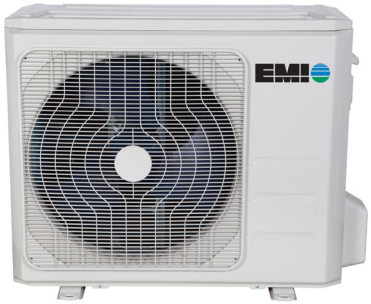
EMI Presents

Iverter

MULTI-ZONE
Ductless Split System Heat Pumps
Installation, Operation & Maintenance Manual



18k

27k, 36k, 45k

ECR international
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A Family of Heating & Cooling Brands.

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Read This Manual

Inside you will find many helpful hints on how to install and test the air conditioner properly.
All the illustrations and specifications in the manual are subject to change without prior notice for product improvement. The actual shape should prevail.

⚠ CAUTION

- Contact an authorized service technician for repair or maintenance of this unit.
- The appliance shall be installed in accordance with national wiring regulations.
- Children should be supervised to ensure they do not play with the air conditioner.
- Do not operate your air conditioner in a wet room such as a bathroom or laundry room.
- Installation work shall be performed in accordance with the national wiring standards by authorized personnel only.

SAFETY PRECAUTIONS

- Read the follow SAFETY PRECAUTIONS carefully before installation.
- Electrical work must be installed by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model to be installed.
- Incorrect installation due to ignoring these instructions will cause harm or damage.

■ **The seriousness is classified by the following indications.**

⚠ **WARNING**	This symbol indicates the possibility of death or serious injury.
⚠ **CAUTION**	This symbol indicates the possibility of injury or damage to property.

■ **The items to be followed are classified by the symbols:**

⃠	Symbol with background white denotes item that is PROHIBITED from doing.

⚠ WARNING

1) Engage dealer or specialist for installation.

2) Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock or fire.

3) Use the attached accessories parts and specified parts for installation.

4) Install at a strong and firm location which is able to withstand the unit's weight. If the strength is not enough or installation is not properly done, the unit will drop and cause injury.

5) For electrical work, follow the local and national wiring standard and this installation instructions. An independent circuit must be used. If electrical circuit capacity is not enough or defective, it will cause electrical shock or fire.

6) Use the specified cable and connect tightly and clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not perfect, it will cause heat-up or fire at the connection.

7) Wiring routing must be properly arranged so control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.

8) When carrying out piping connection, take care not to let air 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. ⃠

9) Do not share the single service with other electrical appliances. Otherwise, it will cause fire or electrical shock. ⃠

⚠ CAUTION

1) This equipment must be grounded and installed with ground fault current breaker. It may cause electrical shock if grounding is not perfect.

2) Do not install the unit where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire. ⃠

3) Carry out drainage piping as mentioned in installation instructions. If drainage is not correct, water may enter the room and damage the furniture.

4) The appliance shall be installed in accordance with local and national wiring codes.

5) Do not operate your air conditioner in a wet room such as a bathroom or laundry room.

6) An all-pole disconnection device which has at least 3mm clearances in all poles , and have a leakage current that may exceed 10mA, the residual current device (RCD) having a rated residual operating current not exceeding 30mA, and disconnection must be incorporated in the fixed wiring in accordance with local and national codes.

1. Selecting installation place

Outdoor unit

- If an awning is built over the outdoor unit to prevent direct sunlight or rain exposure, make sure that heat radiation from the condenser is not restricted.
- Ensure that the clearance around the back of the unit is more than 11.8in. [30cm] and left side is more than 11.8in. [30cm.] The front of the unit should have more than 6ft. 6in. [200cm] of clearance and the connection side (right side) should have more than 23.6 in. [60cm] of clearance.

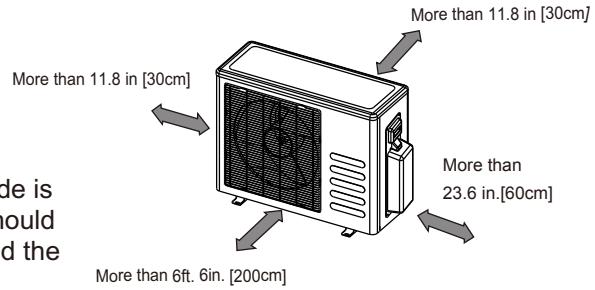


Fig.1

- Take the air conditioner weight into account and select a place where noise and vibration will not be an issue.
- Select a place so that warm air and noise from the air conditioner will not disturb neighbors.

Rooftop installation:

- If the outdoor unit is installed on a roof structure, be sure to level the unit.
- Ensure the roof structure and anchoring method are adequate for the unit location.
- Consult local codes regarding rooftop mounting.
- If the outdoor unit is installed on roof structures or external walls, this may result in excessive noise and vibration, and may also be classed as a non serviceable installation.

INSTALLATION INSTRUCTIONS

Tools needed for installation:

Level gauge
Screwdriver
Electric drill,Hole core drill (Φ2.5in. [65mm])
Flaring tool set
Specified torque wrenches: 13·lbft. [18kg·fm], 30 lb·ft. [4.2kgf·m], 40 lb·ft. [5.5kgf·m], 48lb·ft. [6.6kgf·m] (different depending on model No.) Spanner (half union)
Hexagonal wrench (4mm)
Gas-leak detector

Vacuum pump
Gauge manifold
Users manual
Thermometer
Multimeter
Pipe cutter
Measuring tape

Accessories

Number	Name of Accessories			Qty/one unit
1	Installation Plate			1
2	Plastic Expansion Sheath			5-8 (depending on models)
3	Self-tapping Screw A ST3.9X25			5-8 (depending on models)
4	Connecting pipe Assembly In [mm]	Liquid side	Φ 1/4" [6.35]	Parts you must purchase Consult the technician for the proper size.
			Φ 3/8" [9.52]	
		Gas side	Φ 3/8" [9.52]	
			Φ 1/2" [12.7]	
			Φ 5/8" [15.9]	
5	Remote controller			1
6	Self-tapping Screw B ST2.9X10	Optional parts		2
7	Remote controller holder			1
8	Seal (for cooling& heating models only)			1
9	Drain Joint (for cooling& heating models only)			1
10	Transfer connector(Packed with the indoor unit or outdoor unit, depending on models) (**NOTE:** Pipe size differ from appliance to appliance. To meet different pipe size requirement, sometimes the pipe connections need the transfer connector to install on the outdoor unit .)			Optional part (one piece/one indoor unit) / Optional part (1-5 pieces for outdoor unit, depending on models)
11	Magnetic ring (Hitch it on the connective cable between indoor unit and outdoor unit after installation.)			Optional part (one piece/one cable)
12	Cord protection rubber ring (If the cord clamp can not fasten the cord for the small size of the cord, please use the cord protection rubber ring (supplied with accessories) to wrap on the cord, then fix it with the cord clamp.)			1 (on some models)

Note: Except the above parts provided, the other parts needed during installation you must purchase.

