Airwell INSTALLATION INSTRUCTIONS

– FLOW LOGIC System Air Conditioner –

for Refrigerant R410A

CAV

XAV

DAV

DEV

■ **R410A Models**

Indoor Units

	Indoor Unit Type	7	9	12	16	18
CAV	4-Way Air Discharge Mini Semi-Concealed	AWSI-CAV007-N11	AWSI-CAV009-N11	AWSI-CAV012-N11	AWSI-CAV016-N11	AWSI-CAV018-N11
XAV	Flat Wall-Mounted	AWSI-XAV007-N11	AWSI-XAV009-N11	AWSI-XAV012-N11		
DAV	Slim Concealed-Duct	AWSI-DAV007-N11	AWSI-DAV009-N11	AWSI-DAV012-N11	AWSI-DAV016-N11	AWSI-DAV018-N11
DEV	Heat Exchanger with DX coil		AWSI-DEV018-N11		AWSI-DEV024-N11	AWSI-DEV030-N11

Outdoor Units

C	MFL 40HR, MFL 50HR, MFL 60HR
	MFL 40HCR, MFL 50HCR, MFL 60HCR
	AWAU-GBV112-H13, AWAU-GBV140-H13, AWAU-GBV155-H13
	MFL 80R-3, MFL 100R-3, MFL 120R-3, MFL 140R-3, MFL 160R-3
	AWAU-YEF080-H11, AWAU-YEF100-H11, AWAU-YEF120-H11, AWAU-YEF140-H11, AWAU-YEF160-H11

* Refrigerant R410A is used in the outdoor units

Optional Controllers

RC	Remote Controller	NRCT-FLR
	Wireless Remote Controller (For NKFL Type)	AWAC-RCIRA-FL
	Wireless Remote Controller (For NK2FL Type)	AWAC-RCIRB-FL
	Wireless Remote Controller (For NPFL, NK1FL Type)	AWAC-RCIRD-FL
	Wireless Remote Controller (For NDLP, NDHP, DAV, NFFL, NFMFL, DEV Type)	AWAC-RCIRC-FL
	Wireless Remote Controller (For CAV Type)	AWAC-RCIRF-FL
	Wireless Remote Controller (For NWFL, XAV Type)	AWAC-RCIRE-FL
	Simplified Remote Controller	NRCB-FLR
	Remote Sensor	NSDR
	System Controller	NRSC-FLR
	Schedule Timer	NWTM-FLR

IMPORTANT!
Please Read Before Starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

For safe installation and trouble-free operation, you must:

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state, and national electrical codes.

Note:
This air conditioner uses the new refrigerant R410A
This product is intended for professional use.
Permission from the power supplier is required when installing an outdoor unit that is connected to a 16 A distribution network.

- Pay close attention to all warning and caution notices given in this manual.

This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

If Necessary, Get Help
These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation
The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

SPECIAL PRECAUTIONS

WARNING When Wiring

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause **accidental injury or death.**
- **Ground the unit** following local electrical codes.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

When Installing…

…In a Room

Properly insulate any tubing run inside a room to prevent "sweating" that can cause dripping and water damage to walls and floors.

…In Moist or Uneven Locations

Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

…In an Area with High Winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

…In a Snowy Area (for Heat Pump-type Systems)

Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

When Connecting Refrigerant Tubing

- Ventilate the room well, in the event that is refrigerant gas leaks during the installation. Be careful not to allow contact of the refrigerant gas with a flame as this will cause the generation of poisonous gas.
- Keep all tubing runs as short as possible.
- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.

When Servicing

- Turn the power OFF at the main power box (mains) before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.

- Ventilate any enclosed areas when installing or testing the refrigeration system. Escaped refrigerant gas, on contact with fire or heat, can produce dangerously toxic gas.
- Confirm after installation that no refrigerant gas is leaking. If the gas comes in contact with a burning stove, gas water heater, electric room heater or other heat source, it can cause the generation of poisonous gas.

Check of Density Limit

The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its density will not exceed a set limit.

The refrigerant (R410A), which is used in the air conditioner, is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws imposed to protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its density should rise excessively. Suffocation from leakage of refrigerant is almost non-existent. With the recent increase in the number of high density buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power, etc. Most importantly, the multi air conditioner system is able to replenish a large amount of refrigerant compared to conventional individual air conditioners. If a single unit of the multi air conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its density does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).
In a room where the density may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device. The density is as given below.

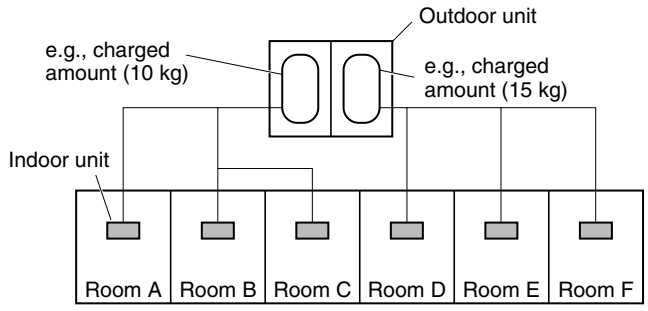
$$\frac{\textbf{Total amount of refrigerant (kg)}}{\textbf{Min. volume of the indoor unit installed room (m}^3\textbf{)}} \leq \textbf{Density limit (kg/m}^3\textbf{)}$$

The density limit of refrigerant which is used in multi air conditioners is 0.3 kg/m^3 (ISO 5149).

NOTE

1. If there are 2 or more refrigerating systems in a single refrigerating device, the amount of refrigerant should be as charged in each independent device.

