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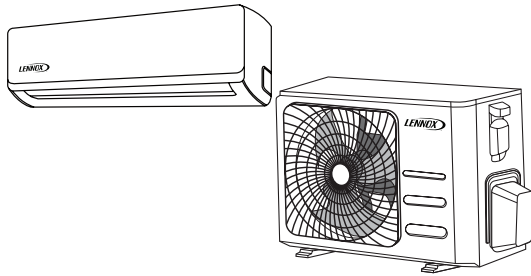


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INSTALLATION INSTRUCTIONS

MHA Series Units

SINGLE-ZONE MINI-SPLIT SYSTEM
(115V and 208/230V)
507927-01 6/2019
Supersedes 3/2019

**THIS MANUAL MUST BE LEFT WITH THE OWNER
FOR FUTURE REFERENCE**

!WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life.

Installation and service must be performed by a licensed professional HVAC installer (or equivalent) or a service agency.

!CAUTION

In order to avoid injury, take proper precaution when lifting heavy objects.

General

Refer to the Product Specifications bulletin (EHB) for more product information. These instructions are intended as a general guide and do not supersede local or national codes in any way. Authorities having jurisdiction should be consulted before installation.

This wall-mounted indoor unit is matched with an outdoor heat pump unit to create a mini-split system that uses HFC-410A refrigerant.

Use of Mini-Split System During Construction



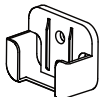
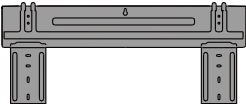
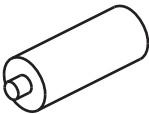

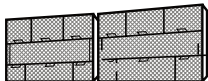

Lennox does not recommend the use of its mini-split systems during any phase of construction. Very low return air temperatures, harmful vapors and operation of the unit with clogged or misplaced filters will damage the system.

However, mini-split systems may be used for cooling of buildings under construction, if the following conditions are met:

- Air filter must be installed in the system and must be maintained during construction.
- Air filter must be replaced upon construction completion.
- The indoor wall unit assembly must be thoroughly cleaned following final construction clean-up.
- All mini-split operating conditions must be verified according to these installation instructions.

Included Parts

The assembled indoor unit will include the following items:

Table 1. Included Parts					
Parts	Figure	Quantity	Parts	Figure	Quantity
Wireless controller		1	Installation instruction, user guide and warranty		1 ea.
Wireless control holder with 2 mounting screws		1	Mounting plate (shipped attached to the back of the indoor unit)		1
Batteries (AAA)		2	Mounting plate securing screws		5
Return Air Filters (Shipped installed in indoor unit.)			Plastic screw anchors		5

Catalog Numbers

Table 2. Component Catalog Number Cross-Reference

Product	Capacity	Voltage	Lennox Model Number	Catalog Numbers
Wall Mounted (Indoor Unit)	9K	115V	MWHA009S4-1L	17K07
Wall Mounted (Indoor Unit)	12K	115V	MWHA012S4-1L	17K09
Wall Mounted (Indoor Unit)	9K	208-230V	MWHA009S4-1P	17K08
Wall Mounted (Indoor Unit)	12K	208-230V	MWHA012S4-1P	17K10
Wall Mounted (Indoor Unit)	18K	208-230V	MWHA018S4-1P	17K11
Wall Mounted (Indoor Unit)	24K	208-230V	MWHA024S4-1P	17K12
Heat Pump (Outdoor Unit)	9K	115V	MHA009S4S-1L	17K01
Heat Pump (Outdoor Unit)	12K	115V	MHA012S4S-1L	17K03
Heat Pump (Outdoor Unit)	9K	208-230V	MHA009S4S-1P	17K02
Heat Pump (Outdoor Unit)	12K	208-230V	MHA012S4S-1P	17K04
Heat Pump (Outdoor Unit)	18K	208-230V	MHA018S4S-1P	17K05
Heat Pump (Outdoor Unit)	24K	208-230V	MHA024S4S-1P	17K06

⚠ WARNING

The clean Air Act of 1990 bans the intentional venting of refrigerant (CFCs, HCFCs, and HFCs) as of July, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for non-compliance.

⚠ CAUTION

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.

IMPORTANT

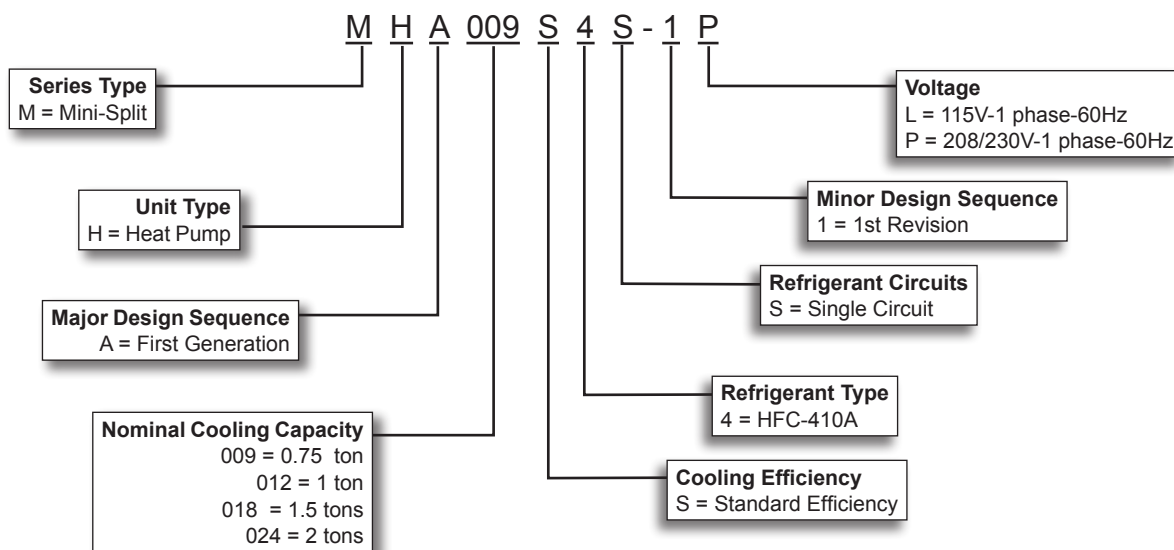
All illustrations in this instruction are typical and do not always represent the exact appearance of the equipment.

IMPORTANT

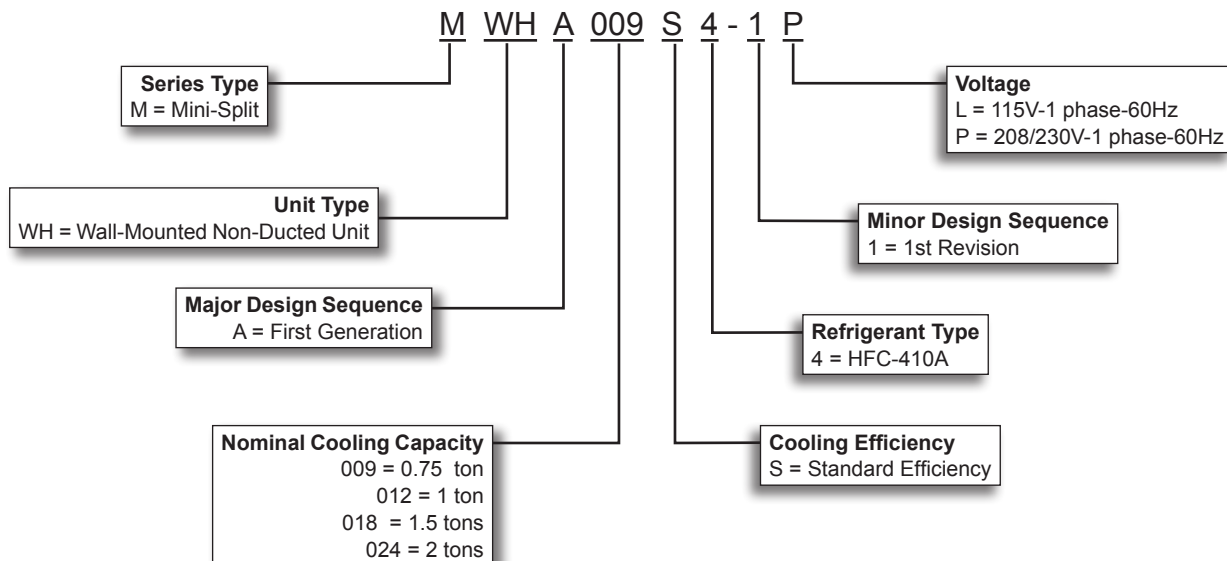
The compressor in this unit contains PVE oil (Polyvinylether). PVE oil is formulated for hydrofluorocarbon (HFC) refrigerants, such as HFC-410A, which this system contains. While it may have some miscibility properties with mineral-based oil and POE oil (Polyolester), it is not recommended to mix PVE oil with any other type of refrigerant oil.

Model Number Identification

OUTDOOR SINGLE ZONE HEAT PUMP UNITS



WALL-MOUNTED INDOOR UNITS



Typical System Components

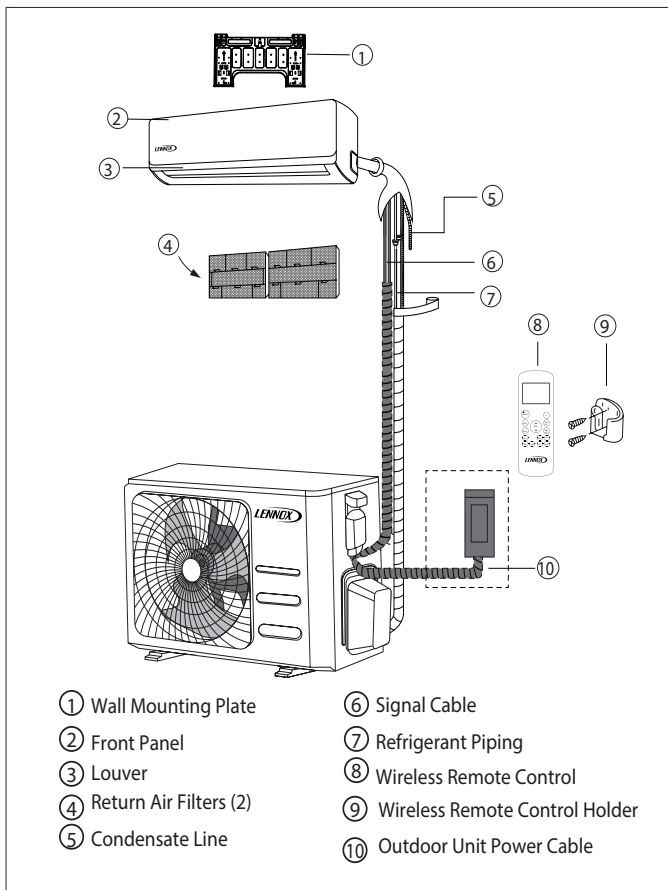


Figure 1. Typical System Shown

System Dimensions

Outdoor Units

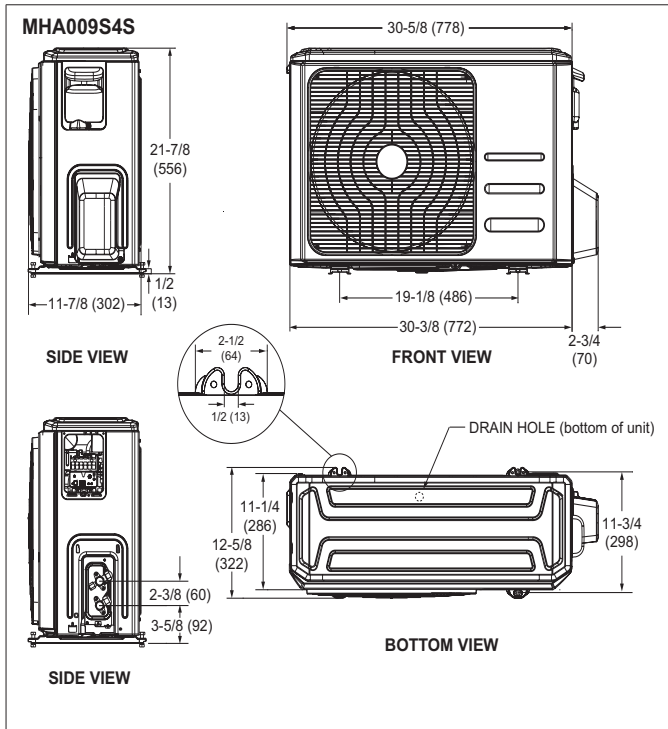


Figure 2. 9K Outdoor Unit Dimensions - Inches (mm)

