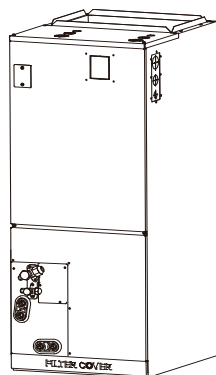


# Installation Instructions



**Fig. 1 —Air Handler**

A220687

**NOTE:** Read the entire instruction manual before starting the installation.

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Scan to access French documentation:




## SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing and work gloves. Have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in the literature and attached to the unit. Consult the local building codes and the current editions of the National Electrical Code (NEC) NFPA 70.

In Canada, refer to the current editions of the Canadian Electrical Code CSA C22.2 No. 60335-2-40. Recognize safety information.

This is the safety-alert symbol . When you see this symbol on the unit and in instruction manuals, be of the potential for personal injury. Understand the signal words **DANGER**, **WARNING**, and **CAUTION**. These words are used with the safety-alert symbol. **DANGER** identifies the most serious hazards which will result in severe personal injury or death. **WARNING** signifies hazards which could result in personal injury or death. **CAUTION** is used to identify unsafe practices which may result in minor personal injury or product and property damage. **NOTE** is used to highlight suggestions which will result in enhanced installation, reliability, or operation.



## WARNING

### ELECTRICAL OPERATION HAZARD

Failure to follow this warning could result in personal injury or death. Before installing or servicing the unit, always turn off all power to the unit. There may be more than one disconnect switch. Turn off accessory heater power if applicable. Lock out and tag the switch with a suitable warning label.



## CAUTION

### CUT HAZARD

Failure to follow this caution may result in personal injury. Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing and gloves when handling parts.

## MODEL NUMBERS AND ACCESSORIES

The Air Handler models are R-410A Fan Coils designed for installation flexibility allowing multi-position installation up-flow, down-flow, horizontal right and horizontal left.

All fan coils have a DC fan motor with variable speeds for efficiency. The units have been designed for up-flow, down-flow, and horizontal orientations, including manufactured and mobile home applications.

A field supplied air filter and electrical disconnect are recommended. These units are designed for specifically matching R-410A refrigerant heat pumps. These units are available for 18,000 through 60,000 BTUh systems with nominal cooling capacity.



### WARNING



#### EXPLOSION HAZARD

Failure to follow this warning could result in death, serious personal injury, and/or property damage.

Never use air or gases containing oxygen for leak testing or operating refrigerant compressors. Pressurized mixtures of air or gases containing oxygen can lead to an explosion.



### WARNING

#### INSTALLATION

Entrust a licensed contractor to install the unit. Installation by unskilled persons may lead to improper installation, electric shock, or fire. Re-installation must be performed by authorized professionals. Non-compliance may lead to electric shock or fire.




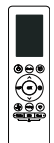

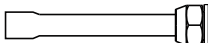





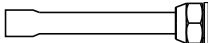

### CAUTION

This unit is **NOT** equipped with a single point electrical connection for an Auxiliary Heat Package. A separate power supply is required for the Auxiliary Heat Package.

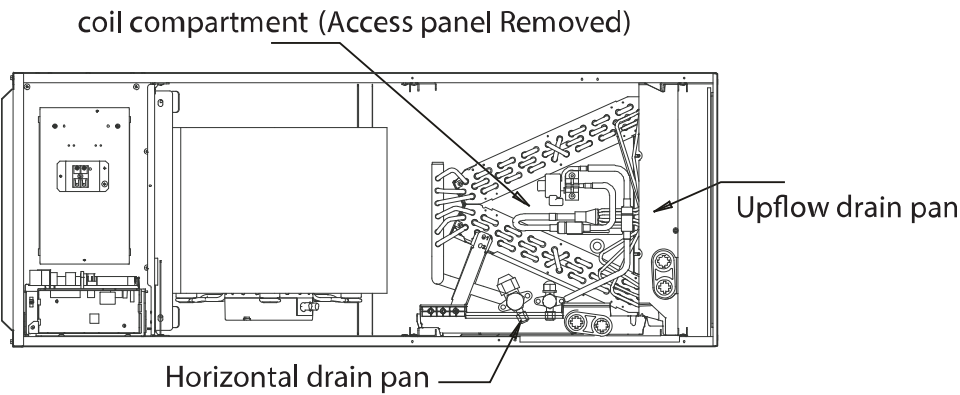
## ACCESSORIES

The system is shipped with the following accessories (see Table 2). Use all of the installation parts and accessories to install the system. Improper installation may result in water leakage, electrical shock and fire, or cause the equipment to fail. Keep the installation manual in a safe place and do not discard any accessories until the installation is complete.

**Table 1 —Accessories**

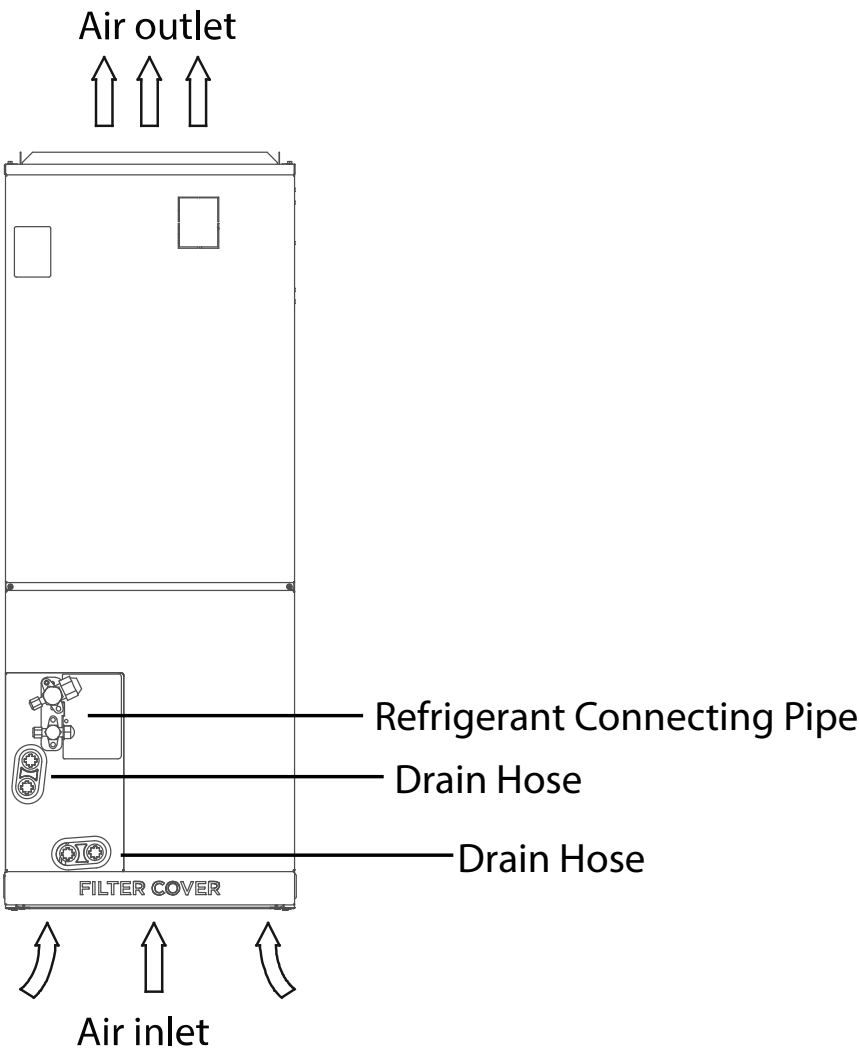
Name	Shape	Quantity
Owner's and Installation Manual		2
Remote Controller		1
Batteries		2
Suction Line Flare to Braze Adapter 3/4" (18K-48K) 7/8" (60K)		1
Liquid Line Flare to Braze Adapter 3/8" (All Sizes)		1
Zip Ties		2
Coil Foam Tape		4
Flare Nut		2
<b>Accessories included with the outdoor unit</b>		
Drain Adapter		1
Rubber Gasket		1
Suction Line Flare to Weld Adapter 3/4" (18K-48K) 7/8" (60K)		1
Liquid Line Flare to Weld Adapter 3/8" (All Sizes)		1
Suction Line reducer		1

Indoor Unit Parts



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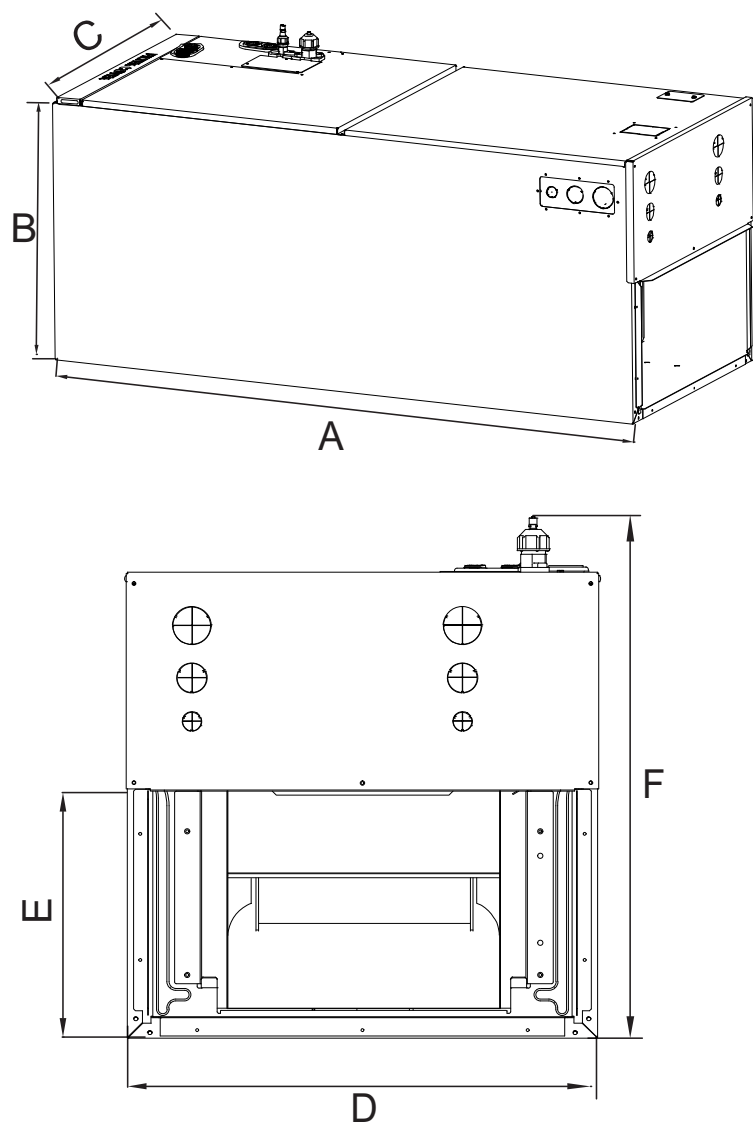
Fig. 2 —Indoor Unit Representation



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Table 2 — Air Handler

DIMENSIONS

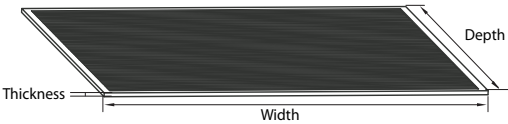


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Model	Dimensions					
	A (Height)	B (Depth)	C (Width)	D	E	F
18K-24K	45in	21in	17.5in	15.75in	10.25in	23in
	(1143mm)	(534mm)	(445mm)	(400mm)	(260mm)	(585mm)
30K-48K	49in	21in	21in	19.31in	10.25in	23in
	(1245mm)	(534mm)	(534mm)	(490mm)	(260mm)	(585mm)
60K	53in	21in	24.5in	22.88in	10.25in	23in
	(1346mm)	(534mm)	(622mm)	(580mm)	(260mm)	(585mm)

Fig. 3 —40MUAA Dimensions

Recommended size of filter      Unit: Inch/mm)



A220850

Model (Btu/h)	Width		Depth		Thickness	
	Inch	mm	Inch	mm	Inch	mm
18-24K	16	406.4	20	508	1	25.4
30-48K	19-1/2	495.3	20	508	1	25.4
60K	23	584.2	20	508	1	25.4

Fig. 4 —Recommended Filter Size

## INSTALLATION REQUIREMENTS

Review the following information before installing the unit:

- **Do not** install the indoor units near a direct source of heat such as direct sunlight or a heating appliance.
- Allow sufficient space for airflow and unit servicing. See Fig. 5 — on page 6 for the minimum required distances between the unit and the walls or ceilings.
- Communication wiring must be at least 3 ft. (1m) away from all electromagnetic interference (televisions, radios, etc.) sources. Interference is still possible even if this distance is maintained.
- Ensure any hanger used is strong enough to withstand the unit's weight.
- If the indoor unit is installed in an unconditioned space, running for long periods of time when the temperatures are outside the recommended indoor unit operation ranges, it is recommended that the installer seal all corners of the indoor unit to prevent any leaks and add insulation material (13/32 to 13/16 in (10-20 mm)) to the entire surface of the indoor unit to avoid condensation or heat transfer.

**NOTE:** Nuisance sweating may occur if the unit is installed in a high humidity environment with low airflow.

**Table 3 — Operating Range**

OPERATING RANGE (Min/Max °F (°C))		
	Cooling	Heating
<b>Indoor DB</b>	62 / 90 (17 / 32)	32 / 86 (0 / 30)
<b>Indoor WB</b>	59 / 84 (15 / 29)	N/A

**NOTE:** DO NOT install the indoor or outdoor units in a location with special environmental conditions. For those applications, contact your Ductless representative.



### WARNING

Securely install the indoor unit on a structure that can sustain its weight. If the structure is too weak, the unit may fall and cause personal injury, unit and property damage, or death.

**DO NOT** install the indoor unit in a bathroom or laundry room as excessive moisture can short the unit and corrode the wiring.



### CAUTION

Install the indoor and outdoor units, cables and wires at least 3.2 ft (1m) from televisions, routers, computer equipment or radios to prevent static or image distortion. Depending on the appliances, a 3.2 ft (1m) distance may not be sufficient.

If the indoor unit is installed on metal, it must be electrically grounded.



### WARNING

#### PRODUCT INSTALLATION

- Installation must be performed by an authorized dealer or specialist. A defective installation can cause water leakage, electrical shock, or fire.
- The installation must be performed according to the installation instructions. Improper installation can cause water leakage, electrical shock, or fire. (In North America, installation must be performed in accordance with the requirements of NEC or CEC by authorized personnel only.)
- Contact an authorized service technician for repair or maintenance of this unit. This appliance must be installed in accordance with local codes.
- Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, or unit failure.
- Install drainage piping according to the instructions in this manual and in accordance with local codes. Improper drainage may cause water damage to your home and property.
- For units that have an auxiliary electric heater installed, ensure 1" of clearance from any combustible materials for first 3 feet (1 meter) of plenum and duct work exiting the unit.
- **DO NOT** install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it may cause a fire.
- **DO NOT** turn on the power until all work has been completed.
- When moving or relocating the system, consult experienced service technicians for the disconnection and re-installation of the

## INSTALLATION

### Step 1 - Check Equipment

Unpack the unit and move to the final location. Remove the carton, taking care not to damage the unit. Inspect the equipment for damage prior to installation. File a claim with the shipping company if the shipment is damaged or incomplete. Locate the unit rating plate, which contains the proper installation information. Check the rating plate to be sure the unit matches the job specifications.

