

# Installation Manual

High Efficiency Side Discharge  
Outdoor unit 1.5-5 Ton Capacity  
R-410A

**E4HL5018A1000A**

**E4HL5024A1000A**

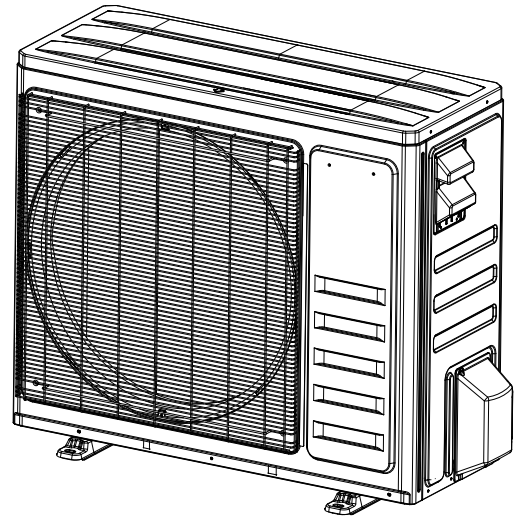
**E4HL5030A1000A**

**E4HL5036A1000A**

**E4HL5042A1000A**

**E4HL5048A1000A**

**E4HL5060A1000A**



NOTE: "Graphics in this document are for representation only. Actual model may differ in appearance."

NOTE: Appearance of unit may vary.  
Installation must be performed in accordance with the requirements of NEC and CEC by authorized personnel only.

All phases of this installation must comply with National, State and Local Codes.

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This document is customer's property and is to remain with this unit. Please return it to customer with service information upon completion of work.

These instructions are intended as an assist to qualified and licensed personnel for proper installation, adjustment and operation of ECM air handler units. Read it thoroughly before attempting installation or service work.

**Failure to follow these instructions may result in fire, electrical shock, property damage, personal injury or death.**

The instructions do not cover all variations in systems or provide for every possible contingency to be met in connection with the installation.



**88-E4HL5001-1B-EN**

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# 1. Safety

Read the following safety instructions before installing the unit or doing service work.

**WARNING** may cause personal death or serious injury.

**CAUTION** may lead to injury or structural damage under some conditions.

 **WARNING**

**HAZARDOUS VOLTAGE!**

DISCONNECT ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING. INSURE THAT ALL MOTOR CAPACITORS HAVE DISCHARGED STORED VOLTAGE.

FAILURE TO DO THE ABOVE COULD RESULT IN DEATH OR SERIOUS INJURY.

 **WARNING**

THIS PRODUCT CAN EXPOSE YOU TO CHEMICALS INCLUDING LEAD, WHICH ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM. FOR MORE INFORMATION GO TO [www.p65Warnings.ca.gov](http://www.p65Warnings.ca.gov)

 **WARNING**

**PRESSURIZED REFRIGERANT! —  
IMPROPER REFRIGERANT!**

SYSTEM CONTAINS OIL AND REFRIGERANT UNDER HIGH PRESSURE. RECOVER REFRIGERANT TO RELIEVE PRESSURE BEFORE OPENING THE SYSTEM.

DO NOT USE NON-APPROVED REFRIGERANTS OR REFRIGERANT SUBSTITUTES OR REFRIGERANT ADDITIVES. SEE OUTDOOR UNIT NAMEPLATE FOR REFRIGERANT TYPE.

FAILURE TO FOLLOW THE ABOVE COULD RESULT IN DEATH, SERIOUS INJURY OR EQUIPMENT DAMAGE.

 **WARNING**

**RISK OF ELECTRIC SHOCK!**

CAN CAUSE INJURY OR DEATH: DISCONNECT ALL REMOTE ELECTRIC POWER SUPPLIES BEFORE SERVICING.

**NOTICE:**

USE COPPER SUPPLY WIRES.

 **WARNING**

**USE COPPER CONDUCTORS ONLY!**

UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.

FAILURE TO DO THE ABOVE COULD RESULT IN EQUIPMENT DAMAGE.

 **WARNING**

RISK OF HOT DANGER, DON'T TOUCH THE CHASSIS ELECTRICAL BELT WHEN UNIT IS IN OPERATION.

 **WARNING**

AFTER INSTALLATION, ENSURE THERE ARE NO REFRIGERANT LEAKS AND THAT THE UNIT IS OPERATING PROPERLY. REFRIGERANT IS BOTH TOXIC AND FLAMMABLE AND POSES A SERIOUS HEALTH AND SAFETY RISK.

INSTALL ACCORDING TO THIS INSTALLATION INSTRUCTIONS STRICTLY. IF INSTALLATION IS DEFECTIVE, IT WILL CAUSE THE SET TO FALL, WATER LEAKAGE, FIRE OR ELECTRICAL SHOCK.

INSTALL AT A STRONG AND FIRM LOCATION WHICH IS ABLE TO WITHSTAND THE SET'S WEIGHT. IF THE STRENGTH IS NOT ENOUGH OR INSTALLATION IS NOT PROPERLY DONE, THE SET WILL DROP AND CAUSE INJURY.

 **CAUTION**

THIS AIR CONDITIONER CONTAINS FLUORINATED GAS. REFER TO THE RELEVANT LABEL OF THE UNIT ITSELF FOR SPECIFIC INFORMATION ON THE TYPE AND QUANTITY OF GAS.

THE INSTALLATION, MAINTENANCE AND REPAIR OF THE DEVICE MUST BE CARRIED OUT BY QUALIFIED TECHNICIANS.

UNLOADING AND RECYCLING OF AIR CONDITIONER MUST BE CARRIED OUT BY CERTIFIED TECHNICIANS.

 **WARNING**

FOR ELECTRICAL WORK, FOLLOW THE LOCAL NATIONAL WIRING STANDARD, REGULATION AND THIS INSTALLTION INSTRUCTIONS. AN INDEPENDENT CIRCUIT AND SINGLE OUTLET MUST BE USED. IF ELECTRICAL CIRCUIT CAPACITY IS NOT ENOUGH OR DEFECT FOUND IN ELECTICAL WORK, IT WILL CAUSE ELECTRECAL SHOCK OR FIRE.

WHEN CARRYING OUT PIPING CONNECTION, TAKE CARE NOT TO LET AIR OR OTHER SUBSTANCES OTHER THAN THE SPECIFIED REFRIGERANT GO INTO REFRIGERATION CYCLE. OTHERWISE, IT WILL CAUSE LOWER CAPACITY, ABNORMAL HIGH PRESSURE IN THE REFRIGERATION CYCLE, EXPLOSION AND INJURY.

ENGAGE DEALER OR SPECIALIST FOR INSTALLATION. IF INSTALLATION DONE BY USER IS DEFECTIVE, IT WILL CAUSE WATER LEAKAGE, ELECTRICAL SHOCK OR FIRE.

 **CAUTION**

DO NOT CHECK THE EQUIPMENT YOURSELF. PLEASE HAVE IT CHECKED BY AN AUTHORIZED DEALER.

DO NOT USE AIR CONDITIONERS FOR PRESERVATION PURPOSES (STORAGE OF FOOD, PLANTS, ANIMALS, ART, ETC.)

DO NOT CLIMB CHILDREN PLAY WITH THE AIR CONDITIONER.


 **CAUTION**

DISCONNECT THE POWER SUPPLY BEFORE WORKING ON THE UNIT.

ALL ELECTRICAL WIRING MUST BE DONE ACCORDING TO LOCAL AND NATIONAL REGULATIONS.

THE WIRING MUST BE CARRIED OUT BY A CERTIFIED TECHNICIAN. IMPROPER CONNECTION MAY CAUSE ELECTRICAL FAILURE, PERSONAL INJURY AND FIRE.

CONNECT THE WIRING TO THE TERMINAL AND SECURE IT WITH THE WIRING CLAMP. IMPROPER CONNECTIONS MAY CAUSE FIRE.

 **CAUTION**

MAKE SURE ALL WIRING IS CORRECT AND THE CONTROL BOX COVER CORRECTLY. OTHERWISE, MAY CAUSE OVERHEATING AT THE CONNECTION POINTS, FIRE, AND ELECTRICAL SHOCK.

ENSURE THAT MAIN SUPPLY CONNECTION IS MADE THROUGH A SWITCH THAT DISCONNECTS ALL POLES, WITH CONTACT GAP OF AT LEAST 0.118".


