

SOPHIA HYPER MULTI-ZONE INVERTER

**SPLIT AIR CONDITIONER
WITH HEAT PUMP**

INSTALLATION MANUAL **OUTDOOR UNIT**

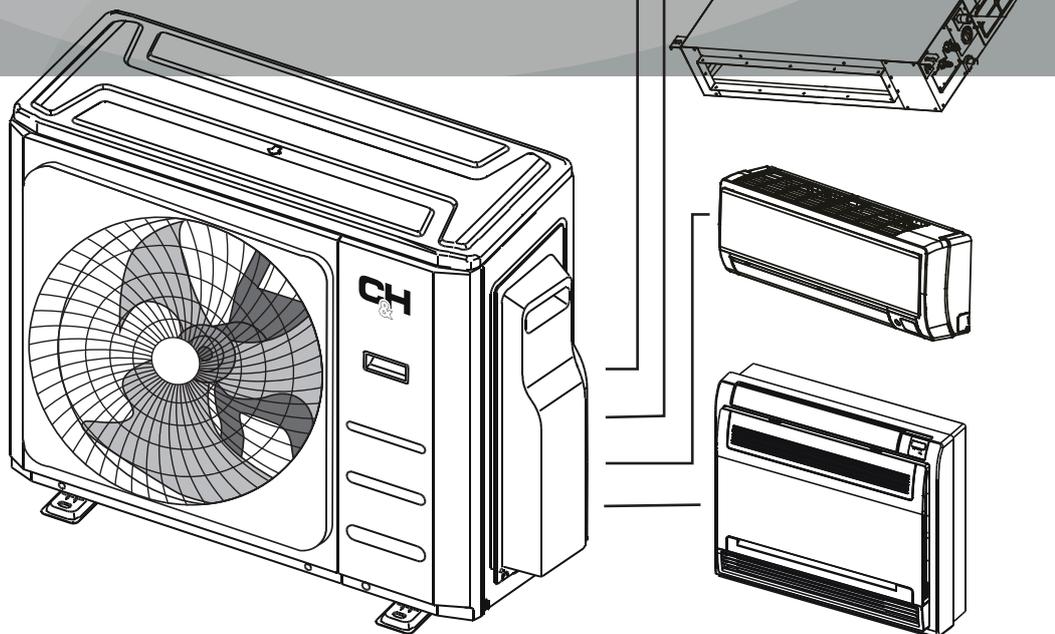
Models:

CH-HYP19MSPH-230VO

CH-HYP28MSPH-230VO

CH-HYP36MSPH-230VO

CH-HYP48MSPH-230VO



IMPORTANT NOTE:

- Read this manual carefully before installing or operating your new air conditioning unit. Make sure to save this manual for future reference.
- This manual only describes the installation of the outdoor unit. When installing the indoor unit, refer to the installation manual of the indoor unit.

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INSTALLATION MANUAL

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Accessories

1

The air conditioning system comes with the following accessories. Use all of the installation parts and accessories to install the air conditioner. Improper installation may result in water leakage, electrical shock and fire, or cause the equipment to fail. The items not included with the air conditioner must be purchased separately.

Name of Accessories	Q'ty(pc)	Shape
Installation plate	1	
Plastic expansion sheath	5-8 (depending on the models)	
Self-Tapping Screw A	5-8 (depending on the models)	
Transfer connector (packed with the indoor unit or outdoor unit, depending on the model) (NOTE: Pipe size differs from appliance to appliance. To meet different pipe size requirements, sometimes a transfer connector must be installed on the outdoor unit) .	Optional part (one piece/ one indoor unit)	
	Optional part (1-5 pieces for outdoor unit, depending on models)	
Drain joint (some models)	1	
Seal ring (some models)	1	
Magnetic ring (After installation, hitch this on the connective cable between the indoor unit and outdoor units) (some models)	Varies by model	
Cord protection rubber ring (If the cord clamp can't fasten the cord because the cord is too small, wrap the cord protection rubber ring (supplied with the accessories) around the cord. Then fix it with the cord clamp). (some models)	1	 (on some models)

Name	Shape	Quantity
Connecting pipe assembly	Liquid side	Φ 1/4in (6.35 mm)
		Φ 3/8in (9.52 mm)
	Gas side	Φ 3/8in (9.52 mm)
		Φ 1/2in (12.7 mm)
		Φ 5/8in (15.9 mm)
		Parts you must purchase separately. Consult your technician for the proper size.

Read safety precautions before installation

Incorrect installation due to ignoring instructions can cause serious damage or injury. The seriousness of potential damage or injuries is classified as either a WARNING or CAUTION.

WARNING

Failure to observe a warning may result in death. The appliance must be installed in accordance with 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.
- Only trained and certified technicians should install, repair, and service this air conditioning unit.
- Improper installation may result in electrical shock, short circuit, leaks, fire, or other damage to equipment and personal property.
- Strictly follow the installation instructions set forth in this manual.
- Before you install the unit, consider strong winds, typhoons, and earthquakes that might affect your unit and locate it accordingly. Failure to do so could cause damage to the unit.
- After installation, ensure there are no refrigerant leaks and that the unit is operating properly.
- Refrigerant is toxic and flammable and poses a serious health and safety risk.

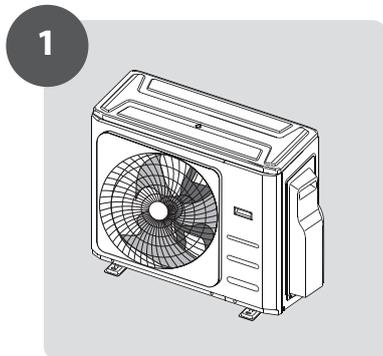
Note about Fluorinated Gasses

1. This air conditioning unit contains fluorinated gasses. For specific information on the type of gas and the amount, please refer to the relevant label on the unit itself.
2. Installation, service, maintenance, and repair of this unit must be performed by a certified technician.
3. Product uninstallation and recycling must be performed by a certified technician.
4. If the system has a leak-detection system 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.

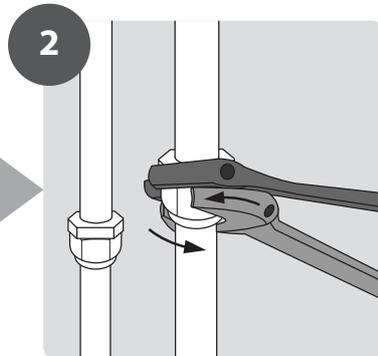
Installation Summary

3

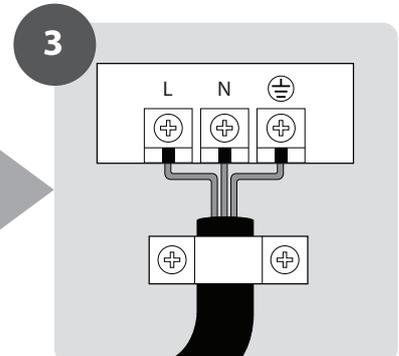
Installation Order



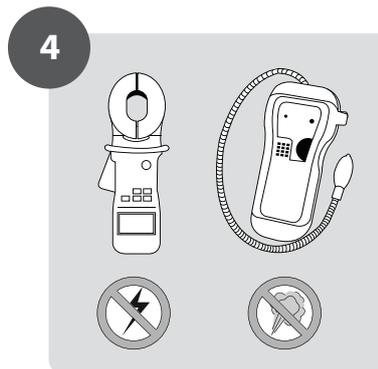
1
Install the outdoor unit
(Page 8)



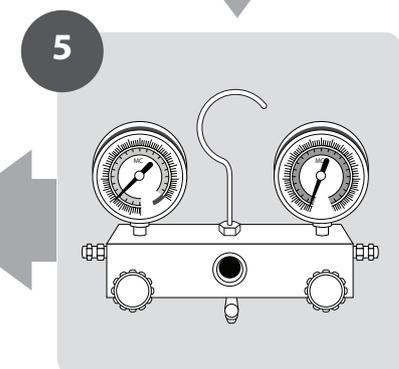
2
Connect the refrigerant pipes
(Page 11)



