USE AND INSTALLATION INSTRUCTIONS

ASDDI4H4S24
ASDDI4H4S36
ASDDI4H4S48
ASDDI4H4S60

Thank you very much for purchasing this Air Conditioner. Please read this use and installation instructions carefully before installing and using this appliance and keep this manual for future reference.

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NOTE:

- This air conditioner has been designed for the following temperatures. Operate the heat pump air-conditioner within this range.

Mode	Outdoor operation temperature range [°F (°C)]	
	Maximum	Minimum
Cooling Operation	122 (50)	5 (-15)
Heating Operation	75 (24)	-13 (-25)

- Storage condition: Temperature -13~140°F (-25~60°C)
  Humidity 30%~80%

Safety precautions

1. **This air conditioner uses new refrigerant HFC (R410A).**
2. **Since the max. working pressure is 550 psig (3.8MPa) [R22:450 psig (R22:3.1MPa)], some of the piping and installation and service tools are special.**
3. **This air conditioner uses power supply: 208/230V ~, 60Hz.**
4. **The outdoor unit must be installed with indoor unit euqipped with TXV and ensure that the TXV can be opened to the maximum angle while running heating mode.**
5. **The outdoor unit must be matched with indoor unit with refrigerant R410A.**
6. **For 24K outdoor unit, it must be connected with 18K~24K indoor units.**
   For 36K outdoor unit, it can be connected with 30K~36K indoor units.
   For 48K outdoor unit, it can be connected with 42K~48K indoor units.
   For 60K outdoor unit, it can be connected with 42K~60K indoor units.
7. **Specified filter drier is required on the liquid pipe when connecting the units.**
8. **Be sure that servicing equipment and replacement components are applicable for R-410A refrigerant.**
9. **Do not discharge R410A refrigerant into the air, and when recover it, the cylinder service pressure rating must be over 550 psig. R410A refrigerant systems should be charged with liquid refrigerant and the service pressure rating of the hoses used must be over 750 psig.**
10. **Leak detectors should be designed to detect HFC refrigerant.**
11. **R410A refrigerant is only compatible with POE oils, which could absorb moisture rapidly, so do not expose it to the air, in case that it damages certain plastics materials.**
12. **Replace all the filter driers after maintenance.**

Please read these SAFETY PRECAUTIONS carefully to ensure correct installation.

- Be sure to use a dedicated power circuit, and do not put other loads on the power supply.
- Be sure to read these SAFETY PRECAUTIONS carefully before installation.
- Be sure to comply with SAFETY PRECAUTIONS of installation manual, because it contains important safety issues. Definitions for identifying hazard levels are provide below with their respective safety symbols.

⚠ WARNING: Hazards or unsafe practices which COULD result in severe personal injury or death.
⚠ CAUTION: Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.

- Please carefully file indoor and outdoor unit manual away for future reference.

⚠WARNING

- Installation should be performed by a qualified personnel.
  Improper installation may cause water leakage, electrical shock or fire.
- Install the air conditioner on a solid base that can support the unit weight.
  An inadequate base or incomplete installation may cause injury if the unit falls off the base.
- Use the specified type of wire for electrical connections safely between the indoor and outdoor units.
  And firmly clamp the interconnecting wires so their terminals receive no external stresses.
- For wiring, use a cable long enough to cover the entire distance with no connection.
  And do not connect multiple devices to the same AC power supply.
  Otherwise, it may be due to bad contact, poor insulation, exceed the allowable current and cause a fire or electric shock.
- After all installation is completed, check to make sure that no refrigerant is leaking out.
  If the refrigerant gas leakage to the interior, and the heater, stove flame touching it, will generate harmful substances.
- Perform the installation securely referring to the installation manual.
  Incomplete installation could cause a personal injury due to fire, electric shock, the unit falling or leakage of water.
- In accordance with the installation instructions for electrical work, please be sure to use a dedicated line.
- If the power supply circuit capacity or electrical work is not in place, may cause a fire or electric shock
- Attach the electrical cover to the indoor unit and the service panel to the outdoor unit securely.