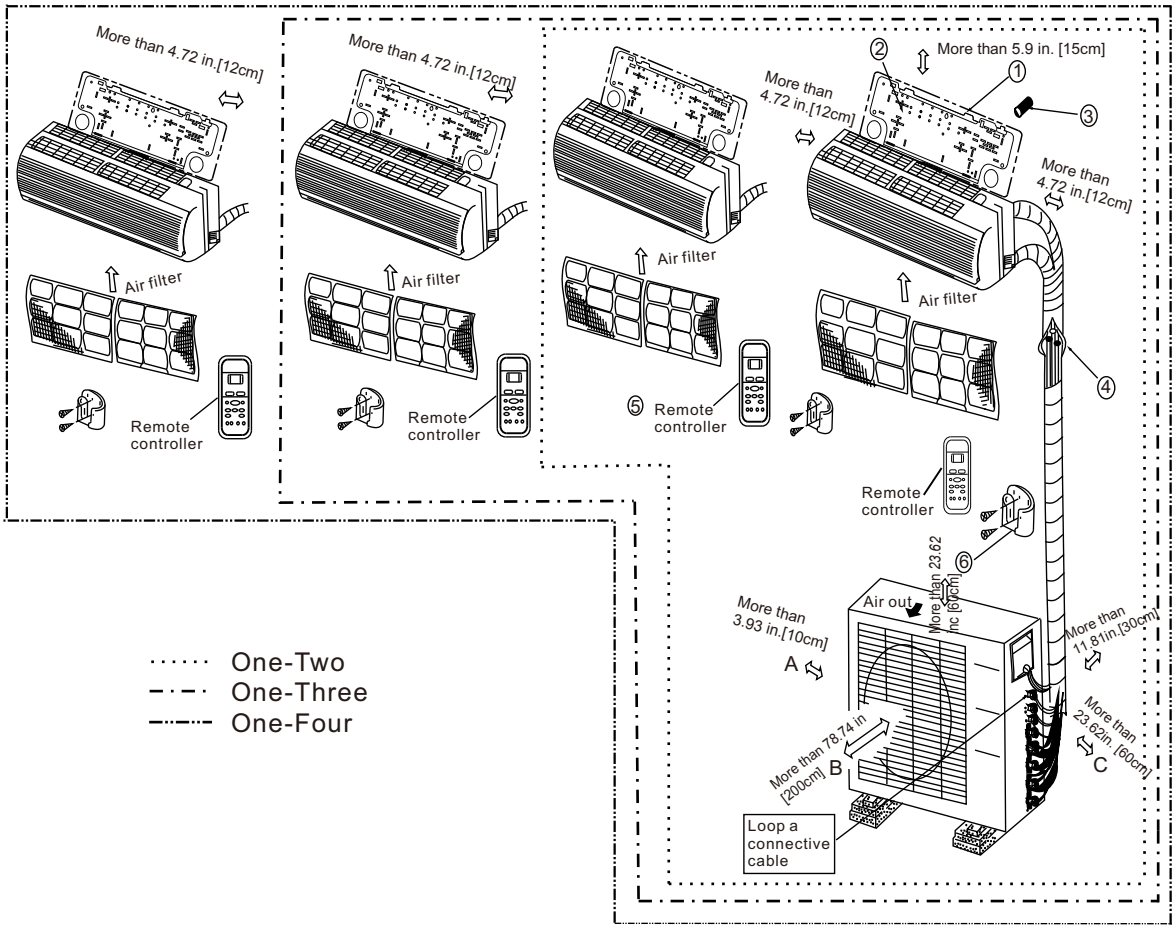


Fig.2

CAUTIONS

- This illustration is for explanation purposes only. The actual shape of your air condtioner may be slightly different.
- Copper lines must be insulated independently

CAUTION

- Use a stud finder to locate studs to prevent unnecessary damage to the wall.
- A minimum pipe run of 9.84ft. [3 metres] is required to minimize vibration & excessive
- noise. Two of the A, B and C directions should be free from obstructions.

Outdoor unit installation

Outdoor installation precaution

- Install the outdoor unit on a rigid base to prevent increasing noise level and vibration.
- Determine the air outlet direction where the discharged air is not blocked. In the case the installation is exposed to strong wind such as a seaside, make sure the is fan operating properly by putting the unit lengthwise along the wall or using a dust or shield plates.
- Specially in windy area, install the unit to prevent the admission of wind. If suspending unit installation, the installation bracket should be according to technique in the installation bracket diagram.
- The installation wall should be solid brick, concrete or the same intensity construction, or actions to reinforce, damping supporting should be taken. The connection between bracket and wall, bracket and the air conditioner should be firm, stable and reliable.
- Be sure there is no obstacle to block flow.

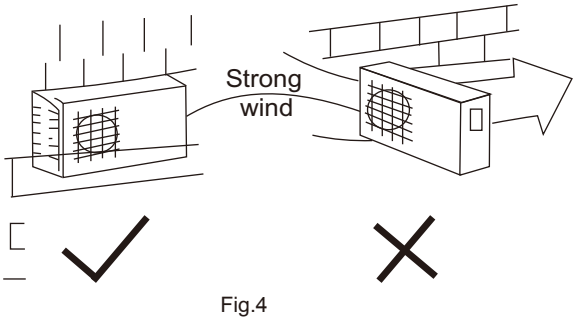


Fig.4

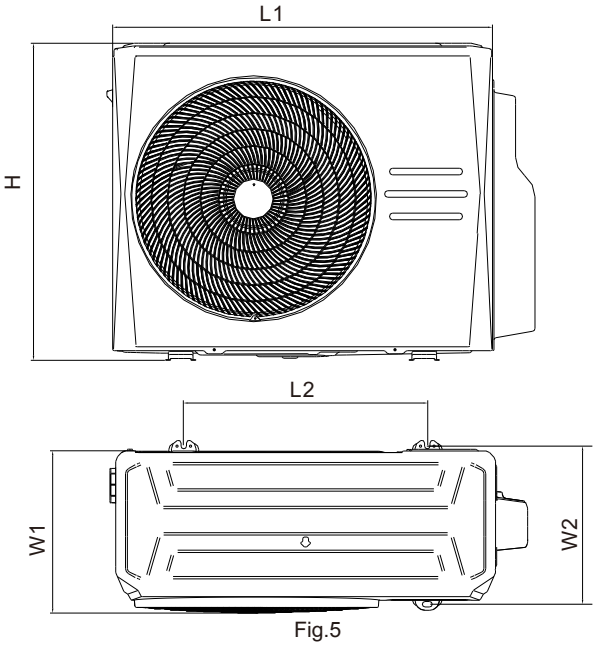


Fig.5

Settlement of outdoor unit

- Anchor the outdoor unit with a bolt and nut ϕ10 or ϕ8 tightly and horizontally on a concrete or rigid mount.