3
Connect the wires
(Page 14)



4
Perform a test run
(Page 24)



5
Evacuate the refrigeration
system
(Page 21)

Specifications

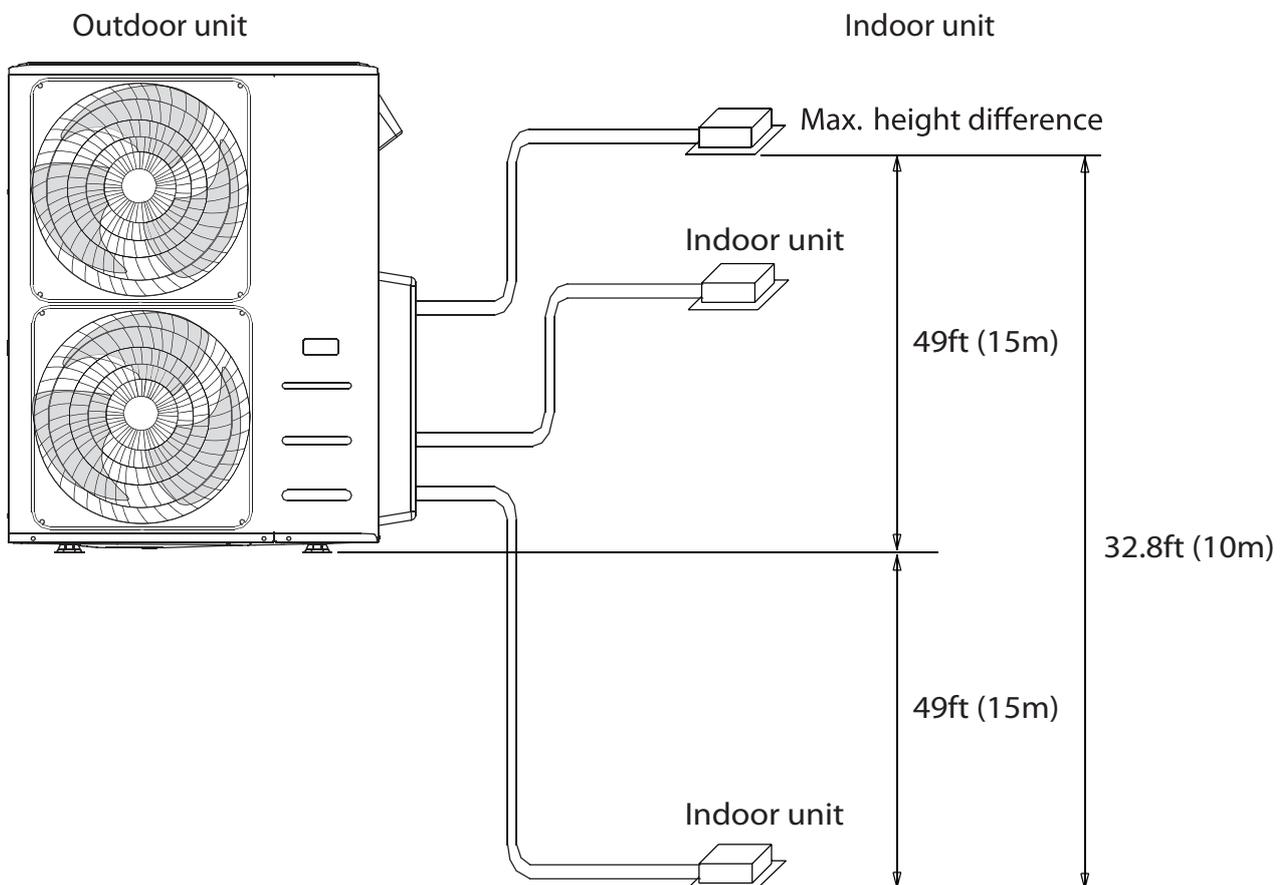
4

Indoor units that can be used in combination	Number of connected units	1-5 units
Compressor stop/start frequency	Stop time	3 minutes or more
Power source voltage	Voltage fluctuation	within $\pm 10\%$ of rated voltage
	Voltage drop during start	within $\pm 15\%$ of rated voltage
	Interval unbalance	within $\pm 3\%$ of rated voltage

Unit: ft/m

	1 drive 2	1 drive 3	1 drive 4	1 drive 5
Max. length for all rooms	131/40	197/60	262/80	262/80
Max. length for one indoor unit	82/25	98/30	115/35	115/35
Max. height different between indoor and outdoor unit	49/15	49/15	49/15	49/15
Max. height different between indoor units	33/10	33/10	33/10	33/10

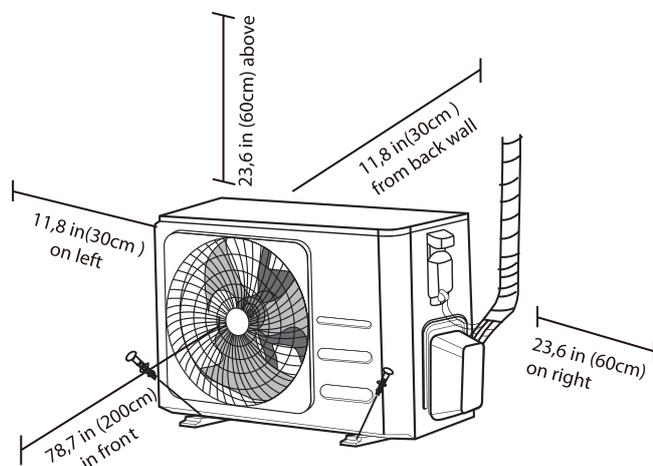
When installing multiple indoor units with a single outdoor unit, ensure that the length of the refrigerant pipe and the drop height between the indoor and outdoor units meet the requirements illustrated in the following diagram:



Outdoor Unit Installation

5

Install the unit by following local codes and regulations, which may differ slightly from region to region.



Installation Instructions – Outdoor unit

Step 1: Select installation location

Before installing the outdoor unit, you must choose an appropriate location. The following are standards that will help you choose an appropriate location for the unit.

Proper installation locations meet the following standards:

- ✔ Meets all spatial requirements shown in Installation Space Requirements above.
- ✔ Good air circulation and ventilation
- ✔ Firm and solid—the location can support the unit and will not vibrate
- ✔ Noise from the unit will not disturb others
- ✔ Protected from prolonged periods of direct sunlight or rain
- ✔ Where snowfall is anticipated, raise the unit above the base pad to prevent ice buildup and coil damage. Mount the unit high enough to be above the average accumulated area snowfall. The minimum height must be 18 inches

DO NOT install unit in the following locations:

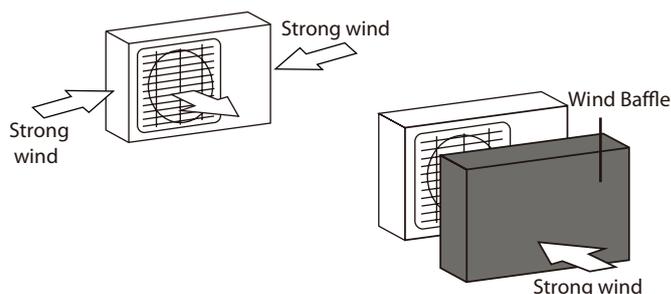
- ⊗ Near an obstacle that will block air inlets and outlets
- ⊗ Near a public street, crowded areas, or where noise from the unit will disturb others
- ⊗ Near animals or plants that will be harmed by hot air discharge
- ⊗ Near any source of combustible gas
- ⊗ In a location that is exposed to large amounts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

Special Considerations For Extreme Weather

If the unit is exposed to heavy wind:

Install unit so that air outlet fan is at a 90° angle to the direction of the wind. If needed, build a barrier in front of the unit to protect it from extremely heavy winds.

See Figures below.



If the unit is frequently exposed to heavy rain or snow:

Build a shelter above the unit to protect it from the rain or snow. Be careful not to obstruct air flow around the unit.

If the unit is frequently exposed to salty air (seaside):

Use outdoor unit that is specially designed to resist corrosion.

**Step 2: Install drain joint
(Heat pump unit only)**

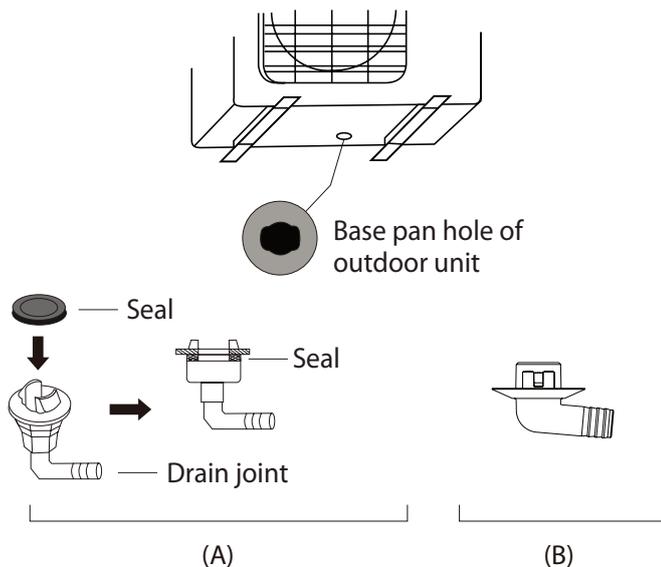
Before bolting the outdoor unit in place, you must install the drain joint at the bottom of the unit. Note that there are two different types of drain joints depending on the type of outdoor unit.

