CHIGO
CENTRAL AIR-CONDITIONING

INSTALLATION MANUAL OF OUTDOOR UNITS
FOR
Inverter One-Two/One-Three/One-Four/One-Five Split-Type
ROOM AIR CONDITIONER

Thank you for choosing our company products!

Air conditioning facilities are valuable products. In order to protect your legitimate rights and interests, please make sure that the installations are done by professional technicians. This manual is a general-purpose version for the conditioning the systems manufactured by our CO., All the illustrations and specifications in the manual are subject to change without prior notice for product improvement. The actual shape should prevail.

Please read the manual carefully before you operate the system and check to see if the model is identical to the one you have purchased, keep the manual properly in case you might refer to it in the future.

The air conditioner is not intended for use by young children or infirmed persons without supervision.

Young children should be supervised to ensure that they do not play with the air conditioner.

CONTENTS

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 of the instruction 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. If installation done by the user is defective, it will cause water leakage, electrical shock fire.
2) Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock fire.
3) Use the attached accessories parts and specified parts for installation. Otherwise, it will cause the set to fall, water leakage, electrical shock fire.
4) 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.
5) For electrical work, follow the local national wiring standard, regulation and this installation instructions. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock 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 that 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 modify the length of the power supply cord or use of extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock. ⃠

CAUTION

1) This equipment must be grounded and installed with earth leakage current breaker. It may cause electrical shock if grounding is not perfect.
2) Do not install the unit at place 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 perfect, water may enter the room and damage the furniture.

The equipment contains fluorinated greenhouse gas R410A
Global Warming Potential(GWP):2087.5

INSTALLATION INSTRUCTION

2.1 Selecting installation place

Read completely, then follow step by step:

■ Indoor unit

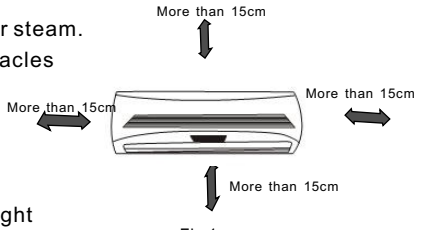


Fig 1

- Do not expose the indoor unit to heat or steam.
- Select a place where there are no obstacles in front or around the unit.
- Make sure that condensation drainage can be conveniently routed away.
- Do not install near a doorway.
- Ensure that the space on the left and right of the unit is more than 15cm.
- Use a stud finder to locate studs to prevent unnecessary damage to the wall.
- The indoor unit should be installed on the wall at a height of 2.0 meters or more from the floor.
- The indoor unit should be installed allowing a minimum clearance of 15cm from the ceiling.
- Any variations in pipe length will/may require adjustment to refrigerant charge.
- There should not be any direct sunlight. Otherwise, the sun will fade the plastic cabinet and affect its appearance. If unavoidable, sunlight prevention should be taken into consideration.

■ Outdoor unit

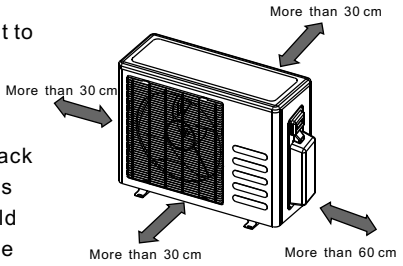


Fig 2

- 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 30cm and left side is more than 30cm. The front of the unit should have more than 200cm of clearance and the connection side (right side) should have more than 60cm of clearance.
- Do not place animals and plants in the path of the air inlet or outlet.
- 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 the warm air and noise from the air conditioner do not disturb neighbors.

2.2 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.

2.3 Tools needed for installation

- Level gauge
- Screwdriver
- Electric drill, Hole core drill (Φ65mm)
- Flaring tool set
- Spanner (half union)
- Hexagonal wrench (4mm)
- Specified torque wrenches: 1.8kgf.m, 4.2kgf.m, 5.5kgf.m, 6.6kgf.m(different depending on model No.)
- Gas-leak detector
- Vacuum pump
- Gauge manifold
- Users manual
- Thermometer
- Multimeter
- Pipe cutter
- Measuring tape

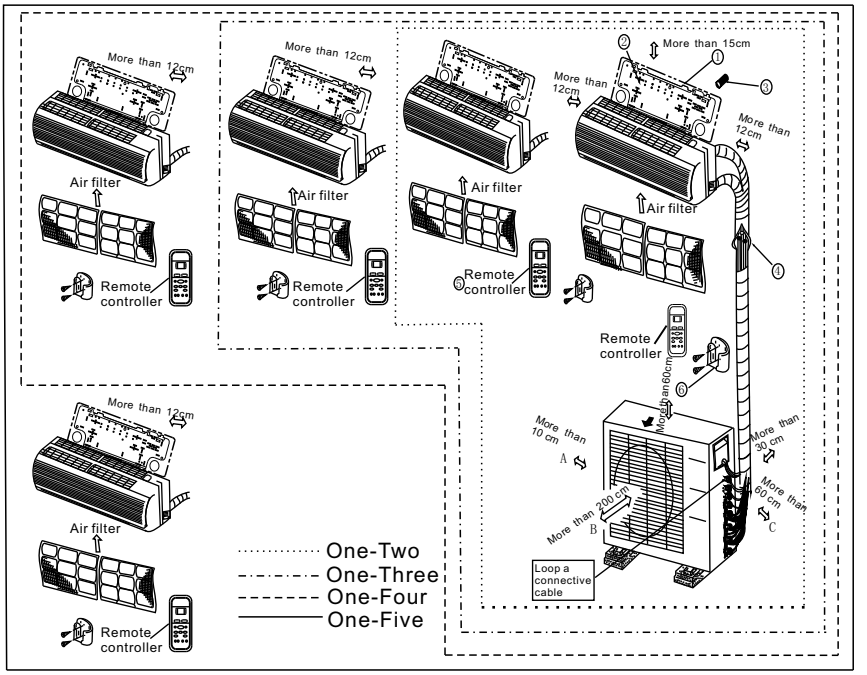


Fig 3

CAUTION

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

CAUTION

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

2. 4 Indoor unit installation(wall-mounted type)