Measurement = mm

Outdoor unit dimension mm(L1xHxW1)			Mounting dimensions Left(mm)	Right(mm)
760	590	285	530	290
810	558	310	549	325
845	700	320	560	335
900	860	315	590	333
938	1369	392	634	404
945	810	395	640	405
990	965	345	624	366
800	554	333	514	340
845	700	340	540	350
946	810	420	673	403
950	1333	410	634	404

Measurement = Inches

Outdoor unit dimension Inches(L1xHxW1)			Mounting dimensions Left(in.)	Right(in.)
29.92	23.23	11.22	20.87	11.42
31.50	21.81	13.11	20.24	13.39
31.89	21.97	12.20	21.61	12.80
33.28	27.56	12.60	20.05	13.19
33.28	27.56	13.39	21.26	13.78
35.43	22.05	12.40	23.23	13.11
36.93	53.90	15.43	24.96	15.91
37.20	31.89	15.55	25.20	15.94
37.24	31.89	16.54	26.50	15.87
37.40	52.48	16.14	24.96	15.91
38.98	37.99	13.58	24.57	14.41

Drain joint installation

NOTE: The drain joint may differ from appliance to appliance.

Fit the seal into the drain joint, then insert the drain joint into the base pan hole of outdoor unit, rotate 90°to secure assembly . Connecting the drain joint with an extension drain hose (Locally purchased), in case water drains off the outdoor unit during the heating mode.

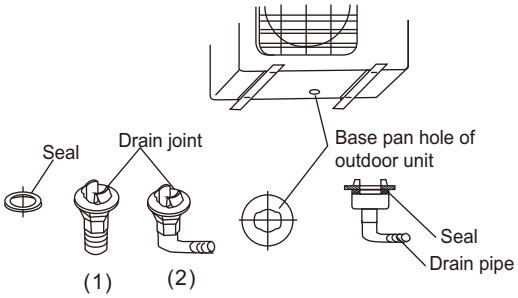


Fig.6

Refrigerant pipe connection

1. Flaring work

Main cause for refrigerant leakage is due to defect in the flaring work. Carry out correct flaring work using the following procedure:

A: Cut the pipes and the cable.

1. Use the piping kit accessory or pipes purchased locally.
2. Measure the distance between the indoor and the outdoor unit.
3. Cut the pipes a little longer than the measured distance.
4. Cut the cable 4.9ft [1.5m] longer than the pipe length.

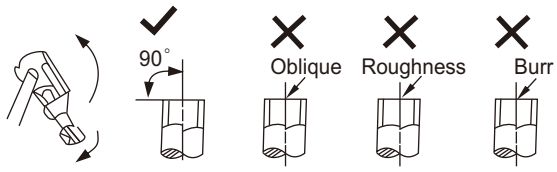


Fig.7

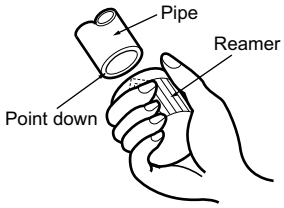


Fig.8

B: Burr removal

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

C: Putting nut on

Remove flare nuts attached to indoor and outdoor unit, then put them on pipe/tube having completed burr removal.(not possible to put them on after flaring work)

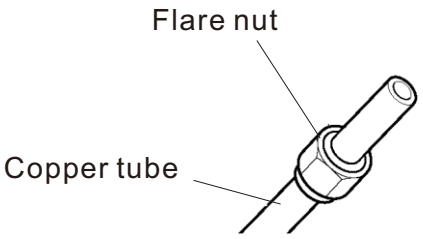


Fig.9

D: Flaring work

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

Outer diam. in [mm]		A in [mm]			
		Max.		Min.	
Φ 1/4"	[6.35]	.05	[1.3]	.03	[0.7]
Φ 3/8"	[9.52]	.06	[1.6]	.04	[1.0]
Φ 1/2"	[12.7]	.07	[1.8]	.04	[1.0]

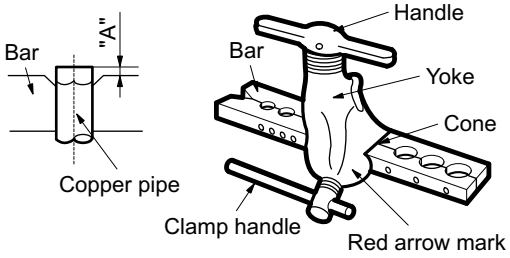


Fig.10

ELECTRICAL WORK

Tightening Connection

- Align the center of the pipes.
- Sufficiently tighten the flare nut with fingers, and then tighten it with a spanner and torque wrench as shown in Fig.11 & 12

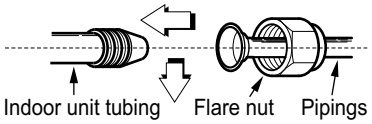


Fig.11

Outer diam.	Tightening torque(N·cm)	Additional tightening torque(N·cm)
ϕ1/4" [6.35]	1500 (11.1 lbf·ft.)	1600 (11.8 lbf·ft.)
ϕ3/8" [9.52]	2500 (18.4 lbf·ft.)	2600 (19.2 lbf·ft.)
ϕ1/2" [12.7]	3500 (25.8 lbf·ft.)	3600 (26.6 lbf· ft.)

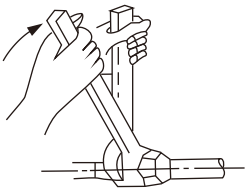


Fig.12

Caution

- Excessive torque can break nut depending on installation conditions.

When select a 24k indoor unit

The 24k indoor unit can only be connected with A system, if there are two 24k indoor units, they can be connected with A and B system. (Fig.13)

Connective pipe size of A and B system:

Unit:in

Indoor unit capacity	Liquid	Gas
9k/12k	1 / 4	3 / 8
18k	1 / 4	1 / 2
24k	1 / 4	5 / 8

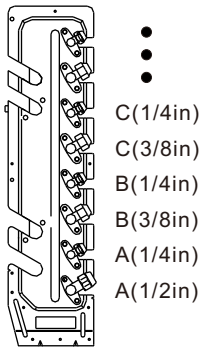


Fig.13

Electrical work

Electric safety regulations for initial Installation

1. If there is serious safety problem about the power supply, the technicians should refuse to install the air conditioner and explain to the client until the problem is solved.
2. Power voltage should be in the range of 90%~110%of rated voltage.
3. A separate over current protection device and disconnect switch should be used for each unit.
4. Ensure the air conditioner is grounded well.
5. Refer to the attached Electrical Connection Diagram located on panel of outdoor unit to connect the wire.
6. All wiring must comply with local and national electrical codes and be installed by qualified and skilled electricians.
7. An individual branch circuit and single receptacle used only for this air conditioner must be available.

