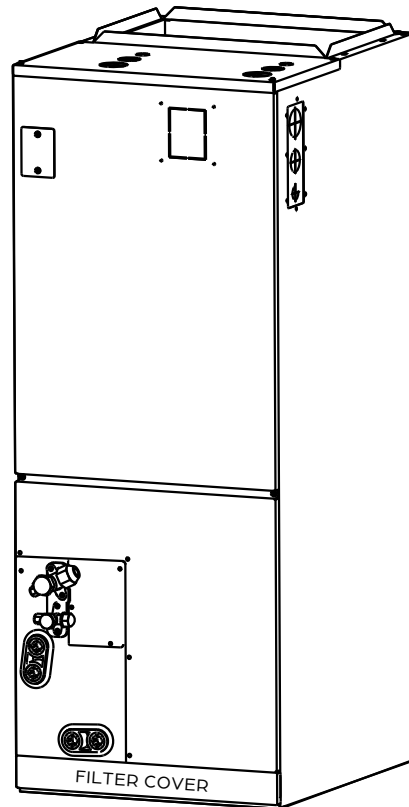


INSTALLATION MANUAL

AIR HANDLER UNIT: 30K to 60K

DRAM30S1A, DRAM36S1A, DRAM48S1A, DRAM60S1A
208/230V 1ph 60 HZ 24V / RS485 Communicating



Model Number:

Serial Number:

Purchase Date:

Installing Contractor Company Name:



NOTE

This manual only refers to the models listed above. If you are installing the DRAM18F1A or DRAM24F1A please refer to the manual included with that unit.



TIP

Capture relevant information about your Durastar mini-split equipment before it is installed and write it above for future reference.

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INTRODUCTION

To better serve you, please do the following before contacting customer service:

- If you received a damaged product, immediately contact the retailer or dealer that sold you the product.
- Read and follow this owner's manual carefully to help you use and maintain your air handler.
- Read the troubleshooting section of this manual as it will help you diagnose and solve common issues.
- Visit us on the web at www.durastar.com to download product guides and up-to-date information.
- If you need warranty service, our friendly customer service representatives are available via email at questions@durastar.com or by telephone at 1-888-320-0706.

WARNINGS

Symbols Used in This Manual



The warning symbol indicates cautionary information for the user. Extra care and precautions should be taken to ensure the user's safety.



The pencil indicates any manufacturer notes relating to surrounding content. These may include further clarifications or call-outs.



A light bulb symbol indicates suggested manufacturer tips for the user to get the most out of the Durastar equipment and to accommodate the best user experience.

IMPORTANT SAFETY PRECAUTIONS

Improper handling can cause serious damage or injury. Please read the following safety information in its entirety.



Operation, Cleaning, and Maintenance Safety Precautions

- Children and people with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, should only use this air handler if they are given supervision and instructions concerning use of the air handler in a safe way and understand the hazards involved.
- Children should not play with the air handler.
- Never stick fingers, other body parts, or other objects into the air inlet or outlet. The internal fan may be rotating at high speeds. This could result in injury.
- Installation and maintenance must be performed by qualified professionals. Otherwise, you may experience personal injury or damage to the air handler and surrounding property.
- If an abnormal situation arises (like a burning smell), immediately turn off the air handler and disconnect power at the circuit breaker immediately. Then contact your dealer or a qualified professional for service.
- Do not climb onto or place objects on top of the outdoor unit.
- Do not install the air handler in a wet room such as a bathroom or laundry room. Too much exposure to water could cause electrical components to short circuit.
- Do not operate the air handler with wet hands. This may cause electric shock.
- Turn off the device and disconnect the power before cleaning. Failure to do so can cause electrical shock.
- Do not clean the air handler with excessive amounts of water.
- Do not clean the air handler with combustible cleaning agents. Combustible cleaning agents can cause fire or deformation.
- Do not use flammable materials such as hair spray, lacquer, or paint near the air handler as they may catch fire.
- Do not operate the air handler in places near combustible gases. Emitted gases may collect around the air handler and cause an explosion.
- Do not use the air handler for any other purpose than its intended use.
- Turn off the air handler if you are not going to use it for a long time.
- Make sure that water can drain unhindered from the unit.
- Do not allow the air handler to operate for long periods of time with doors or windows open, or if the humidity is very high.
- Do not expose your body directly to cool air for a prolonged period of time.
- If the air handler is used together with burners or other heating devices, thoroughly ventilate the room to avoid oxygen deficiency and carbon monoxide build up.
- In certain environments, such as kitchens, server rooms, etc., the use of specially designed air-conditioning units is highly recommended.
- As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

Electrical Safety



WARNING

Before performing any electrical or wiring work, turn off the main power to the system.

- The product must be properly grounded at the time of installation, or electrical shock may occur.
- If there is a serious safety issue with the power supply, stop work immediately. Explain your reasoning to the client, and refuse to install the unit until the safety issue is properly resolved.
- For all electrical work, follow all local and national wiring standards, regulations, and the Installation Manual. Connect cables tightly, and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections can overheat and cause fire, and may also cause shock. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.
- All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not closed properly, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.
- If connecting power to fixed wiring, an all-pole disconnection device which has at least 1/8" (3mm) clearances in all poles, a leakage current that may exceed 10mA, a residual current device (RCD) that has a rated residual operating current not exceeding 30mA, and a disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.
- Only connect the unit to an individual branch circuit. Do not connect another appliance to that circuit.
- No other equipment should be connected to the same power circuit.
- Power voltage should be within 90–110% of rated voltage. Insufficient power supply can cause malfunction, electrical shock, or fire.
- Installation of an external surge suppressor at the outdoor disconnect is recommended.
- The air handler's circuit board (PCB) is designed with a fuse to provide over current protection. The specifications of the fuse are printed on the circuit board.
- Do not let wires touch or rest against refrigerant tubing, the compressor, or any moving parts within the unit.
- To avoid getting an electric shock, never touch the electrical components soon after the power supply has been turned off.
- After turning on the power, always wait 10 minutes or more before you touch the electrical components.
- Make sure that you do not cross your electrical wiring with your signal wiring. This may cause distortion, interference or possibly damage to circuit boards.
- Connect the outdoor wires before connecting the indoor wires.

NOTE



The allowed static pressure range of the air handler on site is 0–0.80 in-H₂O (0–200 Pa). The airflow decreases below 0.80 in WC or 200Pa. System design should allow for the increased resistance as filters become dirty.

The data below represents the static pressures at full required air flow used for AHRI testing. 18–24k: 0.5 in-H₂O(125Pa) 30–36k: 0.5 in-H₂O(125Pa) 48–60k: 0.5 in-H₂O(125Pa)

Installation Safety

- Installation must be performed by an authorized dealer or specialist. Defective installation can cause water leakage, electrical shock, or fire.
- 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 requirement of NEC and CEC by authorized personnel only.)
- Contact an authorized service provider for repair or maintenance of this unit. This appliance shall be installed in accordance with national wiring regulations.
- Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and can cause the unit to fail.
- Install the unit in a firm location that can support the unit's weight. If the chosen location cannot support the unit's weight, or the installation is not done properly, the unit may fall and cause serious injury and damage.
- Install drainage piping according to the instructions in this manual. Improper drainage may cause water damage to your home and property.
- For units that have an auxiliary electric heater, do not install the unit within three (3) feet of any combustible materials.
- 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 fire.
- Do not turn on the power until all work has been completed.
- When moving or relocating the air handler, consult experienced service technicians for disconnection and re-installation of the unit.
- Excessive Weight Hazard - Use two (2) or more people when moving and installing the unit. Failure to do so can result in back or other type of injury.

OPERATING TEMPERATURES

Your air handler is designed to operate in the following indoor and outdoor temperatures. When your air handler is used outside of the following temperature ranges, certain safety features may activate and turn off the unit to protect it from damage. We strongly suggest keeping the unit plugged in at all times when temperatures are below 32°F (0°C) for smooth operation.

TEMPERATURE RANGES

	COOL mode	HEAT mode	DRY mode
Indoor Air Temperature	60°F - 90°F (16°C - 32°C)	32°F - 86°F (0°C - 30°C)	50°F - 90°F (10°C - 32°C)
Outdoor Air Temperature	5°F - 122°F (-15°C - 50°C)	-13°F - 75°F (-25°C - 24°C)	32°F - 122°F (0°C - 50°C)







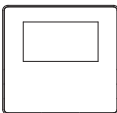
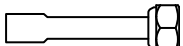


To further optimize the performance of your unit, do the following:

- Keep doors and windows closed.
- Limit energy usage by using TIMER ON and TIMER OFF features.
- Do not block air inlets or outlets.
- Regularly inspect and clean air filters.

ACCESSORIES

INCLUDED INSTALLATION ACCESSORIES

The air conditioning system comes with the following accessories. These are usually packaged in the air outlet. Remove before install.

ACCESSORY	QUANTITY	IMAGE	ACCESSORY	QUANTITY	IMAGE
Manual	3		Cable Ties	2	
Remote Control	1		Foam	4	
Battery	2		Flare Nut	2	
Wired Remote Controller (accs included)	1		Braze To Flare Adapter	2	
Drain Fitting	1		Gasket	1	

NOTE



The Durastar wired control (DRSTAT100) 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.

FIELD SUPPLIED INSTALLATION ACCESSORIES

The following installation accessories are required and must be purchased separately.

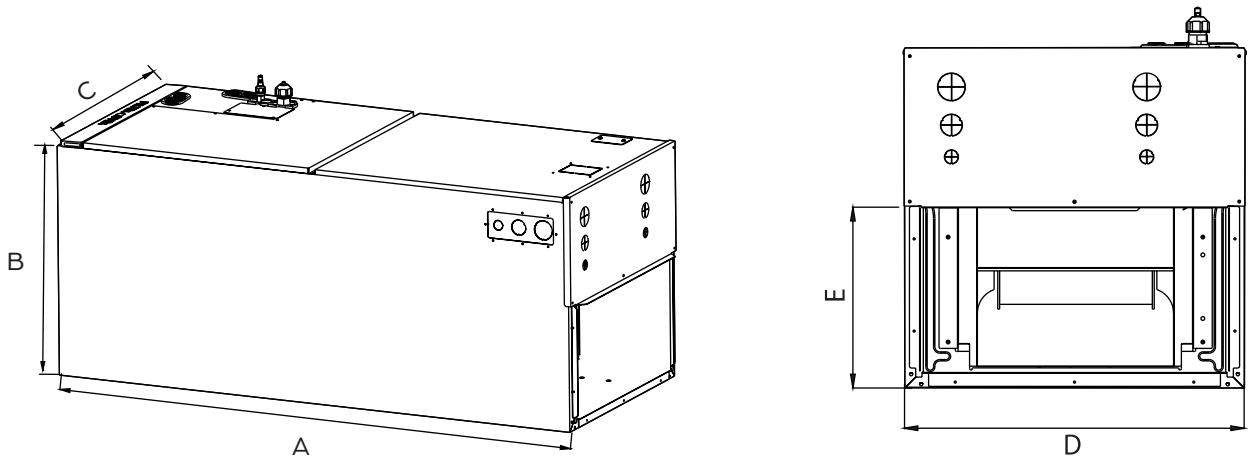
- Refrigerant piping (line set)
- Filter
- Indoor and outdoor connection wire
- Outdoor power supply cord
- Drain pipe
- Pipe and cable wrapping tape
- Wall hole sleeve and cover
- Putty
- Wiring u-lugs

TOOLS NEEDED

The following tools are required for installation.

- Phillips screwdriver
- Drill with 2 1/2" or 3 1/2" (indoor unit model depending) core bit
- Vacuum pump
- HVAC manifold gauge set
- Micron Gauge
- Refrigerant leak detector
- Copper pipe cutter
- Flaring tool
- Burr reamer
- Crescent or spanner wrench
- Hexagonal wrench set
- Torque wrench
- Multimeter
- Electro-probe
- Level
- Hammer
- Wire strippers
- Wire crimper

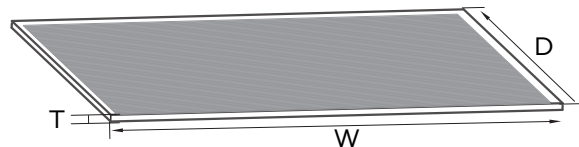
UNIT DIMENSIONS



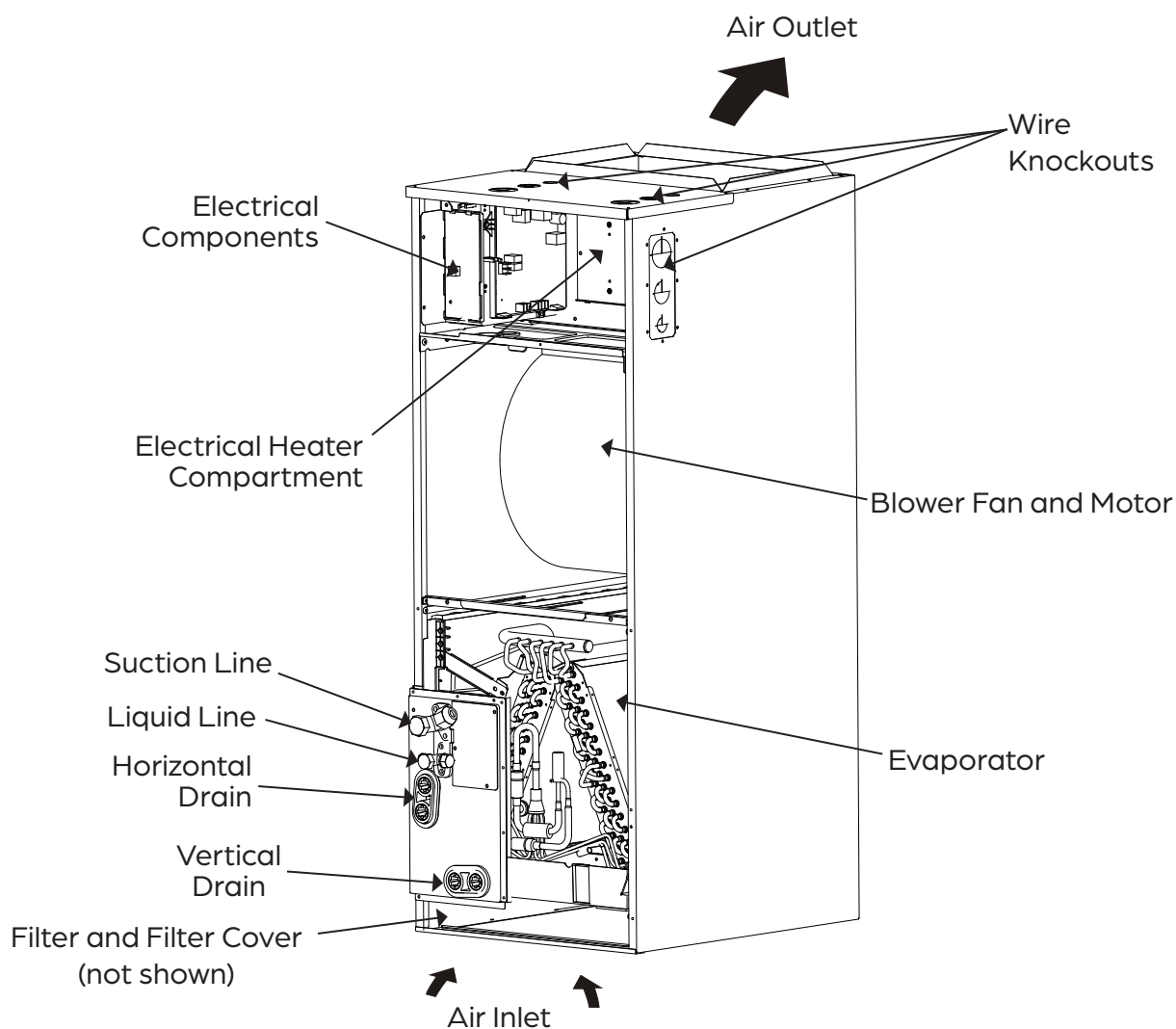
Model BTU	Dimensions				
	A (Height) in (mm)	B (Depth) in (mm)	C (Width) in (mm)	D in (mm)	E in (mm)
30K - 48K	49 (1245)	21 (533)	21 (533)	19-5/16 (490)	10-1/4 (260)
60K	53 (1346)	21 (533)	24-1/2 (622)	22-7/8 (580)	10-1/4 (260)

FILTER SIZE

Nominal Size	30k-48k	60k
Width in (mm)	20 (495)	24 (584)
Depth in (mm)	20 (508)	20 (508)
Thickness in (mm)	1 (25)	1 (25)



PARTS IDENTIFICATION



NOTE

Illustrations in this manual are for explanatory purposes. The actual shape of your equipment may vary slightly.