MHA012S4S, MHA018S4S

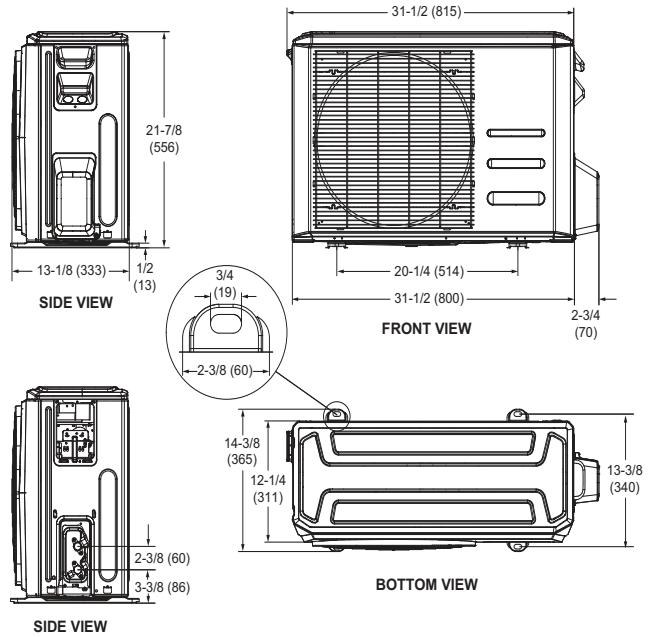


Figure 3. 12K and 18K Outdoor Unit Dimensions - Inches (mm)

MHA024S4S

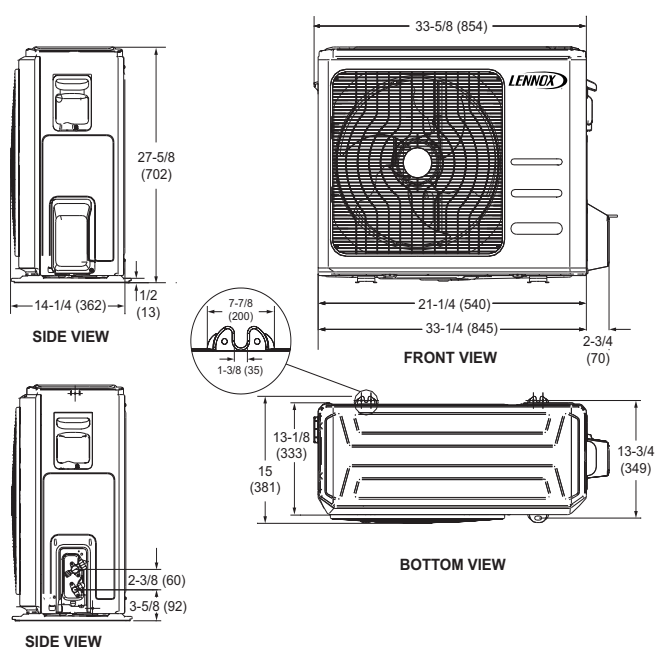


Figure 4. 24K Outdoor Unit Dimensions - Inches (mm)

Indoor Units

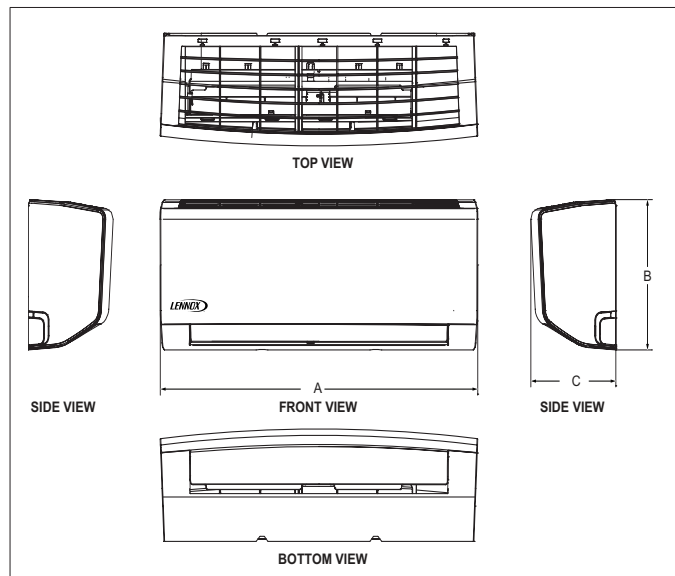


Figure 5. Indoor Unit Dimensions - Inches (mm)

Size	A		B		C	
	in.	mm	in.	mm	in.	mm
9K	29-5/8	752	11-3/8	289	8-5/8	219
12K	32-3/4	832	11-3/4	298	8-3/4	222
18K	39-1/8	994	12-1/2	318	9-7/8	251
24K	44	1118	13-1/4	337	10-1/4	260

Indoor Unit Wall Mounts

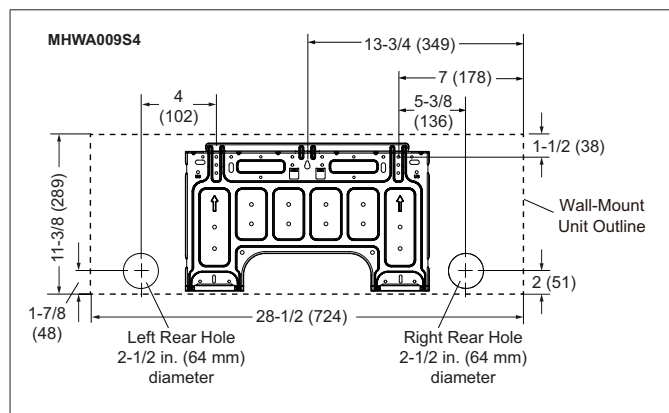


Figure 6. 9K Indoor Unit Wall Plate Dimensions - Inches (mm)

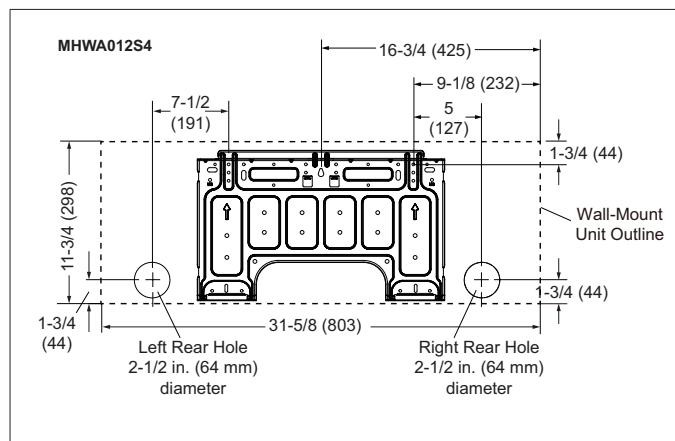


Figure 7. 12K Indoor Unit Wall Plate Dimensions - Inches (mm)

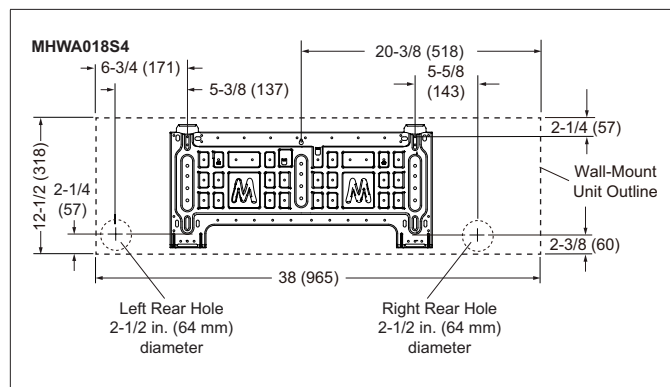


Figure 8. 18K Indoor Unit Wall Plate Dimensions - Inches (mm)

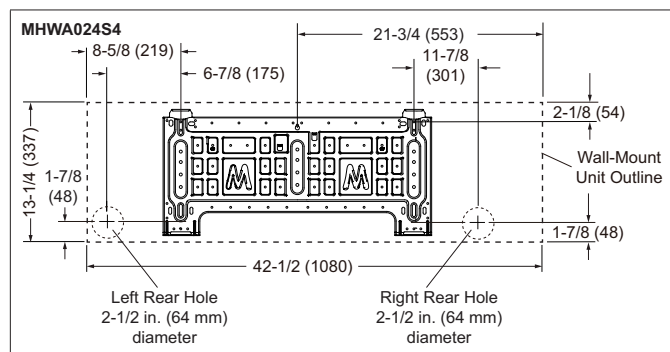


Figure 9. 24K Indoor Unit Wall Plate Dimensions - Inches (mm)

System Clearances

Outdoor Unit

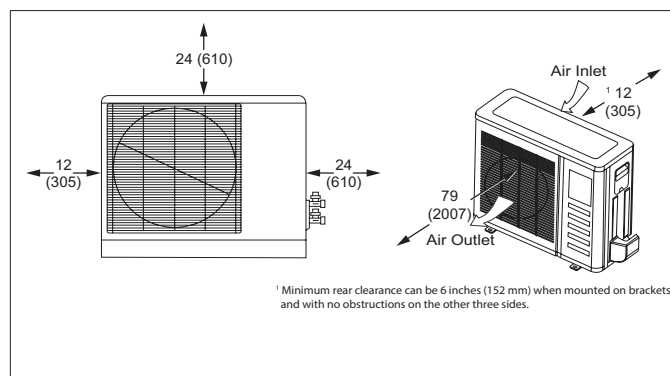


Figure 10. Outdoor Unit Clearances - Inches (mm)

Indoor Unit

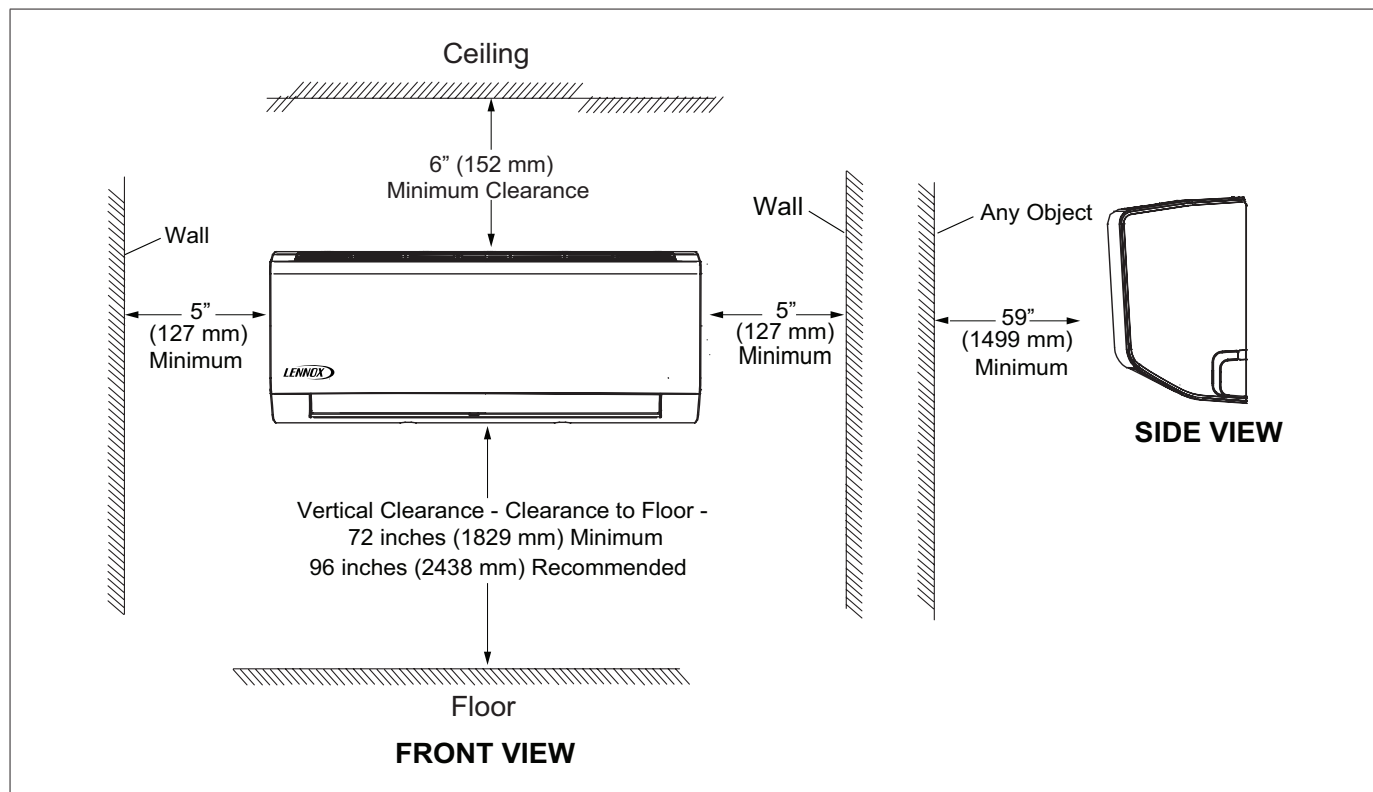


Figure 11. Indoor Unit Clearances - Inches (mm)

