SDV5

FULL DC INVERTER SYSTEMS

INSTALLATION MANUAL

INDOOR CASSETTE UNITS SDV5-56-112CA

COMMERCIAL AIR CONDITIONERS SDV5

sinclair

Original instructions

IMPORTANT NOTE:
Read this manual carefully before installing or operating your new air conditioning unit. Make sure to save this manual for future reference.

CONTENTS PAGE

1. PRECAUTIONS

- **Comply with local, national and international laws and regulations.**
- **Read "PRECAUTIONS" carefully before installation.**
- **The following precautions include important safety items. Strictly follow them.**
- **Keep this manual with the owner's manual in a handy place for future reference.**

The safety precautions listed here are divided into two categories. In either case, important safety information is listed, which you must read carefully.

WARNING

Failure to observe a warning may result in death.

CAUTION

Failure to observe a caution may result in injury or damage to the equipment.

After completing the installation, ensure that the unit operates properly during start-up. Instruct the customer on how to operate the unit and keep it maintained. Also, inform customers that they should store this installation manual along with the owner's manual for future reference.

WARNING

Only qualified service personnel can install, repair, or service the equipment. Installation must be performed in accordance with the requirements of NEC and CEC by authorized personnel only.
Improper installation, repair, and maintenance may result in electric shocks, short-circuit, leaks, fire or other damage to the equipment.

Strictly perform installation according to these installation instructions.
If installation is defective, it may cause water leaks, electric shocks, or a fire.

When installing the unit in a small room, take measures to keep the refrigerant concentration from exceeding allowable safety limits in the event of refrigerant leakage.
Contact the place of purchase for more information.
Excessive refrigerant in a closed ambient environment can lead to oxygen deficiency.

Only use the attached accessories parts and specified parts for installation.
Otherwise, it may cause the set to fall, water leaks, or electrical fires.

Install in a strong and firm location that can with stand the unit's weight.
If the installation area is not strong enough or installation is not properly done, the set may fall and cause injury.

The appliance must be installed at least 2.3m above the floor.

The appliance should not be installed in a laundry room.

Before obtaining access to terminals, all supply circuits must be disconnected.

The appliance must be positioned so that the plug is accessible.

The enclosure of the appliance must be marked by word or symbols, including the direction of fluid flow.

For electrical work, follow the national wiring standards, regulations, and these installation instructions. An independent circuit and single outlet must be used.
If the electric circuit capacity is insufficient or electrical work is defective, an electrical fire may result.

Use the specified cable, connect it tightly and clamp the cable so that no external force will act on the terminal.
If connection or fixing is imperfect, over-heating or a fire at the connection point may occur.

Wiring routing must be properly arranged so that the control board cover is fixed properly.
If the control board cover is fixed imperfectly, it may cause overheating at the connection point of the terminal, a fire, or electric shocks.

If the supply cord is damaged, it must be replaced by the manufacture or its service agent or a similarly qualified person to avoid a hazard.

An all-pole disconnection switch must have a contact separation of at least 3 mm, and the poles should be connected with fixed wiring.

When connecting the pipes, do not let air get into the refrigeration cycle.
Otherwise, it will lower capacity and may cause abnormally high pressure in the refrigeration cycle, an explosion, and injury.

Do not modify the length of the power supply cord or use an extension cord, and do not share the single outlet with other electrical appliances.
Otherwise, it may cause a fire or electric shocks.

Carry out the specified installation work after considering the possibility of strong winds, typhoons or earthquakes.
Improper installation work may result in the equipment falling and causing accidents.

If the refrigerant leaks during installation, ventilate the area immediately.
Toxic gas may be produced if the refrigerant comes into contact with fire.

After completing the installation work, check that the refrigerant does not leak.
Toxic gas may be produced if the refrigerant leaks into the room and comes into contact with a source of fire, such as a fan heater, stove or cooker.

CAUTION

Ground the air conditioner.
Do not connect the ground wire to gas or water pipes, lightning rods, or a telephone ground wire. Incomplete grounding may result in electric shocks.

Be sure to install an earth leakage breaker.
Failure to install an earth leakage breaker may result in electric shocks.

Connect the outdoor unit wires, then connect the indoor unit's wires.
Do not connect the air conditioner with the power source until the wiring and piping is completed.

When following the instructions in this installation manual, install drain piping to ensure proper drainage and insulate piping to prevent condensation.
Improper drain piping may result in water leaks and property damage.

Install the indoor and outdoor units, power supply wiring and connecting wires at least 1 m away from televisions or radios to prevent image interference or noise.
Depending on the radio waves, a distance of 1 m may not be sufficient to eliminate noise.

The appliance is not intended for use by young children or the elderly without supervision.

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

Do not install the air conditioner in the following locations:
- Where there is petroleum.
- Near salty air (near the coast).
- Where there is caustic gas (e.g., sulfide, such as near a hot spring).
- Where the voltage vibrates greatly (in factories).
- In buses or cabinets.
- In kitchens due to oil vapor.
- The appliance should not be installed in a laundry room.
- Where there is a strong electromagnetic wave.
- Where there are inflammable materials or gas.
- Where acid or alkaline liquid evaporates.
- Other special conditions.

2. INSTALLATION INFORMATION

- **To install the unit properly, please read this Installation Manual.**
- **The air conditioner must be installed by qualified personnel.**
- **When installing the indoor unit or its tubing, follow this manual as strictly as possible.**
- **If the air conditioner is installed on a metal part of the building, it must be electrically insulated according to the relevant standards for electrical appliances.**
- **When all the installation work is completed, please turn on the power only after it has been thoroughly checked.**
- **Notice will not be given regarding any changes to this manual due to product improvements.**

INSTALLATION ORDER

- Select the location;
- Install the indoor unit;
- Install the outdoor unit;
- Install the connecting pipe;
- Connect the drain pipe;
- Wiring;
- Test operation.

3. ATTACHED FITTINGS AND LOCAL PURCHASED COMPONENTS

Please check whether all the following fittings have been included. If there are some spare fittings, please store them carefully.

Table: 3-1 ATTACHED FITTINGS

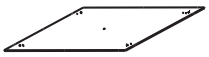
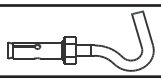
	NAME	SHAPE	QUANTITY
INSTALLATION FITTINGS	1. Installation manual		1
	2. Nut		8
	3. Washer		8
	4. Installation paper board		1
	5. Bolt M6		4
Tubing & Fittings	6. Soundproof / insulation sheath		2
	7. Sponge I(250*250*8)		1
	8. Sponge II(60*100*5)		1
Drainpipe Fittings	9. Outlet pipe sheath		1
	10. Outlet pipe clasp		1
	11. Tightening band		11
	12. Flexible hose tube		1
Others	13. Copper (Use for connecting pipes during engineering installation)		1
	14. Protecting bush		3
	15. Connecting wire		1

Table: 3-2 LOCAL PURCHASED COMPONENTS

NAME	SHAPE	SPECIFICATIONS	QUANTITY	REMARK
Copper pipe		Liquid side pipe / Air side pipe: Refer to Table: 6-1, Table: 6-2	Select according to actual needs	Used for connecting the indoor unit refrigerant system and use flexible copper pipe (T2M)
PVC pipe		The external diameter is about 37-39 mm. The inner diameter is 32 mm	Select according to actual needs	Used to drain the water in the indoor unit
Heat insulation casing pipe		The inner diameter corresponds to the copper pipe and PVC pipe. The thickness should be 10 mm (above). It should be thicker in humid areas.	Select according to actual needs	Used to prevent condensation
Expansible hook		M10	4	Used to install the indoor unit.
Installation hook		M10	4	Used to install the indoor unit.