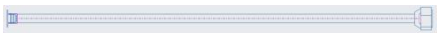
PLEASE TURN OFF THE MAIN POWER OF THE SYSTEM BEFORE PERFORMING ANY ELECTRICAL OR WIRING WORK.

## 2. Accessories

### NOTE:

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.

Table 1. Installation Accessories

Name	Figure	Quantity
Adapter Tube		1
Adapter Tube		1

## 3. Installation Overview

1. Read The Safety Precaution
2. Install The Indoor Unit
3. Install The Outdoor Unit
4. Install The Drainage Pipe
5. Install The Refrigerant Pipe
6. Electrical Wiring
7. Air Evacuation
8. Perform The Test Run

## 4. Outdoor Unit Installation Instructions

### 4.1 Select Installation Location

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

- Keep the outdoor unit as close to the indoor unit as possible.
- Make sure there is enough space for installation and maintenance.
- The installation area must be dry and well ventilated.
- Make sure that the location of the unit is not affected by snow, leaf deposits or other seasonal debris.
- In extreme blizzard weather, it is necessary to install auxiliary snow protection facilities (snow cover) and manual snow clearing in order to avoid freezing on the surface of heat exchanger caused by snow cover unit.
- There must be enough space to install connecting pipes and cables and access them for maintenance.
- The area must be free of combustible gases and chemicals. The length of pipeline between outdoor unit and indoor unit shall not exceed the maximum allowable pipeline length.
- If possible, do not install the unit in direct sunlight.
- If possible, make sure the device is away from the property of your neighbors so that the noise from the device does not interfere with them.

- Air inlet and air outlet shall not be blocked or exposed to strong wind. If the location is exposed to strong winds (for example, near the coast), you must place the unit against the wall to block the wind. If necessary, use a sunshade.
- Install indoor and outdoor equipment, cables and wires at least 3.28 ft away from TV or radio to prevent static electricity or image distortion. Depending on the radio waves, a distance of 3.28 ft may not be enough to eliminate all interference.

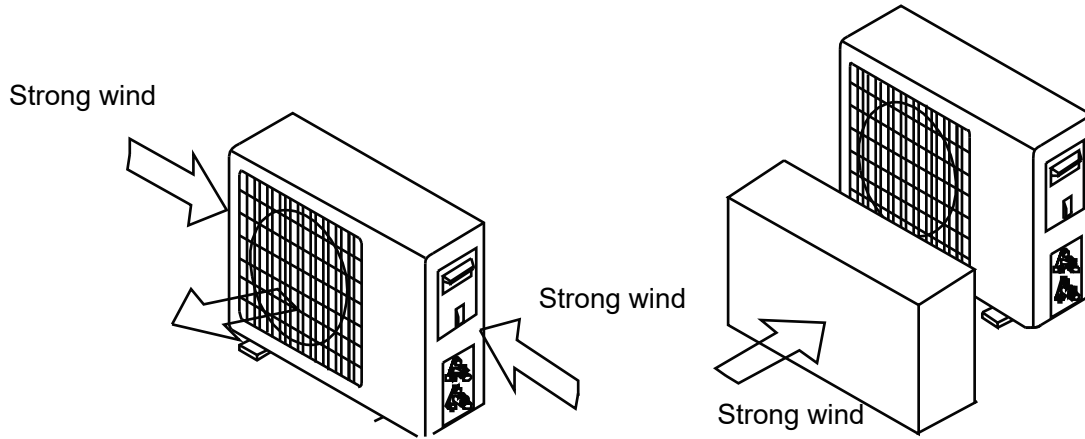


Figure 4-1 Outdoor unit installation location

**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.

## 4.2 Body Dimensions

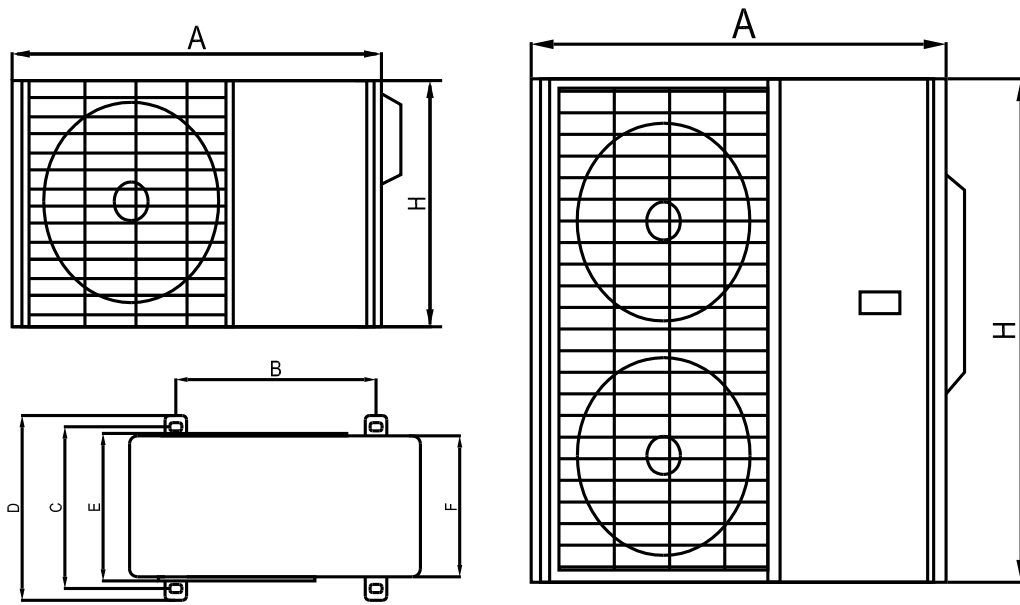


Figure 4-2 Outdoor unit dimensions

Table 2. Unit Dimensions

Model	A/(in)	B/(in)	C/(in)	D/(in)	E/(in)	F/(in)	H/(in)
E4HL5018A1000A E4HL5024A1000A E4HL5030A1000A E4HL5036A1000A	35.6	23.9	15.4	16.6	13.7	13.7	31.6
E4HL5042A1000A E4HL5048A1000A E4HL5060A1000A	37.2	23.6	14.8	16.1	13.3	13.3	55.1



# 4.3 Install Outdoor Unit

## 4.3.1 Single Outdoor unit

To ensure the normal operation of the unit, ensure that the outdoor unit installation space meets the following installation dimensions:

For details about how to install a single outdoor unit, see Figure 4.3:

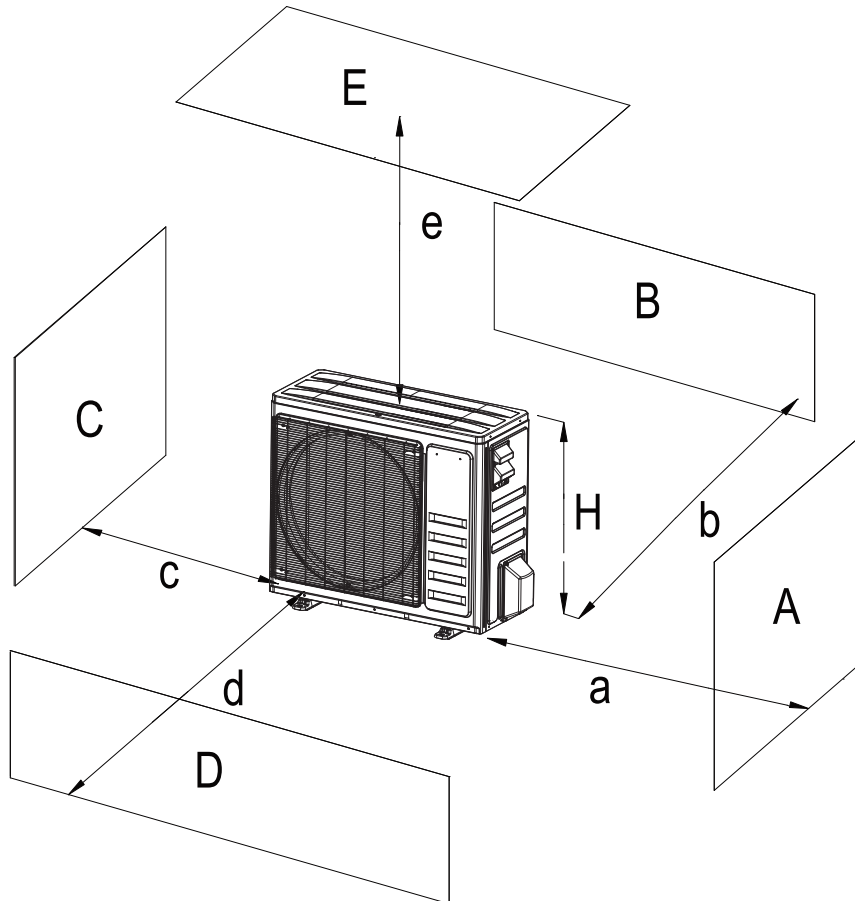


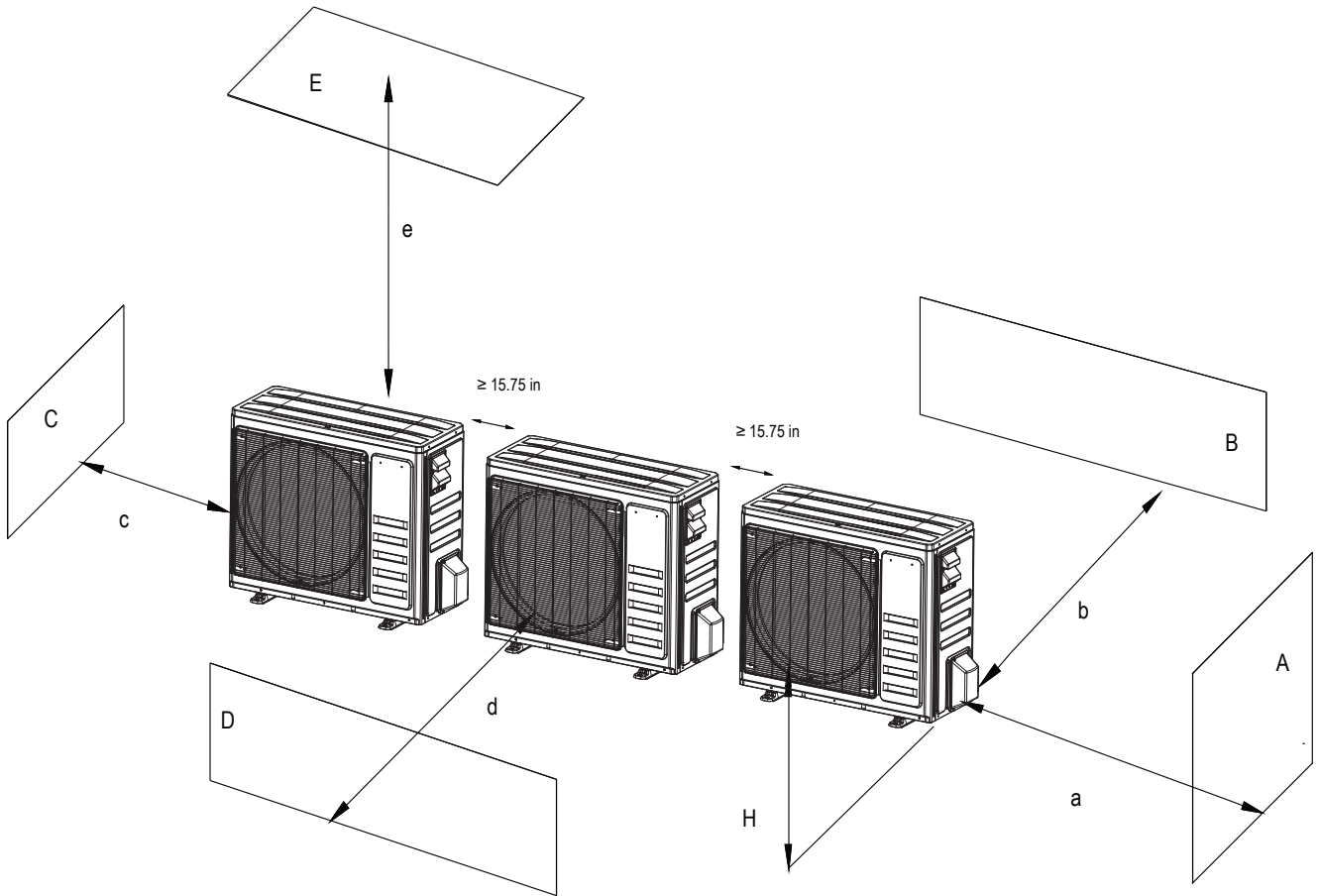
Figure 4-3 Single Outdoor unit installation clearance requirement

A~E	inches (in)				
	a	b	c	d	e
B		≥ 3.94 in			
A,B,C	≥ 11.81 in	≥ 3.94 in	≥ 3.94 in		
B,E		≥ 3.94 in			≥ 39.37 in
A,B,C,E	≥ 11.81 in	≥ 5.9 in	≥ 5.9 in		≥ 39.37 in
D				≥ 39.37 in	
D,E				≥ 39.37 in	≥ 39.37 in
B,D		≥ 3.94 in		≥ 39.37 in	

### 4.3.2 Multiple outdoor unit side by side

To ensure the normal operation of the unit, ensure that the outdoor unit installation space meets the following installation dimensions:

For details about how to install { ~ |ā |^Ā ~ cā [ [ !Ā } ā , see Figure 4.4:



A~E	inches (in)				
	a	b	c	d	e
A,B,C	≥ 11.81 in	≥ 11.81 in	≥ 39.37 in		
A,B,C,E	≥ 11.81 in	≥ 11.81 in	≥ 39.37 in		≥ 39.37 in
D				≥ 78.74 in	
D,E				≥ 78.74 in	≥ 39.37 in
B,D		≥ 11.81 in		≥ 98.43 in	

Figure 4-4 Multiple outdoor unit• side by side installation clearance requirement

## 4.4 Outdoor Unit Condensed Water Drainage(Optional)

The condensed water and the ice formed in the outdoor unit during heating operation can be drained away through the drain pipe:

1. Fasten the drain port in the 0.98" hole placed in the part of the unit as shown in the picture.
2. Connect the drain port and the drain pipe. Pay attention that water is drained in a suitable place.

### CAUTION

- Insulate all piping to prevent condensation.
- Do not pull on the drain strongly, as this may cause it to disconnect.
- If the drain is bent or installed incorrectly, water may leak and cause the water level switch to fail. In heating mode, the outdoor unit will drain water.
- Make sure that the drain hose is placed in a suitable area to avoid water damage and slippage due to freeze drain water.
- The drainpipe is used to drain water. Improper installation may cause damage to equipment and property.

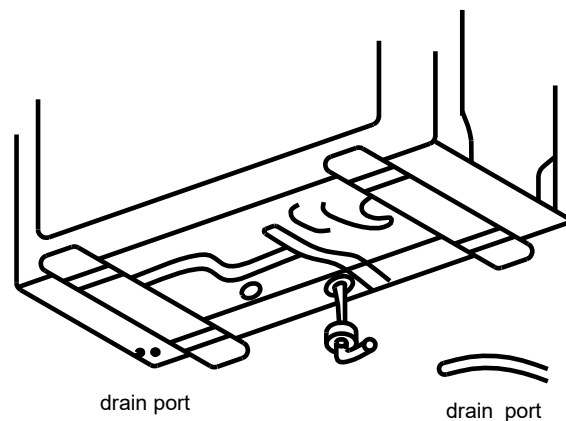


Figure 4-5 Condensate pipe installation instructions

## 4.5 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.

1. Choose the location of the wall hole according to the location of the outdoor unit.
2. Use a 2.5 " core drill to drill holes in the wall.
3. Place the cuff on the hole. This protects the edge of the hole and helps seal the hole when the installation process is complete.

### NOTE:

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

## 5. Refrigerant Piping Connection

### 5.1 Safety Precaution

#### WARNING

- All field piping must be completed by certified technicians and must comply with local and national regulations.
- When installing the refrigeration system, ensure that air, dust, moisture or foreign substances do not enter the refrigerant circuit.
- After completing the installation work, make sure that there are no refrigerant leaks.

### 5.2 Pipe Dimension and Ways of Installation

Outdoor pipe dimension and ways of install (in sequence of cooling capacity)

Table 3. Refrigerant Line Size

Pipe Material		Copper Pipe for Air Conditioner	
Model		E4HL5018A1000A E4HL5024A1000A E4HL5030A1000A E4HL5036A1000A	E4HL5042A1000A E4HL5048A1000A E4HL5060A1000A
Size	Liquid Side	3/8inch	3/8inch
	Gas Side	3/4inch	7/8inch

**NOTE:** Ensure that the length of the refrigerant pipe, the number of bends, and the drop height between the indoor and outdoor units meets the requirements.