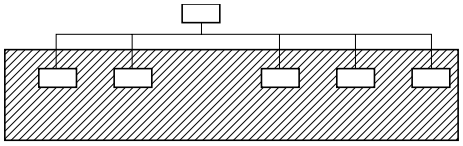
For the amount of charge in this example:



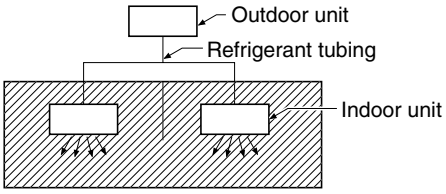
The possible amount of leaked refrigerant gas in rooms A, B and C is 10 kg.
The possible amount of leaked refrigerant gas in rooms D, E and F is 15 kg.

2. The standards for minimum room volume are as follows.

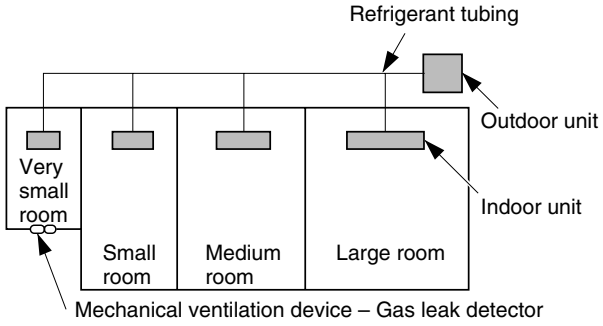
(1) No partition (shaded portion)



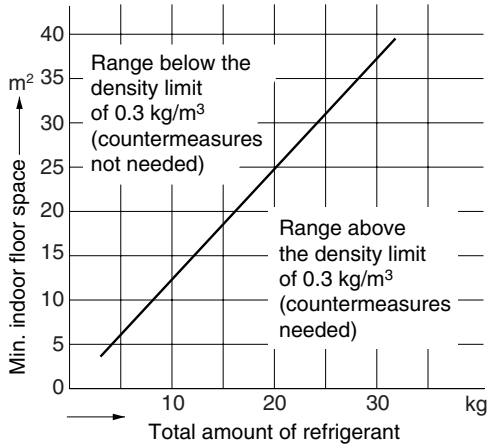
(2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).



(3) If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest room of course becomes the object. But when mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



3. The minimum indoor floor space compared with the amount of refrigerant is roughly as follows (when the ceiling is 2.7 m high):



Precautions for Installation Using New Refrigerant

1. Care regarding tubing

1-1. Process tubing

- Material: Use C1220 phosphorous deoxidized copper specified in JIS H3300 “Copper and Copper Alloy Seamless Pipes and Tubes.”
- **Tubing size: Be sure to use the sizes indicated in the table below.**
- Use a tube cutter when cutting the tubing, and be sure to remove any flash. This also applies to distribution joints (optional).
- When bending tubing, use a bending radius that is 4 times the outer diameter of the tubing or larger.

CAUTION

Use sufficient care in handling the tubing. Seal the tubing ends with caps or tape to prevent dirt, moisture, or other foreign substances from entering. These substances can result in system malfunction.

Unit: mm

Material		O				
Copper tube	Outer diameter	6.35	9.52	12.7	15.88	19.05
	Wall thickness	0.8	0.8	0.8	1.0	1.0

1-2. Prevent impurities including water, dust and oxide from entering the tubing. Impurities can cause R410A refrigerant deterioration and compressor defects. Due to the features of the refrigerant and refrigerating machine oil, the prevention of water and other impurities becomes more important than ever.

2. Be sure to recharge the refrigerant only in liquid form.

2-1. Since R410A is a non-azeotrope, recharging the refrigerant in gas form can lower performance and cause defects of the unit.

2-2. Since refrigerant composition changes and performance decreases when gas leaks, collect the remaining refrigerant and recharge the required total amount of new refrigerant after fixing the leak.

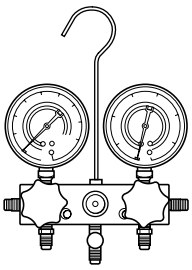
3. Different tools required

3-1. Tool specifications have been changed due to the characteristics of R410A. Some tools for R22- and R407C-type refrigerant systems cannot be used.

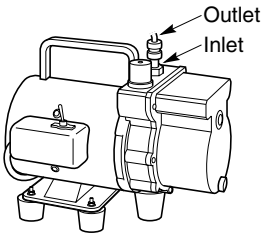
Item	New tool?	R407C tools compatible with R410A?	Remarks
Manifold gauge	Yes	No	Types of refrigerant, refrigerating machine oil, and pressure gauge are different.
Charge hose	Yes	No	To resist higher pressure, material must be changed.
Vacuum pump	Yes	Yes	Use a conventional vacuum pump if it is equipped with a check valve. If it has no check valve, purchase and attach a vacuum pump adapter.
Leak detector	Yes	No	Leak detectors for CFC and HCFC that react to chlorine do not function because R410A contains no chlorine. Leak detector for HFC134a can be used for R410A.
Flaring oil	Yes	No	For systems that use R22, apply mineral oil (Suniso oil) to the flare nuts on the tubing to prevent refrigerant leakage. For machines that use R407C or R410A, apply synthetic oil (ether oil) to the flare nuts.

* Using tools for R22 and R407C and new tools for R410A together can cause defects.

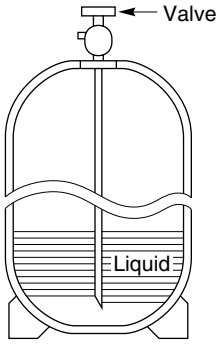
Manifold gauge



Vacuum pump



3-2. Use R410A exclusive cylinder only.



Single-outlet valve

(with siphon tube)
Liquid refrigerant should be recharged with the cylinder standing on end as shown.

CONTENTS

1. GENERAL

This booklet briefly outlines where and how to install the air conditioning system. Please read over the entire set of instructions for the indoor and outdoor units and make sure all accessory parts listed are with the system before beginning.

1-1. Tools Required for Installation (not supplied)

1. Standard (Flathead) screwdriver
2. Phillips head screwdriver
3. Knife or wire stripper
4. Tape measure
5. Capenter's level
6. Sabre saw or key hole saw
7. Hacksaw
8. Core bits
9. Hammer
10. Drill
11. Tube cutter
12. Tube flaring tool
13. Torque wrench
14. Adjustable wrench
15. Reamer (for deburring)

1-2. Accessories Supplied with Unit

See Tables 1-1 to 1-4.