4. INSTALLATION

4.1 Installation place

(Refer to Fig. 4-1, Fig. 4-2, Fig. 4-3 and Table: 4-1 for specification.)

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

- Avoid narrow spaces that are sensitive to noise.
- The ceiling must be flat and able to bear the weight of the indoor unit.
- The outlet and the inlet must not be impeded and there must be minimal influence from the outside air.
- The air flow extends throughout the room.
- The connecting pipe and drainpipe can be removed easily.
- There is no direct radiation from heaters.
- Do not install it in places where the air has high salt content. If this can't be avoided, choose an anticorrosive model.

CAUTION

Installing the equipment in any of the following places may lead to equipment faults: (If this is unavoidable, consult the supplier.)

A. The site contains mineral oils such as cutting lubricant.
B. Where the air is salty, e.g., on the coast.
C. Hot springs and where there are corrosive gases, e.g., sulfides.
D. Factories where the supply voltage fluctuates greatly.
E. Inside a car or cabin.
F. Places like kitchens where there's a lot of oil.
G. Places with strong electromagnetic waves.
H. Places where flammable gases or materials exist.
I. Places where acid or alkali gases evaporate.
J. Other special environments.

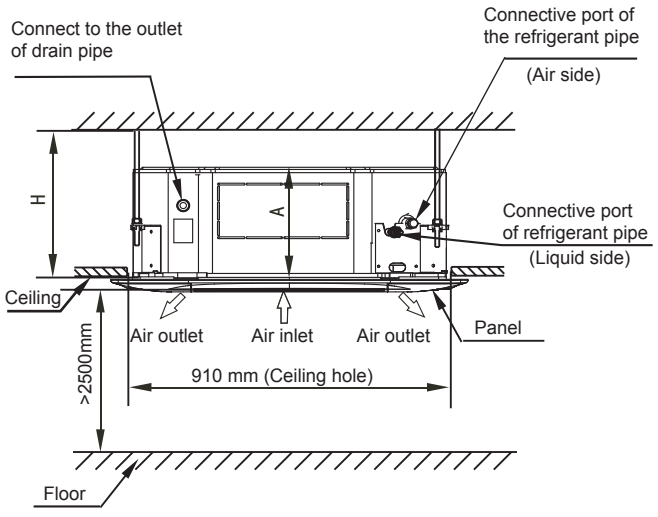


Fig. 4-1

Table: 4-1

Indoor unit	A (mm)	H (mm)
≤ 8000 W	230	≥260
≥ 9000 W	300	≥330

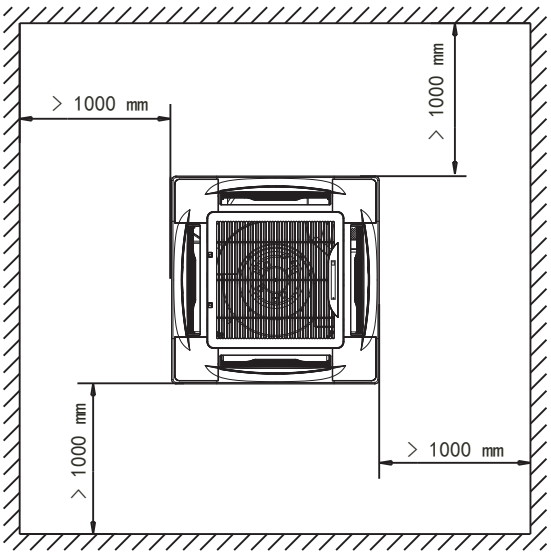


Fig. 4-2

4.2 Air supply direction

Select the following air supply directions based on your room and installation site:

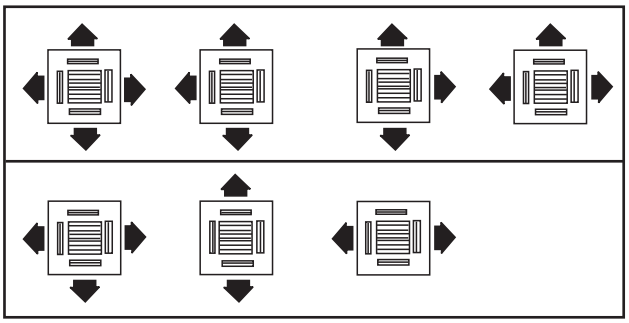


Fig. 4-3

1. Once you change the air supply direction, please replace the wind shield materials. For details of wind shield materials, please consult our dealer.
2. In relation to the air supply direction, remove the panel before installing the wind shield material, and then insert the wing shield panel into air outlet of main body.

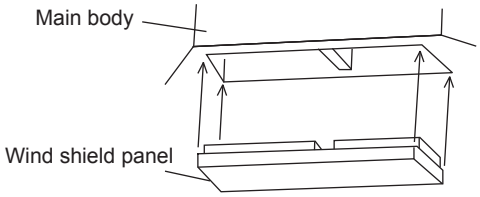


Fig. 4-4

WARNING

- Install the unit in a location that can bear its weight.
- Insufficient support will cause the unit to fall, which may cause injury.
- Special installation methods can prevent the unit be blown around by strong winds or shocked by earthquakes. Improper installation can cause an accident.

4.3 Install the main body

■ **The existing ceiling (to be horizontal)**

1 Cut a quadrangular hole of 910 x 910 mm in the ceiling according to the shape of the installation paper board. (*refer to Fig. 4-4, Fig. 4-6 and Fig. 4-7)*

- The center of the hole should be in the same position the air conditioner body's center.
- Determine the lengths and outlets of the connecting pipe, drainpipe and cables.
- To balance the ceiling and to avoid vibration, please reinforce the ceiling when necessary.

2 Select the position of the installation hooks according to the hook holes on the installation board.

- Drill four holes of ϕ12 mm, 45-50 mm deep at the selected positions on the ceiling. Then embed the expansible hooks.
- Face the concave side of the installation hooks toward the expansible hooks. Determine the length of the installation hooks from the height of ceiling. Then cut off the unnecessary part.
- If the ceiling is extremely high, determine the length of the installation hook according to facts.

3 Adjust the hexangular nuts on the four installation hooks evenly to ensure the balance of the body.

- If the drainpipe is incorrectly installed, leaks will be caused by the malfunction of the water-level switch.
- Adjust the position to ensure the gaps between the body and the four sides of ceiling are even. The body's lower part should sink into the ceiling to a depth of 10-12 mm *(refer to Fig. 4-9)*.
- Locate the air conditioner firmly by wrenching the nuts after having adjusted the body's position. *(Refer to Fig. 4-10)*

■ **Newly built houses and ceilings**

1 In the case of new built house, the hook can be embedded in advance (refer to 2 mentioned in the existing ceiling). But it should be strong enough to bear the indoor unit and not become loose because the concrete has shrunk.

2 After installing the body, fasten the installation paper board onto the air conditioner with bolts (M6X12) to determine in advance the sizes and positions of the hole opening on the ceiling. *(Refer to Fig. 4-5)*

- Please guarantee the horizontal flatness of the ceiling when installing it.
- Refer to 1 mentioned in the existing ceiling.