Multiple Outdoor Units

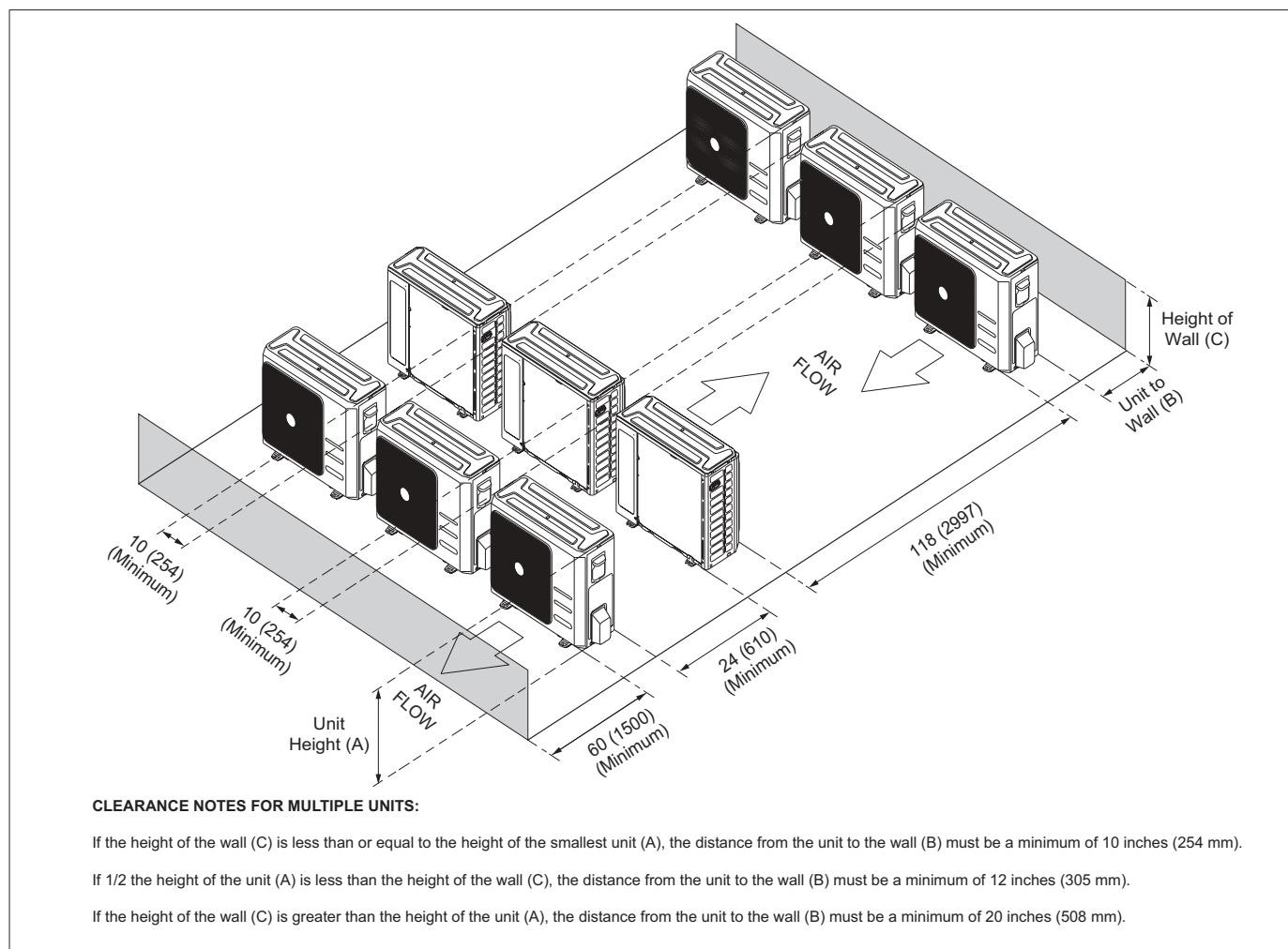


Figure 12. Multiple Outdoor Unit Clearances - Inches (mm)

Torque Requirements for Caps and Fasteners

When servicing or repairing HVAC components, ensure the fasteners are appropriately tightened. "Table 3. Torque Requirements" on page 7 provides torque values for fasteners.

IMPORTANT

Only use Allen wrenches of sufficient hardness (50Rc - Rockwell scale minimum). Fully insert the wrench into the valve stem recess.

Service valve stems are factory-torqued from 9 ft.-lbs. (12 N*m) for small valves, to 25 ft.-lbs. (34 N) for large valves) to prevent refrigerant loss during shipping and handling. Using an Allen wrench rated at less than 50Rc risks rounding or breaking off the wrench, or stripping the valve stem recess.

See the Lennox Service and Application Notes C-08-1 for further details and information.

Table 3. Torque Requirements

Parts	Recommended Torque	
	U.S.	Newton-Meter- N
Service valve cap	8 ft.-lb.	11
Sheet metal screws	16 in.-lb.	2
Machine screws #10	27 in.-lb.	3
Compressor bolts	7 ft.-lb.	10
Gauge port seal cap	8 ft.-lb.	11

Indoor Unit Installation

! CAUTION

In order to avoid injury, take proper precaution when lifting heavy objects.

Unit Placement Considerations

AVOID

Do not install the unit in the following locations:

- Areas exposed to petrochemicals or petrochemical products.
- Areas exposed to salt or other corrosive materials or caustic gases.
- Areas exposed to extreme voltage variations (such as factories).
- Tightly enclosed areas that may impede service of the unit.
- Areas exposed to fossil fuels (such as oil or gas in kitchens).
- Areas exposed to strong electromagnetic forces.
- Areas exposed to acids or alkaline detergents.

DO

- Place the unit so that it is not exposed to direct sunlight.
- Ensure the structural wall can support the weight of the unit.
- Select a location where condensate line will have the shortest run to a suitable drain per local codes.
- Allow sufficient space around unit for proper operation and maintenance.
- Install unit a minimum of 3 feet (1m) away from any antenna, power cord (line) radio, telephone, security system, or intercom. Electrical interference and radio frequencies from any of these sources may affect operation.
- Be sure to instruct homeowners on how to properly operate the unit (especially maintenance of air filter, and operation procedure) by having them carry out operations themselves while looking at the manual provided with the controller.

Determining Wall Mounting Plate Location

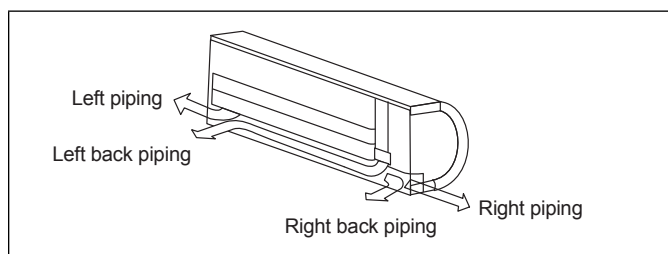


Figure 13. Determining Exit Locations

1. Remove the wall mounting plate from the back of the indoor unit.
2. Determine the best exit location for utility bundle (line set, condensate line and wiring). See the following section concerning wall sleeve installation instructions.
3. Position the wall mounting plate on the wall so that, when installed, the unit will be at least 6 inches (152 mm) from the ceiling and 5 inches (127 mm) from the wall on either side. The wall mounting plate must be level side-to-side.
4. Use the wall mounting plate as a template to determine the exit point for utility bundle. Mark the wall to facilitate drilling hole for utility bundle.

Installation of Wall Mounting Plate

Install the wall mounting plate (see "Figure 6. 9K Indoor Unit Wall Plate Dimensions - Inches (mm)" on page 5) so that it is correctly positioned horizontally and vertically. The indoor unit must be installed level on the wall to allow proper condensate drainage.

1. Use a carpenter's level or measuring tape to verify the wall mounting plate is horizontally level.
2. Secure the wall mounting plate to the wall using the provided screws and screw anchors.

NOTE: It is important to use all screws provided to secure the wall mounting plate to the wall. Additional holes may be drilled through the metal wall mounting plate to better secure wall plate. Field-provided anchors/fixings may be required depending on

wall construction. Use the appropriate type of anchors for the application.

3. The wall mounting plate must be installed flush against the wall so that the indoor unit will be flush after installation. Any space between the wall and unit will cause noise and vibration.
4. The wall mounting plate must be installed horizontally level on the wall.

Installation of Wall Sleeve

The utility bundle may be routed out of the back of the unit or out either side. If the bundle is to be routed out the back through an external wall, use a field-provided wall sleeve to protect the utility bundle.

NOTE: If the utility bundle will be routed out the side of the indoor unit and up the wall above a false ceiling, continue to the next section.

1. Prior to making the hole and installing the wall sleeve for the utility bundle, check to ensure that there are no other utilities located in the wall behind the hole location.
2. Cut a hole in the wall using a suitable hole saw. Hole should be at a slight downward slant - 3/16" to 3/8" toward the outdoor side.
3. Measure the thickness of the wall from the inside edge to the outside edge and cut the field-provided wall sleeve at a slight angle 1/4" (6 mm) shorter than the thickness of the wall.

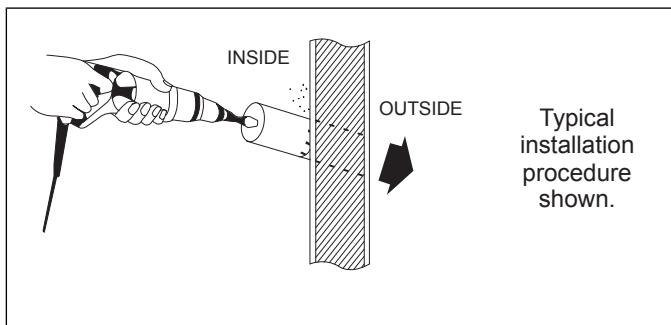


Figure 14. Boring Hole for Wall Sleeve

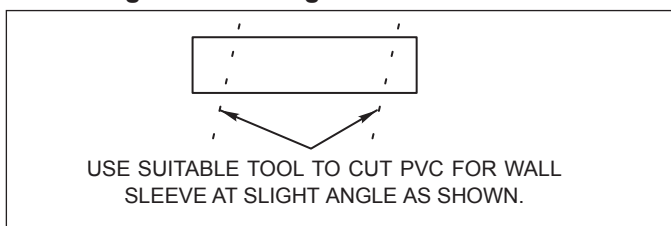


Figure 15. PVC Wall Sleeve Installation

NOTE: When passing bundled services through an exterior brick or concrete wall, protect the copper pipes and wiring from the effects of these construction materials by using a sleeve made of suitable material. The integrity of copper pipe and wiring can deteriorate when exposed to these construction materials.