INSTALLATION PREPARATION

**NOTE**

The installation must be performed in accordance with the required local and national standards. The installation may be slightly different in different areas.

SELECT INSTALLATION LOCATION

Before installing the indoor unit, you must choose an appropriate location. The following standards must be met for an appropriate location for the unit.

Install the unit:

- With enough room for installation (connecting pipe and drainage) and maintenance.
- On a structure that can support its weight. If the structure is too weak, the unit may fall and cause personal injury, unit and property damage, or death.
- With heating elements at least 18 inches above the floor in a garage. Failure to follow these instructions can result in death, explosion, or fire.
- Cables and wires at least three (3) feet / one (1) meter from televisions or radios to prevent static or image distortion. Depending on the appliances, a three (3) feet / one (1) meter distance may not be sufficient.

DO NOT install the unit in:

- A wet environment. Excessive moisture can corrode the equipment, electrical components, and cause electrical shorts.
- A coastal area with high salt content in the air.
- Areas with strong magnetic waves.
- Areas with oil drilling or fracking.
- Areas where there may be detergent or other corrosive gases in the air, such as bathrooms or laundry rooms.
- Areas that store flammable materials or gas. Danger of explosion. Keep flammable materials and vapors, such as gasoline, away from air handler.
- Areas where the air inlet or outlet of the indoor or outdoor unit may be obstructed.

**NOTE**

In addition, you must be aware of needed clearance space, installation direction, and duct requirements. These items are covered in the following pages.

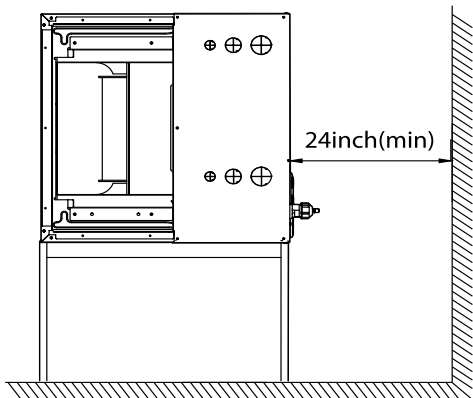
RECOMMENDED CLEARANCE AROUND UNIT



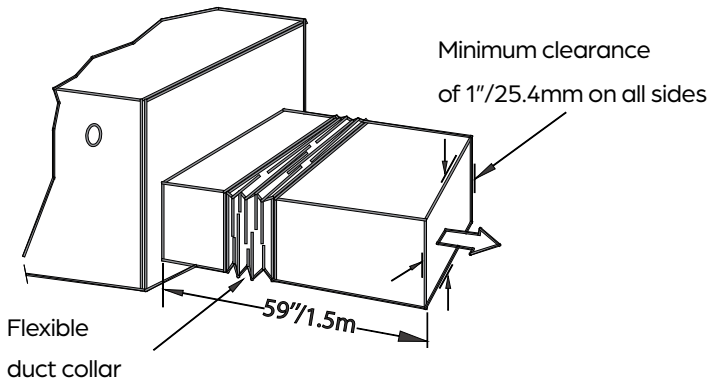
NOTE

Leave 24" of clearance in front of the cabinet doors for service space.

Horizontal Installations



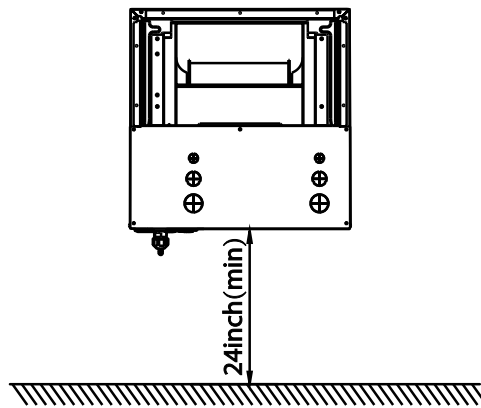
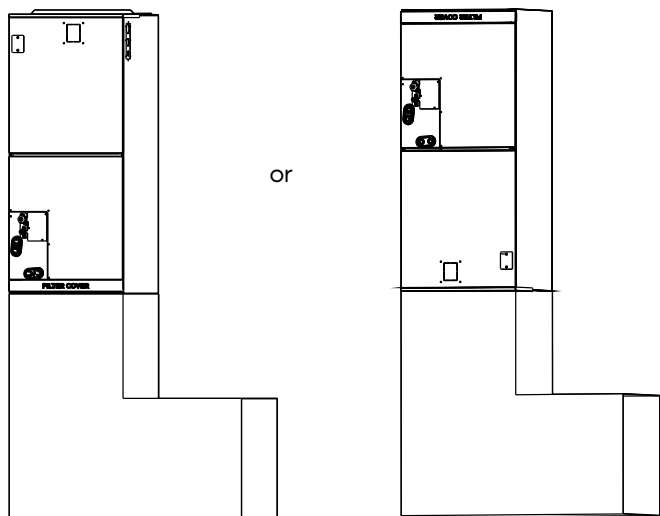
Horizontal installations



The outlet side pipe length 59"/1.5m.

Vertical Installations

When installed vertically (upward or downward), the lower end of the air outlet needs to be connected to the L-shaped metal air duct and fastened by screws.



Vertical installations

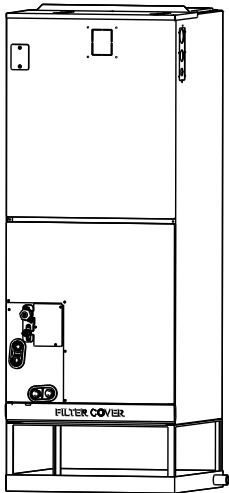
DETERMINE INSTALLATION DIRECTION

The units can be installed in a vertical (up or down) or horizontal (right or left) configuration. Vertical down and horizontal right will require changing the direction of the evaporator coils.

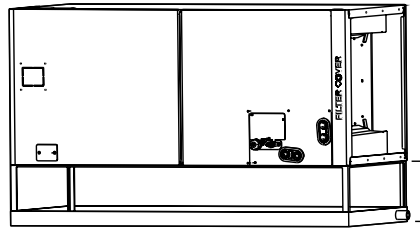


WARNING

It is recommended that a field supplied secondary drain pan is installed with a cut-off switch. This is especially true when the installation is above or in a finished living space. Local codes may require this.



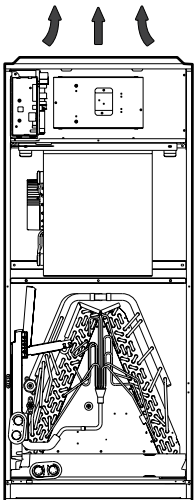
Vertical up



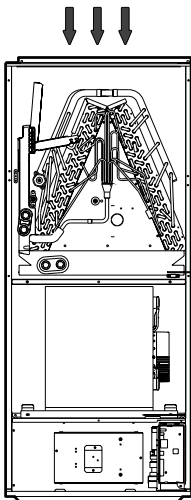
Horizontal

At least
3in(76mm)
Make sure wiring
is not laying in
the pan.

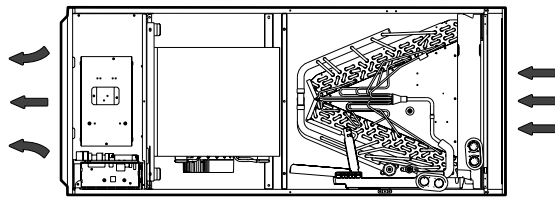
Airflow Direction



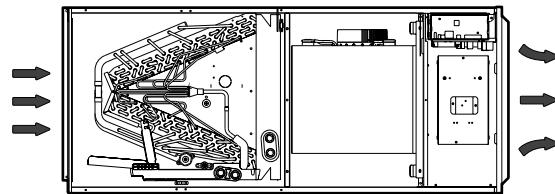
Upflow



Downflow



Horizontal left



Horizontal right



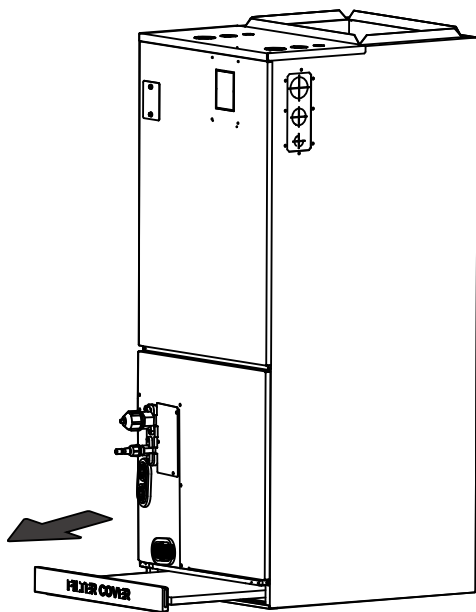
NOTE

Vertical up and horizontal left installations do not need to change the direction of the evaporator.

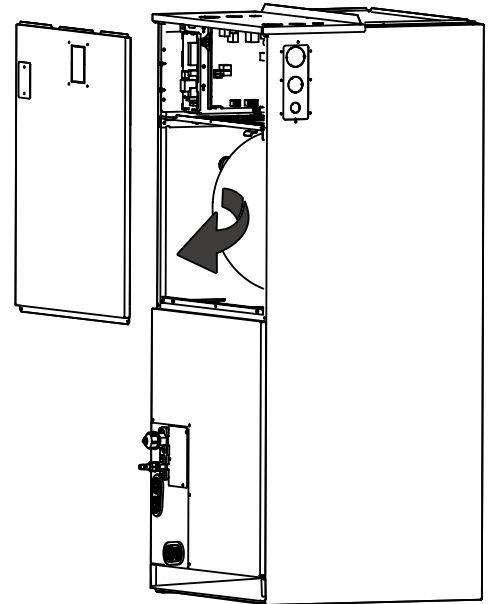
CONVERSION INSTRUCTIONS FOR VERTICAL DOWN AND HORIZONTAL RIGHT INSTALLATION

STEP 1. REMOVE THE FILTER

Remove the filter door, then take the filter out.

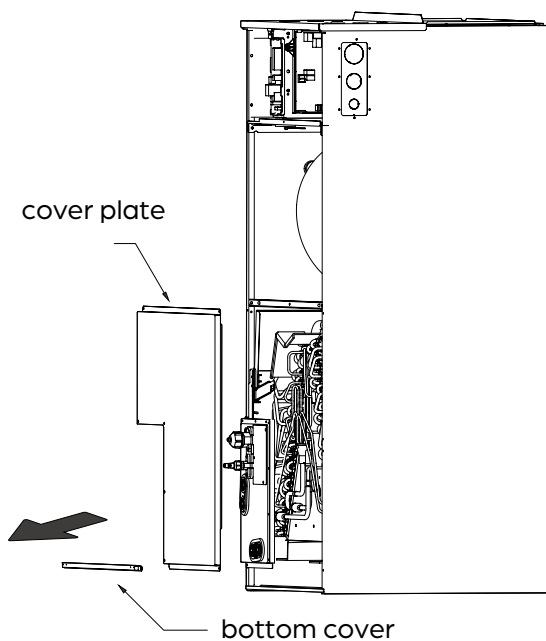


STEP 2. REMOVE THE UPPER COVER



STEP 3. REMOVE THE EVAPORATOR COVER PLATE

Remove the bottom cover first, then remove the cover plate.



STEP 4. UNPLUG SENSORS T1, T2, T2A, T2B AND EEV FROM THE CONTROL BOARD

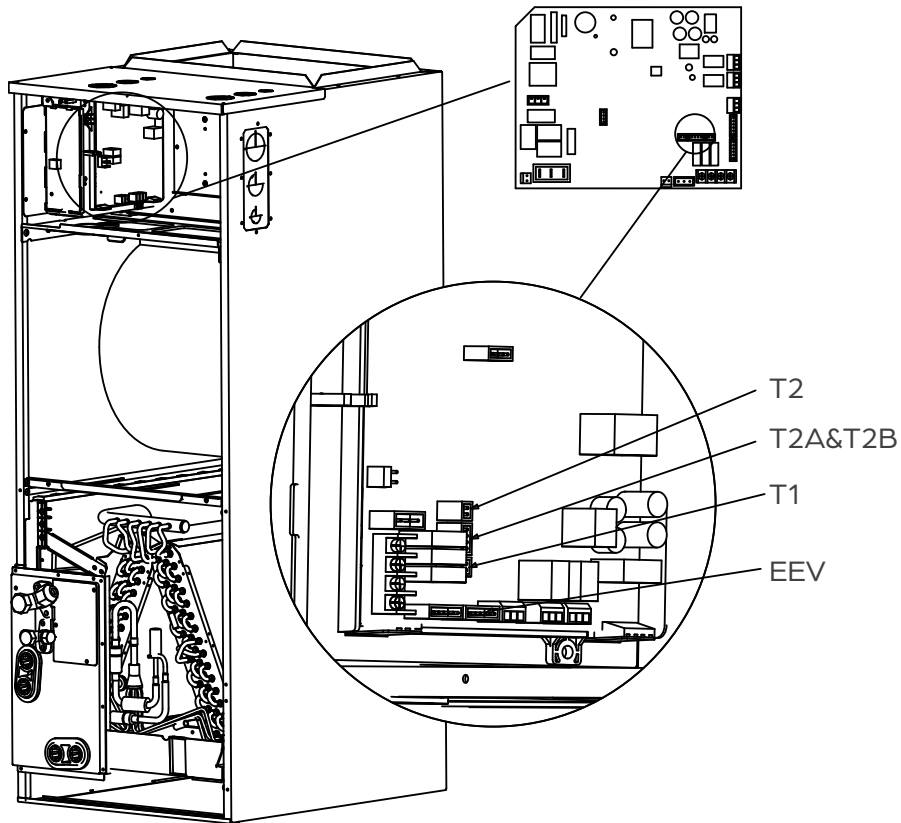
T1: Room temperature sensor

T2: Evaporator central sensor plug (only some models)

T2A: Evaporator input sensor plug (only some models)

T2B: Evaporator output sensor plug

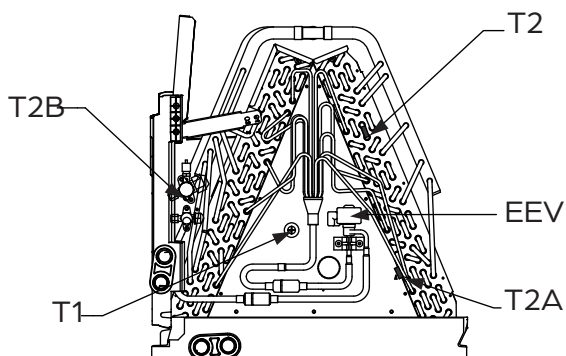
EEV: Electronic Expansion Valve



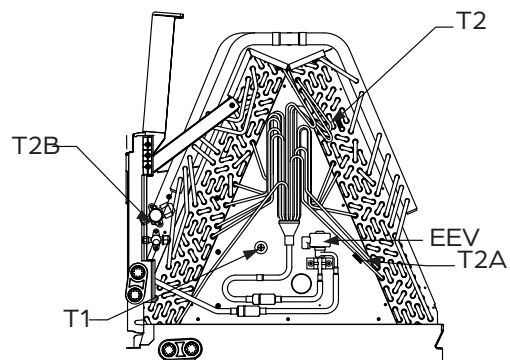
STEP 5. UNLATCH THE ADJUSTABLE WIRE TIES ON THE T1, T2, T2A, T2B AND EEV SENSOR CABLES.

