimeter)	
		Min.	Max.
Ø 3/8 in	23.6-28.8 lb-ft (32-39 Nm)	0.52 in (13.2 mm)	0.53 in (13.5 mm)
Ø 3/4 in	49.4-74.5 lb-ft (67-101 Nm)	0.91 in (23.2 mm)	0.93 in (23.7 mm)
Ø 7/8 in	62.7-81.1 lb-ft (85-110 Nm)	1.04 in (26.4 mm)	1.06 in (26.9 mm)

### NOTE ON TIGHTENING TORQUE

When torquing the flare nut be sure to use the correct torque rating according to the table. **DO NOT** overtighten the flare nut as this could damage it and under tightening it could also cause it to leak.

- Remove the flaring tool and flare form, then inspect the end of the pipe for cracks and even flaring.

- Then, carefully route and bend the piping to the exterior through the wall hole so it can be connected to the outdoor unit. For more detailed information about bending the piping and the minimum pipe radius please refer to the note and **Fig. 6.8** below.

### NOTE ON MINIMUM BEND RADIUS

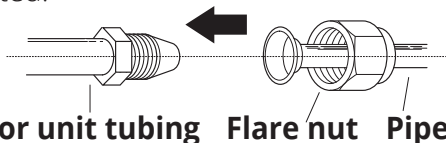
Carefully bend the refrigerant piping in the middle according to the illustration below. **DO NOT** bend the piping at an angle greater than  $90^\circ$  or more than 3 times as it could become damaged and/or break.

### Step 4: Connect Pipes

In this step you will connect the copper refrigerant pipes to the indoor unit first, and then to the outdoor unit. The low pressure pipe should be connected first and then the high pressure pipe can be connected.

**NOTE: If you are installing a 60K capacity air handler, please refer to the instructions on the next page as it requires additional steps.**

- When connecting the flare nuts, apply a thin coat of refrigerant oil to the flared ends of the pipes.
- Align the center of the two pipes that are to be connected.



Indoor unit tubing Flare nut Pipe

- Tighten the flare nut by hand as tightly as possible.
- Using a spanner, grip the nut on the unit tubing.

### Bend the pipe using your thumbs



**Minimum Bend Radius: 3.9 in (10 cm)**

Fig. 6.8

- Then, connect the refrigerant piping to the outdoor unit by repeating steps 1-5.
- Evacuate air and moisture from the refrigerant lines. Please refer to the **Air Evacuation & Adding Refrigerant** section of this manual for more detailed instructions for completing this step.
- Open the stop valves of the outdoor unit to start the flow of the refrigerant between the indoor and outdoor unit.

### NOTICE

**Use both a spanner and a torque wrench when connecting or disconnecting pipes to/from the unit.**

# Refrigerant Piping Connections

## ! CAUTION

Once the refrigerant piping is connected and the installation of the indoor and outdoor units has been completed, perform leak tests to ensure the system is not leaking. Should you detect a refrigerant leak, ventilate the area immediately and evacuate the system (refer to the Air Evacuation section of this manual).

10. Once the unit is installed, and you have confirmed the system does not leak, insulate and wrap all the piping, including the valve bodies with thermal insulation material to prevent condensation. Ensure the valve is sealed. Please refer to **Fig. 6.9**.

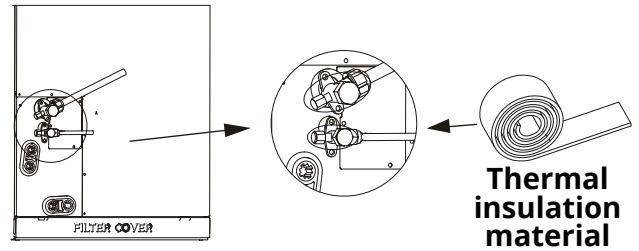


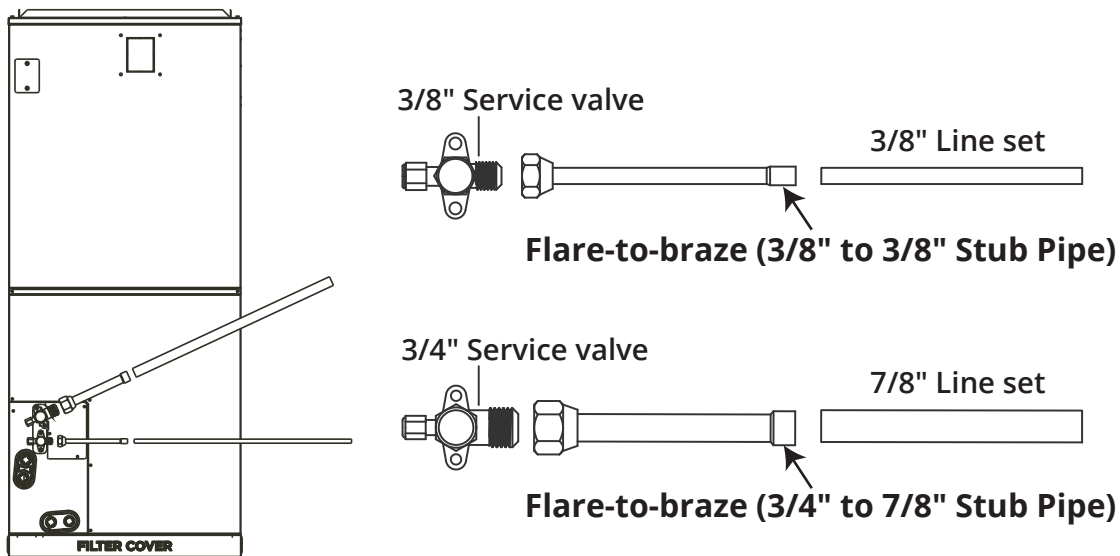
Fig. 6.9

## ! CAUTION

Ensure insulation is properly wrapped around the piping. Direct contact with bare piping may result in burns or frostbite.

### 60K Indoor Air Handler Piping Connection Instructions

When connecting refrigerant piping to a 60K capacity air handler additional steps are required. Complete the piping connections to the indoor unit as shown below. Only use flare-to-braze 3/4" to 7/8" & 3/8" to 3/8" connect the 7/8" line set. If you attempt to connect the line set in any other manner than the one shown below, it will cause the performance of the unit to decrease.





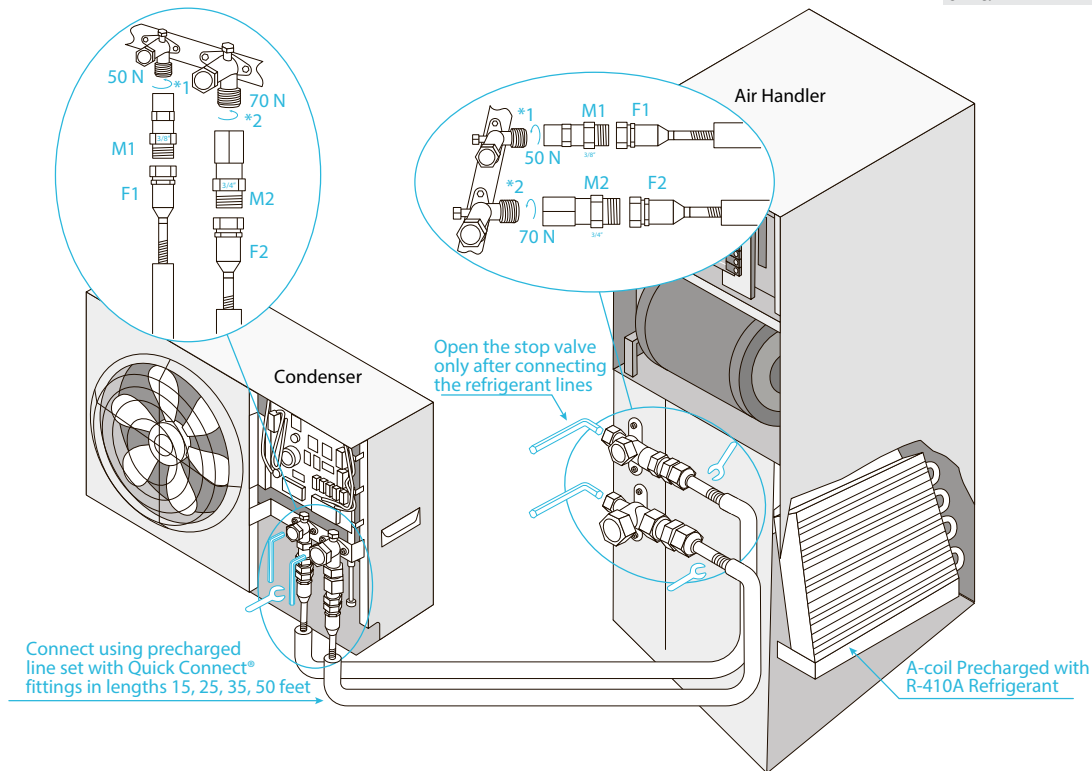
# No-Vac® Quick Connect® Line Set\* Installation

**INSTRUCTIONS FOR USE WITH NO-VAC™ QUICK CONNECT® LINE SET\* SOLD SEPARATELY**  
**KINK RESISTANT, PRECHARGED, SIMPLE SECURE QUICK CONNECT, 100% CONNECTION GUARANTEE**

**Please read and follow the instructions and diagram below\* :**  
**Connections must be made exactly as specified to avoid system leaks and /or damage**

1. Take out matching male connectors **M1** and **M2**.
2. **Remove** protective cap with the copper gasket at each stop valve on the **CONDENSER** and ensure the threads are clean and complete.
3. **Tighten** the **M1** connector to the **cutoff valve \*1** with a tightening force of **37 ft/lb (50 Nm)**. **Tighten** the **M2** connector to the **cutoff valve \*2** with a tightening force of **52 ft/lb (70 Nm)**.
4. **Repeat** step 3 for **AIR HANDLER** at the other end of the **LINE SET**.
5. Unroll and route the **LINE SET** between the **AIR HANDLER** and the **CONDENSER**. Bend the line set piping by hand to route the line set to suit your application. Use care when bending the line set. Please refer to the **Bending the Line Set** section of **Pg. 13** for more detailed instructions on how to properly and safely bend the line set refrigerant piping, as well as the correct bend radius.
6. **Remove** the protective caps of the valves at both ends of the **LINE SET**. Verify that all threads are clean and complete.
7. **Tighten** the **LINE SET F1** valve to the **M1 Connector** (attached in step 3) with a force of **33 ft/lb (45 Nm)**. **Tighten** the **LINE SET F2** valve to the **M2 Connector** (attached in step 3) with a tightening force of **33 ft/lb (45 Nm)**.
8. **Repeat** this process for the **AIR HANDLER** at the other end of the **LINE SET**.
9. At the **OUTDOOR UNIT** remove the **protective cap** at the **cutoff valve switch** and **open** the **stop/cutoff valve** with a hex wrench to release refrigerant into the system. **If** there is any fizz, grease or other **leakage**, then **close** the valve **immediately** and **check** that **steps 3 and 7** were done properly. **Otherwise**, using a sponge or spray bottle, apply a soapy water solution to the connection points to check for micro leaks. **If any bubbles form** it indicates there is a leak. If this does occur, **close** the valve **immediately** and **check** that **steps 3 and 7** were done properly and re-tighten the valves and line set if necessary.
10. **After** the correct connection, **re-tighten** the cutoff valve's **protection cap** and **cover** the **M1, M2** and **F1, F2** connections with the gray **insulating sleeve** to help **prevent condensation**.

## Complete unit replacement using the No-Vac® Quick Connect® lines



### ⚠ IMPORTANT

When running the Line Set through the knockout hole of the condenser, it may be necessary to slightly trim the line set insulation so it feeds through the hole freely. Otherwise, it may be difficult to connect it to the condenser. Once the installation is complete, pack the hole with neoprene to prevent small animals and insects from entering the condenser.



### NOTE ON WRENCHES

The wrench sizes needed for tightening the No-Vac® Quick Connect® Line Set are listed below. However, based on the availability of the wrench sizes needed, it is recommended to use two large crescent (adjustable-type) wrenches. Using one to hold the valve while using the other wrench to tighten the line set connector.