3 Refer to 3 mentioned in the existing ceiling.

4 Remove the installation paper board.

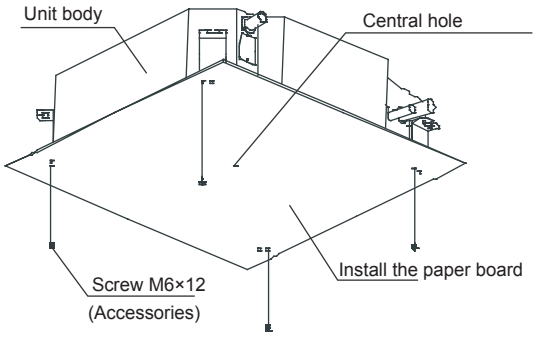


Fig. 4-5

CAUTION

- Before installing the indoor unit, first remove the buffer between the fan and flared mouth. Otherwise, the fan motor will be damaged *(See Fig. 4-6)*.
- Ensure that the indoor unit is placed horizontally.

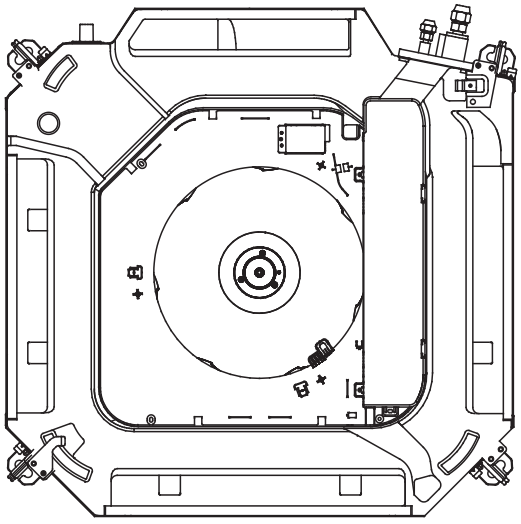


Fig. 4-6

(Unit: mm)

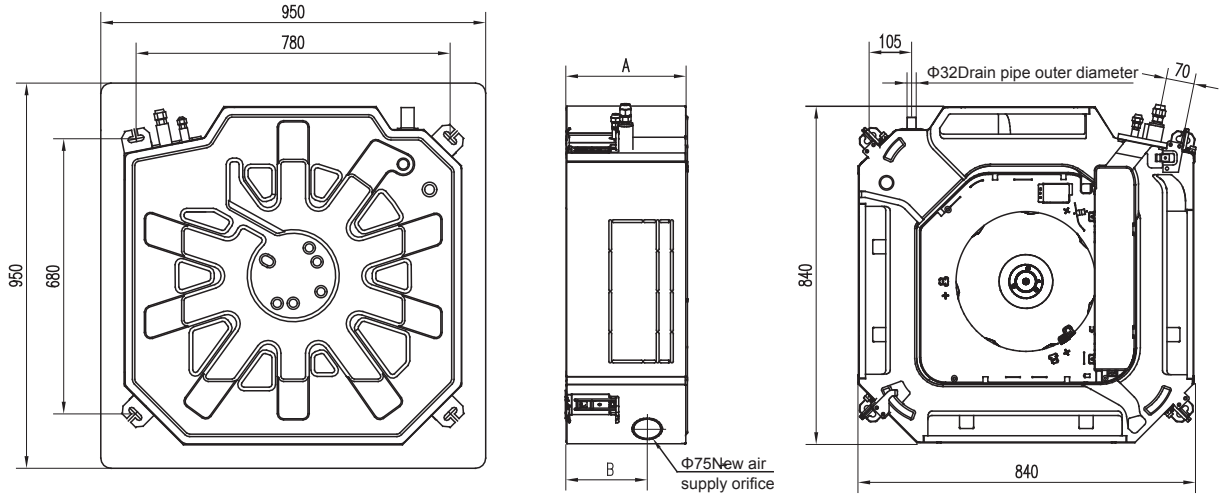


Fig. 4-7

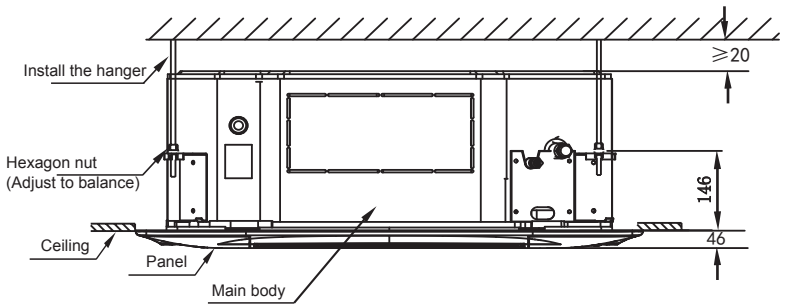


Fig. 4-8

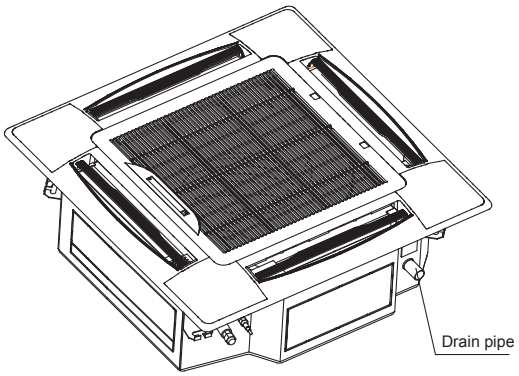


Fig. 4-9

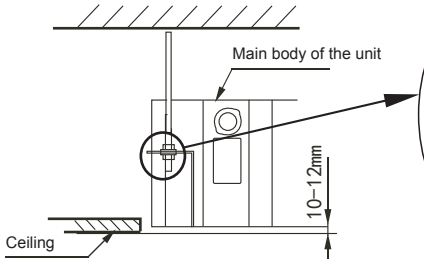


Fig. 4-10

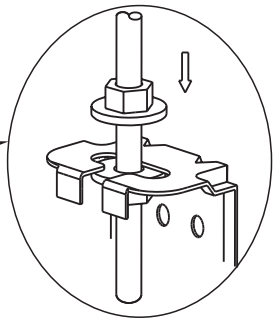


Fig. 4-11

Table: 4-2

Indoor unit model	A (mm)	B (mm)
≤ 8000 W	230	126
≥ 9000 W	300	197

NOTE

All illustrations in this manual are for reference only. They may be slightly different from the air conditioner you purchased (depending on the model). Refer to the actual shape.

4.4 Procedure for installing the pendant bolt

Based on the unit structure, set the screw-pitch according to the size of the following figures:

Table: 4-3

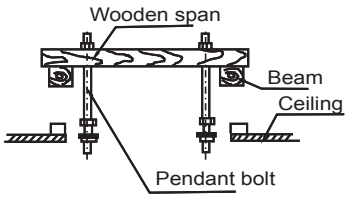
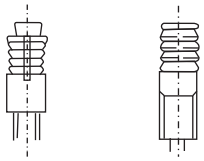
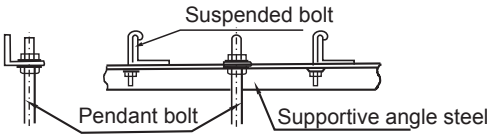
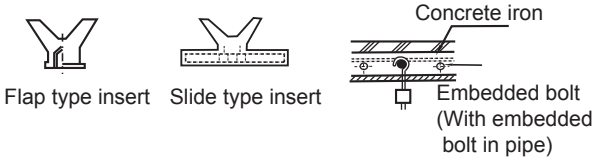
Wooden structure
Put rectangular sticks across the beams and set pendant bolts. 
Old concrete roughcast
Use embedded bolts and embedded pulling plugs. 

Table: 4-4

Steel beam and girder structure
Set and use supportive angle steel. 
New concrete roughcast
Set it with embedded bushes or embedded bolts. 

CAUTION

- The bolt is high-quality carbon steel (galvanized or coated with other anti-rust materials) or stainless steel.
- The ceiling anti-rust measures must be conducted in line with actual construction. For details, consult a building engineer.
- Suspending bolts must be fixed.