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

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

If the drain joint doesn't come with a rubber seal (see **Fig. B**), do the following:

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



IN COLD CLIMATES

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

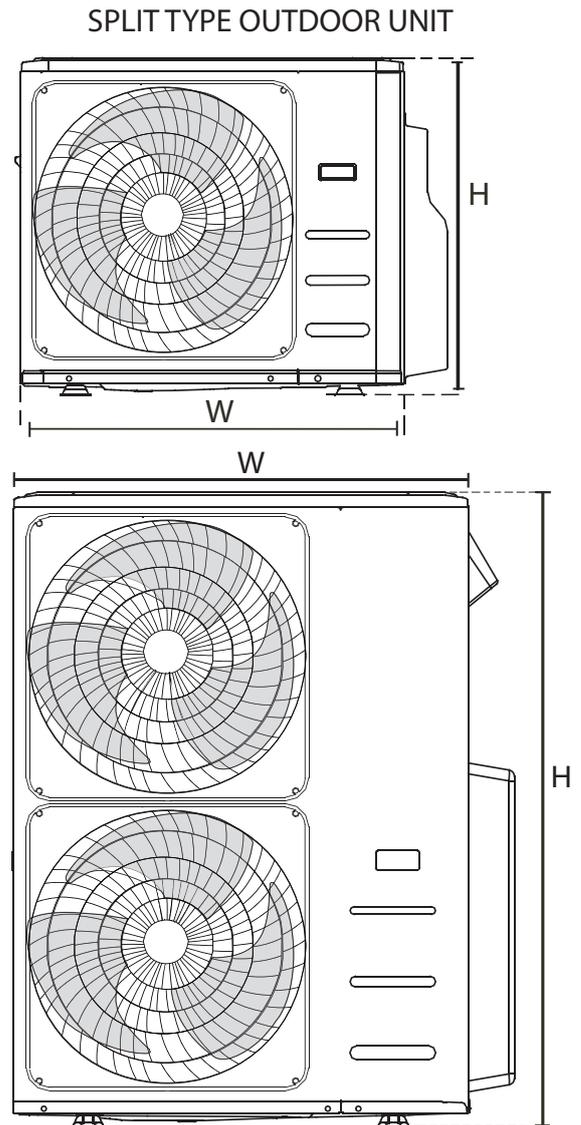
Step 3: Anchor outdoor unit

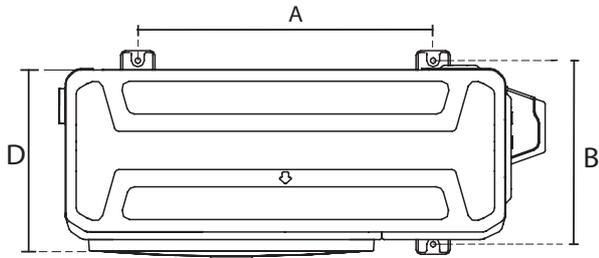
The outdoor unit can be anchored to the ground or to a wall-mounted bracket with bolt (M10). Prepare the installation base of the unit according to the dimensions below.

Unit Mounting Dimensions

The following is a list of different outdoor unit sizes and the distance between their mounting feet. Prepare the installation base of the unit according to the dimensions below.

Outdoor Unit Types and Specifications





1. Determine the location of the wall hole based on the location of the outdoor unit.
2. Using a 2.5 in (65 mm) core drill, drill a hole in the wall.

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

Unit: in/mm

Outdoor Unit Dimensions, W x H x D	Mounting Dimensions	
	Distance A	Distance B
37.24x16.14x31.89 (946x410x810)	26.5 (673)	15.87 (403)
37.48x16.34x52.48 (952x415x1333)	24.96 (634)	15.9 (404)

3. Place the protective wall cuff in the hole. This protects the edges of the hole and helps seal it when you finish the installation process.

Notes On Drilling Hole In Wall

When Selecting a 24k Indoor Unit

The 24k indoor unit can only be connected with an A system. If there are two 24k indoor units, they can be connected with A and B systems.

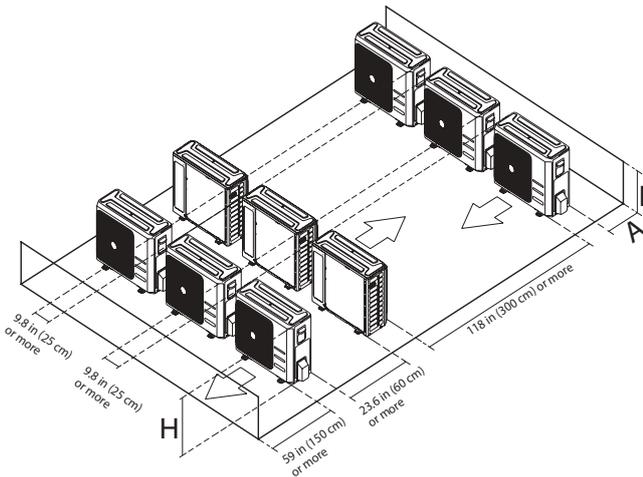
Connective pipe size an A and B systems.

Rows of series installation.
The relations between H, L and A are as follows.

	L	A
L ≤ H	$L \leq 1/2H$	9.8 in/25 cm or more
	$1/2H < L \leq H$	11.8 in/30 cm or more
L > H	Can't be installed	

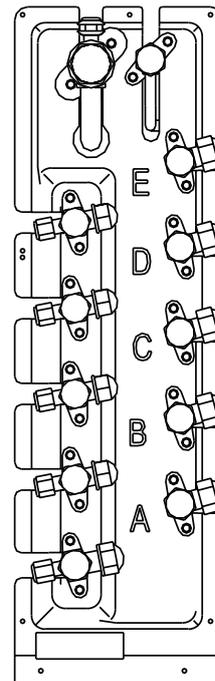
Unit: in

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



Notes On Drilling Hole In Wall

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



Refrigerant Piping Connection 6

When connecting refrigerant piping, **do not** let substances or gasses other than the specified refrigerant enter the unit. The presence of other gasses or substances will lower the unit's capacity, and can cause abnormally high pressure in the refrigeration cycle. This can cause explosion and injury.

Connection Instructions – Refrigerant Piping

Refrigerant Piping Connection Instructions

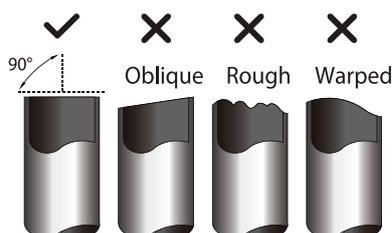
CAUTION

- The branching pipe must be installed horizontally. An angle of more than 10° may cause malfunction.
- **DO NOT** install the connecting pipe until both indoor and outdoor units have been installed.
- Insulate both the gas and liquid piping to prevent water leakage.

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 pipe cutter, cut the pipe a little longer than the measured distance.
3. Make sure that the pipe is cut at a perfect 90° angle.



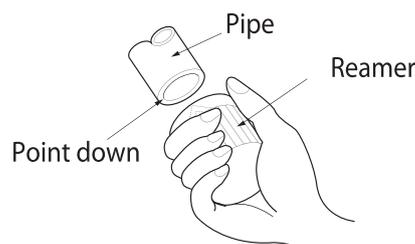
DO NOT DEFORM PIPE WHILE CUTTING

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

Step 2: Remove burrs.

Burrs can affect the air-tight seal of refrigerant piping connection. They must be completely removed.

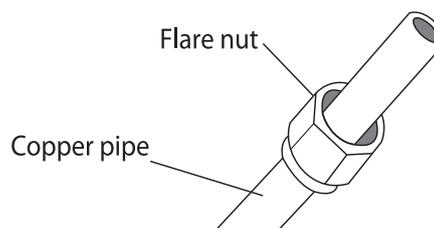
1. Hold the pipe at a downward angle to prevent burrs from falling into the pipe.
2. Using a reamer or deburring tool, remove all burrs from the cut section of the pipe.



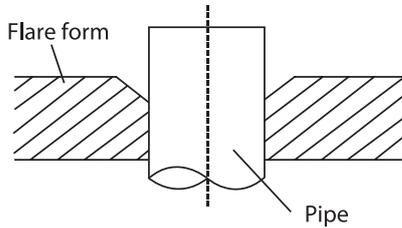
Step 3: Flare pipe ends

Proper flaring is essential to achieve an airtight seal.