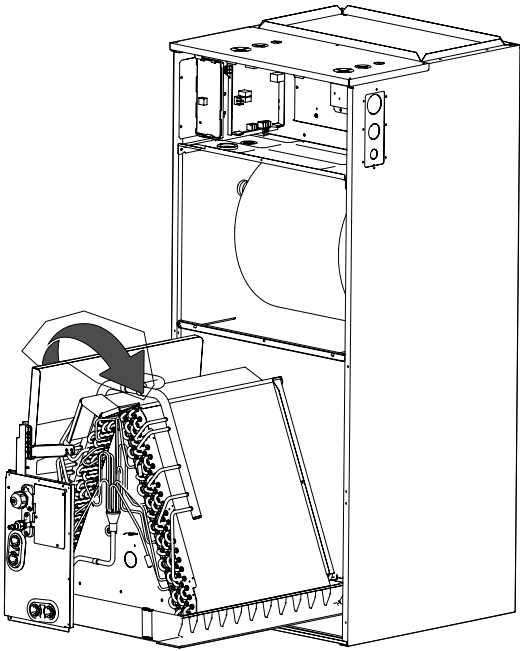
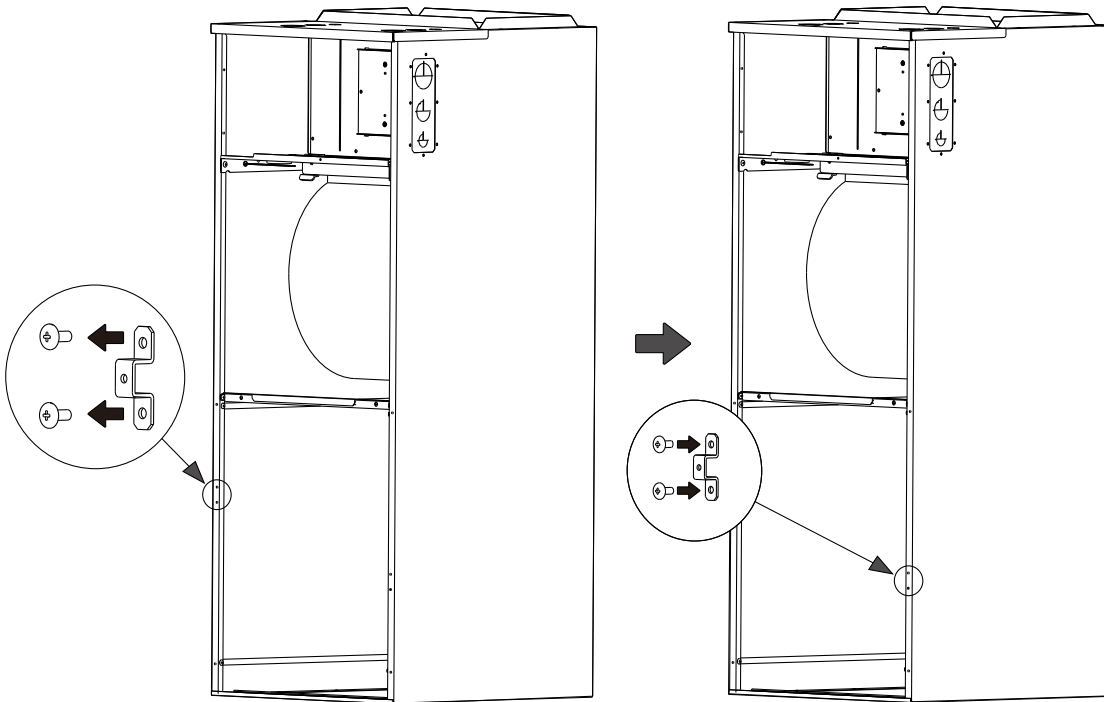
Cut wire ties clamping wires to the coil as necessary to give slack.

30-48k Units

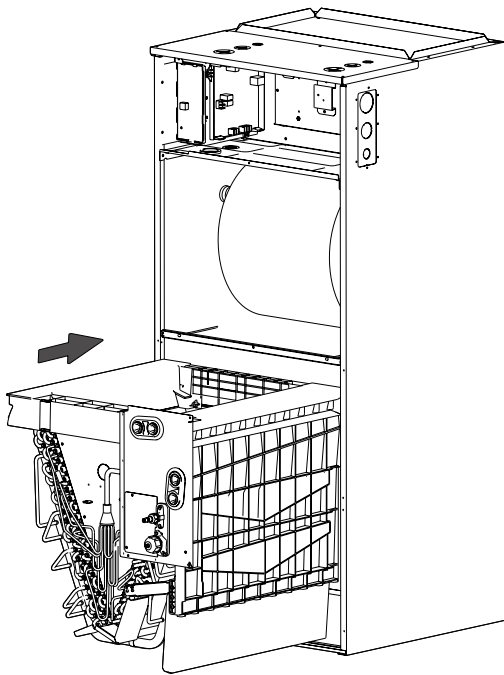


60k Units



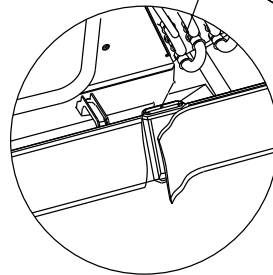
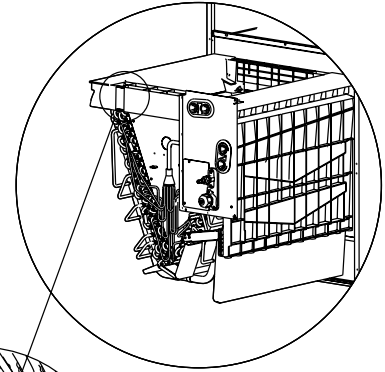
STEP 6. REMOVE THE EVAPORATOR AND DRAIN PAN.**STEP 7. ADJUST THE MOUNTING BRACKET TO THE PRE-DRILLED HOLES ON THE LEFT SIDE OF THE CABINET.**

STEP 8. ROTATE THE COIL 180 DEGREES AND REINSTALL THE EVAPORATOR AND DRAIN PAN.

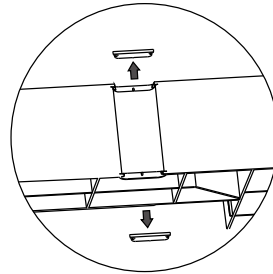


STEP 9. REINSTALL T1, T2 SENSOR PLUGS AND TIE UP THE SENSOR WIRES

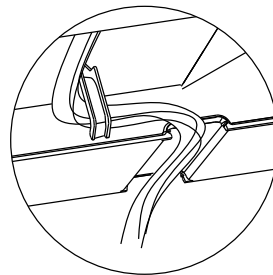
The wire body needs to pass through the wire groove from the drain pan and be stuck on the hook of the drain pan.



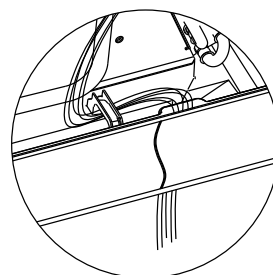
Cut the foam gasket.



Remove knockouts as shown in the figure.



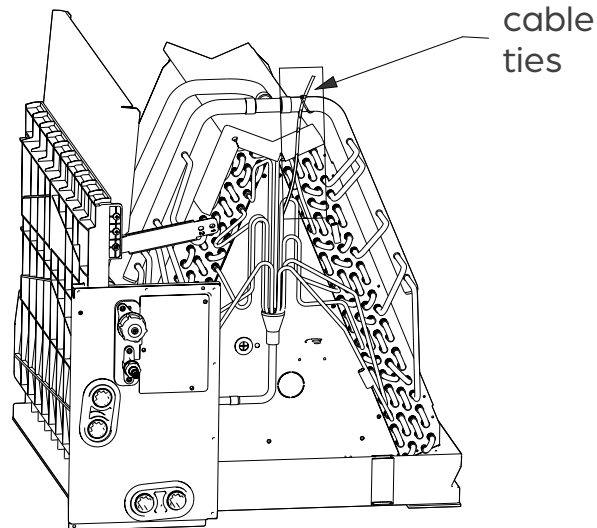
Hook the wire into the buckle and go down from the wire slot.



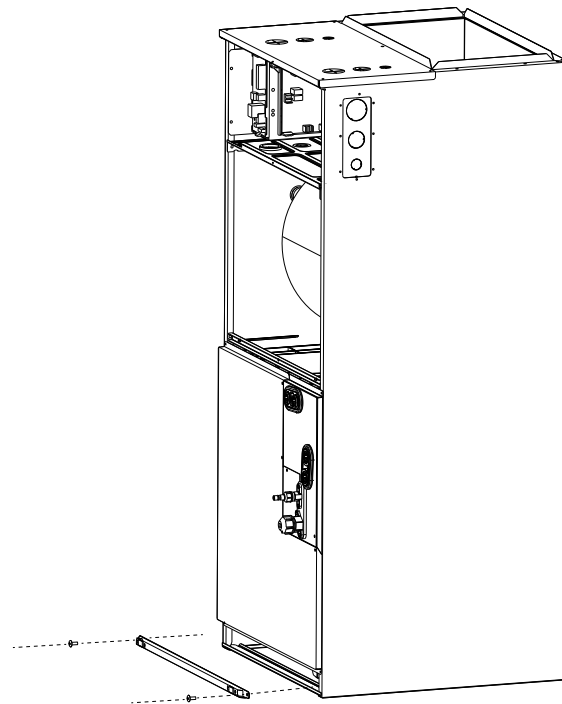
Replace foam gasket over wires.

STEP 10. USE CABLE TIES TO FIX THE ROOM TEMPERATURE SENSOR WIRE TO THE PIPES ON THE TOP OF THE EVAPORATOR.

Leave the sensor overhanging enough to not be affected by the temperature of the pipe.

**STEP 11. REINSTALL THE EVAPORATOR AND FILTER COVER PLATES.**

Place unit into desired downflow or horizontal right position.



AIR HANDLER INSTALLATION

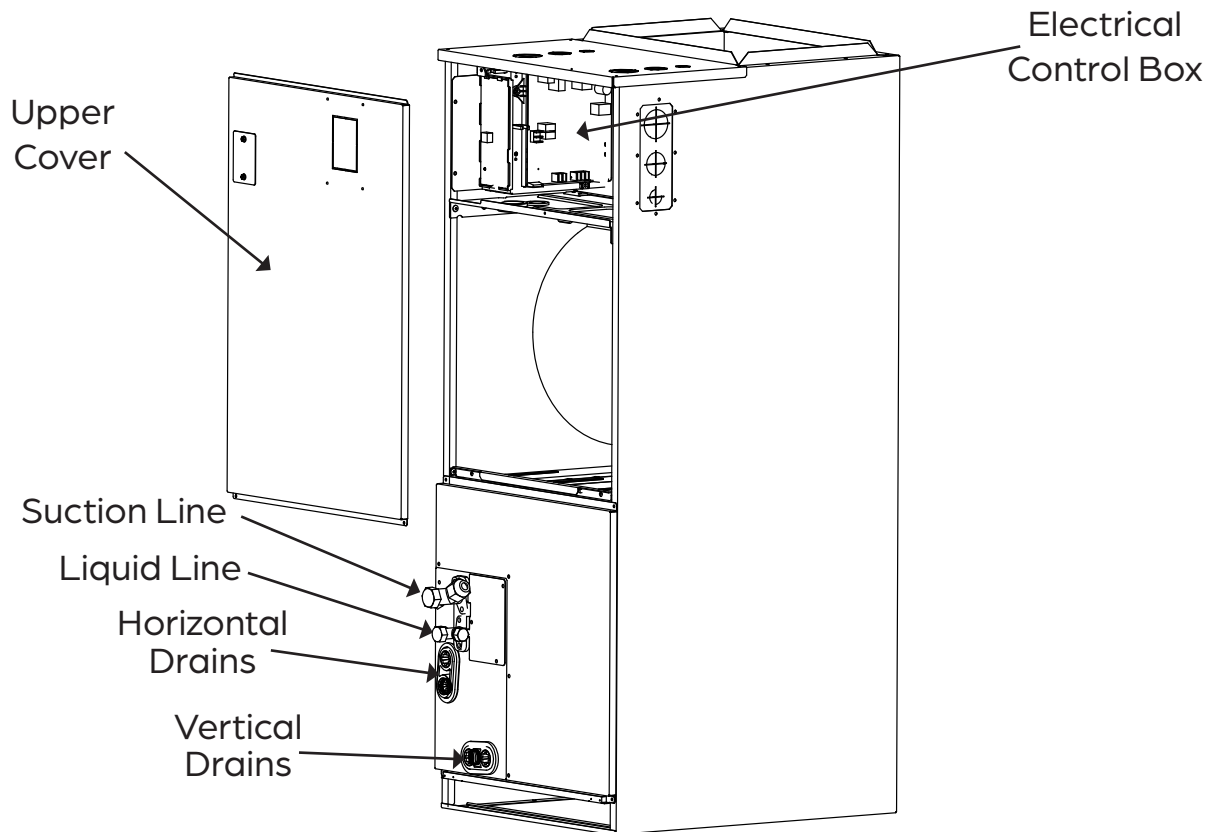
STEP 1: CONSIDER DUCTWORK AND CONDENSATE PIPE INSTALLATION REQUIREMENTS.

STEP 2: CONNECT CONDENSATE PIPE AND REFRIGERANT PIPING.

STEP 3: IF INSTALLING AN OPTIONAL AUXILIARY ELECTRIC HEATER, REFER TO THE HEATER INSTALLATION SECTION FOR WIRING DIAGRAMS AND EXPLANATION.

STEP 4: INSTALL OPTIONAL DEVICES.

STEP 5: CHECK AIR FLOW AND PERFORM A TEST RUN.



DUCT REQUIREMENTS

**NOTE**

This unit is not designed for non-ducted (free-blow) applications

- Air supply and return may be handled in one of several ways best suited to the installation (See unit dimensions for duct inlet and outlet dimensions). The vast majority of problems encountered with ducted systems can be linked to improperly designed or installed duct systems. It is critical for the function and longevity of the unit that the ductwork is correctly designed and installed.
- Use flexible duct collars to minimize the transmission of vibration/noise into the conditioned space.
- It is recommended to use lined return and supply duct near the unit when noise is a concern.
- The ductwork should be assembled according to the instructions.
- Wrap ductwork with insulation as specified by local codes, especially when installing in an unconditioned space. This will avoid condensation formation and building damage.
- The supply air duct connection should be properly sized by use of a transition to match the unit opening.
- All ducts should be suspended using flexible hangers and never fastened directly to the structure.

