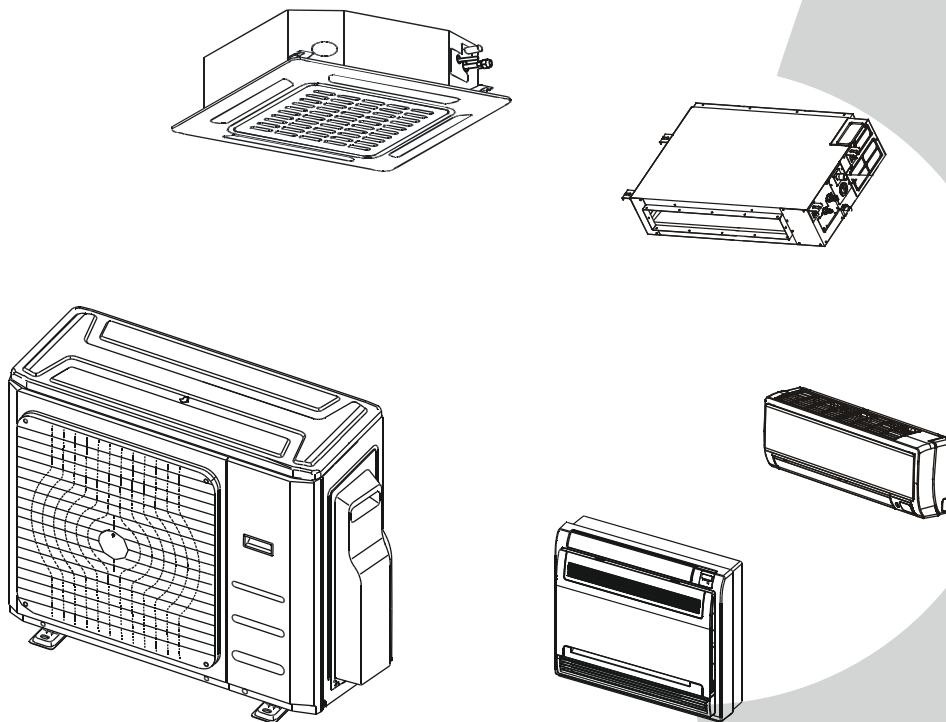




## YN-M Series

Inverter++ Models

Two, Three, Four, and Five Zones  
(Dual, Triple, Quad, and Quint Multi)



# Installation Manual

**IMPORTANT NOTE:**

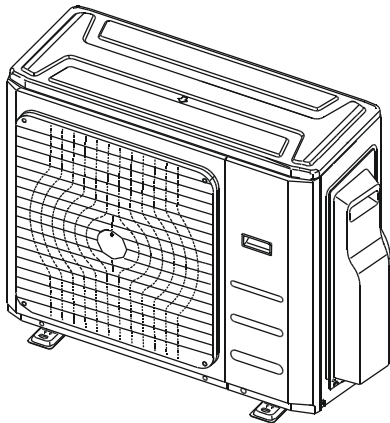
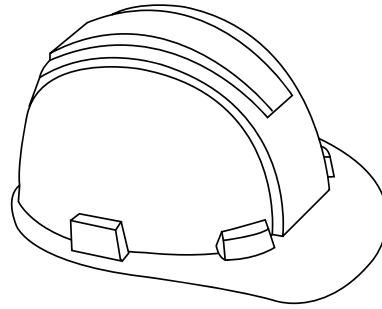
- Read this manual carefully before installing or operating your new air conditioning unit. Be sure to store this manual for your future reference.
- This manual only describes the outdoor unit of the system. For more info on the indoor unit, refer to its installation manual.



# Table of Contents

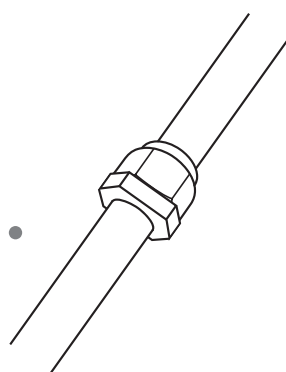
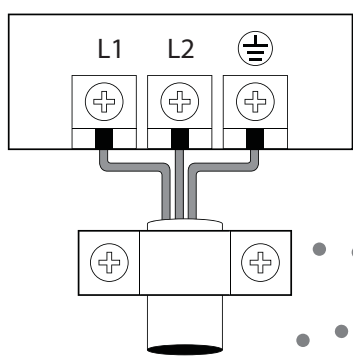
## Installation Manual

1	Accessories.....	04
2	Safety Precautions.....	05
3	Installation Overview.....	06
4	Installation Diagram.....	07
5	Specifications.....	08



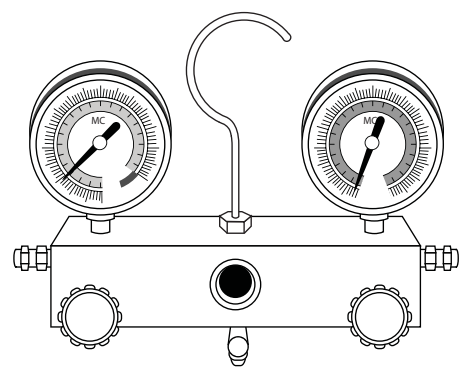
6	Outdoor Unit Installation.....	09
	a. Outdoor Unit Installation Instructions.....	09
	b. Drain Joint Installation.....	11
	c. Notes on Wall Hole Drilling.....	11
	d. When Selecting a 24K Indoor Unit.....	11

**7 Refrigerant Piping Connection.....12**



**8 Wiring.....14**  
a. Outdoor Unit Wiring.....14  
b. Wiring Figure.....16


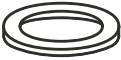
**9 Air Evacuation.....19**  
a. Evacuation Instructions.....19  
b. Note on Adding Refrigerant.....26



**10 Test Run.....27**

**11 Function of Automatic Wiring/Piping Correction.....28**

The air conditioning system comes with the below accessories. Use all of the installation parts and accessories to install the air conditioner. Improper or incomplete installation can result in water leakage, electrical shock and fire, or equipment failure.

Name		Shape	Quantity
Drain joint (some models)			1
Seal ring (some models)			1
Connecting pipe assembly	Liquid side	Ø6.35 (1/4)	9K, 12K, 18K
		Ø9.52 (3/8)	24K
	Gas side	Ø9.52 (3/8)	9K
		Ø12.7 (1/2)	12K, 18K
		Ø15.9 (5/8)	24K
Owner's manual			1
Installation manual			1
Transfer connector (packed with the indoor or outdoor unit, depending on models) NOTE: Pipe size may differ based on capacity and model To meet different pipe size requirements, sometimes the pipe connections need a transfer connector adapter to be installed on the outdoor unit service valves.			Optional part (one piece/one indoor unit)
			Optional part (1-5 pieces for outdoor unit, depending on models)
Magnetic ring (Hitch onto the connective cable between the indoor unit and outdoor unit after installation)			Optional part (one piece/one cable)
Cord protection rubber ring (If the cord clamp cannot secure a small diameter cord, use the cord protection rubber ring [supplied with accessories] to wrap around the cord. Then, fix it in place with the cord clamp.)			1 (on some models)

## Optional Accessories

There are two types of remote controls: wired and wireless.

Select a remote controller based on personal preferences and requirements, and install it in an appropriate place.

Refer to catalogs and technical literature for guidance on selecting a suitable remote controller.

## Read and Understand All Safety Precautions Before Installation

Incorrect installation due to negligence of instructions can lead to serious damage or injury. The magnitude of potential damages or injuries is classified as either a **WARNING** or **CAUTION**.



**WARNING**

Failure to observe a warning may result in severe injury or death. The appliance must be installed in full accordance with all relevant national regulations.



**CAUTION**

Failure to observe a caution may result in injury or equipment damage.

### **WARNING**

- Carefully read the Safety Precautions before installation.
- In certain functional environments, such as kitchens, server rooms, etc., the use of specially designed air-conditioning units is highly recommended. This is a comfort cooling system.
- Only trained and certified technicians should install, repair, and service this air conditioning unit.  
Installation by unqualified persons is highly ill-advised, and can cause diminished performance, as well as risk of damage to equipment or nearby persons.
- Strictly follow the installation instructions set forth in this manual.  
Improper installation may lead to electrical shock, short circuit, leaks, fire or other damage to the equipment.
- Before installing the unit, consider strong winds, earthquakes, or other hazards that might affect your unit, and locate it accordingly. Failure to do so could cause equipment failure.
- After installation, ensure that there are no refrigerant leaks and that the unit is operating properly. Refrigerant and/or oil in the system is toxic, flammable, and poses a serious health and safety risk.

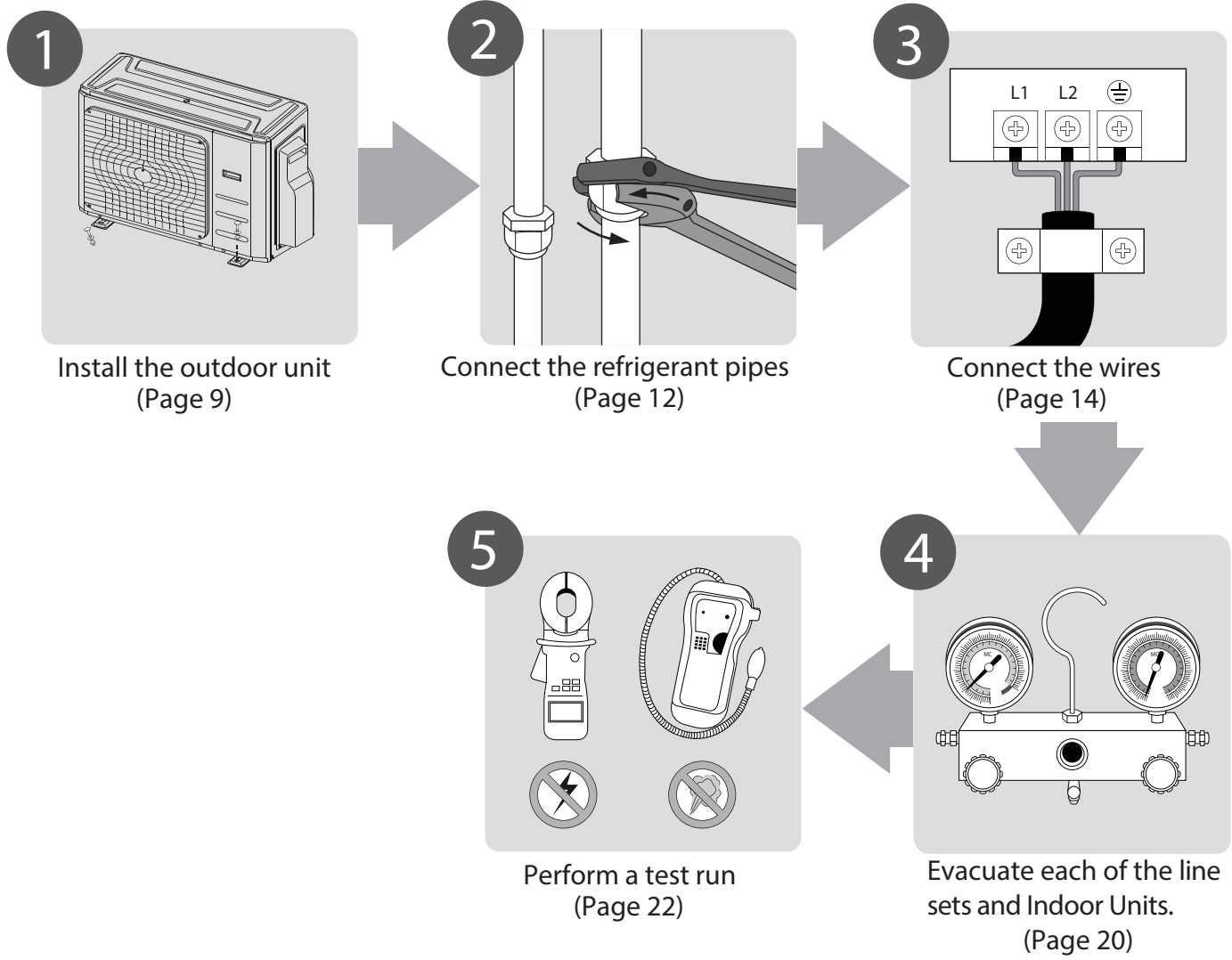
### Note about Fluorinated Gasses

1. This air-conditioning unit contains fluorinated refrigerant, commonly known as R410a. For the charged amount, please refer to the relevant label on the unit side panel.
2. Installation, service, maintenance, and repair of this unit must be performed by a certified technician possessing specialized training and specific tools.
3. Product removal and recycling must also be performed by a certified technician.
4. If the system has a leak-detection feature installed, it must be checked for leaks at least every 12 months.
5. When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