Table	Type
1-1	4-Way Air Discharge Mini Semi-Concealed
1-2	Flat Wall-Mounted
1-3	Slim Concealed-Duct
1-4	Heat Exchanger with DX coil

1-3. Type of Copper Tube and Insulation Material

If you wish to purchase these materials separately from a local source, you will need:

1. Deoxidized annealed copper tube for refrigerant tubing.
2. Foamed polyethylene insulation for copper tubes as required to precise length of tubing. Wall thickness of the insulation should be not less than 8 mm.
3. Use insulated copper wire for field wiring. Wire size varies with the total length of wiring. Refer to **4. Electrical Wiring** for details.

CAUTION

Check local electrical codes and regulations before obtaining wire. Also, check any specified instructions or limitations.

1-4. Additional Materials Required for Installation

1. Refrigeration (armored) tape
2. Insulated staples or clamps for connecting wire (Check your local codes.)
3. Putty
4. Refrigeration tubing lubricant
5. Clamps or saddles to secure refrigerant tubing
6. Scale for weighing

Table 1-1 (4-Way Air Discharge Mini Semi-Concealed)

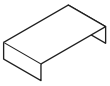
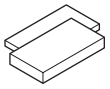
Name	Figure	Q'ty	Remarks	Name	Figure	Q'ty	Remarks
Washer		8	For temporarily suspending indoor unit from ceiling	Full-scale installation diagram		1	Printed on container box
Flare insulation	 T3 T5	2 set	For gas / liquid tube connection	Washer head screw		4	For full-scale installation diagram
Insulation tie		2	For gas / liquid tube / flare nut connection	Drain hose	 L140	1	For unit & PVC tube connection
Vinyl tie		8	For flare / drain insulating connection	Hose band		2	For drain hose connection
Drain hose insulation	 T10	1	For drain tube connection				

Table 1-2 (Flat Wall-Mounted)

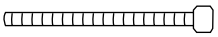
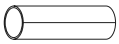
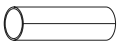
Parts	Figure	Q'ty
Tapping screw	Truss-head Phillips 4 × 30 mm 	8
Clamp		1

Table 1-3 (Slim Concealed-Duct)

	Name	Figure	Q'ty	Remarks		Name	Figure	Q'ty	Remarks
Unit suspension	Washer		8	For suspension fitting	Drain piping	Drain hose		1	For unit & PVC pipe connection
Refrigerant tubing	Flare insulation		2	For gas pipe / liquid pipe connection		Hose band		2	For drain hose connection
			2	For gas pipe / liquid pipe connection		Drain hose insulation		1	For drain pipe connection
	Insulation tape		2	For gas pipe / liquid pipe / flare nut connection	Others	Short circuit connection		1	For high static pressure (Located on the back of the electrical component box lid.)
	Vinyl tie		8	For flare / drain insulating connection					

- Use 3/8" for suspending bolts.
- Field supply for suspending bolts and nuts.

Table 1-4 (Heat Exchanger with DX coil)

	Part name	Figure	Q'ty	Remarks
For refrigerant tubing	Flare insulator		2	For gas and liquid tubes
	Insulating tape	 Black	2	For gas and liquid tube flare nuts
		 White (For thermal insulation)	2	For gas and liquid tube flare nuts
	Clamp		4	
For drain tubing	Drain insulator		1	For drain tube connection
	Packing		1	For drain joint
	Clamp		5	For drain tubes (4) For verifying drainage from the lower drain (1)

- Use M12 for suspending bolts.
- Field supply for suspending bolts and nuts.

2. SELECTING THE INSTALLATION SITE

2-1. Indoor Unit

AVOID:

- areas where leakage of flammable gas may be expected.
- places where large amounts of oil mist exist.
- direct sunlight.
- locations near heat sources which may affect the performance of the unit.
- locations where external air may enter the room directly. This may cause “sweating” on the air discharge ports, causing them to spray or drip.
- locations where the remote controller will be splashed with water or affected by dampness or humidity.
- installing the remote controller behind curtains or furniture.
- locations where high-frequency emissions are generated.

DO:

- select an appropriate position from which every corner of the room can be uniformly cooled.
- select a location where the ceiling is strong enough to support the weight of the unit.
- select a location where tubing and drain pipe have the shortest run to the outdoor unit.
- allow room for operation and maintenance as well as unrestricted air flow around the unit.
- install the unit within the maximum elevation difference above or below the outdoor unit and within a total tubing length (L) from the outdoor unit.
- allow room for mounting the remote controller about 1 m off the floor, in an area that is not in direct sunlight nor in the flow of cool air from the indoor unit.

NOTE

Air delivery will be degraded if the distance from the floor to the ceiling is greater than 3 m.

Slim Concealed-Duct Type
4-Way Air Discharge Mini Semi-Concealed Type

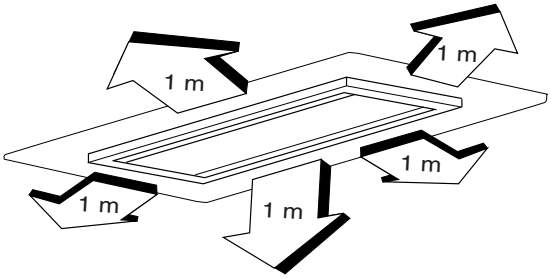
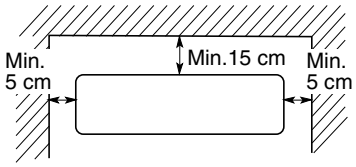


Fig. 2-1

Flat Wall-Mounted Type



Front View

Fig. 2-2

Heat Exchanger with DX coil

- The distance between the indoor unit and any obstructions should be as shown in the figure below.
- If installing in a highly humid location, give consideration to preventing condensation on the main unit.