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

- Enough room for installation and maintenance
- Enough room for the lineset and drainpipe
- A structure that can sustain the weight of the indoor unit
- The air inlet and outlet are not impeded
- There is no direct radiation from heaters



### CAUTION

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

- Areas with oil drilling or fracking
- Coastal areas with high salt content in the air
- Areas with caustic gases in the air, such as near hot springs
- Areas with power fluctuations, such as factories
- Enclosed spaces, such as cabinets
- Areas with strong electromagnetic waves
- Areas that store flammable materials or gas
- Rooms with high humidity, such as bathrooms or laundry rooms.

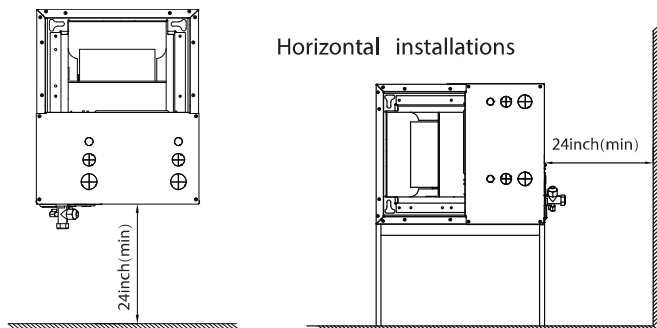
### Step 2 - Mount Unit

The unit can stand or lie on the floor, or hang from a ceiling or a wall. Allow space for wiring, piping, and servicing the unit.

**IMPORTANT:** When the unit is installed over a finished ceiling and/or living area, building codes may require a field-supplied secondary condensate pan to be installed under the entire unit.

Some localities may allow as an alternative, the running of a separate, secondary condensate line. Consult the local codes for additional restrictions or precautions.

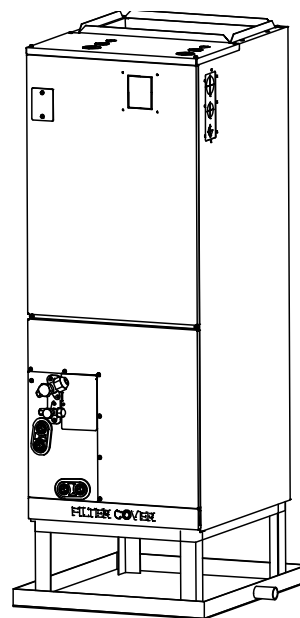
**NOTE:** Nuisance sweating may occur if the unit is installed in a high humidity environment with low airflow.



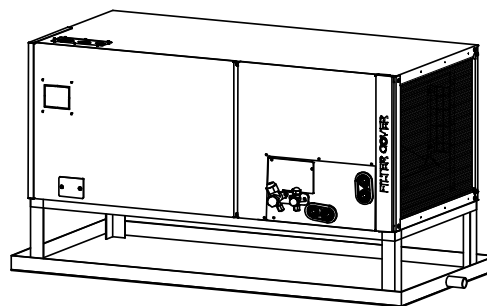
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### Step 3 - Mount Positions

The units can be installed in a vertical (down and up) and Horizontal (right and left) configuration.



**Fig. 5 —Vertical Up Installations**

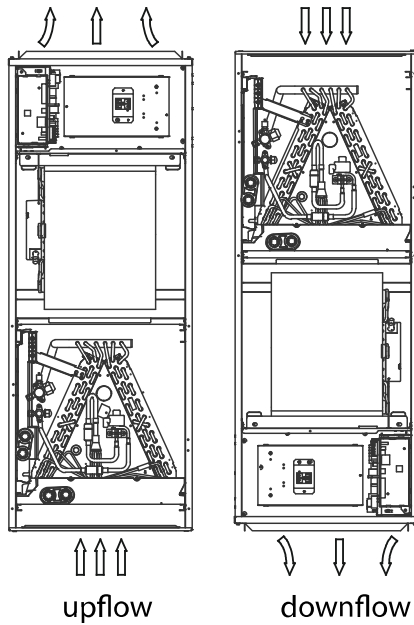


**Fig. 6 —Horizontal Installations**

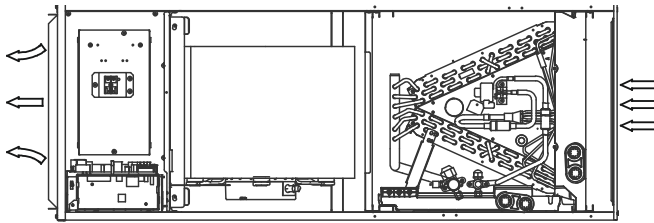
**NOTE:** For horizontal installation, a secondary drain pan (not supplied) must be installed.

Follow these steps to perform Vertical up installation and Horizontal right installation:

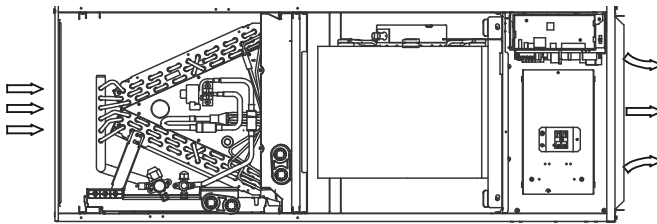
1. Open the upper cover.
2. Open the cover of the electronic control box.
3. Connect the wire according to the wiring diagram.
4. Connect the pipes.
5. Install the drainage pipes.



**Fig. 7 —Upflow/Downflow**



**Fig. 8 —Horizontal Left**

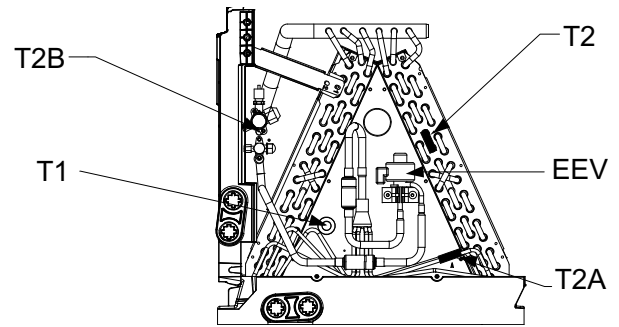


**Fig. 9 —Horizontal Right**

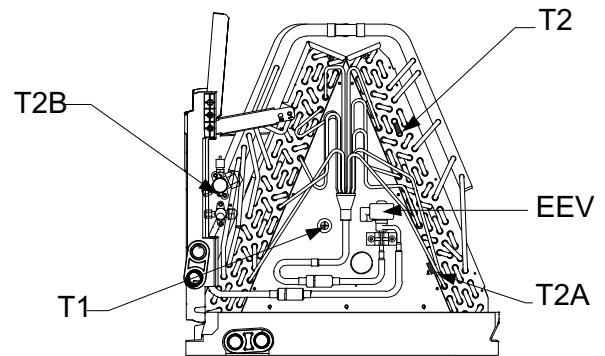
**NOTE:** Vertical up and horizontal left installation does not need to change the direction of evaporator.

**NOTE:** The unit may be installed in one of the upflow, downflow, horizontal left or horizontal right orientations.

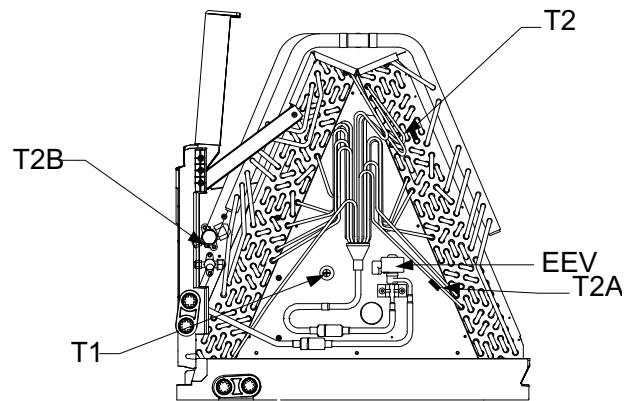
**Position of each temperature sensor of evaporator:**



**Fig. 10 —18K-24K Units**



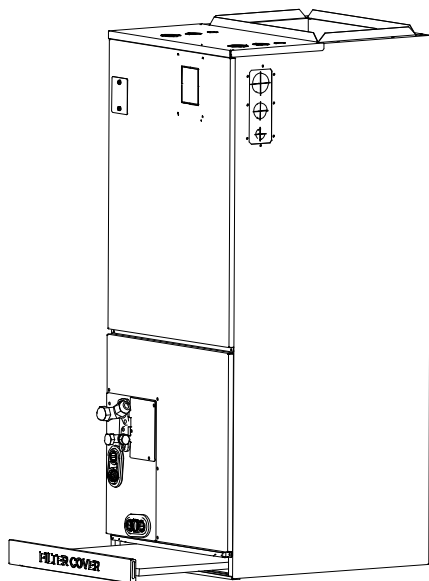
**Fig. 11 —30K-48K Units**



**Fig. 12 —60K Unit**

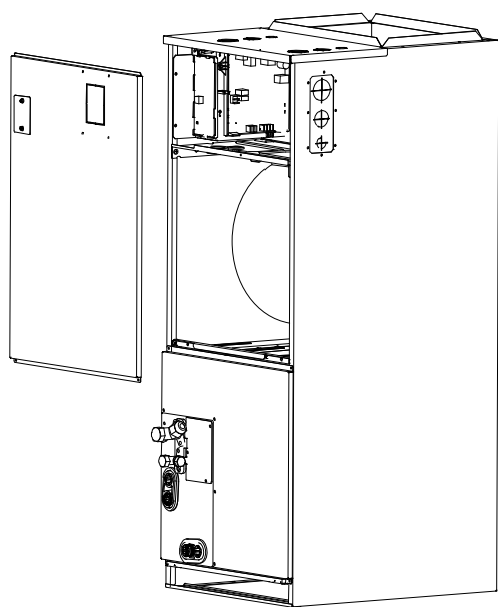
## Reversing Instructions

1. Remove the filter door, then take the filter off.



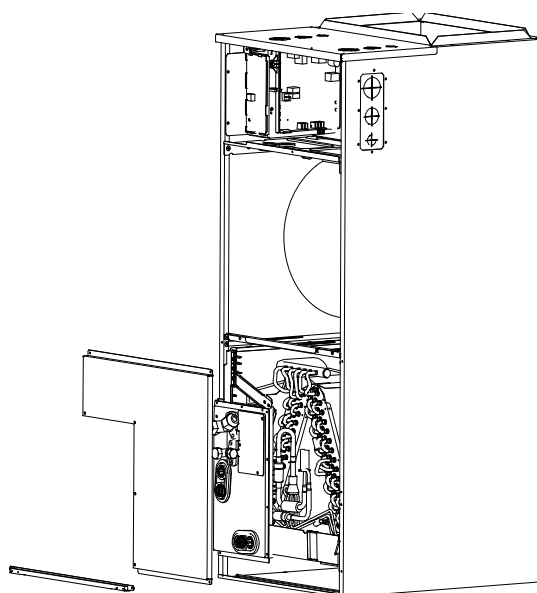
**Fig. 13 —Remove the Filter**

2. Remove the upper cover assembly.



**Fig. 14 —Remove Upper Cover Assembly**

3. Remove the evaporator cover plate.



**Fig. 15 —Remove Evaporator Cover Plate**

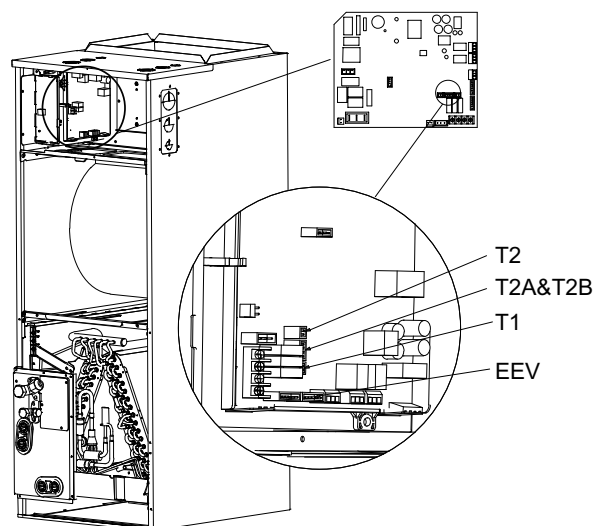
4. Unplug temperature sensors T1, T2, T2A, T2B and electronic expansion valve (EEV) from the control board.