Table 4. Line Set Length

Conventional Pipe, Cooling Capacity	E4HL5018A1000A E4HL5024A1000A E4HL5030A1000A E4HL5036A1000A	E4HL5042A1000A E4HL5048A1000A E4HL5060A1000A
	Allowed Value	
Max Line Length	100 ft	164 ft
Maximum Vertical Change Between Indoor and Outdoor Unit	50 ft	98 ft

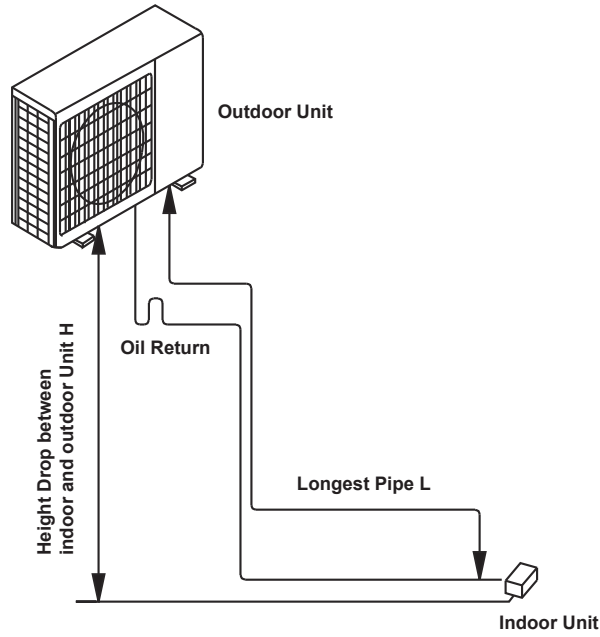


Figure 5-1 Required Line Length and Lift

## 5.3 Oil Traps

### CAUTION

1. If the indoor unit is installed higher than the outdoor unit:

If oil flows back into the outdoor unit's compressor, this might cause liquid compression or deterioration of oil return. Oil traps in the rising gas piping can prevent this. An oil trap should be installed every 32.8 ft of vertical suction line riser.

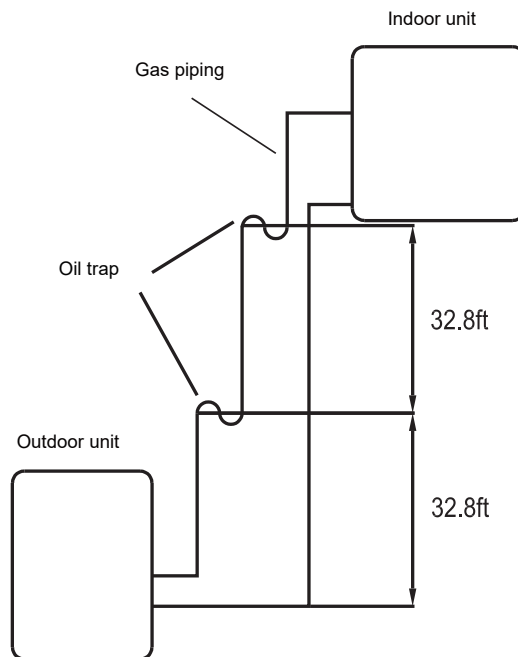


Figure 5-2 Indoor unit in higher installation

2. If the outdoor unit is installed higher than the indoor unit:

It is recommended that vertical suction risers not be upsized. Proper oil return to the compressor should be maintained with suction gas velocity. An oil trap should be installed every 20 ft of vertical suction line riser.

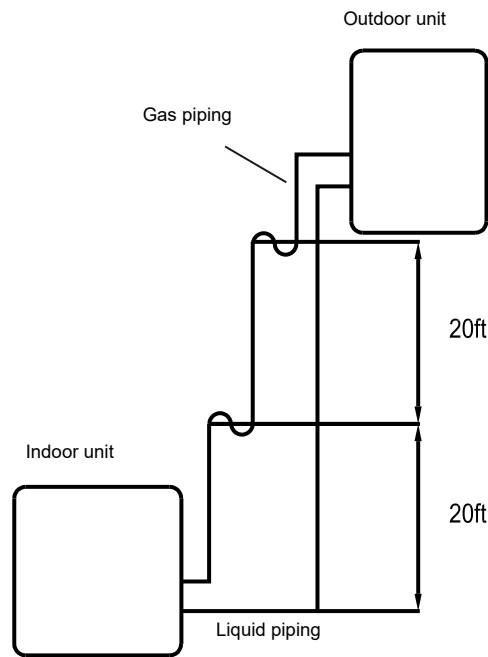


Figure 5-3 Outdoor unit in higher installation

## 5.4 Refrigerant Piping Connection Instructions

### CAUTION

- 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.
- 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.

#### (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. Use the piping kit accessory or the pipes purchased locally.
2. Measure the distance between the indoor and the outdoor unit.
3. Cut the pipes a little longer than measured distance.

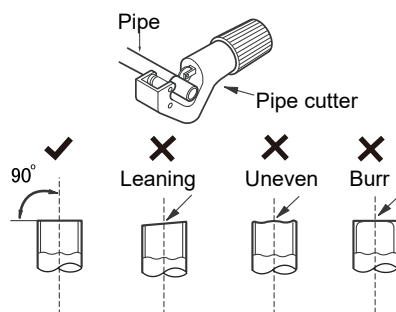


Figure 5-4 Cut pipes

(2) Remove burrs

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

1. Completely remove all burrs from the cut cross section of pipe/tube.
2. Put the end of the copper tube/pipe in a down ward direction as you remove burrs in order to avoid dropping burrs into the tubing.

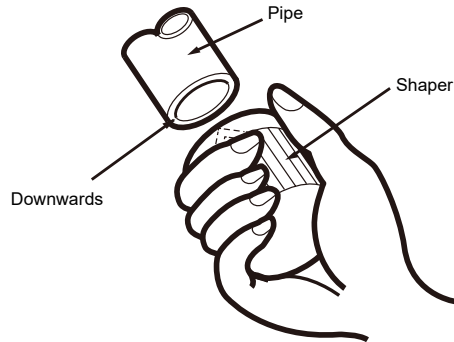


Figure 5-5 Remove burrs

(3) Flaring work

Carry out flaring work using flaring tool as shown below.

Table 5. Flaring Work Dimension

Outside diameter	A
Inch	Inch
3/8"	0.03"~0.04"
3/4"	0.02"~0.03"
7/8"	0.02"~0.03"

Firmly hold copper pipe in a die in the dimension shown in the table above.

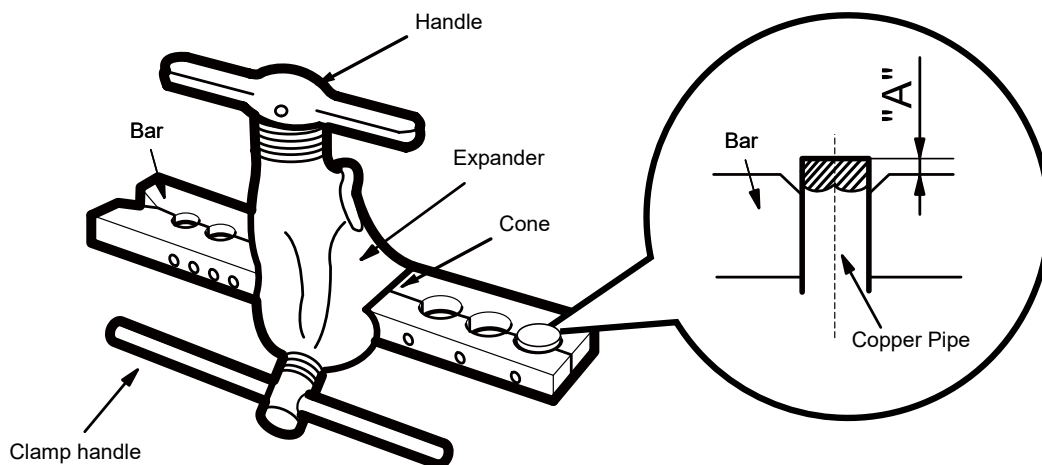


Figure 5-6 Flaring work

(4) Check

1. Compare the flared work with figure below.
2. If flare is noted to be defective, cut off the flared section and do flaring work again.