NOTE

There is a packaging bracket located on each of the four product corners. Remove these brackets from the product.

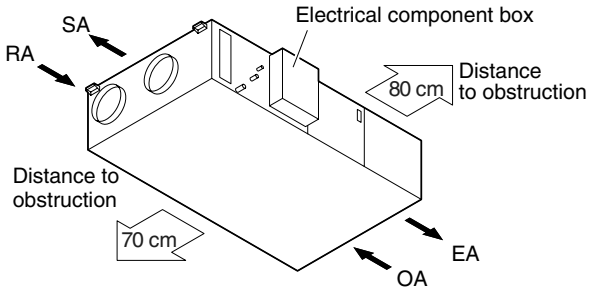


Fig. 2-3

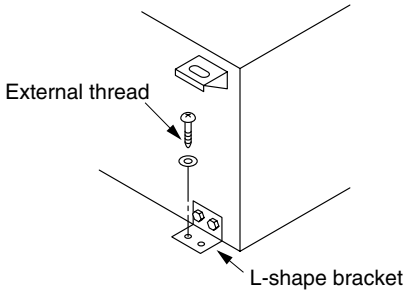


Fig. 2-4

3. HOW TO INSTALL THE INDOOR UNIT

■ 4-Way Air Discharge Mini Semi-Concealed Type (CAV Type)

CAV

3-1. Preparation for Suspending

This unit uses a drain pump. Use a carpenter's level to check that the unit is level.

3-2. Suspending the Indoor Unit

(1) Fix the suspension bolts securely in the ceiling using the method shown in the diagrams, by attaching them to the ceiling support structure, or by any other method that ensures that the unit will be securely and safely suspended.

(2) Follow the diagram to make the holes in the ceiling.

(3) Determine the pitch of the suspension bolts using the supplied full-scale installation diagram. The diagram shows the relationship between the positions of the suspension fitting, unit, and panel.

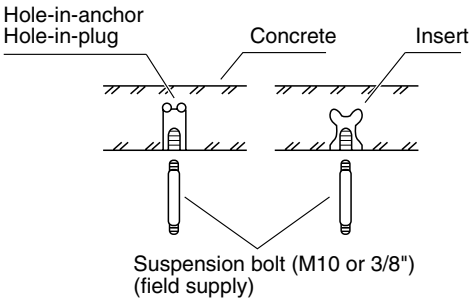


Fig. 3-1

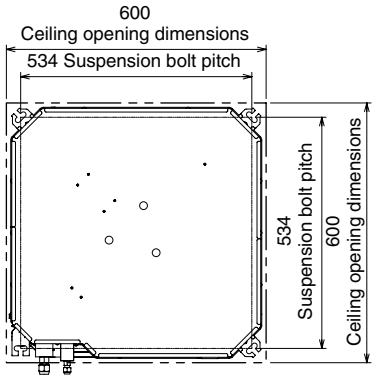


Fig. 3-2

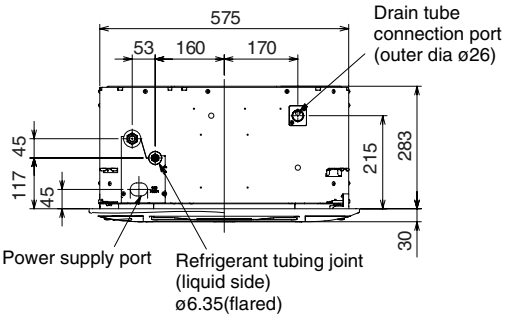


Fig. 3-3

3-3. Placing the Unit Inside the Ceiling

(1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts using the supplied full-scale installation diagram.
Tubing and wiring must be laid inside the ceiling when suspending the unit. If the ceiling is already constructed, lay the tubing and wiring into position for connection to the unit before placing the unit inside the ceiling.

(2) The length of suspension bolts must be appropriate for a distance between the bottom of the bolt and the bottom of the unit of more than 15 mm as shown in the diagram.

(3) Thread the 3 hexagonal nuts and 2 washers (field supply) onto each of the 4 suspension bolts as shown in the diagram. Use 1 nut and 1 washer for the upper side, and 2 nuts and 1 washer for the lower side, so that the unit will not fall off the suspension lugs.

(4) Adjust so that the distance between the unit and the ceiling bottom is 13 to 18 mm. Tighten the nuts on the upper side and lower side of the suspension lug.

(5) Remove the protective polyethylene used to protect the fan parts during transport.

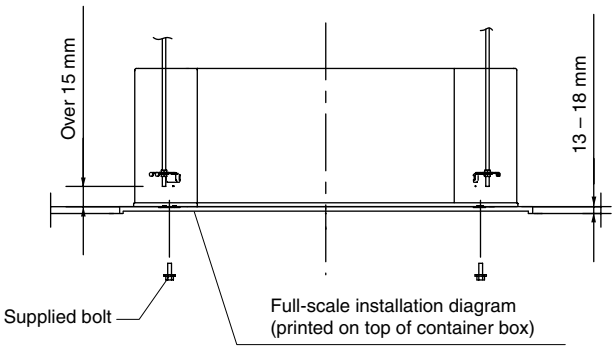


Fig. 3-4

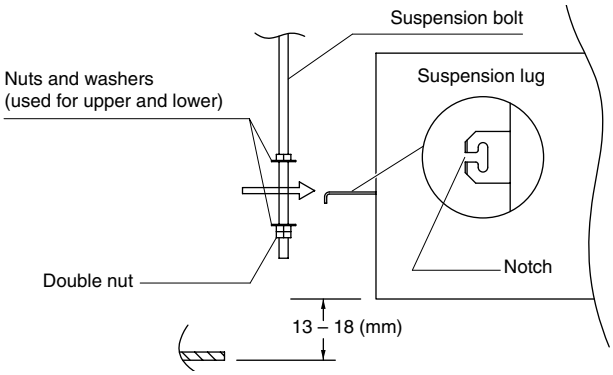


Fig. 3-5

3-4. Installing the Drain Piping

(1) Prepare standard hard PVC pipe (O.D. 26 mm) for the drain and use the supplied hose band to prevent water leaks.
The PVC pipe must be purchased separately.
The transparent drain part on the unit allows you to check drainage.