1. After removing burrs from cut pipe, seal the ends with PVC tape to prevent foreign materials from entering the pipe.
2. Sheath 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



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



- 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.

PIPING EXTENSION BEYOND FLARE FORM

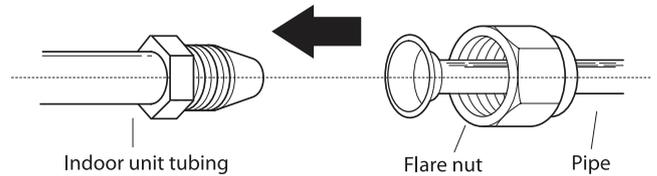
Pipe gauge (Unit: In/mm)	Tightening torque	Flare dimension (A) (Unit: Inch /mm)		Flare shape
		Min	Max	
Ø1/4 (6.4)	18-20 N.m (183-204 kgf.cm)	0.33 /8.4	0.34 /8.7	
Ø3/8 (9.5)	25-26 N.m (255-265 kgf.cm)	0.52 /13.2	0.53 /13.5	
Ø1/2 (12.7)	35-36 N.m (357-367 kgf.cm)	0.64 /16.2	0.65 /16.5	
Ø5/8 (15.9)	45-47 N.m (459-480 kgf.cm)	0.76 /19.2	0.78 /19.7	
Ø3/4 (19.1)	65-67 N.m (663-683 kgf.cm)	0.91 /23.2	0.93 /23.7	
Ø7/8 (22)	75-85 N.m (765-867 kgf.cm)	1.04 /26.4	1.06 /26.9	

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

Step 4: Connect pipes

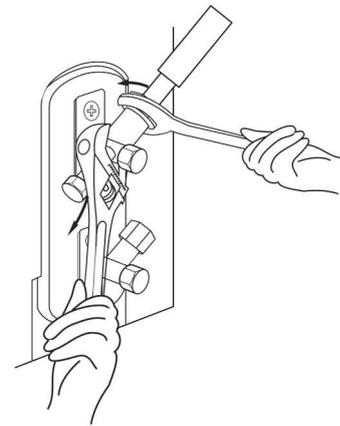
Connect the copper pipes to the indoor unit first, then connect them to the outdoor unit. You should first connect the low-pressure pipe, then the high-pressure pipe.

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



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

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

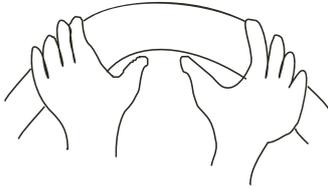


CAUTION

- 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 bell mouth 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 3.93 in (10cm)

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

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

7. Thread this pipeline through the wall and connect it to the outdoor unit.
8. Insulate all the piping, including the valves of the outdoor unit.
9. Open the stop valves of the outdoor unit to start the flow of the refrigerant between the indoor and outdoor unit.



CAUTION

After completing the installation work, make sure there is no refrigerant leak. If there is, ventilate the area immediately and evacuate the system (refer to the Air Evacuation section of this manual).



BEFORE PERFORMING ANY ELECTRICAL WORK, READ THESE REGULATIONS

1. All wiring must comply with local and national electrical codes and regulations and must be installed by a licensed electrician.
2. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.
3. If there is a serious safety issue with the power supply, stop work immediately. Explain your reasoning to the client, and refuse to install the unit until the safety issue is properly resolved.
4. Power voltage should be within 90-110% of rated voltage. Insufficient power supply can cause malfunction, electrical shock, or fire.
5. If connecting power to fixed wiring, install a surge protector and main power switch with a capacity of 1.5 times the maximum current of the unit.
6. If connecting power to fixed wiring, a switch or circuit breaker that disconnects all poles and has a contact separation of at least 1/8in (3mm) must be incorporated in the fixed wiring. The qualified technician must use an approved circuit breaker or switch.
7. Only connect the unit to an individual branch circuit outlet. Do not connect another appliance to that outlet.
8. Make sure to properly ground the air conditioner.
9. Every wire must be firmly connected. Loose wiring can cause the terminal to overheat, resulting in product malfunction and possible fire.
10. Do not let wires touch or rest against refrigerant tubing, the compressor, or any moving parts within the unit.
11. If the unit has an auxiliary electric heater, it must be installed at least 1 meter (40in) away from any combustible materials.
12. To avoid getting an electric shock, never touch the electrical components soon after the power supply has been turned off. After turning off the power, always wait 10 minutes or more before you touch the electrical components.
13. Make sure that you do not cross your electrical wiring with your signal wiring. This may cause distortion and interference.
14. The unit must be connected to the main outlet. Normally, the power supply must have a impedance of 32 ohms.
15. No other equipment should be connected to the same power circuit.
16. Connect the outdoor wires before connecting the indoor wires.



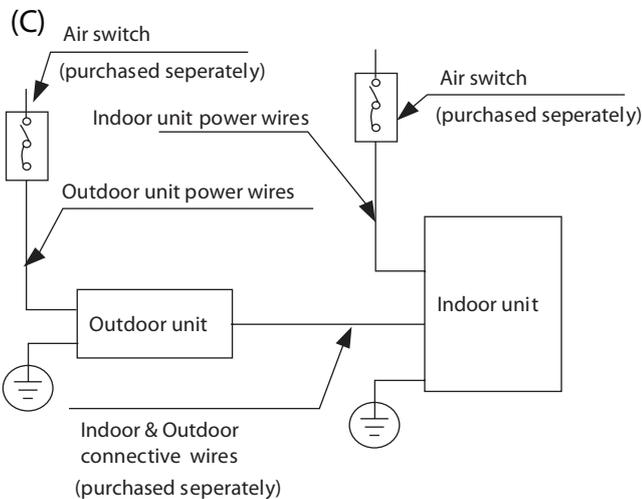
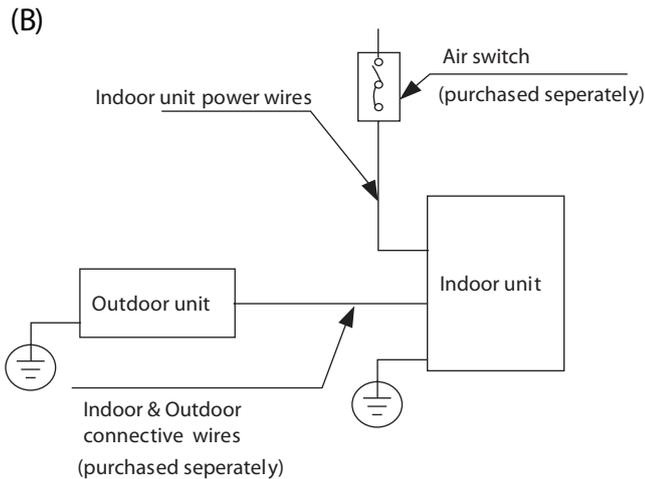
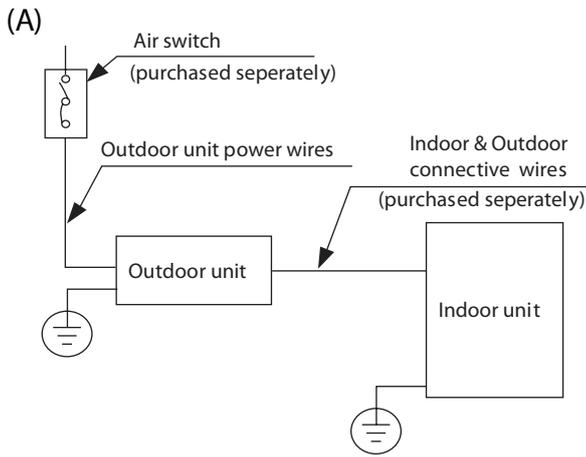
WARNING

BEFORE PERFORMING ANY ELECTRICAL OR WIRING WORK, TURN OFF THE MAIN POWER TO THE SYSTEM.

NOTE ON AIR SWITCH

When the maximum current of the air conditioner is more than 16A, an air switch or leakage protection switch with protective device shall be used (purchased seperately) .

When the maximum current of the air conditioner is less than 16A, the power cord of air conditioner shall be equipped with plug (purchased seperately) .



NOTE: The cograps are for explanation purpose only. Your machine may be slightly different. The actual shape shall prevail.

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. First choose the right cable size. Be sure to use H07RN-F cables.