2. 4. 1 Fit the Installation Plate

- Fit the installation plate horizontally on structural parts of the wall with spaces around the installation plate.
- If the wall is made of brick, concrete or the like, drill eight (8) 5mm diameter holes in the wall. Insert Clip anchor for appropriate mounting screws.
- Fit the installation plate on the wall with eight (8) type

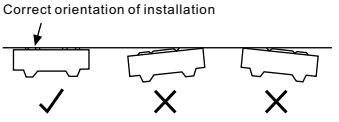


Fig 4

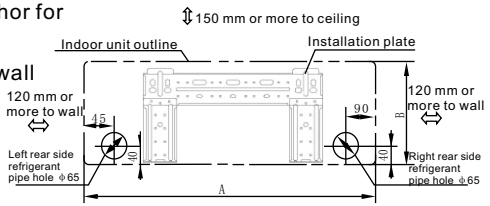


Fig 5

Note:

Fit the Installation Plate and drill holes in the wall according to the wall structure and corresponding mounting points on the installation plate. The Installation Plate may be slightly different according to the different models of indoor unit.

(Dimensions are in mm unless otherwise stated)

Model	A(mm)	B(mm)
≤12000Btu/h	870	280
18000Btu/h	990	300
24000Btu/h	1200	310

2.4.2 Drill a hole in the wall

- Determine hole positions according to the diagram detailed in Fig.5. Drill one (1) hole (Φ65mm)slanting slightly to outdoor side.
- Always use wall hole conduit when drilling metal grid, metal plate or the like.

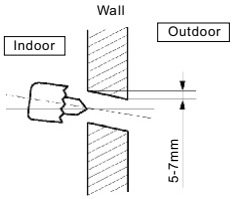


Fig 6

2.4.3 Connective Pipe and Drainage Installation

■ **Drainage**

- Run the drain hose sloping downward. Do not install the drain hose as illustrated in Fig.7.

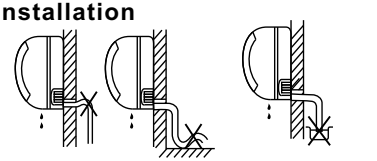


Fig 7

● When connecting extension drain hose, insulate the connecting part of extension drain hose with a shield pipe, do not let the drain hose slack.

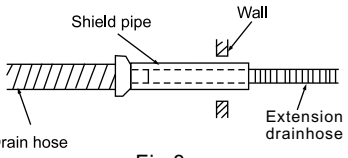


Fig 8

■ **Connective pipe installation**

●For the left-hand and right-hand piping, remove the pipe cover from the side panel.

●For the rear-right-hand and rear-left-hand piping, install the piping as shown in Fig.10.

●Fix the end of the connective pipe. (Refer to Tightening Connection in REFRIGERANT PIPING CONNECTION)

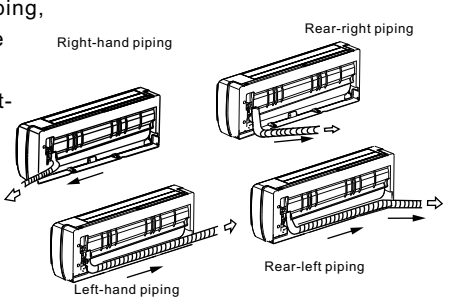


Fig 9 Fig 10

■ **Piping and wrapping**

Bundle the tubing, connecting cable, and drain hose with tape securely, evenly as shown in Fig.11.Because the condensed water from rear of the indoor unit is gathered in ponding box and is piped out of room. Do not put anything else in the box.

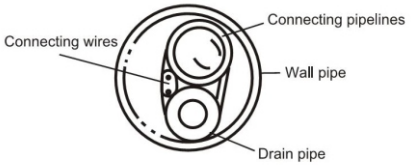


Fig 11

CAUTION

- Connect the indoor unit first, then the outdoor unit.
- Do not allow the piping to let out from the back of the indoor unit.
- Be careful not to let the drain hose slack.
- Heat insulated both of the auxiliary piping.
- Be sure that the drain hose is located at the lowest side of the bundle. Locating at the upper side can cause drain pan to overflow inside the unit.
- Never intercross nor intertwist the power wire with any other wiring.
- Run the drain hose sloped downward to drain out the condensed water smoothly.

■ **Indoor unit installation**

- Pass the piping through the hole in the wall.
- Put the upper claw at the back of the indoor unit on the top hook of the installation plate, move the indoor unit from side to side to see that it is securely hooked (see Fig.12 and Fig13).
- Piping can easily be made by lifting the indoor unit with a cushioning material between the indoor unit and the wall. Get it out after finish piping.
- Push the lower part of the indoor unit up on the wall, then move the indoor unit from side to side, up and down to check if it is hooked securely.

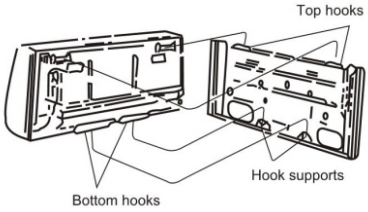


Fig12

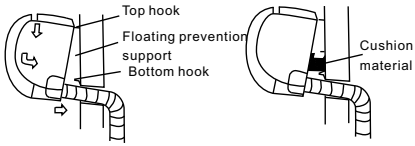


Fig13

2. 5 Indoor unit installation（duceted unit）

2. 5. 1 Indoor unit outline dimension diagram (applies to low static pressure (F1) models)

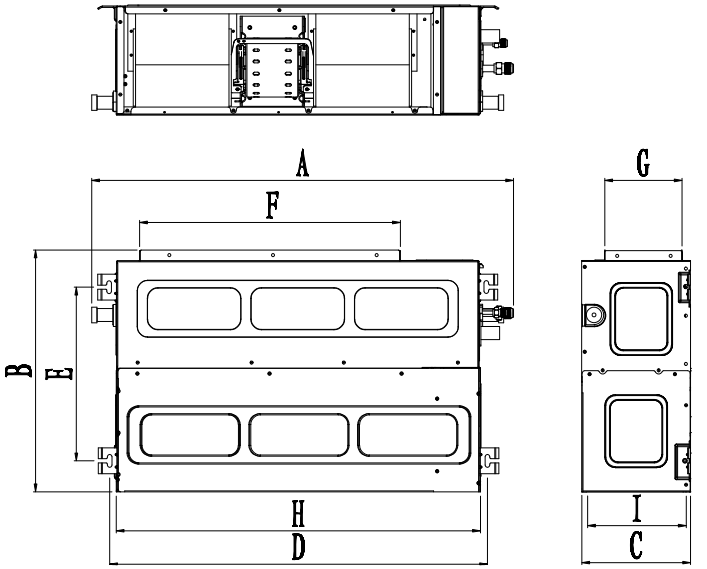


Fig 14

Table 1 Unit: mm

Size code / Model of indoor unit	Body size			Installing size		Air outlet size		Air return size	
	A	B	C	D	E	F	G	H	I
7K/9K/12K	814	467	210	728	335	503	150	611	200
18K	1010	467	210	928	335	705	150	811	200