4.5 Install the panel

CAUTION

- **Never put the panel face down on floor or against the wall, or on irregularly shaped objects.**
- **Never drop or strike it.**

1. Remove the air-in grill.

1) Slide two grill switches toward the middle at the same time, and then pull them up. *(Refer to Fig.4-12)*

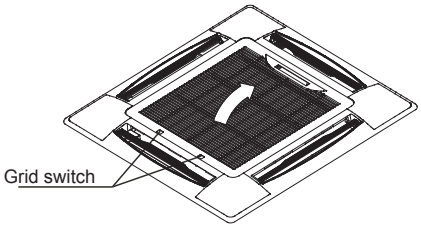


Fig.4-12

2) Draw the grill up to an angle of about 45°, and remove it. *(Refer to Fig.4-13)*

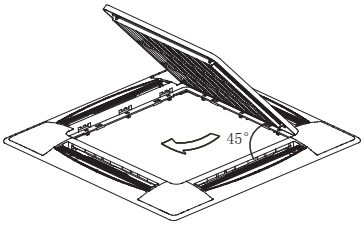


Fig.4-13

2. Remove the installation covers at the four corners.

Wrench off the bolts, loosen the rope of the installation covers, and remove them. *(Refer to Fig.4-14)*

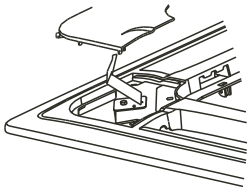


fig.4-14

3. Install the panel

1) The part of the panel marked “PIPING SIDE” and “DRAIN SIDE” must be aligned with the piping outlet and drainpipe outlet from the main body.

2) Fix hooks of the panel at the swing motor and its opposite sides to the hooks of the corresponding water receiver. (Refer to *Fig.4-15 a*) Then hang the other two panel hooks onto the corresponding hangers of the body(Refer to *Fig.4-15 b*). Use the protecting bush to protect the motor line after connecting.

3) Insert the conducting wire of the sway motor into the conducting slot inside of panel. Then, connect the sway motor terminals’ holder to the terminal in the main electric control box.

4) Adjust the four panel hook screws to keep the panel horizontal, and evenly screw them into the ceiling. (Refer to *Fig.4-15 c*)

5) Regulate the panel in the direction of the arrow in Fig 4-14 slightly to fit the panel's center to the center of the ceiling's opening. Guarantee that the hooks of the four corners are fixed well.

6) Keep fastening the screws under the panel hooks until the thickness of the sponge between the body and the panel's outlet has been reduced to about 4-6mm. The edge of the panel should touch

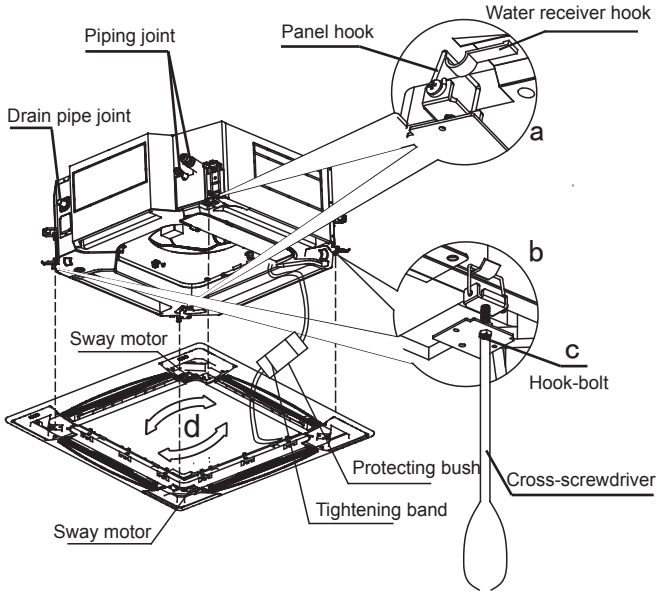


Fig.4-15

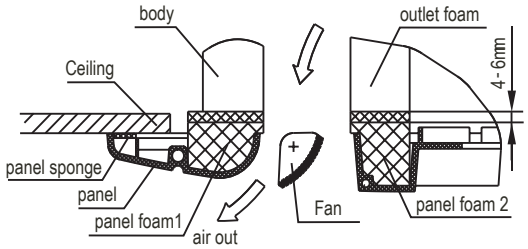


Fig.4-16

CAUTION

1) Insert the sealant plastic cap in the sway motor in the notch of the water outflow pipe seal board.

2) Do not coil the wiring of the swing motor into the seal sponge.

3) Malfunction described in *Fig.4-17* can be caused by inappropriate tightness the screw.

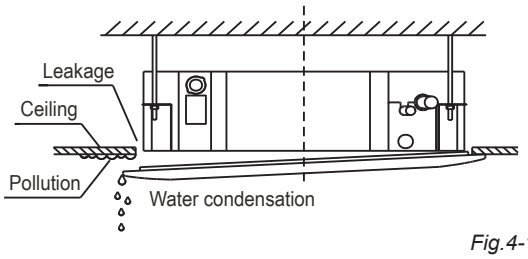


Fig.4-17

4) If the gap between the panel and ceiling still exists after fastening the screws, the height of the indoor unit should be modified again. (*Refer to Fig.4-18*)

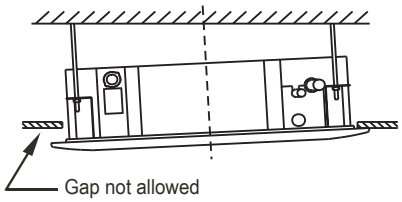


Fig.4-18

5) You can modify the height of the indoor unit through the openings on the panel's four corners, if the lift of the indoor unit and the drainpipe is not influenced *(refer to Fig.4-19).*

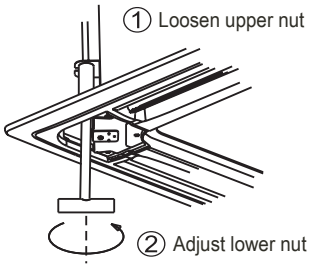


Fig.4-19

4. Hang the air-in grill to the panel. Then, connect the lead terminator of the swing motor and that of the control box with the corresponding terminators on the body.

5. Re-install the air-in grill in reverse order.

6. Re-install the installation cover.

1) Fasten the rope of the installation cover on the bolt of the installation cover. (*Refer to Fig.4-20*)
2) Press the installation cover into the panel lightly. (*Refer to fig.4-21*)

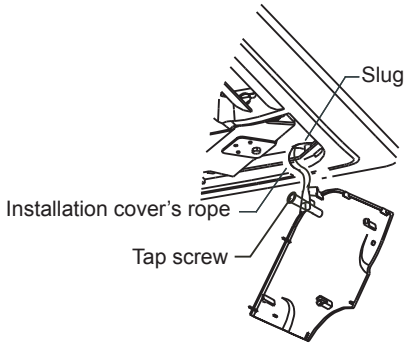


Fig.4-20

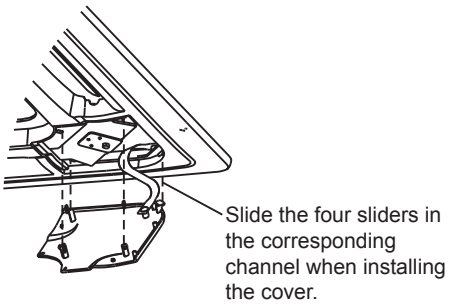


Fig.4-21

4.6 Install the distribution duct

Conditioned air can be distributed by a distribution duct.