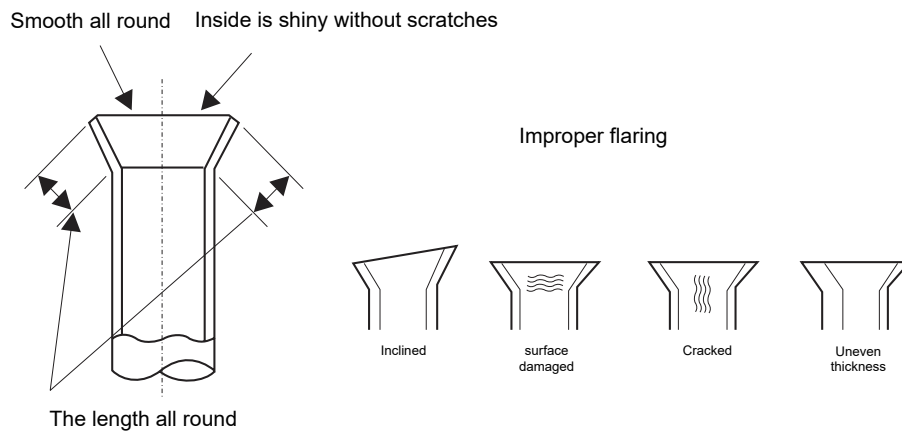


Figure 5-7 Check pipe

**NOTE:** Connect the copper pipes to the indoor unit first, then connect it to the outdoor unit.

(5) You should first connect the low-pressure pipe, then the high-pressure pipe.

1. Align the center of the two pipes that you will connect.
2. Tighten the flare nut as tightly as possible by hand.
3. Using a wrench, grip the nut on the unit tubing.

**NOTE:** Use two wrench to connect the pipe with indoor/outdoor pipes to avoid the copper pipe cracking.

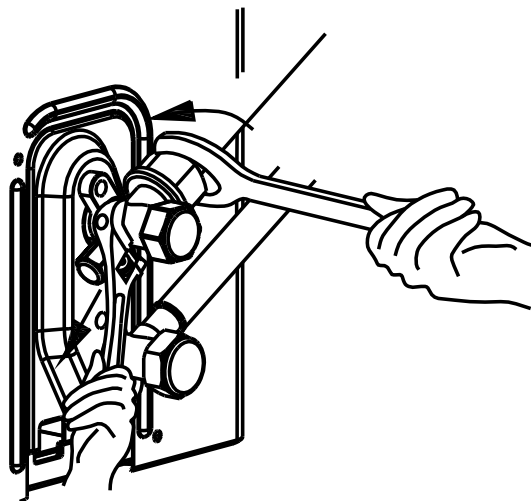


Figure 5-8 Wrench using guide



4. While firmly gripping the nut, use a torque wrench to tighten the flare nut according to the torque values.

**Table 6. Torque Values**

Connecting Pipe Size	Torque Values (lbf*ft)
3/8"	27.3-31
3/4"	51.7-55.3
7/8"	57.5-61.3

5. Insert the connecting pipe of the indoor unit into the reamer transfer nozzle flaring of the outdoor unit, and braze the connecting port.

**CAUTION**

- Ensure 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.

6. Insulate all the piping, including the gas valve of the outdoor unit.

7. Open the stop valves of the outdoor unit to start the flow of the refrigerant between the indoor and outdoor unit.

**CAUTION**

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

# 6. Electric Wiring

## 6.1 Outdoor Unit Wiring

### CAUTION

- Please wire in strict accordance with the wiring diagram.
- The refrigerant circuit can become very hot. Keep the interconnection cable away from the copper tube.
- Field wiring must comply with the National Electric Code and any applicable local ordinance.
- Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.

Table 7. Minimum Cross-Sectional Area of Power and Signal Cables

Rated Current of Appliance(A)	AWG
≤7	18
7-13	16
13-18	14
18-25	12
25-30	10

### (2) Power Wiring

It is important that proper electrical power is available for connection to the unit model being installed. Refer to the unit nameplate, wiring diagram and electrical data in the installation instructions.

- If required, install a branch circuit disconnect of adequate size, located within sight of, and readily accessible to the unit.
- Supply circuit power wiring must be 167°F minimum copper conductors only. Refer to electrical data in this section for ampacity, wire size and circuit protector requirements. Supply circuit protective devices may be either fuses or “HACR” type circuit breakers.

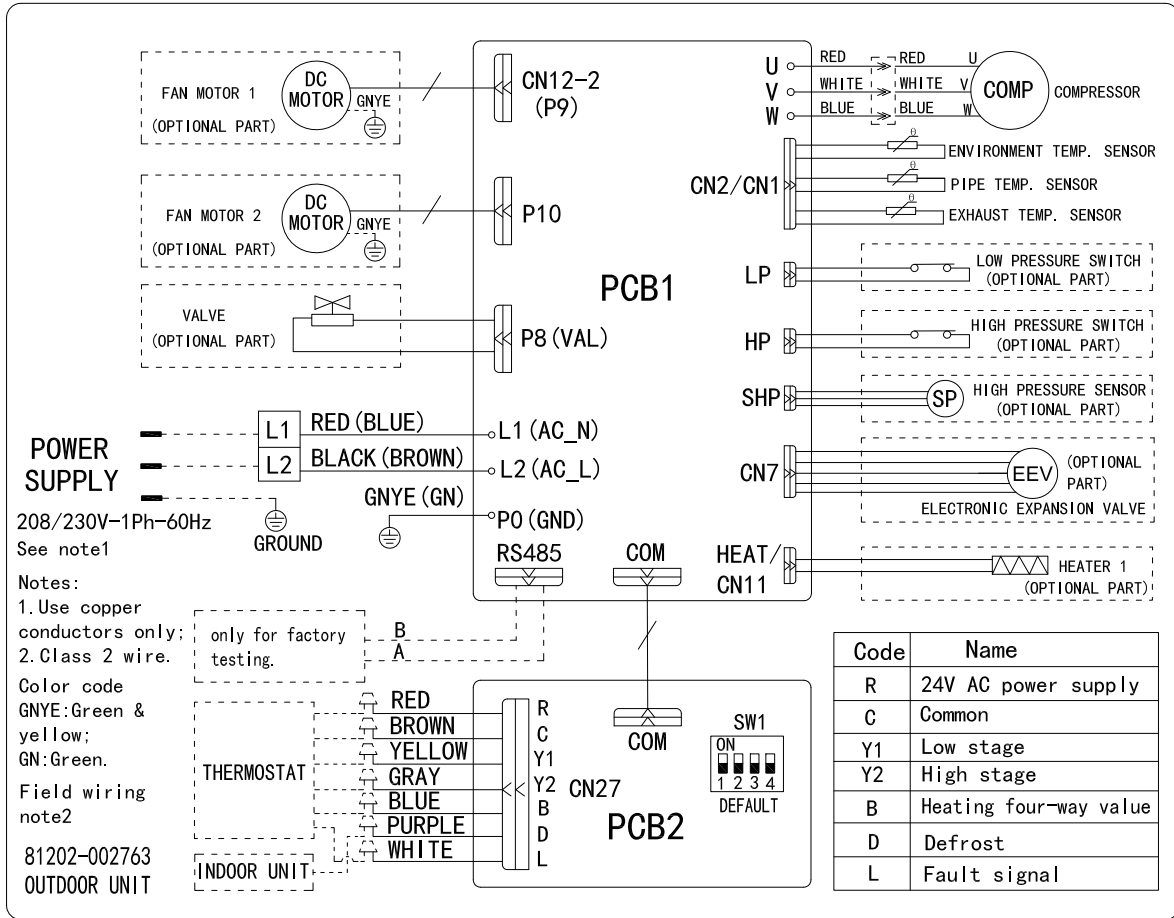
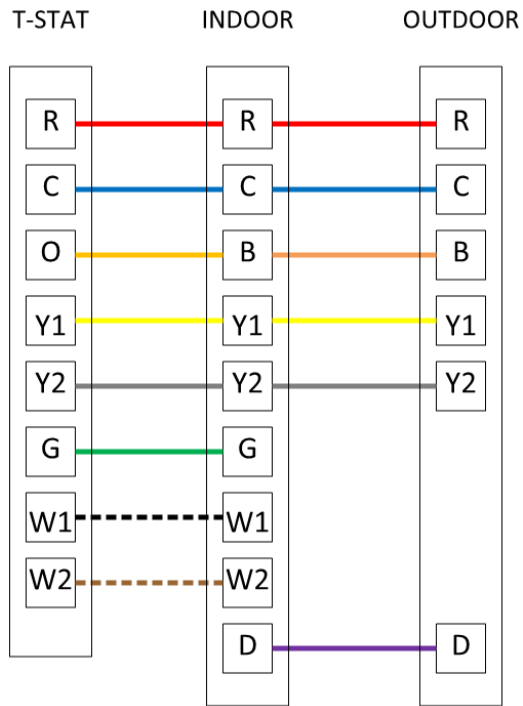