Safety precautions

- If the electrical covers on the indoor unit or the service panel of the outdoor unit are not attached securely, it could result in a fire or an electric shock due to dust water, etc.
- Please be sure to cut off the main power supply before the installation of indoor electronic PCB or wiring. Otherwise, it will cause electric shock.
- The device should be in accordance with the state provisions for installation wiring.
- The outdoor machine installation location should pay attention to the protection, avoid people or other small animals contact with electrical components, please keep the outdoor unit of the surrounding environment clean and tidy.
- When installing or relocating the unit, make sure that no substance other than the specified refrigerant (R410A) enters the refrigerant circuit.
  Any presence of foreign substance such as air can cause abnormal pressure rise or an explosion.

⚠ CAUTION

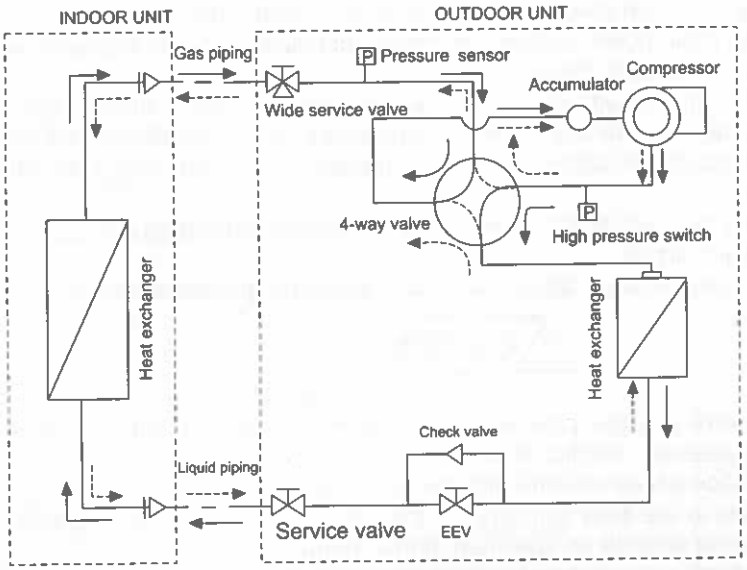
- Perform grounding
  Does not connect the earth wire to a gas pipe, water pipe, lightning rod or telephone earth wire.
  Defective grounding could cause an electric shock.
- Do not install the unit in a place where an inflammable gas leaks.
  If gas leaks and accumulates in the area surrounding the unit, it could cause an explosion.
- Fasten a flare nut with a torque wrench as specified in this manual.
  When fastened too tight, a flare nut may break after a long period and cause a leakage of refrigerant.
- Install an earth leakage breaker depending on the installation place(where it is humid).
  If an earth leakage breaker is not installed, it could cause an electric shock.
- Perform the drainage/piping work securely according to the installation manual.
- If there is a defect in the drainage/piping work, water could drop from the unit and household goods could be wet and damaged.

Safety instructions

- Do not let air enter the refrigeration system or discharge refrigerant when moving the air conditioner.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- The appliance shall be installed in accordance with national wiring regulations.
- Servicing shall only be performed as recommended by the equipment manufacturer.
- Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- Means for disconnection, such as circuit breaker, which can provide full disconnection in all poles, must be incorporated in the fixed wiring in accordance with the wiring rules.
  It is necessary to allow the disconnection of the appliance from the supply after installation.
  Make sure the disconnection of the appliance from the supply when service and maintenance, a disconnection with a locking system in the isolated position shall be provided.
- The method of connection of the appliance to the electrical supply and interconnection of separate components, and the wiring diagram with a clear indication of the connections and wiring to external control devices and supply cord are detailed in below parts.
- Details of type and rating of circuit breakers / ELB is detailed in below parts.
- The information of dimensions of the space necessary for correct installation of the appliance including the minimum permissible distances to adjacent structures is detailed in below parts.
- This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.
- Instructions on additional charging of refrigerants are detailed below.