# Installation Overview

# 3

## INSTALLATION ORDER



## Installation Diagram

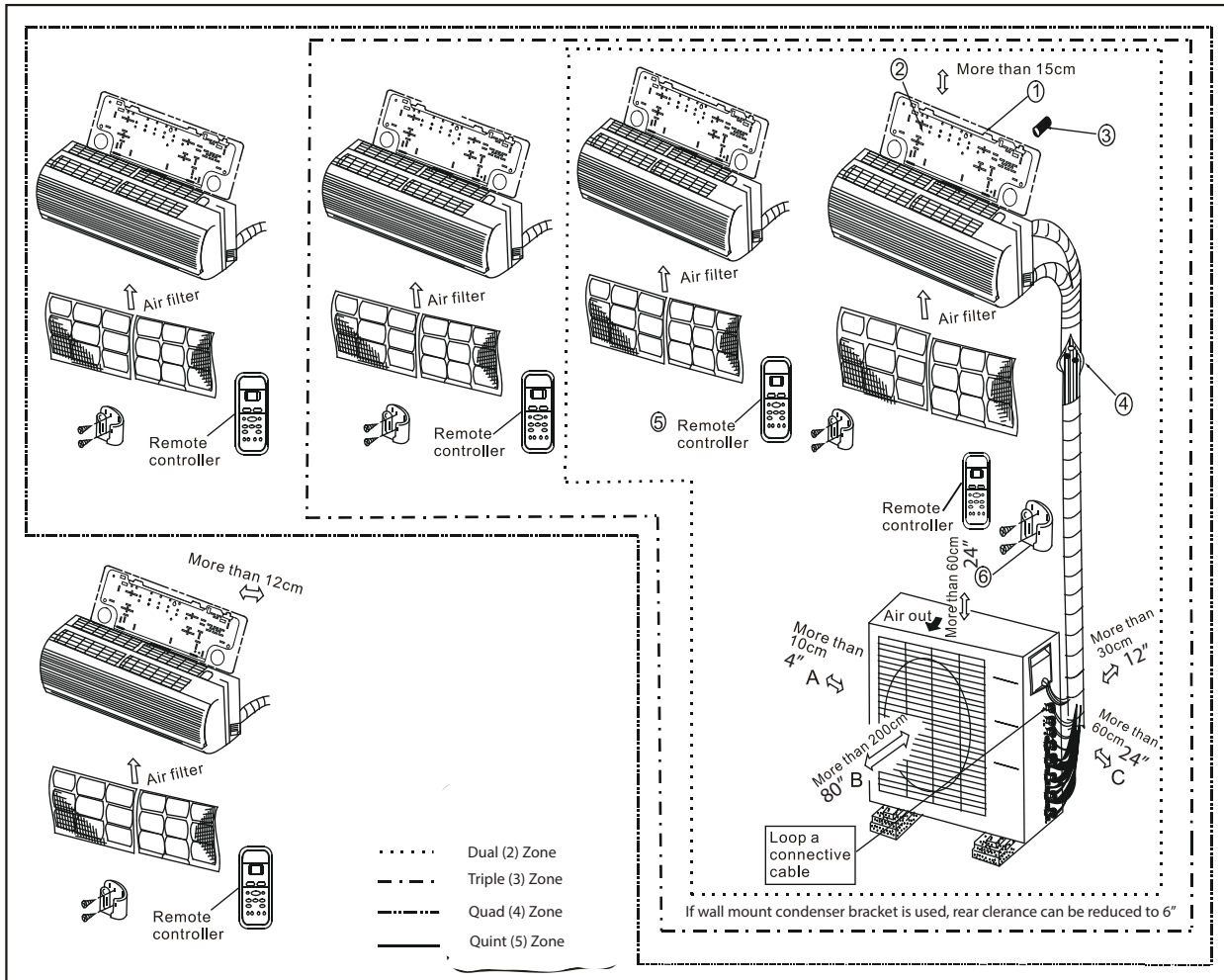


Fig. 4.1

## Safety Precautions

### CAUTION

- This illustration is for demonstration purposes only. The actual shape of your air conditioner may be slightly different.
- Copper lines must be independently and individually insulated.

### CAUTION

- To prevent wall damage, use a stud finder to locate studs.
- A minimum pipe run of 3 m. (10') is needed to minimize vibration and excessive noise.
- A, B, and C air circulation clearance area and pathways must be free from obstructions at all times.

Table 5.1

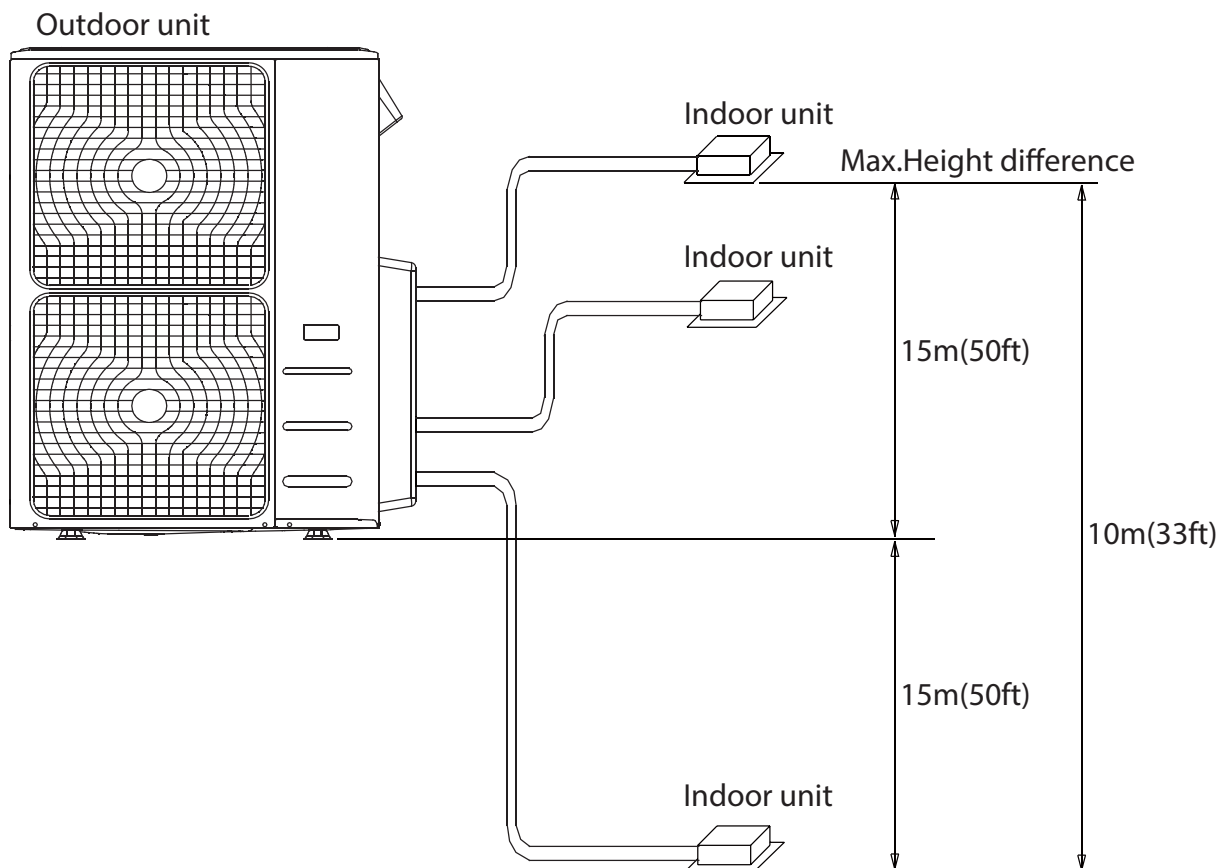
Number of units that can be used together	Connected units	1 to 5 units
Compressor stop/start frequency	Stop time	3 min or more
Power source voltage	voltage fluctuation	within $\pm 10\%$ of rated voltage
	voltage drop during start	within $\pm 15\%$ of rated voltage
	interval phase unbalance	within $\pm 3\%$ of rated voltage

Table 5.2

Unit: m/ft.

	2 Zone	3 Zone	4 Zone	5 Zone
Max. length for all rooms	40/130	60/200	80/260	80/260
Max. length for one indoor unit	25/80	30/100	35/115	35/115
Max. height different between indoor and outdoor unit	15/50	15/50	15/50	15/50
Max. height different between indoor units	10/33	10/33	10/33	10/33

When installing multiple indoor units to work with a single outdoor unit, ensure that the length of the refrigerant pipe and the drop height between the indoor and outdoor units meet the requirements illustrated in the following diagram:





## Outdoor Unit Installation Instructions

### Step 1: Select installation location.

The outdoor unit should be installed at a location in accordance with the following guidelines:

- ☑ Place the outdoor unit as close to the indoor units as possible.
- ☑ Ensure that there is enough room for installation and maintenance.
- ☑ The air inlet and outlet must not be obstructed or exposed to strong winds.
- ☑ Ensure the location of the unit will not be subject to snowdrifts, accumulation of leaves, or other seasonal debris. If possible, provide an awning for the unit. Ensure the awning does not obstruct the airflow.
- ☑ The installation area must be dry and well ventilated.
- ☑ There must be enough room to install the connecting pipes and cables, and to access them for maintenance.

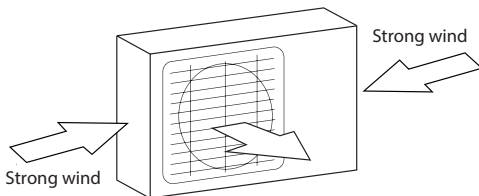


Fig. 6.1

- ☑ The area must be free of combustible gases and chemicals.
- ☑ The pipe length between the outdoor and indoor unit may not exceed the maximum allowable pipe length.
- ☑ If possible, **DO NOT** install the unit where it is exposed to direct sunlight.
- ☑ If possible, make sure the unit is located far away from your neighbors' property so that the noise from the unit will not disturb them.
- ☑ If the location is exposed to strong winds (for example: near a seaside), the unit must be placed against the wall to shelter it from the wind. If necessary, use an awning. (See Fig. 6.1 & 6.2)
- ☑ Install the indoor and outdoor units, cables and wires at least 1 meter from televisions or radios to prevent static or image distortion. Depending on the radio waves, a 1m (3') distance may not be enough to eliminate all interference.

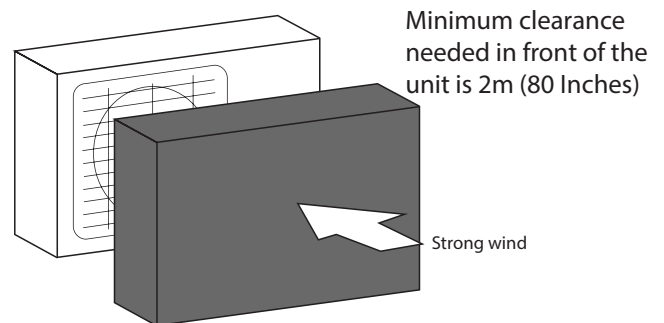


Fig. 6.2

### Step 2: Install outdoor unit.

Fix the outdoor unit with anchor bolts (M10 or 3/8")

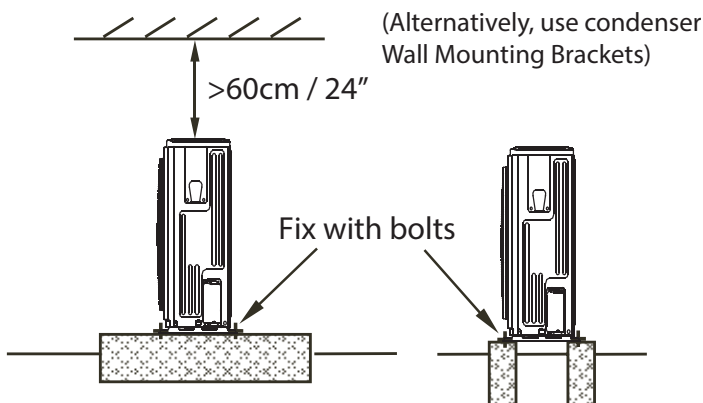


Fig. 6.3

### ! CAUTION

- Be sure to remove any obstacles that may block air circulation.
- Make sure you refer to length specifications to ensure there is enough room for installation and maintenance.