Figure 6-1 Wiring diagram

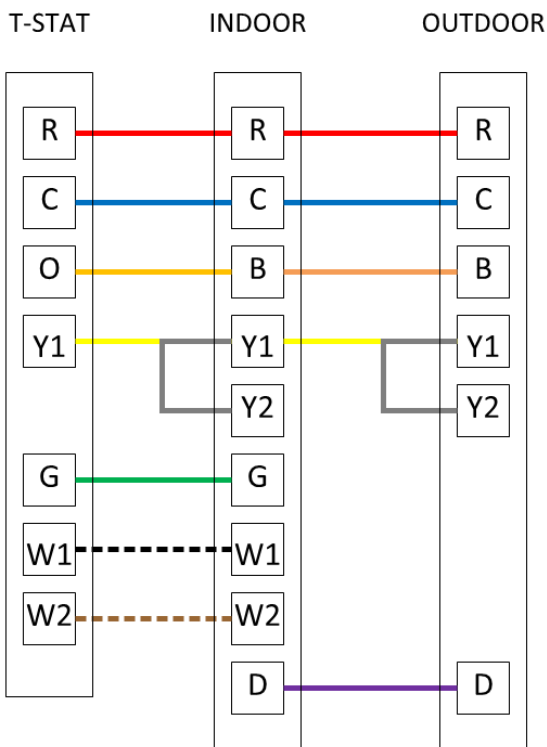
### (3) Control Wiring

Class 2 low voltage control wiring should not be run in conduit with main power wiring and must be separated from power wiring, unless class 1 wire of proper voltage rating is used.

- Low voltage control wiring should be color-coded 18 AWG. For lengths longer than 100 ft, 16 AWG, wire shall be used.
- Refer to wiring diagrams attached to indoor and outdoor sections to be connected.
- Make sure separation of control wiring and power wiring has been maintained.



Two-Stage thermostat



Single-Stage thermostat

Figure 6-2 Schematic diagram for control wiring connection

\*:Reversing valve energizes in the heat pump heating mode

**Table 8. Thermostat Terminal Defination Chart.**

Unit Terminal	Terminal defination
R	24VAC power supply for thermostat from secondary transformer.
C	Common wire.
Y1	Compressor stage 1, low load-output control.
Y2	Compressor stage 2, high load-output control.
B	Reversing valve for heat pump systems.
D	Defrosting single wire.
L	ODU malfunction signal wire

**NOTES:**

1. Be sure power supply agrees with equipment nameplate.
2. Power wiring and grounding of equipment must comply with local codes.
3. Some thermostats may use W2/AUX for heat pump.
4. If a single-stage temperature controller is used, Y1 and Y2 shall be short-circuited.
5. When the thermostat is applied to the syetem, the setting should be as below:
  - Reversing valve operating mode - energized in heating.

**WARNING**

The unit must be permanently grounded.

Failure to do so can result in electrical shock causing personal injury or death.

- Grounding may be accomplished by grounding metal conduit when installed in accordance with electrical codes to the unit cabinet. Grounding may also be accomplished by attaching ground wire(s) to ground lug(s) provided in the unit wiring compartment.
- Use of multiple supply circuits require grounding of each circuit to lug(s) provided in the unit.

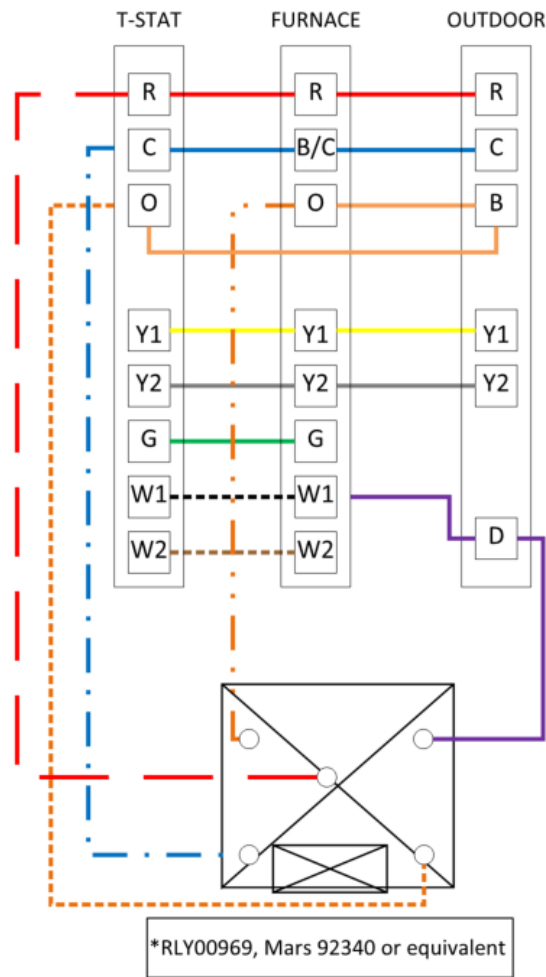


Figure 6-3 Furnace diagram for control wiring connection

## 7. Refrigerant Line Brazing

### 7.1 Braze the Refrigerant Lines

**STEP 1-** Remove caps or plugs. Use a deburring tool to deburr the pipe ends. Clean both internal and external surfaces of the tubing using an emery cloth.

**STEP 2-** Remove the pressure tap cap and valve cores from both service valves.

**STEP 3-** Purge the refrigerant lines and indoor coil with dry nitrogen.

**STEP 4-** Wrap a wet rag around the valve body to avoid heat damage and continue the dry nitrogen purge. Braze the refrigerant lines to the service valves. Continue the dry nitrogen purge. Do not remove the wet rag until all brazing is completed.

Important: Remove the wet rag before stopping the dry nitrogen purge

**STEP 5-** Replace the pressure tap valve cores after the service valves have cooled.

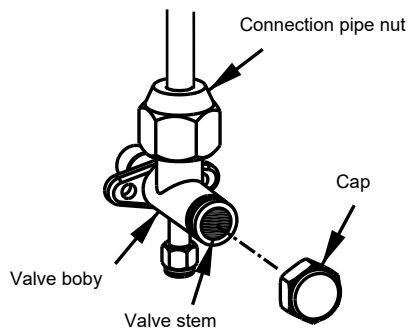


Figure 7-1 High-pressure valve structure

## 7.2 Refrigerant Line Leak Check

**STEP 1-** Pressurize the refrigerant lines and evaporator coil to 150 PSIG using dry nitrogen.

**STEP 2-** Check for leaks by using a soapy solution or bubbles at each brazed location. Remove nitrogen pressure and repair any leaks before continuing.

## 7.3 Additional Refrigerant Charge

### CAUTION

- Refrigerant charging must be done after wiring, vacuuming and leak testing.
- Do not exceed the maximum allowed amount of refrigerant or overcharge the system. This will damage or affect the function of the device.
- Charging with mismatched refrigerant can cause an explosion or an accident. Make sure that a suitable refrigerant is used.
- The refrigerant container must be opened slowly. Always use guards when charging the system.
- Do not mix refrigerant types.
- Some systems require additional refrigerant charge depending on the length of the pipe. The standard pipe length of this air conditioner is 24.6 feet. The following table can be used to calculate the additional refrigerant to be charged.

Table 9. Pipe Size and Additional Refrigerant

Liquid pipe diameter	1/4"	3/8"	1/2"
Additional charge for ft pipe(R410A)	0.16oz	0.32oz	0.69oz

## 8. Evacuation

### 8.1 Evacuate the Refrigerant Lines and Indoor Coil

**Important:** Do not open the service valves until the refrigerant lines and indoor coil leak check and evacuation are complete.

**STEP 1-** Evacuate until the micron gauge reads no higher than 350 microns, then close off the valve to the vacuum pump.

**STEP 2-** Observe the micron gauge.

Evacuation is complete if the micron gauge does not rise above 500 microns in one (1) minute.

Once evacuation is complete blank off the vacuum pump and micron gauge, and close the valves on the manifold gauge set.