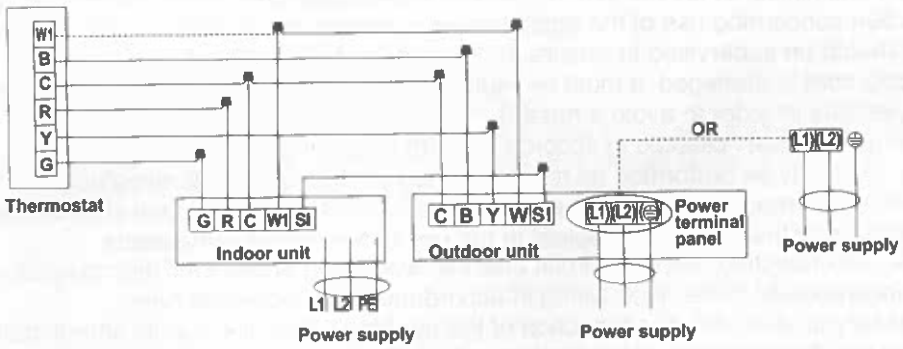
Diagram of refrigerant cycle & Wiring

Refrigerant flow diagram



Note: High pressure switch is only valid for 48K and 60K models.

Electrical wiring diagram



Note:
The SI wire between the indoor and outdoor units is not indispensable, especially when the outdoor unit is connected to an indoor unit of a different brand. It is more energy-saving when the outdoor unit is connected to an indoor unit of the same brand by SI wire. However, it still can run without it.

Installation instructions

Transportation and handling before installation

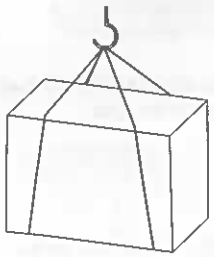
Transport the product as close to the installation location as practical before unpacking.

- Handling Method

When handling the unit, ensure a balance of the unit, check safety and lift it up smoothly.

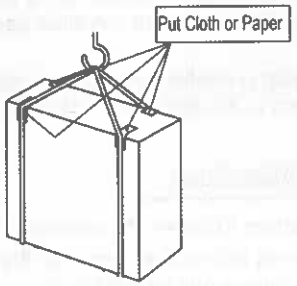
(1) Do not remove any packing materials.

(2) Hang the unit under packing condition with two ropes, as shown in Fig. blow.



- Handling

If have no package to move, please protect with cloth or paper.



Installation locations selection

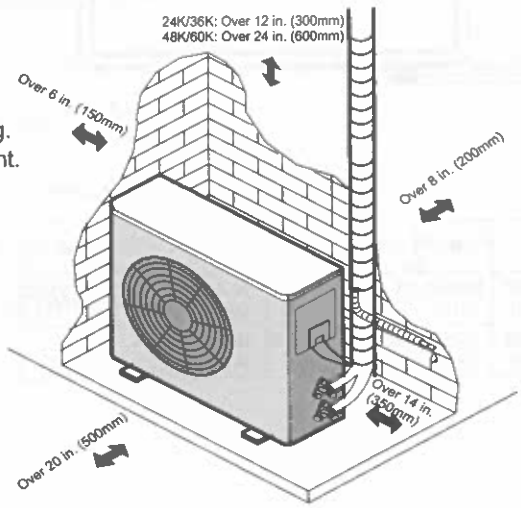
Before choosing the installation site, obtain user's approval.

- Where it is not exposed to strong wind.
- Where airflow is good and clean.
- Where it is not exposed to rain and direct sunshine.
- Where neighbors are not annoyed by operation sound or hot air.
- Where rigid wall or support is available to prevent the increase of operation sound or vibration.
- Where there is no risk of combustible gas leakage.
- Where it is at least 3m away from the antenna of TV set or radio. An amplifier may be required for the affected device.
- Install the unit horizontally.
- Please install it in an area not affected by snowfall or blowing snow. In areas with heavy snow, please install a canopy, a pedestal and/or some baffle boards.

⚠ CAUTION:

Avoid the following places for installation where air conditioner trouble is liable to occur.

- Where there is much machine oil.
- Salty places such as seaside.
- Where sulfide gas is generated such as a hot spring.
- Where there is high-frequency or wireless equipment.



NOTE:

When operating the air conditioner in low outside temperature, be sure to follow the instruction described below.

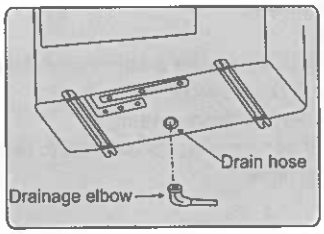
- Never install the outdoor unit in a place where its air inlet/outlet side may be exposed directly to wind.
- To prevent exposure to wind, install the outdoor unit with its air inlet side facing the wall.
- To prevent exposure to wind, it is recommended to install a baffle board on the air outlet side of the outdoor unit.