T1: Room temperature sensor

T2: Evaporator central sensor plug

T2A: Evaporator input sensor plug

T2B: Evaporator output sensor plug

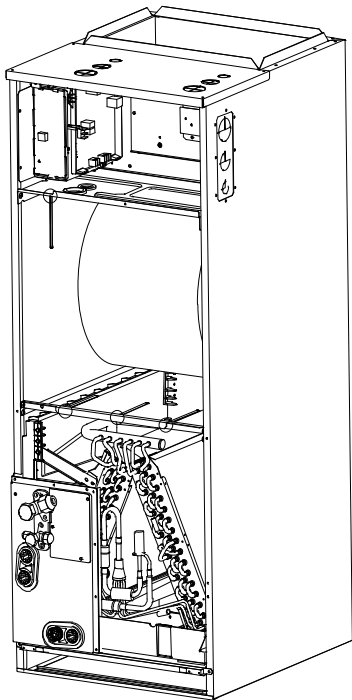


**Fig. 16 —Unplug Temperature Sensors**

**NOTE:** T2A and T2B are only available for some models.

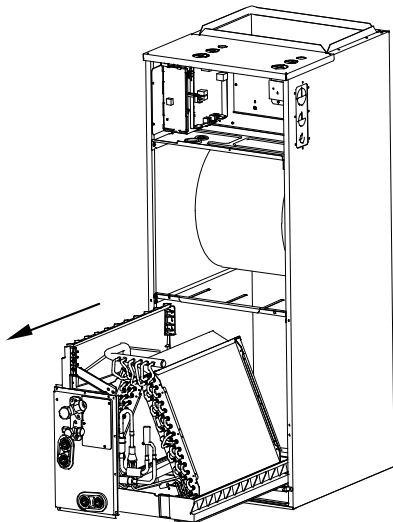


5. Remove T1, T2, T2A, T2B, EEV sensor wire ties.



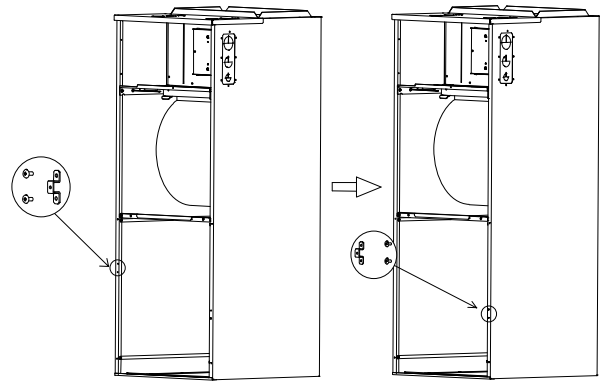
**Fig. 17 —Remove Sensor Wire Ties**

6. Take out the evaporator and drain pan and rotate 180°.



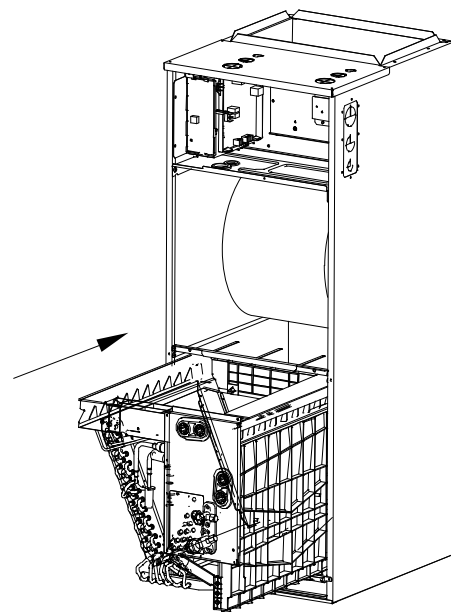
**Fig. 18 —Remove and Rotate Drain Pan**

7. Adjust the position of the mounting parts.



**Fig. 19 —Adjust Mounting Parts Position**

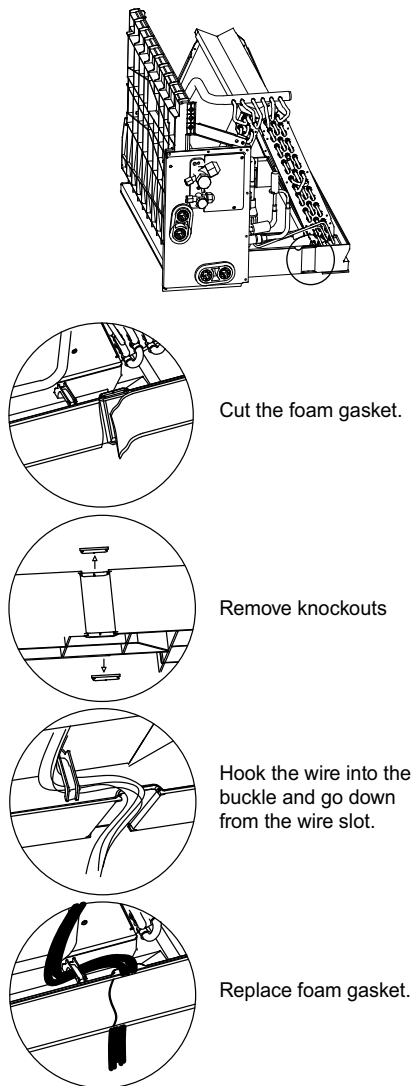
8. Reinstall the evaporator and drain pan.



**Fig. 20 —Reinstall Evaporator and Drain Pan**

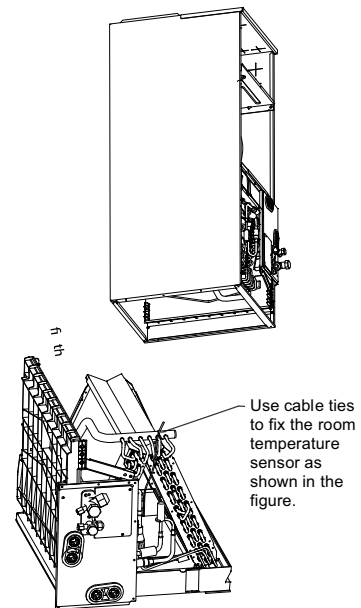
9. Reinstall T1, T2, T2A, T2B sensor plugs and electronic expansion valve (EEV) and tie up the sensor wires.

**NOTE:** The wire body needs to pass through the wire groove from the drain pan and be stuck on the hook of the drain pan.



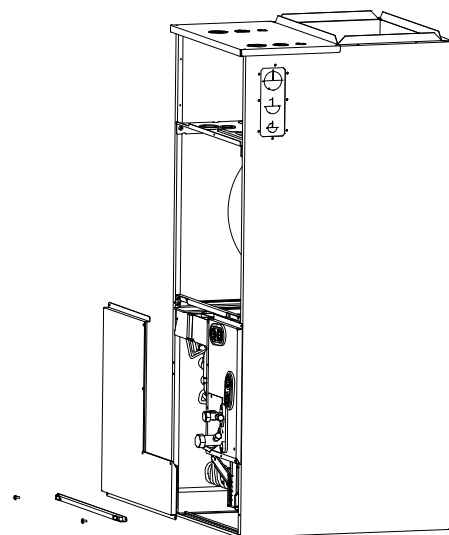
**Fig. 21 —Reinstall Sensor Plugs and Electronic Expansion Valve**

10. The evaporator is assembled in place.



**Fig. 22 —Assembled Evaporator**

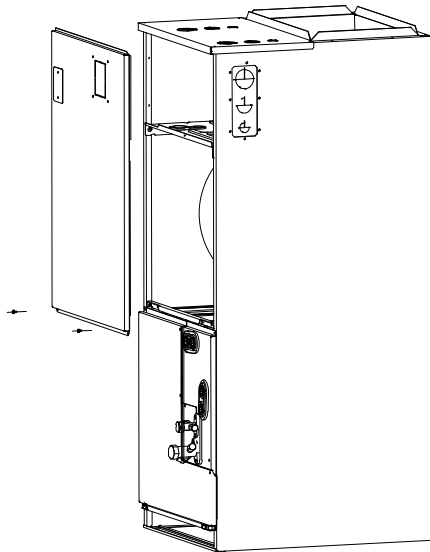
11. Reinstall evaporator cover plate.



**Fig. 23 —Reinstall Cover Plate**

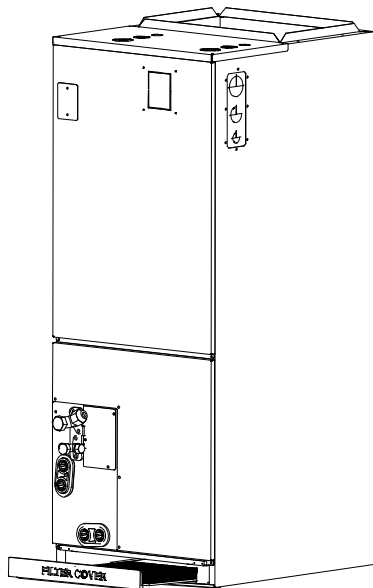
12. Connect the wire according to the wiring diagram.

13. Reassemble the upper cover.



**Fig. 24 —Reassemble Upper Cover**

14. Reinstall the filter and filter cover plate.



**Fig. 25 —Reinstall Filter and Cover Plate**

15. Connect the pipes.

16. Install the drainage pipes.

## Step 4 - Installing Ductwork

Connect the supply-air duct over the outside of the 3/4in (19 mm) flanges provided on the supply-air opening. Secure the duct to the flange, using proper fasteners for the type of duct used, and seal duct-to-unit joint. If the return-air flanges are required, install the factory-authorized accessory kit.

Use flexible connectors between the ductwork and unit to prevent transmission of vibration. When the electric heater is installed, use heat-resistant material for the flexible connector between the ductwork and the unit at the discharge connection. Ductwork passing through the unconditioned space must be insulated and covered with a vapor barrier.

Units equipped with 20kW or greater electric heaters require a 1in (25mm) clearance to combustible materials for the first 36in (914mm) of supply duct. Follow the local codes.

## DUCTWORK ACOUSTICAL TREATMENT

Metal duct systems that do not have a 90 degree elbow and 10ft (3m) of main duct to first branch takeoff may require internal acoustical insulation lining. As an alternative, fibrous ductwork may be used if constructed and installed in accordance with the latest edition of the SMACNA construction standard on fibrous glass ducts. Both acoustical lining and fibrous ductwork shall comply with the National Fire Protection Association as tested by UL Standard 181 for Class 1 air ducts.

The air supply and return may be handled in one of several ways; whichever situation is best suited for the installation (See Fig. 5 — on page 6). A large number of issues encountered with split-system installations can be linked to improperly designed or installed duct systems. It is therefore very important that the duct system be properly designed and installed.

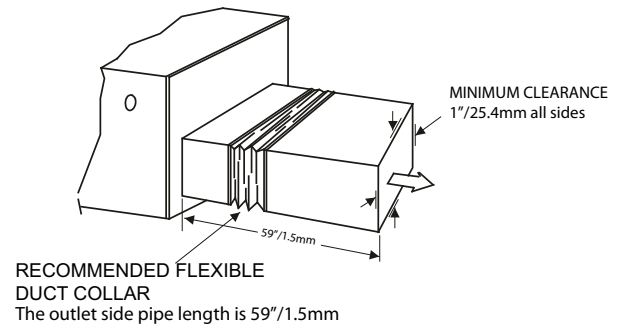
Use of flexible duct collars is recommended to minimize the transmission of vibration/noise into the conditioned space. Where the return air duct is short, or where sound is liable to be a problem, sound absorbing glass fiber should be used inside the duct.

Insulation of duct work must be installed according to local codes and best practices. The supply air duct should be properly sized by use of a transition to match unit opening.

This unit is not designed for non-ducted (freeblow) applications.

**NOTE: Duct work should be fabricated and installed in accordance with local and/or national codes.**

### Plenum Clearances



**Fig. 26 — Flexible Duct Collar Connection**

## Step 5 - Condensate Drains

The drainpipe is used to drain water away from the unit. Improper installation may cause unit and property damage.



## CAUTION

- Insulate suction line to prevent condensation, which could lead to water damage. Check the local codes.
- If the drainpipe is bent or installed incorrectly, water may leak and cause a water-level switch malfunction.
- In **HEAT** mode, the outdoor unit may discharge water. Ensure that the outdoor drain will not contribute to damage and slippage.
- **DO NOT** pull the drainpipe forcefully. This could disconnect it.

**NOTE: Installation requires adapting the locally sourced drain line to a “3/4” NPT female pipe thread connection.**

INDOOR DRAINPIPE INSTALLATION

1. Cover the drainpipe with insulation, as required, to prevent condensation and leakage. These units operate with a positive pressure at the drain connection and a drain trap is required. The trap needs to be installed as close to the unit as possible. Ensure the top of the trap is below the connection to the drain pan to allow complete drainage of the pan.

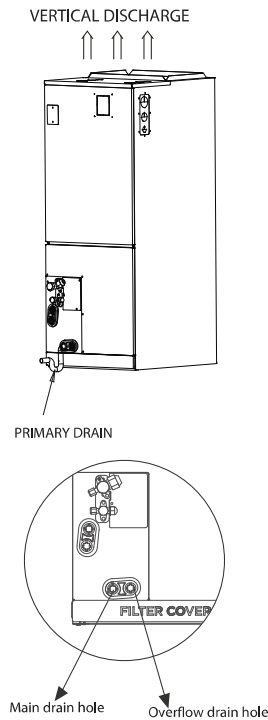


Fig. 27 —Vertical Discharge

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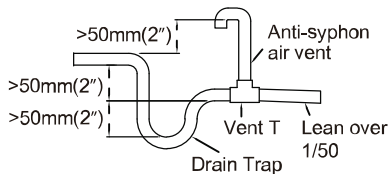


Fig. 28 — Vertical Discharge

A220801

**NOTE:** Horizontal runs must also have a drain trap installed ahead of the horizontal run to eliminate air trapping.

**NOTES:** When using an extended drainpipe, tighten the indoor connection with an additional protection tube to prevent it from pulling loose.

Hand tighten the plug(s) for drain holes that are unused.  
Incorrect installation could cause water to flow back into the unit and flood.

2. Use a 1" core drill to drill a hole in the wall. Make sure the hole is drilled at a slight downward angle, so that the outdoor end of the hole is lower than the indoor end by about 0.5in (12mm). This will ensure proper water drainage. Place the protective wall cuff in the hole. This protects the edges of the hole and helps seal the hole once the installation is complete.

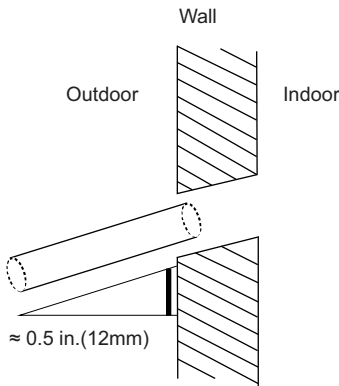


Fig. 29 —Drill hole

A220804

**NOTE:** When drilling the hole, make sure to avoid wires, plumbing, and other sensitive components.

3. Pass the drain hose through the wall hole. Make sure the water drains to a safe location where it will not cause water damage or a slipping hazard.

**NOTE:** The drainpipe outlet should be at least 2in(5cm) above the ground. If it touches the ground, the unit may become blocked and 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 might otherwise come back into the house. Follow the local plumbing codes.

Step 6 - Refrigerant Piping

**IMPORTANT:** Suction line must be insulated.

- The minimum refrigerant line length between the indoor and outdoor units is 10 ft. (3 m).
- Table 4 lists the pipe sizes for the indoor unit. Refer to the outdoor unit's installation instructions for the additional allowed piping lengths and refrigerant information.
- Refer to the outdoor unit's installation manual for details regarding the allowable pipe length and height difference.

Table 4 — Piping Size

		18K	24K	30K	36K	48K	60K
Gas Pipe (Connection Size)	In (mm)	3/4 (19)	3/4 (19)	3/4 (19)	3/4 (19)	3/4 (19)	7/8 (22)
Liquid Pipe (Connection Size)	In (mm)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)

**⚠ WARNING**

All field piping must be completed by a licensed technician and must comply with the local and national regulations.

When the system is installed in a small room, measures must be taken to prevent the refrigerant concentration in the room from exceeding the safety limit in the event of refrigerant leakage. If the refrigerant leaks and its concentration exceeds its proper limit, hazards due to lack of oxygen may result.

When installing the refrigeration system, ensure that air, dust, moisture or foreign substances do not enter the refrigerant circuit. Contamination in the system may cause poor operating capacity, high pressure in the refrigeration cycle, explosion or injury. Ventilate the area immediately if there is refrigerant leakage during the installation.