Split Type Outdoor Unit  
(Refer to Fig 6.4, 6.5, 6.6, 6.10 and Table 6.1)

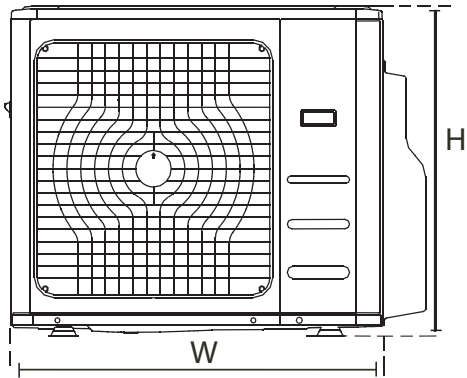


Fig. 6.4

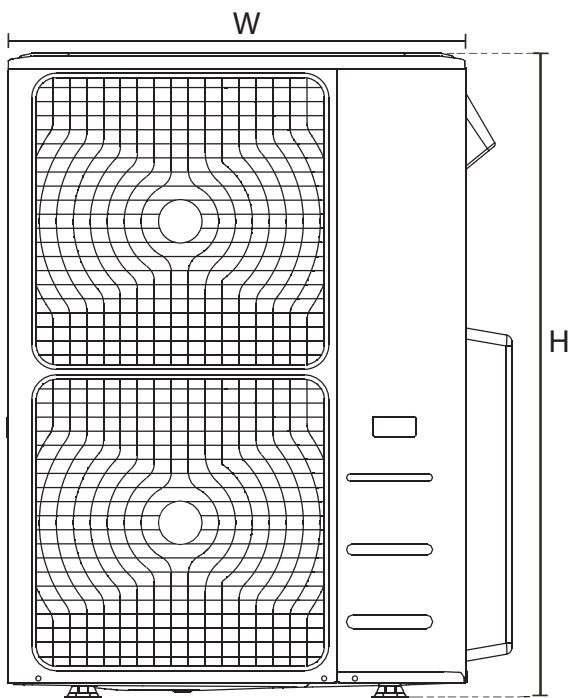


Fig. 6.5

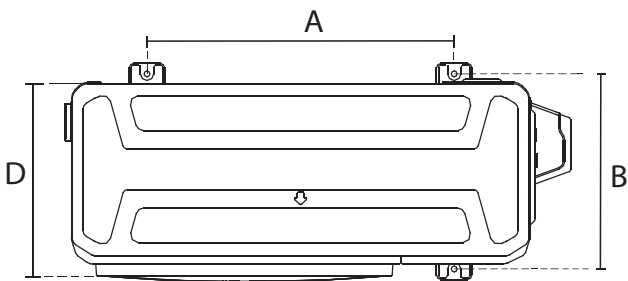


Fig. 6.6

Table 6.1: Length Specifications of Split Type Outdoor Unit (unit: mm/inch)

Outdoor Unit Dimensions W x H x D	Mounting Dimensions	
	Distance A	Distance B
2 Zone (Dual Multi Split) 845x702x363 (33-1/4x27-5/8/14-3/8)	540 (21-1/4)	350 (13-3/4)
3 Zone (Triple Multi Split) 946x810x420 (37-1/4x31-7/8x16-1/2)	673 (26-1/2)	403 (15-7/8)
4 Zone (Quad Multi Split) 946x810x420 (37-1/4x31-7/8x16-1/2)	673 (26-1/2)	403 (15-7/8)
5 Zone (Quint Multi Split) 952x1333x415 (37-1/2x52-1/2x16-1/4)	634 (25)	404 (15-7/8)

Installation in Rows (Parallel or Serial)

Table 6.2 The relations between H, A, and L are as follows:

	L	A
$L \leq H$	$L \leq 1/2H$	25 cm / 10" or more
	$1/2H < L \leq H$	30 cm / 12" or more
$L > H$	Cannot be installed	

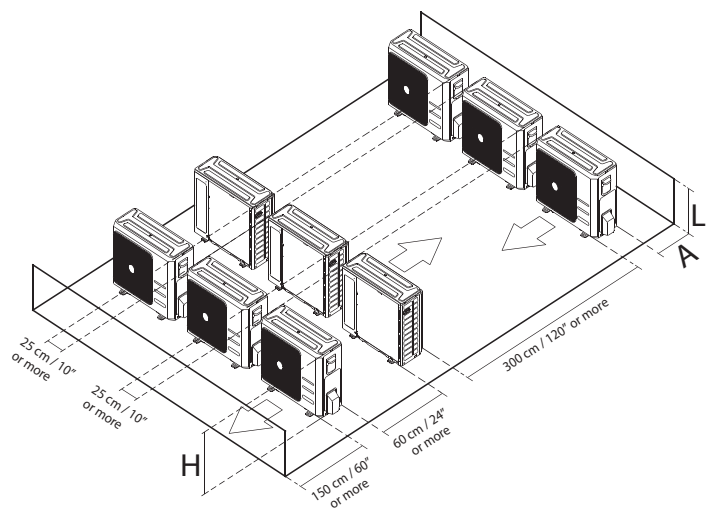


Fig. 6.7

**NOTE:** The minimum distance between the outdoor unit and the walls described in the installation guide does not apply to airtight rooms. Be sure to keep the unit unobstructed in at least two of the three directions (M, N, P) (See Fig. 6.8)

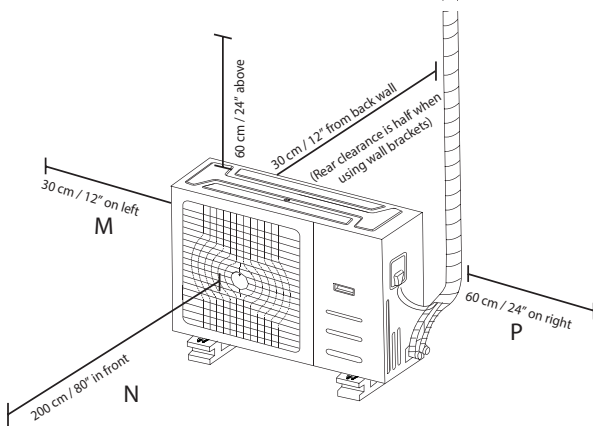


Fig. 6.8

### Drain Joint Installation

Before bolting the outdoor unit in place, you must install the drain joint at the bottom of the unit. (See Fig. 6.9)

1. Fit the rubber seal on the end of the drain joint where it will connect to the outdoor unit.
2. Insert the drain joint into the hole in the base pan.
3. Rotate the drain joint 90° until it clicks in place and faces the front of the unit.
4. Connect a drain hose extension (if included) to the drain joint, to redirect water from the unit during heating mode.

**NOTE:** Make sure the water drains into a safe location where it will not cause water damage or a slipping hazard.

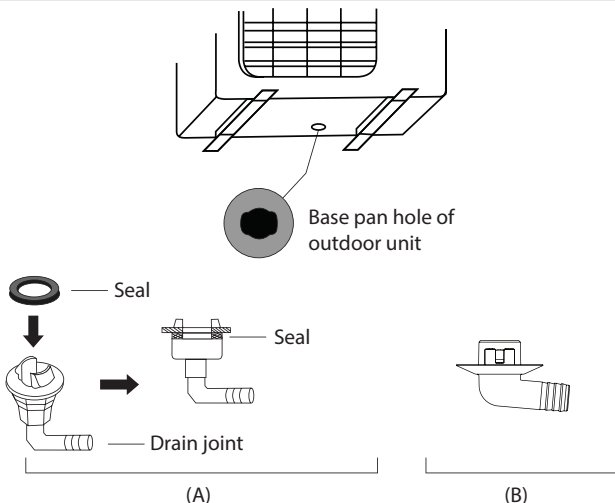


Fig. 6.9

### Notes On Wall Hole Drilling

You must drill a hole in the wall for the refrigerant piping and signal cable that will connect the indoor and outdoor units.

1. Determine the location of the wall hole based on the location of the outdoor unit.
2. Using a 65-mm (2-1/2") core drill, drill a hole into the wall.

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

3. Place the protective wall sleeve into the inside part of the hole. This protects the edges of the hole and helps seal it when you finish the installation process.

### When Selecting a 24K Indoor Unit (5 zone only)

The 24K indoor unit can only be connected with a 5-zone system. If there is one 24K indoor unit, connect it to Circuit A. If there are two 24K indoor units, connect them to circuits A and B only. (See Fig. 6.10)

Table 6.3: Connective pipe size of an A and B system (unit: inch)

Indoor Unit capacity (Btu/h)	Liquid	Gas
9K/12K	1/4	3/8
12K/18K	1/4	1/2
24K	3/8	5/8

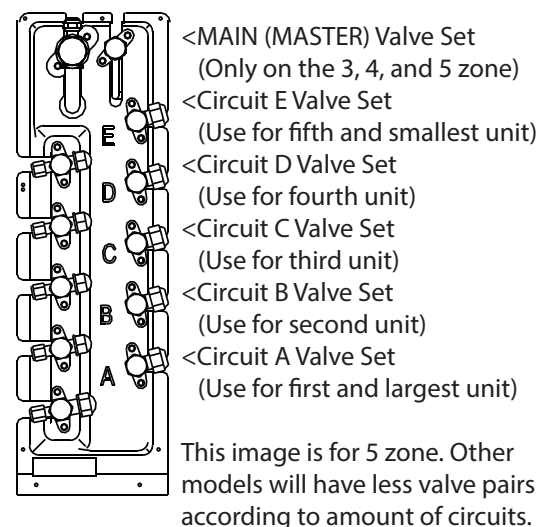


Fig. 6.10

# Refrigerant Piping Connection

# 7

## Safety Precautions

### ! WARNING

- All field piping must be handled by a licensed technician and must comply with all local and national regulations.
- If the air conditioner 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 allowed 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 refrigerant leakage occurs during the installation. Leaked refrigerant gas is both toxic and flammable. Ensure there is no refrigerant leakage after completing the installation work.

## Refrigerant Piping Connection Instructions

### ! CAUTION

- Always keep the ends of the pipes well-sealed by keeping dust caps on or using tape, so that no foreign material enters during installation.
- **DO NOT** install the connecting pipe until both indoor and outdoor units have been installed.
- Insulate both the gas and liquid piping to prevent condensate water damage.

### Step 1: Cut pipes

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

1. Measure the distance between the indoor and outdoor units.
2. Using a roller-blade pipe cutter, cut the pipe a bit longer than the measured distance.

### ! CAUTION

**DO NOT** deform the pipe while cutting. Be extra careful not to damage, kink, or deform the pipe while cutting. This will drastically reduce the efficiency and capacity of the unit.

1. Make sure that the pipe is cut at a perfect 90° angle. Refer to Fig. 7.1 for examples of a good cut versus bad cuts.

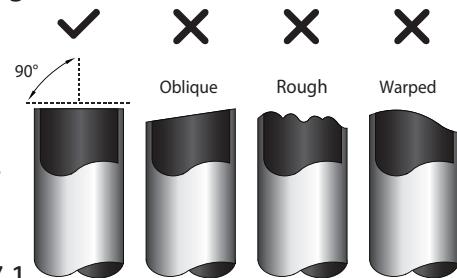


Fig. 7.1

Step 2: Remove burrs carefully.

Burrs can affect the air-tight seal of a refrigerant piping connection. They must be completely removed, or at least totally minimized.

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.

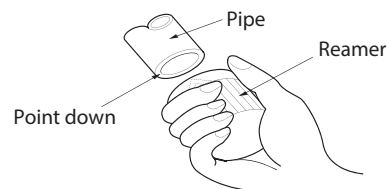


Fig. 7.2

Step 3: Flare pipe ends

Proper flaring is essential to achieve a tight seal.

1. After removing burrs from cut pipe, seal the ends with tape to prevent foreign materials from entering the pipe.
2. Sheath the pipe with insulating material.
3. Place flare nuts on both ends of pipe. Make sure they are facing in the right direction, because you can't put them on or change their direction after flaring. See Fig. 7.3

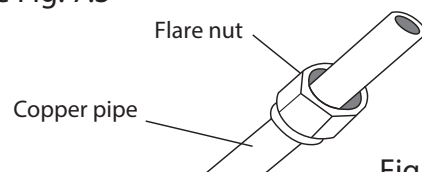


Fig. 7.3

- Remove PVC tape from ends of pipe when ready to perform flaring work.
- Clamp flare form onto the end of the pipe. The end of the pipe must extend beyond the flare form.

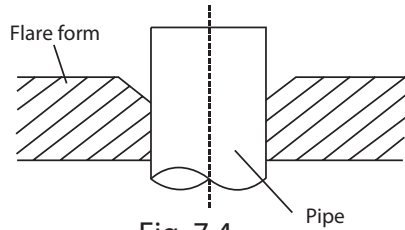


Fig. 7.4

- Place flaring tool onto the form.
- Turn the handle of the flaring tool clockwise until the pipe is fully flared. Flare the pipe in accordance with the dimensions shown in table 7.1.

Table 7.1: PIPING EXTENSION BEYOND FLARE FORM

Pipe Diamt.	Tightening torque	Flare dimension (A) (Unit: mm/Inch)		Flare shape
		Min.	Max.	
Ø 1/4	14.2-17.2 N.m (144-176 kgf.cm)	8.3/0.3	8.3/0.3	
Ø 3/8	32.7-39.9 N.m (333-407 kgf.cm)	12.4/0.5	12.4/0.5	
Ø 1/2	49.5-60.3 N.m (504-616 kgf.cm)	15.4/0.6	15.8/0.6	
Ø 5/8	61.8-75.4 N.m (630-770 kgf.cm)	18.6/0.7	19/0.75	
Ø 3/4	97.2-118.6 N.m (990-1210 kgf.cm)	22.9/0.9	23.3/0.91	
Ø 7/8	109.5-133.7 N.m (1117-1364 kgf.cm)	27/1.06	27.3/1.07	

Fig. 7.5

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

#### Step 4: Connect pipes

First connect the copper pipes to the indoor unit, then connect them to the outdoor unit. You should first connect the low-pressure pipe, then the high-pressure pipe.