NOTE

Model	Series
2800-8000W	Series A=350 mm; Series B=85 mm Series C=107 mm; Series D=126 mm Series E=121 mm; Series F=145 mm
9000-14000W	Series A=350 mm; Series B=155 mm Series C=107 mm; Series D=197 mm Series E=121 mm; Series F=145 mm

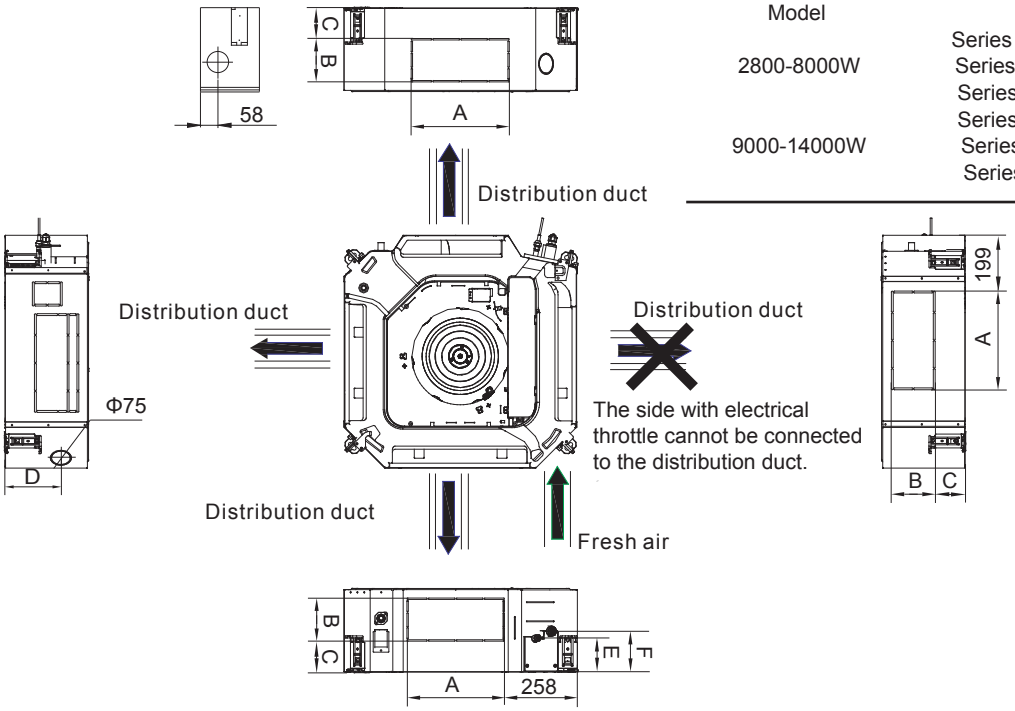


Fig.4-22

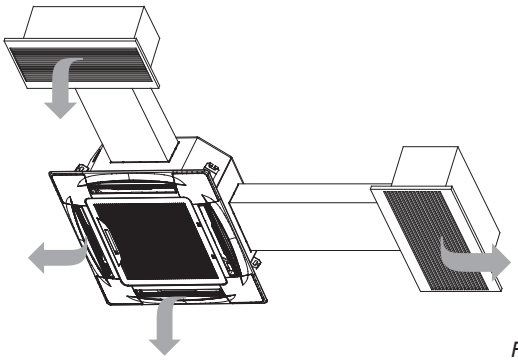


Fig.4-23

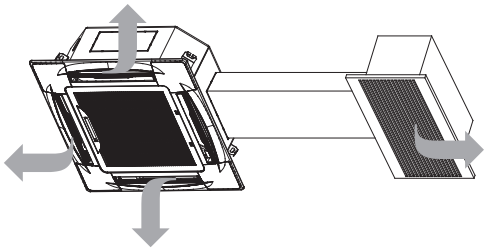


Fig.4-24

- In case of one duct connection
  The air volume in duct is around 300-360 m^3/h for 5600 W to 8000 W unit
  The air volume in duct is around 400-640 m^3/h for 9000W to 14000W unit
  The max. length of duct is 2 m
  The original air outlet with the same direction of duct should be sealed
- In case of two duct connection
  The air volume in one duct is around 200-260m^3/h for a 5600 W to 8000 W unit
  The air volume in one duct is around 300-500m^3/h for a 9000W to 14000W unit
  The max. length of duct is 1.5 m for one duct
  The original air outlet with the same direction of duct should be sealed

5. LAYOUT THE DRAIN PIPE

5.1 Install the drain pipe of the indoor unit

1) The drainpipe can use PVC pipe. (The external diameter about 37-39 mm. The inner diameter is 32 mm.)

2) Joint drainpipe connector to the end of the water pumping pipe. Fix the drainpipe together with the water outflow pipe and thermal insulation tube by clasping the water outflow pipe (attached).

CAUTION

Don't force water-pumping pipe or you might crack it.

3) The water-pumping pipe and drainpipe from the main body must be evenly wrapped with insulation tube and bound tightly with a band to stop air from getting in and also coagulation.

4) Prevent water backflow into unit during shutdown. The drain pipe must be placed downwards and water drained to outdoors (drain side). The gradient of the drain pipe should be higher than (1/100), without salination and water remaining. (*Refer to Fig.5-1 a*)

5) When connecting the drainpipe, do not drag the pipe attached to the main unit. For this, arrange bearing points at every 0.8 to 1.0 meter to avoid bending the pipe (See *Fig.5-1 b*).

6) When connecting a length of drainpipe, apply protective tube to wrap its indoor parts to connect it tightly.

7) If the drainpipe outlet is higher than the pumping connective pipe of the main body, the drainpipe must be arranged upwards vertically by using connective assembly of the water outlet for vertical bending. The height of the drainpipe must be set to the defrosting pan surface no more than 1000 mm. Too much backflow during shutdown would lead to overflow (*Refer to Fig.5-2*).

8) Based on the actual requirements for bending the pipe, use the connective assembly of the water outlet in the terminal box for pipe layout.

CAUTION

The joints in drain system must be sealed to avoid water leaks.

9) The height from the floor to the end of the drainpipe or the bottom of drain slot must more than 50 mm. Don't immerse the end of the drainpipe or the bottom of the drain slot into water. When draining condensation, bend the drainpipe into a U-shaped hydroseal to avoid odor transferring from the drainpipe to indoors.

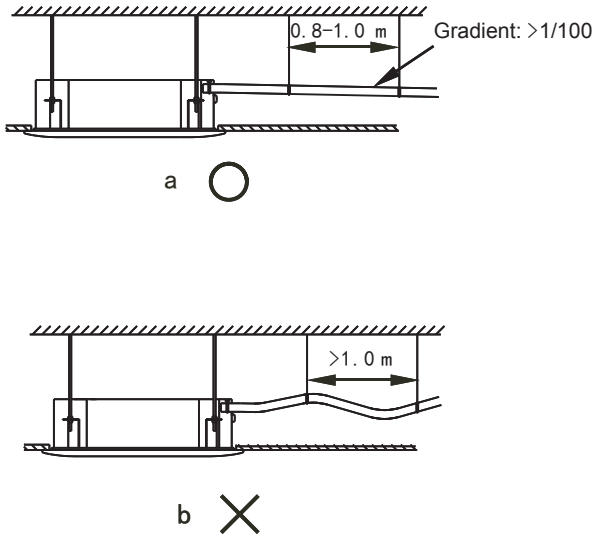
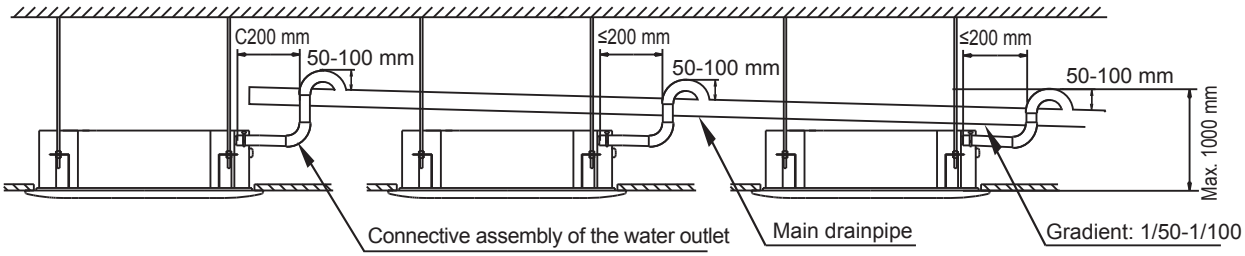


Fig.5-1



Drainpipes from many units converge and discharge water to and from the main drainpipe.