Piping Size (Stamped on piping)	Wrench Size Required	
	Standard	Metric
3/8"	1"	25 mm
3/4"	1-3/8"	35 mm
Or 2x large crescent (adjustable-type) wrenches		

### Allen/Hex Wrench Sizes Needed To Open Stop/Cutoff Valves

Piping/Valve Size (Stamped on piping)	Allen Wrench Size
3/8"	5 mm
3/4"	8 mm

### ⚠ IMPORTANT

The stop/cutoff valves on the unit must be opened **AFTER** connecting the lines and **BEFORE** turning on the unit. **Otherwise**, operation can cause leakage and/or damage to the unit.

*Failure to follow the instructions provided could result in severe harm to you, this product, or other property. The manufacturer, distributor, and seller are not responsible for any harm resulting from the failure to follow instructions and the failure to follow these instructions will void any and all warranties express or implied.*

\*Pat. <https://mrcool.com/mrcool-patents/>

[www.mrcool.com](http://www.mrcool.com)



## BEFORE PERFORMING ELECTRICAL WORK, READ THESE REGULATIONS

**\*\*NOTE: ELECTRICAL WORK MUST BE COMPLETED BY A QUALIFIED TECHNICIAN!\*\***

- ① ***DO NOT*** connect any other equipment to the power circuit for the unit. Only connect the unit to an individual branch circuit.
- ① ***DO NOT*** allow wires to touch or rest against the refrigerant piping, compressor, or any other moving parts within the unit.
  1. All wiring must comply with local and national electrical codes, regulations, and must be installed by a licensed electrician.
  2. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.
  3. If there is a serious safety issue with the power supply, stop work immediately. Explain the issue to the client, and refuse to continue the installation until the safety issue is properly resolved.
  4. Power voltage should be within 90-110% of the rated voltage. An insufficient power supply can cause a malfunction, electrical shock, and/or fire.
  5. If connecting power to fixed wiring, a switch or circuit breaker that disconnects all poles, and has a contact separation of at least 1/8 in (3 mm), must be incorporated in the fixed wiring. The qualified technician/electrician must use an approved circuit breaker or switch.
  6. The circuit, including any switches, should have a capacity 1.5 times the maximum unit current (amps).
  7. Installation of an external surge suppressor at the outdoor disconnect is recommended.
  8. Make sure the unit/system is properly grounded.
  9. Every wire must be firmly and securely connected. Loose wiring can cause the terminal to overheat, which could result in a malfunction and/or fire.
  10. If the unit has an auxiliary electric heater, it must be installed at least 40 in (1 m) away from combustible materials.
  11. To avoid electrical shock, never touch the electrical components soon after the power supply has been turned off. Always wait 10 minutes or more before touching the electrical components once the power has been turned off.
  13. Ensure that the electrical wiring and signal wiring do not cross. This could cause distortion, interference, or possibly damage to the circuit boards
  14. The unit must be connected to the main outlet. Normally, the power supply must have an impedance of 32 ohms.
  15. Connect the outdoor wires before connecting the indoor wires.



## WARNING

**\*\*\*\*\*BEFORE PERFORMING ANY ELECTRICAL WORK, TURN OFF ALL POWER TO THE SYSTEM!\*\*\*\*\***

**NOTE: The wire colors of this series/model may differ from previous models, other series and general conventions. All wiring must be performed in accordance with the wiring diagram on the back of the wiring cover of the outdoor condenser and/or the wiring diagrams found in this section of the manual.**

## ! IMPORTANT!

Depending upon the capacity of unit and accessories (electric heat kit, wired thermostat, etc.) being installed, additional electrical components (circuit breakers, conduit, air switch, etc.) and wiring may need to be purchased separately to properly connect the system. Selection and installation of these components and wiring should only be performed by a qualified technician.

### Outdoor Unit Wiring & Electrical Specifications

#### SELECT THE CORRECT CABLE TO CONNECT THE POWER SUPPLY TO THE OUTDOOR UNIT

• See table below for gauge requirements of power cables for outdoor condenser.

**NOTE:** The table below is a standard chart, the AWG ratings and wiring needs will change based on wire length and temperature.

**Minimum Wire Gauge for Power Cables**

	Model Capacity (BTU/hr)	Appliance Amps (A)	
		MCA	MOP
Single-Zone Condensers	24K	25	35
	36K	41	50
	48K	42	50
	60K	44	60

### Indoor Unit Wiring & Electrical Specifications (for units without optional electric heat kit)

Unit Capacity	Volts-Phase	Rated Input Current of Power Conversion Equipment Amps	Minimum Circuit Amps	BRANCH CIRCUIT	
				Minimum Wire Size (AWG*)	Fuse/Circuit Breaker Amps
24K	208/230-1	3.0	4.0	14#	15.0
36K	208/230-1	4.0	5.0	14#	15.0
48K	208/230-1	6.0	7.5	14#	15.0
60K	208/230-1	7.0	9.0	14#	15.0

\* Use copper wire only to connect the unit. If anything other than uncoated (non-plated) 75°C copper wire (solid wire for 10 AWG and smaller, stranded wire for larger than 10 AWG) is used consult the applicable tables of the National Electric Code (ANSI/NFPA 70).

#### NOTE

- If branch circuit wire length exceeds 100 ft, consult NEC 210-19a to determine maximum wire length. Use a 2% voltage drop.
- If the unit is to have an electric heat kit installed (optional), please refer to the Installation of Air Handler Heat Kit section of manual for more detailed information regarding the electrical specifications.

## Air Switch Diagram

### Air switch diagram (shown with optional electric heat kit)

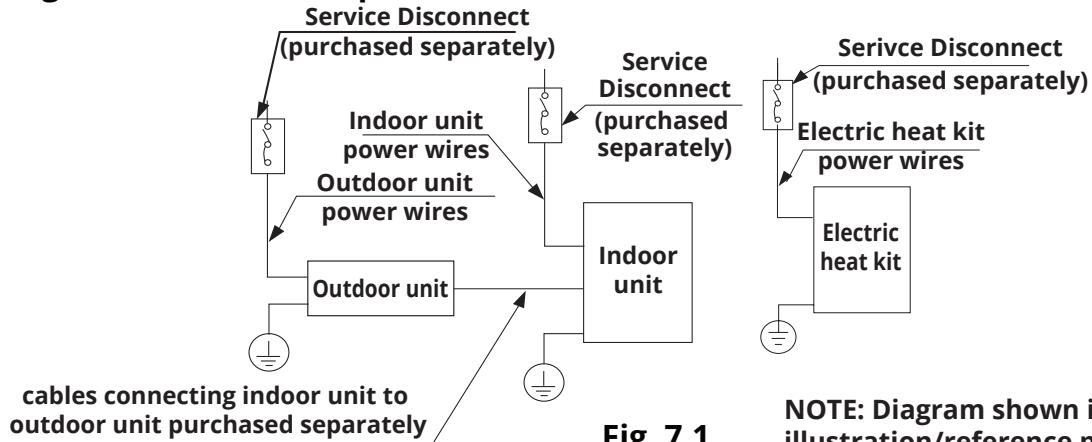


Fig. 7.1

NOTE: Diagram shown is for illustration/reference purposes only.

### NOTE ON AIR SWITCH

• When the maximum current of the air conditioner is more than 16A, a service disconnect with protective device shall be used (purchased separately). Refer to Fig. 7.1.

Systems in the North American market should be wired according to NEC & CEC requirements and state & local regulations.

Please note that units that are equipped with an optional heat kit, the heat kit uses a power supply that is independent of the power supply of the air handler & blower. This power supply may also require an air switch as well. Please be aware of this when wiring the heat kit.

### Outdoor Unit Wiring

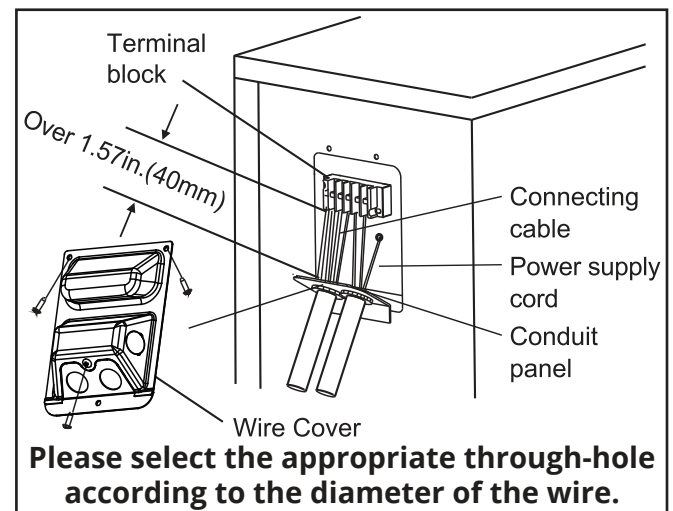
The wiring and other electrical components (insulation or conduit) to connect the indoor and outdoor units must be purchased separately. Please refer to the beginning of **Electrical Connections** section of the manual for wiring specification guidelines. Follow the steps below to wire the outdoor condenser. **NOTE: For more detailed illustrations of the different variations of wiring connections, depending on your specific application, please refer to the wiring diagrams further in this section of the manual.**

1. Prepare the cables for connection.
  - a. Select the correct cable size based on the unit being installed. Ensure to size each wire used so that is several inches longer than the required length for wiring. This will allow for some slack and prevent the wire from being under tension.
  - b. Using wire strippers, strip the jacket from each end of the cable to reveal approximately 6 in (15 cm) of wire.
  - c. Strip the insulation from the ends of the wire.
  - d. Stranded wire requires u-lugs or ring terminals to be crimped onto the ends of the wire.
2. Remove the 3 screws from the electrical wiring cover on the outdoor condenser. Then, remove the cover, as shown in the image below.

**NOTE: Wiring connections must strictly follow the diagram found inside the wiring cover.**

### NOTE ON CABLE RECOMMENDATIONS

The type of cable that is selected to wire the indoor and outdoor unit are based on local electrical codes and regulations. The recommended gauge (AWG) of the cables used should be based the Minimum Circuit Ampacity (MCA) and Maximum Overcurrent Protection (MOP) ratings. These are indicated on the nameplate of the outdoor unit and listed in the tables at the beginning of this section of the manual.

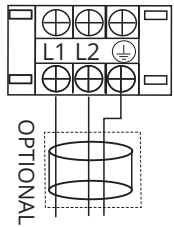


## Outdoor Unit Wiring

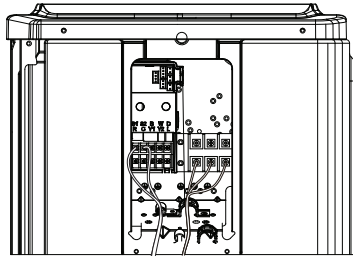
### **! WARNING**

The risk of electric shock can cause injury or death. Disconnect all remote electric power supplies before servicing.

3. Remove the caps on the conduit panel.
4. Mount the conduit tubes (not included, purchased separately) onto the conduit panel.
5. Properly connect the wiring by securely fastening the u-lug or ring terminal of each wire to the corresponding terminal on the terminal block as shown below.



TO POWER SOURCE



**Outdoor Unit Wiring for Condenser**

**Outdoor Unit**

## Indoor Unit Wiring

1. Prepare the cables for connection.
  - a. Using wire strippers, strip approximately 6 inches (15 cm) of the outside rubber jacket.
  - b. Once rubber jacket section is removed, strip the same length of interior insulation from the end of the wire.
2. Open the front panel of the indoor unit. Then, using a screwdriver, remove the cover of the electric control box of the indoor unit.
3. Route and thread the power and communication cables through the wire outlet.
4. Properly connect the wiring by securely fastening the u-lug or ring terminal of each wire to the corresponding terminal on the terminal block. Refer to the unit serial number and the wiring diagram located on the electric control box cover (**Fig. 7.2**). **NOTE: For more detailed illustrations of the different variations of wiring connections, depending on your specific application, please refer to the wiring diagrams on pages 47-50.**
5. Clamp down the cable with the cable clamp. The cable must not be loose or pull on the u-lugs.
6. Reattach the electric control box cover.