(2) Installing the drain hose
To install the drain hose, first place 1 of the 2 hose bands over the unit drain port and the other hose band over the hard PVC pipe (not supplied). Then connect both ends of the supplied drain hose.
On the unit drain side, grasp the hose band with pliers and insert the drain hose all the way to the base.
If other commercially available hose bands are used, the drain hose may become pinched or wrinkled and there is danger of water leakage. Therefore be sure to use the supplied hose bands.
When sliding the hose bands, be careful to avoid scratching the drain hose.
Do not use adhesive when connecting the supplied drain hose to the drain port (either on the main unit or the PVC pipe).

Reasons: 1. It may cause water to leak from the connection. Since the connection is slippery just after the adhesive has been applied, the pipe easily slips off.
2. The pipe cannot be removed when maintenance is needed.

Wrap the hose with the supplied drain hose insulation and use the 4 twist ties so that the hose is insulated with no gaps.
Do not bend the supplied drain hose 90° or more. The hose may slip off.

NOTE

Make sure the drain pipe has a downward gradient (1/100 or more) and that there are no water traps.

CAUTION

- In cases where it is necessary to raise the height of the drain piping, the drain piping can be raised to a maximum height of 850 mm above the bottom surface of the ceiling. Under no conditions attempt to raise it higher than 850 mm above the bottom surface of the ceiling. Doing so will result in water leakage.
- Do not use natural drainage.
- Do not install the pipe with an upward gradient from the connection port. This will cause the drain water to flow backward and leak when the unit is not operating.
- Do not apply force to the piping on the unit side when connecting the drain pipe. The pipe should not be allowed to hang unsupported from its connection to the unit. Fasten the pipe to a wall, frame, or other support as close to the unit as possible.
- Provide insulation for any pipes that are run indoors.

Refer to " ■ SUPPLEMENT ON DRAIN PIPING".

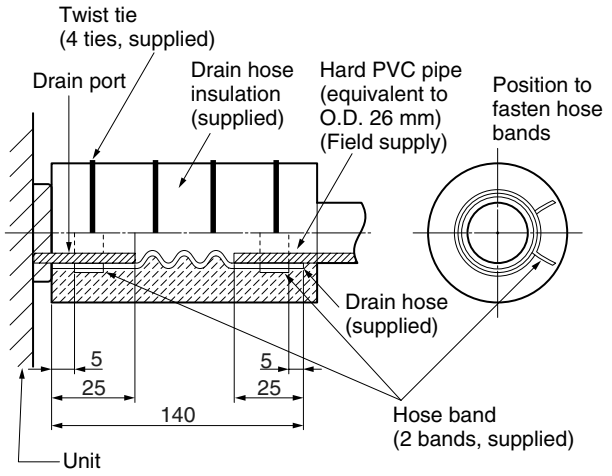


Fig. 3-6

CAUTION

Attach so that the hose band fastener is on the side of the drain port.
Attach the hose bands so that each is approximately 5 to 25 mm from the end of the supplied drain hose.

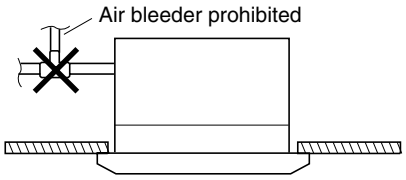


Fig. 3-7

CAUTION

Do not install an air bleeder as this may cause water to spray from the drain pipe outlet.

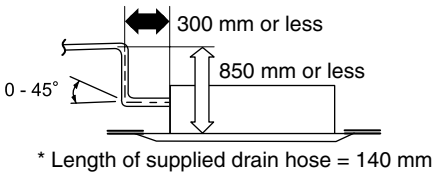


Fig. 3-8

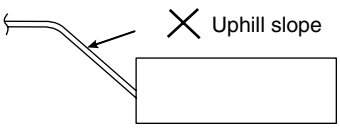


Fig. 3-9

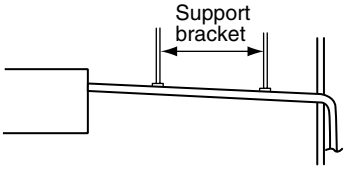


Fig. 3-10

CAV

CAV

3-5. Checking the Drainage

After wiring and drain piping are completed, use the following procedure to check that the water will drain smoothly. For this, prepare a bucket and wiping cloth to catch and wipe up spilled water.

(1) Connect power to the power terminal board (R, S terminals) inside the electrical component box.

(2) Slowly pour about 500cc of water into the drain pan to check drainage.

(3) Short the check pin (CHK) on the indoor control board and operate the drain pump. Check the water flow through the transparent drain pipe and see if there is any leakage.

(4) When the check of drainage is complete, open the check pin (CHK) and remount the tube cover.

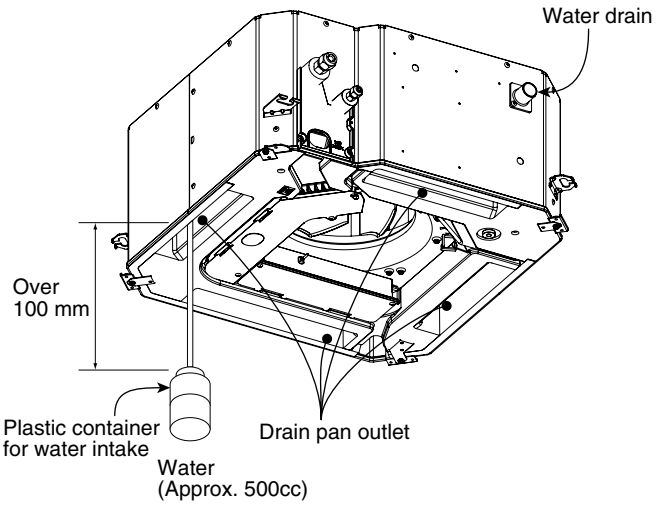


Fig. 3-11

CAUTION

Be careful since the fan will start when you short the pin on the indoor control board.