- When connecting the flare nuts, apply a thin coat of leak guard or refrigeration oil to the flared mating ends of the pipes.
- Align the center of the two pipes that you will connect.

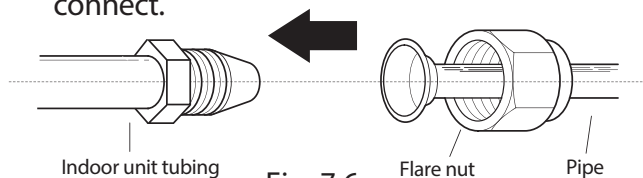


Fig. 7.6

- Tighten the flare nut by hand as tightly as possible.
- Using a spanner, grip the nut on the unit tubing (using double wrenches).
- While firmly gripping the nut, use a torque wrench to tighten the flare nut according to the torque values in table 7.1.

NOTE: Use both a spanner and a torque wrench when connecting or disconnecting pipes to/from the unit to prevent twisting or other damage.

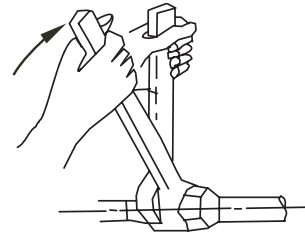


Fig. 7.7

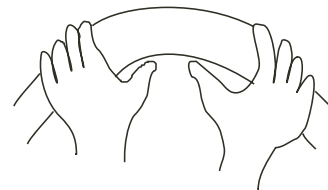
#### CAUTION

- Be sure to wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite.
- Make sure the pipe is properly connected. Over-tightening may damage the flare cone and under-tightening may lead to leakage.

#### NOTE ON MINIMUM BEND RADIUS

Carefully bend the tubing in the middle according to the diagram below. **DO NOT** bend the tubing more than 90° or more than 3 times.

Bend the pipe with thumb



min-radius 10cm (4")

Fig. 7.8

- After connecting the copper pipes to the indoor unit, wrap the power cable, signal cable, and the piping together into a bundle using binding tape.

NOTE: While bundling these items together, be careful not to intertwine or cross the signal cable with any of the other wiring. Keep this wire segregated.

- Thread this pipeline through the wall and connect it to the outdoor unit.
- Insulate all piping, including the valves of the outdoor unit.
- Repeat this process one circuit at a time, for each of the occupied circuits, starting with circuit A (bottom) and working upwards.

#### CAUTION

DO NOT OPEN any of the valves until a complete evacuation and leak checking procedure is performed for each of the circuits, one at a time (refer to the evacuation section of this manual). Mark every pair of pipes to identify circuit letter.

## Safety Precautions

### WARNING

- Be sure to disconnect the power supply before performing any electrical work.
- All electrical wiring must be in accordance with all local and national regulations.
- Electrical wiring must be done by a qualified technician. Improper connections may lead to electrical malfunction, injury, and fire.
- An independent circuit and circuit breaker must be used for this unit. **DO NOT** power another appliance through the same circuit breaker. If the electrical circuit capacity is not enough, or there is a defect in the electrical work, it can lead to shock, fire, or unit and property damage.
- Connect the power cable to the terminals and fasten it with a clamp. An unsecured connection may lead to fire.
- Make sure that all wiring is done correctly and that the control board cover is properly installed. Failure to do so can cause overheating at the connection points, fire, and electrical shock.
- Ensure that if the main supply connection is made through a switch, that it disconnects all poles, with a contact gap of a least 3mm (1/8").
- **DO NOT** use temporary power wiring or an extension cord. Use only hard wiring.

### CAUTION

- Connect the outdoor unit wires before connecting the indoor unit wires.
- Make sure that the unit is grounded. The grounding wire should be away from gas pipes, water pipes, lightning rods, telephone or other grounding wires. Improper grounding may cause electrical shock.
- **DO NOT** connect the unit with a power source until all wiring and piping is completed.
- Make sure that you do not cross your electrical wiring with your signal wiring, as this can cause distortion and interference.

Follow these instructions to prevent distortion when the compressor starts:

- The unit must be connected to the main outlet. Normally, the power supply must have a low output impedance of 32 ohms.
- No other equipment should be connected to the same power circuit.
- The unit's power information can be found on the rating sticker on the product.

## Outdoor Unit Wiring

### WARNING

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

1. Prepare the cable for connection
  - a. You must first choose the right cable size before preparing it for connection. Be sure to use H07RN-F cables.

Table 8.1: Minimum Cross-Sectional Area of Power and Signal Cables North America

Rated Current of Appliance (A)	AWG
≤7	18
7 - 10	16
11 - 15	14
16 - 20	12
21 - 30	10

Table 8.2: European Regions

Rated Current of Appliance (A)	Nominal Cross-Sectional Area (mm <sup>2</sup> )
≤6	0.75
6 - 10	1
10 - 16	1.5
16 - 25	2.5
25 - 32	4
32 - 45	6

- b. Using wire strippers, strip the rubber jacket from both ends of signal cable to reveal about 15cm (6") of the wire leads inside.
- c. Strip the insulation from the ends of the wire leads.
- d. Using a wire crimper, crimp u-lugs on the ends of the wires (Ensuring solid contact).

**NOTE:** While connecting the wires, please follow the wiring diagram (found inside the electrical box cover) strictly .

2. Remove the electric cover of the outdoor unit. If there is no cover on the outdoor unit, disassemble the bolts from the maintenance board and remove the protection board. (See Fig. 8.1)

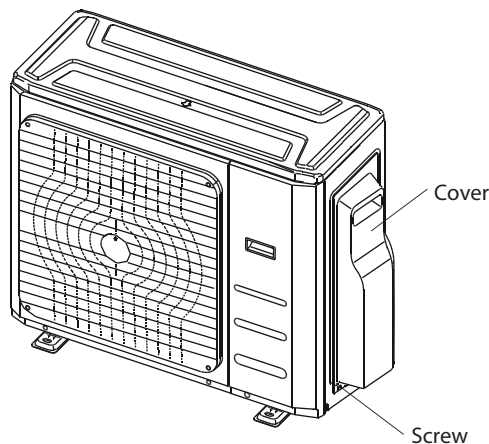


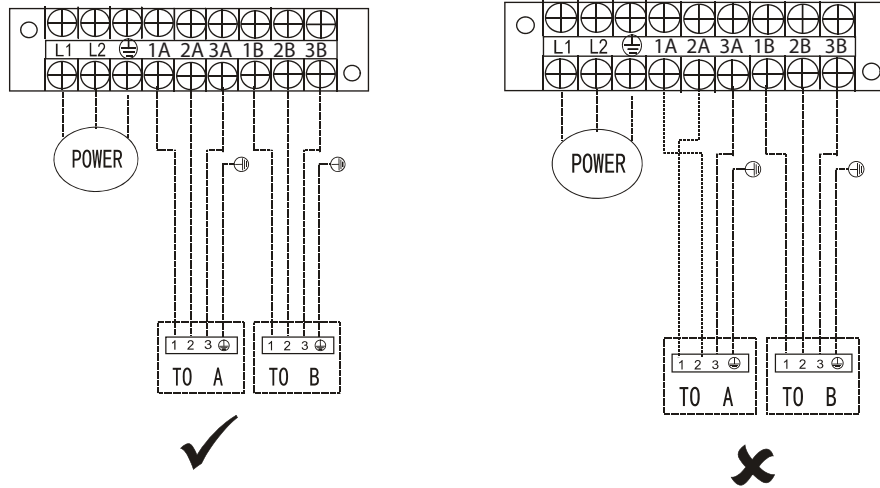
Fig. 8.1

3. Connect the u-lugs to the terminals. Establish a color scheme to use for each of the wire leads. Repeat for every circuit's terminal block positions identically and firmly screw the u-lug of each wire to its corresponding terminal.
4. Clamp down the cable with a designated cable clamp.

5. Insulate unused wires with electrical tape. Keep them away from any electrical or metal parts.
6. Reinstall the cover of the electric control box.
7. Mark all wires for each circuit clearly on both ends to ensure that the wiring cannot be cross-connected to the wrong indoor unit AND that each wire lead with a specific color is attached to the identically marked and matching terminal position at both ends.
8. All inserted terminals and wire ends must make perfect contact with the terminal block, to prevent system errors. Avoid making any loose connections, and be careful when using the crimping tool to crimp any terminals to the wire ends.

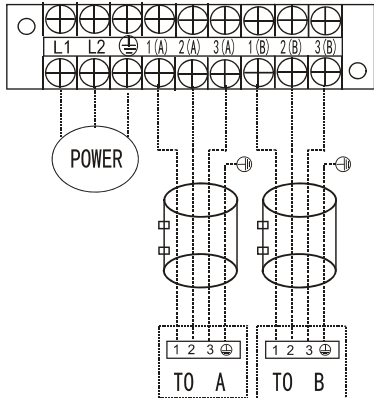
**CAUTION**

Plug the connective cables to the corresponding terminals, as shown, with their matching numbers on the terminal block of the indoor and outdoor units. For example, in the US models shown in the following diagram, Terminal (A) of the outdoor unit must connect with Terminal (A) on the indoor unit, through the same colored wire lead, without any inversions along the way.

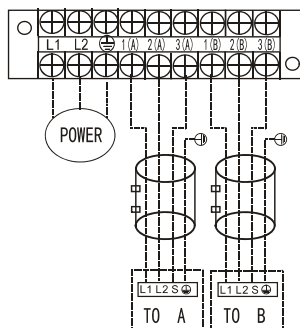


**NOTE:** Refer to the following figures for proper wiring between the outdoor unit and indoor units. Run the main power cord through the lower line-outlet of the cord clamp.

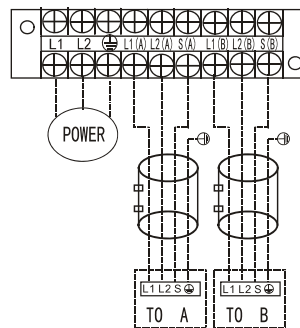
Two-Zone (Dual-Split) models:



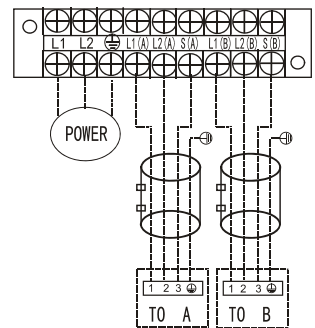
Model A  
(Newest)



Model B

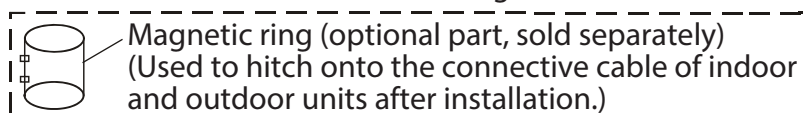


Model C



Model D

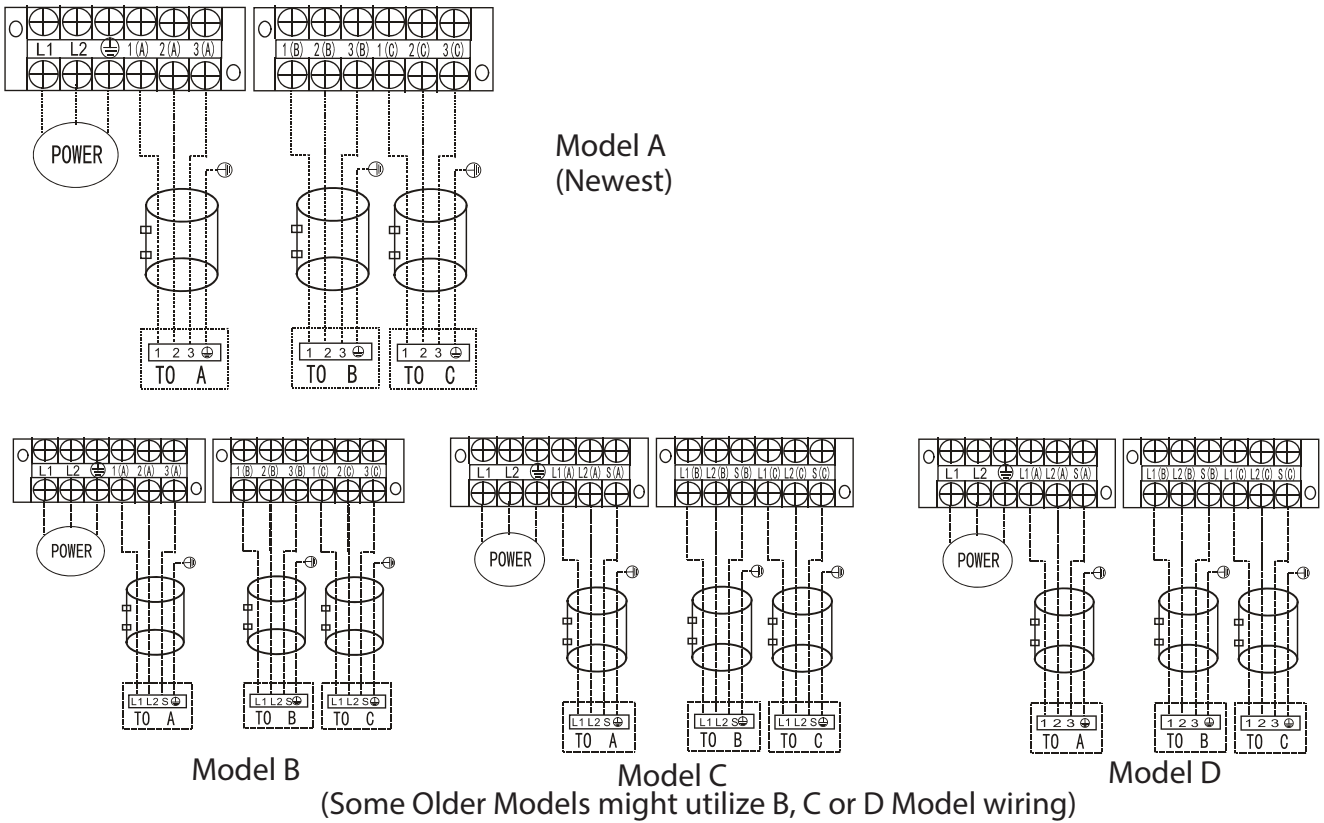
(Some older models might utilize B, C, or D Model wiring)