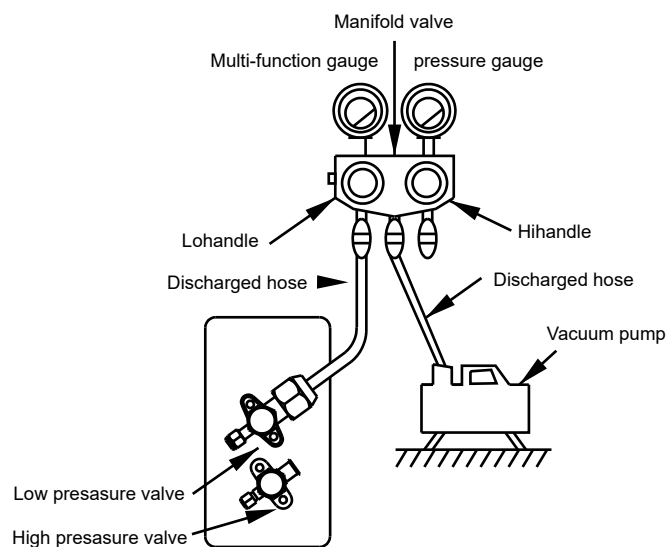


Figure 8-1 Schematic diagram for evacuation

## 9. Test Run

### 9.1 Precaution

The test run needs to be performed after the entire system is completely installed. Before performing the test, please confirm the following points:

- The indoor unit and outdoor unit are installed correctly according to the instructions.
- The electrical wiring is properly connected.
- Make sure there are no obstacles near the air conditioner. These obstacles may cause the air conditioner to malfunction or degrade performance.
- The refrigeration system has no leakage.
- The drain pipe has been installed as required.

#### CAUTION

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



## 9.2 Test Run Instructions

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 unit to Cool or Heating mode.
4. For the Outdoor Unit:
  - Check if there is leak in the refrigerant system.
  - Check if the dip-switch setting is correct.
  - Ensure no abnormal vibration and noise during operation.
  - Ensure the wind, noise and water that are generated by the unit do not affect the surrounding environment or cause any safety risks.
  - Check whether the outdoor unit operating mode is displayed correctly.

**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.

1. When the unit operates for the first time after installation or re-use after long-term power outage, the unit should be powered on and preheated for 8 hours before starting operation.
2. 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.

## 10. Safety Precaution

<b>WARNING</b>	This indication shows the possibility of causing death or serious injury.
<b>CAUTION</b>	This indication shows the possibility of causing injury or damage to properties only.

**NOTE:**

1. Injury means causing harmed, burned, electrical shocked, but not serious for hospitalization.
2. Damage of property means disrepair of property, material.
3. Carry out test running to confirm that no abnormality occurs after the installation. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

Operating Conditions		
Use the air-conditioner under the following temperature:		
Mode	Room Temperature	Outdoor Temperature
Cool mode	62°F -90°F	5°F -129°F
Heat mode	32°F -86°F	-4°F -86°F

If the air conditioner runs for a long time in "COOLING" mode at air relative humidity higher than 80% (doors or windows opened), dew may generate and drip near air outlet.

Noise Pollution
<ul style="list-style-type: none"> <li>● Install the air conditioner in a place that can bear its weight in order to operate more quietly.</li> <li>● Install the outdoor unit in a place where the air discharged and the operation noise do not annoy your neighbors.</li> <li>● Do not place any obstacles in front of the outlet of the outdoor unit.</li> </ul>

#### Features of Protector

1. The protective device will trip at following cases.
  - Stop the appliance and restart it at once or change other modes during operation, you have to wait 3 minutes before restarting.
  - After switching on the power circuit breaker and then turn on the air conditioner at once, you have to wait about 3 minute/20 seconds (some models).
2. In case all operations have stopped, you need.
  - Press "ON/OFF" button on the thermostat or remote controller again to restart it.
  - Set TIMER once again if it has been canceled.

#### Inspection

After a long time of operation, the air conditioner should be inspected for the following items.

- Abnormal heating of the power supply cord and plug or even a burnt smell.
- Abnormal operating noise or vibration.
- Water leakage from indoor unit.
- Metal cabinet electrified.

Stop using the air conditioner if above problem happened.

It is advisable that the air conditioner should be given a detail check-up after using for five years even if none of the above happen.

#### Feature of HEATING Mode

##### Preheat

When the unit is installed and operated for the first time in cold weather in winter or reused after long-term power failure, the unit should be powered on and preheated for 4h before starting operation.

##### Snow protection

In extreme blizzard weather, it is necessary to install auxiliary snow protection facilities (snow cover) and manual snow clearing in order to avoid freezing on the surface of heat exchanger caused by snow cover unit.

##### Defrost

In "HEATING" operation the appliance will defrost automatically. This procedure lasts 2 ~ 10 minutes, then returns to "HEATING" mode automatically. During defrosting, indoor fan stop running and return to heating mode operation automatically when defrosting has finished.

## 11. Troubleshooting

### CAUTION

If one of the following conditions occurs, switch off the power supply immediately and contact your dealer for further assistance:

- The operation light continues to flash rapidly after the unit has been restarted.
- The unit continually trips fuses or circuit breakers.
- A foreign object or water enters the air conditioner.
- The indoor unit leaks.
- Other abnormal situations.

## 11.1 Common Problems

The following symptoms are not a malfunction and in most situations will not require repairs.

Problem	Possible Cause
Abnormal noises of outdoor unit	The unit will make different sounds based on its current operating mode.
Both the indoor and outdoor units make noises	The air conditioner may hum during operation. This is a normal phenomenon, which is caused by refrigerant gas flowing through the indoor and outdoor units.
	When the air conditioner is turned on, and just stopped or defrosted, a hiss may be heard. This noise is normal and is caused by refrigerant gas stopping or turning.
Unit does not turn on when pressing ON/ OFF button	The unit has a 3-minute protection feature that prevents the unit from overloading. The unit cannot be restarted within three minutes of being turned off.
	Cooling and Heating Models: If the Operation light and PRE-DEF (Pre-heating/ Defrost) indicators are lit up, the outdoor temperature is too cold and the unit's anti-cold wind is activated in order to defrost the unit.
The unit changes from COOL mode to FAN mode	The unit changes its setting to prevent frost from forming on the unit. Once the temperature increases, the unit will start operating again.
	The set temperature has been reached, at which point the unit turns off the compressor. The unit will resume operating when the temperature fluctuates again.
Both the indoor and outdoor units emit white mist	When the unit restarts in HEAT mode after defrosting, white mist may be emitted due to moisture generated from the defrosting process.
Dust is emitted from either the indoor or outdoor unit	The unit may accumulate dust during extended periods of non-use, which will be emitted when the unit is turned on. This can be mitigated by covering the unit during long periods of inactivity.
The unit emits a bad odor	The unit may absorb odors from the environment (such as furniture, cooking, cigarettes, etc.) which will be emitted during operations.
	The unit filters have become moldy and should be cleaned.
The fan of the outdoor unit does not operate	During operation, the fan speed is controlled to optimize product operation.

## 11.2 Troubleshooting Advice

When troubles occur, please check the following points before contacting a repair company.

Problem	Possible Cause	Solution
The unit is not working	Power failure	Wait for the power to be restored
	The power switch is off	Turn on the power
	The fuse is burned out	Replace the fuse
	The unit's 3-minute protection has been activated	Wait three minutes after restarting the unit
Poor cooling performance	Temperature setting may be higher than the ambient room temperature	Lower the temperature setting
	The heat exchanger on the indoor or outdoor unit is dirty	Clean the affected heat exchanger
	The air filter is dirty	Remove the filter and clean it according to instructions
	The air inlet or outlet of either unit is blocked	Turn the unit off, remove the obstruction and turn it back on
	Doors and windows are open	Make sure that all doors and windows are closed while operating the unit
	Excessive heat is generated by sunlight	Close windows and curtains during periods of high heat or bright sunshine
	Low refrigerant due to leak or long-term use	Check for leaks, re-seal if necessary and top off refrigerant
The unit starts and stops frequently	There's too much or too little refrigerant in the system	Check for leaks and recharge the system with refrigerant
	There is air, incompressible gas or foreign material in the refrigeration system.	Evacuate and recharge the system with refrigerant
	System circuit is blocked	Determine which circuit is blocked and replace the malfunctioning piece of equipment
	The compressor is broken	Replace the compressor
	The voltage is too high or too low	Install a monostatic to regulate the voltage
Poor heating performance	The outdoor temperature is lower than 44.5°F	Check for leaks and recharge the system with refrigerant
	Cold air is entering through doors and windows	Make sure that all doors and windows are closed during use
	Low refrigerant due to leak or long-term use	Check for leaks, re-seal if necessary and top off refrigerant

# 12. Outdoor Unit Function

## (1) Cooling only and heat pump switch

This switch allows the user to choose between heat pump or cooling only operation. If the heat pump operation is selected, the unit will operate in both heating and cooling. If cooling only operation is chosen, heating will be disabled.