Leaked refrigerant gas is hazardous. Ensure there is no refrigerant leakage after completing the installation work.

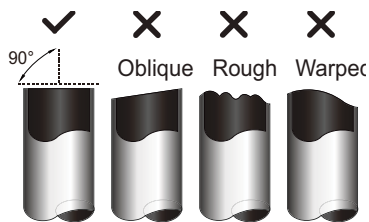


## CAUTION

**DO NOT** install the connecting pipe until both the indoor and outdoor units have been installed.  
Insulate suction line to prevent condensation.

Use the following steps to connect the refrigerant piping:

1. Run the interconnecting piping from the outdoor unit to the indoor unit.
2. Connect the refrigerant piping and drain line outside the indoor unit. Complete the pipe insulation at the flare connection then fasten the piping and wiring to the wall as required. Completely seal the hole in the wall.
3. Cut tubing to correct length.  
When preparing refrigerant pipes, take extra care to cut and flare them properly. This ensures efficient operation and minimizes the need for future maintenance.
  - a. Measure the distance between the indoor and outdoor units.
  - b. Using a pipe cutter, cut the pipe a little longer than the measured distance.
  - c. Make sure the pipe is cut at a perfect 90° angle.



**Fig. 30 —Pipe Cutting**

A220805



## CAUTION

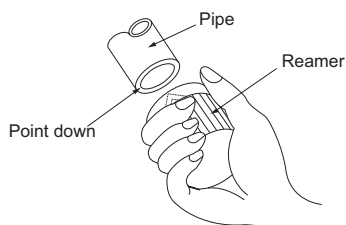
### DO NOT DEFORM PIPE WHILE CUTTING

Be extra careful not to damage, dent, or deform the pipe while cutting. This drastically reduces the heating efficiency of the unit.

#### 4. Remove Burrs

Burrs can affect the air-tight seal of the refrigerant piping connection. Therefore, they must be completely removed. To remove:

- a. Hold the pipe at a downward angle to prevent burrs from falling into the pipe.
- b. Using a reamer or deburring tool, remove all burrs from the cut section of the pipe.



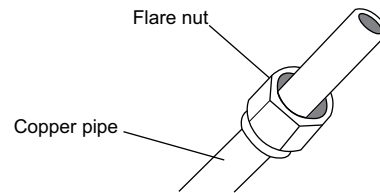
**Fig. 31 —Deburring tool**

A220806

#### 5. Flare Pipe Ends

Proper flaring is essential to achieving an airtight seal.

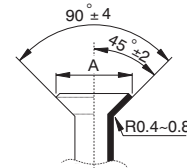
- a. After removing the burrs from the cut pipe, seal the ends with PVC tape to prevent foreign materials from entering the pipe.
- b. Sheath the pipe with insulating material.
- c. Place flare nuts on both ends of the pipe. Ensure they are facing the right direction. Once the ends are flared, it is impossible to put them on or change their direction.



**Fig. 32 —Copper pipe and flare nut**

A220807

- d. Remove the PVC tape from ends of pipe when ready to perform the flaring work.
- e. Clamp the flare block on the end of the pipe. The end of the pipe must extend beyond the flare form.
- f. Place the flaring tool onto the form.
- g. Turn the handle of the flaring tool clockwise until the pipe is fully flared. Flare the pipe in accordance with the dimensions in Table 5.
- h. Remove the flaring tool and flare block, then inspect the end of the pipe for cracks and even flaring.



**Fig. 33 —Flare Shape**

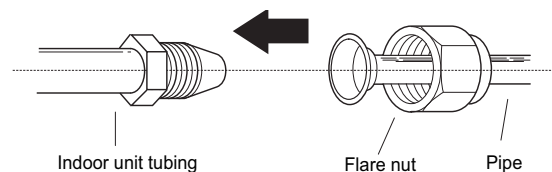
**Table 5 — Flare Nut Spacing**

Pipe Gauge	Tightening Torque	Flare Dimension (A) (Unit: MM/Inch)	
		Min	Max
3/8 in (Ø9.52)	25-25 N.m (18-19 ft-lb)	13.2/0.52	13.5/0.53
3/4 in (Ø19)	65-67 N.m (48-49 ft-lb)	23.2/0.91	23.7/0.93
7/8 in (Ø22)	75-85 N.m (55-63 ft-lb)	26.4/1.04	26.9/1.06

#### 6. Connect the Pipes

Connect the copper pipes to the outdoor unit first, then connect the pipes to the indoor unit. Connect the low-pressure pipe first, then connect the high pressure pipe.

7. When connecting the flare nuts, apply a thin coat of refrigeration oil to the flared ends of the pipes.
8. Align the center of the two pipes that you will connect.



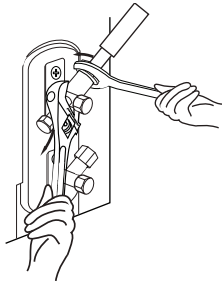
**Fig. 34 —Align the center of the two pipes**

A220815

9. Tighten the flare nut as much as possible by hand.
10. Using a wrench, grip the nut on the unit tubing.

11. While firmly gripping the nut, use a torque wrench to tighten the flare nut. See Table 5.

**NOTE: Use both a backup wrench and a torque wrench when connecting or disconnecting pipes to or from the unit.**



A220813

**Fig. 35 —Torque wrench with backup wrench**

All tubing bends should be performed with a properly sized tubing bender to prevent kinking or damaging the tubing.

12. After connecting the copper pipes to the outdoor unit, wrap the power cable, signal cable and the piping together with binding tape.

**NOTE: While bundling these items together, DO NOT intertwine or cross the signal cable with any other wiring.**

13. Thread this lineset through the wall to connect to the indoor unit.
14. Refer to the liquid line and gas line connection O.D. sizes in Table 4 based on the model being installed. Cut and deburr the tubing (review “Remove Burrs” on page 13) to prepare it for brazing. Setup the nitrogen apparatus and connect to the outside unit to flow nitrogen while brazing. Braze the tubing and any fittings to obtain a proper seal.
15. Adjust the nitrogen apparatus to pressurize the system. Pressure test the system to a maximum of 500 psig for at least 60 minutes.
16. Insulate suction line completely, including the outdoor unit valves.



## CAUTION

Wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite. Ensure the pipe is properly connected. Over tightening may damage the bell mouth and under tightening may lead to leakage.

### 17. Brazing Adapter (Optional)

When flare to braze adapter is used, follow these steps:

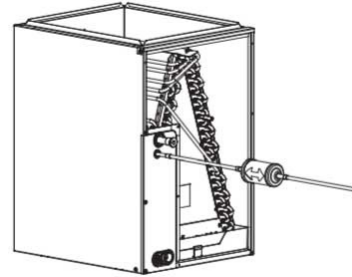
- a. Refer to the liquid line and gas line connection O.D. sizes in Table 4 based on the model being installed. Cut and deburr the tubing (review “Remove Burrs” on page 12) to prepare it for brazing. Setup the nitrogen apparatus and connect to the outside unit to flow nitrogen while brazing. Braze the tubing and any fittings to obtain a proper seal.
- b. Adjust the nitrogen apparatus to pressurize the system. Pressure test the system to a maximum of 500 psig for at least 60 minutes.
- c. Insulate suction line completely, including the outdoor unit valves.

Refer to IM-38MURA-02.pdf page 12 step 7. for reference.

## Step 7 - Filter Drier (Heat Pump Drier ONLY)

Refer to Fig. 36 and install the drier as follows:

1. Cut a minimum 4" length of 3/8 tubing and assemble:
  - a. 3/8" adapter
  - b. short tubing
  - c. filter drier
  - d. lineset
2. Wrap filter drier with damp cloth.
3. Flow nitrogen.
4. Braze assembled components from Step 1 above.



A221164

**Fig. 36 —Filter Drier Components**

The filter drier must be replaced whenever the refrigeration system is exposed to the atmosphere.

Only use factory specified liquid-line filter driers with rated working pressures less than 600 psig.

**NOTE: Do not install a suction-line filter drier in liquid line.**

## Step 8 - Evacuate Coil and Tubing System



### CAUTION

#### UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Never use the system compressor as a vacuum pump.

Refrigerant tubes and the indoor coil should be evacuated using the recommended 500 microns deep vacuum method. The alternate triple evacuation method may be used if the procedure outlined below is followed.

**NOTE: Always break a vacuum with dry nitrogen.**

#### Using Vacuum Pump

1. Completely tighten flare nuts A, B, C, D, connect the manifold gage charge hose to a charge port of the low side service valve (see Fig. 37).
2. Connect the charge hose to vacuum pump.
3. Fully open the low side of manifold gage (see Fig. 38 ).
4. Start the vacuum pump.
5. Evacuate using either the deep vacuum or triple evacuation method.
6. After evacuation is complete, fully close the low side of manifold gage and stop the vacuum pump operation.
7. The factory charge contained in the outdoor unit is good for up to 25 ft. (8 m) of line length. For refrigerant lines longer than 25 ft. (8 m), add refrigerant, up to the allowable length.
8. Disconnect the charge hose from the charge connection of the low side service valve.
9. Fully open service valves B and A.
10. Securely tighten the service valve caps.

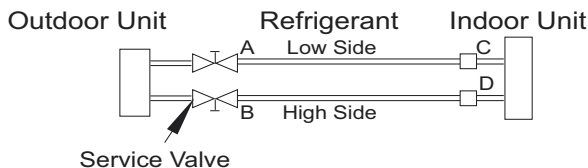


Fig. 37 —Service Valve

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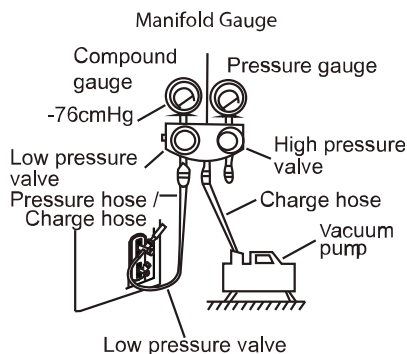


Fig. 38 — Manifold

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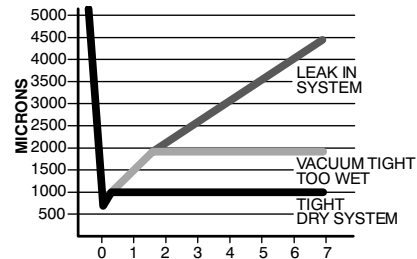
### Evacuation

Evacuation of the system removes air or nitrogen (non-condensables) as well as moisture. A proper vacuum will assure a tight, dry system before charging with refrigerant. The two methods used to evacuate a system are the deep vacuum method and the triple vacuum method.

#### Deep Vacuum Method

The deep vacuum method requires a vacuum pump capable of pulling a vacuum of 500 microns and a vacuum gauge capable of accurately measuring this vacuum depth. The deep vacuum method is the most positive way of assuring a system is free of air and moisture.

**NOTE: DO NOT add a filter line drier.**



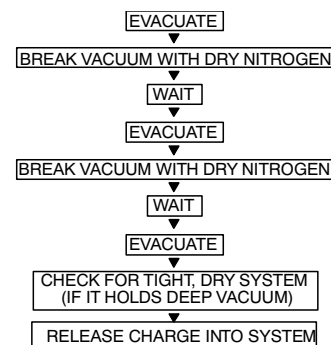
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Fig. 39 —Deep Vacuum Graph

#### Triple Evacuation Method

The triple evacuation method should be used when vacuum pump is not capable of pumping down to 500 microns and system does not contain any liquid water. Refer to Fig. 40 and proceed as follows:

1. Attach refrigeration gauges and evacuate system down to 28 in. of mercury and allow pump to continue operating for an additional 15 minutes.
2. Close service valves and shut off vacuum pump.
3. Connect a nitrogen cylinder and regulator to system and flow nitrogen until system pressure is 2 psig.
4. Close service valve and allow system to stand for 1 hour. During this time, dry nitrogen can diffuse throughout the system absorbing moisture.
5. Repeat this procedure as indicated in Fig. 40. The system should now be free of any contaminants and water vapor.



A220818

Fig. 40 —Triple Evacuation Method

#### Final Tubing Check

Check to be certain factory tubing on both the indoor and outdoor unit has not shifted during shipment. Ensure tubes are not rubbing against each other or any sheet metal. Pay close attention to the feeder tubes, making sure wire ties on feeder tubes are secure and tight.









## Step 9 - Mount Electric Heater (Optional)

### Heater Kits

This unit is not equipped with an electric heater package. A factory-approved, field-installed, ETL listed heater package is available from your equipment supplier. Factory-authorized, field-installed electric heater packages are available in sizes 5kW through 25kW. Electric heaters that are not factory approved may cause damage which would not be covered under the equipment warranty. Review the product data literature for all available accessory kits.

**Table 6 — Accessories**

Name	Shape	Quantity
Owner's and Installation Manual		1
Seal		1
Screw		7
Resilient Cap		1
Electric Auxiliary Heating Wiring Diagram		1
Circuit Breaker Label		1

**NOTE: Installation must be performed by an authorized dealer or specialist. Use recommended PPE when installing the unit.**

Specification of electric auxiliary heat modules: 5kW, 8kW, 10kW, 15kW, 20kW, 25kW.

**Table 7 — Auxiliary Heater Compatibility**

MODEL (Btu/h)	5kW	8kW	10kW	15kW	20kW	25kW
18K	Y	Y	Y	-	-	-
24K	Y	Y	Y	Y	-	-
30K	Y	Y	Y	Y	-	-
36K	Y	Y	Y	Y	Y	-
48K	-	Y	Y	Y	Y	-
60K	-	-	Y	Y	Y	Y


**Table 8 — Heater Kits**

Heater Kit Size (kW)	Model Number
18	40MUAAQ18XA3
24	40MUAAQ24XA3
30	40MUAAQ30XA3
36	40MUAAQ36XA3
48	40MUAAQ48XA3
60	40MUAAQ60XA3

**NOTE: Heaters must be ordered via Replacement Components.**

**Table 9 — Power Requirements for Heaters**

Heater Kit Size (KW)	Model Number	MCA Circuit 1 208V/ 230V	MCA Circuit 2 208V/ 230V	MCA Circuit 3 208V/ 230V	MOPD Circuit 1 208V/ 230V	MOPD Circuit 2 208V/ 230V
5	EHKMB0 5KN	23.0/ 27.0			25.0/ 30.0	
8	EHKMB0 8KN	37.0/ 42.0			40.0/ 45.0	
10	EHKMB1 0KN	46.0/ 53.0			50.0/ 60.0	
15	EHKMB1 5KN	23.0/ 27.0	46.0/ 53.0		25.0/ 30.0	50.0/ 60.0
20	EHKMB2 0KN	46.0/ 53.0	46.0/ 53.0		50.0/ 60.0	50.0/ 60.0
25	EHKMB2 5KN	23.0/ 27.0	46.0/ 53.0	46.0/ 53.0	25.0/ 30.0	50.0/ 60.0



## CAUTION

This electric auxiliary heat module is internally mounted in the air handler. **DO NOT** mount in the ductwork.