Installation instructions

Drainage elbow and drain hose installation

Install Drainage Elbow and Drain Hose

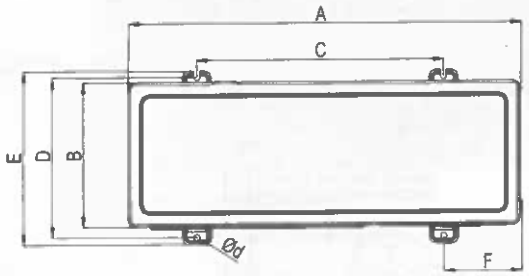
- The condensate water may drain from the outdoor unit when the unit operates in heating mode. In order to avoid disturbing neighbors and protect the environment, it is necessary to install a drainage elbow and a drain hose to drain out the condensate water.
- Please do the drainage work before the indoor unit and outdoor unit are connected. Otherwise, it will be difficult to install drainage elbow after the machine becomes immovable.)
- Connect the drain hose(field-supplied, inside diameter: 15mm) as shown in the figure for drainage.



NOTE:
Do not use the drainage elbow in the cold region. Drain may freeze to stop the fan runs.

Outdoor unit installation

(1) Use the washers to fasten the machine at the foundation bolts.
(2) When fastening the outdoor unit with the foundation bolts, the fasten holes position is shown as the Fig.1.
(3) Fasten the outdoor unit as the Fig.2.
(4) Make sure to fasten the outdoor unit tight and horizontal to prevent noise when the machine is oblique or inclined by strong breeze or earthquake.
(5) Do not drain off water to the public places to avoid to skidding.
(6) The strong base (made of concrete, etc.) should be made. The appliance should be placed not less than 10 cm high to avoid being wet or corroded. Otherwise, it may cause damage to the appliance or reduce its life time. (Fig.3)



[Unit: in. (mm)]

Model	A	B	C	D	E	F	d
24K	33-7/8 (860)	12-3/16 (310)	21-11/32 (542)	13-7/16 (341)	14-1/2 (368)	6-5/8 (168)	7/16*21/32 (11*17)
36K/48K /60K	37-3/8 (950)	13-3/8 (340)	22-7/8 (580)	14-15/16 (380)	16-1/4 (414)	7-1/4 (185)	5/8 (15)

Fig.1

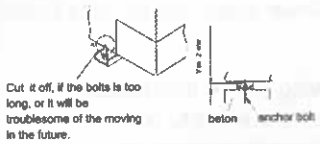


Fig.2

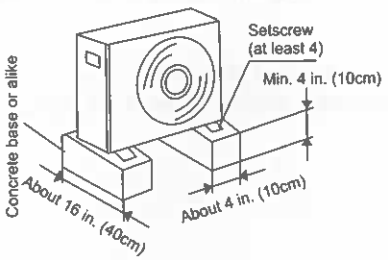


Fig.3

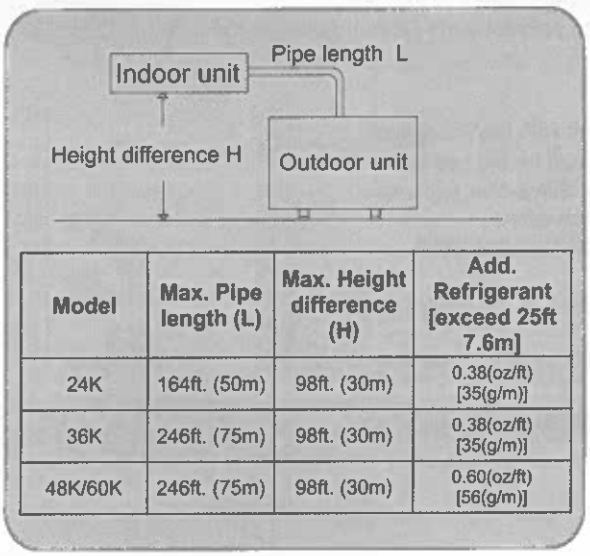
Installation instructions

Refrigerant piping

1. Piping requirement

Model	Outer Diameter of Pipe [in. (mm)]	
	Gas	Liquid
24K	5/8 (15.88)	3/8 (9.52)
36K	3/4 (19.05)	3/8 (9.52)
48K/60K	7/8 (22.22)	3/8 (9.52)

The shorter the refrigerant piping is, the better the performance will be. So the connecting pipe should be as short as possible.