2. 5. 2 Indoor unit installation space dimension

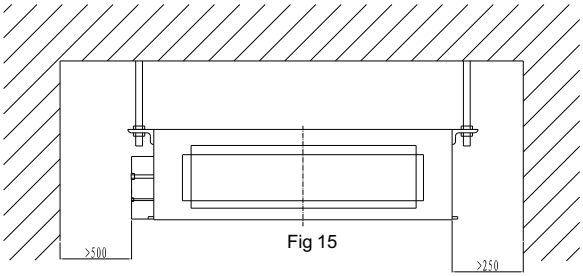


Fig 15

Installation of indoor unit

1.The selection of install location

(1) Sufficient strength to ensure that on top hanging parts to bear the weight of the unit.

(2) Water is easily discharged from the drain.

(3) Accessible in import and export, to maintain good air circulation.

(4) In indoor unit, the install distance required must be ensured to make sure the space required by repair and maintenance is kept.

(5)Away from place of heat, flammable gas leakage and smoke.

(6)The machine is ceiling mounted (ceiling built-concealed installation).

(7)Indoor, outdoor, power cord, connecting wires should keep at least 1 m away from the TV, radio.

This is to prevent image interference and noise in above mentioned home appliances. (Even with a distance of 1 m, if the generated wave is strong, it may occur noises)

2.The installation of the indoor unit

a.Insert M10 expansion bolt into the hole, then knock the nails into the bolt, for the pitch referring to figure 14, the installation of expansion bolts is shown.

b.Install the hook onto the indoor unit, shown in Figure 15.

c.The indoor unit is mounted on the ceiling, See Figure 16.

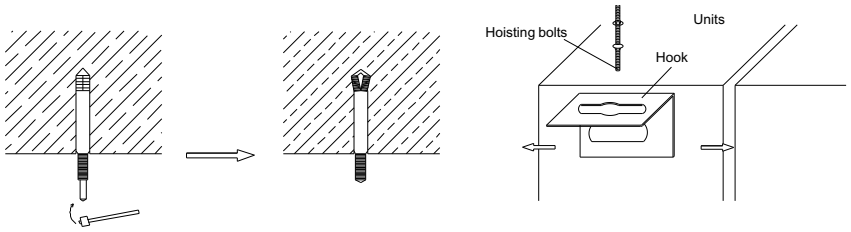


Fig 16

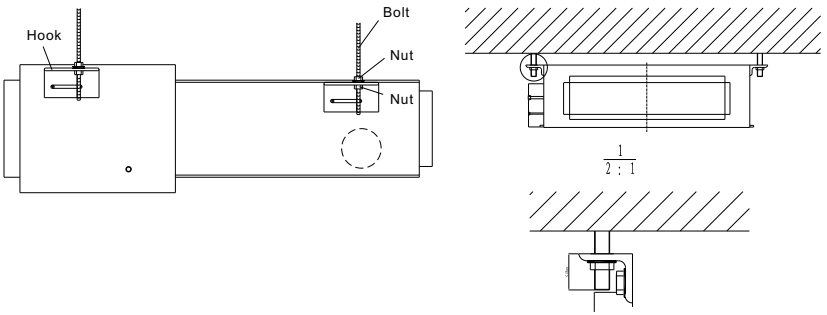


Fig 17

Notice

1.Before installation, first complete the preparatory work of all pipes (refrigerant, drainage) and wires (line controller connection, indoor and outdoor unit connecting wire) which need to be connected with the indoor unit to immediately be able to connect with the indoor unit after installation.
2.An opening is cut in the ceiling, and the ceiling is possibly to be reinforced to maintain the ceiling level, and prevent vibration of the ceiling. For details, please consult the user or builders.
3.If the ceiling is not strong enough, an angle iron can be used to set up a transom bracket, or put the unit on the beam for fixation.

2. 5. 3 Installation of condense pipes

As for the cold condensate pipe of central air conditioning indoor unit, the following factors were considered major:

(1) Displacement of large condensate

(2) Incidental loss of cooling capacity

(3) Maintenance is inconvenient during installation, wind cross can occur from this location.

1. The material of condensate pipe can be chosen among U-PVC pipe or galvanization pipes. Health, rust and other issues should be considered, U-PVC pipe is recommended to be adopted.
2. The installation requirements:

1) Water seal must be installed at the outdoor drain and be fixed.

2) The slope of drain pipe should be ≥1%.

3) Indoor section of the condensate pipe should put on a pipe insulation or be wrapped with cotton insulation.

4) After condensate pipe installation, irrigation leak test must be performed. Confirm no water leakage in various joints and smooth drainage. The installation can be performed with reference to figure 18:

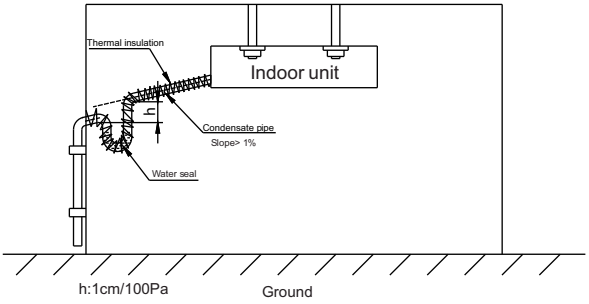
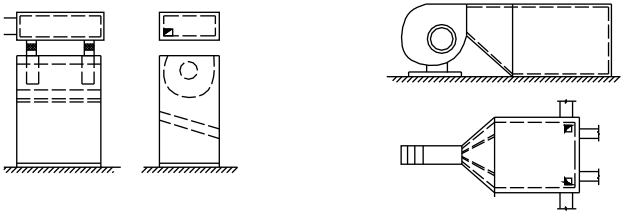


Fig 18

2. 5. 4 Plenum chamber

1. The location and function of the plenum chamber

Plenum is set outside the outlet of the unit, and sound-absorbing material is affixed on it, so that it can both stabilize the airflow, but also effectively attenuate the fan noise by using the mutation on the box section and t he sound absorption effect of the cabinet inner surface, as shown in figure 19.