Installation of Indoor Unit on Wall Mounting Plate

1. A length of field-provided flexible condensate piping should be connected to the drain prior to securing the unit to the wall mounting plate.
2. If the factory-provided refrigerant piping connections and field-provided flexible condensate piping are long enough to enable final field connections after unit is installed on wall mounting plate, use field-provided tape to bundle them together.
3. The utility bundle may be routed out of the back of the unit or out either side. If the bundle is to be routed out the back through an external wall, feed the utility bundle through the wall sleeve. If the utility bundle is to be routed out of the side of the indoor unit and up an inside wall, carefully form the utility bundle so that it makes a gentle 90° turn.
4. Align the back of the indoor unit with the hooks at the top of the wall mounting plate. Move the unit from side to side to make sure that it settles securely.
5. The bottom of the unit can be lifted to facilitate refrigerant piping and condensate drain connections, if necessary.

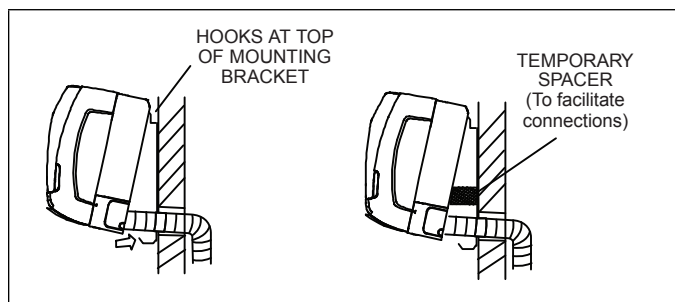


Figure 16. Secure Unit to Wall Mounting Plate

Indoor Unit Condensate Piping Connections

IMPORTANT

Make sure that drain piping is properly routed and insulated to prevent both leaks and condensation.

1. Use a field-provided hose clamp to secure the drain line stub on the side of the cabinet to a field-supplied 1-inch (25 mm) drain line.
- NOTE:** Take care not to over-tighten the hose clamps this may damage the drain line stub.
- NOTE:** Connection between stub and drain line must be watertight. Apply non-hardening plumbing joint compound if needed to ensure a watertight seal.
2. Confirm proper slope (not less than 1/4 inch per foot (18 mm per meter) and routing of condensate lines to ensure moisture is drained away from the indoor unit.
 3. Drain should be as short as possible and should not have any droops or kinks that would restrict condensate flow and shall be approved resistant pipe. There must be a 2-inch (51 mm) space between the end of the condensate drain and the final termination point (ground, open drain, etc.) to ensure that the line will drain freely.
 4. After the system installation is complete, the condensate drain line must be checked for leaks and proper drainage. If a field-provided condensate

pump has been installed, it must be checked to ensure proper operation. This check is part of the start-up process which must be done by the installing contractor.

IMPORTANT

Drain should have a slope of at least $\frac{1}{4}$ inch per foot and should be approved corrosion-resistant pipe. You must confirm operation of every drain and pump in the system as part of the commissioning procedure.

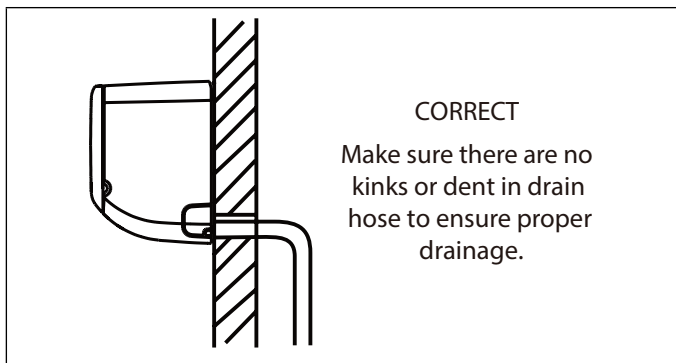


Figure 17. Condensate Line

Outdoor Unit Installation

Placement Considerations

Consider the following when positioning the unit:

- In coastal areas or other places with salty atmosphere of sulfate gas, corrosion may shorten the life of the unit. In coastal areas, the coil should be cleaned with potable water several times per year to avoid corrosive buildup (salt).
- Some localities are adopting sound ordinances based on the unit's sound level registered from the adjacent property, not from the property where the unit is installed. Install the unit as far as possible from the property line.
- When possible, do not install the unit directly outside a window. Glass has a very high level of sound transmission.
- Install unit level.

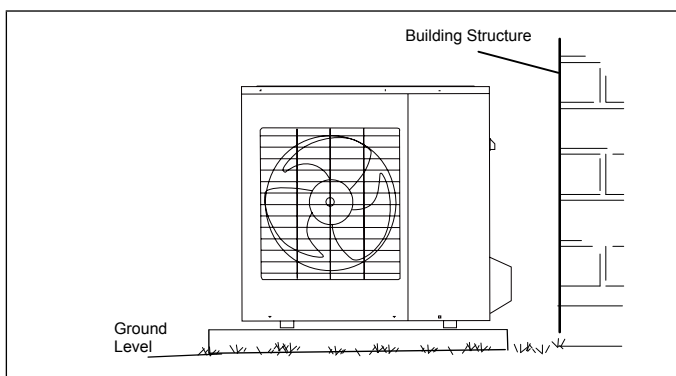


Figure 18. Install Unit Level

- Choose a place solid enough to bear the weight and vibration of the unit, where the operation noise will not be amplified.
- Choose a location where the hot air discharged from the unit or the operation noise will not be a nuisance to neighbors.

- Avoid installing the outdoor unit near a bedroom or other places where noise may cause a problem.
- There must be sufficient space to carry the unit into and out of the site.
- There must be unobstructed air flow around the air inlet and the air outlet.
- The unit must not be installed in areas where a flammable gas leak may occur.
- Install the outdoor unit a minimum of 3 feet (1m) away from any antenna, power cord (line), radio, telephone, security system, or intercom. Electrical interference and radio frequencies from any of these sources may affect operation.
- Since water drains from the outdoor unit during various stages of operation, do not place anything which may be damaged by moisture under the unit.

Direct Sunlight, Rain and Ice Protection

- If the outdoor unit is subjected to prolonged exposure to direct sunlight with temperatures over 100°F (38°C) a canopy is recommended as illustrated in "Figure 19. Outdoor Unit on Pedestal and Protective Canopy" or "Figure 20. Dog House-Style Shelter" on page 9.

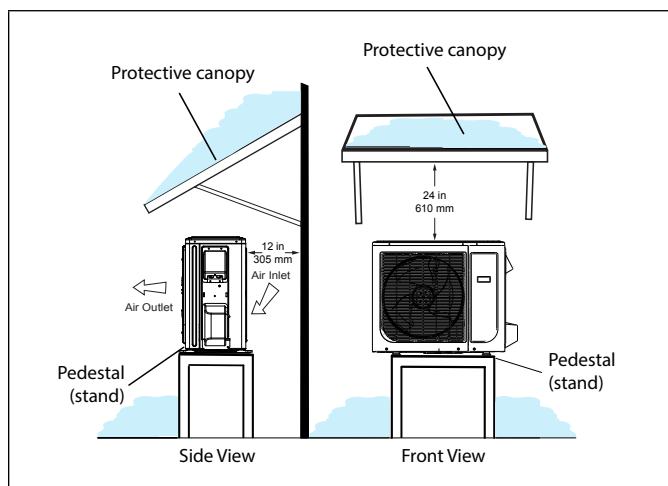


Figure 19. Outdoor Unit on Pedestal and Protective Canopy

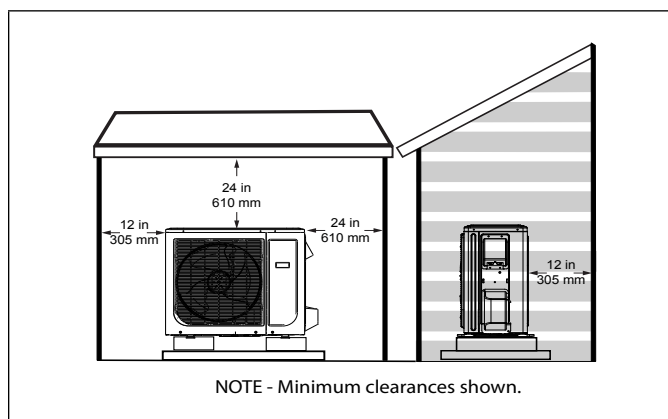


Figure 20. Dog House-Style Shelter

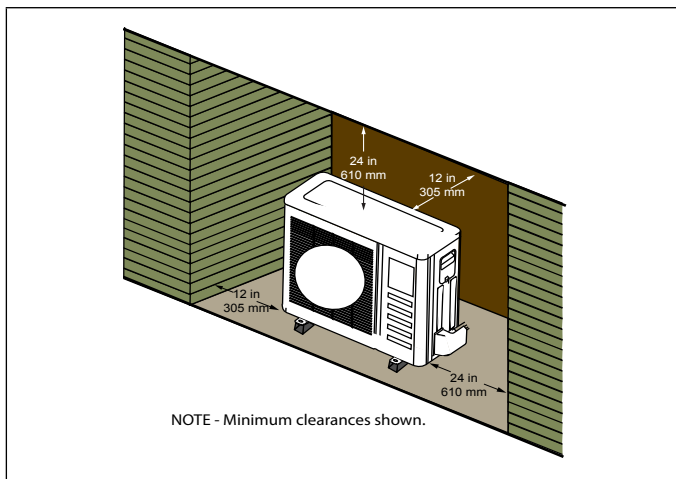


Figure 21. Unit installed in Alcove

IMPORTANT

The construction of a canopy or shade is necessary because of an ambient limit control set to 122°F (50°C) to protect the electronics. If the outdoor unit is placed in direct sunlight it is possible that the limit may activate and shut down the unit.

- Place unit away from overhanging roof lines which would allow water or ice to drop on, or in front of, coil or into unit. Construct a canopy as illustrated in “Figure 19. Outdoor Unit on Pedestal and Protective Canopy”.
- The unit base should be elevated above the depth of average snows as illustrated in “Figure 22. Outdoor Unit on Brackets above Snow Line”.
- In heavy snow areas, do not place the unit where drifting will occur as illustrated in “Figure 23. Outdoor Unit Air Flow Obstructed by Snow”.
- Carefully consider how to manage defrost water disposal to prevent ice from blocking walkways or creating a safety hazard near the outdoor unit as illustrated in “Figure 24. Avoid Defrost Water Ice Hazard”.

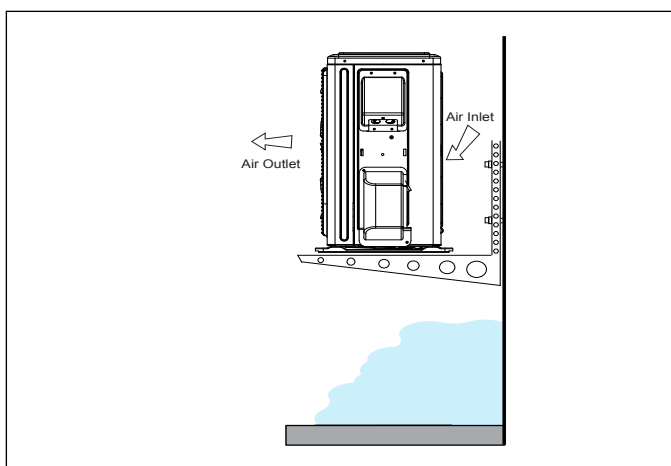


Figure 22. Outdoor Unit on Brackets above Snow Line

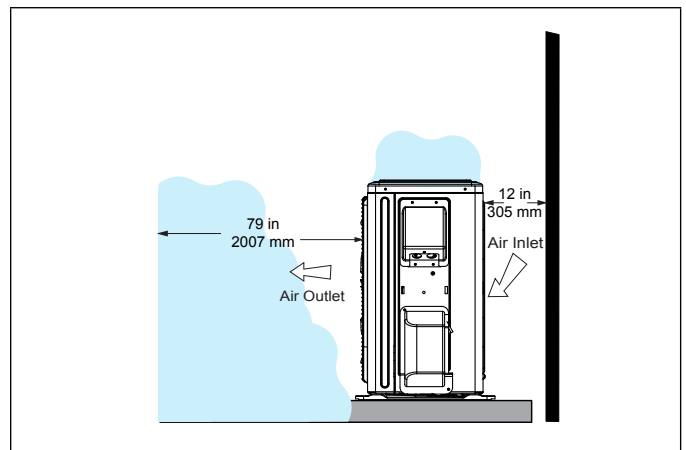


Figure 23. Outdoor Unit Air Flow Obstructed by Snow

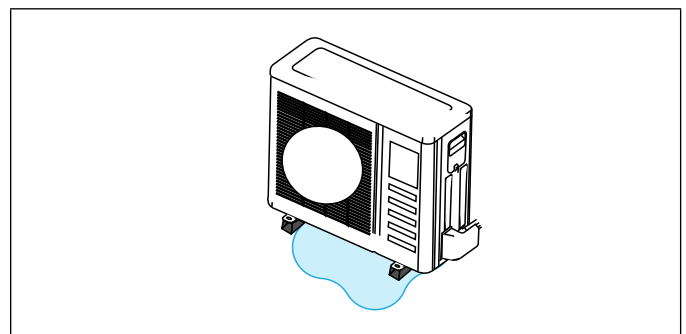


Figure 24. Avoid Defrost Water Ice Hazard

Condensate Piping

Condensate formed during the heating and defrost processes must be drained from heat pump units. Drain holes are provided in the base of the units to ensure proper drainage. Heat pumps must be raised when installed on a concrete pad or the ground to allow drainage to occur. If the heat pump unit is installed on wall mounting bracket, insert the provided drain connector into one of the 1 inch (25 mm) drain holes and attached a field-provided insulated drain hose to the connector. Use field-provided rubber plugs to cover any unused drain holes (see “Figure 25. Condensate Drain” on page 10).