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

Rated Current of Appliance (A)	Nominal Cross-Sectional Area (mm ²)
> 3 and ≤ 6	0.75
> 6 and ≤ 10	1
> 10 and ≤ 16	1.5
> 16 and ≤ 25	2.5
> 25 and ≤ 32	4
> 32 and ≤ 40	6

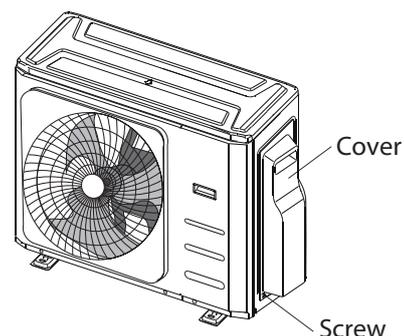
- B. Using wire strippers, strip the rubber jacket from both ends of the signal cable to reveal approximately 5.9 in (15cm) of wire.

- C. Strip the insulation from the ends.

- D. Using a wire crimper, crimp u-lugs on the ends.

NOTE: When connecting the wires, strictly follow the wiring diagram found inside the electrical box cover.

2. Remove the electric cover of the outdoor unit. If there is no cover on the outdoor unit, take off the bolts from the maintenance board and remove the protection board.

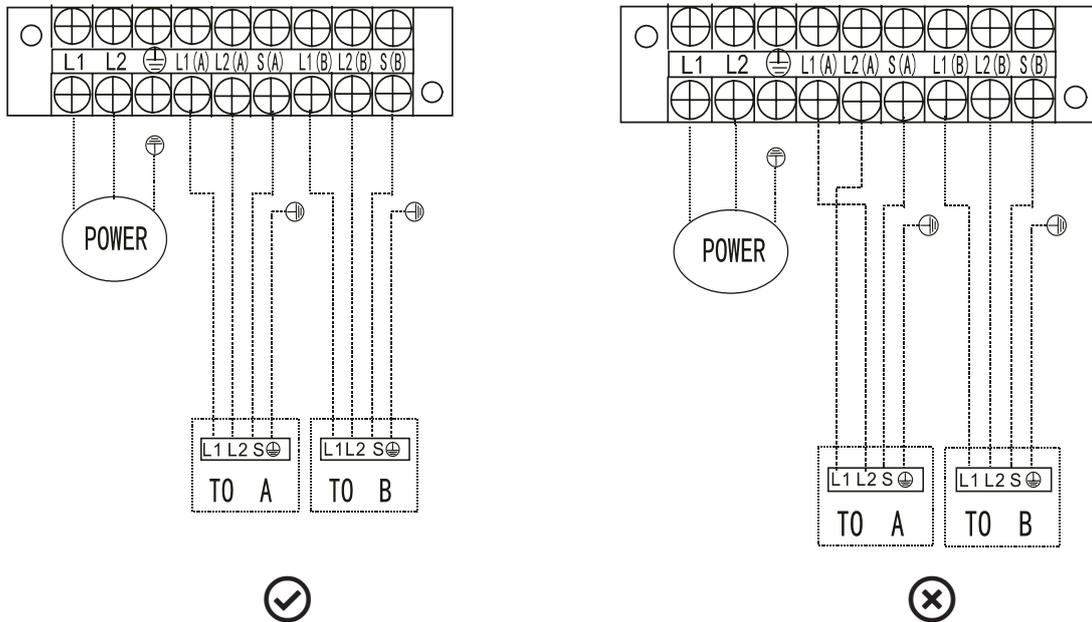


3. Connect the u-lugs to the terminals Match the wire colors/labels with the labels on the terminal block, and firmly screw the u-lug of each wire to its corresponding terminal.
4. Clamp down the cable with designated cable clamp.
5. Insulate unused wires with electrical tape. Keep them away from any electrical or metal parts.
6. Reinstall the cover of the electric control box.

Wiring Figure

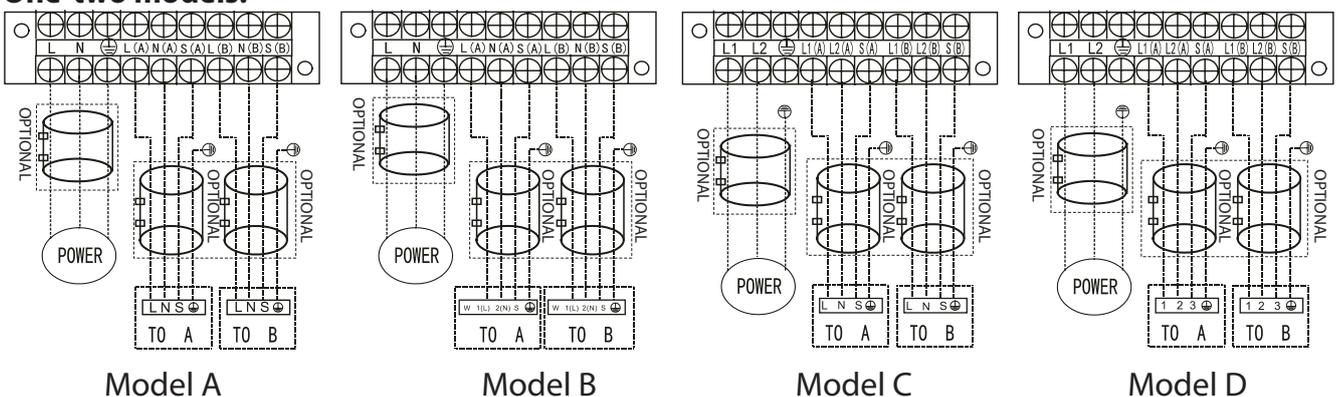
CAUTION

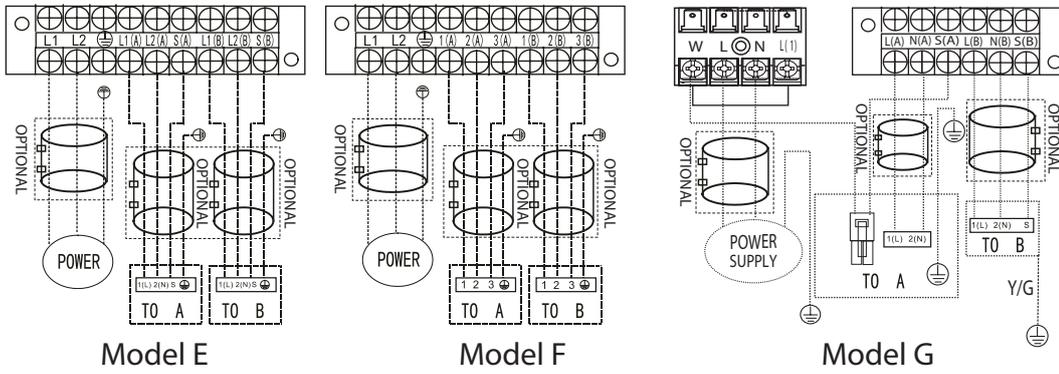
Connect the connective cables to the terminals as identified with their respective matched numbers on the terminal block of the indoor and outdoor units. For example, see the following US models: Terminal L1(A) on the outdoor unit must connect with terminal L1 on the indoor unit.



NOTE: If the client wants to perform the wiring himself, refer to the following figures. Run the main power cord through the lower line-outlet of the cord clamp.

One-two models:





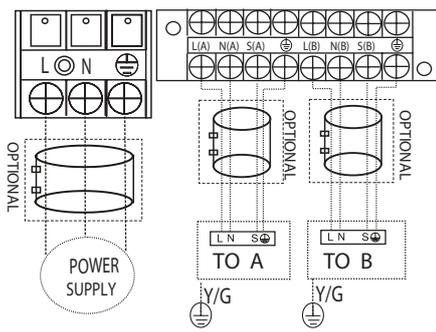
Model E

Model F

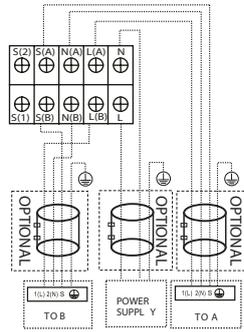
Model G



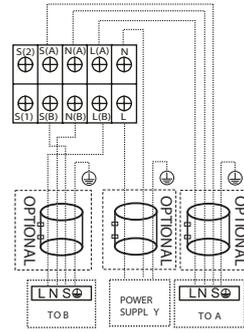
NOTE: Use the magnetic ring (not supplied, optional part) to hitch the connective cable of indoor and outdoor units after installation. One magnetic ring is used for one cable.