**WARNING**

Do not install this air handler or draw return air from where a gas-fueled appliance (i.e., water heater), or carbon monoxide-producing device (i.e., wood fireplace) is installed.

**WARNING**

There must be an airtight seal between the bottom of the air handler and the return air plenum. Use fiberglass sealing strips, foil duct tape, caulking, or an equivalent sealing method between the plenum and the air handler cabinet to ensure a tight seal.

CONDENSATE PIPING INSTALLATION

- Insulate all piping to prevent condensation, which could lead to water damage.
- The drainpipe is used to drain water away from the unit. If the drainpipe is bent or installed incorrectly, water may leak and cause a water-level switch malfunction.
- In HEAT mode, the outdoor unit will discharge water. Ensure that the drain hose is placed in an appropriate area to avoid water damage and icy conditions on walkways.
- DO NOT pull the drainpipe forcefully. This could disconnect it.
- Please apply sealant around the places where the wires, refrigerant pipes and condensate pipes enter the cabinet.
- Use duct tape or flexible sealant to seal closed any space around the holes where the drain lines exit the cabinet. Warm air must not be allowed to enter through any gaps or holes in the cabinet.
- After removal of drain pan plug(s), check drain hole(s) to verify that drain opening is fully open and free of any debris. Also check to make sure that no debris has fallen into the drain pan during installation that may plug up the drain opening.
- On units where the blower “draws” rather than “blows” air through the coil, traps must be installed in the condensate drain lines (primary and auxiliary, if used). Traps prevent the blower from drawing air through the drain lines into the air supply.

NOTE



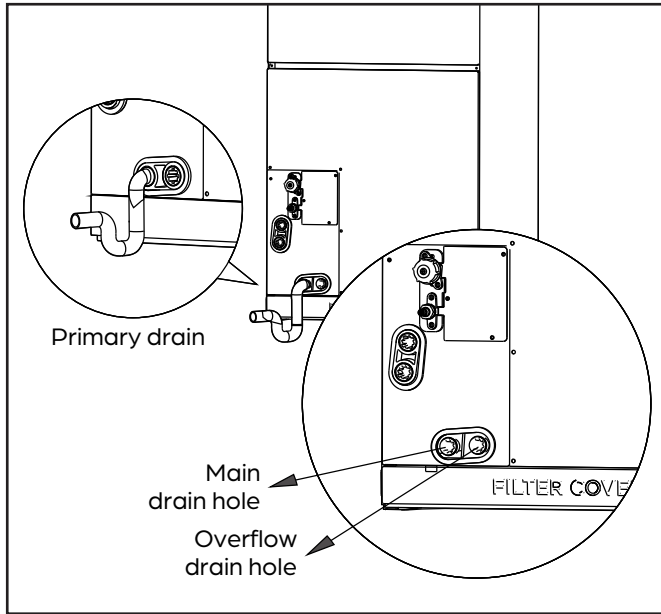
A field-fabricated secondary drain pan, with a drain pipe to the outside of the building, is required in all installations over a finished living space or in any area that may be damaged by overflow from the main drain pan. The drain pan must be installed under the entire unit and its condensate drain line must be routed to a location such that the user will see the condensate discharge.

For horizontal installations, a secondary drain pan-not supplied-must be installed.

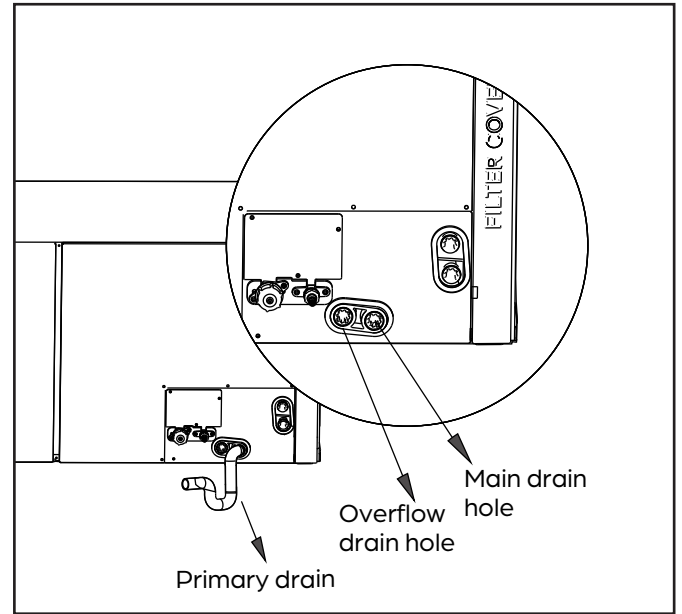
Drain Hole Location

The air handler has a primary and overflow drain hole for both vertical and horizontal installations. Make sure the factory installed seal plugs are tight when drains are not in use. Incorrect installation could result in leaks and flooding. See drain hole positions below.

Vertical Installation

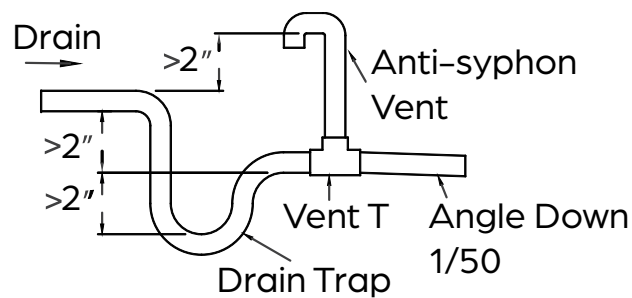


Horizontal Installation



Drain Trap Format

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.



WARNING

The drainpipe outlet should be at least 1.9" above the ground or anticipated snowfall line. If it touches the ground, the drain may become blocked.

REFRIGERANT PIPING CONNECTION

- All field piping must be completed by a licensed technician and must comply with the local and national regulations.
- When the air handler 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 both toxic and may be flammable. Ensure there is no refrigerant leakage after completing the installation work

Refrigerant Piping Specifications

Capacity	Refrigerant Connection Size	Standard Length w/ Precharged Refrigerant	Additional Refrigerant Charge	Maximum Length of Piping	Maximum Rise Length
	in (L x G)	ft (m)	oz/ft (g/m)	ft (m)	ft (m)
30k	3/8 x 3/4	25 (7.6)	0.69 (65)	164 (50)	82 (25)
36k	3/8 x 3/4	25 (7.6)	0.69 (65)	213 (65)	98.4 (30)
48k	3/8 x 3/4	25 (7.6)	0.69 (65)	213 (65)	98.4 (30)
60k	3/8 x 7/8	25 (7.6)	0.69 (65)	213 (65)	98.4 (30)



NOTE

Adapters are included with the indoor unit and outdoor unit to convert the flared fittings to brazed if necessary.

OIL TRAPS

Oil traps are necessary for the continued performance of the system if the indoor and outdoor units are installed at significantly different heights.

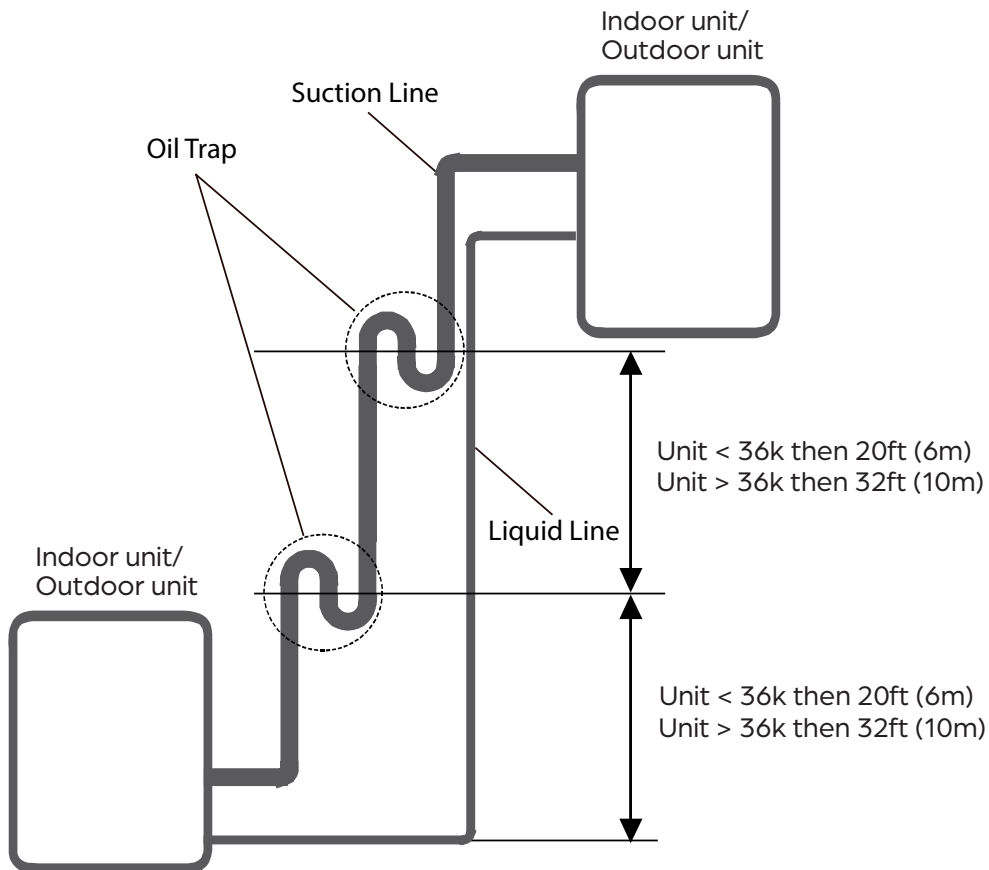


CAUTION

If oil flows back into the outdoor unit's compressor, this might cause liquid compression or deterioration of oil return. Oil traps in the rising gas piping can prevent this.

If the unit is **less than** 36000Btu/h an oil trap should be installed every 20ft (6m) of vertical suction line rise.

If the unit is **greater than** 36000Btu/h an oil trap should be installed every 32.8ft (10m) of vertical suction line rise.

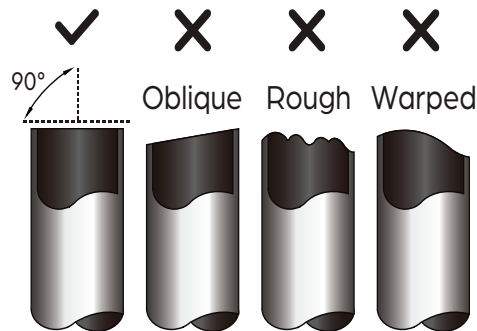


Refrigerant Pipe Connection Instructions

STEP 1: CUT PIPES

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

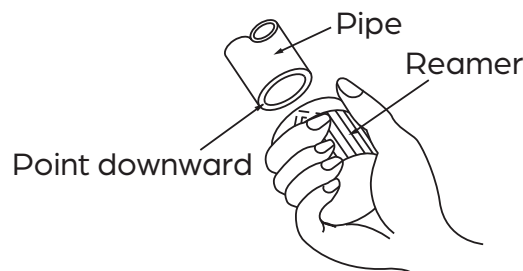
1. Measure the distance between the indoor and outdoor units.
2. Using a pipe cutter, cut the pipe length a little longer than the measured distance.
3. Make sure that the pipe is cut at a perfect 90° angle.
4. Do not damage, deform, or dent the pipe while cutting.



STEP 2: REMOVE BURRS

Burrs can affect the airtight seal of the refrigerant piping connection and must be completely removed.

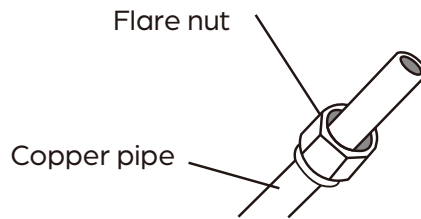
1. Hold the pipe at a downward angle to prevent burrs from falling into the pipe.
2. Using a reamer or deburring tool, remove all burrs from the cut section of the pipe.



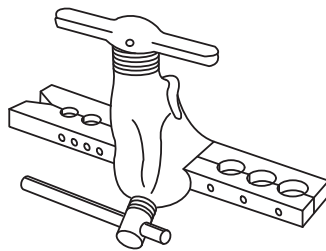
STEP 3: FLARE PIPE ENDS

Proper flaring is essential to achieve an airtight seal.

1. After removing burrs from cut pipe, seal the ends with PVC tape to prevent foreign materials from entering the pipe.
2. Sheath pipe with insulating material.
3. Place flare nuts on both ends of the pipe. Make sure they are facing in the right direction as you cannot change their orientation after flaring.



4. Remove PVC tape from ends of pipe when ready to perform flaring.
5. Clamp flare form on the end of pipe. The end of the pipe must extend beyond the edge of the flare form in accordance with the pipe extension table.



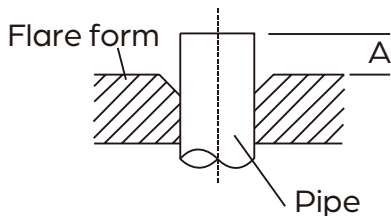
PIPE EXTENSION BEYOND FLARE FORM

Outer Diameter of Pipe Inches (mm)	"A" Minimum Extension Inches (mm)	"A" Maximum Extension Inches (mm)
Ø 3/8" (9.5mm)	0.04" (1.0mm)	0.063" (1.6mm)
Ø 3/4" (19.1mm)	0.078" (2.0mm)	0.094" (2.4mm)
Ø 7/8" (22.0mm)	0.078" (2.0mm)	0.094" (2.4mm)



WARNING

Do not use excessive torque. Excessive force can break the nut or damage the refrigerant piping. You must not exceed the torque requirements shown in the table above.



TIP: THICKNESS COMPARISON

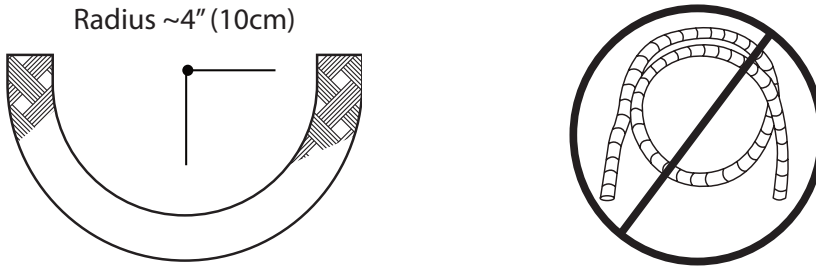
- 0.0275" = A Thumbnail
- 0.04" = A Dime
- 0.078" = A Nickle

6. Place flaring tool onto the form.
7. Turn the handle of the flaring tool clockwise until the pipe is fully flared.
8. Remove the flaring tool and flare form, then inspect the pipe for cracks and even flaring.

STEP 4: CONNECT PIPES

When connecting refrigerant pipes, be careful not to use excessive torque or to deform the piping in any way. You should first connect the low-pressure pipe, then the high-pressure pipe.

When bending connective refrigerant piping, the minimum bending radius is 4 inches (10cm). Do not leave coils in the refrigerant line sets. Remove excess line length to ensure proper system operation.