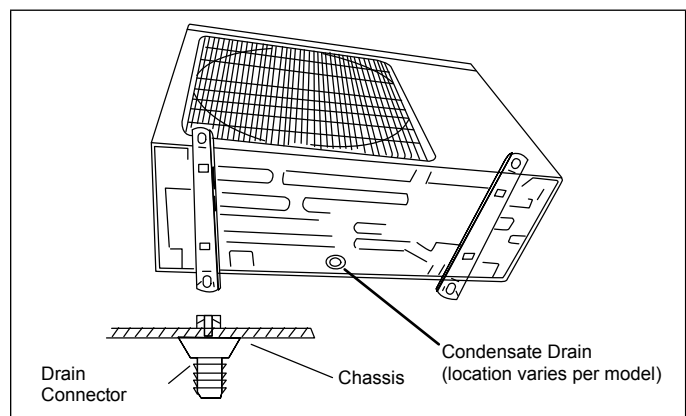


Figure 25. Condensate Drain

Buried Refrigerant Pipe Protection

- All refrigerant lines must be insulated regardless of if it is buried.
- In addition to insulating each line of piping, buried lines must rest inside a **sealed, watertight** conduit.

- The conduit must be designed so it cannot collect and retain water.

Securing the Outdoor Unit

Slab or Roof Mounting

Install the unit a minimum of 4 inches (102 mm) above the roof or ground surface to avoid debris build-up around the unit. Place the unit above a load bearing wall or area of the roof that can adequately support the unit. Consult local codes for rooftop applications.

! CAUTION

Roof Damage!

This system contains both refrigerant and oil. Some rubber roofing material may absorb oil. This will cause the rubber to swell when it comes into contact with oil. The rubber will then bubble and could cause leaks. Protect the roof surface to avoid exposure to refrigerant and oil during service and installation. Failure to follow this notice could result in damage to roof surface.

Securing Outdoor Unit to Slab, Frame, or Rails

If the outdoor unit is installed on a field-provided slab or frame, use lag bolts or equivalent to secure the outdoor unit to the slab or frame.

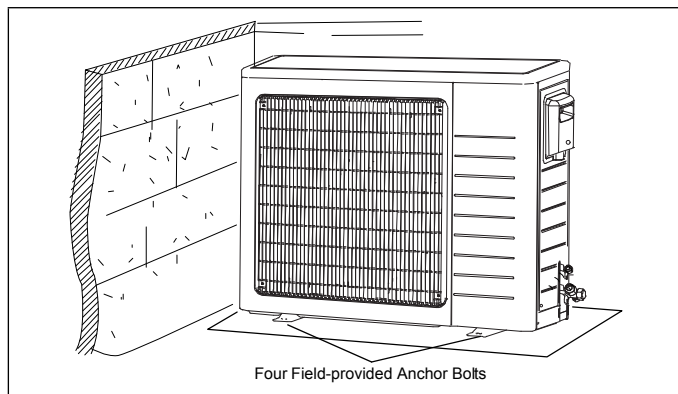


Figure 26. Securing Outdoor Unit to Slab

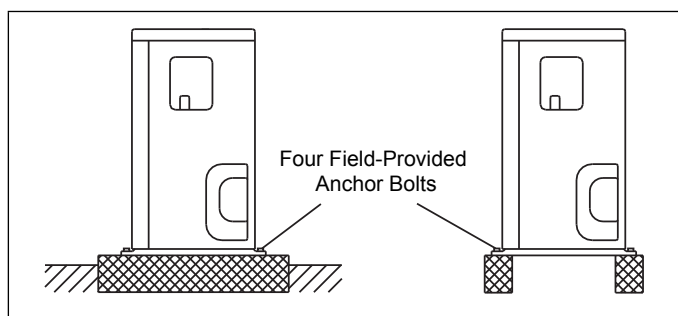


Figure 27. Securing Outdoor Unit to Rails

Securing Outdoor Unit to Hanging Brackets

If the outdoor unit is installed on field-provided wall mounting brackets, use lag bolts or equivalent to secure the outdoor unit to the bracket. Minimum rear clearance can be reduced to 6 inches (152 mm) when mounted on brackets and with no obstructions on the other three sides. Allow for moisture disposal when placing units above one another.

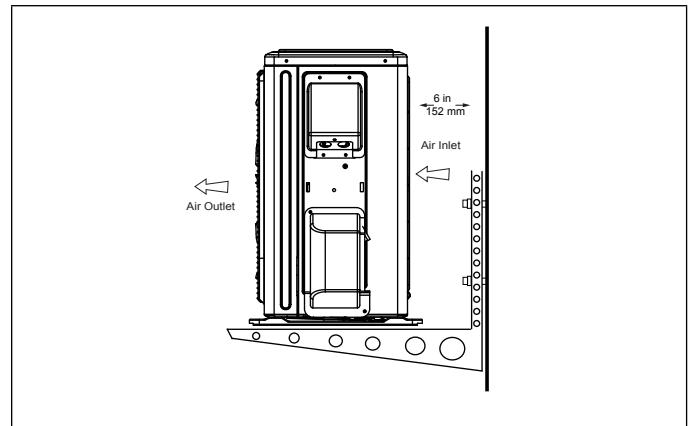


Figure 28. Securing Outdoor Unit to Brackets

Refrigerant Piping Connections

Field piping consists of two copper lines connecting the outdoor unit to the indoor unit. "Table 5. Refrigerant Piping and Indoor Unit Connection Sizes" on page 12 lists the connection sizes. The connections are made using the provided brass flare nuts at the end of the refrigerant piping connections.

1. Choose the correct pipe sizes for your application using "Table 5. Refrigerant Piping and Indoor Unit Connection Sizes" on page 12.
2. Confirm that you are using the correct diameter piping.
3. Determine the necessary piping length required for the application.
4. Cut the selected pipes with a pipe cutter. Make the cuts flat and smooth as illustrated in "Figure 29. Cutting Piping".

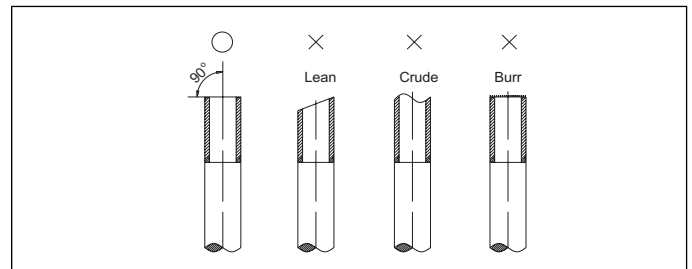
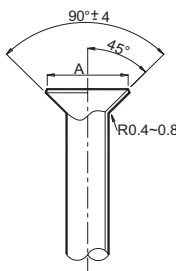


Figure 29. Cutting Piping

5. Insulate the copper piping.
6. Insert a flare nut onto each pipe before flaring.
7. Use "Table 4. Flaring Pipe" to properly flare the pipe.

Table 4. Flaring Pipe

Pipe Diameter	Flare Dimension A (mm)		Flare Shape
	Min	Max	
1/4"	8.3	8.7	
3/8"	12.0	12.4	
1/2"	15.4	15.8	
5/8"	18.6	19.1	
3/4" (22.9)	22.9	23.3	

8. After flaring the pipe, temporarily sealed pipe ends with adhesive tape to avoid contaminants from entering the pipes.
9. The seal on the unit refrigerant piping connections should remain in place until the last possible moment. This will prevent dust or water from getting into the refrigerant piping before it is connected.
10. **CAREFULLY** adjust refrigerant piping connections to suit the application.
11. Slowly loosen one of the flare nuts to release the factory nitrogen charge from the indoor units only.
12. Remove the flare nuts from the connections on the unit and discard the seal from each of the piping connections.
13. Slide the flare nuts onto the ends of the field-provided refrigerant piping before using a suitable flaring tool to flare the end of the copper pipe.
14. Apply recommended HFC-410A refrigerant lubricant to the outside of the flared refrigerant lines.
15. Align the threaded connections with the flared refrigerant lines. Tighten the flare nuts lightly at first to obtain a smooth match as illustrated in "Figure 30. Making Connections (Male to Female Connection)".

Table 5. Refrigerant Piping and Indoor Unit Connection Sizes

Size (Btuh)	Liquid Line in.	Suction Line in.
9K	1/4	3/8
12K	1/4	1/2
18K	1/4	1/2
24K	3/8	5/8

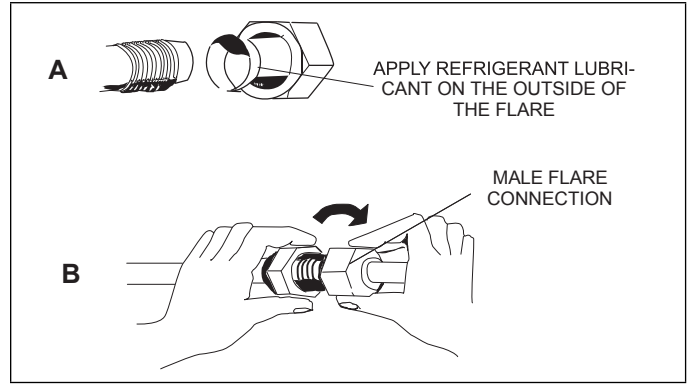


Figure 30. Making Connections (Male to Female Connection)

16. Once snug, continue another half-turn on each nut which should create a leak-free joint. A torque wrench may be used to tighten flare nuts using "Table 6. Flare Nut Torque Recommendations".
17. After refrigerant piping has been installed and checked for leaks, apply insulation over all flared connections.

IMPORTANT

Always use two wrenches when tightening flare nuts to avoid twisting refrigerant piping. DO NOT over-tighten flare nuts.

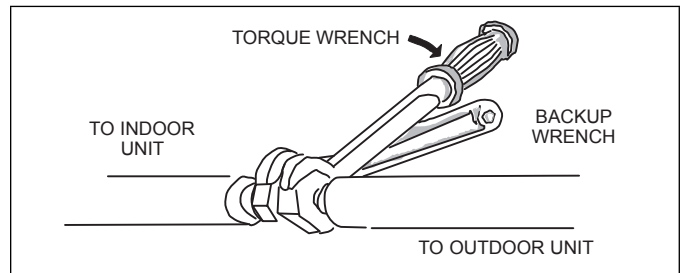


Figure 31. Tighten Flare Nut

Table 6. Flare Nut Torque Recommendations

Outside Diameter	Recommended Torque	No torque wrench available Finger tighten and use an appropriately sized wrench to turn an additional:
Inches		
1/4	15 ft.-lb. (20 N)	1/4 turn
3/8	26 ft.-lb. (35 N)	1/2 turn
1/2	41 ft.-lb. (56 N)	7/8 turn
5/8	48 ft.-lb. (65 N)	1 full turn

IMPORTANT

Do not allow for excess length of line sets to be left rolled up as part of the required, or in general. This will also cause additional performance issues.