Fig. 5-2

5.2 Drain test

1. Before testing, ensure that water can drained well and check all joints are sealed.

2. The drainage test must be done before constructing the ceiling of a new house.

1) Remove the water finding cap, charge 2000 ml water into a defrosting pan through the water orifice by a water charged pipe. (See *Fig. 5-3*)

2) Power on the unit and run cooling mode. Check that the noise of the water drain pump is normal and that water discharges well. (Depending on the length of the drainage pipe, it may take about one minute for water to start draining.) Then, check whether the joints leak.

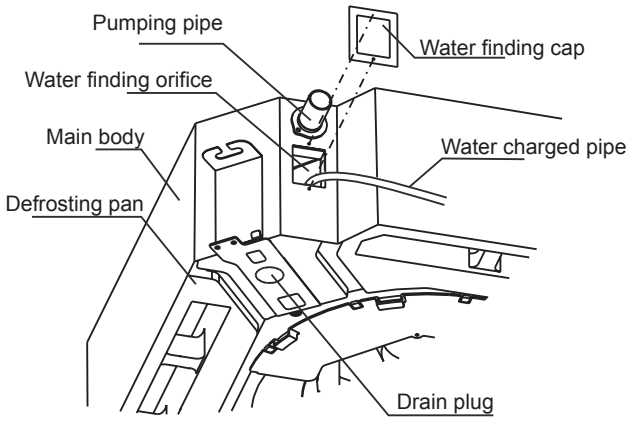


Fig. 5-3

CAUTION

If an error occurs, solve the problem asap.

3) Stop the air conditioner and check for the problem in about 3 minutes. Improperly setting the drainpipe can lead to water backflow and cause the alarm detector in the control box flash or water to overflow from the defrosting tray.

4) The alarm will flash if water level exceeds the alarm threshold. Please check whether the drain pump is in water discharge mode. If the level does not decrease to under the alarm threshold within 3 minutes, the unit will close down. You must switch of the power and discharge the accumulated water. Then, the unit can restart normally.

5) Cut off the power, discharge the accumulated water, and reset the test cap to its original position.

CAUTION

A drain plug at the bottom of main unit is used for discharging any accumulated water in the defrosting tray when an error occurs. During normal operations, ensure that this plug is inserted tightly to prevent water leaks.

6. INSTALL THE CONNETING PIPE

6.1 The connective length of indoor and outdoor piping and those height difference requirements.

Connect to different outdoor units with a different connective length based on height difference requirements. Please refer to Indoor Unit Installation Manual for details.

6.2 Piping materials and size

1) Piping materials: Copper tube special for air conditioner, normally T2M.

2) Piping size: Refrigerant is R410A, please refer to Table: 6-1

Table: 6-1

Indoor unit model	Piping size (mm)	
	Liquid side	Air side
≤4500W	φ6. 4	φ12. 7
≥5600W	φ9. 5	φ15. 9

Applicable for models that use R410A refrigerant

6.3 Procedure for connecting pipes

1. Measure the required length of the connective pipes and configure them as per the following procedure. (Refer to the Pipeline Connection for details)

1) Connect the indoor unit first, and then connect the outdoor unit.
a. The pipe bend should be handled carefully to prevent damaging the pipe and insulation layer.
b. Before fastening the flared nut, apply refrigerant oil on the outer surface of the pipeline flare and the taper surface of the connection nut. Rotate the nut for 3-4 times before fastening it (see *Fig.6-1*).

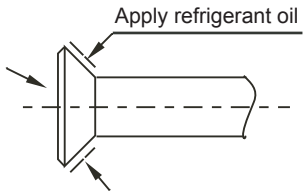


Fig.6-1

c. When connecting or disconnecting the pipe, use two wrenches at the same time.
d. Do not rest the weight of the connective pipe on the adapter for the indoor unit. Excessive load on the adapter of the indoor unit may deform the pipe and thus affect the cooling/heating effect.

2) The valve of the outdoor unit should be closed completely (as in factory status). Every time when connecting the pipe, screw the valve nut, and connect the flared pipe (within 5 minutes). If the nut is left loose for a long time on the valve, dust and other foreign substances may enter the pipeline system and lead to fault.

3) After the refrigerant pipe is connected to the indoor and outdoor units, expel air as instructed in the “Expel air” section. After expelling the air, screw the nut in the maintenance hole. a. Precautions for the flexible part of the pipeline
i. The bend angle must not exceed 90°. (See *Fig.6-2*)

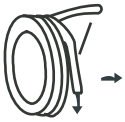
Use your thumb to bend the pipe

Minimum radius 100 mm

Fig.6-2

ii. The bend shall be preferably in the middle of the pipe length and higher bend radiuses are preferred.
iii. Do not bend the flexible pipe more than 3 times.

b. Bend the thin-wall connective pipe (See *Fig.6-3*)



→ Method for unravelling the spooled pipe. Straighten the pipe end

Fig.6-3

i. When bending the pipe, cut out a notch at the desired size at the bend of the adiabatic pipe, and then expose the pipe (wrap the pipe with the wrapping tape after bending it).
ii. The radius of the elbow pipe should be as large as possible to prevent flattening or crushing.
iii. Use the pipe bender to close the elbow pipe.

c. Buy and use a copper pipe
When the copper pipe is purchased from the market, use the same type of heat insulation materials (with a thickness of over 9 mm).

2. Deploy the pipelines

1) Drill a porthole on the wall, and put the hole sheath and hole cover through the wall.

2) Place the connective pipe together with the indoor & outdoor connection wires. Use wrapping tape to tie them tightly. Do not let air enter or condensation will form.

3) Pull the connective wrapped connective pipe from outdoors through the sheath, through the wall, and lead it into the room.

3. Make a vacuum from the connective pipeline.

4. After the above steps are completed, the spool of the valve of the outdoor unit should be completely open, and the refrigerant pipeline of the indoor unit and the outdoor unit should be smooth.

5. Use a leak detector or soapy water to detect leaks.

6. Put on an adiabatic envelope (accessory) on the connective pipe adapter for the indoor unit and wrap it tightly with wrapping tape to prevent condensation from forming and leaks.