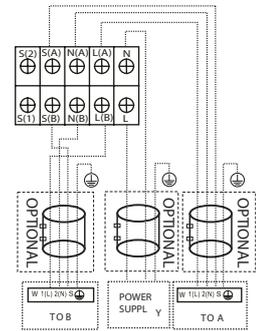
Model H



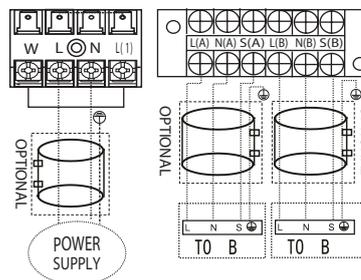
Model I



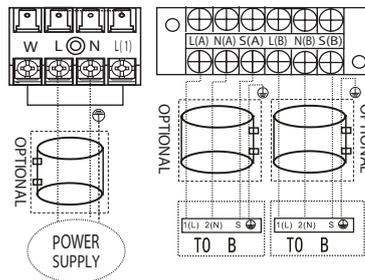
Model J



Model K



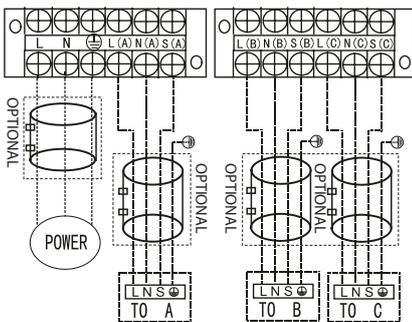
Model L



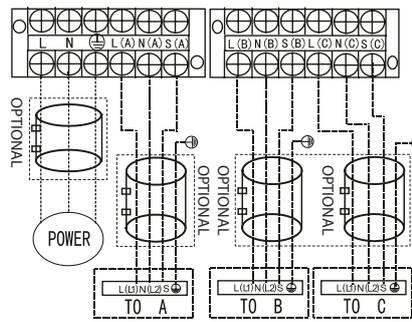
Model M

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

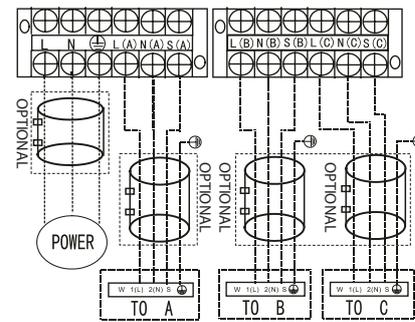
One-three models:



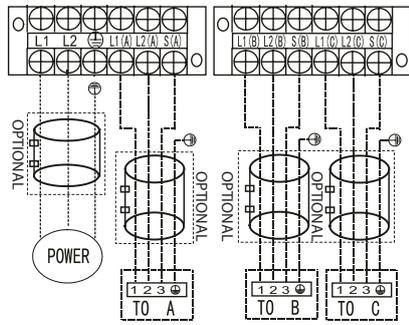
Model A



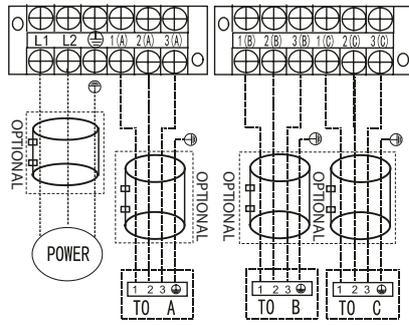
Model B



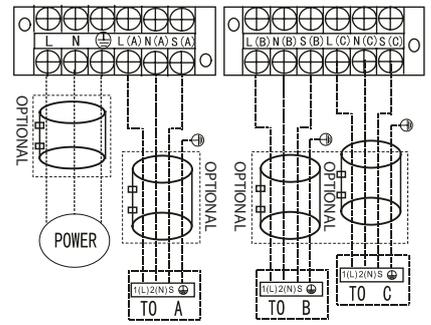
Model C



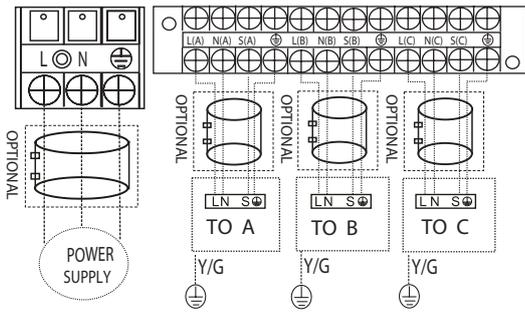
Model D



Model E

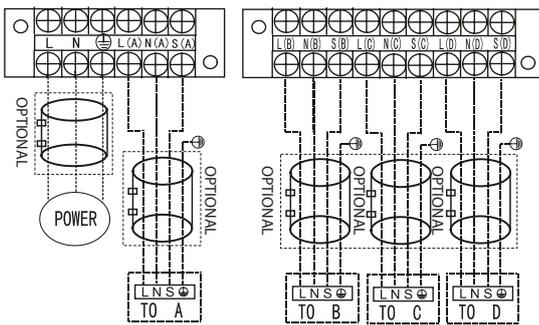


Model F

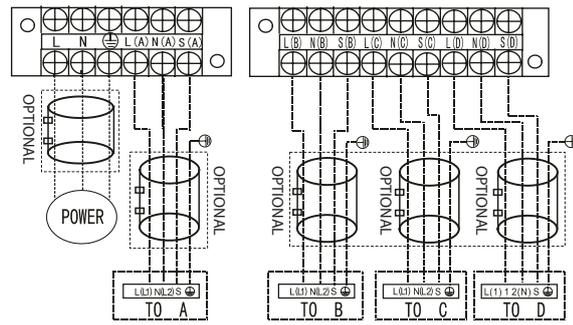


Model G

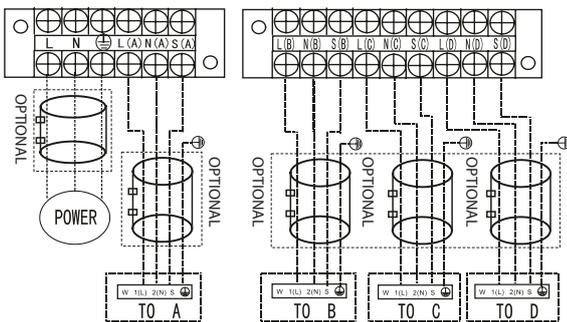
One-four models:



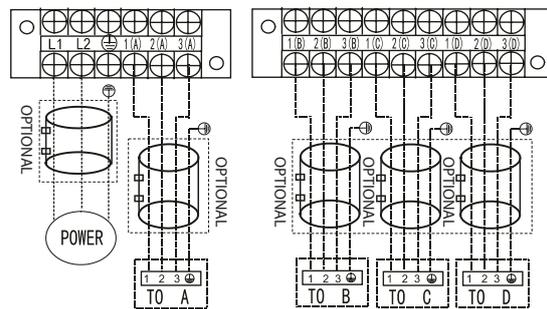
Model A



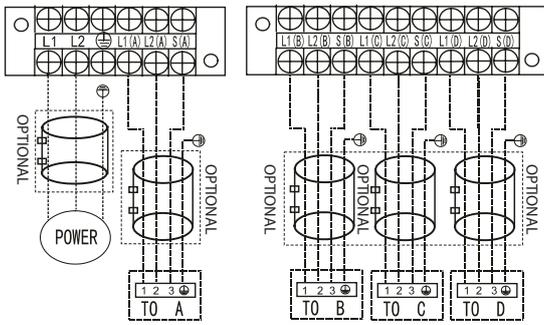
Model B



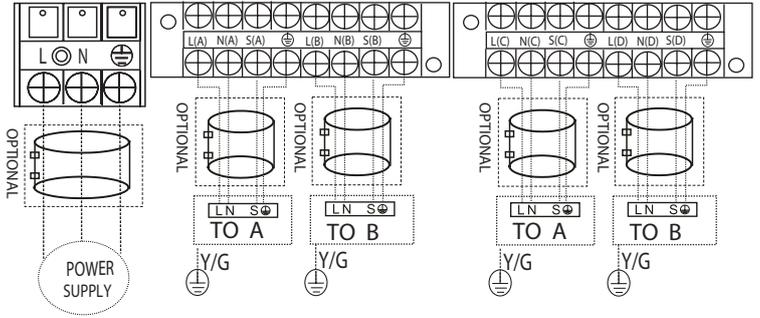
Model C



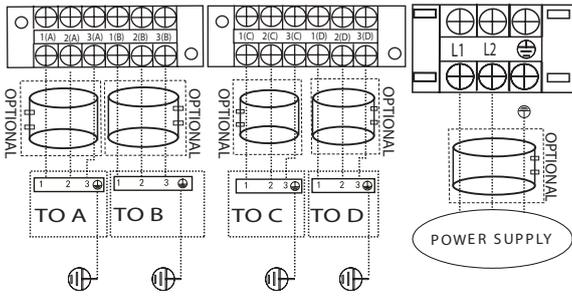
Model D



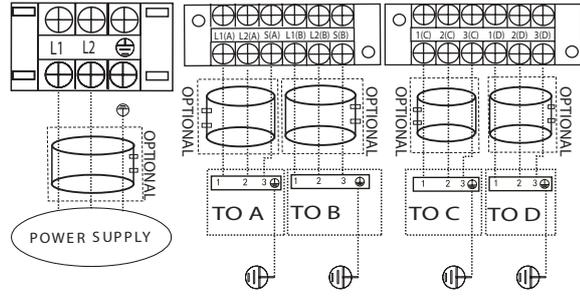
Model E



Model F

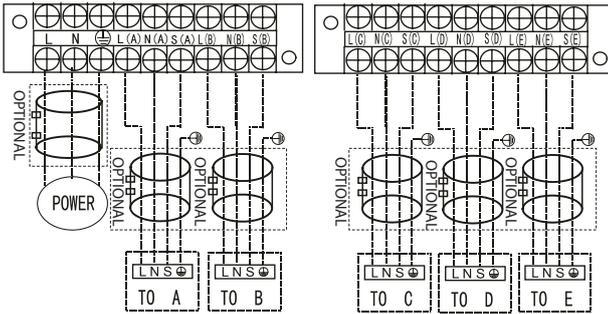


Model G

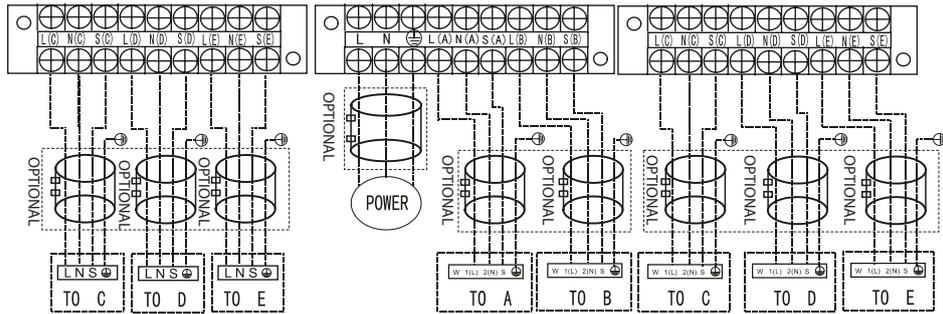


Model H

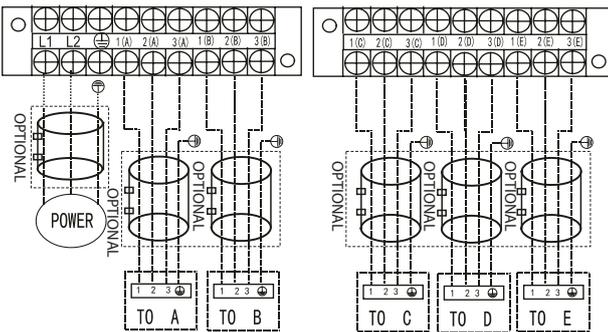
One-five models:



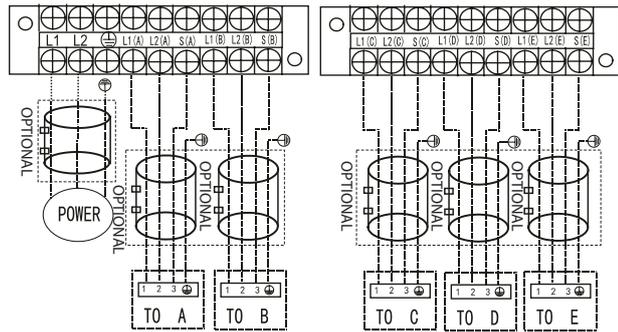
Model A



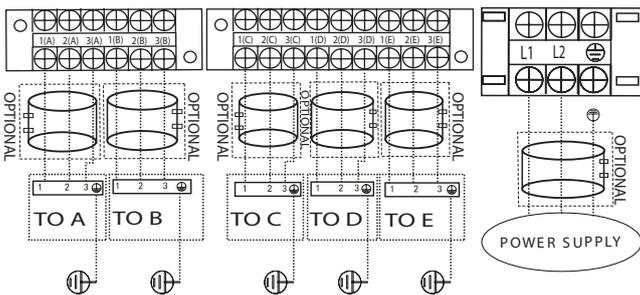
Model B



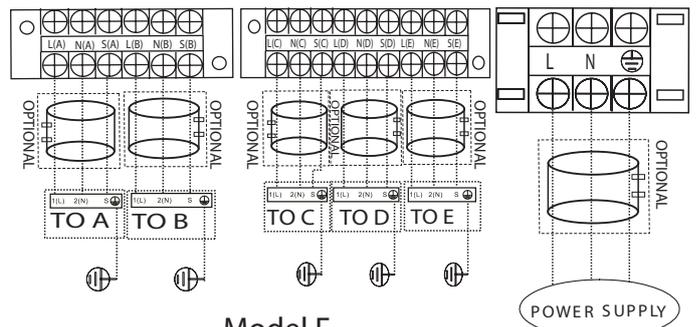
Model C



Model D



Model E



Model F



CAUTION

After the confirmation of the above conditions, prepare the wiring as follows:

- Never fail to delegate an individual power circuit specifically for the air conditioner. For the method of wiring, use the circuit diagram posted on the inside of the control cover as a guide.
- The screws which fasten the wiring in the casing of electrical fittings are liable to come loose from vibrations to which the unit will be subjected during the course of transportation. Check to make sure they are all tightly fastened. (If they are loose, the wires could burn out.)
- Specification of power source.
- Confirm that the electrical capacity is sufficient.
- See that the starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.
- Confirm that the cable thickness is as specified in the power source specification.
- Always install an earth leakage circuit breaker in a wet or moist area.
- The following could be caused by a voltage drop: The vibration of a magnetic switch (which will damage the contact point), the breakage of a fuse, or the disturbance of the normal function of the overload.
- The means for disconnection from a power supply must be incorporated in the fixed wiring and have an air gap contact separation of at least 0.12 in (3 mm) in each active (phase) conductor
- Before terminals are accessed, all supply circuits must be disconnected.

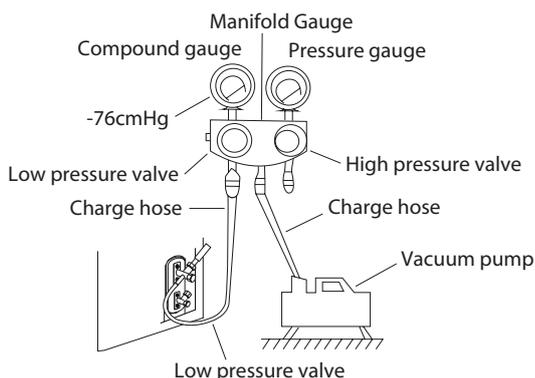
Safety Precautions

! CAUTION

- Use a vacuum pump with a gauge reading lower than -0.1 MPa and an air discharge capacity above 40 L/min.
- The outdoor unit does not need vacuuming. **DO NOT** open the outdoor unit's gas and liquid stop valves.
- Ensure that the compound meter reads -0.1 MPa or below after 2 hours. If after 3 hours of operation the gauge reading is still above -0.1 MPa, check if there is a gas leak or water inside the pipe. If there is no leakage, perform another evacuation for 1 or 2 hours.
- **DO NOT** use refrigerant gas to evacuate the system.

Evacuation Instructions

Before using the manifold gauge or vacuum pump, read their operation manuals to familiarize yourself with how to use them properly.



1. Connect the charge hose of the manifold gauge to the service port on the outdoor unit's low-pressure valve.
2. Connect another charge hose from the manifold gauge to the vacuum pump.
3. 3. Open the low-pressure side of the manifold gauge. Keep the low-pressure side closed.

4. 4. Turn on the vacuum pump to evacuate the system.
5. 5. Run the vacuum for at least 15 minutes, or until the compound meter reads -76 cmHG (-1x10⁵ Pa).
6. 6. Close the low-pressure side of the manifold gauge and turn off the vacuum pump.
7. 7. Wait 5 minutes, then check that there has been no change in the system pressure.

NOTE: If there is no change in the system pressure unscrew the cap from the packed valve (high-pressure valve). If there is a change in the system pressure, there may be a gas leak.

8. Insert a hexagonal wrench into the packed valve (high-pressure valve) and open the valve by turning the wrench counterclockwise a 1/4 turn. Listen for gas to exit the system, then close the valve after 5 seconds.
9. Watch the Pressure Gauge for one minute to make sure that there is no change in pressure. The pressure gauge should read slightly higher than atmospheric pressure.
10. 10. Remove the charge hose from the service port.
11. Using a hexagonal wrench, fully open both the high-pressure and high-pressure valves.