IMPORTANT

Do not over-tighten a flared joint. Flared connections should always be accessible and must be insulated to prevent condensation.

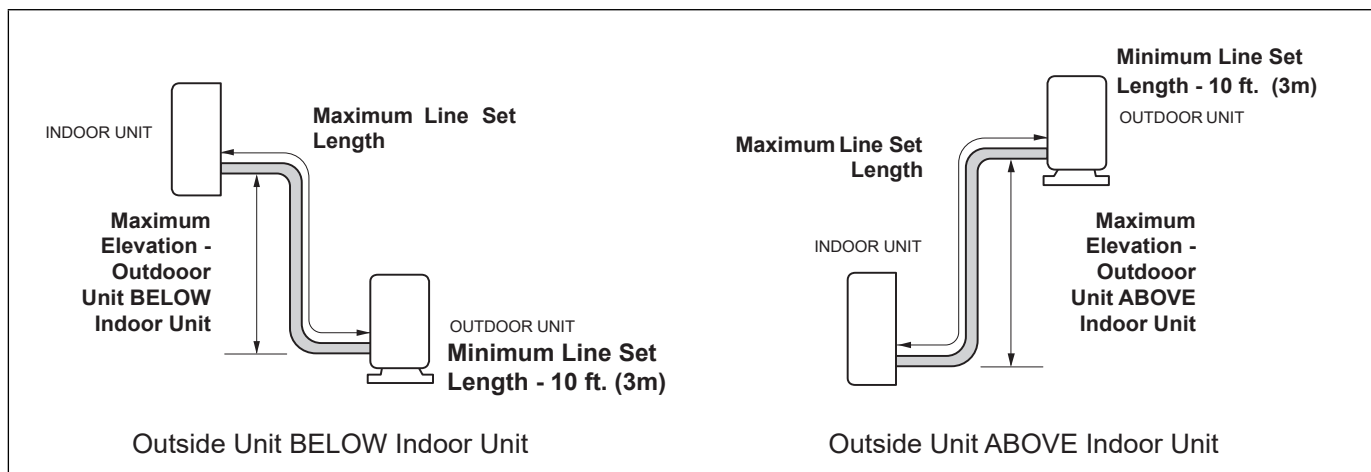


Figure 32. Indoor and Outdoor Unit Elevation Relationships

Table 7. Line Set Guide

Each system size has a line set length and vertical elevation parameters.						
System Size (KBtu)	Line Set Diameters (in.)		Maximum Elevation Outdoor Unit BELOW Indoor Unit - Feet (Meter)	Maximum Elevation Outdoor Unit ABOVE Indoor Unit - Feet (Meter)	Maximum Line Set Length - Feet (Meters)	Additional Refrigerant for greater than 25 Foot Line Set Length
	Liquid	Gas				
009	1/4	3/8	33 (10)	33 (10)	82 (25)	For the additional charging, add 0.16 oz. for 1/4" liquid line and 0.32 oz. for 3/8" liquid line per foot.
012	1/4	1/2	33 (10)	33 (10)	82 (25)	
018	1/4	1/2	66 (20)	66 (20)	98 (30)	
024	3/8	5/8	66 (20)	66 (20)	98 (30)	

Adding Refrigerant for Longer Line Set

The outdoor unit is factory-charged with refrigerant to accommodate up to 25 feet of line set. For adding additional refrigerant for longer line sets, see "Table 7. Line Set Guide".

Be sure to add the proper amount of additional refrigerant. Failure to do so may result in reduced performance.

Leak Test and Evacuation

Air and moisture remaining in the refrigerant system will have undesirable effects as indicated below:

- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze.
- Water may lead to corrosion of parts in the refrigeration system.

The line set between the indoor and outdoor units must be leak tested and evacuated to remove any non-condensables and moisture from the system.

Leak Test

Use the following procedure to test for system leaks:

1. Connect the manifold gauge set and dry nitrogen gas cylinder to the suction and gas service ports.
2. Open valve on nitrogen cylinder.
3. Pressurize the system per the pressure test specifications in "Table 8. Pressure Test Specifications".

4. Check that the system pressure remains stable. If there is any movement check system for leaks.
5. After the system is found to be free of leaks:
 - Close valve on nitrogen cylinder.
 - Relieve the nitrogen pressure by: loosening the charge hose connector at the nitrogen cylinder.
 - When the system pressure is reduced to normal, disconnect the hose from the cylinder.

Table 8. Pressure Test Specifications

	Bar	Psig	kPa	Duration
1	3	44	303	Minimum of 10 minutes
2	15	220	1517	Minimum of 10 minutes
3	32	470	3241	Minimum of 10 minutes
4	45	650	4482	1 hour. Stress test to prove the integrity of the complete installation.
5	32	470	3241	24 hours. Lower system pressure test, after confirmation No. 4 was successfully completed.

IMPORTANT

Use only oxygen-free nitrogen (OFN).

Triple Evacuation Procedure

A Micron or Torr gauge must be used for this procedure.

1. Discharge the oxygen-free nitrogen and evacuate the system to a reading of 8000 Microns (8 Torr) using all service valves.
2. Break the vacuum by allowing nitrogen into the port connections (liquid and gas line pipes) until a positive pressure is achieved.

3. Evacuate the system to a reading of 5000 Microns (5 Torr).
4. Break the vacuum by allowing nitrogen into the port connections (liquid and gas line pipes) until a positive pressure is achieved.
5. Evacuate the system to a minimum reading of 500 Microns (0.5 Torr).
6. For a moisture-free system, ensure the vacuum is held without movement for a minimum of 4 hours.
7. If vacuum fails to hold, carry out steps 2 through 6 until vacuum holds.

Wiring Connections

In the U.S.A., wiring must conform with current local codes and the current National Electric Code (NEC).

In Canada, wiring must conform with current local codes and the current Canadian Electrical Code (CEC).

⚠ WARNING

Electric Shock Hazard. Can cause injury or death. Unit must be rounded in accordance with national and local codes.

Line voltage is present at all components when unit is not in operation. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power sources.

⚠ CAUTION

All terminal connections must be made as illustrated in the following diagrams. Improperly connected wiring could damage unit or cause communication errors between indoor and outdoor units.

Outdoor Unit

- Refer to unit nameplate for minimum circuit ampacity and maximum over-current protection size.
- Make all electrical power wiring connections at the outdoor unit.

- Be sure to reattach all electrical box covers after connections are complete.

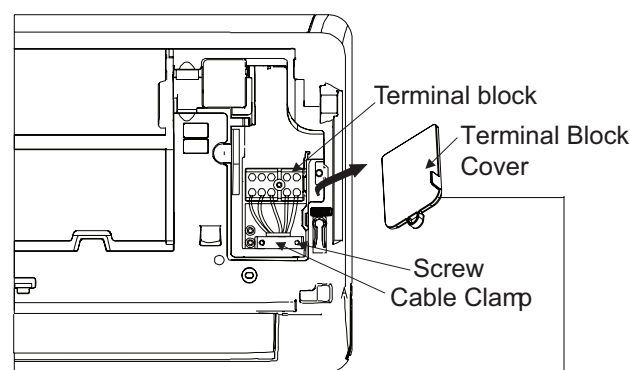
Indoor Unit

- Indoor unit is powered by the outdoor unit.
- Communication, power and ground wiring - Use one stranded 3-conductor with ground wire.
- See "Table 9. Single Zone Installation Wiring Requirements" on page 15 for wiring requirements.

NOTE: When installing a condensate pump the line voltage will have to be broken by using the condensate wiring or through the use of an external relay or contactor.

IMPORTANT

All illustrations listed are typical wiring diagrams. Refer to the wiring diagram on the unit for actual wiring.



The wiring diagram is located on the inside of the indoor unit's terminal block cover.

Figure 33. Indoor Unit Terminal Block

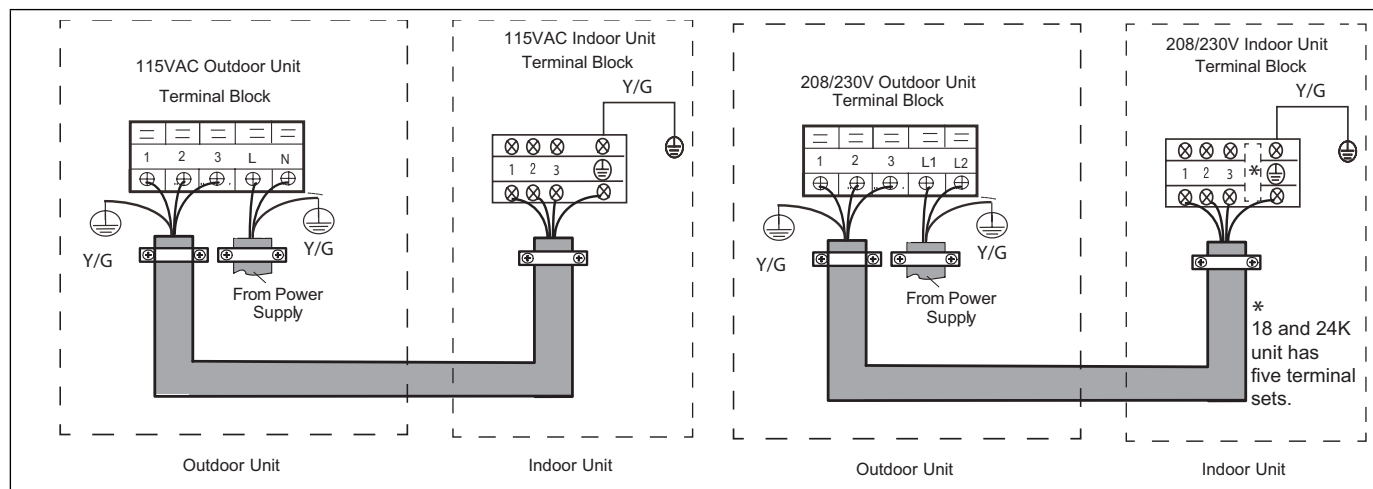


Figure 34. Single Zone Wiring

IMPORTANT

This unit must be properly grounded and protected by a circuit breaker. The ground wire for the unit must not be connected to a gas or water pipe, a lightning conductor or a telephone ground wire.

Do not connect power wires to the outdoor unit until all other wiring and piping connections have been completed.

Do not install the unit near a lighting appliance that includes a ballast. The ballast may affect remote control operation.