Wiring connection

NOTE: Before performing any electrical work, turn off the main power to the system.

CAUTIONS

- Do not touch the capacitor even if you have disconnected the power for there is still high voltage power on it, or electric shock hazard may occur. For your safety, you should start repairing at least 5 minutes later after the power is disconnected.
- The power is supplied from the Outdoor Unit. The Indoor Units are connected with signal wires or power cords are connected reliably and correctly, or the air conditioner could not run normally.

NOTE:

The cable size and the current of thefuse or switch are determined by the maximum current indicated on the nameplate which located on the side panel of the unit. Please refer to the nameplate before selecting the cable, fuse and switch. Please refering to the above tables and choosing the proper wire size under the local electrical requirements.

Connect the cable to the outdoor unit

1. Remove the electrical control board cover from the outdoor unit by loosening the screw as shown in Fig.14
2. Connect the connective cables to the terminals as identified with their respective matched numbers on the terminal block of indoor and outdoor units.
3. Secure the cable onto the control board with the cord clamp.
4. To prevent the ingress of water, from a loop of the connective cable as illustrated in the installation diagram of indoor and outdoor units.
5. Insulate any unused conductors with PVC-tape. Process them so they do not touch any electrical or metal parts.

CAUTIONS

Make sure to connect the indoor unit (A,B, C, D, E) to the Hi and Lo valve and terminals of signal wires(A, B, C, D, E) of outdoor unit as identified with their respective matched connection. Wrong wiring connections may cause some electrical parts to malfunction.

Minimum norminal cross-sectional area of conductors:

Rated current of appliance (A)	Nominal cross-sectional area in^2 (mm^2)	
>3 and ≤6	.098	[2.5]
>6 and ≤10	.098	[2.5]
>10 and ≤16	.098	[2.5]
>16 and ≤25	.098	[2.5]

Suggest Minimum Wire Size
(**AWG:**American Wire Gage)**:**

Appliance Amps	AWG Wire Size
10	14
13	14
18	14
25	12
30	10

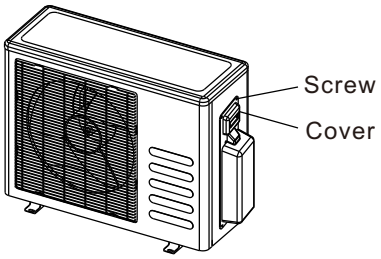


Fig.14

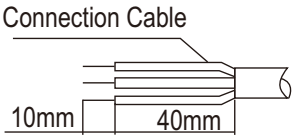
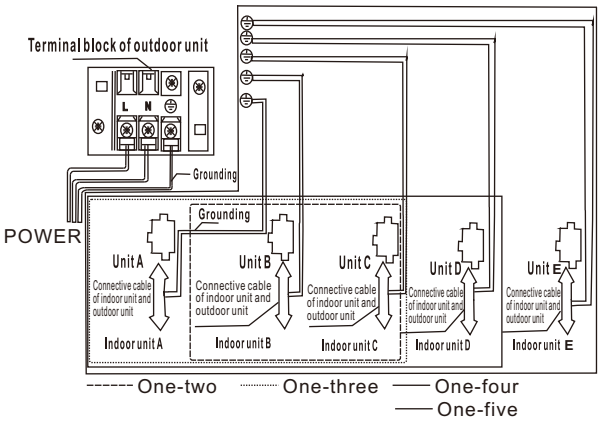
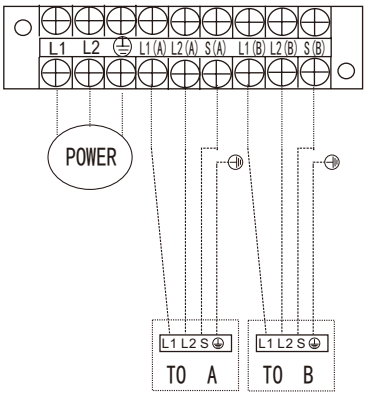


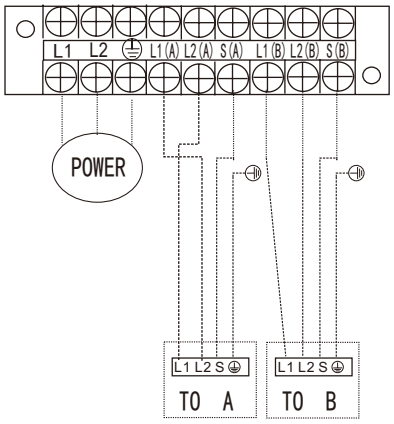
Fig.15



ELECTRICAL WORK

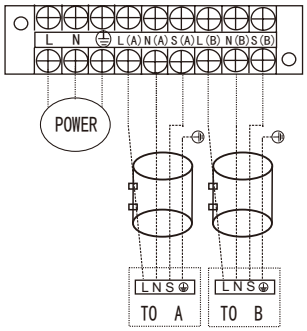
IMPORTANT: Connect the connective cables to the terminals as identified with their respective matched numbers on the terminal block of indoor and outdoor units. For example, see the following US models: Terminal L1(A) of outdoor must connect with terminal L1 on the indoor unit.



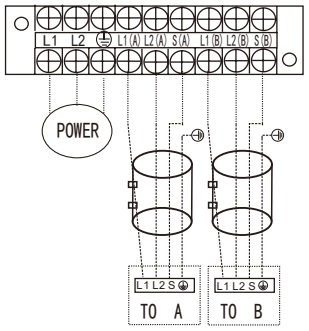


NOTE: please refer to the following figures, if the client want wire by themselves. please run the main power cord through the lower line-outlet of the cord clamp.