(a) Anechoic chamber is mounted on the outlet

(b) of the air conditioning unit, which also has the functin as sub-wind plenum box

Fig 19 Application of the plenum chamber

2. Installation of the plenum chamber

1) Relevant provisions on equipment static tube

a. For equipment in which air out static pressure is greater than 30Pa, hydrostatic tank must be installed on its wind pipe, for its specifications and installation, please see related provisions in GB50243-2002.

b.Plenum chamber should be located in the pipe section with a smooth flow in air duct system, when the air flow velocity in the air duct system is less than 8 m/s, the plenum chamber should be located on main pipe section; when the airflow speed is more than 8m/ s, they should be installed in the respective branch pipes respectively.

c. Plenum chamber is not directly installed in the air conditioner room, nor directly in the outdoors, to avoid being penetrated by the noise outside and into the pipe downstream the plenum chamber. In situations where there may be external noise, the sound insulation capability of the duct should be verified.

d. The flow rate of air passing the plenum chamber shouldn't exceed the following values:
Negative plenum chamber 5-10m/s (in high requirements:4-6 m/s);
Resonance plenum chamber 5 m/s, silencer elbow 6-8 m/s.

e. Plenum chamber is mainly used to reduce the noise from the dynamic air, anti-vibration measures should be taken to solve the noise caused by ventilator vibration.

2) Installation requirements of plenum chamber;

a. Direction of plenum chamber is installed correctly. Pay attention to loss prevention and anti-moisture.

b. The surface of perforated plates remain clean, non-corrosive, no clogging in the hole.

c. Separate brackets should be installed both in plenum chamber and in silencer corners.

d. The screws used to fasten hydrostatic tank must be uniform, smooth, no loosening, shedding in the seams.

e. The glass fiber cloth packed outside the muffler piece should be smooth, without visible scratches and corrosion.

2. 6 Outdoor unit installation

2. 6. 1 Outdoor installation precaution

● Install the outdoor unit on a rigid base to prevent increasing noise level and vibration.

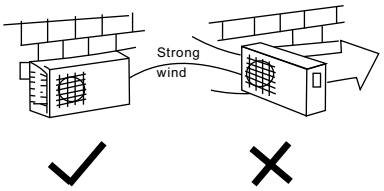


Fig20

● Determine the air outlet direction where the discharged air is not blocked. In the case that the installation place is exposed to strong wind such as a seaside, make sure the fan operating properly by putting the unit lengthwise along the wall or using a dust or shield plates.

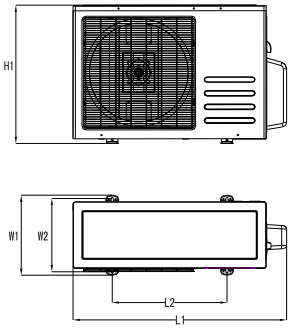
● Specially in windy area, install the unit to prevent the admission of wind. If need suspending installation, the installation bracket should accord with technique requirement in the installation bracket diagram.

● 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 which block radiating air.

2. 6. 2 Settlement of outdoor unit

● Anchor the outdoor unit with a bolt and nut ϕ10 or ϕ 8 tightly and horizontally on a concrete or rigid mount.



Outdoor unit dimension mm(L1 ×H ×W1)	Mounting dimensions	
	L2(mm)	W2(mm)
16K/18K 940×609×352	505	322
21K/27K 991×839×388	600	361
28K~42K 1090 ×994×400	694	374

Fig 21

2. 6. 3 Drain joint installation

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

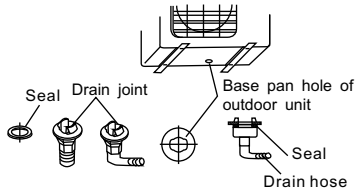


Fig 22

NOTE: The drain joint differ from appliance to appliance.

REFRIGERANT PIPE CONNECTION

3. 1 Refrigerant pipe connection

3. 1. 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:

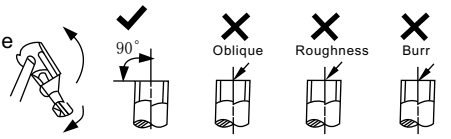


Fig 23

■ **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 1.5m longer than the pipe length.

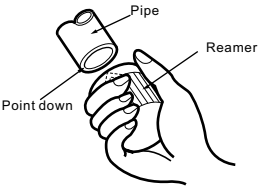


Fig 24

■ **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.

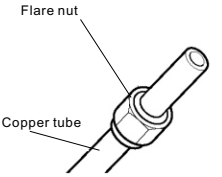


Fig 25

■ **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)

■ **Flaring work**

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

Outer diam. (mm)	A(mm)	
	Max.	Min.
φ6.35	1.3	0.7
φ9.52	1.6	1.0
φ12.7	1.8	1.0
φ15. 88	2.0	1.2

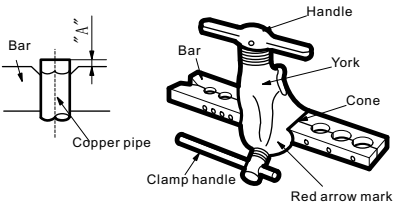


Fig 26

3. 1. 2 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.27 & 28.

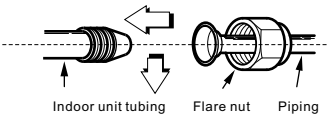


Fig 27

Outer diam. (mm)	Tightening torque(N.cm)	Additional tightening torque(N.cm)
φ6.35	1000	1200
φ9.52	1500	1800
φ12. 7	2000	2300
φ15. 88	2800	3200

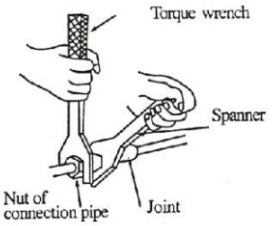


Fig 28

Caution

Excessive torque can break nut depending on installation conditions.