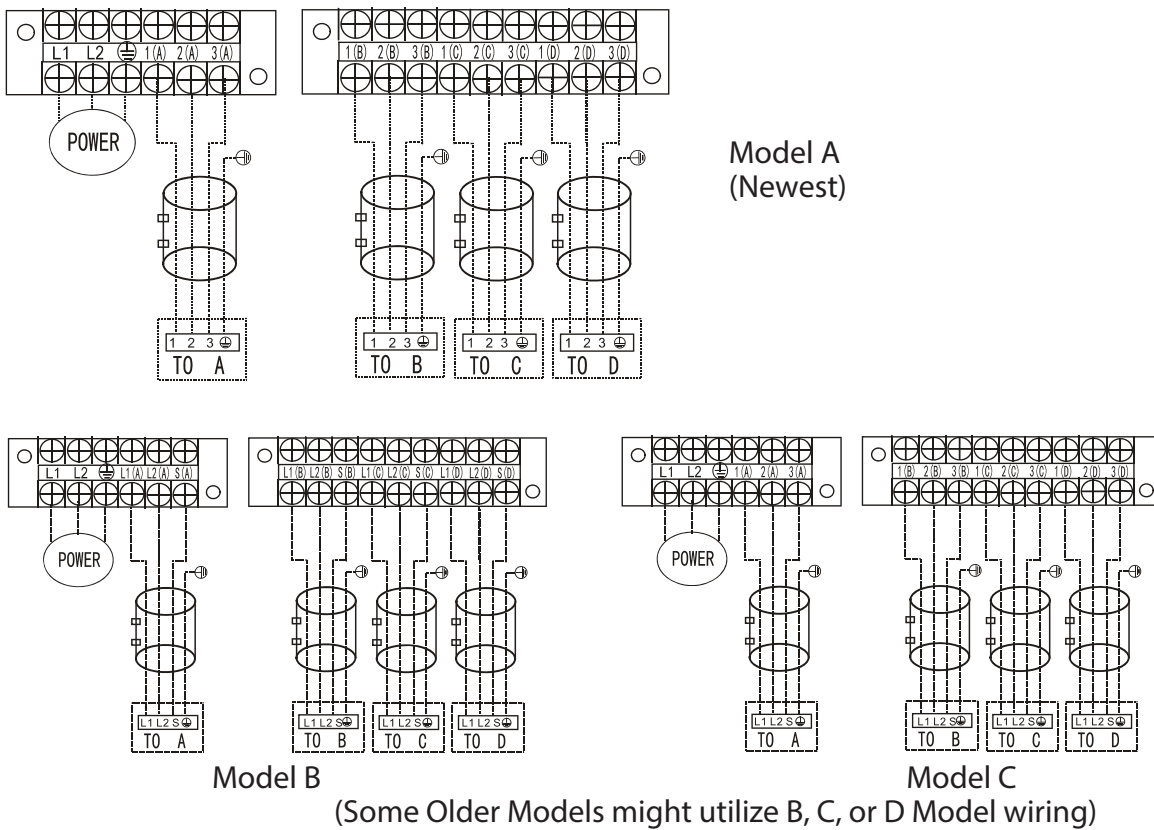


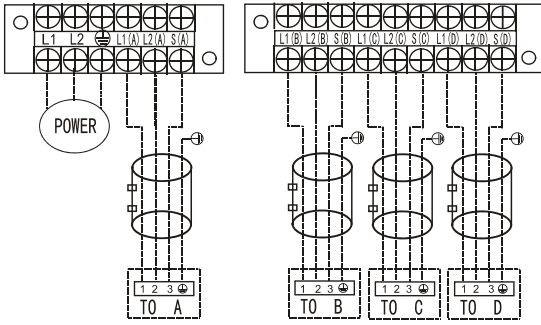
NOTE: Please refer to the following figures if end-users wish to perform their own wiring.

Three-Zone (Triple-Split) models:



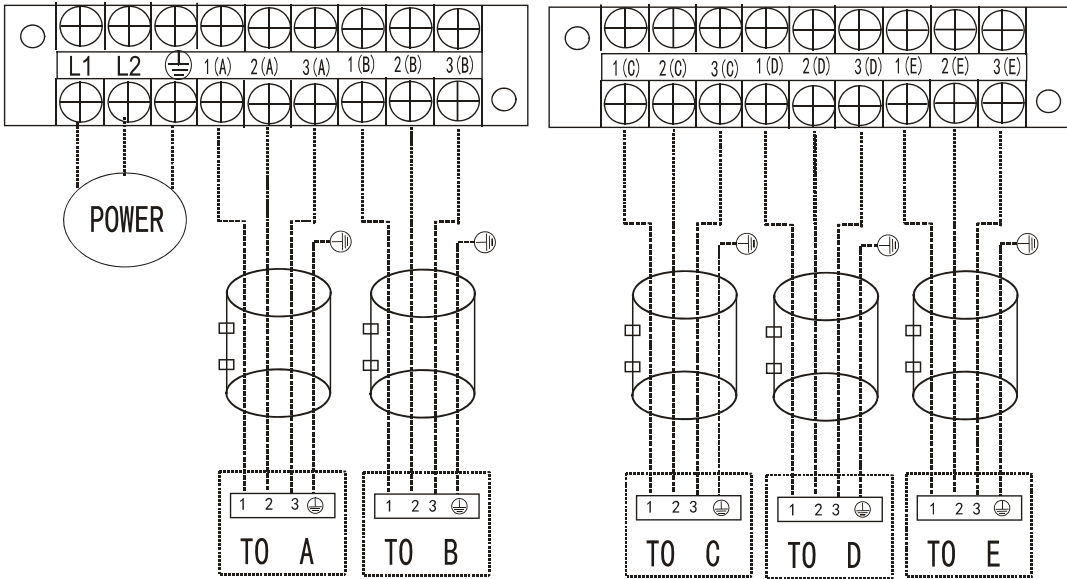
Four-Zone (Quad-Split) models:



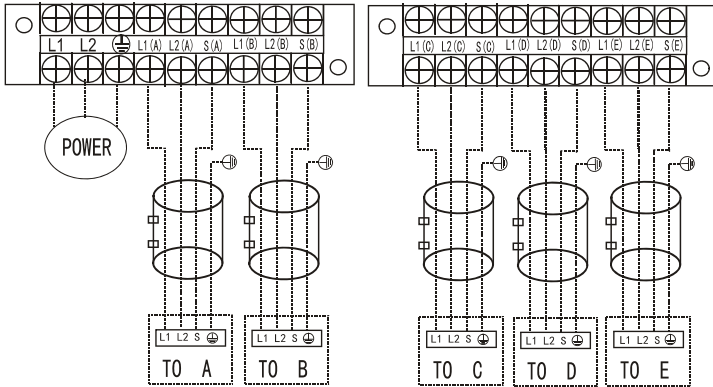


Model D

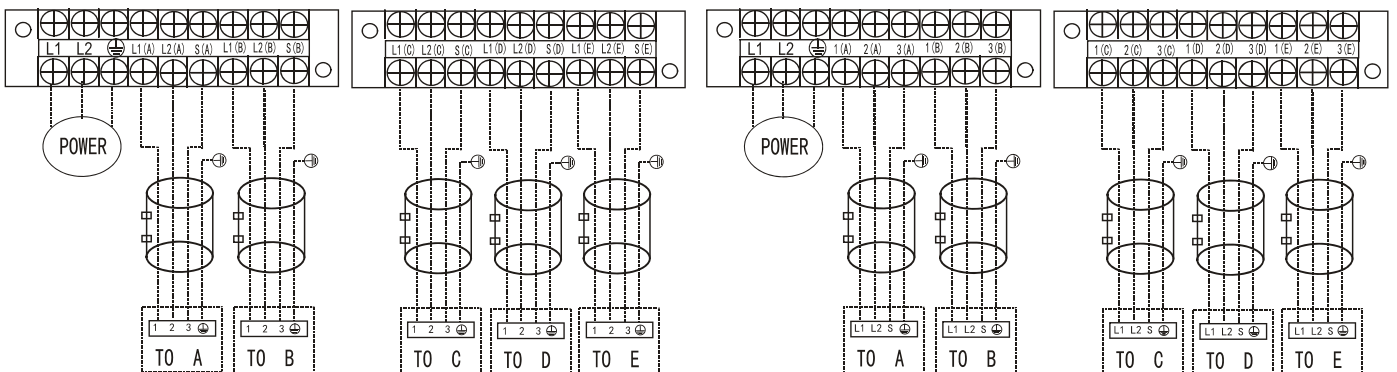
Five-Zone (Quint-Split) models:



Model A  
(Newest)



Model B  
(Some Older Models might utilize B, C, or D Model wiring)



Model C

Model D

## ! CAUTION

After confirmation of the above conditions, follow these guidelines when performing wiring:

- Always have an individual dedicated power circuit specifically for the air conditioner. Always follow the circuit diagram posted on the inside of the control cover.
- Screws that fasten the wiring inside the casing of the electrical terminals may come loose during transportation. Because loose screws can cause wire burn-out, check that the screws are tightly fastened and that all connections are secure.
- Check that the specifications for the power source meet the requirements of this system.
- Confirm that electrical capacity is sufficient.
- Confirm that starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.
- Confirm that cable thickness is sufficient as specified in the power source specifications.
- Always install an earth leakage circuit breaker when in wet or moist areas.
- The following can cause drops in voltage: vibration at the magnetic switch, which damages the contact point, results in broken fuses, and results in disturbance of normal functioning.
- Disconnect box for the power supply must be incorporated into the fixed wiring. It must have an air gap contact separation of at least 3mm (1/8") between each active (phase) conductors.
- Before accessing terminals, all supply circuits must be disconnected.

## System Evacuation

# 9

### Safety Precautions

## ! CAUTION

- Use a vacuum pump with a gauge reading lower than -0.1MPa (-15 PSI) and air discharge capacity above 40L/min. (1.5 CFM)
- The outdoor unit does not need vacuuming. **DO NOT** open the outdoor unit's gas and liquid stop valves until instructed below.
- Follow all instructions STEP BY STEP carefully. Read and understand all of the instructions given below. Mistakes will always result in much more complicated solutions and may cause unnecessary expenses, equipment damage or shortened life span.
- **DO NOT** use refrigerant gas to evacuate the system by gas sweeping the pipes.