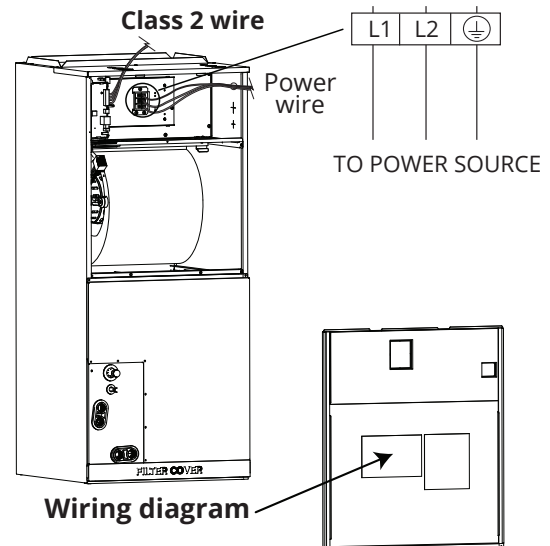
### **! WARNING**

Isolate the power wires and communication wires by the strain relief and ensure they have enough slack. Keep them separated and **DO NOT** allow them to intertwine. If this occurs it could create interference and cause the unit to malfunction.

6. Ensure the unit is properly grounded in accordance with any and all state and local codes.
7. Ensure all wiring is properly insulated and protected in accordance with any and all state and local codes.
8. Then, reinstall the electrical wiring cover by positioning it into place and reinstalling the screws. Once complete, route the indoor unit wiring to the air handler.

### **! WARNING**

Isolate the power wires and communication wires and keep them separated to ensure they **DO NOT** intertwine as this could cause the unit to malfunction.



**Fig. 7.2**

### **! CAUTION**

- While connecting the wires, strictly follow the wiring diagram.
- The refrigerant circuit can become very hot. Keep all wiring and cables away from the copper piping.

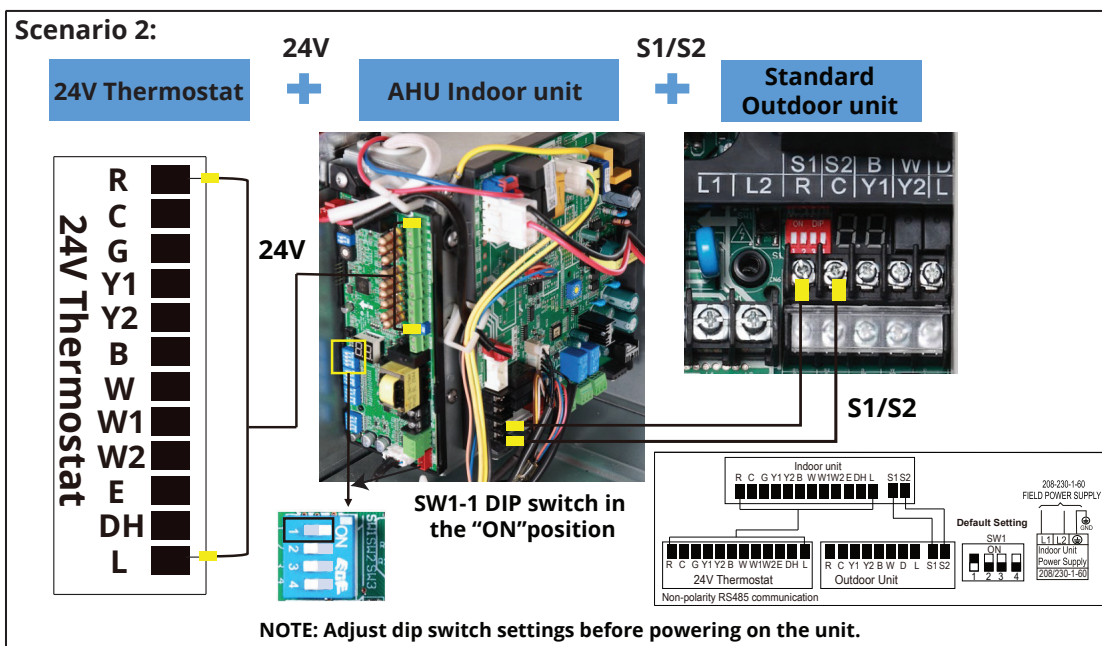
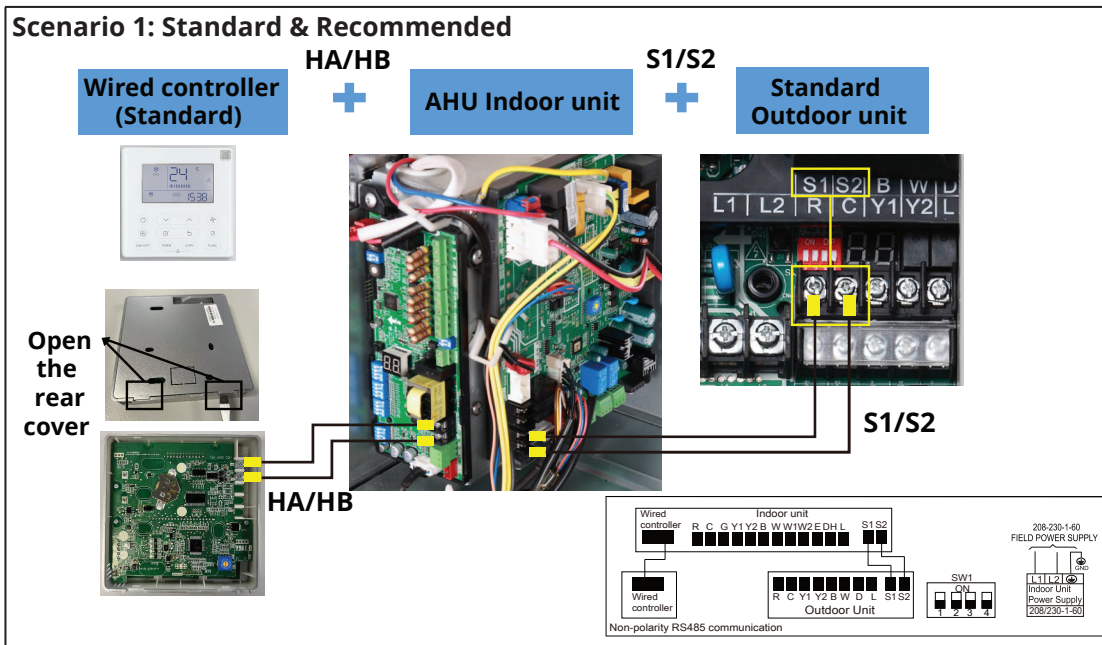
# Electrical Connections

## Wiring Diagrams & Connection Methods

The wiring diagrams below and on the following pages show the proper wiring and DIP switch settings (for indoor and outdoor units) depending upon your application and the type of thermostat used (standard wired controller or 24V thermostat).

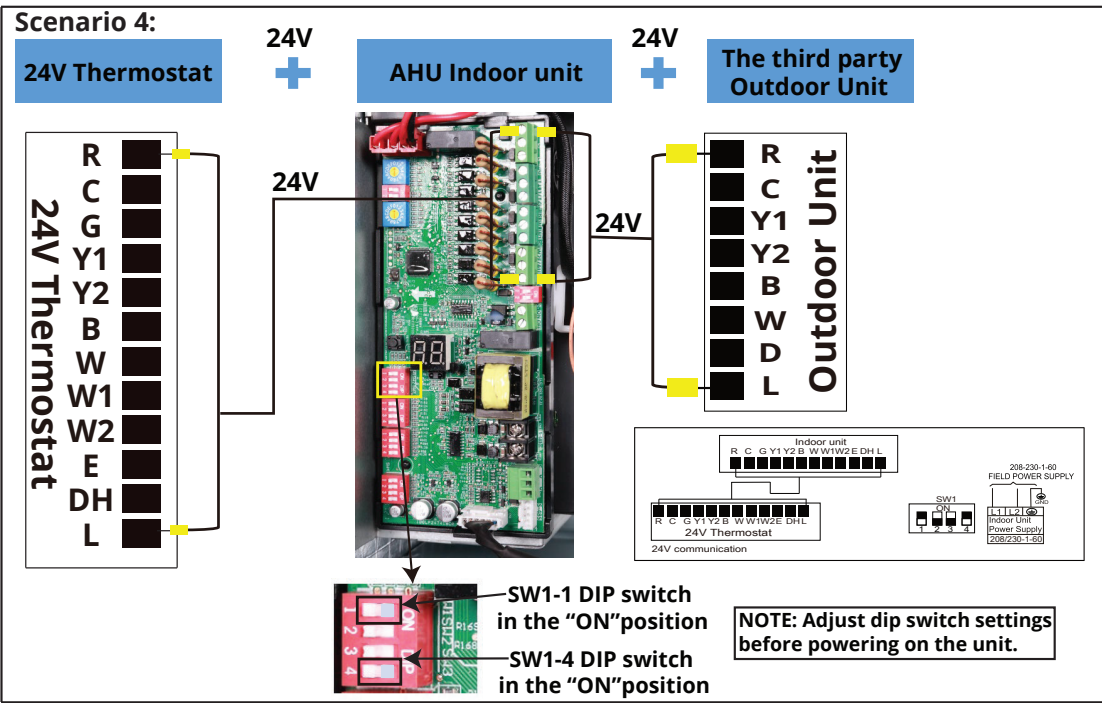
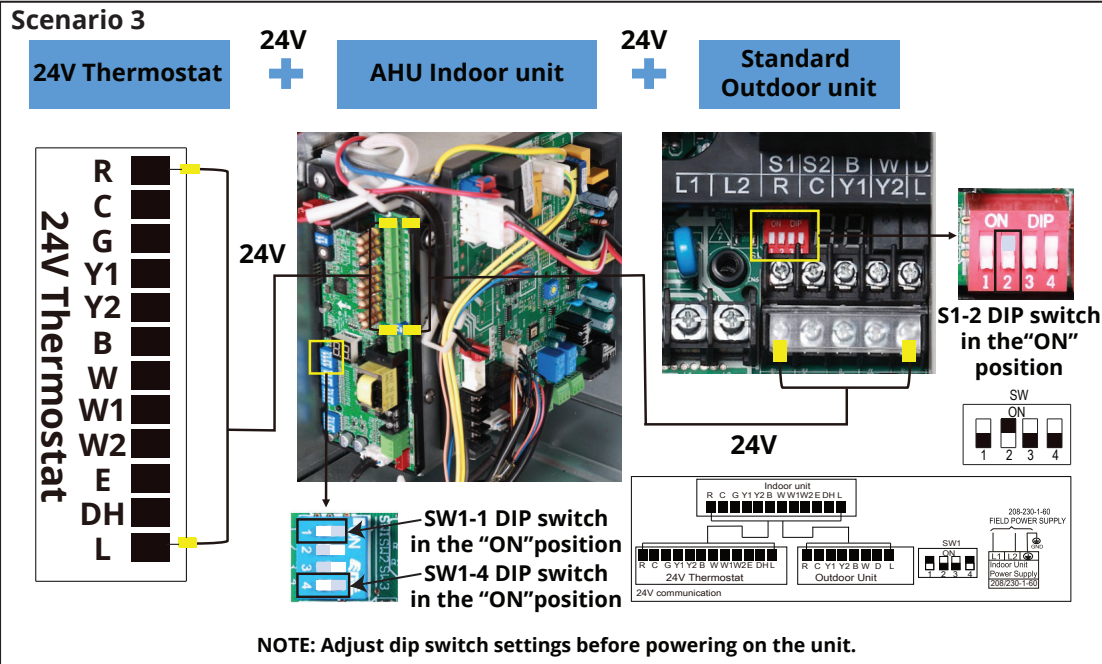
Scenario	Controller	Indoor Unit	Connection between indoor & outdoor units	Outdoor Unit	AHU DIP switch		ODU DIP switch
					SW1-1	SW1-4	S1-2
<b>Scenario 1 (Recommended)</b>	Wired controller (Standard)	Air handler	RS485: S1/S2	Standard outdoor unit	OFF (Default)	OFF (Default)	OFF (Default)
<b>Scenario 2</b>	24V Thermostat	Air handler	RS485: S1/S2	Standard outdoor unit	ON	OFF (Default)	OFF (Default)
<b>Scenario 3</b>	24V Thermostat	Air handler	24V: R/C/B/Y1/Y2/G/W	Standard outdoor unit	ON	ON	ON
<b>Scenario 4</b>	24V Thermostat	Air handler	24V: R/C/B/Y1/Y2/G/W	Third party outdoor unit	ON	ON	n/a

NOTE: Adjust dip switch settings before powering on the unit.