Piping length and heigh difference

Make sure of piping length and height difference according with following form

One indoor	Length	MAX. 15m
Dual split	Total length	MAX. 30m
	Difference in height between indoor and outdoor units	MAX. 10m
	Difference in height between indoor units	MAX. 5m
Triple split	Total length	MAX. 45m
	Difference in height between indoor and outdoor units	MAX. 10m
	Difference in height between indoor units	MAX. 5m
Quadruple split	Total length	MAX. 60m
	Difference in height between indoor and outdoor units	MAX. 10m
	Difference in height between indoor units	MAX. 5m
Quintuple split	Total length	MAX. 75m
	Difference in height between indoor and outdoor units	MAX. 10m
	Difference in height between indoor units	MAX. 5m

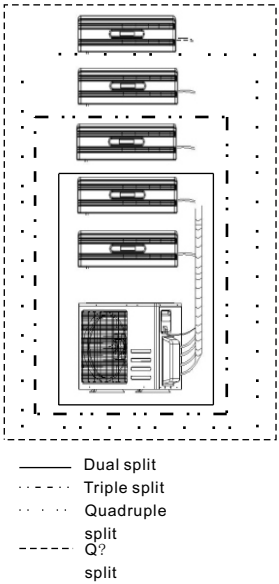


Fig 29

3. 1. 3 Connection pipe diameter:

Indoor unit	Liquid	Gas	Accessories
7K/9K/12K	1/4	3/8	/
18K/24K	3/8	5/8	Two to one pipe component

3. 1. 4 The caution for indoor unit connection:

1. For 7K/9K/12K unit:

a. For one 7K/9K/12K indoor unit gas/liquid pipe, it should connect to the same group gas/liquid pipe. eg. Connect to Group A gas/liquid pipe together, as figure shown below.

b. The Group number of copper pipe, it should be the same as communication wire group number.

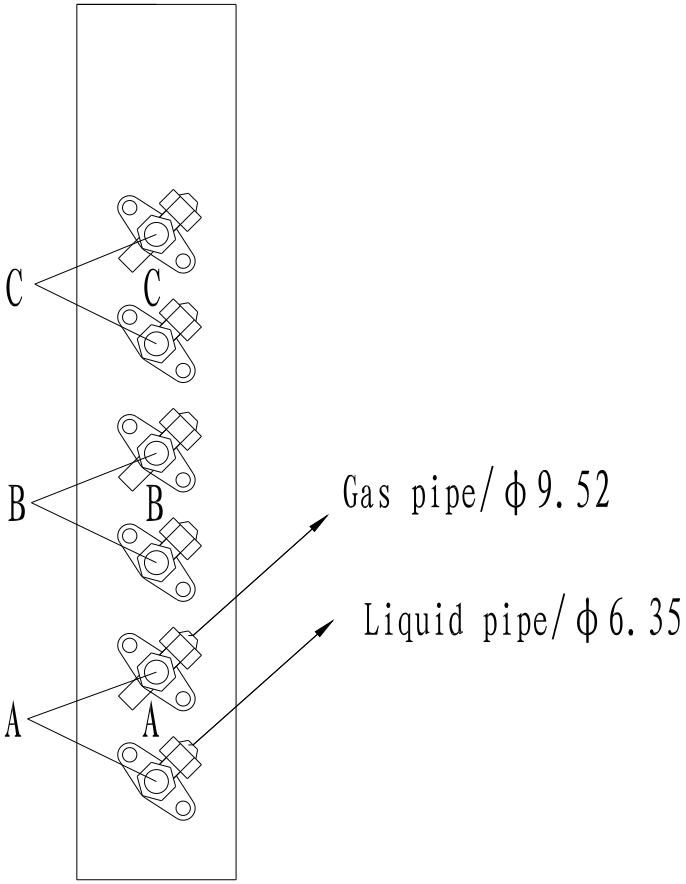


Fig 30

2. For 18/24K unit:

a. For 18K/24K indoor unit, it should connect to adjacent two group pipe. As figure shown, connect to group A and group B; for gas/liquid pipe connection, it should use the special joint;

b. The joint is in the accessary of indoor unit;

c. The communication wire must connect to the first communication terminal, rather than the second one, otherwise it will show error code.As figure shown, indoor and outdoor unit communication should connect to La, Na, Sa, and shouldn't connect to Lb, Nb, Sb.

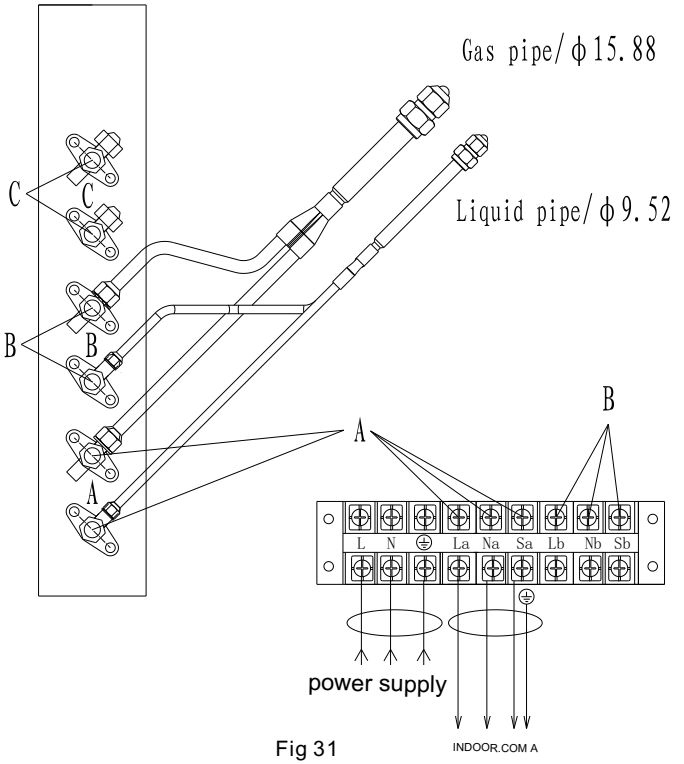


Fig 31

Remark:

1. 18/24K indoor unit must use the special joint, connect toadjacent two group pipe of outdoor unit;
2. 18K/24K indoor unit communication wire must connect to the first group terminal of the corresponding pipe, as figure above shown, connect A group.