Table 9. Single Zone Installation Wiring Requirements

Systems and Terminal Designations	System Capacity	System Voltage	Number of Conductors	Wire Type	Wire Gauge / Minimum Circuit Ampacity	Max Fuse
Indoor to Outdoor Wiring (Communication/Power) 1, 2, 3 and GND	09K	115VAC	4		16AWG / 16A	20A
Outdoor to Main Power L, N and GND	09K	115VAC	3		16AWG / 16A	
Indoor to Outdoor Wiring (Communication/Power) 1, 2, 3 and GND	12K	115VAC	4	Stranded and unshielded	16AWG / 15A	20A
Outdoor to Main Power L, N and GND	12K	115VAC	3		16AWG / 15A	
Indoor to Outdoor Wiring (Communication/Power) 1, 2, 3 and GND	09K	208/230VAC	4		16AWG / 10A	15A
Indoor to Outdoor Wiring (Communication/Power) 1, 2, 3 and GND	09K	208/230VAC	4		16AWG / 10A	
Indoor to Outdoor Wiring (Communication/Power) 1, 2, 3 and GND	12K	208/230VAC	4		16AWG / 15A	15A
Outdoor to Main Power L1, L2 and GND	12K	208/230VAC	3		16AWG / 15A	
Indoor to Outdoor Wiring (Communication/Power) 1, 2, 3 and GND	18K	208/230VAC	4		16AWG / 15A	20A
Outdoor to Main Power L1, L2 and GND	18K	208/230VAC	3		16AWG / 15A	
Indoor to Outdoor Wiring (Communication/Power) 1, 2, 3 and GND	24K	208/230VAC	4		16AWG / 20A	25A
Outdoor to Main Power L1, L2 and GND	24K	208/230VAC	3		16AWG / 20A	
MCA = Minimum Circuit Amps						