Model	Max. Pipe length (L)	Max. Height difference (H)	Add. Refrigerant [exceed 25ft 7.6m]
24K	164ft. (50m)	98ft. (30m)	0.38(oz/ft) [35(g/m)]
36K	246ft. (75m)	98ft. (30m)	0.38(oz/ft) [35(g/m)]
48K/60K	246ft. (75m)	98ft. (30m)	0.60(oz/ft) [56(g/m)]

Refrigerant additional charge

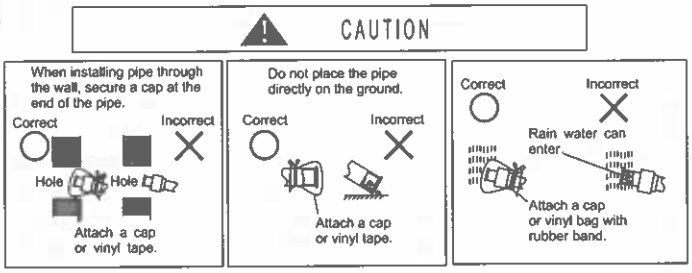
The unit has been filled with refrigerant, but if exceeds 25 ft. (7.6m), additional refrigerant (R410A) change is required.
24K/36K: Additional refrigerant charge= (L-25) ft×0.38 oz/ft
48K/60K: Additional refrigerant charge= (L-25) ft×0.60 oz/ft

2. Piping material

(1) Prepare locally-supplied copper pipes.
(2) Select clean copper pipes. Make sure that there is no dust and moisture inside of the pipes. Blow the inside of the pipes with nitrogen or dry air to remove any dust or foreign materials before connecting pipes.
(3) Piping thickness and material of the pipe are shown as below.

Diameter [in. (mm)]	Thickness [in. (mm)]
ø 1/4 (6.35)	1/32 (0.8)
ø 3/8 (9.52)	1/32 (0.8)
ø 1/2 (12.70)	1/32 (0.8)
ø 5/8 (15.88)	1/32 (1.0)
ø 3/4 (19.05)	1/32 (1.0)
ø 7/8 (22.22)	1/32 (1.0)

Installation instructions



3. Processing of refrigerant piping

(1) Pipe cutting

Cut the cooper pipe correctly with pipe cutter.

(2) Burrs removal

Completely remove all burrs from the cut cross section of the pipe.

Put the end of the copper pipe downward to prevent burrs from dropping in the pipe.

4. Piping connection

(1) Confirm that the valves are closed.

(2) Connect the indoor unit and the outdoor unit with field-supplied refrigerant pipes. The refrigerant piping should be brazed with a phosphorous-copper alloy material such as Silfos-5 or equivalent.

Precautions and steps during brazing service valve:

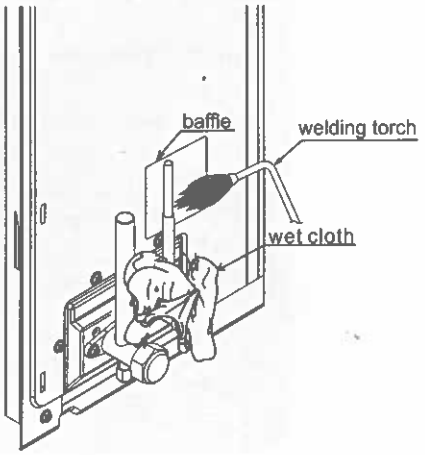
a. Remove the caps from both the liquid and gas service valve service ports at the outdoor unit.

b. Braze the liquid piping and gas piping to valves at the outdoor unit.

Precautions should be taken to prevent heat damage to service valve by wrapping a wet cloth around it.