If the unit needs to be equipped with the electric auxiliary heat module, check the electric auxiliary heat module specification that is compatible with the unit to avoid unnecessary consequences caused by improper matching and refer to Product Data Manual.

## INSTALLATION REQUIREMENTS

**NOTE: Installation of Auxiliary Electric Heat Module should be completed before installing the discharge ductwork to insure proper alignment of the inside support brackets.**

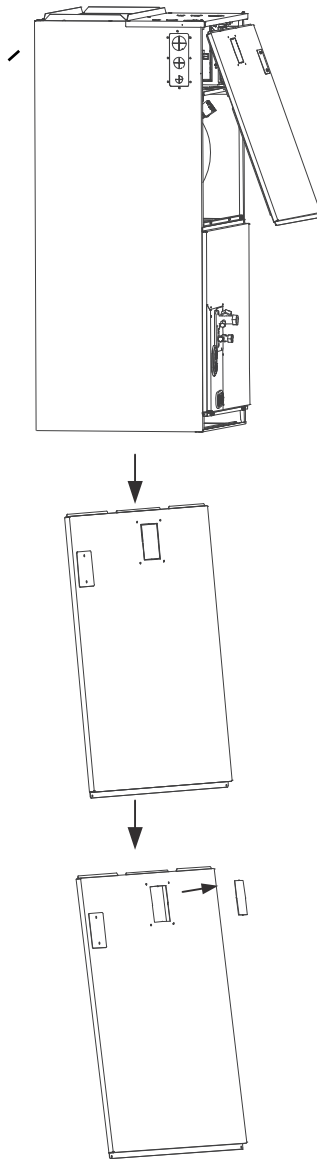
Before installation, check the list of electric auxiliary heat modules and physical objects. After transportation, check whether the electric heat module is damaged. If any damage is detected, contact the after-sales personnel immediately.

**NOTE: A separate power source is required for an Auxiliary Electric Heater. These units do NOT support a SINGLE POINT electrical connection when utilizing auxiliary heat.**



## ELECTRIC AUXILIARY HEAT MODULE INSTALLATION AND WIRING

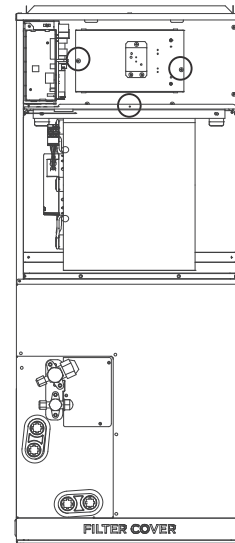
1. Remove the upper cover and use professional tools to remove the upper cover knock-outs.



**Fig. 41 — Remove the Upper Cover**

A220792

2. Remove the terminal block and power cord.
3. Loosen the screws.
4. Remove the electric auxiliary heating cover.

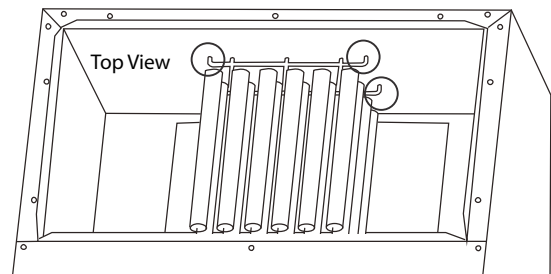
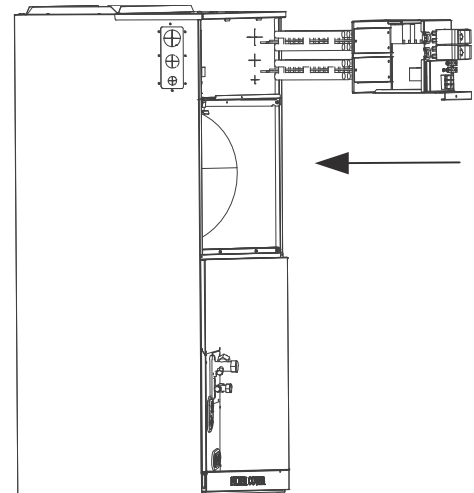


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**Fig. 42 — Remove the Terminal Block and Power Cord**

5. Install the electric auxiliary heating component into the chassis shell along the front of the unit.

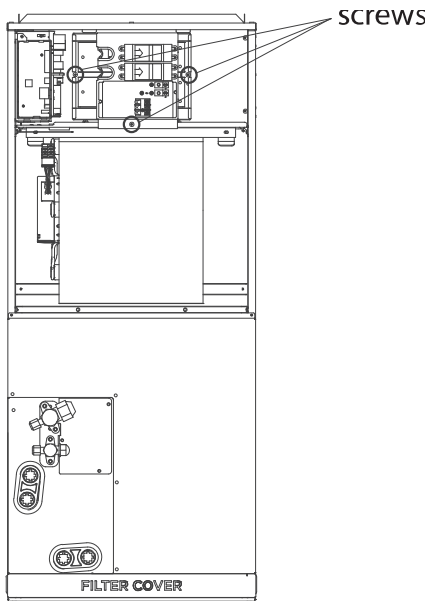
**NOTE:** Insert the front end into the shell assembly hole.



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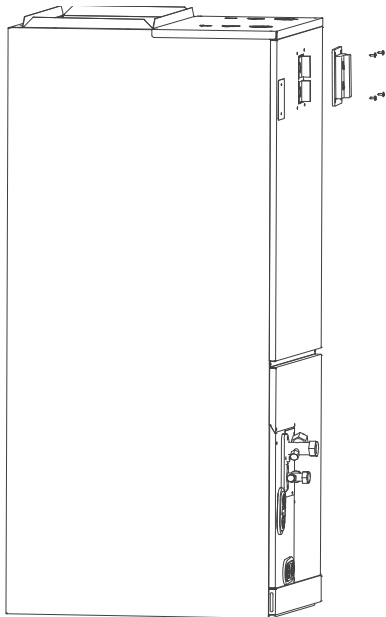
**Fig. 43 — Install the Electric Auxiliary Heating Component**

6. Tighten the screws.



**Fig. 44 — Tighten the Screws**

7. Wiring according to the wiring template.  
8. Install the upper cover.  
9. Install the Resilient Cover.



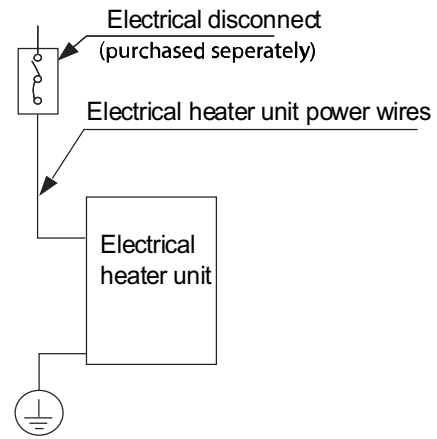
**Fig. 45 — Wiring According to the Wiring Template**

After the electric heating wiring is connected and before powering on:

- check all wiring and ensure a reliable connection of the wire body
- ensure the electric heating screw is tightened
- ensure the size selection of the power wire meets the power supply requirements.

**NOTE:** An electric auxiliary heating wiring diagram is supplied with the accessories. For maintenance convenience, paste the wiring diagram in the inside cover after the installation of electric auxiliary heating modules is complete.

**NOTE:** After installing the electric auxiliary heat module, adhere the circuit breaker label near the upper cover circuit breaker.



**Fig. 46 — Electrical Disconnect**

**IMPORTANT:**

## INDOOR UNIT WIRING

A220795

Before proceeding with electrical connections, make certain that the supply voltage, frequency, phase, and ampacity are as specified on the unit rating plate. Review the unit wiring label for proper field high and low voltage wiring.

Ensure all electrical connections are in accordance with the NEC and any local codes or ordinances that may apply. Use copper wire **only**.



## CAUTION

### PROPERTY DAMAGE HAZARD

Failure to follow this caution may result in product or property damage. If a disconnect switch is to be mounted on the unit, select a location where the drill or fastener will not contact electrical or refrigerant components.



## WARNING

### ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death. Field wires on the line side of the disconnect found in the fan coil unit remain live, even when the pull-out is removed. Service and maintenance to incoming wiring cannot be performed until the main disconnect switch (remote to the unit) is turned off.



## CAUTION

### EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation. Size the wires in accordance with NEC and local codes.

Use the following steps to wire the indoor unit.

**NOTE:** Wiring in this section is for the base unit **ONLY**. Auxiliary Electric Heat wiring is covered in “Step 4 - Installing Ductwork” on page 11.

1. Prepare the cable for connection.
  - a. Using wire strippers, strip the insulation from both ends of the signal cable to reveal about 1/2 in (12mm) of wire.
  - b. Strip the insulation from both ends of the wires.
  - c. Use a wire crimper to crimp the fork terminals to the ends of the wires.
2. Open the indoor unit's front panel. Use a screwdriver to remove the cover of the electric control box on the indoor unit.
3. Thread the power cable and the signal cable through the wire outlet.
4. Connect the fork terminals to the terminals. Match the wire colors/ labels with the labels on the terminal block.
5. Firmly screw the fork terminals of each wire to its corresponding terminal. Refer to the serial number and wiring diagram located on the cover of the electric control box.

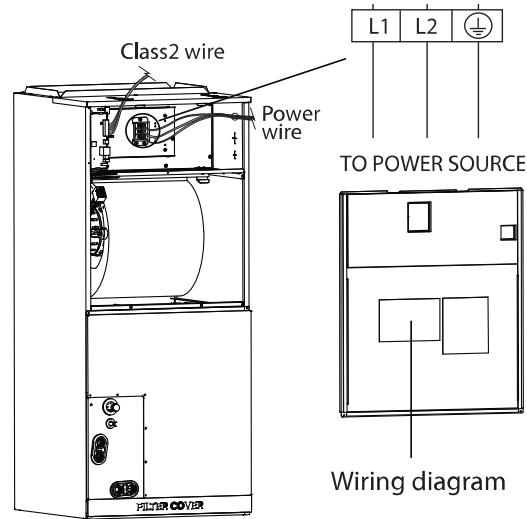


Fig. 47 —Indoor Unit Power Wiring

**NOTE:** The electric auxiliary heat wiring diagram is supplied with the accessories. Paste the wiring diagram in the designated position after installing the heat modules.

**CAUTION**

While connecting the wires, strictly follow the wiring diagram. The refrigerant circuit can become very hot. Keep the interconnection cable away from the copper tube.

6. Clamp down the cable with the cable clamp. The cable must not be loose or put strain on the fork terminals.
7. Reattach the electric box cover.

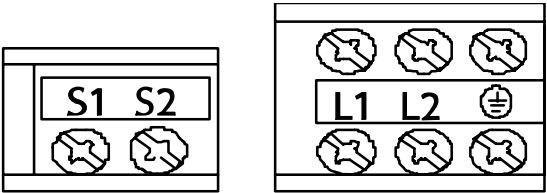


Fig. 48 —Controls and Power Terminals on Indoor Unit (All Sizes)

WIRING REQUIREMENTS

Size all wires per the NEC (National Electrical Code) or CEC (Canadian Electrical Code) and local codes. Use the electrical data from the outdoor unit (MCA - minimum circuit amps and MOCP - maximum over current protection), to correctly size the wires and the disconnect fuse or breakers respectively.

**Communication Wiring:** There are two options available to establish communication between the outdoor unit and approved indoor unit.

Table 10 — Options for Establishing Communication

OPTIONS	COMMUNICATION TYPE	RECOMMENDED CABLE SIZE
1	Non-Polarity RS485 Communication (S1 - S2)	16 AWG (stranded shielded)
2	24V communication	18 AWG 8 conductor thermostat wire

**WARNING**

Refer to the wiring template for the wiring method.  
**DO NOT** connect the power cord to the communication line as this may damage the system.

**CAUTION**

**EQUIPMENT DAMAGE HAZARD**  
Be sure to comply with local codes while running wire from the indoor unit to the outdoor unit.  
Every wire must be connected firmly. Loose wiring may cause the terminal to overheat or result in a unit malfunction. A fire hazard may also exist. Ensure all wiring is tightly connected.  
No wire should touch the refrigerant tubing, compressor or any moving parts.  
Disconnecting means must be provided and located within sight and readily accessible from the system. Route the connecting cable with conduit through the hole in the conduit panel.

## ELECTRICAL DATA

Table 11 — Electrical Data

UNIT SIZE	V-PH-HZ	INDOOR FAN				MAX FUSE CB AMP When powered independently
		FLA	HP	W-Out	System Power Factor (%)	
18K	208-230/1/60	2.0	1/3	250	69	15
24K		3.0	1/3	250	89	
30K		3.5	1/2	375	96	
36K		3.5	1/2	375	98	
48K		5.0	3/4	560	98	
60K		7.0	1	750	98	

## CONNECTION DIAGRAMS

### Scenario 1 - Non-Polarity RS485 Communication + 24V Thermostat

This is the preferred method when using a 24V thermostat and when the indoor unit communicates with the outdoor unit via RS485 protocol.

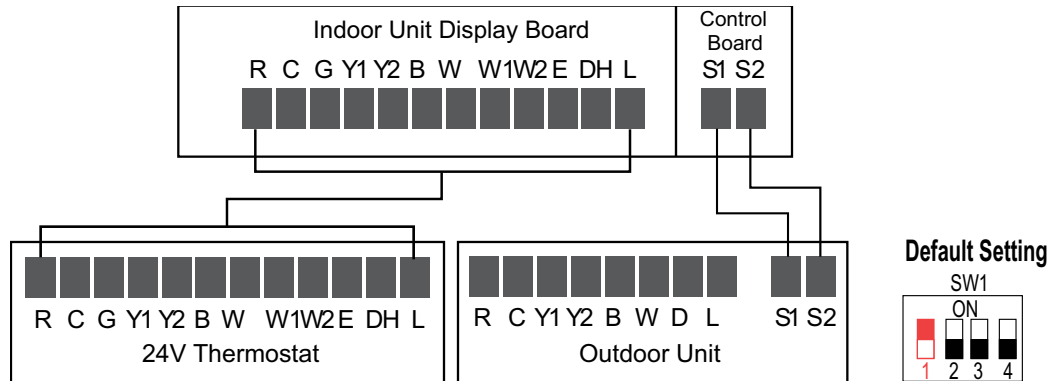


Fig. 49 —Scenario 1



## WARNING

Refer to the wiring nameplate for the wiring method.