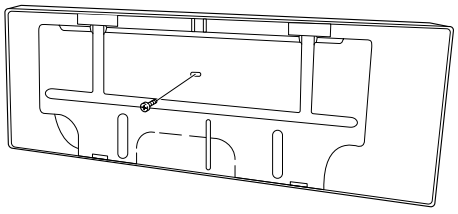
■ Flat Wall-Mounted Type (XAV Type)

3-6. Remove the Rear Panel from the Unit

(1) Remove and discard the set screw on the rear panel. (Fig. 3-12)

(2) Press the 2 △ marks on the frame cover and disengage the stationary tabs from the frame. (Fig. 3-13)

(3) Remove the rear panel.



Set screw only for transportation

Fig. 3-12

NOTE

Tubing can be extended in 5 directions as shown in Fig. 3-14. Select the direction you need providing the shortest run to the outside unit.

- When left tubing is to be done, switch the drain hose and drain cap. (For details, refer to "Switching drain hose and drain cap".)

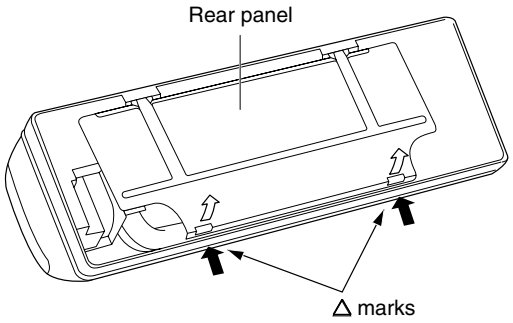


Fig. 3-13

3-7. Make a Hole

(1) Place the rear panel from the indoor unit on the wall at the location selected. Make sure the panel is horizontal, using a carpenter's level or tape measure to measure down from the ceiling. Wait until after cutting the hole before attaching the rear panel to the wall.

(2) Deteremine which side of the unit you should make the hole for tubing and wiring. (Fig. 3-15)

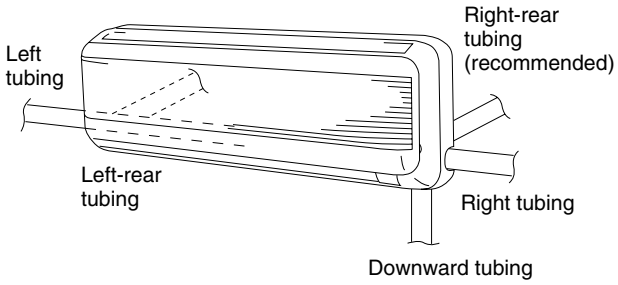


Fig. 3-14

NOTE

In the case of left-rear tubing, use the measurement points from the edge of the rear panel for precise placement of the hose outlet. (Fig. 3-15)

(3) Before making the hole, check carefully that no studs or pipes are directly run behind the spot to be cut.

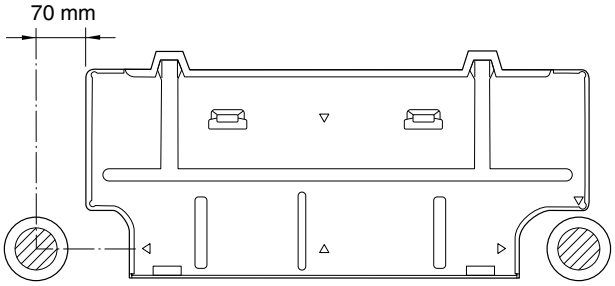


Fig. 3-15

CAUTION

Also avoid areas where electrical wiring or conduits are located.

The above precautions are also applicable if tubing goes through the wall in any other location.

(4) Using a sabre saw, key hole saw or hole-cutting drill attachment, cut a hole in the wall. (Fig. 3-16)

Table 3-1

Hole Dia. (mm)
AWSI-XAV007-N11 / AWSI-XAV009-N11 / AWSI-XAV012-N11
65

(5) Measure the thickness of the wall from the inside edge to the outside edge and cut PVC pipe at a slight angle 6 mm shorter than the thickness of the wall. (Fig. 3-17)

(6) Place the plastic cover over the end of the pipe (for indoor side only) and insert the pipe in the wall. (Fig. 3-18)

NOTE

Hole should be made at a slight downward slant to the outdoor side.

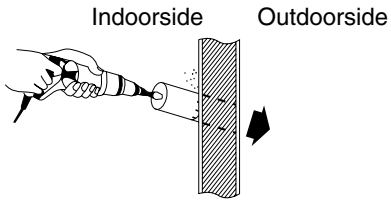


Fig. 3-16

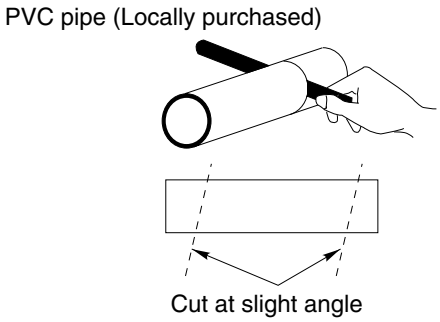


Fig. 3-17

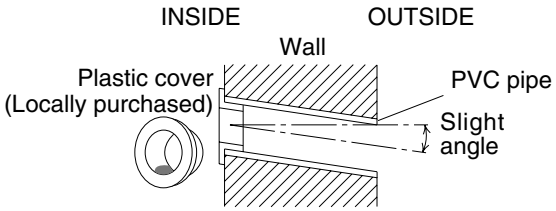


Fig. 3-18

3-8. Install the Rear Panel on the Wall

Be sure to confirm that the wall is strong enough to suspend the unit.