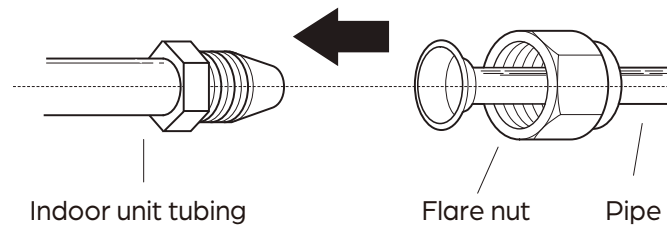


WARNING

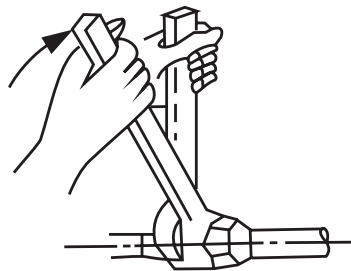
Do not leave coils in the refrigerant line sets. All excess line length must be removed to ensure proper system operation.

Connecting Piping

1. Apply a thin coat of refrigerant oil on the flare part of the flare nut, but not the threads. If oil is applied to the threads the torque values can not be reached and the seal will leak.
2. Align the center of the two pipes that you will connect.



3. Tighten the flare nut as tightly as possible by hand.
4. Using a wrench, grip the nut on the unit tubing.



5. While firmly gripping the nut on the unit tubing, use a torque wrench to tighten the flare nut according to the torque values in the table in Step 3. Loosen the flaring nut slightly, then tighten again.

Outer Diameter of Pipe Inches (mm)	Tightening Torque lb-ft (Nm)	Flare Dimension "B" Inches (mm)	Flare Shape
Ø 3/8" (9.5mm)	23.6~28.8 (32~39)	0.52~0.53 (13.2~13.5)	
Ø 3/4" (19.1mm)	49.4~74.5 (67~101)	0.91~0.93 (23.2~23.7)	
Ø 7/8" (22.0mm)	62.7~81.1 (85~110)	1.04~1.06 (26.4~26.9)	



NOTE

It is advised to braze a 3/8 **bi-flow** drier on the liquid line near the indoor unit.

6. Thread the line set through the wall and connect it to the outdoor unit.
7. Insulate all the piping, including the valves of the outdoor unit.

Insulate Refrigerant Fittings



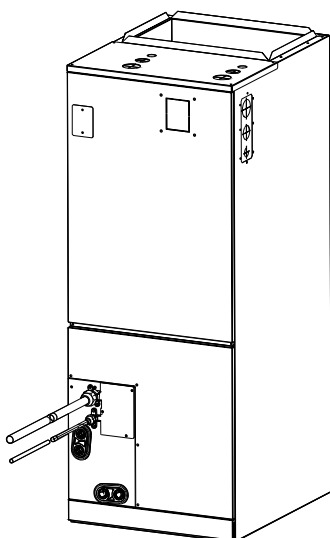
CAUTION

Wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite.



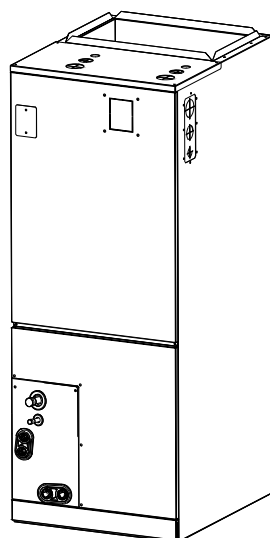
CAUTION

Check to make sure there is no refrigerant leak after completing the installation work. If there is a refrigerant leak, ventilate the area immediately and evacuate the system (refer to the air evacuation section of the outdoor unit manual).

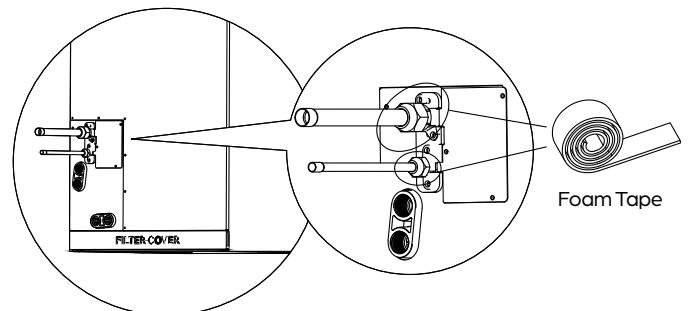


Braze Connection

or



Flare Connection



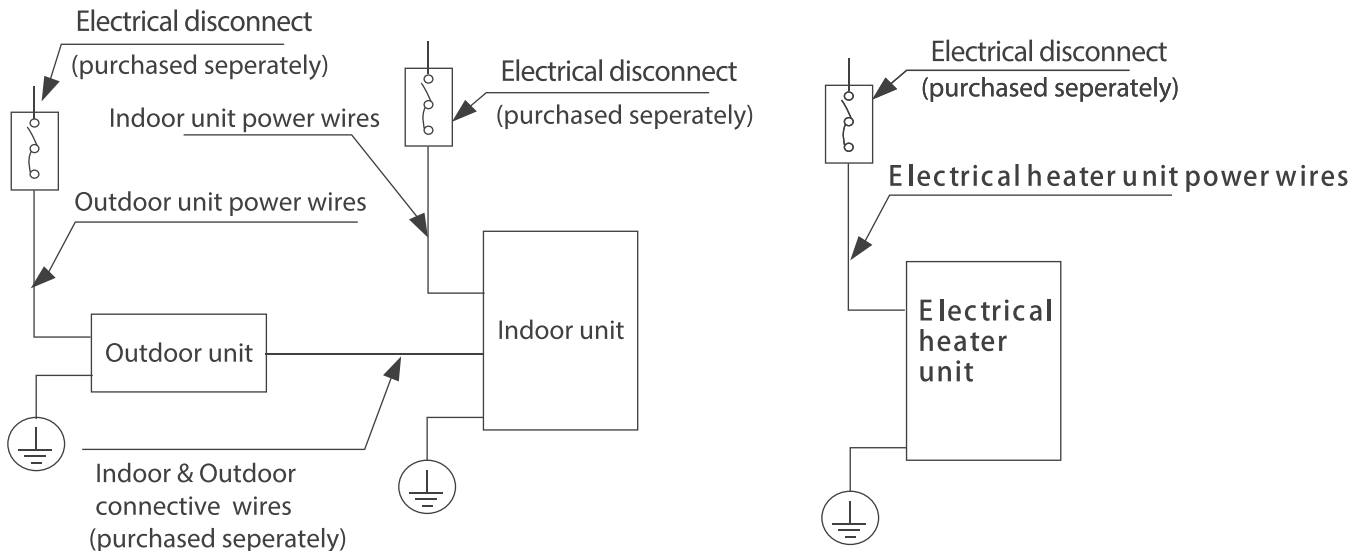
Foam Tape

WIRING OVERVIEW



NOTE

The diagrams are for explanatory purposes only. Your unit may be slightly different.



ELECTRIC HEATER INSTALLATION (OPTIONAL)

CAUTION



- Installation must be performed by a licensed contractor. Use recommended PPE.
- Before installation, please confirm the electric auxiliary heat module and supplied accessories are complete and free of damage. Do not install if any items are damaged.
- Durastar factory approved heaters are UL rated with the equipment. DO NOT install a non-approved heater, this can cause damage and will not be covered under warranty.
- This heater is for installation in the air handler, DO NOT mount in the ductwork.

For installations requiring supplemental heating, the optional Electric Auxiliary Heat Module is available in sizes 5kW, 8kW, 10kW, and 15kW to accommodate the specific heat load and electrical requirements of each installation. Please refer to the compatibility table below.

INCLUDED ACCESSORIES

ACCESSORY	QUANTITY	ACCESSORY	QUANTITY
Manual	2	Silicone Breaker Cover	1
Gasket Seal	1	Wiring Diagram	1
Screws	7	Circuit Breaker Label	1

AUXILIARY HEATER COMPATIBILITY CHART

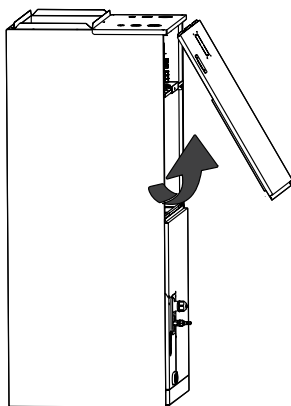
MODEL (Btu/h)	DRHTR05BRKA 5kW	DRHTR08BRKA 8kW	DRHTR10BRKA 10kW	DRHTR15BRKA 15kW
DRAM30S1A (30k)	Y	Y	Y	Y
DRAM36S1A (36k)	Y	Y	Y	Y
DRAM48S1A (48k)		Y	Y	Y
DRAM60S1A (60k)			Y	Y

AUXILIARY HEATER ELECTRICAL DATA

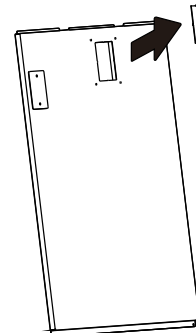
HEATER PART MODEL NUMBER (kW)	CIRCUIT 1 208/230V			CIRCUIT 2 208/230V		
	HEATER AMPS (1)	MCA (1)	MOCP (1)	HEATER AMPS (2)	MCA (2)	MOCP (2)
DRHTR05BRKA (5kW)	18.0/ 20.0	23.0/ 27.0	25.0/ 30.0			
DRHTR08BRKA (8kW)	28.8/ 32.0	37.0/ 42.0	40.0/ 45.0			
DRHTR10BRKA (10kW)	36.0/ 40.0	46.0/ 53.0	50.0/ 60.0			
DRHTR15BRKA (15kW)	18.0/ 20.0	23.0/ 27.0	25.0/ 30.0	36.0/ 40.0	46.0/ 53.0	50.0/ 60.0

INSTALLATION STEPS

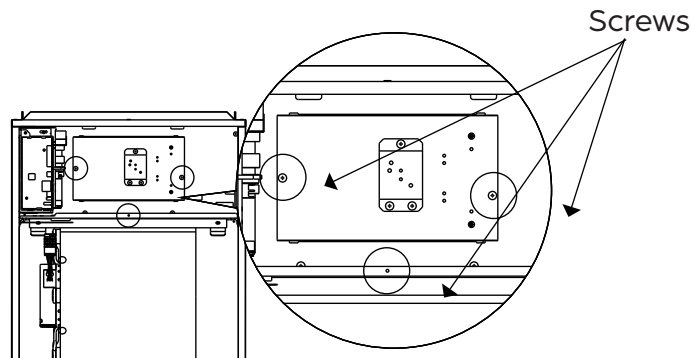
STEP 1: Open the upper cover.



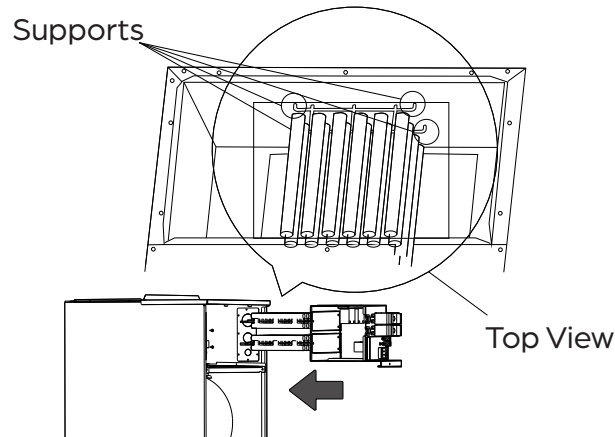
STEP 2: Remove the knock-out hole of the upper cover.



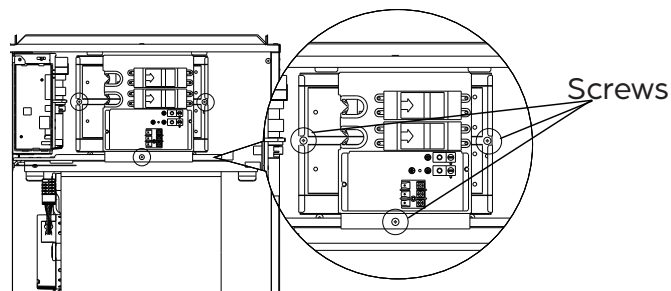
STEP 3: Remove the terminal block and power wires, loosen the screws, and remove the electric auxiliary heating cover.



STEP 4: Install the electric auxiliary heating assembly and note that the support assembly must lock into the support holes in the back of the cabinet.

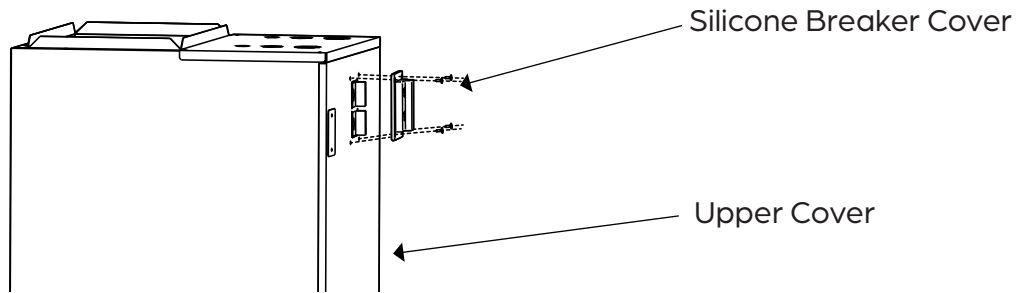


STEP 5: Tighten the mounting screws.



STEP 6: Connect the wiring according to the wiring diagram on page 32. Attach the wiring diagram sticker provided to the inside of the front cover for future reference.

STEP 7. Install the upper cover and the silicone breaker cover.



STEP 8. After installing the electric auxiliary heat module, apply the circuit breaker label included near the silicone breaker cover that was just installed for future reference.

CONFIRM ELECTRIC HEATER WIRING

After the electric heating wiring is connected, please confirm before turning power on that all wiring connections are secure and that wiring size is correct for NEC and local codes.

NOTE



The electric auxiliary heating wiring diagram is packed with the accessories.
If the branch circuit wire length exceeds 100 ft, consult NEC 210-19a to determine the maximum wire length. Use a two (2)% voltage drop.

SPECIFICATIONS	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

Only use copper wire to connect the unit. If wire 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 applicable tables of the National Electric Code (ANSI/NFPA 70).

ELECTRIC AUXILIARY HEATING WIRING DIAGRAMS

NOTE



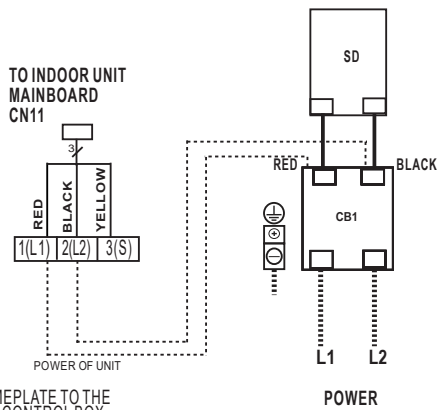
MAKE SURE THE MANUAL MATCHES THE MODEL OF YOUR AIR HANDLER.

The wiring diagrams below are for installing an electric heater in a 24V / RS485 air handler. Terminal 3(S) is not used in this case.

5KW HEAT KIT

:THERMAL CUT-OUT

:THERMAL LINK, SELF-RESETTING



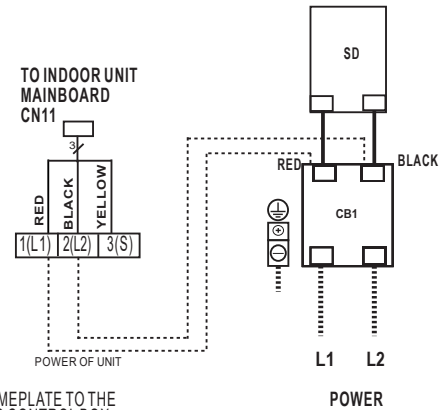
NOTE:
PLEASE ATTACH THE NAMEPLATE TO THE COVER OF THE ELECTRIC CONTROL BOX. ALL THE ROUND HOLES LOCATED ON THE PLATE REPRESENT NUMBERS. PLEASE REFER TO THE INSTALLATION MANUAL FOR DETAILS.