NOTE: Adjust dip switch settings before powering on the unit.

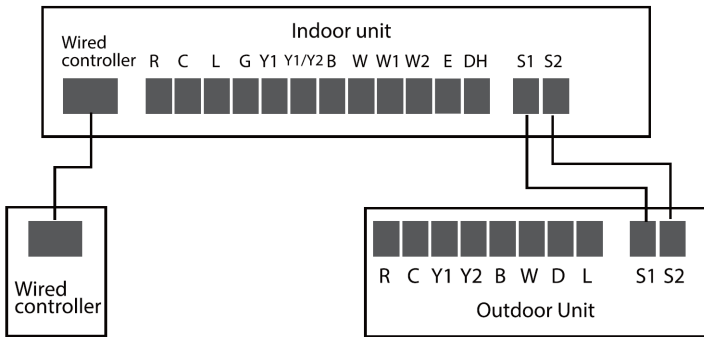
# Electrical Connections



## Wiring Diagrams & Connection Methods (Without Communication)

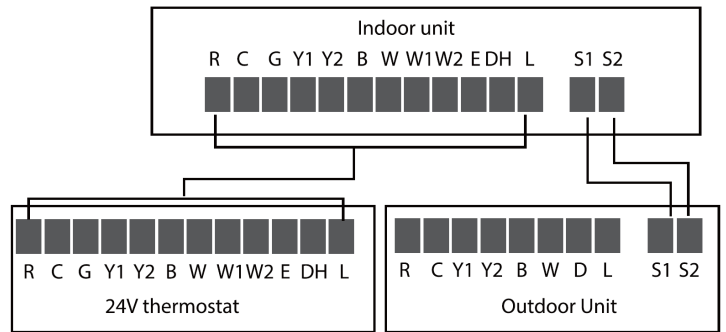
### Connection Method A:

Refer to the wiring method of internal and external machine communication and wired controller as follows:



### Connection Method B:

To use a 24V thermostat, refer to the following wiring method:



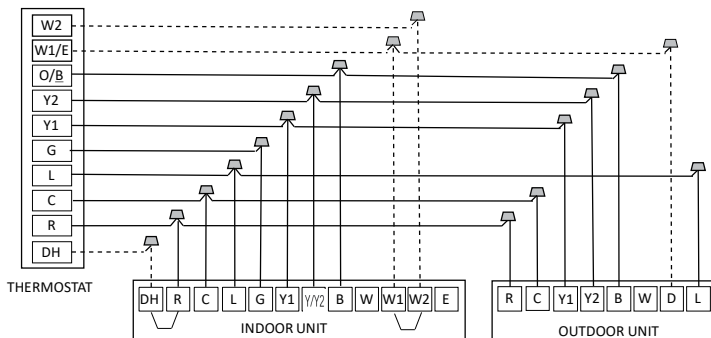
### Connection Method C (36K-60K units ONLY):

The following wiring diagrams are suitable for the AHU and outdoor condenser when used with a 24V thermostat without communication.

#### NOTE

- This equipment uses B functionality. The terminal is energized for heating functionality. Please ensure thermostat is setup for B functionality.

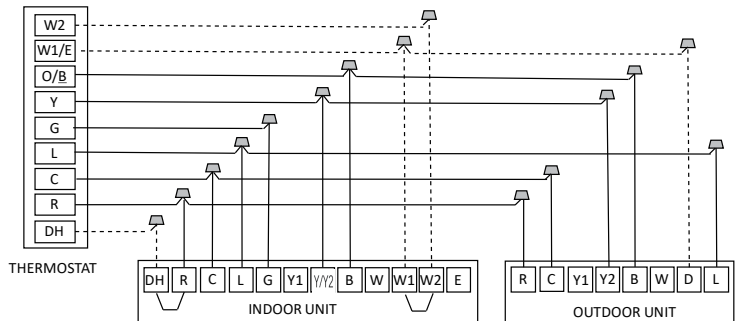
### Wiring for 4H and 2C thermostat



S4-2 DIP switch off  
Perform disconnection and short-circuit to achieve partition, control or dehumidification

S4-1 DIP switch off  
Disconnect and short circuit to realize heating segment

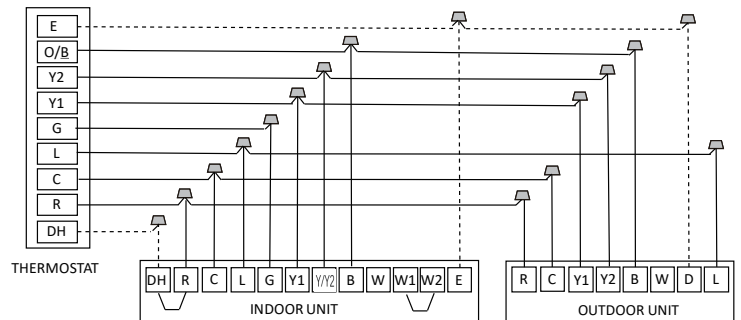
### Wiring for 3H and 1C thermostat



S4-2 DIP switch off  
Perform disconnection and short-circuit to achieve partition, control or dehumidification

S4-1 DIP switch off  
Disconnect and short circuit to realize heating segment

### Wiring for 3H and 2C thermostat



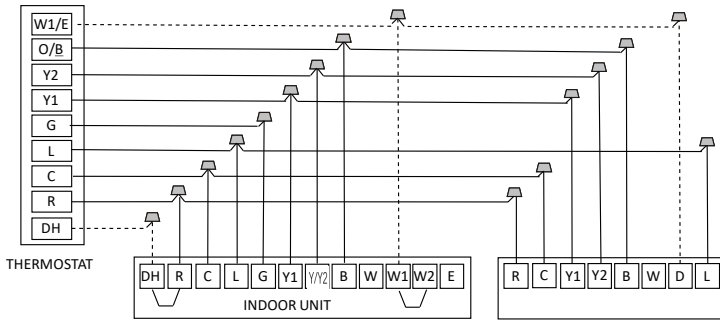
S4-2 DIP switch off  
Perform disconnection and short-circuit to achieve partition, control or dehumidification

Emergency heating control two groups of electric heating at the same time



## Wiring Diagrams & Connection Methods

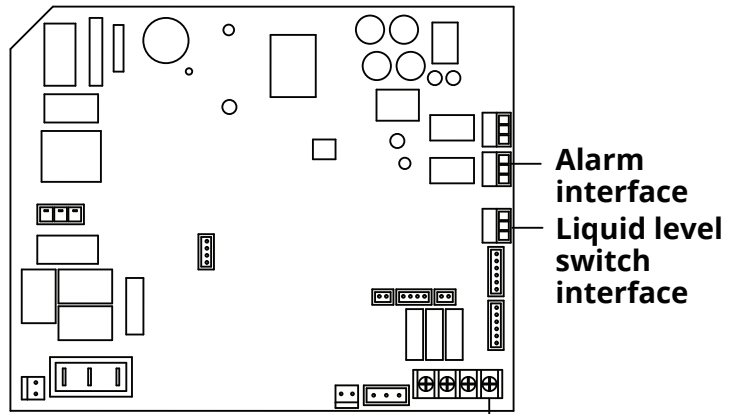
### Wiring for 3H and 2C thermostat



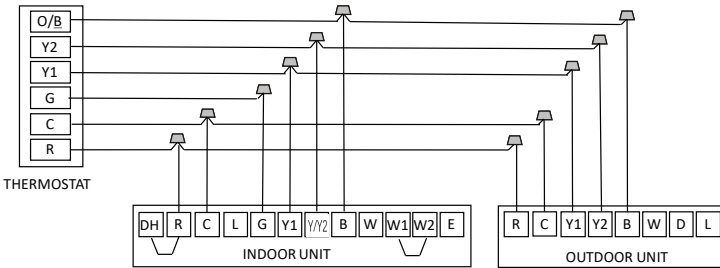
S4-2 DIP switch off  
Perform disconnection and short-circuit to achieve partition, control or dehumidification

S4-1 DIP switch off  
Disconnect and short circuit to realize heating segment

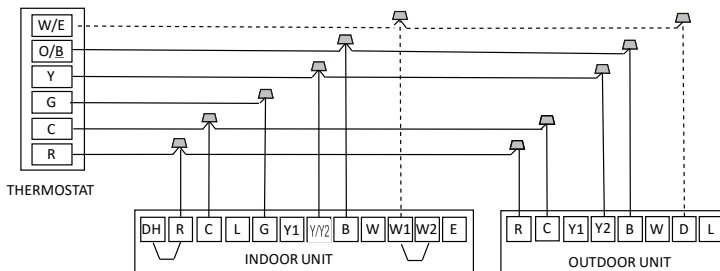
### Wiring for Optional Functions



### Wiring for 2H and 2C thermostat

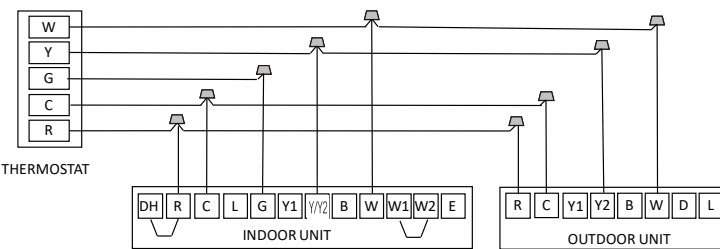


### Wiring for 2H and 1C thermostat



S4-1 DIP switch off  
Disconnect and short circuit to realize heating segment

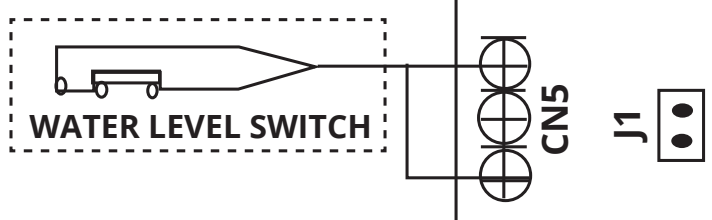
### Wiring for 1H and 1C thermostat



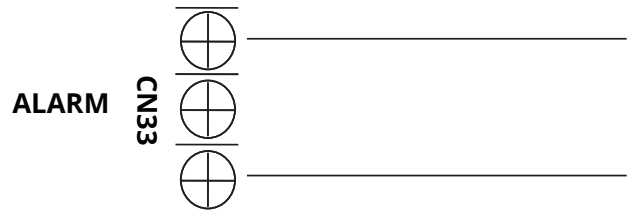
**NOTE:** This the least preferred method of control wiring and should only be used for emergency situations. Full comfort capacity may not be achieved using this method.

### Liquid Level Switch:

This unit has a liquid level detection interface. If you choose to incorporate this function, it will be necessary to purchase a liquid level switch separately, connect it to the CN5 interface, and remove J1. When the water receiving pan is full, the water level switch will become disconnected. Then, the water level switch sends a signal and the unit will stop operating.



### The Fault Warning

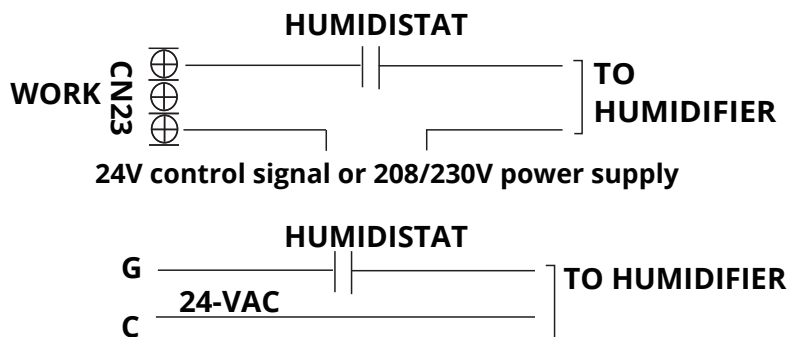


### Alarm Output:

An alarm output (CN33) can be utilized if actions are required when a fault is present. This is a passive outlet port, so you will need to input a voltage signal. The relay is normally open during normal operation. It closes when a fault condition is active.