### Evacuation Instructions

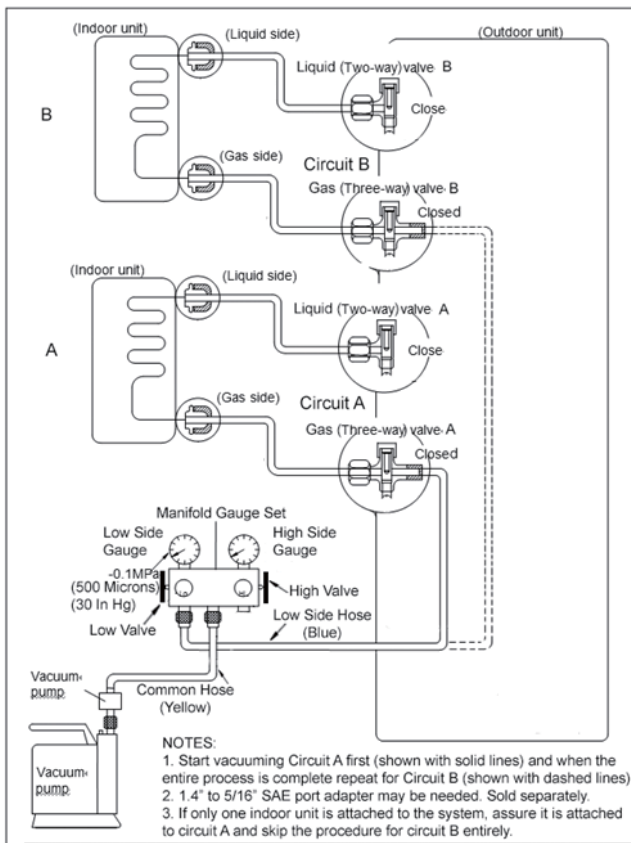
Before using manifold gauge and vacuum pump, read their operation manuals to familiarize yourself with how to use them properly. Air and moisture in the refrigerant system will result in significant problems with your system, such as:

- ☒ Rise of pressure in the system.
- ☒ Rise of operating current.
- ☒ Drops in cooling or heating efficiency.
- ☒ Moisture in the refrigerant circuit may freeze and block flow through the expansion devices.
- ☒ Water when mixed with refrigerant and oil will create acid that will damage the motor windings and components of the compressor.

PROCEDURE FOR DUAL (2) ZONE OUTDOOR UNITS IS DIFFERENT FROM OTHER MODELS.

## FOR DUAL (TWO-ZONE SYSTEMS):

Indoor units and the pipes between indoor and outdoor units must be evacuated and leak tested to remove trapped air and moisture from the system. ONE CIRCUIT AT A TIME. This procedure should start after all electrical connections are finalized and the system receives proper power for immediate test running, to be performed one circuit at a time.



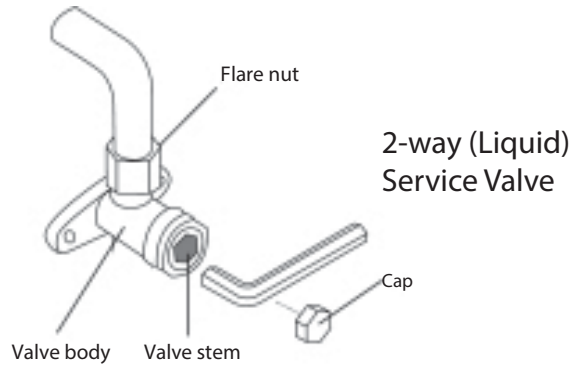
1. Completely tighten ALL brass flare nuts, which connect the ends of copper refrigerant lines to the attached indoor units and the circuit service valves on the outdoor unit, using proper torque.
2. Ensure that both the 2-way (Liquid) and 3-way (Gas) valves for each circuit at the outdoor unit STAY CLOSED, just as they arrived originally.
3. Connect the low pressure hose on your gauge manifold (usually blue) to the 3-way (Gas) valve's service port, belonging to circuit A. Note: If there is only one indoor unit, it should be attached to circuit A as the primary.
4. If the manifold gauge set's hoses have 1/4" SAE connections, a 1/4" to 5/16" SAE port adapter will be needed. (Sold separately).
5. Connect the center hose of the gauge manifold (usually yellow) to the vacuum pump.
6. Fully open the gauge manifold valve on the low side (blue) of your gauge manifold. Ensure that the manifold valve on the high side (red) of your manifold gauge stays closed.
7. Start the vacuum pump, and operate according to the pump manufacturer's specifications. If your vacuum pump has a valve, open it as well.
8. If the proper vacuum cannot be achieved within 30 minutes, the vacuum pump should be kept running for an additional 15 minutes. If, after the additional 15 minutes of operation, the vacuum still cannot be achieved, there could be a leak at one or more of the flare pipe connections at either

end of the refrigerant pipes. The leak must be located, and the leaking nut must be tightened properly, before re-vacuuming the circuit.

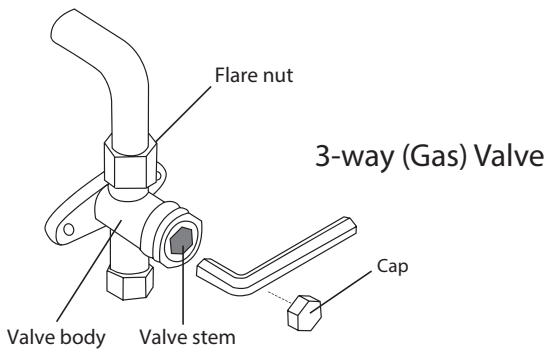
**9.** If the vacuum is achieved, close the manifold valve at the low (blue) side on your gauge manifold first, and shut the vacuum pump off. Leave the gauge manifold set and the hoses connected, and recheck the vacuum reading 15 minutes later to ensure there is no vacuum loss. (Very small increases in vacuum level is normal).

**10.** Circuit A is now dry and free of contaminants. Do not remove the hose of your gauge manifold set from the service port.

**11.** Remove the 2-way (liquid) service valve's brass cap of circuit A. Insert proper size Allen wrench into the valve core, turn it counter-clockwise for 1/4 turn, wait for 5 seconds, and quickly close the valve by turning it in reverse direction. Check your low pressure gauge on the manifold to be sure it now indicates positive pressure of approximately 80 to 120 PSI in your lines.



12. Apply soap-water mixture on both the indoor unit connections and the outdoor unit connections for circuit A with a soft brush to check for leakage at the connecting points of the piping. If you notice air bubbles, the specific connector has leakage and must be tightened to stop the leakage. (An electronic leak detector will be more efficient to use, if available).
13. Re-insert the proper size Allen wrench into the valve core of the 2-way (liquid) circuit valve for circuit A, and turn it counter-clockwise until it is fully back seated. Do not force it, once it stops turning. Repeat the leak checking procedure entirely at all connections of circuit A. If you find a new leak, close the 2-way (liquid) circuit valve you just opened first, and tighten the flare nut at the leaking connection, until the leak is sealed. Reopen the 2-way (liquid) valve, and check again.
14. Remove the 3-way (gas) service valve's cap for circuit A. Insert proper size Allen wrench into the valve core, and turn it counter clockwise until it is fully back seated. Do not force it, once it stops turning.



**15.** Power up the system, and run the indoor unit for circuit A in COOLING mode to ensure that all functions are working.

**16.** Switch the indoor unit of circuit A to HEAT mode, and ensure that all functions are working.

**17.** Set temperature on remote to the HIGHEST setting, and while the unit is running in heat mode, check one last time for leaks on all 4 related pipe connections of circuit A. It is easier to catch even the smallest leaks in HEAT mode, as the pressures are much higher.

**18.** If you discover a leak that cannot be stopped by tightening the flare nuts at this stage, shut off both 2-way (liquid) and 3-way (gas) service valves, repair the leak properly, and start from the beginning. Please remember you may need to add fresh refrigerant to the system, as a significant value may have been lost at this stage.

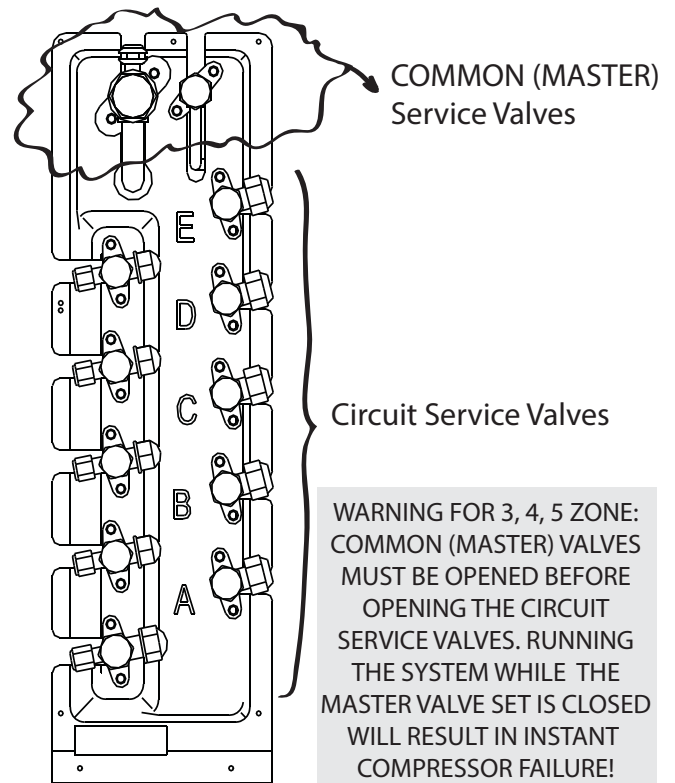
**19.** REPEAT THIS ENTIRE PROCEDURE FOR CIRCUIT B (if it is being utilized by an indoor unit).

PROCEDURE FOR 3, 4, AND 5 ZONE OUTDOOR UNITS ARE DIFFERENT FROM 2 ZONE MODELS.

### FOR 3, 4, AND 5 ZONE SYSTEMS:

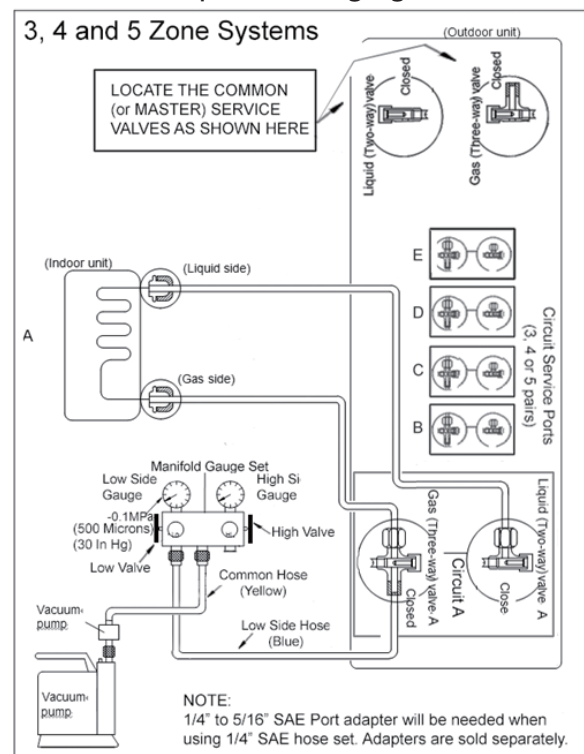
Indoor units and the pipes between indoor and outdoor units must be evacuated and leak tested to remove trapped air and moisture from the system. ONE CIRCUIT AT A TIME. This procedure should start after all electrical connections are finalized, and the system receives proper power for immediate test running, to be performed one circuit at a time.

For installation convenience, one set of COMMON (or MASTER) service valves have been adopted into the 3, 4, and 5 zone systems. The common (master) set of service valves control the common refrigerant circuitry behind the standard sets of circuit service valves, where the indoor units are attached. See the layout shown in the next picture.



In some models, common (master) valves are on the left side of the area of the circuit service valves.

1. Completely tighten ALL brass flare nuts, which connect the ends of copper refrigerant lines to the attached indoor units, and the circuit service valves on the outdoor unit, using sufficient torque.
2. Ensure that both of the 2-way (liquid) and 3-way (gas) service valves for each circuit at the outdoor unit STAY CLOSED as they arrived.
3. Connect the low pressure hose on your gauge manifold (usually blue) to the 3-way (gas) service valve's service port, belonging to circuit A.



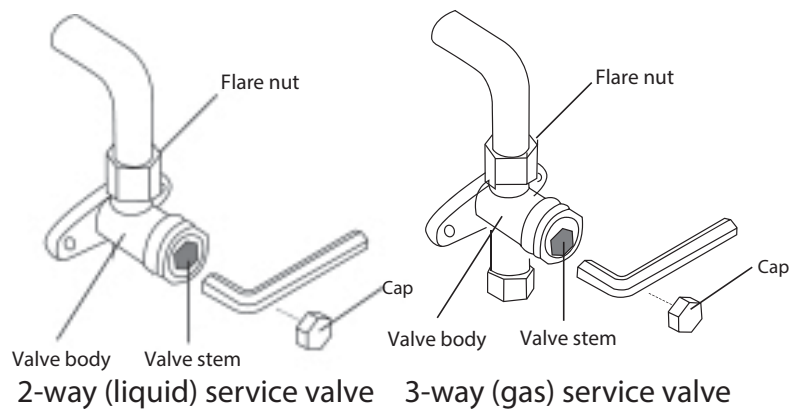
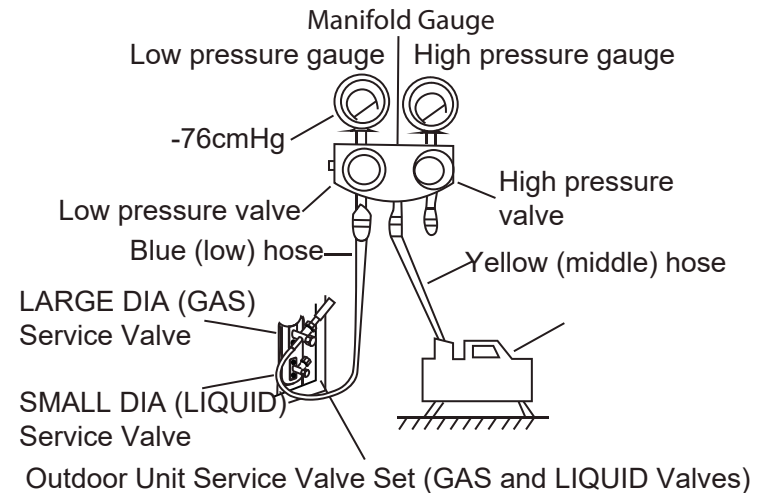
Note: The first and largest capacity indoor unit should always be connected to circuit A as primary.