**DO NOT** connect 24V AC to S1-S2, as this will damage the system.

### Scenario 2 - Non-Polarity RS485 Communication

This is the preferred method of control with wired controller KSACN1001(Not included)

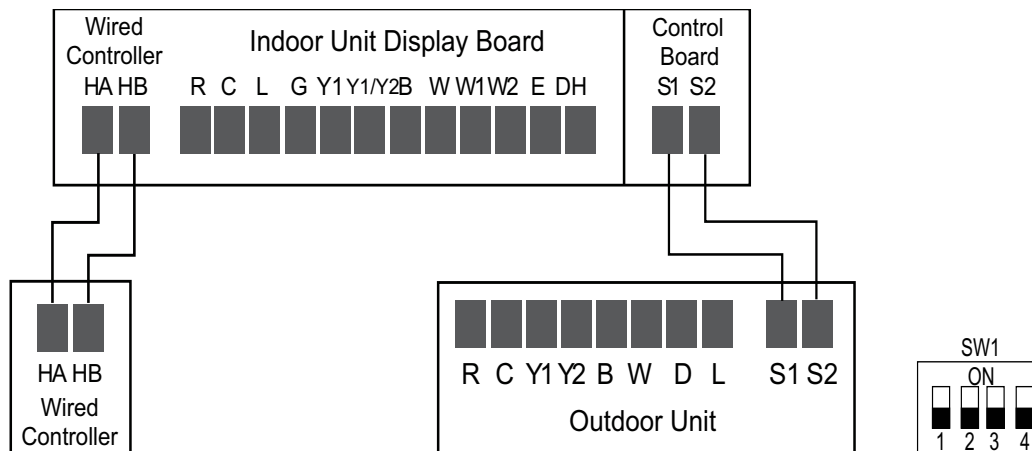
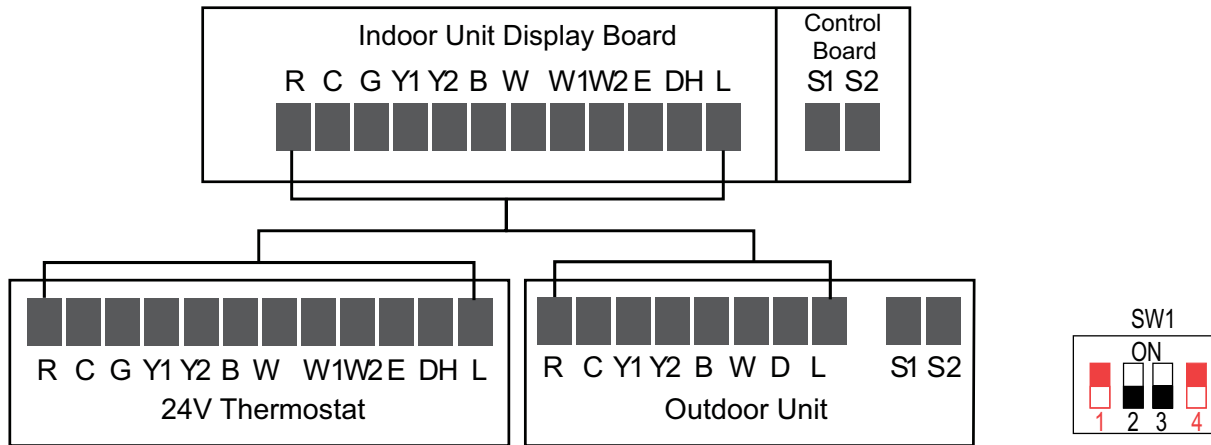


Fig. 50 —Scenario 2

### Scenario 3 - Full 24V Communication

This is the preferred method when using a 24V thermostat and when the indoor unit communicates with the outdoor unit via RS485 protocol.



**Fig. 51 —Scenario 3**

**NOTE:** For scenarios 2 and 3 - The use of shielded communication or thermostat wire is not required but is recommended where separation from high voltage conductors cannot be maintained, or in areas with high electrical noise.

The shield and drain conductor must be grounded at the outdoor unit and stripped back and taped at the indoor unit. Grounding at both ends results in an increase of noise transmitted onto the signal wires.

**Table 12 — Functional Display**

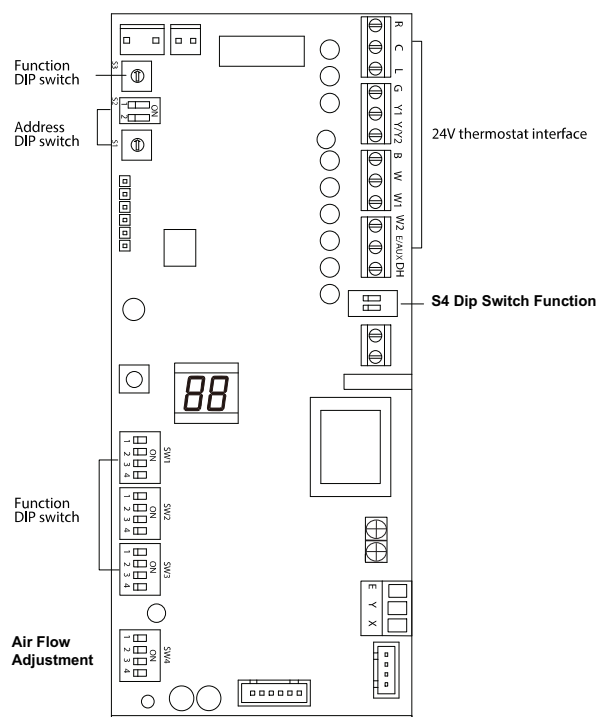
Mode	Priority	G	Y1	Y/Y2	B	W	W1	W21	E/AUX	DH/DS/BK	Display
Shut Down	/	0	0	0	0	0	0	0	0	*	00
Fan	7	1	0	0	0	0	0	0	0	1	01
Fan		1	0	0	0	0	0	0	0	0	
Cooling	6	*	1	0	0	0	0	0	0	1	02
Cooling2		*	*	1	0	0	0	0	0	1	03
Dehumidification 1		*	1	0	0	0	0	0	0	0	04
Dehumidification 2		*	*	1	0	0	0	0	0	0	05
Heating 1	5	*	1	0	1	0	0	0	0	1	06
Heating 2		*	*	1	1	0	0	0	0	1	
Heating 2		*	*	*	*	1	0	0	0	1	
Electric Heating 1	3	*	0	0	0	0	1	0	0	*	8
Electric Heating 1		*	0	0	0	0	0	1	0	*	
Electric Heating 2		*	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		*	1	0	1	0	1	1	0	1	
Heating 2 + Electric Heating 2		*	*	1	1	0	1	1	0	1	
Heating 2 + Electric Heating 2	1	*	*	*	*	1	1	1	0	1	11
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	

1: Signal

0: No Signal

The terminal input signal is stable for 1 second before confirmation

## DIP SWITCH DEFINITIONS



A220843

**Fig. 52 — DIP Switches**

**Table 13 — Dip Switch Definitions**

Number	Dial Code	Function	ON	OFF
1	SW1-1	Control Function	[Default] 24 V Communication	RS485 S1-S2 Communication
2	SW1-2	Anti-cold blow protection option	NO	[Default] YES
3	SW1-3	Single cooling / heating and cooling options	Cooling	[Default] Cooling & Heating
4	SW1-4	Future Use	N/A	[Default] Leave OFF
5*	SW2-1	Temperature differential to activate first stage auxiliary heat	2°F	[Default] 4°F
6*	SW2-2	Electric heat on delay	30 minutes	[Default] 15 minutes
7*	SW2-3	Electric auxiliary heating delay to start time	YES	[Default] NO
8*	SW2-4	Compressor/Auxiliary heat outdoor ambient lockout	The heater will not operate if the outdoor temperature is greater than the temperature represented by S3	[Default] The compressor will not operate if the outdoor temperature is lower than the temperature represented by S3
9*	Rotary Switch S3	Set outdoor temperature Limitation (for auxiliary heating or compressor)	0 means that the temperature protection is not turned on, the dial range is 1 through F, 1 equals 4°F and it increased up to 46°F based on Fig.	
10*	SW3-1	Maximum continuous runtime allowed before system automatically stages up capacity to satisfy set point. This adds 1 to 5°F 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	Cooling and heating Y2 temperature differential adjustment.	2°F	4°F [Default]
12	SW3-3	Temperature differential to activate second stage auxiliary heating	4°F	6°F [Default]
13	SW4	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	
14**	S4-1	Default ON	[Default] For single stage supplemental heat, W1 and W2 are connected	For dual stage supplemental heat, W1 and W2 are controlled independently.
15**	S4-2	DH function selection	[Default] Dehumidification control not available	Dehumidification feature is enabled through thermostat

\*Only available with native wired controller KSACN1001

\*\* Only available with 24V thermostat communication (Scenarios 1 and 3).

**SW1**

This dip switch group mainly controls and selects the type of unit. It is suggested that adjustments are only made under the guidance of the authorized technician.

- SW1-1:** Control function, (**ON:** 24V Thermostat; **OFF:** Wired controller, default)
- SW1-2:** Use this dip switch to determine whether to stop the fan when cold air is released; **OFF** stops the fan, **ON** does not stop the fan, the default is **OFF**
- **SW1-3:** Select Cooling Only and heat pump functions; **ON:** cooling only; **OFF:** heating and cooling, default
- SW1-4:** Leave **OFF**. Not Applicable.

**SW2**

This dip switch group mainly controls the opening form of the electric auxiliary heat.

- SW2-1:** This dial code can control the temperature difference when the electric heating is turned on. **OFF:** 4°F(2°C), default; **ON:** 2°F(1°C), 3-level temperature setting, consistent with user thermostat setting.

**NOTE: When E/AUX controls electric heating, there is no temperature difference, and it starts directly.**

- SW2-2, SW2-3:** This two-digit dialing code can control the delayed start of electrically-assisted heat. When the temperature difference is too great, the delayed start and the delayed start time can be selected.


SW2-2	1-bit dialing, ON 5°F (2.5°C), OFF without delay
	1 bit dialing, OFF 15 minutes, ON 30 minutes, 15 minutes by default, delayed opening time

- SW2-4:** This dial code controls the permissible opening temperature of electric heating or compressor, **OFF** allows the opening temperature of electric heating (using the set temperature of **S3 Rotary Switch** as the upper limit temperature of electric heating), and **ON** the allowable opening temperature of the compressor (using **Rotary Dial S3** as the upper limit temperature of electric heating). The lower limit temperature at which the compressor can allow operation.)

**S3 Rotary Switch**

Ambient temperature controlled by electric heating or compressor, 0 means no temperature protection is turned on, Rotary Dial position 1 through F maps to -4°F (-20°C) through 46°F (8°C). Each rotary dial point is a 4°F (2°C) change from the previous point.

**Example:** Set dial point 1 = -20C. Dial point 2 = -18C. ....Dial point F = 8C, and each scale represents 4°F (2°C).



S3	S3 (°F)
0	OFF
1	-4
2	0
3	3
4	7
5	10
6	14
7	18
8	21
9	25
A	28
B	32
C	36
D	39
E	43
F	46

**Fig. 53 —SW3 Settings**

**SW3**

This dip switch group mainly controls adjustments to temperature dead-bands.

- SW3-1:** This dialing code can set the continuous operation time for increasing the set temperature by 1°F-5°F(0.5°C~3°C) before reaching the temperature. The default is **OFF** = 90 minutes; **ON** = 30 minutes.
- SW3-2:** This dialing code can set Y/Y2 signal setting temperature adjustment deviation, **ON:** 2°F (1°C); **OFF:** 4°F (2°C)
- SW3-3:** This dialing code can set W2 signal setting temperature adjustment deviation, **ON:** 4°F (2°C); **OFF:** 6°F (3°C).
- SW3-4:** Not in use

**SW4 Air Flow Adjustment**

This dip switch group works as a combination and enables nominal CFM adjustments.

Only switches 1-3 are enabled. Switch 4 is reserved for future use. The available settings are: 000/001/010/011, and the air flow is adjusted according to Table 14:

**Table 14 — Air Volume**

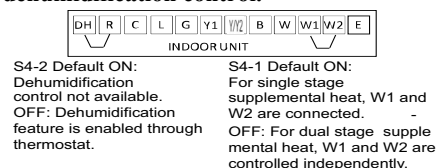
Model	SW4-1, 2, 3 Setting (Default) Air Volume (CFM)	001 - Air Volume (CFM)	010 - Air Volume (CFM)	011 - Air Volume (CFM)
18K	660	630	600	570
	10KW	10KW, 8KW	8KW	5KW, 3KW
24K	880	850	830	800
	15KW	15KW, 8KW	10KW, 8KW	5KW, 3KW
30K	1100	1040	990	930
	15KW	15KW, 10KW	10KW, 8KW	8KW, 5KW
36K	1320	1255	1190	1125
	20KW	15KW	10KW, 8KW	8KW, 5KW
48K	1760	1675	1580	1490
	20KW	15KW, 10KW	10KW, 8KW	8KW
60K	2195	2055	1920	1775
	25KW	20KW, 15KW	15KW, 10KW	10KW

**S4 Dip Switch Settings**

This dip switch group is for configuring the staging of supplemental heat and for dehumidification fan control.