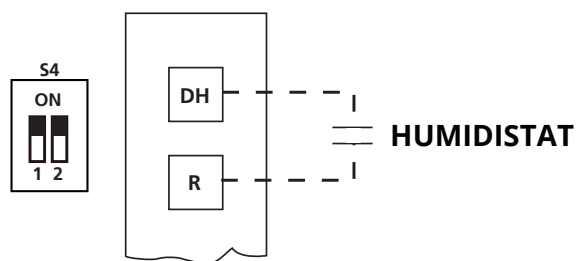
## Wiring for Optional Functions (cont'd)

### Humidification Control Wiring:



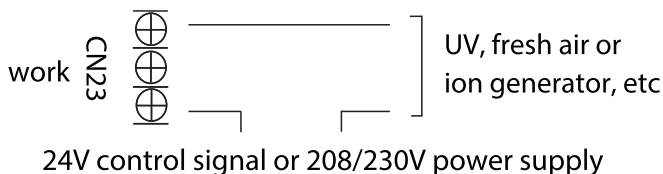
To connect a humidifier, utilize the passive signal "WORK" output (CN23) port, as well as the G and C wires on the controller, and wire the humidistat and humidifier per the above wiring diagram. When the fan is running, the CN23 relay will be closed which will allow power to be routed to the humidifier when the humidistat is below the humidity setpoint. If the thermostat or zone controller has a HUM interface, connect the humidifier directly to the HUM and C ports.

### Dehumidification Control Wiring:



Dehumidification control requires an external humidistat at DH and R. Set the S4-2 dip switch to OFF. When the humidity rises and exceeds the set value of the humidistat, the 24V signal of DH changes to 0V, the cooling system then begins the dehumidification operation, and the air volume drops to 80% of the nominal cooling air volume.

### UV, Fresh Air, or Ion Generator Wiring:



The WORK port is linked with the fan. When the fan is running, the relay is closed; if an active 24V signal is required, it can be directly connected to the G and C ports.

## Control Logic

### Indoor Unit Connector

Connector	Purpose
R	24V Power Connection
C	Common
G	Fan Control
Y1	Low Cooling
Y/Y2	High Cooling
B	Heating Reversing Valve
W	Heating Control
W1	Stage 1 Electric Heating
W2	Stage 2 Electric Heating
E/AUX	Emergency Heating
DH/DS/BK	Dehumidification/Zoning Control
L	System Fault Error

### Outdoor Unit Connector

Connector	Purpose
R	24V Power Connection
C	Common
Y1	Low Cooling
Y2	High Cooling
B	Heating Reversing Valve
W	Heating Control
D	Defrost Heat
L	System Fault Error

## LED Display

The control displays unit status as well as any active fault codes on the LED display. If the unit is functioning normally, the LED will display the current temperature setpoint. Or, if a 24V thermostat is used, a functional display code from the table on the following page will be shown. When a fault code is active, the display will flash the active code.

Please refer to the fault code table located in the troubleshooting section of the Service Manual for more detailed fault code information.

## KEY1 Instructions (For Wired Controller only)

- Press KEY1 to enter the forced automatic mode, press KEY1 again to enter the forced cooling mode (LED display FC), and press KEY1 again to shut down.
- Keep pressing KEY1 under forced cooling mode (LED display FC) 5s to enter forced defrost mode.

# Electrical Connections

## Functional Display

Mode	Priority	G	Y1	Y/Y2	B	W	W1	W2	E/AUX	DH/DS/BK	Display
Shut down	/	0	0	0	0	0	0	0	0	*	00
Fan	7	1	0	0	0	0	0	0	0	1	01
Fan		1	0	0	0	0	0	0	0	0	
Cooling	6	*	1	0	0	0	0	0	0	1	02
Cooling 2		*	*	1	0	0	0	0	0	1	03
Dehumidification 1		*	1	0	0	0	0	0	0	0	04
Dehumidification 2		*	*	1	0	0	0	0	0	0	05
Heating 1	5	*	1	0	1	0	0	0	0	1	06
Heating 2		*	*	1	1	0	0	0	0	1	07
Heating 2		*	*	*	*	1	0	0	0	1	
Electric heating 1	3	*	0	0	0	0	1	0	0	*	08
Electric heating 1		*	0	0	0	0	0	1	0	*	
Electric heating 2		*	0	0	0	0	0	1	1	0	*
Heating 1 + electric heating 1	4	*	1	0	1	0	1	0	0	1	10
Heating 1 + electric heating 1		*	1	0	1	0	0	1	0	1	
Heating 2 + electric heating 1		*	*	1	1	0	1	0	0	1	
Heating 2 + electric heating 1		*	*	*	*	1	1	0	0	1	
Heating 2 + electric heating 1		*	*	1	1	0	0	1	0	1	
Heating 2 + electric heating 1		*	*	*	*	1	0	1	0	1	
Heating 1 + electric heating 2	4	*	1	0	1	0	1	1	0	1	11
Heating 2 + electric heating 2		*	*	1	1	0	1	1	0	1	
Heating 2 + electric heating 2		*	*	*	*	1	1	1	0	1	
Emergency heating	1	*	*	*	*	*	*	*	1	*	12
Heating zone control	2	*	1	0	1	0	*	*	0	0	13
Heating zone control		*	*	1	1	0	*	*	0	0	
Heating zone control		*	*	*	*	1	*	*	0	0	

### NOTES:

- 1 = signal, 0 = no signal
- The terminal input signal is stable for 1 second before confirmation.

## DIP Switch Definitions

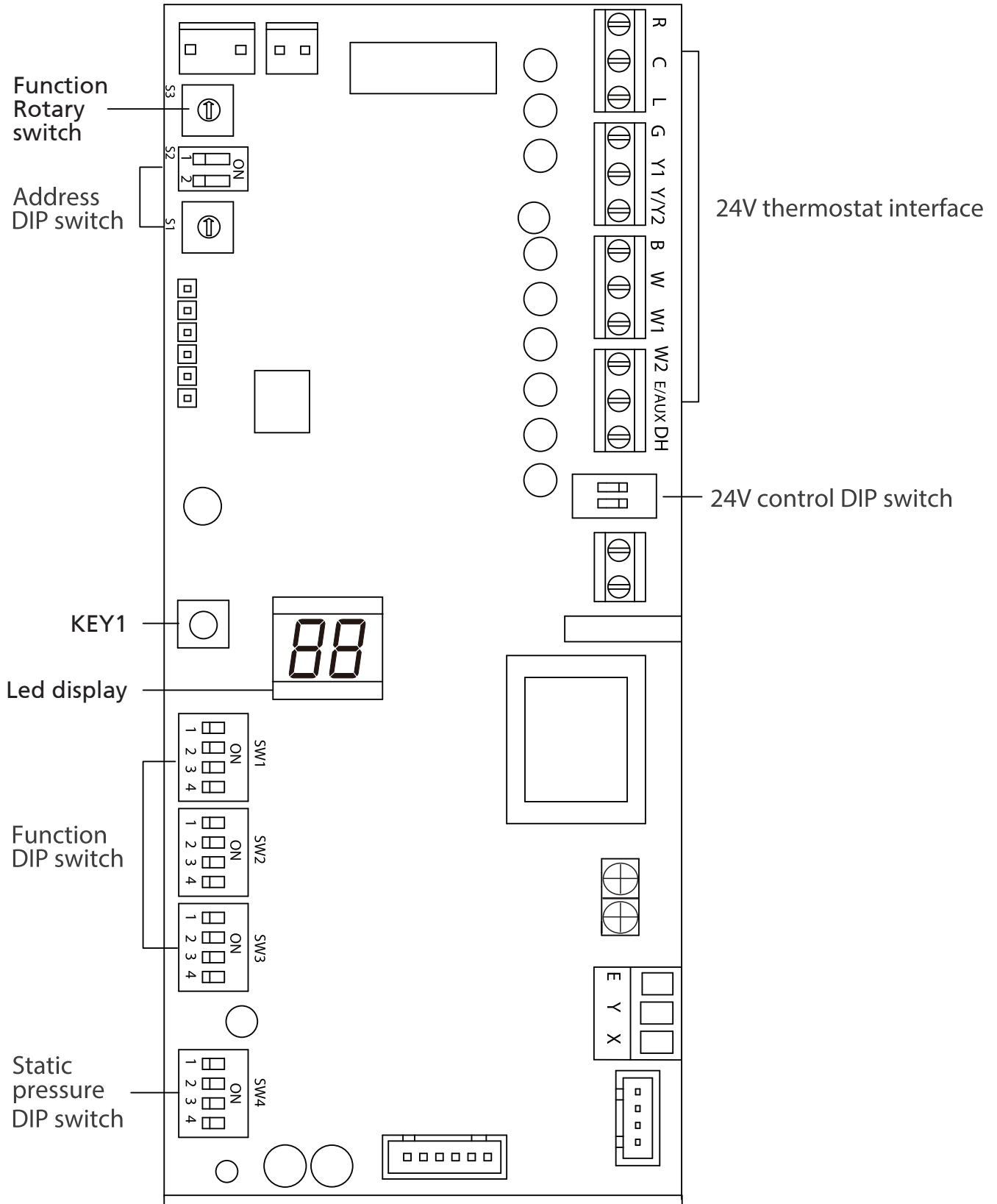


Fig. 7.3

## Function DIP Switch Settings

The 24V thermostat mode needs to refer to the following DIP switch settings.



Function combination table of SW1-1 and SW1-4:

SW1	Control type	Stand alone or full system
	Free match	Free match
	Wired controller	Full system
	24V Thermostat	Full system
	24V Thermostat	Stand alone

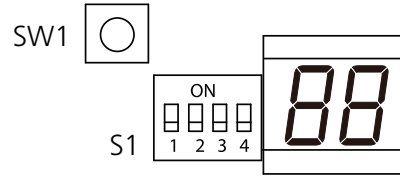
- SW4-1** • 000 is the default
- SW4-2** • 000/001/010/011/100/101/110/111, internal machines with different abilities, electric heating and PSC classification for use
- SW4-3**