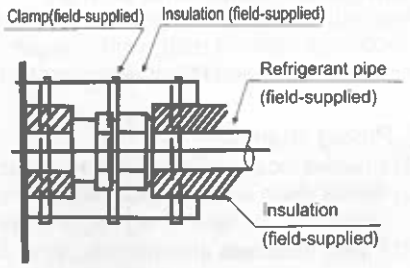
Also, a baffle can be set to protect all painted surfaces, insulation, during brazing.

c. After brazing cool joint with wet rag.



(3) After finishing connecting the refrigerant pipes, keep it warm with the insulation material like figure right.

- For outdoor unit side, surely insulate every piping including valves.
- Cover piping joints with pipe cover.
- Using piping tape, apply taping starting from the entry of outdoor unit.
  - Fix the end of piping tape with adhesive tape.
  - When piping has to be arranged through above ceiling, closet or area where temperature and humidity are high, wind additional commercially sold insulation for prevention of condensation.



Piping insulation procedure

5. Air tight test

- Do use Nitrogen.

Connect the gauge manifold using charging hoses with a nitrogen cylinder to the check joints of the liquid line and the gas line stop valves.

Perform the air-tight test.

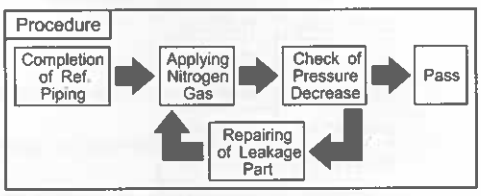
Don't open the gas line stop valves.

Apply nitrogen gas pressure of 550 psig (3.8 MPa).

Check for any gas leakage at the flare nut connections, or brazed parts by gas leak detector or foaming agent.

Gas pressure doesn't decrease is OK.

After the air tight test, release nitrogen gas.

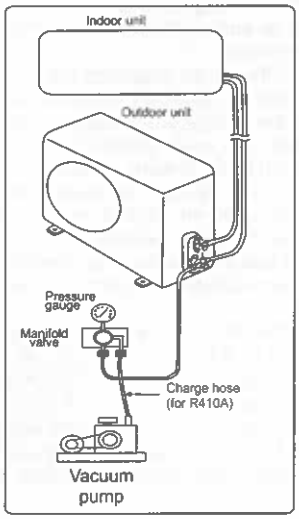


Air tight procedure

6. Vacuum pumping and charge refrigerant

• Vacuum pumping

(1) Remove the service port cap of the stop valve on the gas pipe side of the outdoor unit.
(2) Connect the manifold gauge and vacuum pump to the service port of the stop valve on the gas pipe side of the outdoor unit.
(3) Run the vacuum pump. (Work for more than 15 minutes.)
(4) Check the vacuum with the gauge manifold valve, then close the gauge manifold valve and stop the vacuum pump.
(5) Leave it as is for one or two minutes. Make sure the pointer of the manifold gauge remains in the same position. Confirm that the pressure gauge shows -14.7 psig (-0.101MPa or -760mmHg).
(6) Remove the manifold gauge quickly from the service port of the stop valve.
(7) After refrigerant pipes are connected and evacuated, fully open all stop valves on both sides of gas pipe and liquid pipe.
(8) Open adjusted valve to add refrigerant (must be refrigerant is liquid).
(9) Tighten the cap to the service port .
(10) Re-tighten the cap.
(11) Leak test foam with halogen leak detector to check the flare nut and brazing Carolina Department leaks. Use foam that not generate ammonia (NH3) in the reaction.

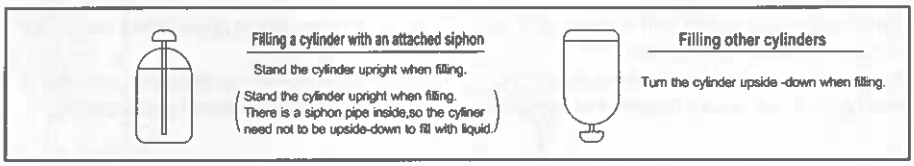


⚠ CAUTION

- An excess or a shortage of refrigerant is the main cause of trouble to the unit. Charge the correct refrigerant quantity according to the description of label at the inside of the manual.
- Check for refrigerant leakage in detail. If a large refrigerant leakage occurs, it will cause difficulty with breathing or harmful gases would occur if a fire was being used in the room.