- S4-1:** Use this dip switch when 2 stages of supplemental heat, W1 and W2, are available; **OFF** allows for independent control of W1 and W2 via the Thermostat (dual stage), **ON** is used for single stage supplemental heat, W1 and W2 are internally jumped together. The default is **ON**
- S4-2:** Use this dip switch to enable dehumidification fan operation. **OFF** will remove the internal jumper from R to DH, meaning DH will be controlled via the thermostat. When the system is configured for dehumidification and there is a demand present, the 24V output from the thermostat drops to 0V, the refrigeration system starts the dehumidification operation, and the fan air volume drops to 80% of the nominal refrigeration air volume. **ON** will create an internal jump between R and DH, meaning no external dehumidification signal is present, DH will always receive a 24V signal and the fan will operate as normal. The default is **ON**

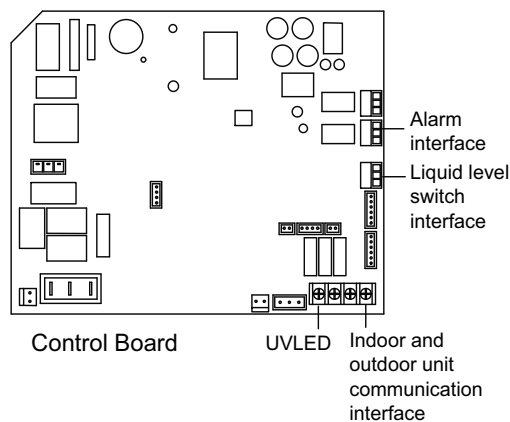
**NOTE: S4-2 operates on reverse logic. DH is energized when there is no external dehumidification control.**



**Fig. 54 —S4 DIP Switch**

**Table 15 — High, Medium, Low Air Volume Parameters**

18K			24K			30K			36K			48K			60K		
The PWM duty cycle	Static pressure	Air volume (CFM)	The PWM duty cycle	Static pressure	Air volume (CFM)	The PWM duty cycle	Static pressure	Air volume (CFM)	The PWM duty cycle	Static pressure	Air volume (CFM)	The PWM duty cycle	Static pressure	Air volume (CFM)	The PWM duty cycle	Static pressure	Air volume (CFM)
Low	0	489	Low	0	598	Low	0	422	Low	0	879	Low	0	946	Low	0	1151
	0.10"	493		0.10"	613		0.10"	705		0.10"	883		0.10"	943		0.10"	1133
	0.15"	490		0.15"	625		0.15"	713		0.15"	888		0.15"	942		0.15"	1136
	0.20"	488		0.20"	630		0.20"	705		0.20"	892		0.20"	948		0.20"	1132
	0.30"	501		0.30"	632		0.30"	708		0.30"	893		0.30"	947		0.30"	1128
	0.40"	497		0.40"	635		0.40"	711		0.40"	893		0.40"	940		0.40"	1134
	0.50"	495		0.50"	631		0.50"	707		0.50"	892		0.50"	940		0.50"	1130
	0.60"	492		0.60"	624		0.60"	704		0.60"	890		0.60"	933		0.60"	1133
	0.80"	489		0.80"	614		0.80"	702		0.80"	873		0.80"	925		0.80"	1126
	1.00"	488		1.00"	624		1.00"	698		1.00"	826		1.00"	925		1.00"	1118
Mid	0	524	Mid	0	692	Mid	0	813	Mid	0	1010	Mid	0	1155	Mid	0	1367
	0.10"	528		0.10"	690		0.10"	811		0.10"	1001		0.10"	1156		0.10"	1358
	0.15"	532		0.15"	685		0.15"	813		0.15"	1001		0.15"	1154		0.15"	1362
	0.20"	542		0.20"	695		0.20"	816		0.20"	1000		0.20"	1154		0.20"	1361
	0.30"	523		0.30"	693		0.30"	815		0.30"	995		0.30"	1143		0.30"	1360
	0.40"	524		0.40"	692		0.40"	811		0.40"	995		0.40"	1147		0.40"	1352
	0.50"	533		0.50"	688		0.50"	809		0.50"	996		0.50"	1149		0.50"	1353
	0.60"	523		0.60"	684		0.60"	801		0.60"	983		0.60"	1143		0.60"	1348
	0.80"	521		0.80"	670		0.80"	807		0.80"	996		0.80"	1140		0.80"	1340
	1.00"	519		1.00"	654		1.00"	801		1.00"	969		1.00"	1113		1.00"	1316
High	0	573	High	0	752	High	0	899	High	0	1137	High	0	1325	High	0	1608
	0.10"	577		0.10"	746		0.10"	895		0.10"	1123		0.10"	1328		0.10"	1590
	0.15"	580		0.15"	750		0.15"	902		0.15"	1119		0.15"	1337		0.15"	1586
	0.20"	576		0.20"	756		0.20"	898		0.20"	1120		0.20"	1337		0.20"	1560
	0.30"	579		0.30"	750		0.30"	900		0.30"	1112		0.30"	1330		0.30"	1561
	0.40"	574		0.40"	746		0.40"	909		0.40"	1111		0.40"	1333		0.40"	1554
	0.50"	573		0.50"	741		0.50"	901		0.50"	1113		0.50"	1338		0.50"	1549
	0.60"	576		0.60"	745		0.60"	908		0.60"	1101		0.60"	1335		0.60"	1545
	0.80"	577		0.80"	735		0.80"	905		0.80"	1094		0.80"	1321		0.80"	1543
	1.00"	574		1.00"	714		1.00"	899		1.00"	1088		1.00"	1321		1.00"	1548

**Optional Function Wiring****Fig. 55 — Optional Function Wiring**

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## AUXILIARY CONTACTS

### Main Board

#### WORK terminal port CN23 – DRY CONTACT – OUTPUT

- The WORK port is linked to the unit's indoor blower
- When the indoor blower is off, the contact is open
- When the indoor blower is running, the contact is closed
- There is no voltage from CN23, power is provided from the external control system and not from the unit
- The contacts are rated at 250VAC and 10 AMP maximum
- If an active 24V signal output is required, G and C ports (thermostat connections) may be used instead

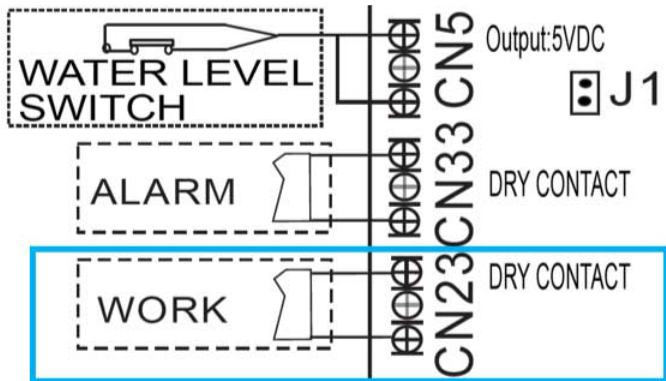


Fig. 56 —WORK Terminal Port CN23

#### ALARM terminal port CN33 – NORMALLY OPEN DRY CONTACT (OUTPUT)

- Allows the terminal port to connect to an external ALARM interface or annunciator
- There is no voltage from CN33, power is provided from the ALARM system and not from the unit
- The contacts are rated at 250VAC and 10 AMP maximum
- When the unit experiences a problem, the contact closes, and the ALARM is triggered. When the unit experiences a problem, the relay closes, and the ALARM is triggered.

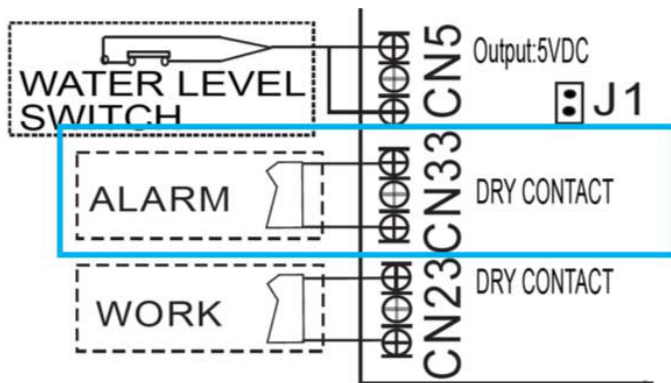


Fig. 57 —ALARM Terminal Port CN33

#### WATER LEVEL switch terminal port CN5 – SWITCH INPUT

- To enable this switch, jumper J1 must be removed
- A field supplied float switch can be directly connected to CN5
- CLOSED contacts = normal
- OPEN contacts = overflow
- When an overflow condition occurs, a signal is sent to the system to turn it off: Alarm EE is displayed.

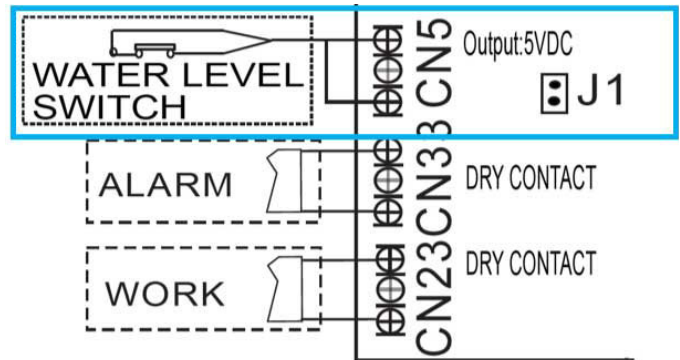


Fig. 58 —WATER LEVEL Terminal Port CN5

#### UV LED terminal port CN43 – OUTPUT 24VAC:

- The UV LED port is linked to the unit's fan
- When the fan is running, the relay is closed and there is an output of 24VAC through the contacts that can be used to power a compatible UV LED LIGHT

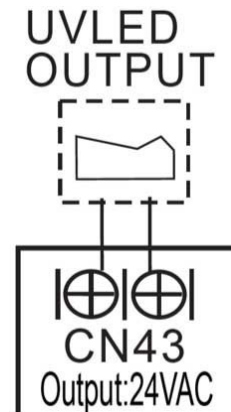
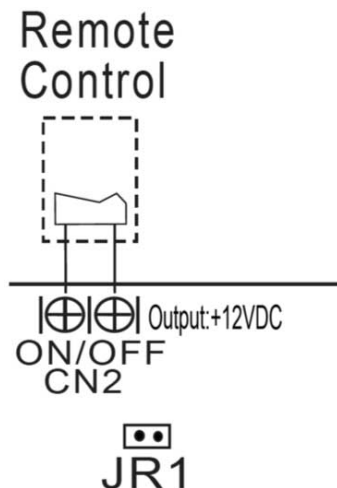


Fig. 59 —UV LED Terminal Port CN43

## 24V Interface Board

### Remote control (ON-OFF) terminal port CN2 and jumper JR1 – OUTPUT 12VDC:

- **Remove the jumper JR1** to enable the ON-OFF function
- When the remote switch is off (OPEN); the unit is OFF
- When remote switch is on (CLOSE); the unit is ON
- When the remote switch is close/open, the unit responds to the demand within 2 seconds
- When the remote switch is on, you can use the included remote controller or wired controller to operate the unit as normal. When the remote switch off, the unit would not respond the command from the remote controller or wired controller and a CP code would be displayed on the board.
- The voltage of the port is 12V DC, design Max. current is 5mA.



**Fig. 60 —Remote Control Terminal Port CN2 and Jumper JR1**

## Control Logic

**Table 16 — Indoor Unit Connector**

Connector	Purpose
R	24V
C	COM
G	FAN
Y	First stage cooling
Y Y2	Second stage cooling
B	Heating (Four-way valve)
W	Heating operation
W1	Electric Heating Operation 1
W2	Electric Heating Operation 2
E/AUX	Emergency Heat / Auxiliary Heat
DH	Dehumidification
L	Error Signal

## LED Display

The control displays active faults switches on the **LED** display. If the control displays the fault switch and the **LED** flashes quickly, the unit has malfunctioned. Refer to the detailed fault switches.

## TEST RUN

### BEFORE THE TEST RUN

A test run must be performed after the entire system has been completely installed. Confirm the following points before performing the test.

- Indoor and outdoor units are properly installed.
- Piping and wiring are properly connected.
- There are no obstacles near the unit's inlet and outlet that might cause poor performance or product malfunction.
- Refrigeration system does not leak.
- Drainage system is unimpeded and draining to a safe location.
- Heating insulation is properly installed.
- Grounding wires are properly connected.
- Length of the piping and additional refrigerant recorded.
- Power voltage is the correct voltage for the system.



## CAUTION

Failure to perform the test run may result in unit damage, property damage, or personal injury.

### Test Run Instructions

- Open both the liquid and gas stop valves.
- Turn on the main power switch and allow the unit to warm up.
- Set the air conditioner to the **COOL** mode.
- For the indoor unit:**
  - Double check to see if the room temperature is being registered correctly.
  - Ensure the manual buttons on the indoor unit work properly.
  - Ensure the drainage system is unimpeded and draining smoothly.
  - Ensure there is no vibration or abnormal noise during operation.
- For the outdoor unit:**
  - Check to see if the refrigeration system is leaking.
  - Ensure there is no vibration or abnormal noise during operation.
  - Ensure the wind, noise, and water generated by the unit do not disturb neighbors or pose a safety hazard.
- Drainage Test**
  - Ensure the drainpipe flows smoothly. New buildings should perform this test before finishing the ceiling.
  - Remove the test cover. Add 2,000 ml of water to the tank through the attached tube.
  - Turn on the main power switch and run the air conditioner in the **COOL** mode.
  - Check to see that the water is discharged. It may take up to one minute before the unit begins to drain depending on the drainpipe.
  - Ensure there are no leaks in any of the piping.
  - Stop the air conditioner. Turn off the main power switch and reinstall the test cover.

**NOTE:** If the unit malfunctions or does not operate according to your expectations, please refer to the Troubleshooting section of the owner's manual before calling customer service.

## SYSTEM CHECKS

- Conceal the tubing where possible.
- Ensure the drain tube slopes downward along its entire length.
- Ensure all tubing and connections are properly insulated.
- Fasten the tubes to the outside wall, when possible.
- Seal the hole through which the cables and tubing pass.

### INDOOR UNIT

- Do all the remote controller buttons function properly?
- Do the display panel lights work properly?
- Does the drain work?

Explain the following items to customer (with the aid of the owner's manual):

- How to turn air conditioner **ON** and **OFF**;
- How to select **COOLING**, **HEATING** and other the operating modes;
- How to set a desired temperature;
- How to set the timer to automatically start and stop air conditioner operation;
- How to control all the other features of the remote controller and display panel.
- How to remove and clean the air filter.
- Unit care and maintenance.

Present the owner's manual and installation instructions to the customer.

## START-UP PROCEDURES

Refer to outdoor unit's installation instructions for system start-up instructions.



## CAUTION

### UNIT COMPONENT HAZARD

Failure to follow this caution may result in product damage. Never operate the unit without a filter. Damage to the blower motor or coil may occur. For those applications where access to an internal filter is impractical, a field-supplied filter must be installed in the return duct system.

## CARE AND MAINTENANCE

To continue high performance and minimize possible equipment failure, it is essential that periodic maintenance be performed on this equipment. Consult your local dealer as to the proper frequency of maintenance contract.

The ability to properly perform maintenance on this equipment requires certain mechanical skills and tools. If you do not possess these, contact your dealer for maintenance. The only consumer service recommended or required is filter replacement or cleaning on a monthly basis.

## TROUBLESHOOTING

For ease of service, the systems are equipped with diagnostic code display LEDs on some outdoor units. The outdoor diagnostic display consists of two LEDs (red and green) on the outdoor unit board and is limited to a few errors. The indoor diagnostic display is a digital readout on the display panel. If possible, always check the diagnostic codes displayed on the indoor unit first before consulting a service technician. The diagnostic codes, displayed in the indoor and outdoor units, are listed in Table 17.

**Table 17 — Indoor Unit Diagnostic Guides**

DISPLAY	ERROR INFORMATION
<b>EH00</b>	Indoor EEPROM Malfunction
<b>EL01</b>	Communication malfunction between the indoor and outdoor units
<b>EH03</b>	Indoor fan speed malfunction
<b>EC51</b>	Outdoor EEPROM malfunction
<b>EC52</b>	Condenser coil temperature sensor (T3) malfunction
<b>EC53</b>	Outdoor ambient temperature sensor (T4) malfunction
<b>EC54</b>	Outdoor unit exhaust temperature sensor error
<b>EH60</b>	Indoor Room Temperature Sensor T1 Error
<b>EH61</b>	Indoor Evaporator Coil Temperature Sensor T2 Error
<b>EH62</b>	Air inlet temperature sensor error
<b>EC07</b>	Outdoor DC fan speed malfunction
<b>EH0b</b>	Indoor PCB and display board communication error
<b>EL0C</b>	Refrigerant leakage detection
<b>EH0E</b>	Indoor water level warning error
<b>FL09</b>	New and old platform match malfunction
<b>PC00</b>	Inverter module (IPM) protection
<b>PC01</b>	Over high voltage or over low voltage protection
<b>PC02</b>	High temperature protection of compressor top/IPM temperature protection
<b>PC04</b>	Inverter compressor drive error
<b>PC03</b>	Low pressure protection
<b>PC0L</b>	Low temperature protection of outdoor unit
<b>----</b>	Indoor units mode conflict

**NOTE: If the LED display shows DF (Defrost) or FC (Forced Cooling), these are operational codes and, not fault or protection.**

For additional diagnostic information, refer to the indoor unit service manual.