## Indoor Unit Dial Code

No.	Dial Code	Control Scenario	Function	ON	OFF	Note
1	SW1-2	1,2,3	Anti-cold blow protection option	NO	[Default] YES	
2	SW1-3	1,2,3	Single cooling / heating and and cooling options	Cooling	[Default] Cooling & Heating	
3	SW2-1	1	Compressor Running (demand working with heat pump+ Electric heat)	Compressor slower speed	[Default] Faster Compressor	Only affects compressor and W1
4	SW2-1	2	Temperature differential to activate first stage auxiliary heat(the GAP of T1 and Ts),Wire controller demand with heat pump+Electric heat working together	2°F (1 °C)	[Default] 4 °F (2 °C)	
5	SW2-2	2	Electric heat on delay	YES	[Default]NO	
6	SW2-3	2	Electric auxiliary heating delay to start time	30 minutes	[Default] 15 minutes	Based on SW2-2 is ON
7	SW2-4	1	Compressor	The operation of heat pump is limited by the outdoor temperature, and the operation of auxiliary heat is not limited.The system makes judgments according to the following rules: 1) The compressor can be operated when the outdoor temperature is $\geq$ S3 DIP switch temperature +36°F (2 °C). 2) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch temperature.	[Default]The operation of heat pump is limited by the outdoor temperature, and the operation of auxiliary heat is not limited. The system makes judgments based on the following rules: 1) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch. 2) The compressor can be operated when the outdoor temperature is $\geq$ S3 DIP switch temperature +36°F (2 °C).	SW2-4 and S3 need to working together
8	SW2-4	2	Compressor/Auxiliary heat outdoor ambient lockout	The operation of heat pump is limited by the outdoor temperature, and the operation of auxiliary heat is not limited.The system makes judgments according to the following rules: 1) The compressor can be operated when the outdoor temperature is $\geq$ S3 DIP switch temperature +36°F (2 °C). 2) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch temperature.	[Default]Only one heat pump or auxiliary heat can be operated.The system makes judgments according to the following rules: 1) When the outdoor temperature is lower than the S3 DIP switch temperature,the compressor is not allowed to operated, but auxiliary heat is allowed to operated ; 2) When the outdoor temperature is $\geq$ S3 DIP switch temperature +36°F (2°C), the compressor can be operated, but auxiliary heat cannot be operated.	
9	Rotary Switch S3	1,2	Set outdoor temperature Limitation (for auxiliary heating or compressor)	Table A		
10	SW3-1	1	Maximum continuous runtime allowed before system automatically stages up capacity to satisfy set point. This adds 1 to 5°F (-17°C to -15°C) to the user set point in the calculated control point to increase capacity and satisfy user set point	30 minutes	[Default] 90 minutes	
11	SW3-2	1	Cooling and heating Y/Y2 temperature differential adjustment.	Compressor slower speed	[Default] Faster Compressor	Only affects compressor
12	SW3-3	1	Compressor Running (demand working with heat pump+ Electric heat)	Compressor slower speed	[Default] Faster Compressor	Only affects compressor and W2
13	SW3-3	2	Temperature differential to activate second stage auxiliary heating(the GAP of T1 and Ts)Wire controller demand with heat pump+Electric heat working together	4°F (2 °C)	[Default] 6 °F (3 °C)	
14	SW3-4	1,3	Fan speed of cooling mode when 24V Thermostat is applied for.	Turbo	High	
15	SW4	1,2,3	Electric heat nominal CFM adjustment	Available settings are 000/001/010/011. Each digit corresponds an individual switch position. For example [SW4-1 OFF, SW4-2 ON, SW4 -3 OFF] = 010 See table 11 for the corresponding CFM adjustment		
16	S4-1	1,3	Default ON	[Default] For single stage supplemental heat,W1 and W2 are connected	For dual stage supplemental heat, W1 and W2 are controlled independently.	
17	S4-2	1,3	DH function selection	[Default] Dehumidification control not available	Dehumidification feature is enabled through thermostat	

## Outdoor unit DIP Switch setting

Press the SW1 button 10S for force defrosting



NO.	Dial code	Features	ON	OFF
1	S1-1	Function to be defined		
2	S1-2	Communication dial code	24V communication scheme	485 communication scheme
3	S1-3	Strong cold and strong heat function	The cooling/heating target pressure compensation value is valid	The cooling/heating target pressure compensation value is invalid
4	S1-4	Enhanced defrosting function	Enhanced defrosting	Default setting(standard defrost algorithm)

Control Scenario	24V Tstat, S1+S2	1
	Wired Controller S1+S2	2
	Full 24V	3

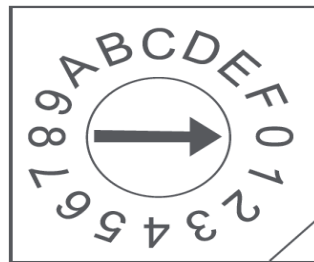


Table A

S3	S3 ( °F)	S3 ( °C)
0	OFF	OFF
1	-22	-30
2	-18	-28
3	-15	-26
4	-11	-24
5	-8	-22
6	-4	-20
7	3	-16
8	10	-12
9	18	-8
A	25	-4
B	32	0
C	36	2
D	39	4
E	43	6
F	46	8

## Address DIP Switch

Address dialing S1+S2: When the user uses the centralized controller, the address dialing is required.

Network address: The address silkscreen is NET address, which is composed of a 16-bit address rotary code S2 plus a two-digit DIP switch S1 (set during electrical installation, no network function needs to be set).

- When S2 is 00 (the dialing code is not connected), the address value is the value of S2.
- When S2 is 10 (corresponding to the switch of the hardware connected to the 10K resistor), the network address value is S2 plus 32.
- When S2 is 01 (corresponding to the dial code of the 5.1K resistor connected to the hardware is turned on), the network address value is the value of S2 plus 16.
- When S2 is 11 (all dialing codes are on), the network address value is the value of S2 plus 48.

## Determined by dial code S2 1-10K 2-5.1K

S2 DIP switch selection	Website address
	<b>S2 + 48</b>
	<b>S2 + 32</b>
	<b>S2 + 16</b>
	<b>S2</b>

# Electrical Connections

**Notice:** The constant airflow volume motor is applied. Therefore, the airflow volume is constant at all ESP within the stated range.

## Air volume table

Capacity	External Static Pressure Range	Fan speed	Electric heater kit	24V thermostat		Wired controller		Airflow volume (CFM)
				DIP Switch	24V terminal engaged	DIP Switch	Mode	
24K (2 Ton)	0 - 0.80 in. w.g.	Cooling Turbo	—	SW3-4=ON	Y2/Y	—	Cool	824
		Cooling High	—	SW3-4=OFF	Y2/Y	—	Cool	759
		Cooling Medium	—	—	Y1	—	Cool	694
		Cooling Low	—	—	—	—	Cool	629
		Heat Pump Turbo	—	—	—	—	Heat	788
		Heat Pump High	—	—	B+Y2/Y, W	—	Heat	753
		Heat Pump Medium	—	—	Y1	—	Heat	641
		Heat Pump Low	—	—	—	—	Heat	524
		Electric heater kit 0(Default)	15KW	SW4-1=OFF SW4-2=OFF SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=OFF	Heat + AUX, AUX	871
		Electric heater kit 1	15KW, 10KW	SW4-1=OFF SW4-2=OFF SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=ON	Heat + AUX, AUX	841
		Electric heater kit 2	10KW, 8KW	SW4-1=OFF SW4-2=ON SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=OFF	Heat + AUX, AUX	818
		Electric heater kit 3	5KW	SW4-1=OFF SW4-2=ON SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=ON	Heat + AUX, AUX	788
30K (2.5 Ton)	0 - 0.80 in. w.g.	Cooling Turbo	—	SW3-4=ON	Y2/Y	—	Cool	988
		Cooling High	—	SW3-4=OFF	Y2/Y	—	Cool	894
		Cooling Medium	—	—	Y1	—	Cool	806
		Cooling Low	—	—	—	—	Cool	712
		Heat Pump Turbo	—	—	—	—	Heat	918
		Heat Pump High	—	—	B+Y2/Y, W	—	Heat	876
		Heat Pump Medium	—	—	Y1	—	Heat	665
		Heat Pump Low	—	—	—	—	Heat	453
		Electric heater kit 0(Default)	15KW	SW4-1=OFF SW4-2=OFF SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=OFF	Heat + AUX, AUX	1088
		Electric heater kit 1	15KW, 10KW	SW4-1=OFF SW4-2=OFF SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=ON	Heat + AUX, AUX	1029
		Electric heater kit 2	10KW, 8KW	SW4-1=OFF SW4-2=ON SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=OFF	Heat + AUX, AUX	976
		Electric heater kit 3	5KW	SW4-1=OFF SW4-2=ON SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=ON	Heat + AUX, AUX	918
36K (3 Ton)	0 - 0.80 in. w.g.	Cooling Turbo	—	SW3-4=ON	Y2/Y	—	Cool	1188
		Cooling High	—	SW3-4=OFF	Y2/Y	—	Cool	1082
		Cooling Medium	—	—	Y1	—	Cool	971
		Cooling Low	—	—	—	—	Cool	865
		Heat Pump Turbo	—	—	—	—	Heat	1112
		Heat Pump High	—	—	B+Y2/Y, W	—	Heat	1059
		Heat Pump Medium	—	—	Y1	—	Heat	794
		Heat Pump Low	—	—	—	—	Heat	582
		Electric heater kit 0(Default)	20KW	SW4-1=OFF SW4-2=OFF SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=OFF	Heat + AUX, AUX	1306
		Electric heater kit 1	15KW	SW4-1=OFF SW4-2=OFF SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=ON	Heat + AUX, AUX	1241
		Electric heater kit 2	10KW, 8KW	SW4-1=OFF SW4-2=ON SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=OFF	Heat + AUX, AUX	1176
		Electric heater kit 3	5KW, 8KW	SW4-1=OFF SW4-2=ON SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=ON	Heat + AUX, AUX	1112
48K (4 Ton)	0 - 0.80 in. w.g.	Cooling Turbo	—	SW3-4=ON	Y2/Y	—	Cool	1471
		Cooling High	—	SW3-4=OFF	Y2/Y	—	Cool	1282
		Cooling Medium	—	—	Y1	—	Cool	1094
		Cooling Low	—	—	—	—	Cool	906
		Heat Pump Turbo	—	—	—	—	Heat	1471
		Heat Pump High	—	—	B+Y2/Y, W	—	Heat	1306
		Heat Pump Medium	—	—	Y1	—	Heat	1141
		Heat Pump Low	—	—	—	—	Heat	976
		Electric heater kit 0(Default)	20KW	SW4-1=OFF SW4-2=OFF SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=OFF	Heat + AUX, AUX	1741
		Electric heater kit 1	15KW	SW4-1=OFF SW4-2=OFF SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=ON	Heat + AUX, AUX	1653
		Electric heater kit 2	10KW, 8KW	SW4-1=OFF SW4-2=ON SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=OFF	Heat + AUX, AUX	1559
		Electric heater kit 3	8KW	SW4-1=OFF SW4-2=ON SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=ON	Heat + AUX, AUX	1471
60K (5 Ton)	0 - 0.80 in. w.g.	Cooling Turbo	—	SW3-4=ON	Y2/Y	—	Cool	1806
		Cooling High	—	SW3-4=OFF	Y2/Y	—	Cool	1582
		Cooling Medium	—	—	Y1	—	Cool	1359
		Cooling Low	—	—	—	—	Cool	1135
		Heat Pump Turbo	—	—	—	—	Heat	1659
		Heat Pump High	—	—	B+Y2/Y, W	—	Heat	1582
		Heat Pump Medium	—	—	Y1	—	Heat	1247
		Heat Pump Low	—	—	—	—	Heat	976
		Electric heater kit 0(Default)	25KW	SW4-1=OFF SW4-2=OFF SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=OFF	Heat + AUX, AUX	2171
		Electric heater kit 1	15KW, 20KW	SW4-1=OFF SW4-2=OFF SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=OFF SW4-3=ON	Heat + AUX, AUX	2029
		Electric heater kit 2	10KW, 15KW	SW4-1=OFF SW4-2=ON SW4-3=OFF	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=OFF	Heat + AUX, AUX	1894
		Electric heater kit 3	10KW	SW4-1=OFF SW4-2=ON SW4-3=ON	W1, W2, AUX	SW4-1=OFF SW4-2=ON SW4-3=ON	Heat + AUX, AUX	1753

## Preparations and Precautions

If air or foreign matter is present within the refrigerant system, it can cause abnormal rises in pressure, which can reduce its efficiency, damage the unit, and/or cause personal injury. Use a vacuum pump and manifold gauge to evacuate the refrigerant system to remove any non-condensable gas and moisture from the system. **This process should be performed upon initial installation and when refrigerant is removed for any reason.**

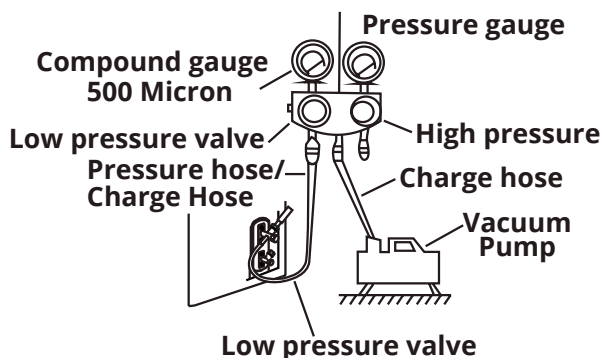
## BEFORE PERFORMING EVACUATION

- Ensure the refrigerant piping between the indoor and outdoor units are connected properly.
- Ensure all wiring and electrical connections are properly connected.