ELECTRICAL WORK

4. 1 Electrical safety regulations for the 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. The creepage protector and main power switch with a 1.5 times capacity of Max. Current of the unit should be installed in power circuit.
4. Ensure the air conditioner is grounded well.
5. According to the attached Electrical Connection Diagram located on the panel of the outdoor unit to connect the wire.
6. All wiring must comply with local and national electrical codes and be installed
7. An individual branch circuit and single receptacle used only for this air conditioner must be available.
8. Electrical work must be done by qualified and skilled electricians.

4. 2 Wiring connection

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

Minimum nominal cross-sectional area of conductors:

Rated current of appliance (A)	Nominal cross-sectional area (mm^2)
>3 and ≤6	0.75
>6 and ≤10	1
>10 and ≤16	1.5
>16 and ≤25	2.5

CAUTION

- 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 Unit are connected with a signal wires or power cords are connected reliably and correctly, or the air conditioner could not run normally.

4. 3 Connect the cable to the outdoor unit

1. Remove the electrical control board cover from the outdoor unit as shown in Fig. 32.
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 he 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 unused cords（conductors）with PVC-tape. Process them so they do not touch any electrical or metal parts.

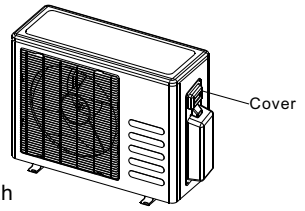


Fig 32

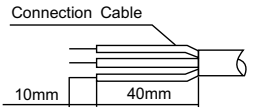
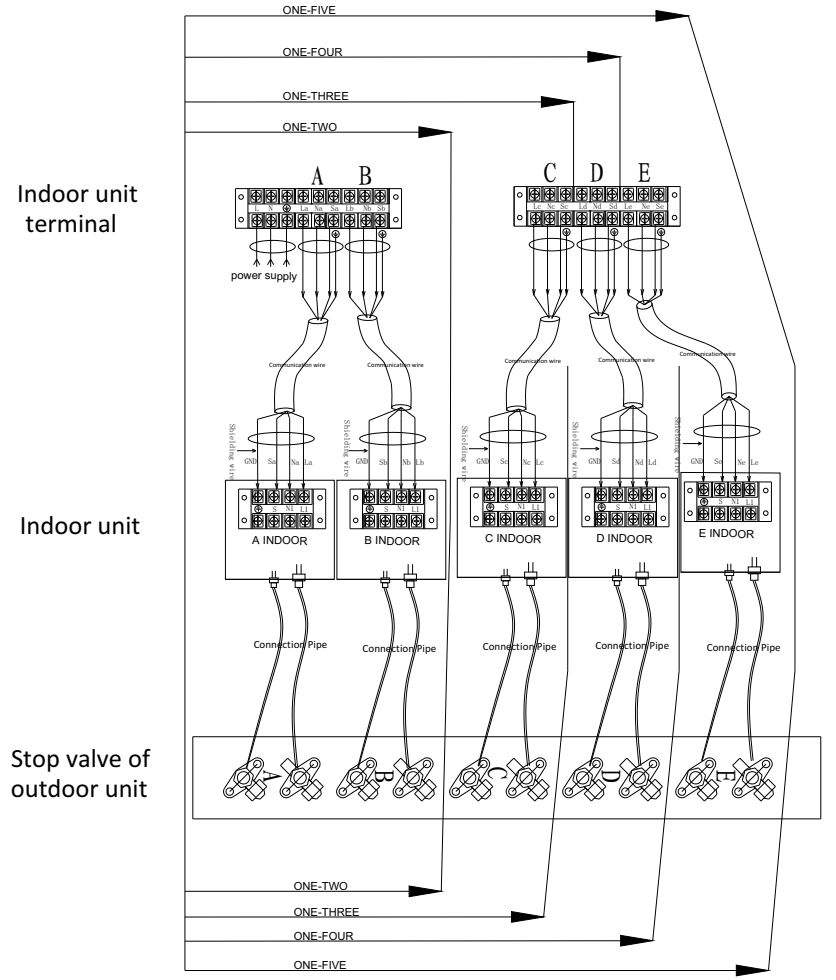


Fig 33

Fig 26



Note： The group number of indoor part and outdoor part should be the same, otherwise it cause malfunction

Fig 34

CAUTION

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.

AIR PURGING

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 more than 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 earth leakage circuit breaker in a wet or moist 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 the 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.

5. 1 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 non-condensables and moisture from the system.

5. 1 .1 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:

Connective pipe length	Air purging method	Additional amount of refrigerant to be charged
Less than 5m	Use vacuum pump.	————
More than 5m	Use vacuum pump.	R410A: (Pipe length-5m)x15g/m for Φ6.35 R410A: (Pipe length-5m)x20g/m for Φ9.52

Note: Piping length means that liquid side of each indoor unit.

● 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.
(Not applicable to the units adopt Freon R22)

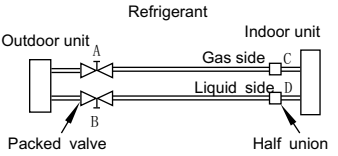


Fig 35

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).

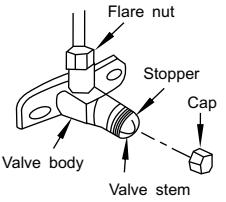


Fig 36

5.1.2 When Using the Vacuum Pump

● Preparation

(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.
4. Operate the vacuum pump to evacuate. After starting evacuation, slightly loose the flare 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 (−1x105Pa).
6. Turn the stem of the packed valve B about 45o 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.

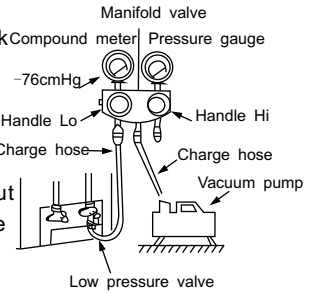


Fig 37

Vacuum:

1.For one drive two unit:

Vacuum for two indoor unitsseparately.