Round hole number	Relay number	Round hole number	Air switch number
○	RELAY 1	○	CB1
○○			
○○○			
○○○○			
○○○○○			

8KW/10KW HEAT KIT

:THERMAL CUT-OUT

:THERMAL LINK, SELF-RESETTING



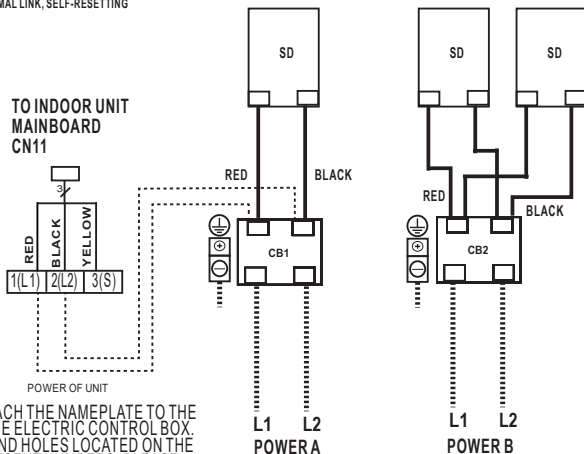
NOTE:
PLEASE ATTACH THE NAMEPLATE TO THE COVER OF THE ELECTRIC CONTROL BOX. ALL THE ROUND HOLES LOCATED ON THE PLATE REPRESENT NUMBERS. PLEASE REFER TO THE INSTALLATION MANUAL FOR DETAILS.

Round hole number	Relay number	Round hole number	Air switch number
○	RELAY 1	○	CB1
○○	RELAY 2		
○○○			
○○○○			
○○○○○			

15KW HEAT KIT

:THERMAL CUT-OUT

:THERMAL LINK, SELF-RESETTING



NOTE:
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: POWER A AND B ARE DIFFERENT POWERS.

Round hole number	Relay number	Round hole number	Air switch number
○	RELAY 1	○	CB1
○○	RELAY 2	○○	CB2
○○○	RELAY 4		
○○○○			
○○○○○			

INDOOR UNIT WIRING

**WARNING**

Failure to follow warnings may lead to equipment damage, injury or death. Field line side wires may remain live, DO NOT perform service or maintenance until the main disconnect is pulled.

**WARNING**

While connecting the wires, strictly follow the wiring diagram, and refer to the nameplate for electrical information. Wire according to NEC and local codes. The refrigerant circuit can become very hot. Keep the interconnection cable away from the copper tube.

Connect the Signal Cable

The signal cable enables communication between the indoor and outdoor units. You must first choose the right cable size before preparing it for connection. Run a continuous length of cable and avoid splicing the cable.

Cable Sizing

Use the correct size cable depending on the communication type (see page 35)

- Non-polar RS485 Communication (S1/S2): 16 AWG stranded, shielded
- 24V Communication: 18 AWG/ 8 conductor thermostat wire
- Power Cables: Determined by the minimum circuit ampacity (MCA) and maximum over current protection (MOCP) of system and the NEC and local codes in your area. Refer to the nameplate to choose the right cable, fuse, or switch.

STEP 1. PREPARE THE CABLE FOR CONNECTION.

- Using wire strippers, strip the insulating jacket from both ends of the signal cable to reveal about 5 in (12 cm) of the wire, then strip the insulation from the ends of the wires.

STEP 2. OPEN THE FRONT PANEL OF THE UNIT.

- Using a screwdriver, remove the cover of the electric control box on your indoor unit.

STEP 3. CONNECT THE WIRES TO THE TERMINALS.

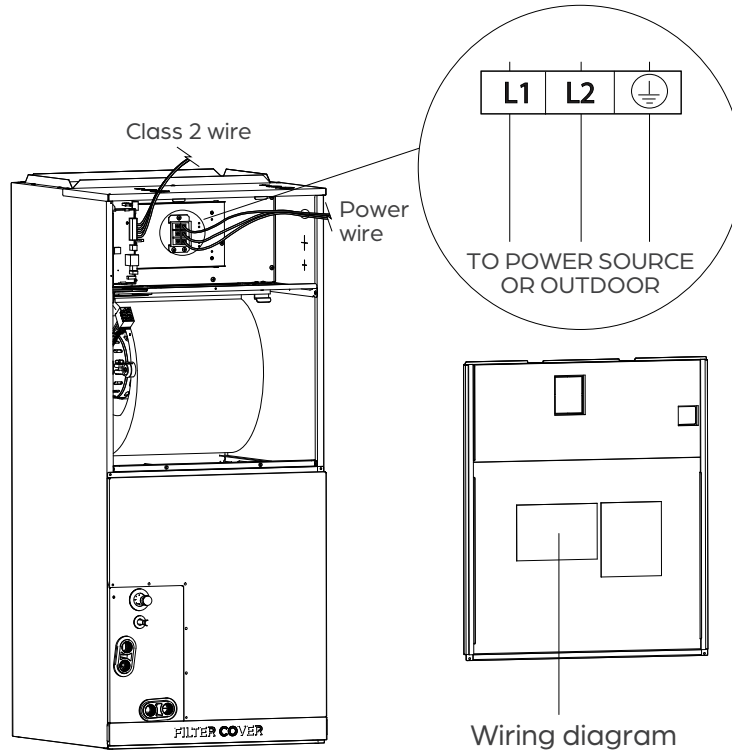
- Thread the power cable and the signal cable through the wire outlet.
- Match the wire colors/labels with the labels on the terminal block. Firmly screw the wires of each wire to its corresponding terminal. Refer to the Serial Number and Wiring Diagram located on the cover of the electric control box.



WARNING

Isolate the power supply leads from the communication wire leads by using different knockouts in the cabinet and/or zip ties.

Wiring Indoor Without Heater



Wiring the Communication Cable

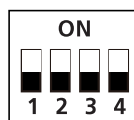


WARNING

TURN OFF POWER BEFORE ADJUSTING DIP SWITCHES.

The air handler ships with DIP SWITCH SW1 defaulted to off as seen below. Under this setting, the system will AUTOMATICALLY detect which of the three connection methods on the following page has been used. In the event of unexpected failure, the SW1 can be switched according to connection methods 1, 2, and 3.

Default Indoor Unit
SW1



WARNING

DO NOT connect 24VAC to the S1/S2 terminals. This will damage the system. Only connect to Class 2 terminals.

Wiring Methods (cont.)

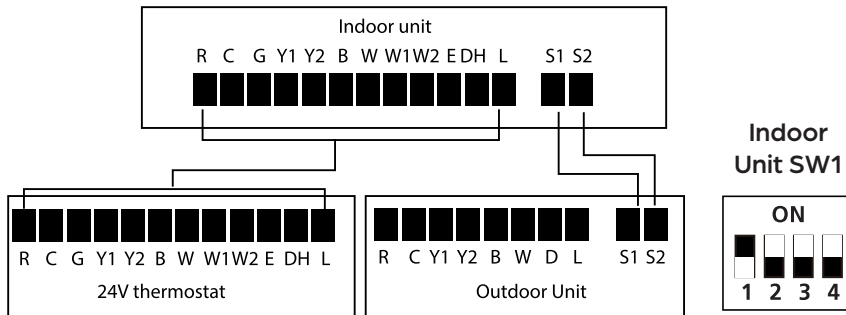


WARNING

Please refer to the wiring nameplate for the wiring method.

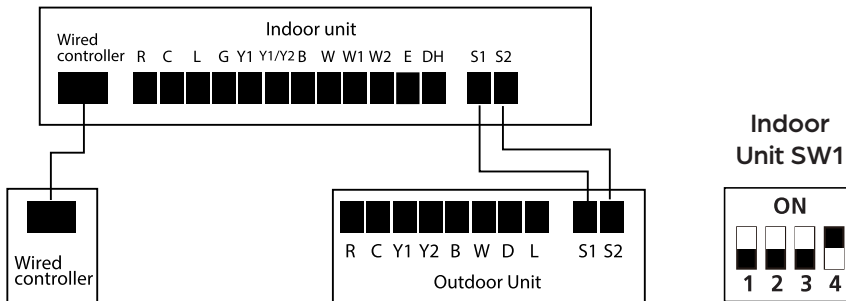
Connection Method 1: RS485 Communication + 24V Thermostat

Use this method to connect a 24V thermostat while the indoor and outdoor are connected via RS485 communication.



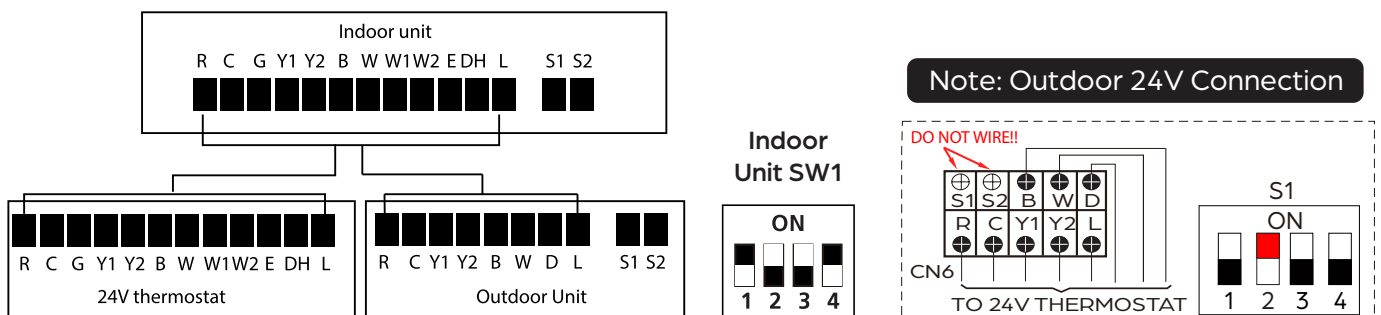
Connection Method 2: RS485 Communication

Use this connection method to connect the DRSTAT100 that is included with the air handler.



Connection Method 3: 24V Communication

Use this method for full 24V communication. Refer to 24V wiring methods on page 39 depending on your application. Note: S1-2 must be flipped on at the outdoor unit.



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 Signal

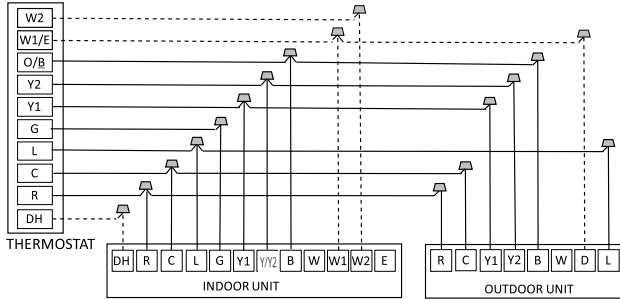
Outdoor Unit Connector

CONNECTOR	PURPOSE
R	24v Power Connection
C	Common
Y1	Low Cooling
Y2	High Cooling
B	Heating Reversing Valve
W	Heating Control
D	Defrost Control
L	System Fault Signal

Connection Method 3 (cont.):

The following wiring diagrams are suitable for the air handler and outdoor with a 24V thermostat.

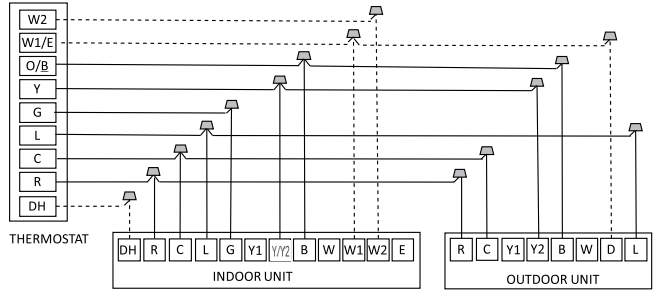
Wiring for 4H and 2C Thermostat



S4-2 Defaults ON: DH function off. Turn switch OFF to activate DH function.

S4-1 Defaults ON: W1 and W2 set for single stage Aux heat. Turn OFF to separate stages.

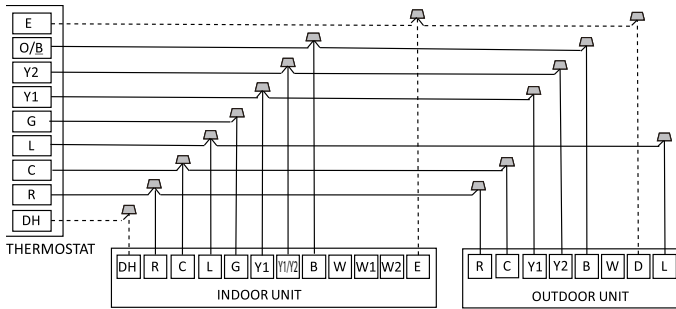
Wiring for 3H and 1C Thermostat



S4-2 Defaults ON: DH function off. Turn switch OFF to activate DH function.

S4-1 Defaults ON: W1 and W2 set for single stage Aux heat. Turn OFF to separate stages.

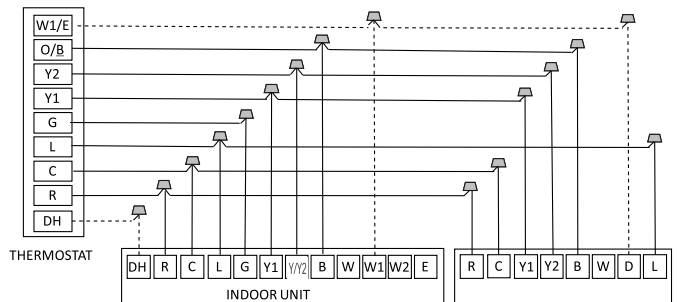
Wiring for 3H and 2C Thermostat



S4-2 Defaults ON: DH function off. Turn switch OFF to activate DH function.

Emergency heating (E) controls two groups of electric heating at the same time.

Wiring for 3H and 2C Thermostat



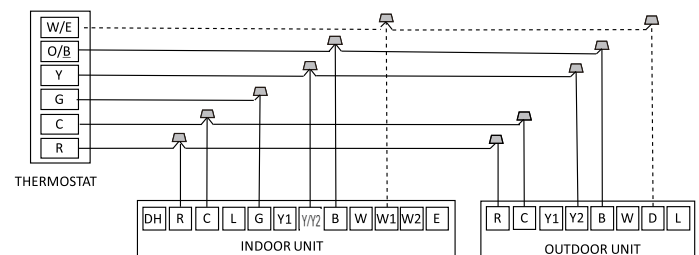
S4-2 Defaults ON: DH function off. Turn switch OFF to activate DH function.

S4-1 Defaults ON: W1 and W2 set for single stage Aux heat. Turn OFF to separate stages.

Wiring for 2H and 2C Thermostat

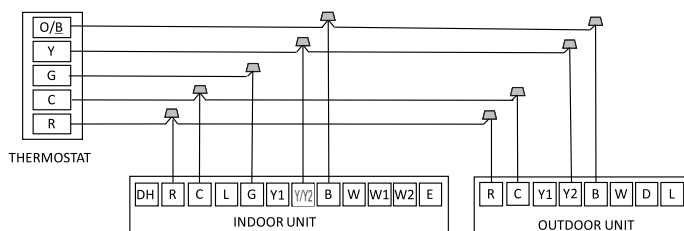


Wiring for 2H and 1C Thermostat

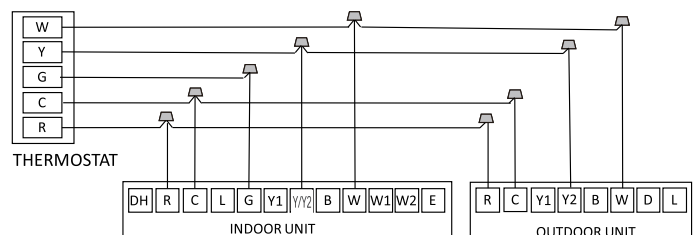


S4-1 Defaults ON: W1 and W2 set for single stage Aux heat. Turn OFF to separate stages.