## Evacuation Instructions

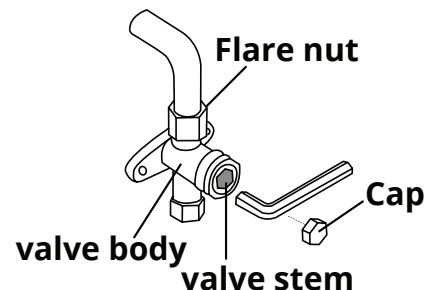
1. Connect the charge hose of the manifold gauge to the service port on the outdoor unit low pressure valve.
2. Connect another charge hose from the manifold gauge to the vacuum pump.
3. Open the low pressure side of the manifold gauge. Keep the high pressure side closed.
4. Turn on the vacuum pump to evacuate the system.
5. Run the vacuum for at least 15 minutes, or until the Micron gauge reads 500 micron.

### Manifold Gauge



6. Close the low pressure side of the manifold gauge and turn off the vacuum pump.
7. Wait 5 minutes, then check that there has not been any change in system pressure.

8. If there is a significant change in system pressure, check for leaks. If there is no change in system pressure, unscrew the cap from the high pressure valve.
  - If pressure rises but becomes stable below 1000 Microns, it is okay to open the valves.
  - If the pressure becomes stable above 1000 but below 2000 Microns there is moisture in the system. Further evaluation and dehydration is required.
  - If pressure rises above 2000 Microns or does not become stable, indicates there is a leak.
9. Then, insert an Allen/hexagonal wrench into the high pressure valve. Open the valve by turning the wrench counterclockwise 1/4 of a turn. Listen for gas to exit the system, then close the valve after 5 seconds.
10. Watch the pressure gauge for 1 minute to ensure that there is no change in pressure. The pressure gauge should read slightly higher than atmospheric pressure.
11. Remove the charge hose from the service port.



12. Using an Allen/hexagonal wrench, fully open both the high pressure and low pressure valves.

## OPEN VALVES GENTLY

- When opening the valves, continue turning the Allen/hexagonal wrench gently until it reaches the stopper. **DO NOT** try to force the valve to open further than this.
  - Ensure the Allen/hexagonal wrench is inserted fully into valve stem socket. Failure to do this, or using a stepped service valve tool could result in stripping the valve stem socket.
13. Tighten the valve caps on all three valves (service port, high pressure, & low pressure) by hand. You may need to tighten them further using a wrench or torque wrench if necessary.



# Air Evacuation & Adding Refrigerant

## Note on Adding Refrigerant

Some systems require additional refrigerant charging depending on pipe lengths. The standard pipe length varies according to local regulations. For example, in North America, the standard pipe length is 25 ft (7.5 m). In other areas, the standard pipe length is 16 ft (5 m). The system **MUST** be operating in cooling mode to add refrigerant. The refrigerant should be charged as liquid from the service port on the outdoor unit's low pressure valve. The additional refrigerant to be charged can be calculated using the following formula:

### Liquid Side Pipe Diameter

	φ 1/4 in (6.35 mm)	φ 3/8 in (9.52 mm)	φ 1/2 in (12.7 mm)
<b>R410A: (Metering device in the indoor unit):</b>	(Total pipe length - standard pipe length) x 30g (0.32oz)/m(ft)	(Total pipe length - standard pipe length) x 65g (0.69oz)/m(ft)	(Total pipe length - standard pipe length) x 115g (1.23oz)/m(ft)
<b>R410A: (Metering device in the outdoor unit):</b>	(Total pipe length - standard pipe length) x 15g (0.16oz)/m(ft)	(Total pipe length - standard pipe length) x 30g (0.32oz)/m(ft)	(Total pipe length - standard pipe length) x 65g (0.69oz)/m(ft)

## ! CAUTION

⚠ **DO NOT** mix refrigerant types.

## Refrigerant Type, Charge, & Design Pressure

Model	Refrigerant Type	Refrigerant Charge	Add'l Charge per Meter	Add'l Charge per Foot	Design Pressure
24k	R-410A	2.9 kg 102.29 oz	65 g/m	.69 oz/ft	550/340
36k	R-410A	4.7 kg 165.79 oz	65 g/m	.69 oz/ft	550/340
48k	R-410A	4.8 kg 169.32 oz	65 g/m	.69 oz/ft	550/340
60k	R-410A	4.8 kg 169.32 oz	65 g/m	.69 oz/ft	550/340

## Cleaning the Indoor Unit

### BEFORE CLEANING OR PERFORMING MAINTENANCE

Always turn off the system and disconnect its power supply before cleaning or performing any type of maintenance.

- Contact an authorized service technician for repair or maintenance. Improper repair and maintenance may cause water leakage, electrical shock, and/or fire. It could also void your warranty.
  - Ensure the drain hose is set up according to the instructions. Failure to do this could result in leakage that could cause personal property damage, fire, and/or electric shock.
  - Make sure that all wires are connected securely and properly. Failure to connect wires according to the instructions could result in property damage, electrical shock, and/or fire.
- ⊘ **DO NOT** substitute a blown fuse with a higher or lower amperage fuse, as this could cause damage to the circuit and/or an electrical fire.

### CAUTION

Only use a soft, dry cloth to wipe the unit clean. If the unit is especially dirty, you can use a warm, damp cloth to wipe it clean.

- ⊘ **DO NOT** use chemicals or chemically treated cloths to clean the unit.
- ⊘ **DO NOT** use benzene, paint thinner, polishing powder, or other solvents to clean the unit. They can cause the plastic surface to crack or deform.
- ⊘ **DO NOT** use water hotter than 104°F (40°C) to clean the front panel. This can cause the panel to deform or become discolored.
- ⊘ **DO NOT** wash the unit under running water, as this could create an electrical hazard.

## Air Filter Replacement

The air filter prevents dust and other particles from entering the indoor unit. Dust can accumulate and reduce the efficiency of the unit. For optimum efficiency, clean the air filter every two weeks, or more frequently if you live in a dusty area. If the filter is heavily clogged and cannot be cleaned, replace the filter with a new one.

### CAUTION

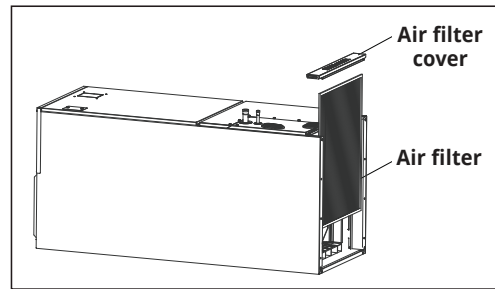
- Before changing the filter or cleaning, turn off the unit and disconnect the power supply.
  - When removing the filter, do not touch the metal parts of the unit. The sharp metal edges can cause injury.
  - Any maintenance or cleaning of the outdoor unit should be performed by an authorized dealer or a licensed service provider.
  - Any unit repairs should be performed by an authorized dealer or a licensed service provider.
- ⊘ **DO NOT** use water to clean the inside of the indoor unit. Doing this could destroy the insulation and could cause electrical shock.
- ⊘ **DO NOT** expose the filter to direct sunlight when drying, as this could cause it to shrink.

### NOTE ON AIR FILTER REPLACEMENT

Replace the air filter every 30 to 90 days depending on the Minimum Efficiency Reporting Values (MERVs) Rating.

# Care & Maintenance

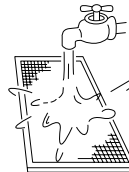
1. Remove cover plate.
2. Slide out the air filter.
3. Clean the air filter by vacuuming the surface or washing it in warm water with mild detergent.
4. If using water, allow the filter to dry.
5. Reinstall the filter by reversing steps 1 & 2.



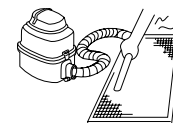
## NOTE:

- In households with animals, the grille will periodically need to be wiped down to prevent animal hair from blocking airflow.
- If the unit has a filter installed from the factory, it is only there for an energy efficiency sampling test. The user will need to use a filter that meets the requirements of UL900.

If using water, the inlet side should face down and away from the water stream.

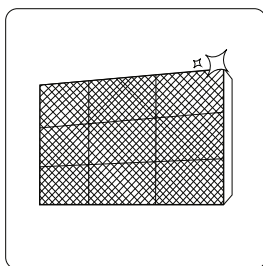


If using a vacuum cleaner, the inlet side should face the vacuum.

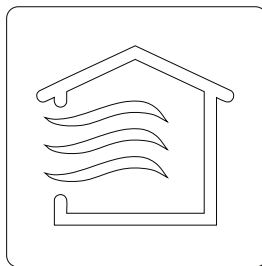


## Maintenance - Preparation for Extended Periods of Non-Use

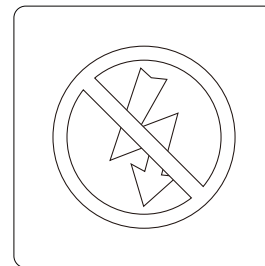
If you plan on not using the unit for an extended period of time, please do the following:



**Replace all filters**



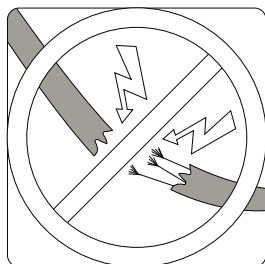
**Turn on the FAN until the unit is completely dried out**



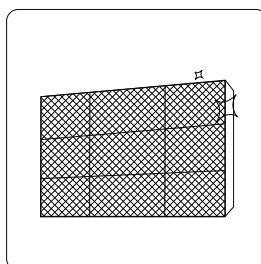
**Turn off the unit and disconnect the power**

## Maintenance - Pre-Season Inspection

After extended periods of non-use, or in preparation for periods of frequent use, please do the following:



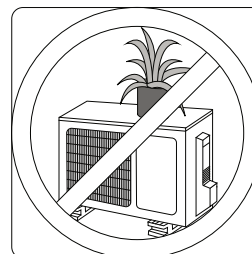
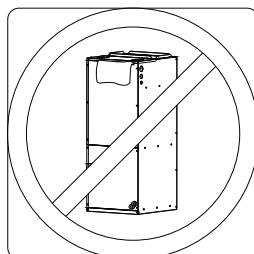
**Check for damaged wires**



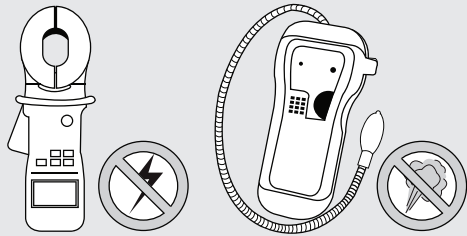
**Replace all filters**



**Check for leaks**



**Make sure nothing is blocking the air inlets and outlets**



## WARNING – RISK OF ELECTRICAL SHOCK

**ALL WIRING MUST BE INSTALLED BY A LICENSED ELECTRICIAN AND COMPLY WITH LOCAL, STATE, AND NATIONAL ELECTRICAL CODES.**

### Electrical Safety Checks

After installation is complete, confirm that all electrical wiring has been installed in accordance with local and national regulations, and according to the installation manual.

#### BEFORE TEST RUN

##### Check Insulated Resistance

The insulated resistance must be more than  $2M\Omega$ .

##### Check Grounding Work

Measure grounding resistance by visual detection and with a grounding resistance tester. Grounding resistance must be less than  $0.1\Omega$ .

**NOTE: This may not be required for some locations in North America.**

#### DURING TEST RUN

##### Check for Electrical Leakage

During the Test Run, use an electroprobe and multimeter to perform a comprehensive electrical leakage test.

#### IF ELECTRICAL LEAKAGE IS DETECTED

**If electrical leakage is detected, turn off the unit immediately and call a licensed electrician to find and resolve the cause of the leakage.**

**NOTE: This may not be required for some locations in North America.**

### Gas Leak Checks

There are two different methods to check for gaseous leaks. Use **Fig. 10.1** below as a guide for the critical points to check for leaks.