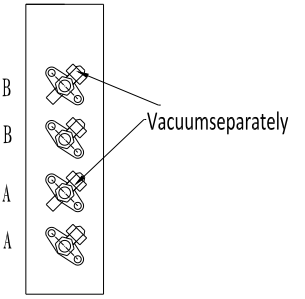


Fig 38

2.For one drive three unit:

Vacuum for three indoor unitsseparately.

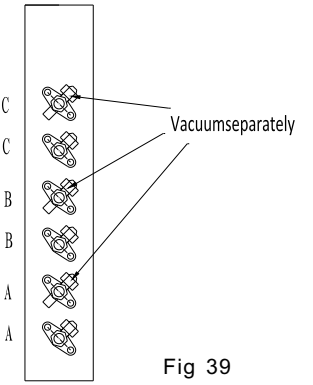


Fig 39

3. **For one drive four and one drive five unit**

a. Vacuum from the main valve, no need vacuum for each indoor unit;

b. Make sure main valve close before vacuum, then open all small valves for indoor units , keep the small valve close if there is no indoor unit.

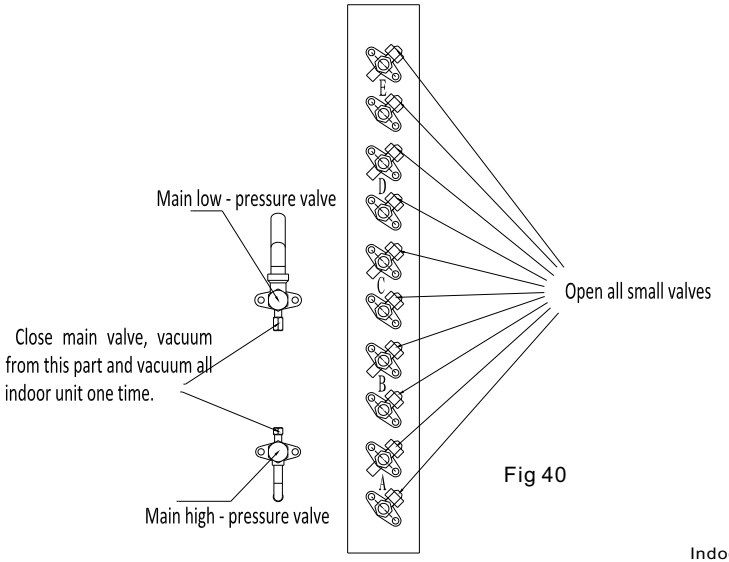


Fig 40

5. 2 Safety and leakage check

5. 2. 1 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.

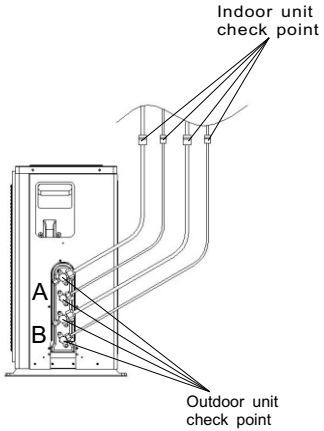


Fig 41 Dual split type

5. 2. 2 Gas leak check

● **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 bubblescome out, the pipes have leakage.

● **Leak detector**

Use the leak detector to check for leakage.

CAUTION

A、B、C D and E are packed valve of outdoor unit

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.

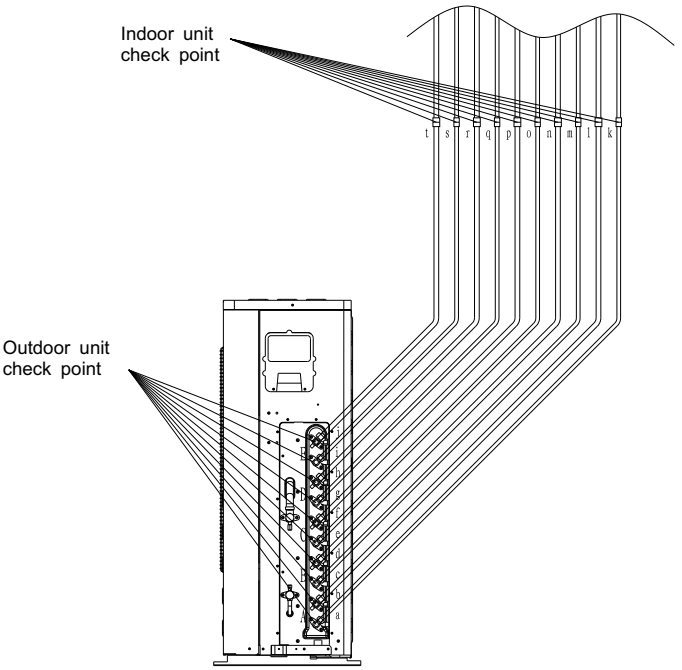


Fig 42

A, b, c, d, e, f, g, h, k, l, m, n, o, p, q and r are points for Quadruple split type.
a, b, c, d, e, f, g, h, i, j, k, l, m, n,o, p, q, r, s and t are points for Quintuple split type.

TEST RUNNING

6.1 Dialing setting of main control board

Switch No.	Dialing Illustration			
SW3		16k		28K
		18K		36K
		21K		42K
		27K		

Table 6-1 Capacity setting

6.2 Outdoor unit spot-check instructions

Table 6-2 Outdoor Unit Spot-check Instructions

No.	Spot-check Content	No.	Spot-check Content
1	Current frequency/number of indoor units (stand by display)	17	Opening degree of electronic expansion for indoor "A" valve = spot-check display value × 8
2	Capacity of outdoor unit	18	Opening degree of electronic expansion for indoor "B" valve = spot-check display value × 8
3	Total capacity need of indoor unit	19	Opening degree of electronic expansion for indoor "C" valve = spot-check display value × 8
4	Total capacity needs of corrected host	20	Opening degree of electronic expansion for indoor "D" valve = spot-check display value × 8
5	Operation mode (0-4)	21	Opening degree of electronic expansion for indoor "E" valve = spot-check display value × 8
6	Actual running ability of outdoor unit	22	AC transformer current
7	Gears of fan (0-7)	23	Secondary side current
8	T2 / T2 B average temperature	24	Input AC voltage
9	T3 temperature of outdoor condenser	25	Secondary side current - (spot-check display × 4)
10	T4 environmental temperature	26	Number of indoor units
11	T5 exhaust temperature	27	Number of indoor unit working
12	Capacity need of indoor unit "A"	28	Last fault protection code (no fault display -)
13	Capacity need of indoor unit "B"	29	Control parameters (only for use of development personnel), display "--"
14	Capacity need of indoor unit "C"	30	Control parameters (only for use of development personnel)
15	Capacity need of indoor unit "D"		
16	Capacity need of indoor unit "E"		

Definition of operation mode: 0-OFF/Fan; 2-Cooling; 3-Heating; 4-Forced cooling.