Wiring for 1H and 1C Thermostat



Wiring for 1H and 1C Thermostat



LED DISPLAY DEFINITIONS

The unit displays status as well as any active fault codes on the LED display. If the unit is functioning normally, the LED will display current temperature setpoint. When a fault code is active, the display will flash quickly the active fault code. Please refer to the fault code table located in the troubleshooting section of the manual for detailed fault code information.

MODE	PRIORITY	G	Y1	Y/ Y2	B	W	W1	W2	E/ AUX	DH/ DS/BK	FAN SPEED	DISPLAY
OFF	/	0	0	0	0	0	0	0	0	*	OFF	0
FAN	7	1	0	0	*	0	0	0	0	*	Low	1
Cooling Stage 1	6	*	1	0	0	0	0	0	0	1	Mid	2
Cooling Stage 2		*	*	1	0	0	0	0	0	1	High	3
Dehumidification 1		*	1	0	0	0	0	0	0	0	Low	4
Dehumidification 2		*	*	1	0	0	0	0	0	0	Low	5
Heat Pump Stage 1	5	*	1	0	1	0	0	0	0	1	Mid	6
Heat Pump Stage 2		*	*	1	1	0	0	0	0	1	High	
Heat Pump Stage 2		*	*	*	*	1	0	0	0	1	High	7
Electric Heater Kit 1	3	*	0	0	*	0	1	0	0	*	Turbo	8
Electric Heater Kit 2		*	0	0	*	0	0	1	0	*	Turbo	
Electric Heater Kit 1 and Kit 2		*	0	0	*	0	1	1	0	*	Turbo	9
Heat Pump Stage 1 + Electric Heater Kit 1	4	*	1	0	1	0	1	0	0	1	Turbo	10
Heat Pump Stage 1 + Electric Heater Kit 2		*	1	0	1	0	0	1	0	1	Turbo	
Heat Pump Stage 2 + Electric Heater Kit 1		*	*	1	1	0	1	0	0	1	Turbo	
Heat Pump Stage 2 + Electric Heater Kit 1		*	*	*	*	1	1	0	0	1	Turbo	
Heat Pump Stage 2 + Electric Heater Kit 2		*	*	1	1	0	0	1	0	1	Turbo	
Heat Pump Stage 2 + Electric Heater Kit 2		*	*	*	*	1	0	1	0	1	Turbo	
Heat Pump Stage 1 + Electric Heater Kit 1 and Kit 2		*	1	0	1	0	1	1	0	1	Turbo	11
Heat Pump Stage 2 + Electric Heater Kit 1 and Kit 2		*	*	1	1	0	1	1	0	1	Turbo	
Heat Pump Stage 2 + Electric Heater Kit 1 and Kit 2		*	*	*	*	1	1	1	0	1	Turbo	
Emergency Heat	1	*	*	*	*	*	*	*	1	*	Turbo	12
Heating Zone Control	2	*	1	0	1	0	*	*	0	0	Low	13
Heating Zone Control		*	*	1	1	0	*	*	0	0	Low	
Heating Zone Control		*	*	*	*	1	*	*	0	0	Low	
Heating Zone Control		*	0	0	*	0	1	0	0	0	Low	
Heating Zone Control		*	0	0	*	0	0	1	0	0	Low	
Heating Zone Control		*	0	0	*	0	1	1	0	0	Low	

Note:

1 = 24V Signal

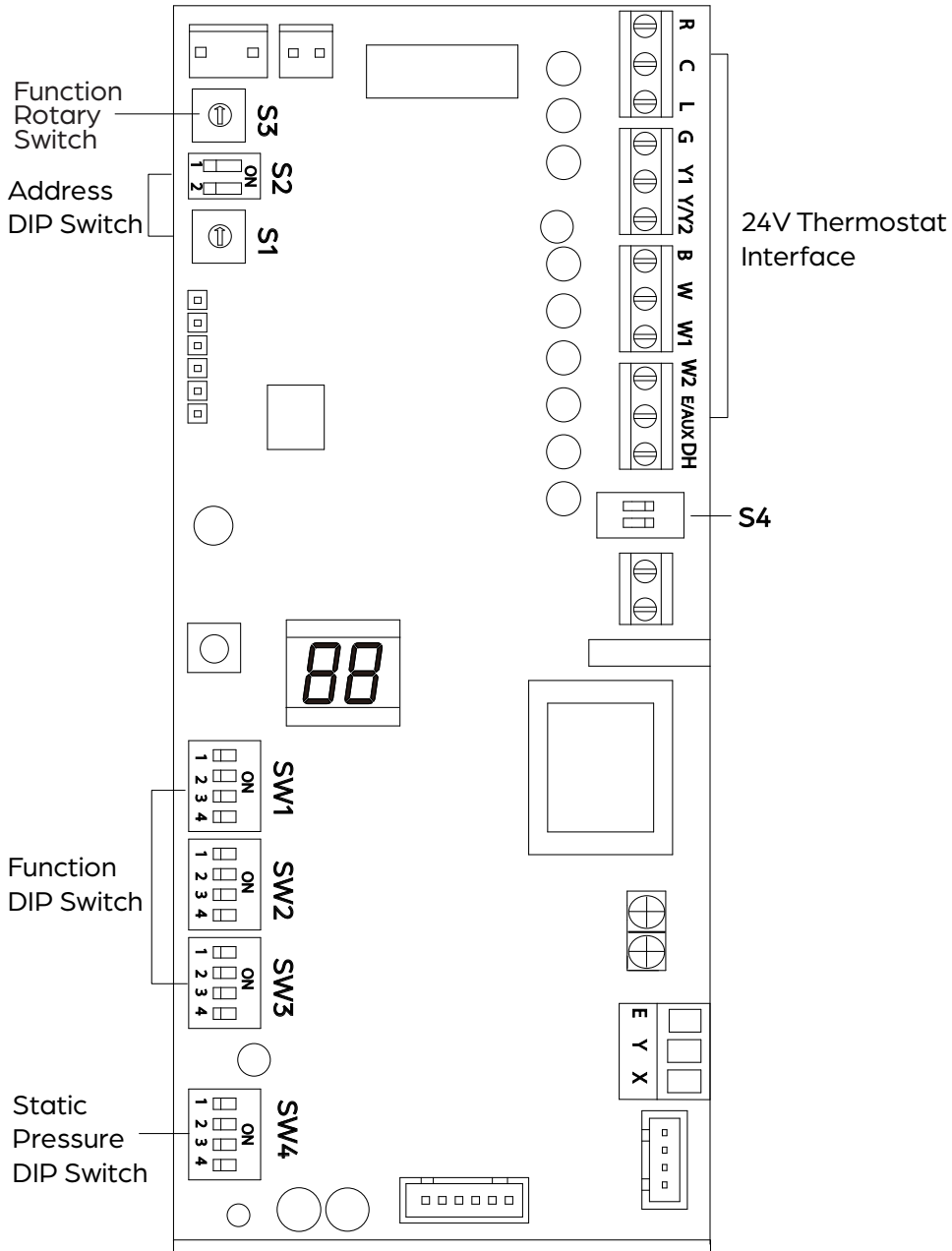
0 = No 24V Signal

DIP SWITCHES SETTINGS



CAUTION

Only certified service technicians should change dip switch settings. Incorrect dip switch settings cause malfunctions or harm the unit.



Use the following two charts to make any necessary dip switch changes based on the chosen control scenario.

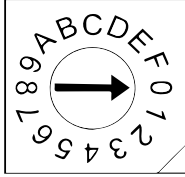
Control Scenario	24V Tstat, S1+S2	1
	DRSTAT100 Wired Controller, S1+S2	2
	Full 24V	3

DIP SWITCH DEFINITIONS

DIP SWITCH	CONTROL SCENARIO	FUNCTION	ON	OFF	NOTE
SW1-2	1,2	Anti-cold blow protection option	NO	[Default] YES	
SW1-3	1,2,3	Single cooling / heating and cooling options	Cooling [[Default] Cooling & Heating	
SW2-1	1	Compressor Running (demand working with heat pump+ Electric heat)	Compressor slower speed	[Default] Faster Compressor	Only affects compressor and W1
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)	
SW2-2	2	Electric heat on delay	YES	[Default] NO	
SW2-3	2	Electric auxiliary heating delay to start time	30 minutes	[Default] 15 minutes	Based on SW2-2 is ON
SW2-4	2	Compressor/Auxiliary heat outdoor ambient lockout	The compressor will not operate if the outdoor temperature is lower than the temperature represented by S3	[Default] The heater will not operate if the outdoor temperature is greater than the temperature represented by S3	SW2-4 and S3 need to be working together
Rotary Switch S3	2	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 the Rotary Switch table on the following page.		
SW3-1	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	
SW3-2	1	Cooling and heating Y/Y2 temperature differential adjustment.	Compressor slower speed	[Default] Faster Compressor	Only affects compressor
SW3-3	1	Compressor Running (demand working with heat pump+ Electric heat)	Compressor slower speed	[Default] Faster Compressor	Only affects compressor and W2
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)	
SW3-4	1,3	Fan speed of cooling mode when 24V Thermostat is applied for.	Turbo	High	
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		
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.	
S4-2	1,3	DH function selection	[Default] Dehumidification control not available	Dehumidification feature is enabled through thermostat	

Function DIP Switch Settings

S3 Rotary Switch



The S3 rotary switch is used to set the temperature protection between 0°F and 46°F. The switch defaults to OFF.

Rotary Switch Table

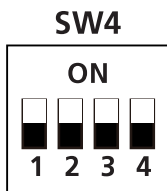
S3	S3 (°F)	S3 (°C)
0	OFF	OFF
1	-4	-20
2	0	-18
3	3	-16
4	7	-14
5	10	-12
6	14	-10
7	18	-8
8	21	-6
9	25	-4
A	28	-2
B	32	0
C	36	2
D	39	4
E	43	6
F	46	8



NOTE

The SW4 DIP switch is only for certified service technicians to use.

When using a 24V thermostat, use the SW4 dip switch to set the proper air flow and heater settings.



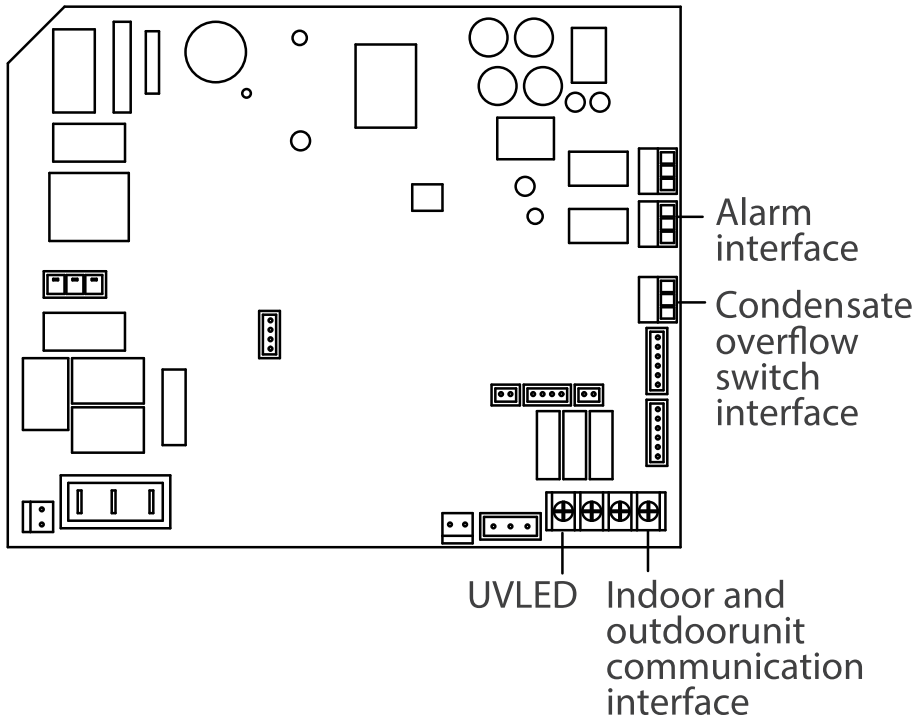
SW4-1	000 is the default Can be set as
SW4-2	000/001/010/ 011/100/101/110/111, for electric heating and PSC classification depending on the unit.
SW4-3	

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	
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

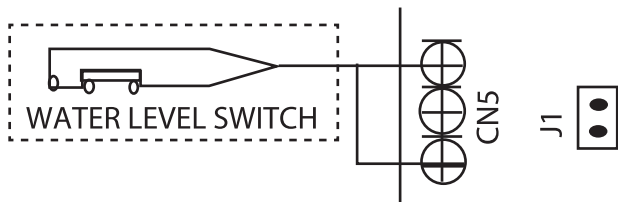
CAPACITY	EXTERNAL STATIC PRESSURE RANGE	FAN SPEED	ELECTRIC HEATER KIT	24V THERMOSTAT		WIRED CONTROLLER		AIRFLOW VOLUME (CFM)
				DIP SWITCH	24V TERMINAL ENGAGED	DIP SWITCH	MODE	
48K (4 TON)	0-0.80 In. w.g.	Cooling Turbo	----	SW3-4=ON	Y2/Y	----	COOL	988
		Cooling High	----	SW3-4=OFF	Y2/Y	----	COOL	894
		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)	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	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)	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

Optional Function Wiring



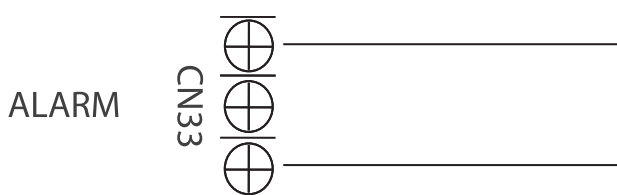
Condensate Overflow Switch:

The unit will accommodate a remote condensate overflow switch. To enable, remove jumper J1, and connect the installer provided condensate overflow device to CN5 per below. When an overflow condition is present, the device should open the connection, signaling the unit to turn off the system.



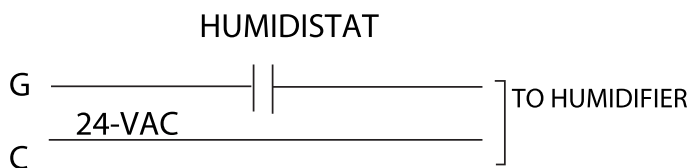
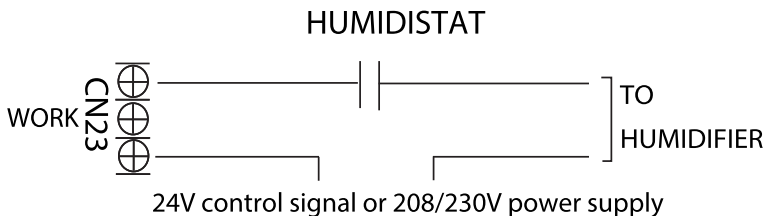
Alarm Output:

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 for normal operation, and closed when a fault condition is active.