• Additional refrigerant charge

The unit has been filled with refrigerant.
Please according "Piping Requirement" to calculate additional charge.
After vacuum pump procedure has been finished, first exhaust air from charge hose, then open valves, charge refrigerant as "liquid " type through Liquid stop valve.
At the end, please close valves and record the refrigerant charging quantity.



Installation instructions

Wiring

⚠ WARNING

- Turn OFF the main power switch to the indoor unit and the outdoor unit and wait for more than 3 minutes before electrical wiring work or a periodical check is performed.
- Check to ensure that the indoor fan and the outdoor fan have stopped before electrical wiring work or a periodical check is performed.
- Protect the wires, electrical parts, etc. from rats or other small animals. If not protected, rats may gnaw at unprotected parts and at the worst, a fire will occur.
- Avoid the wirings from touching the refrigerant pipes, plate edges and electrical parts inside the unit. If not do, the wires will be damaged and at the worst, a fire will occur.
- Install an ELB (Electric Leakage Break)in the power source. If ELB is not used, it will cause electric shock or fire at the worst.
- This unit uses an inverter, which means that it must be used an earth leak detector capable handing harmonics in order to prevent malfunctioning of the earth leak detector itself.
- Do not use intermediate connection wires, stranded wires(see **<Attentions when Connect the power supply wiring>**), extension cables or control line connection, because the use of these wires may cause fever, electric shock or fire.
- The tightening torque of each screw shall be as follows.
  M4: 0.7 to 1.0 lbf·ft. (1.0 to 1.3 N·m)
  M5: 1.5 to 1.8 lbf·ft. (2.0 to 2.5 N·m)
  M6: 3.0 to 3.7 lbf·ft. (4.0 to 5.0 N·m)
  M8: 6.6 to 8.1 lbf·ft. (9.0 to 11.0 N·m)
  M10: 13.3 to 217 lbf·ft. (18.0 to 23.0 N·m)
  Keep the above tightening torque when wiring work.

⚠ CAUTION

- With tape material along the wire wrapped, sealed wiring holes, prevent the condensed water and insects.
- Tightly secure the power source wiring using the cord clamp inside the unit.
  Note: Fix the rubber bushes with adhesive when conduit tubes to the outdoor unit are not used.

General check

(1) Make sure that the field-selected electrical components (main power switches, circuit breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical data.
Make sure that the components comply with National Electrical Code (NEC).

(2) Check to ensure that the voltage of power supply is within +10% of nominal voltage and earth phase is contained in the power supply wires. If not, electrical parts will be damaged.

(3) Check to ensure that the capacity of power supply is enough.
If not, the compressor will be not able to operate cause of voltage drop abnormally at starting.

(4) Check to ensure that the earth wire is connected.

(5) Install a main switch, multi-pole main switch with a space of 0.14 in. (3.5mm) or more, single phase main switch with a space of 0.12 in. (3.0mm) or more between each phase.

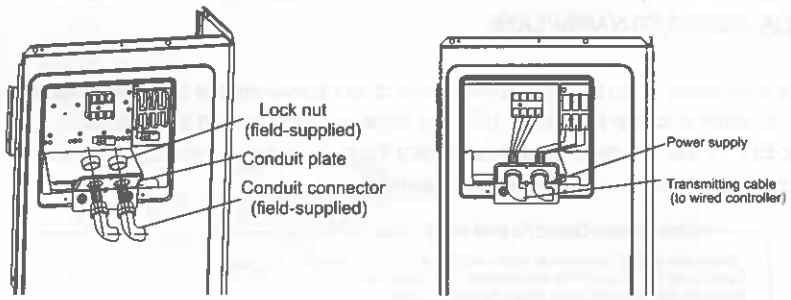
(6) Check to ensure that the electrical resistance is more than 2 MΩ, by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is found and repaired.