6.4 Pipeline connection

1. Flare
1) Use a pipe cutter to cut off the pipe (See *Fig.6-4*)

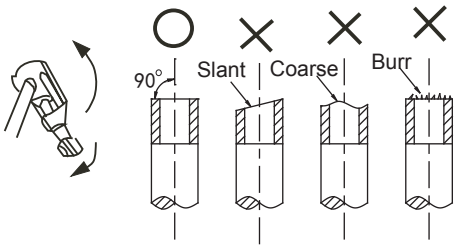
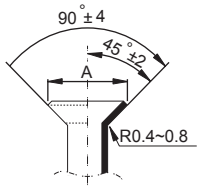


Fig.6-4

2) Pull the pipe into the rear flare of the connective nut. (Refer to *Table: 6-3*)

Table: 6-3

Outer diameter (mm)	A (mm)	
	Max.	Min.
φ 6. 4	8. 7	8. 3
φ 9. 5	12. 4	12. 0
φ 12. 7	15. 8	15. 4
φ 15. 9	19. 0	18. 6
φ 19. 1	23. 3	22. 9



2. Tighten the nut
Align with the connective pipe, start fastening the connection pipe nut by hand and use a spanner to tighten it as shown in *Fig.6-5*.

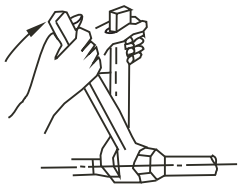


Fig.6-5

CAUTION

According to the installation conditions, excessive torque will damage the flaring and too little will lead to looseness and leaks. Determine the tightening torque by referring to the *table: 6-4*.

Table: 6-4

Tubing size	Torque
Φ6.4mm	14.2~17.2 N.m (144~176 kgf.cm)
Φ9.5mm	32.7~39.9 N.m (333~407 kgf.cm)
Φ12.7mm	49.5~60.3 N.m (504~616 kgf.cm)
Φ15.9mm	61.8~75.4 N.m (630~770 kgf.cm)
Φ19.1mm	97.2~118.6 N.m (990~1210 kgf.cm)

CAUTION

- Be cautious when installing the connective pipe. Do not let any air, dust or other foreign substance enter the system.
- Pipe connections should be conducted after the indoor and outdoor unit are fixed.
- Connective pipes must stay dry during installation.
- Connective copper pipes must be wrapped with an insulation layer (at least 9 mm thick).
- The temperature of the refrigerant circuit will be high. Keep the interconnection cable away from the copper tube

6.5 Air expels

Apply the vacuum pump to expel air from refrigerant charging vent from the air side in the outdoor unit.
Do not apply the refrigerant inside the indoor unit for vacuum air.

6.6 Open valve

Use a 5-mm hexagon wrench to open the valve spool of the indoor and outdoor units.

6.7 Leak detection

Use soapy water to check whether gas is leaking from the adapters

6.8 Thermal insulation

To install the thermal insulation for the air side and liquid side piping. Complete insulation is required for the air side and liquid side piping because the ambient temperature is very low in cooling mode.

1) Thermal insulation of at least 120 °C material is required for the air side piping.
2) Apply the attached thermal insulation material to wrap the connective part of the indoor piping tightly without any gaps.

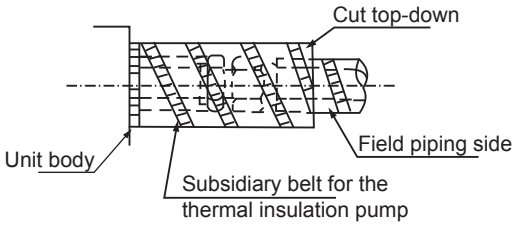


Fig.6-6

7. WIRING

7.1 Electrical wiring

CAUTION

1) Special power must be applied within the rated voltage range. The external circuit of this air conditioner must be grounded. The power cable of the outdoor unit must be jointed with external grounding wire and reliable.

2) Wiring up the electrics must be performed by professionals and completed according to the wiring label.

3) Fixing circuit must be wired with an 11-pole disconnection device with at least 3 mm switching distance from contact.

4) Set the electrical leakage device according to national regulations.

5) Power cables and signal wires must be arranged in an ordered manner so they do not interfere with each other or come into contact with connective pipes and the body of valves.

6) The attached connective wire is 10 m. If this is not long enough, replace it with a longer one at the same specifications. Normally, do not overlap the two wires, except for welding them and insulating them with an adhesive band.

7) An all-pole disconnection device, which has at least 3 mm away from all poles and a residual current device (RCD) with a rating of above 10 mA, must be incorporated in the fixed wiring scheme and comply with national regulations.

8) When the wiring is completed, start up the power once you have confirmed that all wires are correctly connected and fix tightly.

7.2 Power specifications

The power cable specifications are as follows. Too low power capacity may overheat the piping and burn out the unit.

Table 7-1

Item / Model:		Power supply for the indoor part				Connect wiring	Ground Line
		Power switch		Power cable		Signal wire for the indoor and outdoor units	
		Capacity	Safety fuse	≤ 20 m	≤ 50 m	Wire diameter	
2800W-14000W	Power supply: Signal-phase 220-240 V~ 50 Hz 220-240 V~ 50/60 Hz	15A	15A	2X2.5 mm^2	2X4.0 mm^2	Shielded wire 3 X 0.75 mm^2	Signal line 2.0 mm^2

7.3 Indoor unit power

7-3-1 A special power supply is employed for indoor units that is different from the outdoor units' supply.
7-3-2 Use a universal indoor power supply and electricity leakage protection devices and operating switches for indoor units that connect to the same outdoor unit.

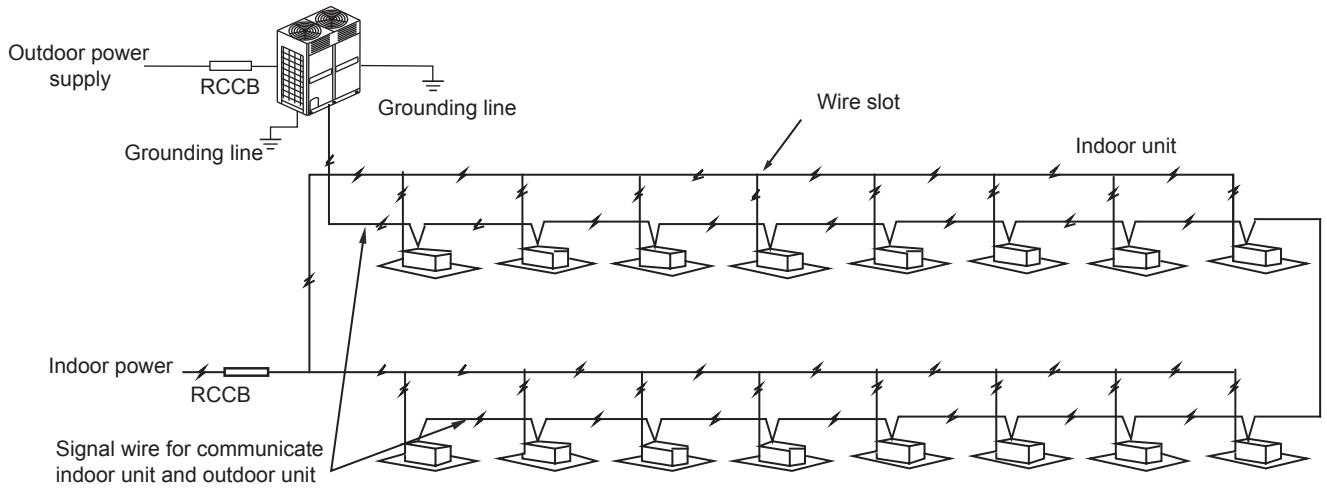


Fig. 7-1

7.4 Signal wire for communicate indoor unit and outdoor unit

This wire must be connected based on terminals' numbers. A connection error could lead to a unit malfunction.

7.5 Jointing part of wire

Apply the attached thermal insulation material to seal pipe joints. Failure to seal will lead to condensation.