Wiring Diagrams

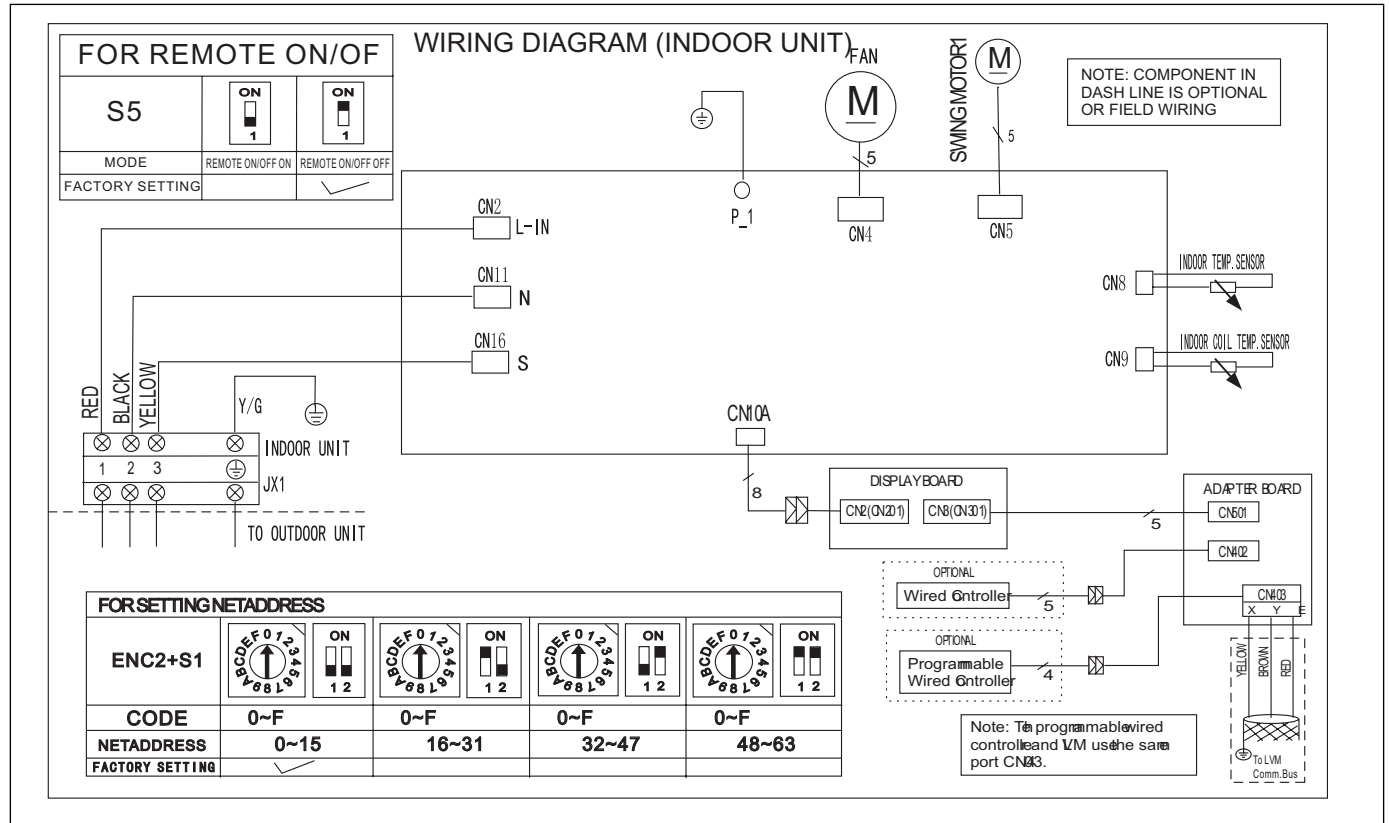


Figure 35. 09K,12K, 18K and 24K - 115V and 208/230VAC Indoor Unit Wiring Diagram

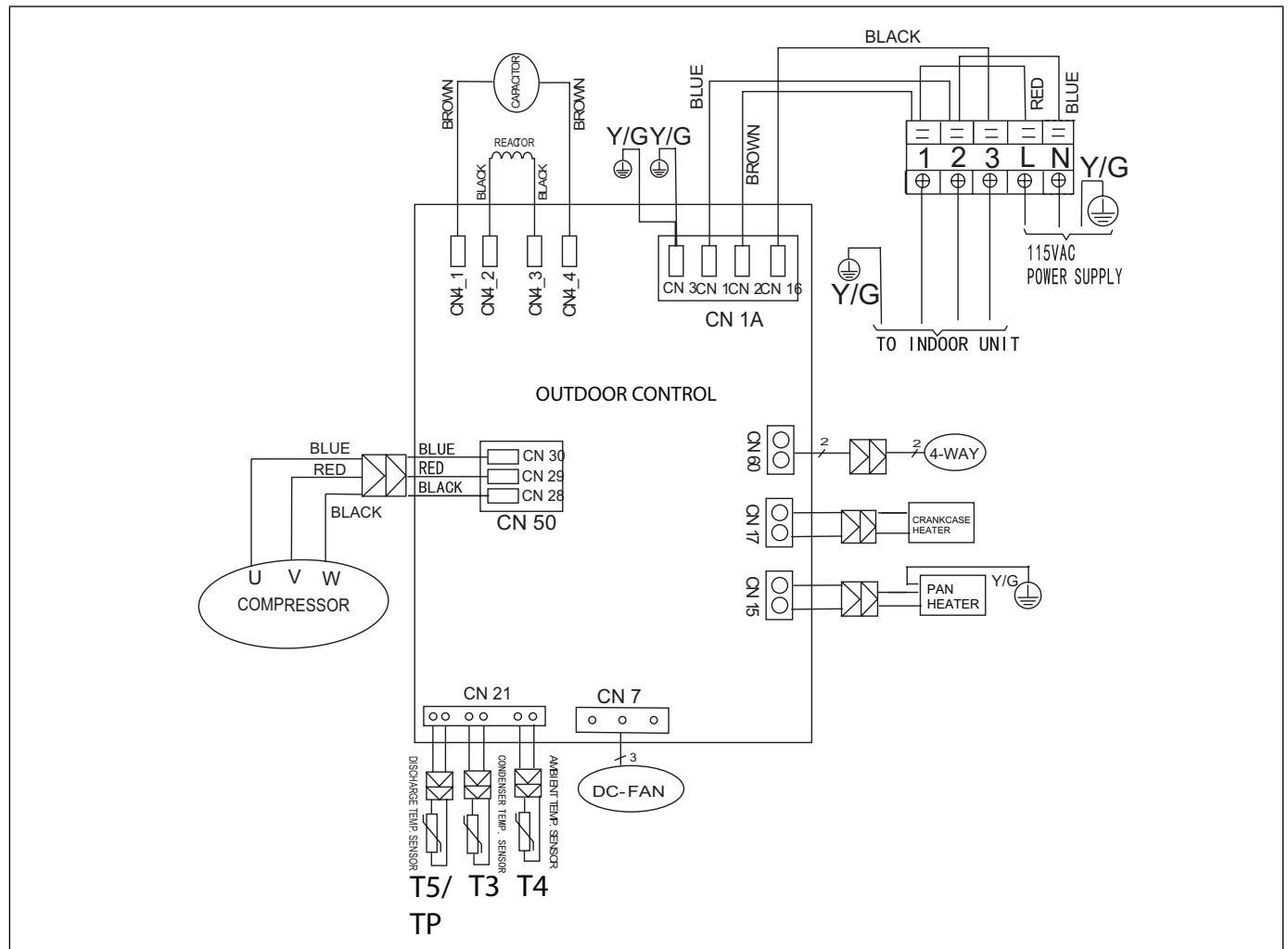


Figure 36. 9K - 115VAC Outdoor Unit Wiring Diagram

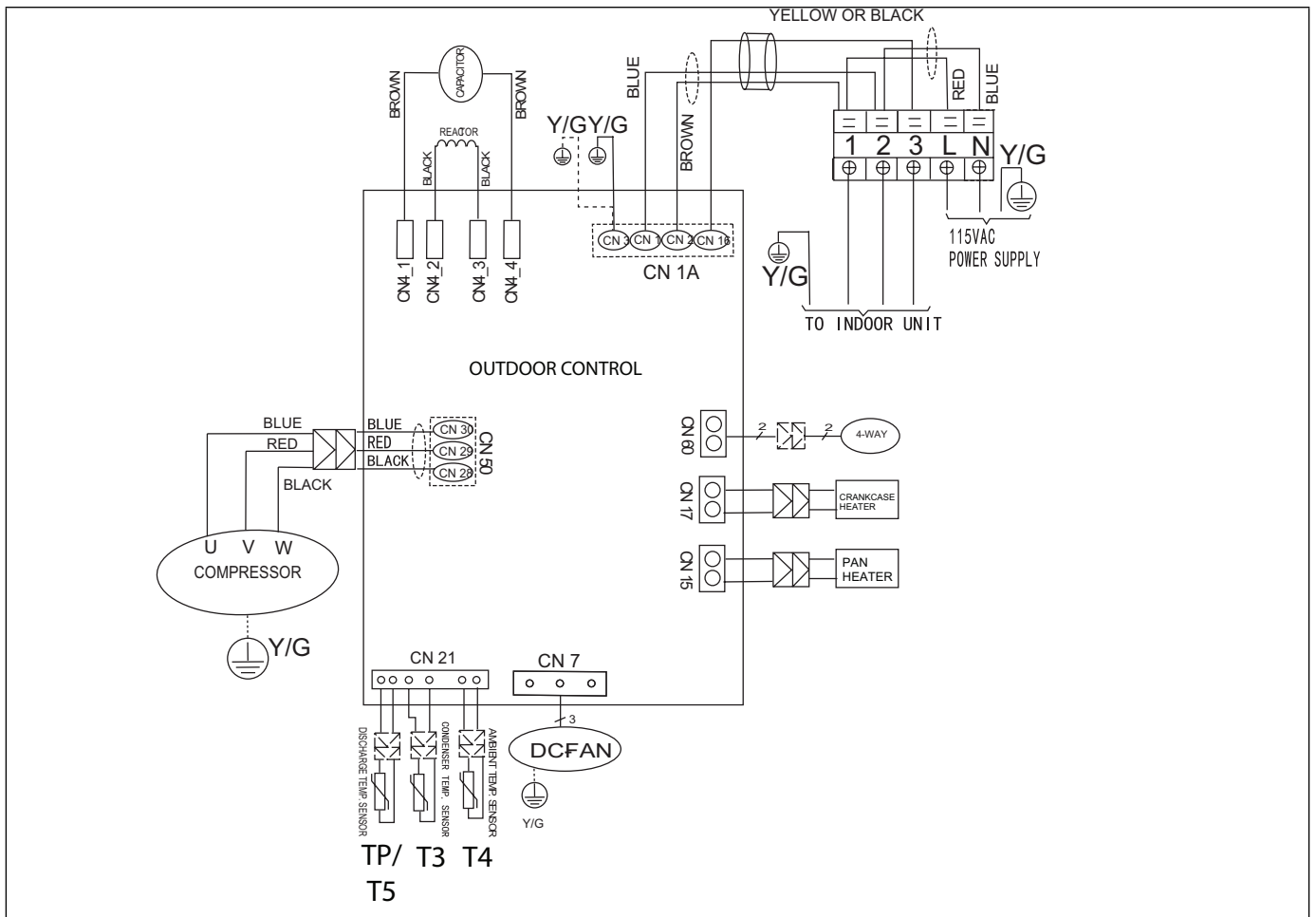


Figure 37. 12K - 115VAC Outdoor Unit Wiring Diagram

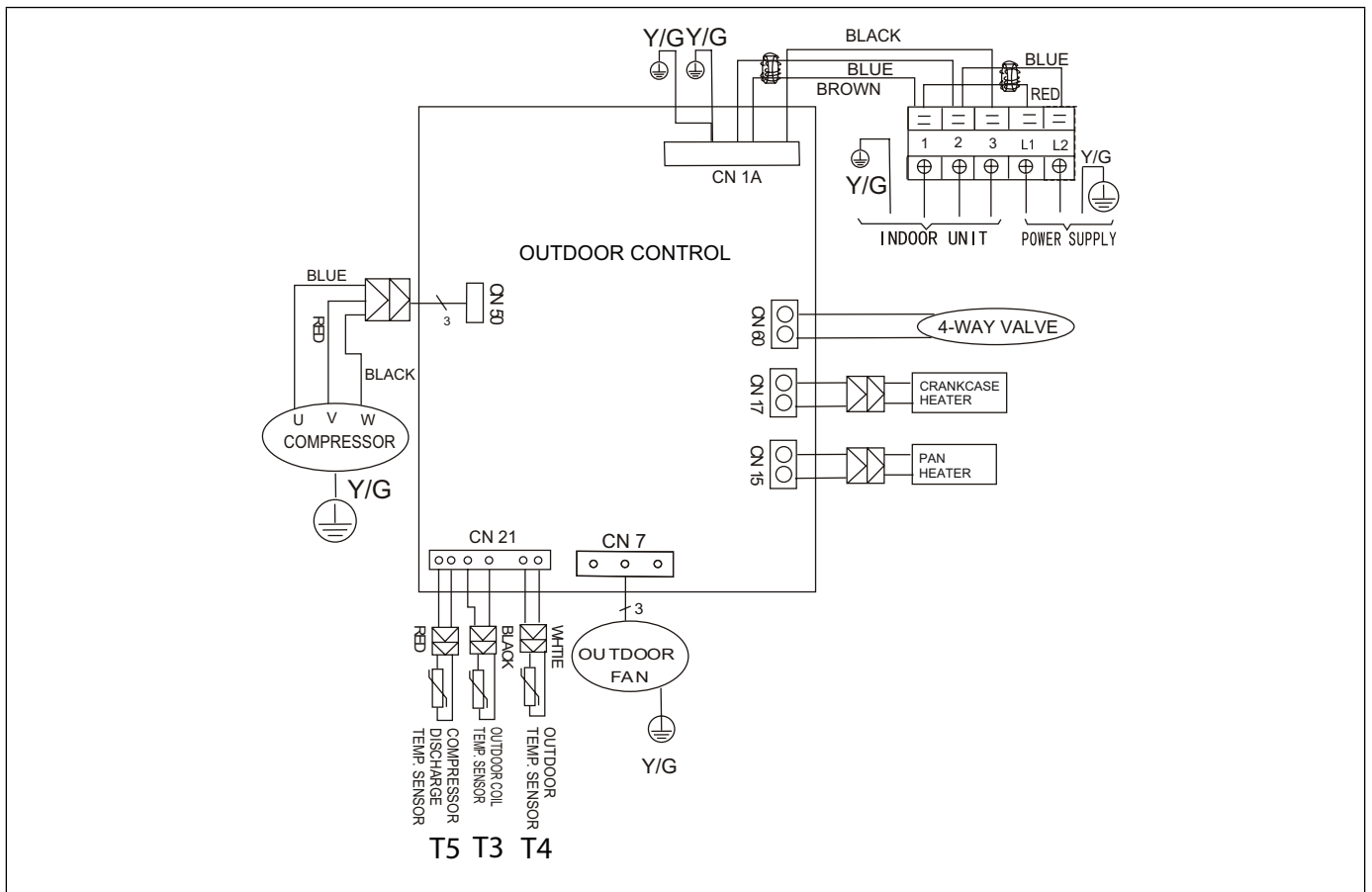


Figure 38. 09K, 12K and 18K - 208/230VAC Outdoor Unit Wiring Diagram

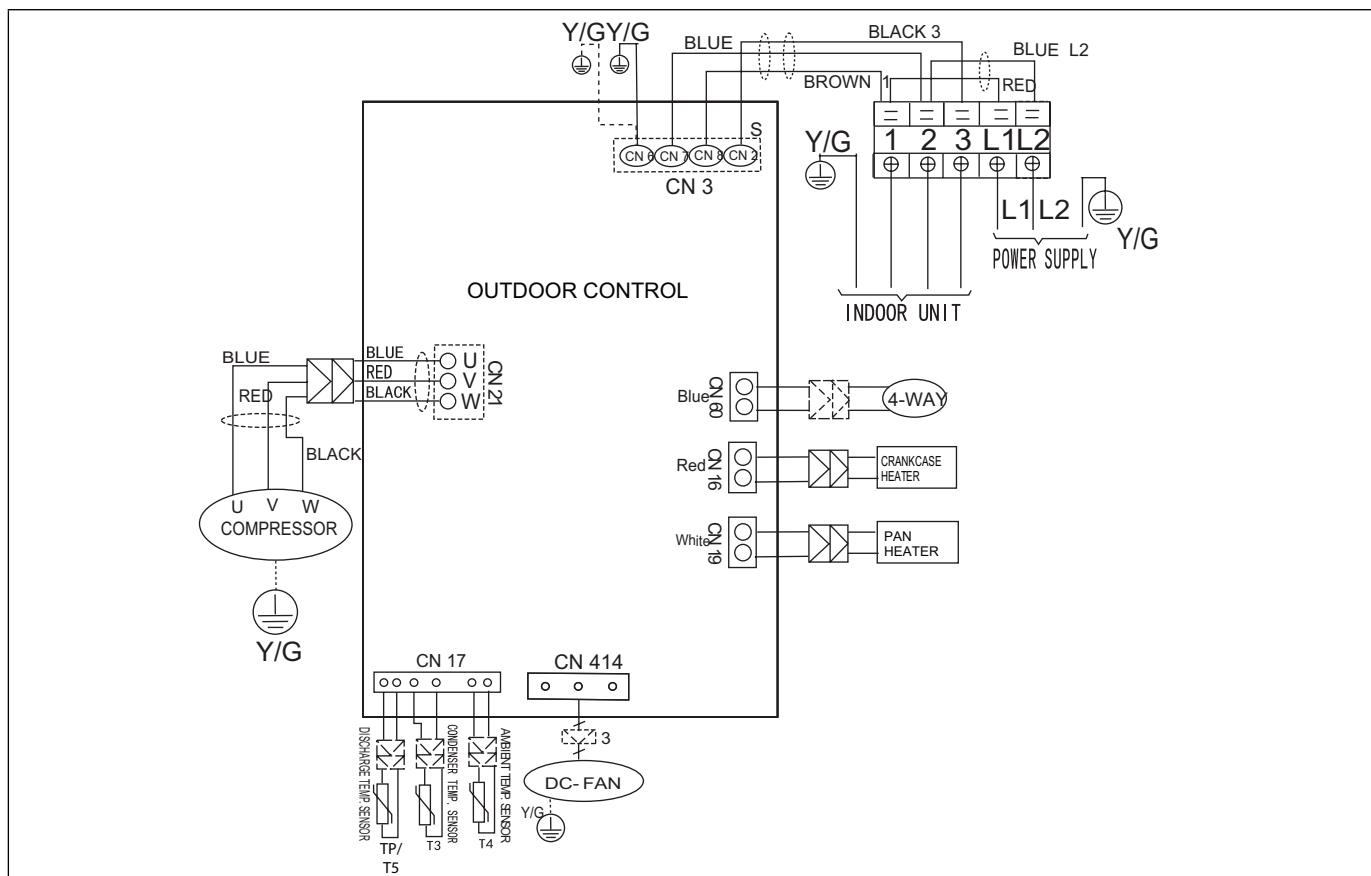


Figure 39. 24K - 208/230VAC Outdoor Unit Wiring Diagram

Unit Start-Up

IMPORTANT

Units should be energized 24 hours before unit start-up to prevent compressor damage as a result of slugging.

1. Inspect all factory- and field-installed wiring for loose connections.
2. Verify that the manifold gauge set is connected.
3. Add additional refrigerant charge if required before opening valves and while system is still under a vacuum.
4. Open the liquid and suction line service valves to release the refrigerant charge contained in outdoor unit into the system.
5. Replace the stem caps and tighten to the value listed in "Table 3. Torque Requirements" on page 7.
6. Check voltage supply at the outdoor unit terminal strip. The voltage must be within the range listed on the unit's nameplate. If not, do not start the equipment until you have consulted with the power company and the voltage condition has been corrected.
7. Refer to the included user guide to operate the system using the provided remote control.
8. Visually check for binding of both indoor and outdoor fans.

Troubleshooting

Table 10. Indoor Unit Error Codes

Display	Error Information
E0	Indoor unit EEPROM parameter error
E1	Indoor / outdoor units communication error
E2	Zero-crossing signal detection error
E3	The indoor fan speed is operating outside of the normal range
E4	Indoor room temperature sensor T1 is in open circuit or has short circuited
E5	Evaporator coil temperature sensor T2 is in open circuit or has short circuited
EC	Refrigerant leak detected
F0	Overload current protection
F1	Outdoor ambient temperature sensor T4 open circuit or short circuit
F2	Condenser coil temperature sensor T3 is in open circuit or has short circuited
F3	Compressor discharge temperature sensor TP open circuit or short circuit
F4	Outdoor unit EEPROM parameter error
F5	The outdoor fan speed is operating outside of the normal range
p0	IPM malfunction or IGBT over-strong current protection
p1	Over voltage or over low voltage protection
p2	High temperature protection of IPM module

Table 10. Indoor Unit Error Codes

Display	Error Information
P3	Outdoor ambient temperature too low.
p4	Inverter compressor drive error

Test Run

Pre-Checks

Only perform test run after you have completed the following steps:

- Electrical Safety Checks – Confirm that the unit's electrical system is safe and operating properly.
- Refrigerant Leak Checks – Check all flare nut connections and confirm that the system is not leaking.
- Confirm that suction and liquid valves are fully open.

Procedure

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 to turn it on.
3. Let each function run for 5 minutes, and perform the following checks:

Test Run Checklist

Table 11. Test Run Checklist

Checks	Pass	Fail
No electrical leakage		
Unit is properly grounded		
All electrical terminals properly covered		
Indoor and outdoor units are solidly installed		
All pipe connection points do not leak		
Water drains properly from drain hose		
All piping is properly insulated		
Unit performs COOL function properly		
Indoor unit louvers rotate properly		
Indoor unit responds to wireless remote		

Double-Check Line Set Connections

During operation, the pressure of the refrigerant circuit will increase. This may reveal leaks that were not present during your initial leak check. Take time during the Test Run to double-check refrigerant line set connections and verify there are no leaks.

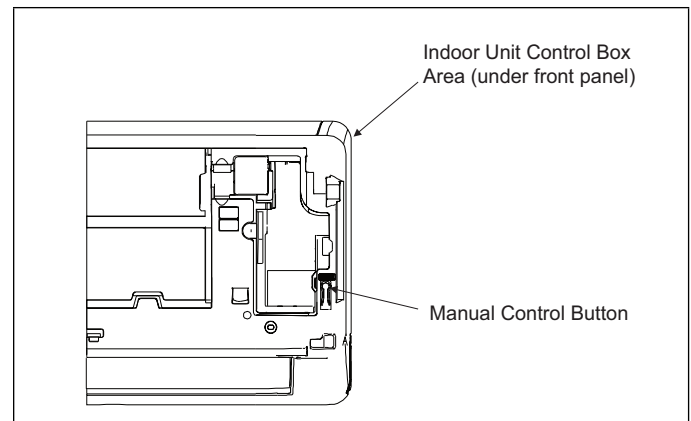
1. Using the wireless remote control, return unit to the normal operating temperature.
2. Using insulation tape, wrap the indoor refrigerant pipe connections that you left uncovered during the indoor unit installation process.

Ambient Temperature is Below 63°F (17°C)

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

You cannot use the wireless remote control to turn on the COOL function when the ambient temperature is below 63°F (17°C). In this instance, you can use the MANUAL CONTROL button on the indoor unit to test the COOL function.

1. Lift the front panel of the indoor unit, and raise it until it clicks in place.
2. The MANUAL CONTROL button is located on the right-hand side of the unit. Press it two times to select the COOL function. See "Figure 40. Manual Control Button".
3. Perform Test Run as normal.

**Figure 40. Manual Control Button**