The dip-switch is located on the outdoor unit main board. Heat pump operation is the default selection with the SW1-1 located at the digit end (down). To switch to cooling only operation, set the SW1-1 to the ON position.

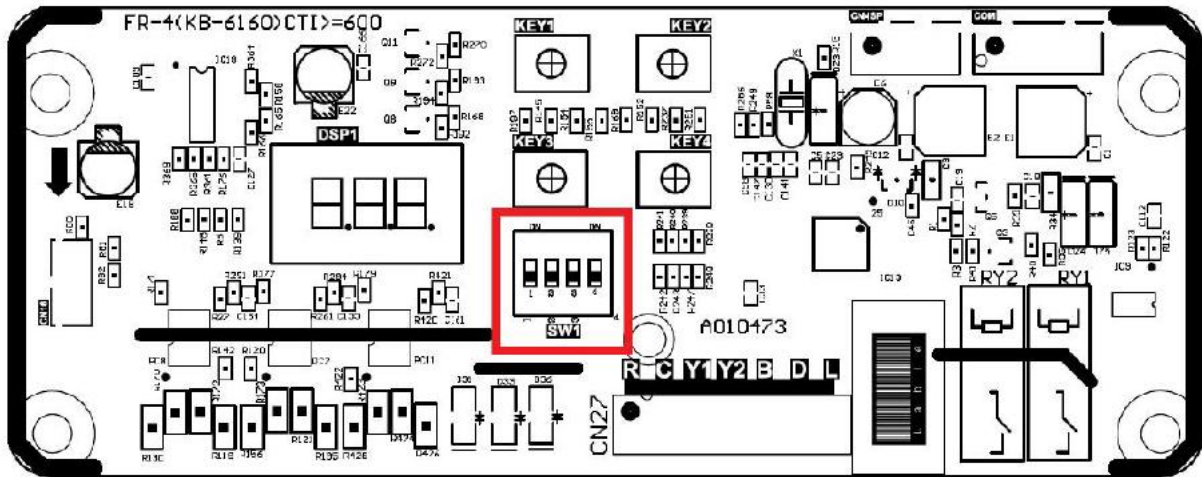


Figure 12-1 Outdoor unit main PCB

## (2) Unit Capacity Adjustment

This switch allows the technician to adjust the capacity of the unit during installation. The default setting (SW1-2 at the digit end (down)) represents 100% capacity. The capacity can be adjusted to 75% by positioning the SW1-2 to the ON position.

Table 10. The Outdoor Unit Dip-Switch Function

Outdoor unit DIP-switch		Description	
Item	Definition	The DIP set position	Detail description
SW1-1	Cooling only / Heat pump function selection		Default setting, the outdoor is a normal Heat Pump unit, which runs in Cooling or Heating mode based on the customer selection.
			It turns off the Heating function, and operates the Cooling mode when receiving the cooling start signal, and keeps standby while receiving the heating start signal.
SW1-2	Unit capacity selection		100% capacity (default setting).
			75% capacity.
SW1-3	For manufacturer adjustment		For manufacturer adjustment, please keep the original setting.
SW1-4	For manufacturer adjustment		For manufacturer adjustment, please keep the original setting.

**Note:**

The dip-switch should be adjusted only when the unit is powered off. If the dip-switch is activated when the unit is powered on, there will be no change until it is power cycled.

(1) ODU Operation Mode Display

This display enables the technician to observe the unit's mode of operation. When the unit is running in normal condition, the left and center positions on the digital display will not be illuminated. The right position of the digital display will indicate the ODU operation mode. Refer to the following chart for the indicators of the different modes.

S3 is the indicator for the ODU operation mode, the display description is as below:

0	No startup signal is received, stop state
1	Startup signal has been received, ready to start up
2	Cooling mode
3	Heating mode
4	Oil return mode
5	Defrosting mode
6	Force defrosting mode
7	Force cooling mode
8	Force heating mode
9	Test mode
A	Failure or protection, stop state

(2) Error code display

The same digital display is used for error codes using the left and center positions. In the case of multiple failures or protections, the error codes will alternate on the display. Please refer to the list of error codes in the following chart.

Error Code List

Code	Description	Remark	Class
E0	IDU & ODU Communication failure	hardware failure	I
E1	IDU Room Temperature sensor failure. (IDU RT failure)	hardware failure	I
E2	IDU Coil temperature sensor failure. (IDU IPT failure)	hardware failure	I
E3	ODU Coil temperature sensor failure. (OPT)	hardware failure	I
E4	AC Cooling system abnormal	hardware failure	I
E5	IDU/ODU mismatched failure (specially performance test on the production line)	hardware failure	I
E6	DU PG Fan motor / DC fan motor works abnormal (IDU failure)	hardware failure	I
E7	ODU Ambient Temperature sensor failure	hardware failure	I
E8	ODU Discharge Temperature sensor failure.	hardware failure	I
E9	IPM / Compressor driving control abnormal.	hardware failure	I
EA	ODU Current Test circuit failure	hardware failure	I
EB	The Communication abnormal of Main PCB and Display board (IDU failure)	hardware failure	I
EC	ODU EEPROM failure.	hardware failure	I
EE	ODU DC fan motor failure.	hardware failure	I
EF	ODU Ambient Temperature sensor failure	hardware failure	I
EH	ODU compressor suction Temp. sensor failure	hardware failure	I
EP	ODU compressor roof shell Temp. sensor failure	hardware failure	I
EU	ODU Voltage test circuit abnormal.	hardware failure	I
EJ	ODU middle coil Tmep. Sensor failure	hardware failure	I
EN	ODU gas pipe Temp. sensor failure	hardware failure	I
EY	ODU pipe Temp. sensor failure	hardware failure	I
P0	IPM module protection.	hardware failure	II
P1	Over / under voltage protection.	other failure	II
P2	Over current protection.	other failure	II
P3	ODU Discharge pipe Over temperature protection.	other failure	II
P4	Sub-cooling protection on Cooling mode.	other failure	II
P5	Overheating protection on Cooling mode.	other failure	II
P6	Overheating protection on Heating mode.	other failure	II
P7	Outdoor Over temperature/Under temperature protection.	other failure	II
P8	Compressor driving protection (Load abnormal).	other failure	I



P9	Communication failure for TOP flow unit/ Preset mode conflict.	other failure	II
PA	IPM module protection.	other failure	I
F0	Infrared Customer feeling test sensor failure. (IDU failure)	other failure	I
F1	Electric Power test module failure. (IDU failure)	other failure	I
F2	Discharge temperature sensor failure PROTECTION.	other failure	I
F3	ODU coil temperature failure PROTECTION..	other failure	I
F4	Cooling system gas flow abnormal PROTECTION..	other failure	I
F5	PFC PROTECTION	other failure	II
F6	The Compressor lack of phase / Anti-phase PROTECTION.	other failure	I
F7	IPM Module temperature PROTECTION	other failure	II
F8	4-Way Value reversing abnormal..	other failure	I
F9	The module temperature test circuit failure.	hardware failure	I
FA	The compressor Phase-current test circuit failure.	hardware failure	I
FB	Limiting/Reducing frequency for Over load protection on Cooling/Heating mode.	other failure	II
FC	Limiting/Reducing frequency for High power consumption protection.	other failure	II
FE	Limiting/Reducing frequency for Module current protection ( phase current of compressor).	other failure	II
FF	Limiting/Reducing frequency for Module temperature protection.	other failure	II
FH	Limiting/Reducing frequency for Compressor driving protection.	other failure	II
FP	Limiting/Reducing frequency for anti-condensation protection..	other failure	II
FU	Limiting/Reducing frequency for anti-frost protection.	other failure	II
FJ	Limiting/Reducing frequency for Discharge over temperature protection.	other failure	II
FN	Limiting/Reducing frequency for ODU AC Current protection.	other failure	II
FY	Gas leakage protection	other failure	I
H1	High pressure switch malfunction	hardware failure	I
H2	Low pressure switch malfunction	hardware failure	I

## 13. Service Manual

For more information, please scan the QR code for the service manual.



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