Installation instructions

Wires connect steps:

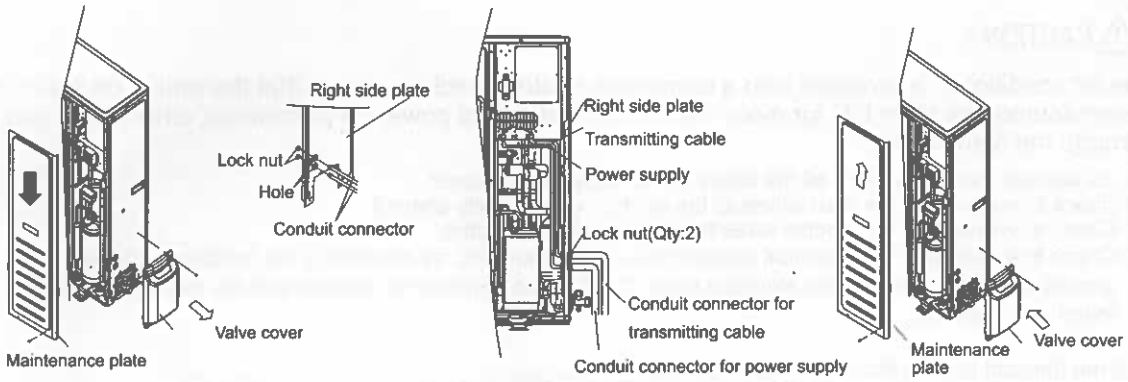
24K/36K

(1) Electric box cover removal
Unscrew the mounting screws to remove the electric box cover.
(2) Fasten the power supply cable and the transmitting cable to the conduit holder using the lock nut.
(3) Connect the power supply cable and the transmitting cable to terminal.
(4) Fasten the power supply cable and the connection cable with the cable clamp.
(5) Be sure to seal the holes when applying the putty.
Place the cables side to side. (Do not overlap the cables.)
(6) Put the electric box cover back after completion of the work.



48K/60K

(1) Remove the screws, maintenance plate and the valve cover.
(2) Pass transmitting cable and power supply through the two holes on the right side plate.
(3) Fasten the conduit connection to the right side plate using the lock nut.
(4) Connect the transmitting cable and power supply to the terminal.
(5) Tie the transmitting cable and power supply with the clamp tightly.
(6) After completing the wiring, seal the wiring hole with the putty.
(7) Put the maintenance plate and the valve cover after completion of the work.



Installation instructions

Electrical Data

Model (Capacity)	Power Supply	ELB		Power Source Cable Size	Transmitting Cable Size	Circuit Breaker (A)
		Rated Current (A)	Nominal Sensitive Current (mA)			
24K	208/230V ~/60Hz	25	30	3×12AWG	5×16AWG	25
36K	208/230V ~/60Hz	35	30	3×10AWG	5×16AWG	35
48K/60K	208/230V ~/60Hz	50	30	3×8AWG	5×16AWG	50

Max. Running Current (A): REFER TO NAMEPLATE

Note:

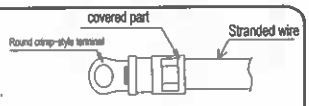
(1) Follow local codes and regulations when select field wires ,and all the above are the minimum wire size.

(2) When transmitting cable length is longer than 262ft. (80m), a larger wire size should be selected.

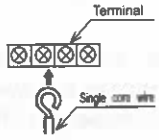
(3) Install main switch and ELB for each system separately. Select the high response type ELB that is acted within 0.1second.
Recommended capacity to see outdoor machine switch capacity.

<Attentions when Connect the power supply wiring>

1. When connecting the terminal block using stranded wire, make sure to use the round crimp-style terminal for connection to the power supply terminal block. Place the round crimp-style terminals on the wires up to the covered part and secure in place.



2. When connecting the terminal block using a single core wire, be sure to perform curing.



Test run

Test run should be performed after refrigerant piping, drain, wiring, etc. have been finished.

⚠CAUTION

The air conditioner is provided with a crankcase heater, check to ensure that the switch on the main power source has been ON for more than 6 hours ahead of power on preheating, otherwise it might damage the compressor!

Do not operate the system until all the check points have been cleared.

(A) Check to ensure that the stop valves of the outdoor unit are fully opened.

(B) Check to ensure that the electric wires have been fully connected.

(C) Check to ensure that the electrical resistance is more than 2MΩ, by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is found and repaired.

Test run function identification

Operate the thermostat to turn ON the appliance, and then proceed test run.

Pay attention to the following items while the system is running.

Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated higher than 194°F (90°C) .

● Turn off the power after test run is finished.

Installation of the appliance is generally finished after the above operations are done. If you still have any trouble, please contact local technical service center of our company for further information.