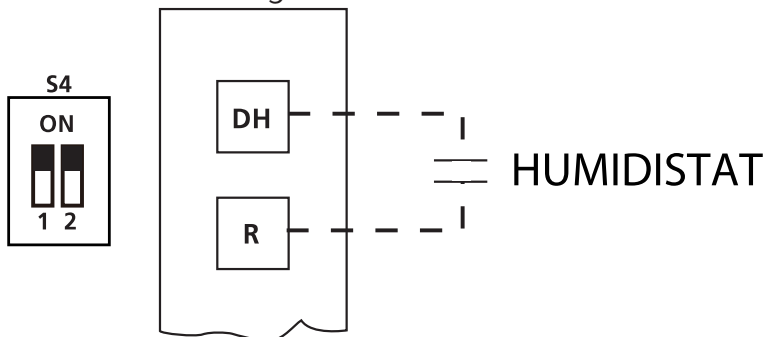
Humidifier Control:

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 above wiring diagram. When the fan is running, the CN23 relay will be closed, which will allow power to the humidifier when the humidistat is below humidity setpoint. If the thermostat or zone controller has an HUM interface, connect the humidifier directly to the HUM and C ports.



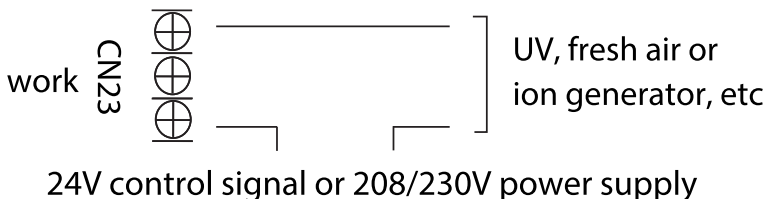
Dehumidification Control Wiring

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



UV LED 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.



POWER SPECIFICATIONS



WARNING

While connecting the wires, strictly follow the wiring diagram, and refer to the nameplate for electrical information. Wire according to NEC and local codes.

Indoor Units Without Electric Heat

Model Number	MCA (A)	MOCP (A)	Volts-Phase	Motor HP	FLA (A)
DRAM30S1A	4.5	15	208/230-1	1/2	3.5
DRAM36S1A	5.0	15	208/230-1	1/2	4.0
DRAM48S1A	7.5	15	208/230-1	3/4	6.0
DRAM60S1A	9.0	15	208/230-1	3/4	7.0

Outdoor Units

Model Number	MCA (A)	MOCP (A)	Voltage Range (V)	Cooling Current (A)	Cooling Input Power (W)	Heating Current (A)	Heating Input Power (W)
DRA1U30S1A	20	35	187-253	13.20	2835	12.40	2795
DRA1U36S1A	24	40	187-253	15.82	3560	15.80	3110
DRA1U48S1A	34	50	187-253	23.20	5320	22.50	5117
DRA1U60S1A	34	60	187-253	29.00	6475	20.90	5085

FINAL CHECKS

**CAUTION**

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

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.
- No obstacles near the inlet and outlet of the unit that might cause poor performance or product malfunction.
- Drainage system is unimpeded and draining to a safe location.
- Insulation of piping and duct is properly installed.
- Grounding wires are properly connected.
- Length of the piping and additional refrigerant capacity have been recorded.
- Power voltage is the correct voltage for the air handler.
- Electrical Safety Checks – Confirm that the unit's electrical system is connected and operating correctly.
- Gas Leak Check – Check all flare nut connections and confirm the system is not leaking.
- Confirm that the low and high pressure valves are fully open.
- Check grounding work by measuring the grounding resistance by visual detection and with a multimeter. The grounding resistance must be less than 0.1 Ω .

ELECTRICAL SAFETY CHECKS

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

DURING TEST RUN

Using your multimeter, verify the voltage of the main power entering the system. If the main power voltage is greater than $\pm 10\%$ of the name plate voltage, turn off the unit and immediately call a licensed electrician to find and resolve the cause.

**WARNING**

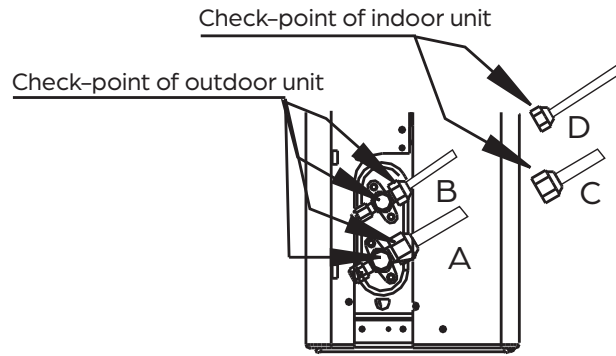
RISK OF ELECTRICAL SHOCK – All wiring must comply with local and national electrical codes, and must be installed by a licensed electrician.

GAS LEAK CHECK

There are two methods to check for gas leaks:

1. Soap and Water Method – Using a soft brush, apply a soapy water or liquid detergent to all pipe connection points on the indoor and outdoor unit. The presence of bubbles indicates a leak.
2. Leak Detector Method – If using a leak detector, refer to the device's operation manual for proper usage instructions.

GAS LEAK CHECK POINTS



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

TEST RUN

TEST RUN INSTRUCTIONS

You should perform the test run for at least 30 minutes.

1. Connect power to the unit.
2. Press the ON/OFF button on the remote controller or wired thermostat to turn the unit on.
3. Press the MODE button to scroll through the following functions, one at a time:
 - COOL – Select lowest possible temperature.
 - HEAT – Select highest possible temperature.
4. Let each function run for 5 minutes and perform the following checks:

LIST OF CHECKS TO PERFORM	[X]
Unit is Properly Grounded	[]
All Electrical Terminals are Properly Covered	[]
Indoor and Outdoor Units are Solidly Installed	[]
All Pipe Connection Points Do Not Leak	[]
Water Drains Properly from Drain Hose without leaks	[]
All Piping is Properly Insulated	[]
Unit Performs COOL Function Properly	[]
Unit Performs HEAT Function Properly	[]
There is no abnormal noise or vibration	[]
Indoor Unit Responds to Remote Controller or Thermostat	[]

5. Double check all pipe connections. During operation, the pressure of the refrigerant system will increase. This may reveal leaks that were not present during the initial leak check. Take time during the test run to recheck all pipe connection points. Refer to *Gas Leak Check* section for instructions.
6. Ensure the condensate flows smoothly through the drain. It may take up to one (1) minute before the unit begins to drain, depending on the drainpipe. In new buildings, this should be performed before finishing the ceiling.

TROUBLESHOOTING

SAFETY PRECAUTIONS

If ANY of the following conditions occur, turn off your unit immediately!

- The power cord is damaged or abnormally warm
- You smell a burning odor
- The unit emits loud or abnormal sounds
- A power fuse blows or the circuit breaker frequently trips
- Water or other objects fall into or out of the unit

DO NOT ATTEMPT TO FIX THESE YOURSELF! CONTACT AN AUTHORIZED SERVICE PROVIDER IMMEDIATELY!


COMMON ISSUES

The following problems are not malfunctions and in most situations do not require repairs.

ISSUE	POSSIBLE CAUSES
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.
	The set temperature has been reached, at which point the unit turns off the compressor. The unit will continue operating when the temperature fluctuates again.
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 three minutes of being turned off.
	Cooling and Heating Models: If the Operation light and PRE-DEF (Pre-heating/Defrost) indicators are lit up, 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 lit up, the outdoor temperature is too cold and the unit's anti-freeze protection is activated in order to defrost the unit.
Outdoor units emit white mist	When the unit restarts in HEAT mode after defrosting, white mist may be emitted due to moisture generated during the defrosting process.
Both the indoor unit and outdoor unit make noises	Low hissing sound during operation: This is normal and is caused by refrigerant gas flowing through both indoor and outdoor units.
	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 stopping or changing direction.
	Squeaking sound: Normal expansion and contraction of plastic and metal parts caused by temperature changes during operation can cause squeaking noises.

ISSUE	POSSIBLE CAUSES
The outdoor unit makes noises	The unit will make different sounds based on its current operating mode.
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 dirty and should be cleaned.
	During heating the unit may emit a bad odor. This is a result of the electric heat module (AUX) heating up and burning off small particles of dust from the cooling season. This smell will lessen after a few uses and go away when the AUX heat is off.
The fan of the outdoor unit does not operate	During operation, the fan speed is controlled to optimize product operation.
Operation is erratic, unpredictable, or unit is unresponsive	<p>In rare cases, interference from radio waves and remote boosters may cause the unit to malfunction. In this case, try the following:</p> <ul style="list-style-type: none"> • Disconnect the power, then reconnect. • Press ON/OFF button on remote control to restart operation.

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 your model number.

TROUBLESHOOTING cont.

If trouble occurs, please check the following points before contacting a repair company.

PROBLEM	POSSIBLE CAUSES	SOLUTION
Poor cooling performance	Temperature setting may be higher than ambient room temperature.	Lower the temperature setting.
	The heat exchanger coil on the indoor or outdoor unit is dirty.	Contact a servicer to clean the affected heat exchanger coil.
	The air filter is dirty.	Replace the air filter.
	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.	Make sure that all doors and windows 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 sources of heat in the room (people, computers, electronics, etc.).	Reduce amount of heat sources.
	Return grille is blocked or diffuser vents are shut.	Make sure the return grille and diffusers are unrestricted.
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.
	The air filter is dirty.	Replace the air filter.
	Return grille is blocked or diffuser vents are shut.	Make sure the return grille and diffusers are unrestricted.
Indicator lamps continue flashing or error code appears	<p>The unit may stop operation or continue to run safely. If the indicator lamps continue to flash or error codes appear, wait for about 10 minutes. The problem may resolve itself.</p> <p>If not, turn off the unit, then turn it on again.</p> <p>If the problem persists, disconnect the power and contact your nearest customer service center.</p>	
The unit is not working	Power failure	Wait for the power to be restored
	Remote control batteries are dead	Replace the batteries
	The unit's 3-minute protection has been activated	Wait three minutes after restarting the unit
	Timer is activated	Turn timer off

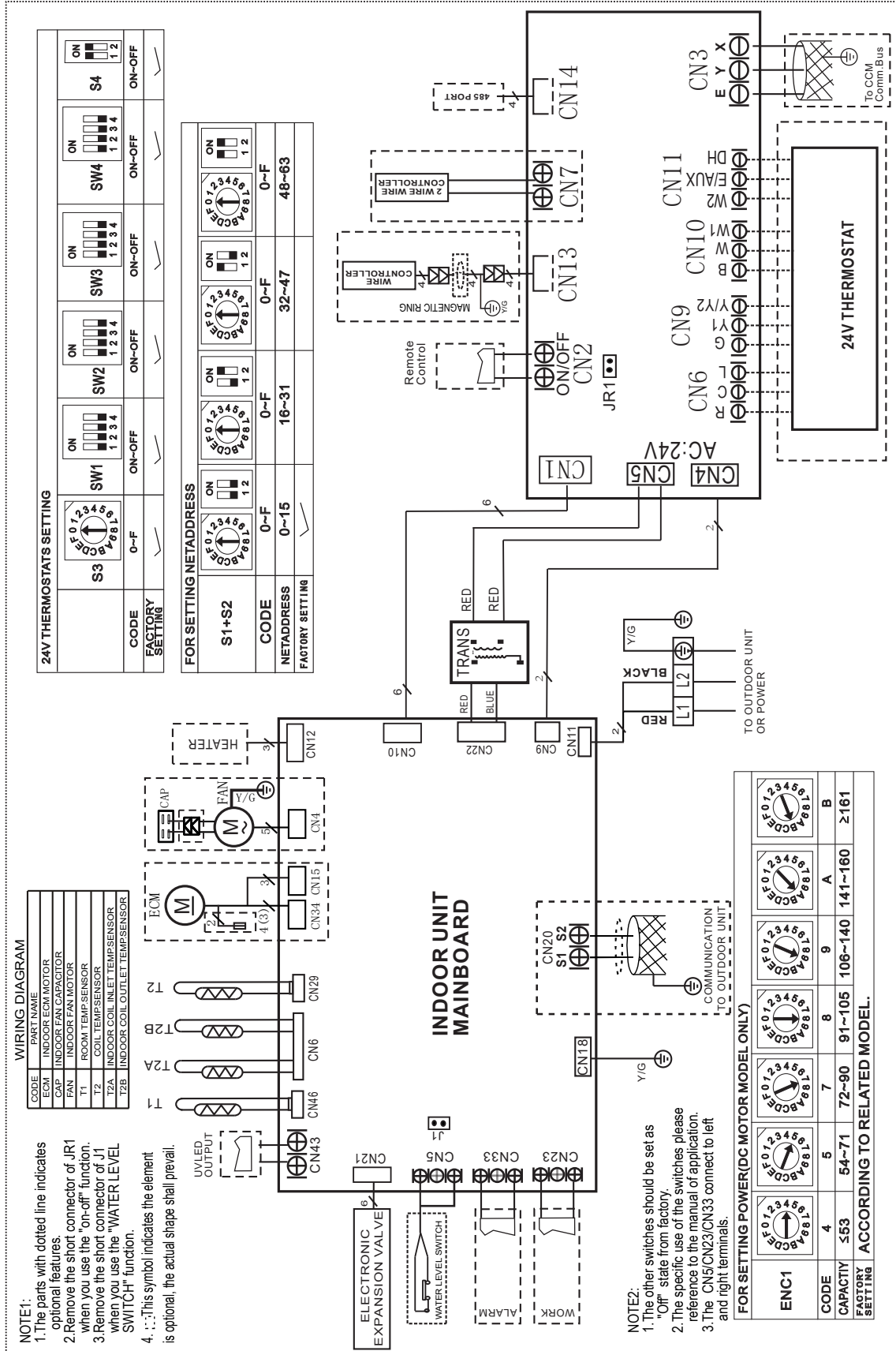


NOTE

If your problem persists after performing the checks and diagnostics above, or an error code remains, turn off your unit immediately and contact an authorized service center.

WIRING DIAGRAM

30K, 36K, 48K, 60K



ERROR AND OPERATING CODES

Error Code	Description
EH 00	Indoor unit EEPROM parameter error
EL 01	Indoor / outdoor unit communication error
EL 16	Communication malfunction between adapter board and outdoor main board
EH 03	The indoor fan speed is operating outside of the normal range(for some models)
EH 60	Indoor room temperature sensor T1 is in open circuit or has short circuited
EH 61	Evaporator coil temperature sensor T2 is in open circuit or has short circuited
EH 62	Evaporator coil temperature sensor T2B is in open circuit or has short circuited
EH 65	Evaporator coil temperature sensor T2A is in open circuit or has short circuited
EL 0C	Refrigerant Leakage Detection(for some models)
EH 0b	Communication error between indoor two chips
EH 0E	Water-level alarm malfunction
EC 53	Outdoor room temperature sensor T4 is in open circuit or has short circuited
EC 52	Condenser coil temperature sensor T3 is in open circuit or has short circuited
EC 54	Compressor discharge temperature sensor TP is in open circuit or has short circuited
EC 56	Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited(for freematch indoor units)
EC 51	Outdoor unit EEPROM parameter error
EC 07	The outdoor fan speed is operating outside of the normal range(for some models)
PC 00	IPM malfunction or IGBT over-strong current protection
PC 01	Over voltage or over low voltage protection
PC 02	Top temperature protection of compressor or High temperature protection of IPM module
PC 03	Low pressure protection (for some models)
PC 04	Inverter compressor drive error
EC 0d	Outdoor unit malfunction
PC 0L	Low ambient temperature protection
FL 09	Mismatch between the new and old platforms

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