OPEN VALVE STEMS GENTLY

When opening valve stems, turn the hexagonal wrench until it hits against the stopper. **DO NOT** try to force the valve to open further.

12. Tighten the valve caps by hand, then tighten them using the proper tool.
13. If the outdoor unit uses all vacuum valves, and the vacuum position is at the main valve, the system is not connected with the indoor unit and must be tightened with a screw nut. Check the gas leakage before operation to prevent leakage.

Note on Adding Refrigerant

CAUTION

- Refrigerant charging must be performed after wiring, vacuuming, and the leak test.
- DO NOT exceed the maximum allowable quantity of refrigerant or overcharge the system.
- Doing so may damage or impact the unit's function.
- Charging with unsuitable substances may cause explosions or accidents. Ensure that the appropriate refrigerant is used.
- Refrigerant containers must be opened slowly. Always use protective gear when charging the system.
- DO NOT mix refrigerant types

N=2 (one-twin models), N=3 (one-three models), N=4 (one-four models), N=5 (one-five models). Some systems require additional charging depending on pipe lengths. The standard pipe length varies according to local regulations. For example, in North America, the standard pipe length is 25 ft (7.5 m) In other areas, the standard pipe length is 16 ft (5 m). The additional refrigerant to be charged can be calculated using the following formula:

Additional Refrigerant Per Pipe Length

Connective Pipe Length	Air Purging Method	Additional Refrigerant (R410A)	
Pre-charge pipe length (ft/m) Vacuum pump (standard pipe length x N)	Vacuum pump	N/A	
More than (standard pipe length x N) ft/m	Vacuum pump	Liquid Side: \varnothing 6.35 (\varnothing 1/4") (Total pipe length - standard pipe length x N) x 15 g/m. (Total pipe length - standard pipe length x N) x 0.16 oz/ft	Liquid Side: \varnothing 9.52 (\varnothing 3/8") (Total pipe length - standard pipe length x N) x 30 g/m. (Total pipe length - standard pipe length x N) x 0.32 oz/ft

Safety And Leakage Check

Electrical safety check

Perform the electric safety check after completing installation:

1. Insulated resistance
The insulated resistance must be more than 2 M Ω .
2. Grounding work
After finishing the grounding work, measure the grounding resistance by visual detection and with a grounding resistance tester. Make sure the grounding resistance is less than 4 Ω .
3. Electrical leakage check (performed during test running)
During test operation after installation is finished, the service man can use the electroprobe and multimeter to perform the electrical leakage check. Turn off the unit immediately if there is leakage.
Look for a solution to the problem until the unit operates properly.

Gas leak check

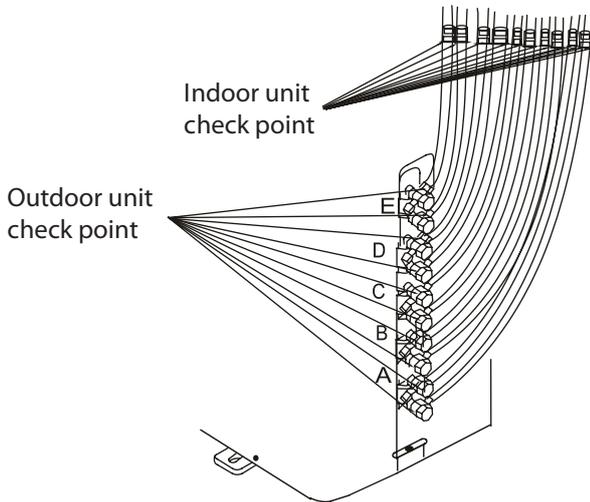
1. Soapy water method:
To check for leakage in the connecting points of the piping, use a soft brush to apply soapy

water or a liquid neutral detergent to the indoor or outdoor unit connections. If bubbles come out, there is leakage.

2. Leak detector

Use the leak detector to check for leakage.

NOTE: The illustration is for explanation purposes only. The actual order of A, B, C, D and E on the machine may be slightly different from the unit you purchased. The actual shape prevails.



A, B, C, and D are points on a one-four type.

A, B, C, D, and E are points on a one-five type.

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) The indoor and outdoor units are properly installed.
- b) Piping and wiring are properly connected.
- c) No obstacles are near the inlet and outlet of the unit that might cause poor performance or product malfunction.
- d) The refrigeration system does not leak.
- e) The drainage system is unimpeded and draining to a safe location.
- f) The heating insulation is properly installed.
- g) The grounding wires are properly connected.
- h) The length of the piping and the added refrigerant stow capacity have been recorded.
- i) The power voltage is the correct voltage for the air conditioner.

CAUTION

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

Before Test Run

1. Open both the liquid and gas stop valves.
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 being 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 works properly.

5. For the outdoor unit:

a) Check to see if the refrigeration system is leaking.

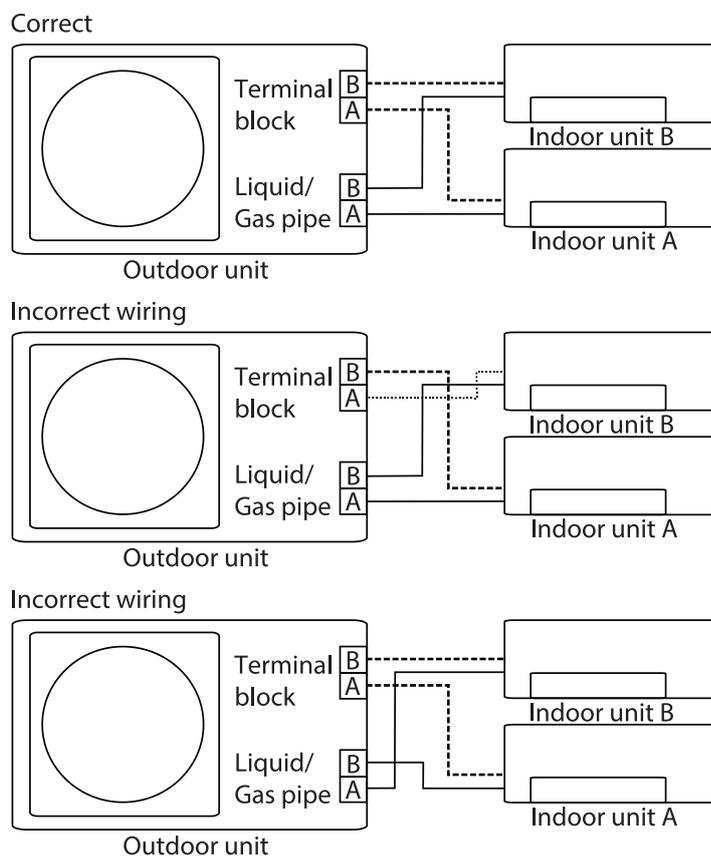
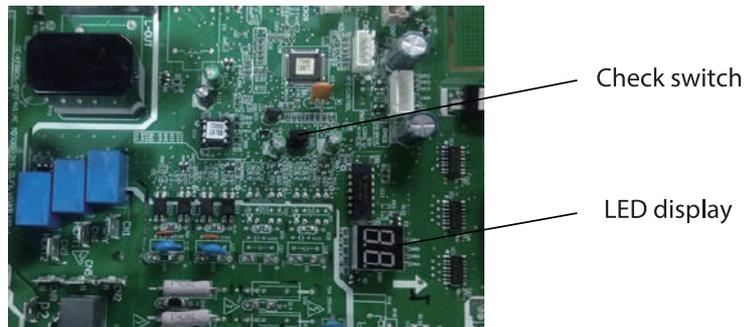
b) Make sure there is no vibration or abnormal noise during operation.

c) Make sure the wind, noise, and water generated by the unit do not disturb your neighbors 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 User's manual before calling customer service.

Automatic Wiring/Piping Correction Function

The new product is able to automatically correct a wiring/piping error. Press the “check switch” on the outdoor unit PCB board for 5 seconds until the LED display shows “CE.” This means the function is working. Approximately 5-10 minutes after the switch is pressed, “CE” will disappear, the wiring/piping error will be corrected, and the wiring/piping will be properly connected.



How to Activate This Function

1. Check that the outside temperature is above 41° F (5° C).
(This function does not work when the outside temperature is not above 41° F (5° C))
2. Check that the stop valves on the liquid and gas pipes are open.
3. Turn on the breaker and wait at least 2 minutes.
4. Press the check switch on the outdoor PCB board until the LED display shows “CE.”