## ELECTRIC AUXILIARY HEATING WIRING DIAGRAMS

Table 18 — Specifications

Specifications	No. of Circuit Breakers	No. of Relays	No. of Power Cord Groups*	No. of Power Cord Grounding Screws
5kW	1	1	2	2
8kW	1	2	2	2
10kW	1	2	2	2
15kW	2	3	2	2
20kW	2	4	3	3
25kW	3	5	4	4

\*Power cord “A” for main unit on all sizes

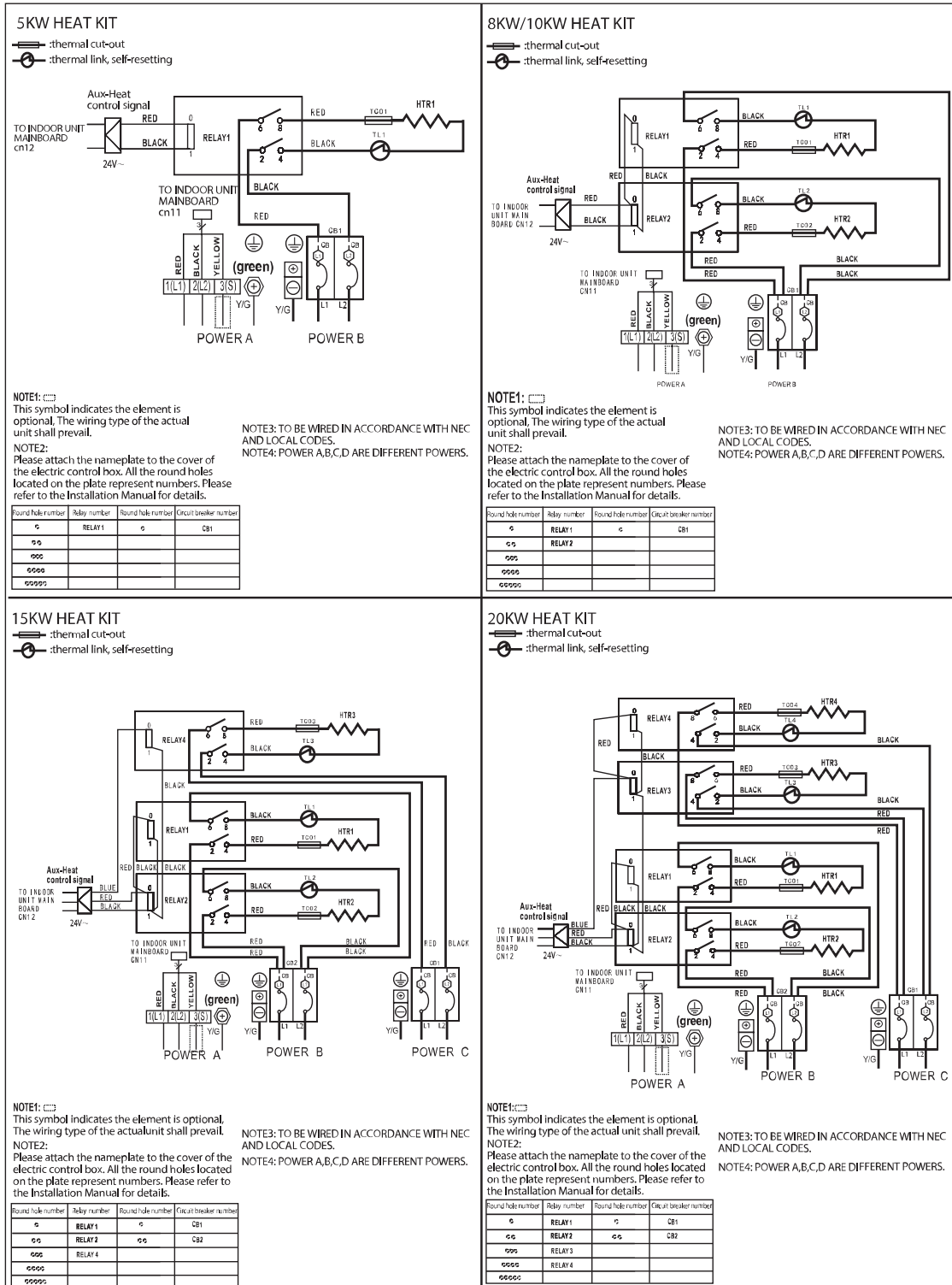


Fig. 61 — Electric Auxiliary Heating Wiring Diagram

ELECTRIC AUXILIARY HEATING WIRING DIAGRAMS (CONT)

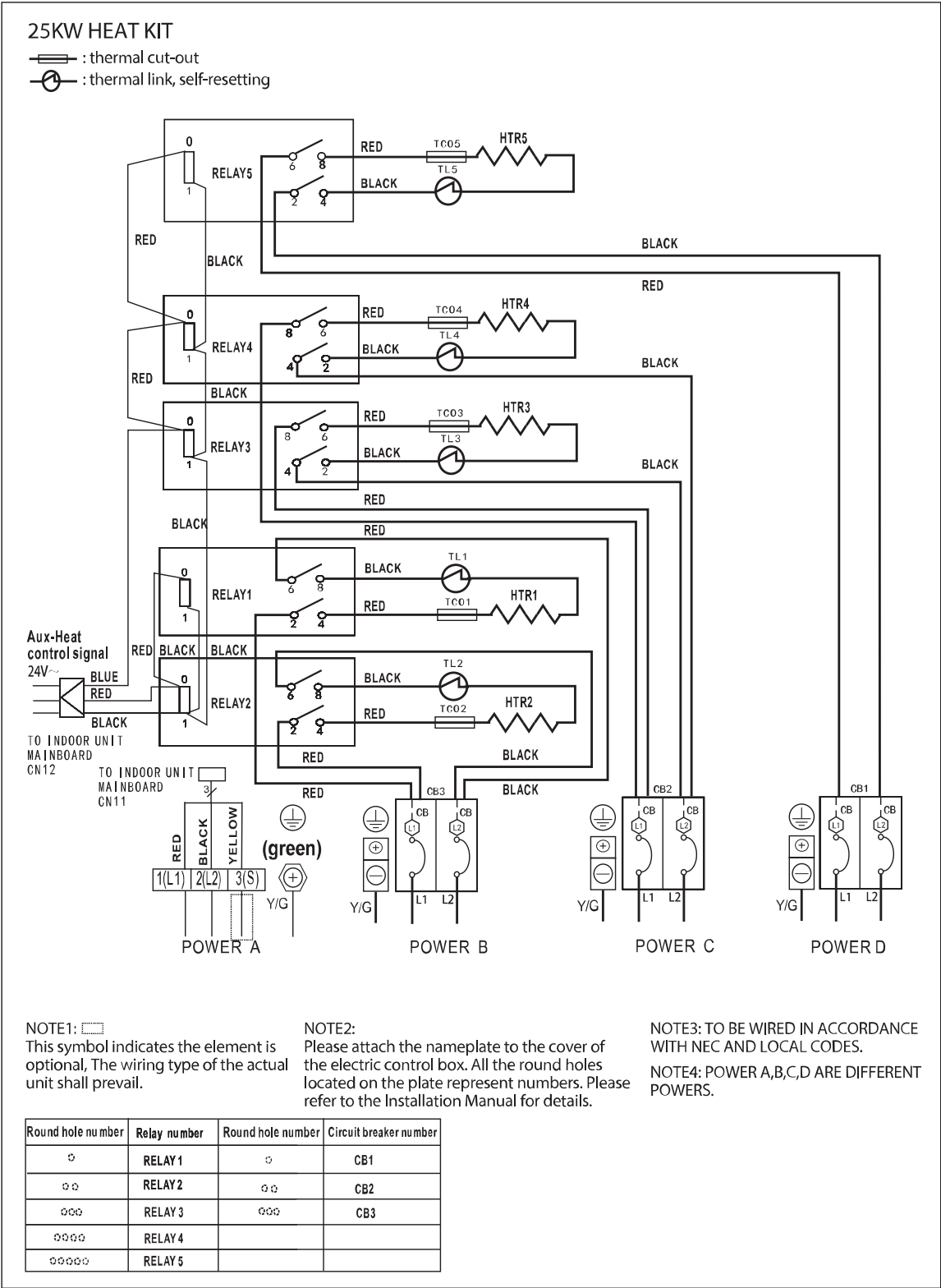


Fig. 62 —Electric Auxiliary Heating Wiring Diagram

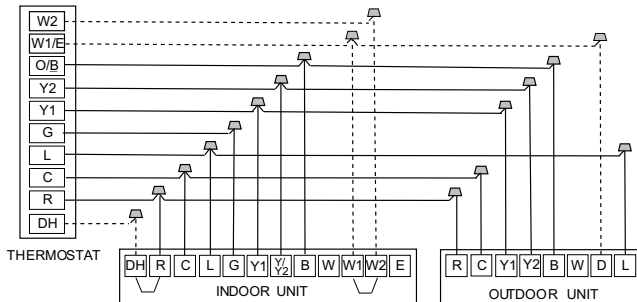
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## 24V CONNECTION DIAGRAMS

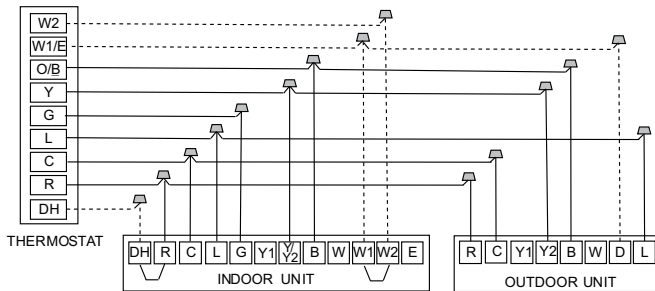
**Table 19 — Terminal Function**

R	24V Power Connection
C	Common
Y1	Low Demand
Y2	High Demand
B	Heating Reversing Valve
W	Heating Control
D	Defrost - (24V output signal)
L	System Fault - (24V output signal)

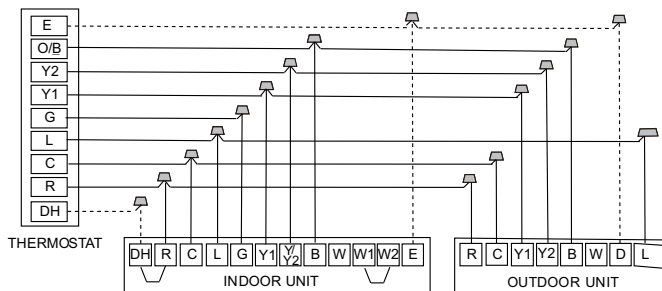
**NOTE:** Terminal D will be energized when the outdoor unit goes into defrost mode and can be used to enable electric heat. This feature is not available when the outdoor unit communicates with the indoor unit via non-polarity RS485 Communication S1-S2.



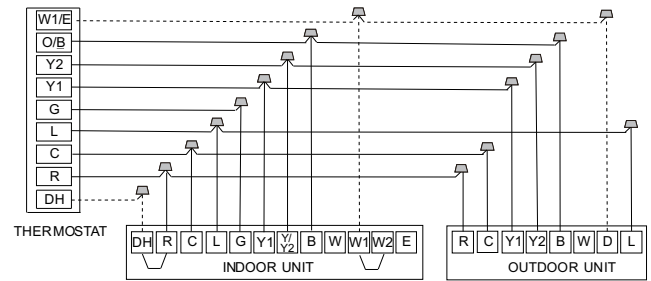
**Fig. 63 —Wiring for 4H and 2C Thermostat**



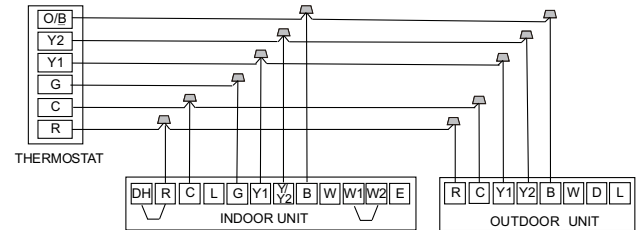
**Fig. 64 —Wiring for 3H and 1C Thermostat**



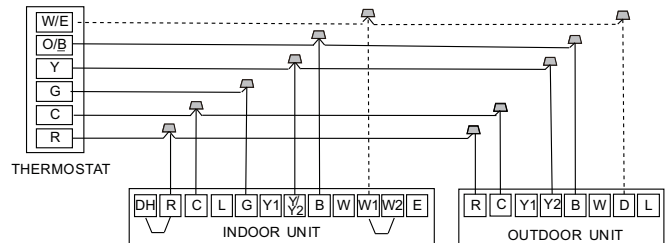
**Fig. 65 —Wiring for 3H and 2C Thermostat**



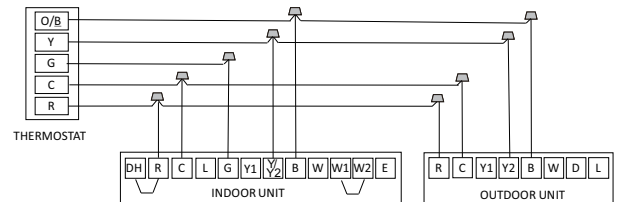
**Fig. 66 —Wiring for 3H and 2C Thermostat**



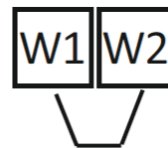
**Fig. 67 —Wiring for 2H and 2C Thermostat**



**Fig. 68 —Wiring for 2H and 1C Thermostat**



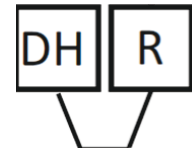
**Fig. 69 —Wiring for 1H and 1C Thermostat**



**S4-1:**

Default ON: For single stage supplemental heat, W1 and W2 are connected.

OFF: For dual stage supplemental heat, W1 and W2 are controlled independently. feature is enabled through thermostat.



**S4-2:**

Default ON: Dehumidification control not available.

OFF: Dehumidification feature is enabled through thermostat.

**Note:** Dip switches are located on compatible indoor unit. Refer to the indoor unit installation manual for additional information.