See either item a) or b) below depending on the wall type.

a) If Wooden Wall

(1) Attach the rear panel to the wall with the 8 screws provided. (Fig. 3-19)
If you are not able to line up the holes in the rear panel with the beam locations marked on the wall, use rawl plugs or toggle bolts to go through the holes on the panel or drill 5 mm dia. holes in the panel over the stud locations and then mount the rear panel.

(2) Double check with a carpenter's level or tape measure that the panel is level. This is important to install the unit properly. (Fig. 3-20)

(3) Make sure the panel is flush against the wall. Any space between the wall and unit will cause noise and vibration.

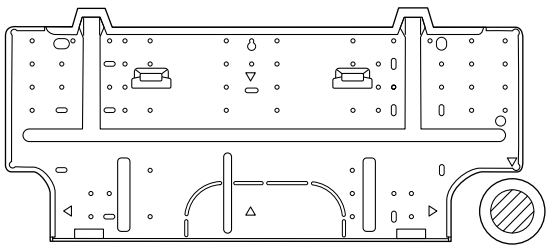


Fig. 3-19

Fig. 3-20

b) If Block, Brick, Concrete or Similar Type Wall

Make 4.8 mm dia. holes in the wall. Insert rawl plugs for appropriate mounting screws. (Fig. 3-21)

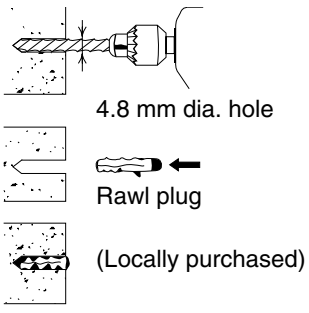


Fig. 3-21

3-9. Remove the Grille to Install the Indoor Unit

Basically, these models can be installed and wired without removing the grille. If access to any internal part is needed, follow the steps as given below.

How to remove the grille

(1) Grasp both ends of the air intake grille, and remove it by opening towards the front and pulling towards you. (Fig. 3-22)

(2) Remove the 2 screws. (Fig. 3-23)

(3) Press the 3 tabs at the top of the grille and the 3 tabs on the front face to separate the grille from the frame. (Fig. 3-24)

(4) Pull the grille toward you to remove it.

How to replace the grille

(1) When installing the grille, place the bottom of the grille into the frame first. (Fig. 3-25)
Then insert the tabs on the top of the grille and on the front face into the frame.

(2) Make sure that the grille and frame are firmly fitted together by engaging the tabs.

(3) Affix the grille with the 2 previously removed screws. (Fig. 3-23)

(4) Install the air intake grille.

a) Allow the edge of the air intake grille to slide into the top of the indoor unit, and then insert it all the way inside. (Fig. 3-26)

b) Press the bottom right and left corners and center of the air intake grille to attach it to the indoor unit. (Fig. 3-27)

NOTE

Attach so that the round pins at the top right and left corners of the air intake grille are inserted into the grooves at the top right and left of the indoor unit.

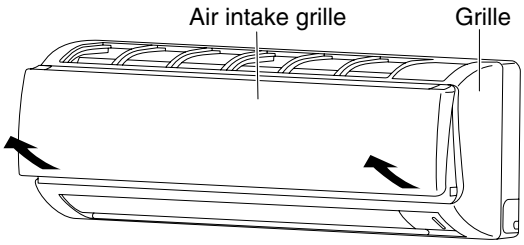


Fig. 3-22

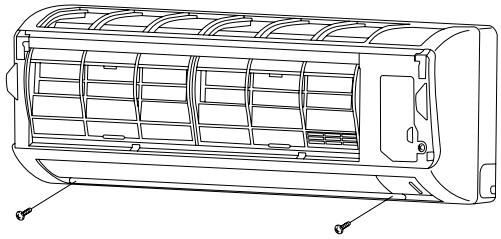


Fig. 3-23

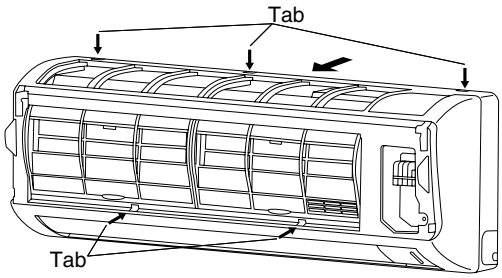


Fig. 3-24

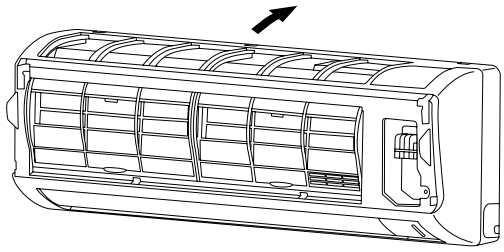


Fig. 3-25

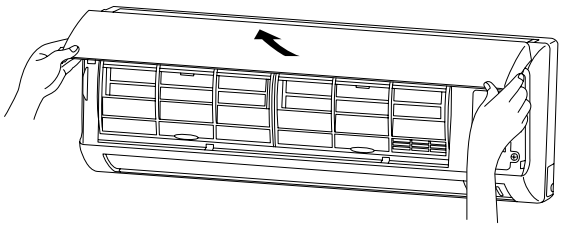


Fig. 3-26

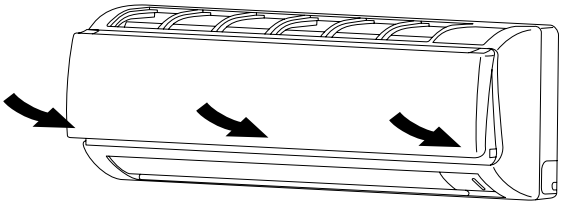


Fig. 3-27

XAV

3-10. Shape the Indoor Side Tubing

(1) Arrangement of tubing by directions

a) Right or left tubing

Cut out the corner of the right/left frame with a hacksaw or the like. (Figs. 3-28 and 3-29)

b) Right-rear or left-rear tubing

In this case, the corner of the frame need not be cut.