4. If the manifold gauge set's hoses have 1/4" SAE connections, a 1/4" to 5/16" SAE port adapter will be needed. (sold separately).
5. Connect the center hose of the gauge manifold (usually yellow) to the vacuum pump.
6. Fully open the manifold valve on the low (blue) side of your gauge manifold. Ensure that the manifold valve on the high (red) side of your gauge manifold stays closed.
7. Start the vacuum pump, and operate according to pump manufacturer's specifications. If your vacuum pump has a valve, open it as well.
8. Perform vacuuming/evacuation for a minimum period of 30 minutes, and check that the low pressure gauge indicates a vacuum of -30 in/hg (500 microns). (A more sensitive vacuum gauge should be used if available).
9. If the proper vacuum cannot be achieved within 30 minutes, the vacuum pump should be kept running for an additional 15 minutes. If after the additional 15 minutes of operation, the vacuum still cannot be achieved, there could be a leak at one or more of the flare pipe connections at either end of a refrigerant pipes. The leak must be located, and the leaking nut must be tightened properly before re-vacuuming the circuit.
10. If the vacuum is achieved, close the manifold valve at the low (blue) side on your gauge manifold first, and shut the vacuum pump off. Leave the gauge manifold set and the hoses connected, and recheck the vacuum reading 15 minutes later to verify that there is no vacuum loss. (Very small increases in vacuum level is normal).
11. Circuit A is now dry and free of contaminants. Do not remove the hose of your gauge manifold set from the service port.

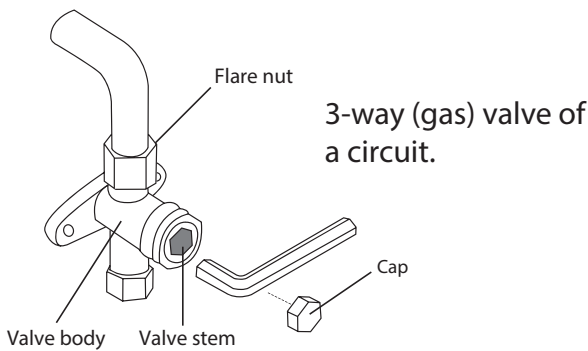
**Procedure 12 & 13 are for 3, 4, and 5 zone only, and need to be performed only once in the beginning:**

12. Remove the 2-way (liquid) MASTER valve's brass dust cap. Insert a proper sized Allen wrench into the valve core, and turn it counter clockwise until it is fully back seated. Do not force it, once it stops turning.
13. Remove the 3-way (gas) MASTER valve's brass dust cap. Insert a proper sized Allen wrench into the valve core and turn it counter clockwise until it is fully back seated. Do not force it, once it stops turning.
14. Remove the 2-way (liquid) service valve's brass cap of circuit A. Insert proper size Allen wrench into the valve core, and turn it counter clockwise for 1/4 turn, wait 5 seconds and quickly close the valve by turning

it in the reverse direction. Check your low pressure gauge on the manifold to verify that it now indicates positive pressure of approximately 80 to 120 PSI in your lines.



15. Apply soap-water mixture on both the indoor unit connections and the outdoor unit connections for circuit A with a soft brush to check for leakage at the connecting points of the piping. If you notice air bubbles, the specific connector has leakage and must be tightened to stop the leakage. (An electronic leak detector will be more efficient to use for this, if available).
16. Re-insert proper sized Allen wrench into the valve core of the liquid service valve (2 way) for circuit A, and turn it counter-clockwise until it is fully back seated. Do not force it, once it stops turning. Repeat the leak-checking procedure entirely on all connections of circuit A. If you find a new leak, close the 2-way (liquid) service valve you just opened first, and tighten the flare nut at the leaking connection until the leak is sealed. Reopen the 2-way (liquid) service valve, and check again.
17. Remove the 3-way (gas) service valve's cap for circuit A. Insert proper sized Allen wrench into the valve core, and turn it counter-clockwise until it is fully back seated. Do not force it, once it stops turning.



**18.** Power up the system, and run the indoor unit for circuit A in COOLING mode to verify that all functions are working.

**19.** Switch the indoor unit of circuit A to HEAT mode, and verify that all functions are working.

**20.** Set the temperature on remote to HIGHEST setting, and while the unit is running in heat mode, check one last time for leaks at all 4 related pipe connections of circuit A. It is easier to catch the smallest leaks in HEAT mode, as the pressures are much higher.

**21.** If you discover a leak that cannot be stopped by tightening the flare nuts at this stage, shut off both 2-way (liquid) and 3-way (gas) service valves, repair the leak properly, and start from the beginning. Please remember, you may need to add fresh refrigerant to the system, as a significant value may be lost at this stage.

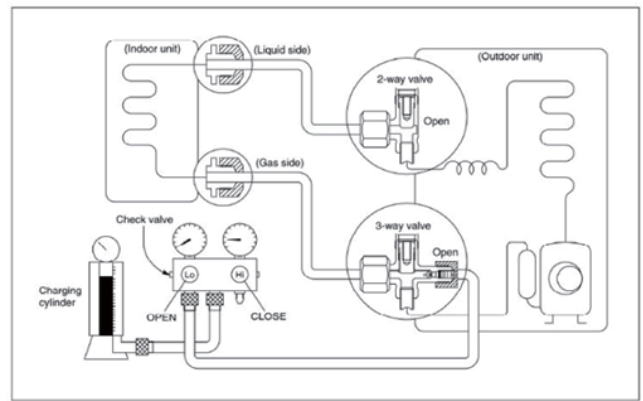
**22.** REPEAT THIS ENTIRE PROCEDURE FOR THE REMAINING CIRCUITS. Skip if a circuit is not being utilized by an indoor unit to keep its circuit valves closed. In case an indoor unit is added in the future, the same procedure should be followed for that circuit entirely.

## ADDING REFRIGERANT, IF THE TOTAL REQUIRED VOLUME EXCEEDS THE STANDARD FACTORY PRE-CHARGE

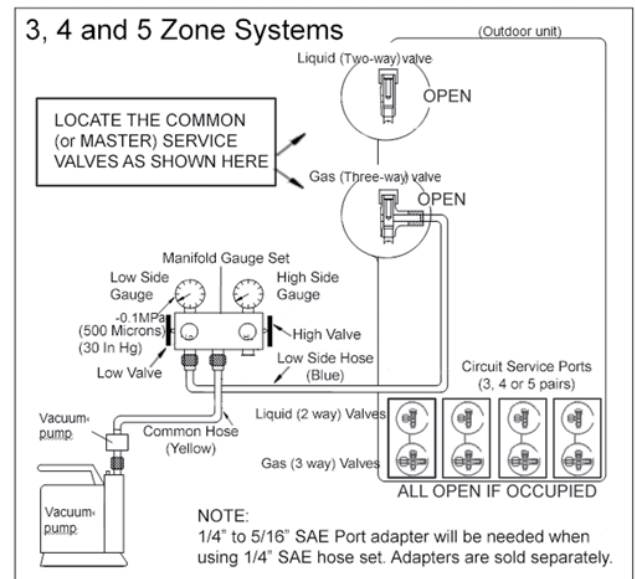
Your system is pre-charged with sufficient refrigerant to work properly, according to an average length of 7.5 meter (25 feet) piping for each of the available circuits (e.g. a 4 zone system can have a total piping length for all zones, added together, of 30 meters (100 feet), max. If your total piping length exceeds this limit, additional refrigerant must be added to the system to compensate for the difference (0.16 oz. per additional ft, for 1/4" liquid pipe and 0.32 oz. per additional ft for 3/8" liquid pipe)

PROCEDURE FOR 3, 4, AND 5-ZONE OUTDOOR UNITS ARE DIFFERENT FROM 2-ZONE MODELS. See the specific instructions below for each type as it applies to your model.

**1.** For dual (2-zone) systems, connect the low pressure hose on your gauge manifold (usually blue) to the 3-way (gas) valve's service port of one of the occupied circuits (Circuit A preferred). See the following drawing.



**2.** For 3, 4, and 5 zone systems, connect the low pressure hose from the gauge manifold set (this is usually the blue hose on most sets) to the 3-way (gas) side valve of the common (master) circuit. See below drawing.



**3.** Connect the center hose of the gauge manifold to the refrigerant container (usually the yellow hose on most sets). Refrigerant R410a can only be charged in liquid form, while the container is inverted (upside down). Note that all

2-way (liquid) and 3-way (gas) service valves for all "occupied" circuits, where an indoor unit is attached, must be in the open position. Additionally, for 3, 4, and 5 circuit models, the common (master) 2-way (liquid) and 3-way (gas) valves must also be in open position.

**4.** The air trapped in the gauge manifold and the hoses must be purged out. Use the pressure from the system to purge the low side hose, by briefly loosening its connection at the gauge manifold for a moment. Next, open the valve of the refrigerant container to pressurize the center hose, and loosen the connector of the center hose at the gauge manifold for a moment, and purge.

**5.** Determine the total volume of the additional refrigerant added into the system for the additional piping.

6. Set the refrigerant container onto an electronic charging scale, and record the weight (or zero-out the scale, depending on the scale used).
7. Start all indoor units attached to the system in cooling mode, and lower the set points on each of their controllers to the minimum setting, so that the system will not shut off during the procedure.
8. Refrigerant can now be added to the system. Open the lower side manifold valve at the lower side of the gauge manifold, and get set to start charging the unit with liquid refrigerant. Please remember to nurse the refrigerant in slowly by controlling the lower side manifold valve at the lower side of your gauge manifold (open for 3 seconds and close for 10 seconds for the system to digest each load). Keep track of the refrigerant being added into the system (do not overcharge the system).
9. Once the correct charge has been added to the system, close the lower side gauge valve at the lower side of the gauge manifold set, and check the operating pressure. Keep running the system continuously for 20 minutes, and record the pressure reading, along with the indoor and outdoor temperature readings for future reference. The system is now charged and can be shut off.
10. Close the valve on the refrigerant container and disconnect the hose from the manifold set. Also, disconnect the hose from the 3-way (gas) valve where it is attached to the unit, and replace and torque all brass dust caps.

Be sure to use a torque wrench to tighten the service port caps to a torque of 18N·m (13.3 ft·lbs).

Always leak-check all service ports after servicing the refrigerant system.

**WARNING FOR 3, 4, 5-ZONE:  
COMMON (MASTER) VALVES  
MUST BE OPENED BEFORE  
OPENING THE CIRCUIT  
SERVICE VALVES. RUNNING  
THE SYSTEM WHILE THE  
MASTER VALVE SET IS CLOSED  
WILL RESULT IN INSTANT  
COMPRESSOR FAILURE !**

## ADDING OR REPLACING REFRIGERANT AFTER A REFRIGERANT LOSS IS DISCOVERED:

Please note: R410a is a blended and isotropic refrigerant. If refrigerant is lost from your system in significant amounts (exceeding 15% of the total volume), the remaining refrigerant may no longer contain the proper original ratio of the blend. Therefore, the system must be entirely evacuated and recharged with fresh refrigerant. If the system is determined to have lost only a small amount of refrigerant, it can be topped off using the same procedure as covered above, until proper operating pressures and performance are obtained. Prior to recharging refrigerant after a leak is discovered, the leak itself must be located and repaired to avoid repeated refrigerant losses. A well-sealed system will never need refrigerant to be recharged, as it stays as a sealed-closed system entirely.

COMPLETE PROCEDURES EXPLAINING THE METHODS FOR COMPLETE EVACUATION AND FRESH REFRIGERANT RECHARGE ARE EXPLAINED IN THE SERVICE MANUAL. PLEASE REFER TO THE ENGINEERING AND SERVICE MANUAL WHICH CAN BE DOWNLOADED ONLINE AT THE MANUFACTURER'S WEB SITE.