#### Soap and Water Method

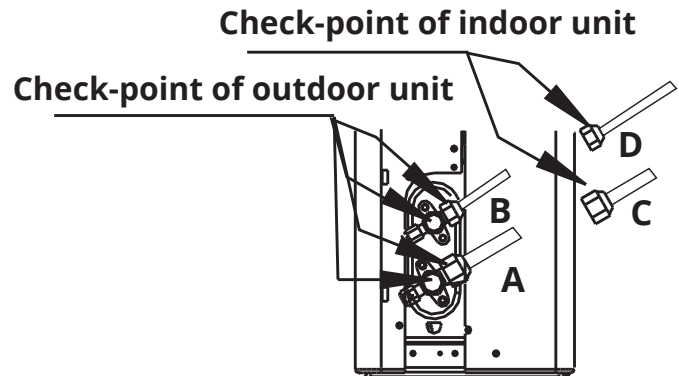
Using a soft brush or spray bottle, apply a soapy water solution to all of the pipe connection points of the indoor and outdoor units, watching to see if any bubbles form. The presence of bubbles indicates there is a leak.

#### Leak Detector Method

If using a leak detector, refer to the device's operation/instruction manual for proper usage instructions.

#### AFTER PERFORMING GAS LEAK CHECKS

**After confirming that all of the refrigerant pipe connection points *DO NOT* leak, replace the valve cover on the outside unit and wrap and insulate the piping connections.**



**A: Low pressure stop valve  
B: High pressure stop valve  
C & D: Indoor unit flare nuts**

**Fig. 10.1**

**NOTE: Fig. 10.1 above is for demonstration purposes only. It represents the connection points to check for leaks.**

## Before Test Run

A test run must be performed after the entire system has been completely installed. Complete and confirm the list of checks below before performing a test run.

### List of Checks to Perform Before Test Run

- The indoor & outdoor units are properly installed
- Unit is properly grounded
- All wiring & electrical terminals are properly covered & connected
- The power voltage is the correct voltage for the unit
- Length of piping and additional refrigerant stow capacity have been recorded.
- All refrigerant piping connection points are properly connected and **DO NOT** leak
- Water drains properly from drain pipe and to a safe location
- Heating insulation is properly installed
- Ensure there are no obstacles near the inlet and outlet of the outdoor or indoor units
- Ensure all connection valves on the outdoor condenser are fully opened

## Test Run Instructions

### **WARNING**

Failure to perform the test run could result in damage to the unit, property, or personal injury. Only perform test run after you have ensured the following steps have been completed:

- **Electrical Safety Checks** - Confirm that the unit's electrical system is safe and operating properly.
- **Gas Leak Checks** - Check all refrigerant piping/line set connections and confirm that the system is not leaking.
- Confirm that the gas and liquid (high and low pressure) stop valves are fully open.

You should perform the Test Run for at least 30 minutes.

1. Connect power to the unit. Then, turn on the main power switch and allow the unit to warm up.
2. Set the air conditioner to **COOL** mode.

### List of Checks to Perform During Test Run

#### For Indoor Unit

- Ensure the room temperature is being registered/displayed correctly
- Ensure the manual buttons of the indoor air handler function properly
- Check to see that the drainage system is unimpeded and draining smoothly
- Ensure there is no vibration or abnormal noise during operation

#### For Outdoor Unit

- Ensure refrigerant system & piping connections **DO NOT** leak
- Ensure there is no vibration or abnormal noise during operation
- Ensure the wind, noise, and water generated by the unit **DO NOT** pose a safety hazard or cause a disruption to your neighbors

### Drainage System Test

This test is to ensure the drainage system is functioning properly and drains smoothly. New buildings should have this test performed before the ceiling is finished.

1. Remove the test cover. Then, add 2,000 ml of water to the tank through the attached tube.
2. Turn on the main power switch and run the air conditioner in **COOL** mode.
3. Listen to the sound of the drain pump to see if it makes any unusual noises.
4. Ensure that the water is being discharged. It may take up to one minute before the unit begins to drain depending on the drain pipe.
5. Ensure that there are no leaks in any of the piping.
6. Then, stop the air conditioner. Turn off the main power switch and reinstall the test cover.

**NOTE: If the unit malfunctions or does not operate correctly, please refer to the Troubleshooting section of this manual before contacting technical support.**

## Common Issues

The following events may occur during normal operation, and may not indicate a malfunction or a need for repairs.

Symptom	Cause
Unit does not turn on when pressing ON/OFF button.	The unit has a 3 minute protection feature that prevents the unit from overloading. The unit cannot be restarted within 3 minutes of being turned off.
	Cooling & Heating models: If the operation light and PRE-DEF (pre-heating/Defrost) indicators are illuminated, the outdoor temperature is too cold and the unit's anti-cold wind is activated in order to defrost the unit.
	In Cooling-Only models: If the FAN-ONLY indicator is illuminated, the outdoor temperature is too cold and the unit's antifreeze protection is activated in order to defrost the unit.
The unit changes from COOL/HEAT mode to FAN mode.	The unit may change its setting to prevent frost from forming on the unit. Once the temperature increases, the unit will start operating in the previously selected mode again.
	Once the set temperature has been reached, at this point the unit turns off the compressor. The unit will continue operating when the temperature fluctuates again.
Indoor unit and outdoor unit make noises.	A low hissing sound during operation: This is normal and is caused by refrigerant gas flowing through both indoor and outdoor units.
	A low hissing sound when the system starts, has just stopped running, or is defrosting: This noise is normal and is caused by the refrigerant gas changing direction or stopping.
	Normal expansion and contraction of the plastic and metal parts caused by temperature changes during operation can cause squeaking noises.
The outdoor unit makes noises.	The unit will make different noises based on which mode it is currently operating in.
The unit emits a bad odor.	The unit may absorb odors from the environment (such as furniture, cooking, cigarettes, etc.) which will be emitted during operations.
	The unit's filters have become moldy and should be cleaned.
Outdoor unit fan does not operate.	During operation, the fan speed is controlled to optimize product operation.
Dust is emitted from the indoor or outdoor unit.	The unit may accumulate dust during extended periods of non-use, which will be emitted when the unit is turned on. This can be mitigated by covering the unit during extended periods of not being used.
The compressor continues to run, and the indoor and outdoor motors aren't operational.	During defrosting mode, the compressor continues to run, the indoor and outdoor motors will cease operation, the defrost light on the indoor unit will turn on, and the "df" symbol is displayed.

**NOTE:** If problem persists, contact a local dealer or your nearest customer service center. Provide them with a detailed description of the unit malfunction as well as the model number of your unit.

For detailed error code list, refer to the Service Manual.

## **WARNING**

In the case of any of the following, turn off the unit immediately!

- Signal/power cable is damaged or abnormally warm
- Burning odor
- Loud or abnormal sounds
- A power fuse or circuit breaker trips frequently
- Water or other objects fall into or out of the unit

**DO NOT ATTEMPT TO CORRECT OR FIX THESE ITEMS YOURSELF!**

**CONTACT AN AUTHORIZED SERVICE PROVIDER IMMEDIATELY!**

Before calling for service assistance, troubleshoot a problem by performing the following checks:

Symptom	Possible Causes	Solution
Poor Cooling Performance	Temperature setting may be higher than ambient room temperature.	Lower the temperature setting.
	The air filter is dirty.	Remove the filter and clean it according to the instructions.
	The air inlet or outlet of either unit is blocked.	Turn the unit off, remove the obstruction and turn it back on.
	Doors and windows are open.	Ensure all windows and doors are closed while operating the unit.
	Excessive heat is generated by sunlight.	Close windows and curtains during periods of high heat or bright sunshine.
	Too many other sources of heat in the room (people, computers, electronics, etc.).	Reduce the amount of heat sources.
	Low refrigerant due to a leak or long-term use.	Check for leaks, reseal if necessary, and top off the refrigerant level.
	The heat exchanger on the indoor or outdoor unit is dirty.	Clean the affected heat exchanger.
Non-Working Unit	Power failure.	Wait for power to be restored.
	The power is turned off.	Turn on the power.
	The fuse is burned out.	Replace the fuse.
	Remote control batteries are dead.	Replace the batteries.
	The unit's 3 minute protection feature has been activated.	Wait three minutes after restarting the unit.
	Timer is activated.	Turn timer off.
Frequent Stopping & Starting	System circuit is blocked.	Determine the location of the blockage and repair.
	There's too much or too little refrigerant in the system.	Check for leaks and recharge the system with refrigerant.
	Incompressible gas or moisture has entered the system.	Evacuate and recharge the system with refrigerant.
	The compressor is broken.	Replace the compressor.
	The voltage is too high or too low.	Install a manostat to regulate the voltage.
Poor Heating Performance	The outdoor temperature is extremely low.	Use auxiliary heating device.
	Cold air is entering through doors and windows.	Make sure that all doors and windows are closed during use.
	Low refrigerant due to leak or long-term use.	Check for leaks, re-seal if necessary, and top off refrigerant.

# Troubleshooting

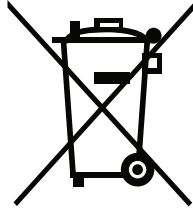
## Error Display (Indoor Unit)

When the indoor unit encounters a recognized error, the operation lamp will flash in a corresponding series, the timer lamp may turn on or begin flashing, and an error code will be displayed. These error codes are described in the following table:

Display	Error Information	Solution
E400	Indoor unit EEPROM parameter error	TS21
E401	Indoor / outdoor unit communication error	TS22
E416	Communication malfunction between adapter board and outdoor main board	TS47
E403	The indoor fan speed is operating outside of the normal range(for some models)	TS23
E460	Indoor room temperature sensor T1 is in open circuit or has short circuited	TS25
E461	Evaporator coil temperature sensor T2 is in open circuit or has short circuited	TS25
E462	Evaporator coil temperature sensor T2B is in open circuit or has short circuited	TS25
E465	Evaporator coil temperature sensor T2A is in open circuit or has short circuited	TS25
E40C	Refrigerant Leakage Detection	TS26
E40b	Communication error between indoor two chips	TS46
E40E	Water-level alarm malfunction	TS27
E453	Outdoor room temperature sensor T4 is in open circuit or has short circuited	TS25
E452	Condenser coil temperature sensor T3 is in open circuit or has short circuited	TS25
E454	Compressor discharge temperature sensor TP is in open circuit or has short circuited	TS25
E456	Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited(for free-match indoor units)	TS25
E451	Outdoor unit EEPROM parameter error	TS21
E407	The outdoor fan speed is operating outside of the normal range(for some models)	TS23
P400	IPM malfunction or IGBT over-strong current protection	TS28
P401	Over voltage or over low voltage protection	TS29
P402	Top temperature protection of compressor or High temperature protection of IPM module	TS32
P404	Inverter compressor drive error	TS30
P403	Low pressure protection (for some models)	TS31
E40d	Outdoor unit malfunction	TS33
P40L	Low ambient temperature protection	TS40
F409	Mismatch between the new and old platforms	TS47



The marking shown below when depicted on the product or its literature, indicates that electrical waste and electrical equipment should not be mixed with general household waste.



## Correct Disposal of This Product (Electrical Waste & Electronic Equipment)

This appliance contains refrigerant and other potentially hazardous materials. When disposing of this appliance, the law requires special collection and treatment.

**⊘ DO NOT dispose of this product as household waste or unsorted municipal waste.**

When disposing of this appliance, you have the following options:

- Dispose of the appliance at a designated municipal electronic waste collection facility.
- When buying a new appliance, the retailer will receive the old appliance free of charge.
- The manufacturer will receive the old appliance free of charge.
- Sell the appliance to certified scrap metal dealers.

### Special Notice

Disposing of this appliance in the forest or other natural surroundings endangers your health and is bad for the environment. Hazardous substances may leak into the ground water and enter the food chain.



**MRCOOL®**

COMFORT MADE SIMPLE

# **Hyper-Heat Single-Zone 24K-60K Ducted Air Handler**

Due to updates and constantly improving performance, the information and instructions within this manual are subject to change without notice. Please visit [www.mrcool.com/documentation](http://www.mrcool.com/documentation) to ensure you have the latest version of this manual.