Table 6-3 Outdoor Unit Fault Code

Fault Code	Fault Contents	Remark
E1	Outdoor unit phase-sequence fault	
E2	Communication fault between the outdoor unit and the host	20-minute break at first or 2-minute break later
E4	Environmental temperature sensor fault	
E6	Condenser pipe temperature sensor fault	
E9	AC over-voltage / under-voltage protection	
E10	EEPROM fault	
H0	DSP and 0513 communication failure	

Table 6-3 Outdoor Unit Fault Code

Fault Code	Fault Contents	Remark
H4	Display P6 protection for 3 times within 30 minutes	
H5	Display P2 protection for 3 times within 30 minutes	20-minute break at first or 2-minute break later
H6	Display P4 protection for 3 times within 100 minutes	Restore when powering on
H9	Display P9 protection for 2 times within 10 minutes	Restore when powering on
H10	Display P3 protection for 3 times within 60 minutes	Restore when powering on
P1	High pressure protection	
P2	Low pressure protection	Display H5 after P2 protection for 3 times within 30 minutes
P3	Various frequency over-current protection	
P4	Exhaust overheating protection	Display H6 for 3 times within 100 minutes
P5	T3 high temperature protection	
P6	Module protection	Display H4 after P6 protection for 3 times within 30 minutes
P9	DC fan fault	Display H9 after P9 protection for 2 times within 10 minutes
P10	Anti-typhoon protection	
P11	T2 high temperature protection	
L0	DC compressor module fault	
L1	DC bus low voltage protection	
L2	DC bus high voltage protection	
L4	MCE fault / sync / closed loop	
L5	Zero speed protection	
L7	Phase sequence error protection	
L8	Protection when the speed change of two successive periods exceeds 15Hz	
L9	Protection of speed change (> 15Hz) for the previous time and the next time	

6.3 Inspection and confirmation before debugging

1. Check and make sure the refrigerating pipeline and communication line connecting with the indoor and outdoor units are connected with the same refrigerating system. Otherwise, some running faults occur. .
2. The power supply voltage is within the rated voltage of ±10%.
3. Check and make sure the power supply line and the control line are correctly connected.
4. Before power-on, make sure there is no short circuit.
5. Check if all units have passed 24-hour nitrogen pressure-maintaining (40kgf /cm2) test.
6. Make sure the debugged system is fully vacuumized, dried and filled with the refrigerant as specified.

6.4 Preparation before debugging

1. Calculate the refilling volume of refrigerant for each set of units according to the length of on-site liquid pipe.
2. Prepare the required refrigerant.
3. Prepare the system plan, system piping diagram and control wiring diagram.
4. Mark the set address codes on the system plan.
5. Turn on the power supply switch of the outdoor unit in advance, and make sure it is power-on for more than 12 hours, so that the heater heats the compressor oil.
6. Fully open air pipe check valve, liquid pipe check valve and oil balance valve of the outdoor unit. If they are fully opened, the machine may be damaged.
7. Check if the power supply phase sequence of the outdoor unit is correct.
8. Check if all dialing switches of the indoor and outdoor units are set according to the technical requirements of the product.

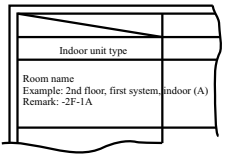


Fig. 6-4 Filling of Names of Connecting Systems

6.5 Filling of names of connecting systems

When the multiple indoor units are arranged, in order to distinguish the connecting systems of indoor and outdoor units, all systems shall be named respectively and recorded on the nameplate on the electronic control box cover of the outdoor unit.

6.6 Precautions against refrigerant leak

1) The refrigerant of the air conditioner is harmless and nonflammable.
2) The room for the air conditioner shall have an appropriate space. In case of refrigerant leak, it cannot go beyond the critical concentration. In addition, necessary measures can be taken.
3) The critical gas concentration harmless to the human body is 0.3 kg/m^3.
4) Confirm the critical concentration according to the following steps and take corresponding measures.
   a) Calculate the filling volume of refrigerant (A[kg])
      Volume of refrigerant = filling volume of refrigerant before delivery (see the nameplate) + refilling volume of refrigerant corresponding to the length of pipe
   B) Calculate the indoor volume (B [m^3]) (by the minimum volume)
c) Calculate the refrigerant concentration

$$\frac{A[kg]}{B[m^3]} \leqslant \text{Critical concentration:0. 3[Kg/m}^3\text{]}$$

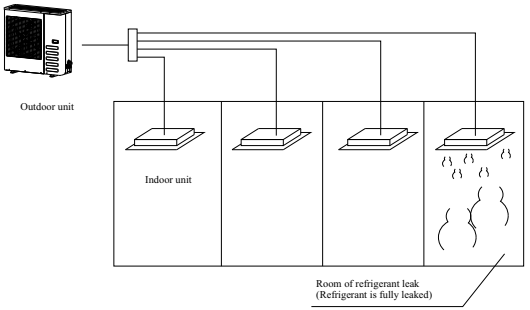
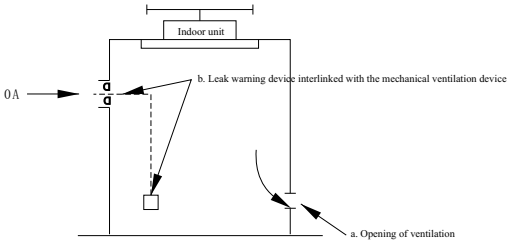


Fig. 6-2 Refrigerant Leak

5) Measures against exceeding the critical concentration
   a) To reduce the refrigerant concentration below the critical concentration, install a mechanical ventilation device (for frequent ventilation).



(The leak warning device shall be installed in the gathering place of refrigerant.)

Fig. 6-3 Mechanical Ventilation Device

G-SA-ZM02ENG-0
802000190206

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