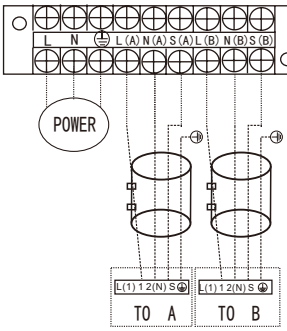
One-two models:



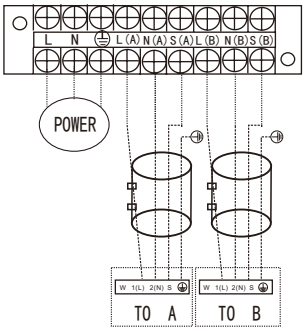
Model A



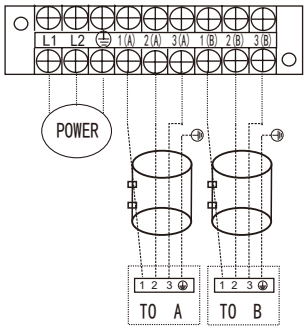
Model B



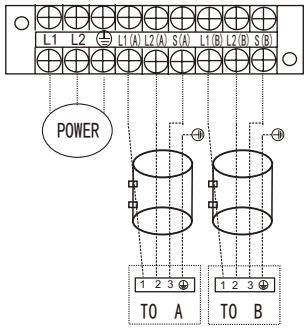
Model C



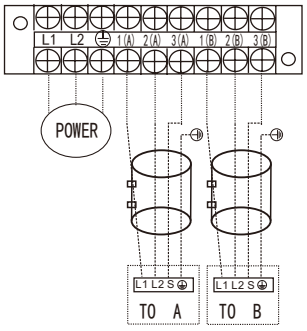
Model D



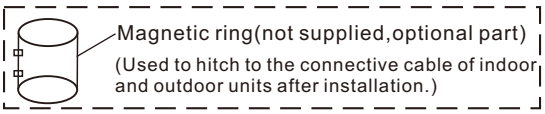
Model E



Model F

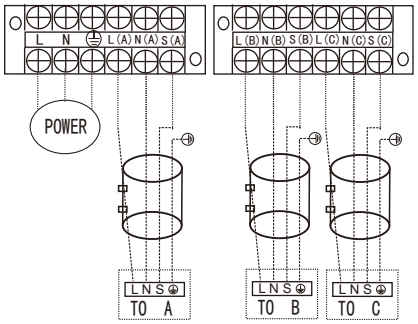


Model G

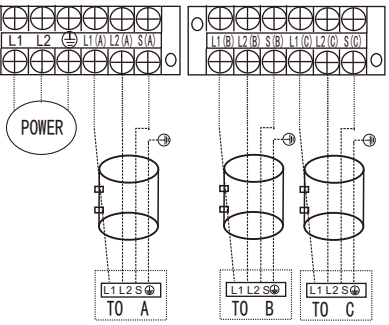


NOTE:please refer to the following figures,if the client want wire by themselves.

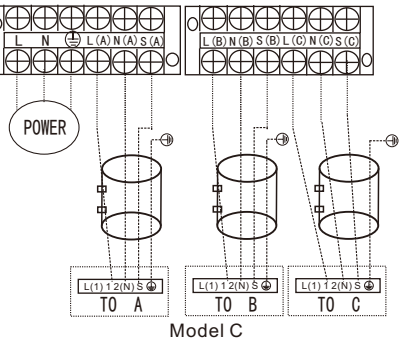
One-three models:



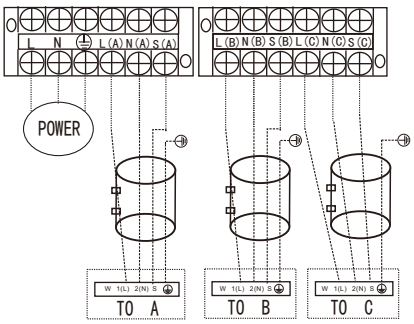
Model A



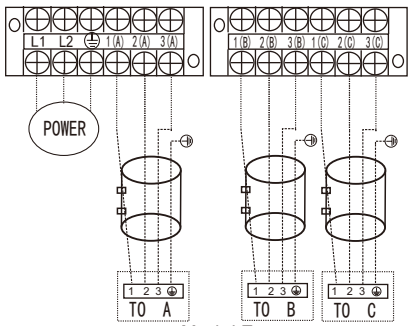
Model B



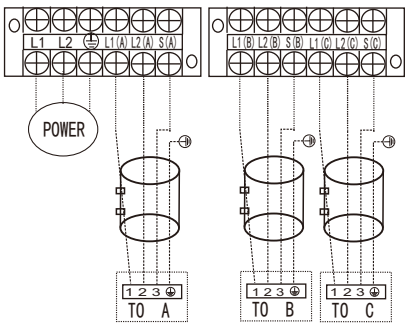
Model C



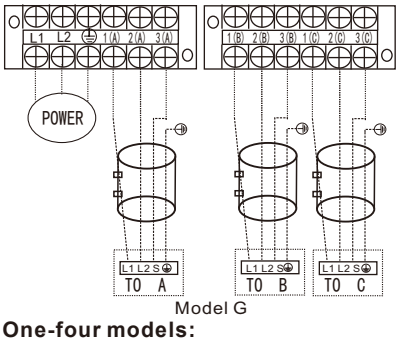
Model D



Model E

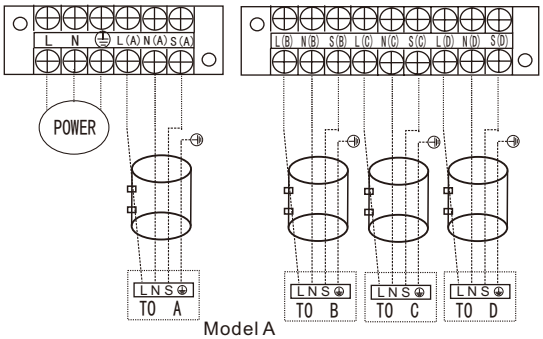


Model F

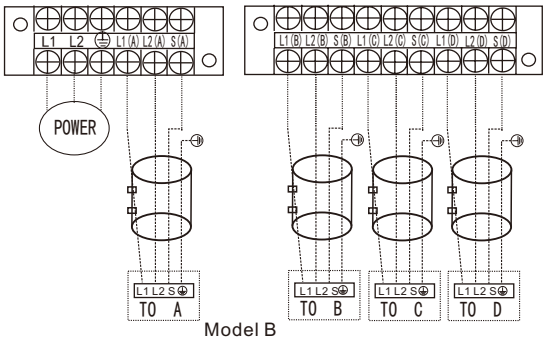


Model G

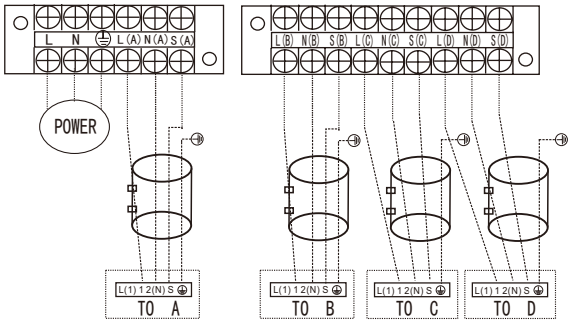
One-four models:



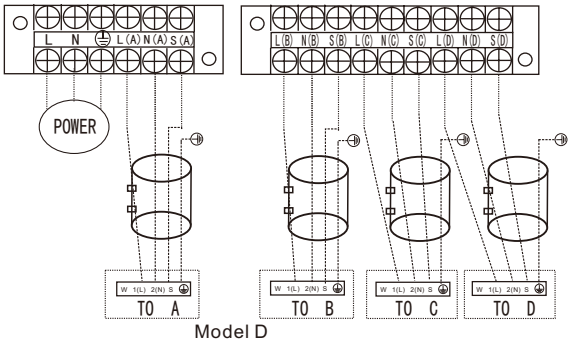
Model A



Model B

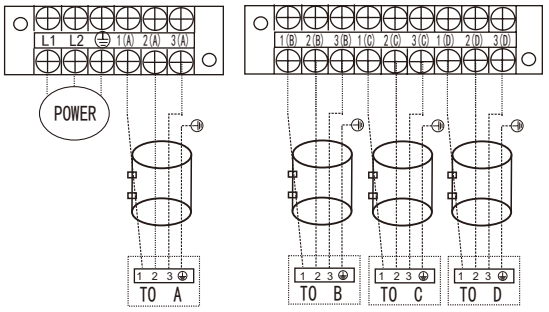


Model C

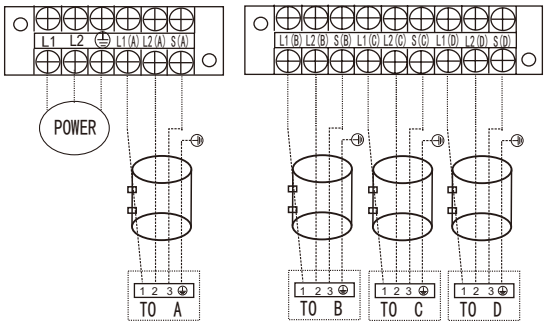


Model D

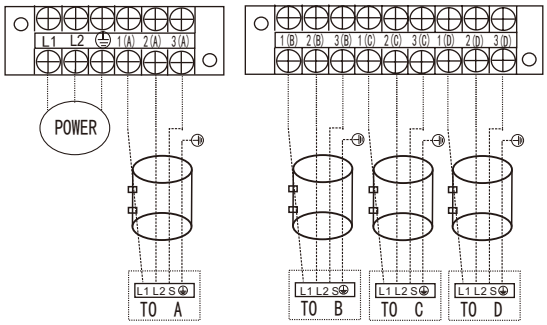
ELECTRICAL WORK



Model E

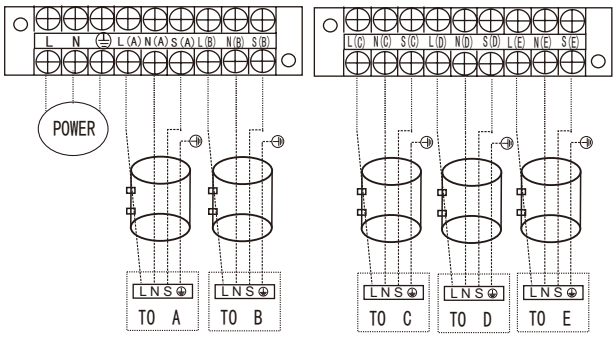


Model F

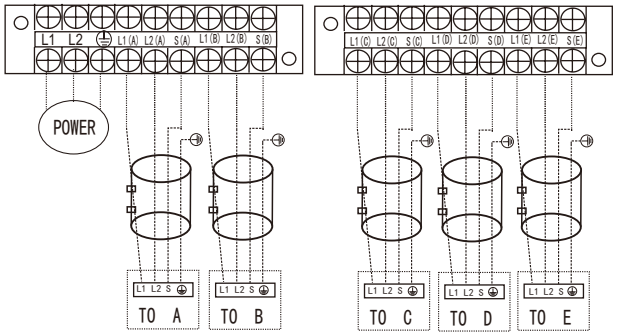


Model G

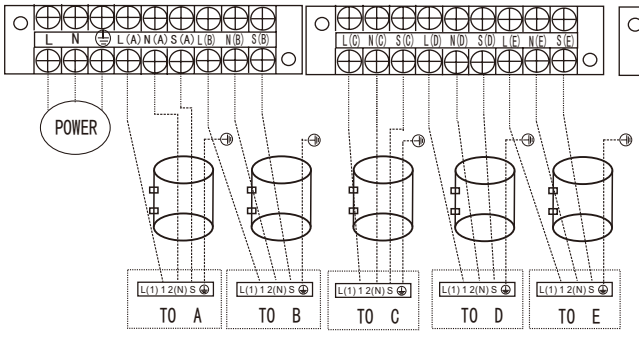
One-five models:



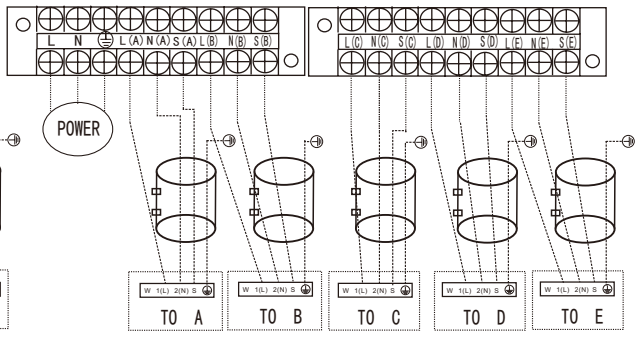
Model A



Model B

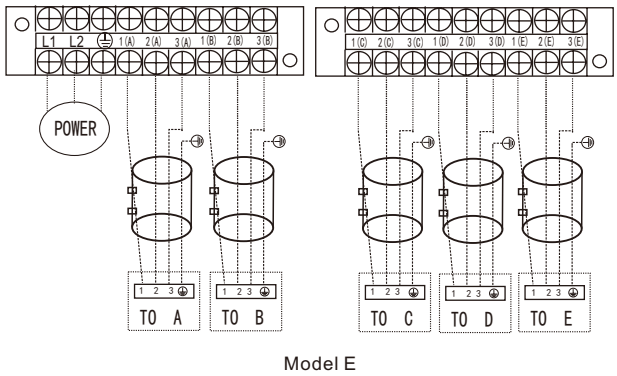


Model C

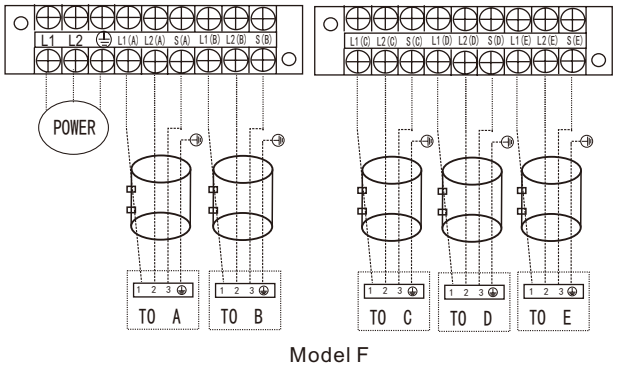


Model D

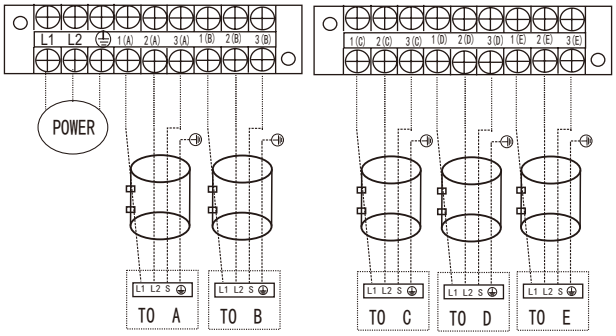
ELECTRICAL WORK



Model E



Model F



Model G

CAUTION

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

1) **Never fail to have an individual power circuit specifically for the air conditioner. As for the method of wiring, be guided by the circuit diagram posted on the inside of control cover.**
2) **The screw which fasten the wiring in the casing of electrical fittings are liable to come loose from vibrations to which the unit is subjected during the course of transportation. Check them and make sure that they are all tightly fastened. (If they are loose, it could cause burn-out of the wires.)**
3) **Specification of power source.**
4) **Confirm that electrical capacity is sufficient.**
5) **See to that the starting voltage is maintained at least 90 percent of the rated voltage marked on the name plate.**
6) **Confirm that the cable thickness is as specified in the power source specification.**
7) **Always install an ground fault circuit breaker in a wet or dump area.**
8) **The following would be caused by voltage drop.**
   Vibration of a magnetic switch, which will damage the contact point, fuse breaking, disturbance of normal function of the overload.
9) **The means for disconnection from a power supply shall be incorporated in the fixed wiring and have an air gap contact separation of at least 3mm in each active(phase) conductors.**
10) **Before obtaining access to terminals, all supply circuits must be disconnected.**

Air purging

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

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

Therefore, the indoor unit and tubing between the indoor and outdoor unit must be leak tested and evacuated to remove any noncondensables and moisture from the system.

Air purging with vacuum pump

- Preparation
  Check that each tube(both liquid and gas side tubes) between the indoor and outdoor units have been properly connected and all wiring for the test run has been completed. Remove the service valve caps from both the gas and the liquid side on the outdoor unit. Note that both the liquid and the gas side service valves on the outdoor unit are kept closed at this stage.
- Pipe length and refrigerant amount:

  NOTE: N=2(one-twin models), N=3(one-three models), N=4(one-four models), N=5(one-five models). The Standard pipe length is 7.5m(25ft).

Connective pipe length	Air purging method	Additional amount of refrigerant to be charged (R410A)
Pre-charge pipe length(ft/m) (Standard pipe lengthxN)	Use vacuum pump.	———
More than (Standard pipe lengthxN)ft/m	Use vacuum pump.	Liquid side: Φ 6.35(1/4") (Total pipe length - standard pipe lengthxN)x15g(0.16oz)/m(ft) Liquid side: Φ 9.52(3/8 ") (Total pipe length - standard pipe lengthxN)x30g(0.32oz)/m(ft)

- When relocate the unit to another place, perform evacuation using vacuum pump.
- Make sure the refrigerant added into the air conditioner is liquid form in any case.

Caution in handling the packed valve

- Open the valve stem until it hits against the stopper. Do not try to open it further.
- Securely tighten the valve stem cap with a spanner or the like.
- Valve stem cap tightening torque (See Tightening torque table in previous page).

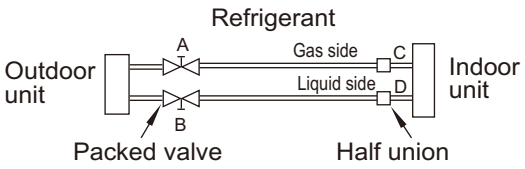


Fig.16

When Using the Vacuum Pump

(For method of using a manifold valve, refer to its operation manual.)

1. Completely tighten the flare nuts, A, B, C, D, connect the manifold valve charge hose to a charge port of the low-pressure valve on the gas pipe side.
2. Connect the charge hose connection to the vacuum pump.
3. Fully open the handle Lo of the manifold valve.

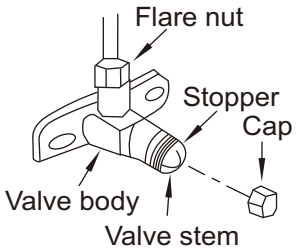


Fig.17

AIR PURGING

4. Operate the vacuum pump to evacuate. After starting evacuation, slightly loose theflare nut of the Lo valve on the gas pipe side and check that the air is entering(Operation noise of the vacuum pump changes and a compound meter indicates 0 instead of minus)
5. After the evacuation is complete, fully close the handle Lo of the manifold valve and stop the operation of the vacuum pump. Make evacuation for 15 minutes or more and check that the compound meter indicates -76cmHg (-1x10^{5}Pa).
6. Turn the stem of the packed valve B about 45° counterclockwise for 6~7 seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure.
7. Remove the charge hose from the Low pressure charge hose.
8. Fully open the packed valve stems B and A.
9. Securely tighten the cap of the packed valve.
10. 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 must be tightened with a screw nut. Checking the gas leakage before operation to prevent leakage.

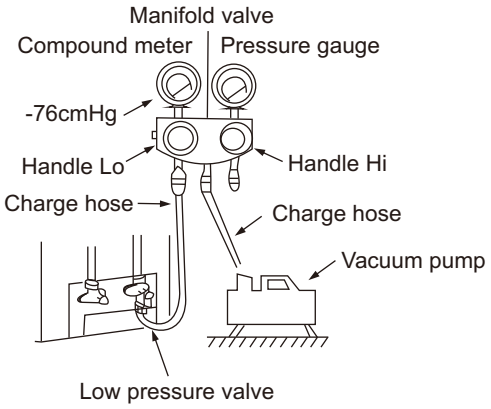


Fig.18

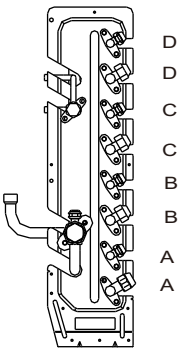


Fig.19

Safety and leakage check

● **Electrical safety check**

Perform the electric safe check after completing installation:

1. Insulated resistance
   The insulated resistance must be more than 2MΩ.
2. Grounding work
   After finishing grounding work, measure the grounding resistance by visual detection and grounding resistance tester. Make sure the grounding resistance is less than 4Ω.
3. Electrical leakage check (performing during test running)
   During test operation after finishing installation, the serviceman can use the electroprobe and multimeter to perform the electrical leakage check. Turn off the unit immediately if leakage happens. Check and find out the solution ways till the unit operate properly.