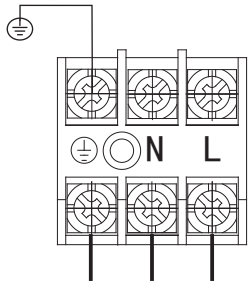
7.6 Wires in the panel

Wire the wire holder of the swinging motor according to (5.4). Install the panel.

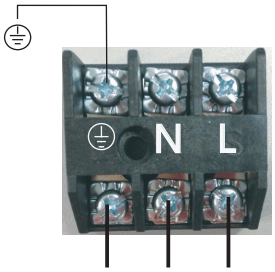
7.7 Settings diagram for the terminal holder

Please refer to the nameplate in each indoor unit for the connective method.

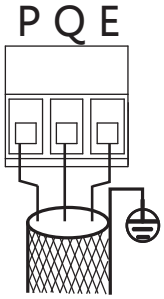
Signal-phase power supply model



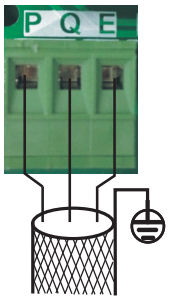
Indoor Unit Power



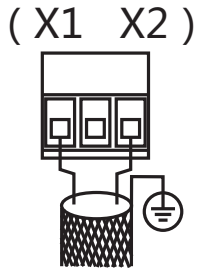
Indoor Unit Power



To outdoor/indoor units comm. bus



To outdoor/indoor units comm. bus

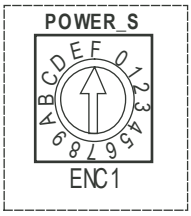


To wired controller
comm. bus

8. CONTROL OPERATION

8.1 Horsepower settings

Horsepower code



Based on different purposes for setting the switch cords on the PC panel of the indoor electrical control box. Once you complete the settings, please restart the main power supply for the settings to become active.

Table: 8-1

ENC1	Switch	For setting the cooling output
Note: Only licensed maintenance personnel can alter the cooling output that is set before shipping.	Switch cord	Setting the cooling output
	0	2200 W
	1	2800 W
	2	3600 W
	3	4500 W
	4	5600 W
	5	7100 W
	6	8000 W
	7	9000 W
	8	10000 W
	9	11200 W
	A	12500 W
	B	14000 W

CAUTION

The system has a total of 64 units (0-63). Each has only one system address code. If an address is duplicated, an error will occur.

Switch off the power before configuring the settings, or an error will occur.

8.2 Network address settings

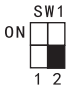
1) The network address is set based on communication between the indoor and outdoor units. The address is the same as the indoor address, and there is no need to set them separately.
2) The central control of indoor units can be done on an outdoor unit. There is no need to control indoor unit separately.
3) For previous control of the indoor units, the network can be set by connecting (X, Y, E) terminals. There is no need to set the network address. The network can also be set by outer network module and main board (CN20).

8.3 Error Content

Error Content	Error Code
● No address at the first power on	FE
● Mode conflict	E0
● Comm. error with outdoor unit	E1
● Temp. sensor (T1)) error	E2
● Temp. sensor (T2) error	E3
● Temp. sensor(T2B) error	E4
● DC fan error	E6
● Outdoor unit error	Ed
● EEPROM error	E7
● EEV coil error	Eb
● Water level alarm	EE

8.4 Main board Code designation

SW1 definition

	● 0 means the cooling mode temperature compensation is 0°C (default) ● 1 means the cooling mode temperature compensation is 2°C
	● 0 means EEV positions 96 (steps) in standby in heating mode (default) ● 1 means EEV positions 72 (steps) in standby in heating mode

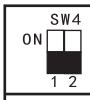
SW2 definition

	● Reserved (defaults 0)

SW3 definition

	● 0 means no action (default) ● 1 means clear indoor unit address
	● Reserved (defaults 0)

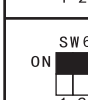
SW4 definition

	● 00 means the time for stopping the TERMAL fan is 4 minutes (default)
	● 01 means the time for stopping the TERMAL fan is 8 minutes
	● 10 means the time for stopping the TERMAL fan is 12 minutes
	● 11 means the time for stopping the TERMAL fan is 16 minutes

SW5 definition

	● 00 means shutting down the unit to "stop cold air" at 15°C(default)
	● 01 means shutting down the unit to "stop cold air" at 20°C
	● 10 means shutting down the unit to "stop cold air" at 24°C
	● 11 means shutting down the unit to "stop cold air" at 26°C

SW6 definition

	● 00 means the temp. compensation value is 6°C in heat mode (default)
	● 01 means the temp. compensation value is 2°C in heat mode
	● 10 means the temp. compensation value is 4°C in heat mode
	● 11 means temp. compensation value is 0°C in heat mode (follow me)

SW7 definition

	● Reserved (defaults 0)
	● Reserved (defaults 0)

0/1 definition

	Means 0
	Means 1

J1 definition

	● Without jumper “J1” for the auto restart function
	● With jumper “J1” for the non-auto restart function

9. TEST OPERATION

1 Testing must be carried out after installation is completed.

2 Please confirm the following points before the test:

- The indoor unit and outdoor unit are installed properly.
- The tubing and wiring have been correctly completed.
- The refrigerant pipe system has been checked for leaks.
- Drainage is unimpeded.
- The heating insulation works well.
- The ground wiring is connected correctly.
- The length of the tubing and the added stow capacity of the refrigerant have been recorded.
- The power voltage fits the rated voltage of the air conditioner.
- There is no obstacle at the outlet and inlet of the outdoor and indoor units.
- The gas side and liquid side stop valves are both open.
- The air conditioner is pre-heated by turning on the power.

3 According to the user's requirements, install the remote controller frame where the remote controller's signal can smoothly reach the indoor unit.

4 Test operation

■ Set the air conditioner in "COOLING" mode with the remote controller, and check the following points. If there is an error, please resolve it according to the chapter "Troubleshooting" in the "Owner's Manual".

- 1) The indoor unit
  a. Whether the switch on the remote controller is working well.
  b. Whether the buttons on the remote controller is working well.
  c. Whether the air flow louver moves normally.
  d. Whether the room temperature is adjusted properly.
  e. Whether the indicator lights normally.
  f. Whether the temporary buttons works well.
  g. Whether drainage is normal.
  h. Whether there is vibration or abnormal noise during operation.
  I. Whether the air conditioner heats well in HEATING/COOLING mode.

  2) The outdoor unit
  a. Whether there is vibration or abnormal noise during operation.
  b. Whether the generated wind, noise, or condensation produced by the air conditioner affect your neighbors.
  c. Whether any refrigerant leaks.

CAUTION

A protection feature prevents the air conditioner from being activated for approximately 3 minutes when it restarts after shut off.

NOTE CONCERNING PROTECTION OF ENVIRONMENT

This product must not be disposed of via normal household waste after its service life, but must be taken to a collection station for the recycling of electrical and electronic devices. The symbol on the product, the operating instructions or the packaging indicate such disposal procedures. The materials are recyclable in accordance with their respective symbols. By means of re-use, material recycling or any other form of recycling old appliances you are making an important contribution to the protection of our environment. Please ask your local council where your nearest disposal station is located.

INFORMATION CONCERNING USED REFRIGERANT MEDIUM

This unit is containing fluorinated gases included in the Kyoto protocol. The maintenance and the liquidation must be carried out by qualified personnel.
Type of refrigerant: R410A
The composition of the cooling medium R410A: (50% HFC-32, 50% HFC-125)
The quantity of the refrigerant: please see the unit label.
The value GWP: 2088 (1 kg R410A = 2,088 t CO_2 eq)
GWP = Global Warming Potential

In case of quality problem or other please contact your local supplier or authorized service center.
Emergency number: 112

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