## Flare Nut Torque Values:

Outside Diameter		Torque	Additional Tightening Torque
mm	inch	N.cm	N.cm
Φ6.35	1/4	1500 (11 LbF·Ft)	1600 (12 LbF·Ft)
Φ9.52	3/8	2500 (18 LbF·Ft)	2600 (19 LbF·Ft)
Φ12.7	1/2	3500 (26 LbF·Ft)	3600 (27 LbF·Ft)

## Main Power Input Wiring Gauges:

Unit	AWG
DUAL (2 Zone)	14
TRIPLE (3 Zone)	14
QUAD (4 Zone)	12
QUINT (5 Zone)	10

For 4-lead interconnecting cables, use AWG-16 wiring for any capacity or type indoor unit. If preferred, a suitable Romex 14-3 can also be used.



# Outdoor Unit Error Display

YN020GMFI22M2D, YN030GMFI22M3D, YN040GMFI22M4D, YN050GMFI22M5D

Display	LED STATUS	New indoor Error
E0	Outdoor unit EEPROM parameter error	F4
E2	Communication malfunction between indoor and outdoor units	E1
E3	Communication malfunction between IPM board and outdoor main control board	---
E4	Outdoor temperature sensor (coil sensor T3, ambient sensor T4, Compressor discharge sensor T5, indoor coil outlet pipe sensor T2B) malfunction	F2/F1/F3/F6
E5	Over-voltage or under-voltage protection	P1
E6	PFC module protection	---
E8	Outdoor fan speed has been out of control	F5
F1	No. A Indoor unit coil outlet temp. sensor malfunction	---
F2	No. B Indoor unit coil outlet temp. sensor malfunction	---
F3	No. C Indoor unit coil outlet temp. sensor malfunction	---
F4	No. D Indoor unit coil outlet temp. sensor malfunction	---
F5	No. E Indoor unit coil outlet temp. sensor malfunction	---
F6	No. F Indoor unit coil outlet temp. sensor malfunction	---
P0	Compressor top high temperature protection (OLP)	P2
P1	High pressure protection	P2
P2	Low pressure protection	P2
P3	Current overload protection	F0
P4	Temperature protection of compressor discharge	---
P5	Condenser high temperature protection	---
P6	Inverter module (IPM) malfunction	P0

Indoor unit		Extension pipe diameter (mm/inch)		
Model	Pipe diameter (mm/inch)			
9K	Liquid	6.35 (1/4)	Liquid	6.35 (1/4)
	Gas	9.52 (3/8)	Gas	9.52 (3/8)
12K 18K	Liquid	6.35 (1/4)	Liquid	6.35 (1/4)
	Gas	12.7 (1/2)	Gas	12.7 (1/2)
24K	Liquid	9.52 (3/8)	Liquid	9.52 (3/8)
	Gas	15.9 (5/8)	Gas	15.9 (5/8)
Outdoor unit union diameter (mm/inch)				
Dual (2 Zone)	Liquid	6.35 (1/4) *2		
	Gas	9.52 (3/8) *2		
Triple (3 Zone)	Liquid	6.35 (1/4) *3		
	Gas	9.52 (3/8) *3		
Quad (4 Zone)	Liquid	6.35 (1/4) *4		
	Gas	9.52 (3/8) *3		
		12.7 (1/2) *1		
Quint (5 Zone)	Liquid	6.35 (1/4) *5		
	Gas	9.52 (3/8) *3		
		12.7 (1/2) *2		

		2-Zone	3-Zone	4-Zone	5-Zone
Pre-charged up to max total pipe length m (ft)		15 (50 ft)	22.5 (75 ft)	30 (100 ft)	37.5 (125 ft)
Additional refrigerant charge needed beyond total max length	g	15 g per excess meter beyond total 15 meters	15 g per excess meter beyond total 23 meters	15 g per additional feet beyond total 30 feet	15 g per additional feet beyond total 38 feet
	oz	0.16 oz per excess foot beyond total 50 feet	0.16 oz per excess foot beyond total 75 feet	0.16 oz per excess foot beyond total 100 feet	0.16 oz per excess foot beyond total 125 feet

## Note On Adding Refrigerant

### ! CAUTION

- Refrigerant charging must be performed after wiring, vacuuming, and leak testing.
- **DO NOT** exceed the maximum allowable quantity of refrigerant or overcharge the system. Doing so can damage the unit or impact its functioning.
- Charging with unsuitable substances may cause explosions or accidents. Ensure that only the appropriate refrigerant (R410a) is used.
- Refrigerant containers must be opened slowly. Always use protective gear when charging the system.
- **DO NOT** mix refrigerants types.

N=2 (Two Zone models), N=3 (Three Zone models), N=4 (Four Zone models), N=5 (Five Zone models). Depending on the length of connective piping, or the pressure of the evacuated system, you may need to add refrigerant. Refer to the table below for refrigerant amounts to be added:

#### ADDITIONAL REFRIGERANT PER PIPE LENGTH

Connective Pipe Length	Air Purging Method	Additional Refrigerant (R410a)	
If total pipe length is less than $N \times 7.5\text{m}$ ( $N \times 25'$ )	Vacuum Pump	Do not add Refrigerant	
If total pipe length is more than $N \times 7.5\text{m}$ ( $N \times 25'$ ), calculate the excess length	Vacuum Pump	Liquid Side: $\varnothing 6.35$ ( $\varnothing 1/4''$ ) 9K, 12K, 18K Indoor Units For each m of excessive pipe length, add: 15g/m For each ft. of excessive pipe length, add: 0.16oz/ft	Liquid Side: $\varnothing 9.52$ ( $\varnothing 3/8''$ ) 24K Indoor Units For each m of excessive pipe length, add: 30g/m For each ft. of excessive pipe length, add: 0.32oz/ft

Note: The standard pipe length calculated for precharged value for each circuit is 7.5m (25').

### Safety and Leakage Check

#### Electrical Safety Check

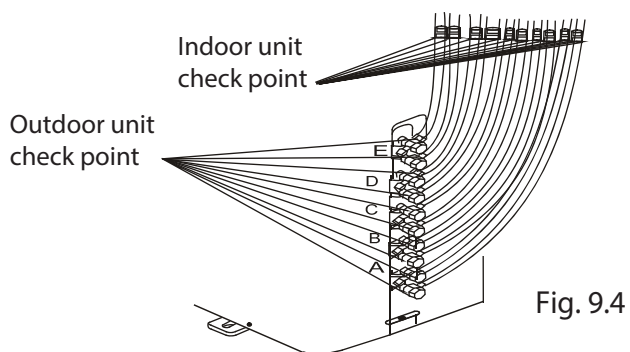
Perform the electrical safety check after completing installation. Cover the following areas:

1. Insulation resistance:  
The insulation resistance must be more than  $2\text{M}\Omega$ .
2. Grounding work:  
After finishing grounding work, measure the grounding resistance by visual detection and using the grounding resistance tester. Make sure the grounding resistance is less than  $4\Omega$ .
3. Electrical leakage check (performed during test while unit is on)  
During a test operation, after completing installation, use an electroprobe and multimeter to perform an electrical leakage check. Turn off the unit immediately if leakage is detected. Try and evaluate different solutions until the unit operates properly.

#### Gas Leak Check

1. Soapy water method:  
Apply a soap-water solution, or a liquid neutral detergent, on the indoor unit connection, or outdoor unit connections, with a soft brush to check for leakage of the connecting points of the piping. If bubbles emerge, the pipes are experiencing leakage.
2. Leak detector  
Use a leak detector to check for leakage.

NOTE: The illustration is for example purposes only. The actual order of A, B, C, D, and E on the system may be slightly different from the unit you purchased, but the general shape will remain the same.



A, B, C, D are points for the four zone type.  
A, B, C, D, and E are points for the five zone type.

## Test Run

### Before Test Run

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

- a) Indoor and outdoor units are properly installed.
  - b) Piping and wiring are properly connected.
  - c) No obstacles near the inlet and outlet of the unit that might cause poor performance or product malfunction.
  - d) Refrigeration system does not leak.
  - e) Drainage system is unimpeded and draining to a safe location.
  - f) Heating insulation is properly installed.
  - g) Grounding wires are properly connected.
  - h) Length of the piping and additional refrigerant amount have been recorded.
  - i) Power voltage is the correct voltage for the air conditioner.
- f. Check to see that the drainage system is unimpeded and is draining smoothly.
  - g. Ensure that there is no vibration or abnormal noise during operation.
5. For the outdoor unit:
    - a. Check to see if the refrigeration system is leaking.
    - b. Make sure there is no vibration or abnormal noise during operation.
    - c. Ensure the wind, noise, and water generated by the unit do not disturb your neighbors or yourself, or pose a safety hazard.

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

### ! CAUTION

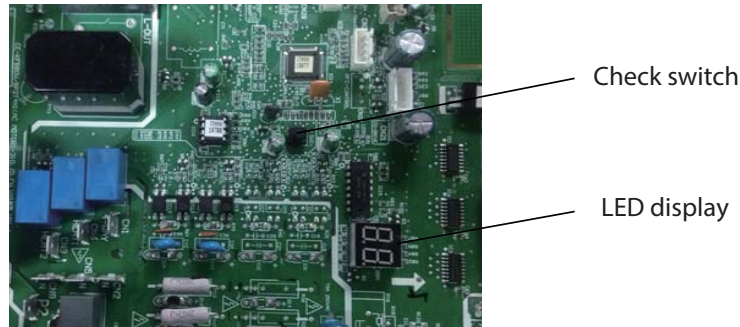
Failure to perform the test run may result in unit damage, property damage, or personal injury.

### Test Run Instructions

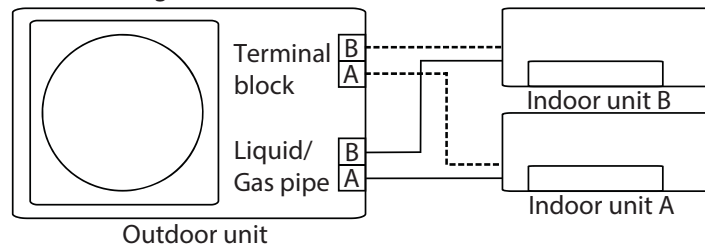
1. Ensure liquid and gas service valves are open.
2. Turn on the main power switch and allow the unit to warm up.
3. Set the air conditioner to COOL mode.
4. For the indoor unit:
  - a. Ensure the remote control and its buttons work properly.
  - b. Ensure the louvers move properly and can be changed using the remote control.
  - c. Double-check to see if the room temperature is registered correctly.
  - d. Ensure the indicators on the remote control and the display panel on the indoor unit work properly.
  - e. Ensure the manual buttons on the indoor unit work properly.

## Automatic Wiring/Piping Correction Function

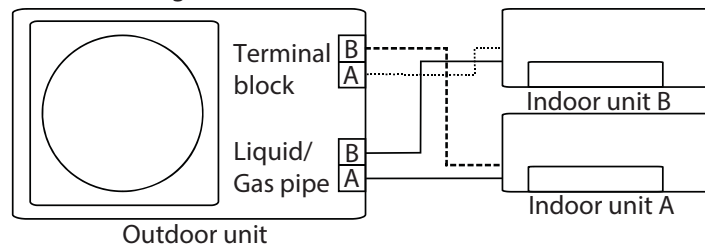
The newest models now feature automatic correction of wiring/piping errors. Press the "check switch" on the outdoor unit PCB board for 5 seconds until the LED displays "CE", indicating that this function is working. Approximately 5-10 minutes after the switch is pressed, the "CE" disappears, meaning that the wiring/piping error is corrected and that all wiring/piping is properly connected.



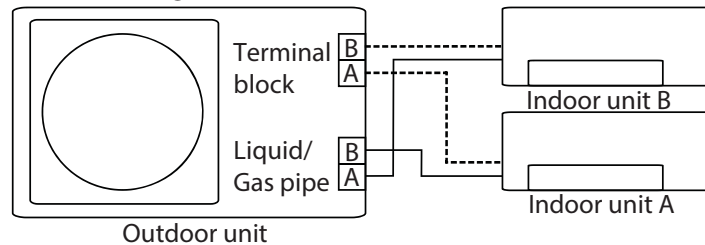
Correct wiring



Incorrect wiring



Incorrect wiring



## How To Activate the Function

1. Check that the outside temperature is above 5°C.  
(This function does not work when outside temperature is not above 5°C)
2. Check that the service valves of the liquid pipe and gas pipe are open.
3. Turn on the breaker and wait at least 2 minutes.
4. Press the check switch on the outdoor PCB board unit LED display "CE".

The design and specifications of this product are subject to change without prior notice as development continues. Consult with the sales agency or manufacturer for details.



is a registered trademark of Parker Davis HVAC International, Inc.

**Parker Davis HVAC International, Inc.**

2250 NW 102 Place, Doral, FL 33172 - USA

Tel : (305) 513-4488

Fax : (305) 513-4499

email : [info@pd-hvac.com](mailto:info@pd-hvac.com)

Website: [www.pd-hvac.com](http://www.pd-hvac.com)

**QSBPTYI-040AEN**

**16122000003394**

**20171212**