● **Gas leak check**

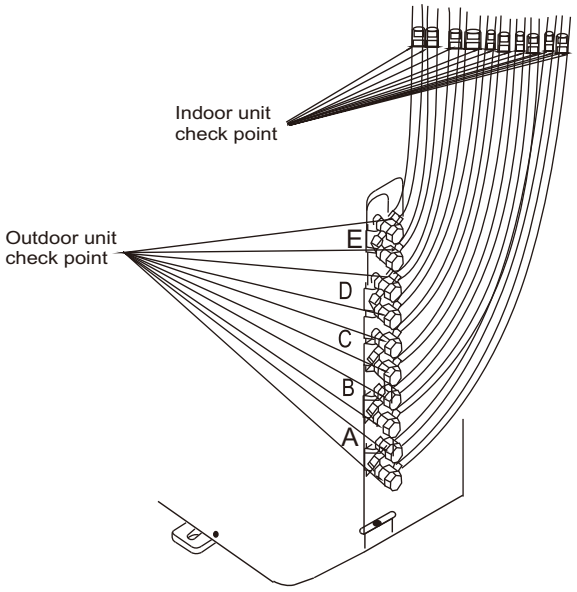
1. **Soap water method:**
   Apply a soap water or a liquid neutral detergent on the indoor unit connection or outdoor unit connections by a soft brush to check for leakage of the connecting points of th piping. If bubbles come out, the pipes have leakage.

2. **Leak detector**
   Use the leak detector to check for leakage.

CAUTION

A: Lo packed valve B: Hi packed valve
C and D are ends of indoor unit connection.

NOTE: The illustration is for explanation purpose 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 shall prevail.



A, B,C,D are points for one-four type.
A, B,C,D, E are points for one-five type.

Fig.20

Test running

Perform test operation after completing gas leak check at the flare nut connections and electrical safety check.

- Check that all tubing and wiring have been properly connected.
- Check that the gas and liquid side service valves are fully open.

1. Connect the power, press the ON/OFF button on the remote controller to turn the unit on.
2. Use the MODE button to select COOL, HEAT, AUTO and FAN to check if all the functions works well.
3. When the ambient temperature is too low(lower than 17°C/63°F the unit cannot be controlled by the remote controller to run at cooling mode, manual operation can be taken. Manual operation is used only when the remote controller is disable or maintenance necessary. Hold the panel sides
- and lift the panel up to an angle until it remains fixed with a clicking sound.
  Press the Manual control button to select the AUTO or COOL, the unit will operate under Forced
- AUTO or COOL mode(see User Manual for details).

4. The test operation should last about 30 minutes.

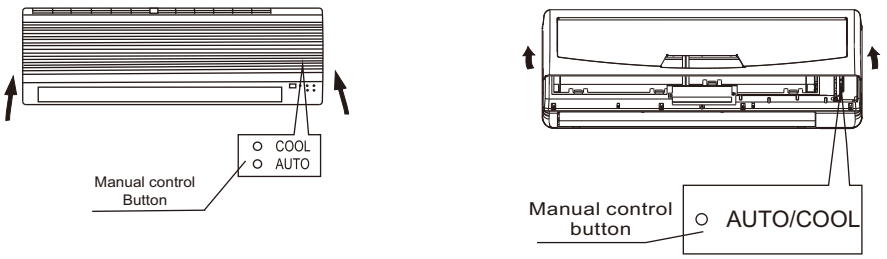


Fig.21

EMI Presents

Iverter

Iverter *Multi-Zone* Wireless Remote Controller Programming Instructions

Multi-Zone Programming Requirement

Follow the steps below to program ***EACH*** Air Handler Control:

1. Disconnect Power of outdoor unit and indoor unit.
2. Wait one (1) minute. Resume power to both indoor and outdoor units.
3. Use remote to turn Indoor unit **ON**. With remote turn Indoor unit **OFF TO STANDBY MODE**. Indoor unit display will be blank.
4. Remove batteries from Wireless Remote Controller.
5. Press **ON/OFF** button and wait until Wireless Remote Controller screen is blank.

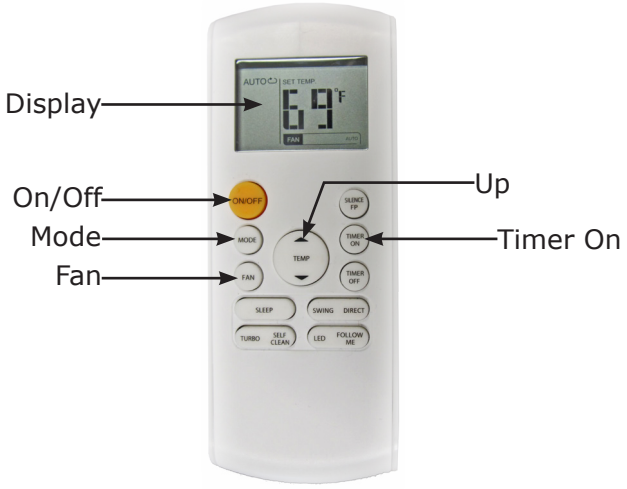
Note ***DO NOT POINT*** Wireless Remote Controller at the Indoor Unit for steps 6 and 7.

6. Install batteries into Wireless Remote Controller.
7. Immediately press and hold **MODE, FAN and TIMER-ON** button for 3 seconds until Wireless Remote Controller enters ***ENGINEERING MODE***.

Note **POINT REMOTE** at INDOOR UNIT for steps 8-12.

8. Press **UP** button until Wireless Remote Controller displays **F4**.
9. Press **MODE** button, Wireless Remote Controller displays **1**.
10. Press **TIMER-ON** button, while **1** is still shown on display. Wireless Remote Controller will show **F4**, Indoor Unit will beep once and display **01**.
11. Remove batteries. Push **ON/OFF** button screen will be blank.
12. Install batteries to exit ***ENGINEERING MODE***. Operate A/C and Heat cycles to test remote.

Iverter *Multi-Zone* Wireless Remote



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NOTES

The design and specifications are subject to change without prior notice for product improvement. Consult with the sales agency or manufacturer for details.

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