(2) To mount the indoor unit on the rear panel:

Hang the 2 mounting slots of the unit on the upper tabs of the rear panel. (Fig. 3-30)

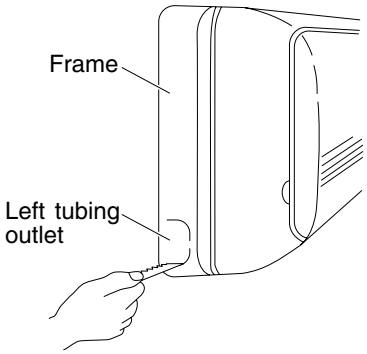


Fig. 3-28

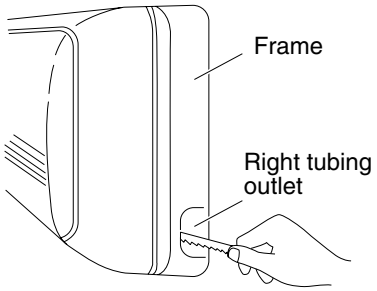


Fig. 3-29

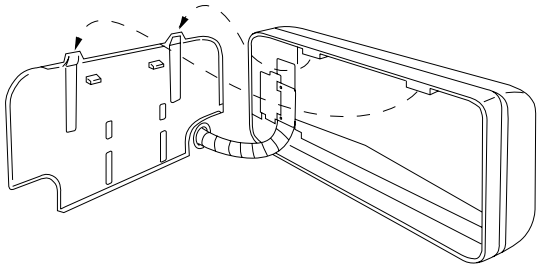


Fig. 3-30

XAV

3-11. Wiring Instructions

General precautions on wiring

(1) Before wiring, confirm the rated voltage of the unit as shown on its nameplate, then carry out the wiring closely following the wiring diagram.

(2) Provide a power outlet to be used exclusively for each unit, with a power supply disconnect and circuit breaker for overcurrent protection provided in the exclusive line.

(3) To prevent possible hazard due to insulation failure, the unit must be grounded.

(4) Each wiring connection must be done tightly and in accordance with the wiring system diagram. Wrong wiring may cause the unit to misoperate or become damaged.

(5) Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.

(6) Unauthorized changes in the internal wiring can be very dangerous. The manufacturer will accept no responsibility for any damage or misoperation that occurs as a result of such unauthorized changes.

3-12. Wiring Instructions for Inter-unit Connections

(1) Grasp both ends of the air intake grille, and remove it by opening toward the front and pulling it toward you.

(2) Remove the screw on the right side cover plate and open the cover. (Fig. 3-31)

(3) Insert the inter-unit wiring into the through-the-wall PVC pipe. Lead the power wiring into the room allowing approx. 25 cm to extend from the wall face. (Fig. 3-32)

(4) Route the inter-unit wiring from the back of the indoor unit and pull it toward the front for connection. (Fig. 3-33)

(5) Connect the inter unit wiring to the corresponding terminals on the terminal plate (Fig. 3-33) while referring to the wiring diagram.

(6) Be sure to secure the wiring with the provided clamp.

NOTE

When closing the air intake grille, press the bottom right and left corners and center. (Fig. 3-34)

Please refer to "How to replace the grille" for installing the air intake grille.

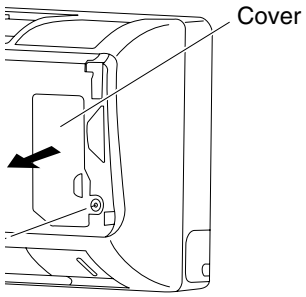


Fig. 3-31

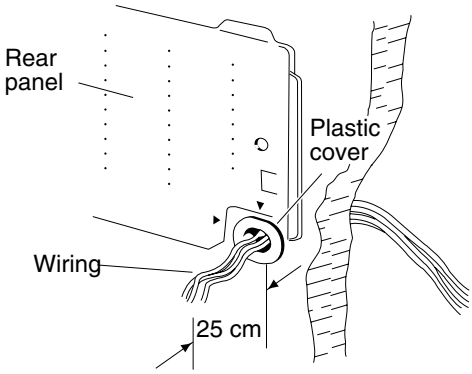


Fig. 3-32

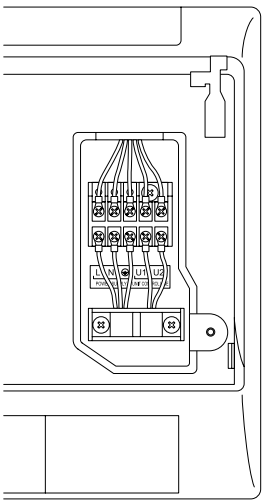


Fig. 3-33

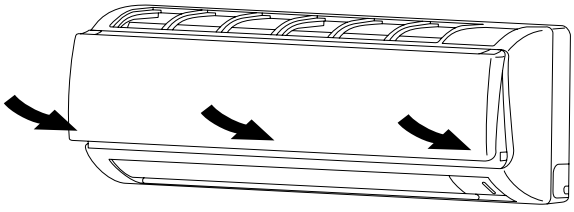


Fig. 3-34

XAV

WARNING **Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, be sure all wiring is tightly connected.**

When connecting each power wire to the corresponding terminal, follow the instructions "How to connect wiring to the terminal" and fasten the wire securely tight with the fixing screw of the terminal plate.

XAV

How to connect wiring to the terminal

a) For Indoor Unit

(1) Cut the wire end with a cutting pliers, then strip the insulation to expose the wire about 7 mm. See the label (Fig. 3-35) near the terminal plate.

(2) Using a screwdriver, loosen the terminal screw on the terminal plate.

(3) Insert the wire and tighten the terminal screw completely using a screwdriver.

b) For Outdoor Unit

- **For solid core wiring (or F-cable)**

(1) Cut the wire end with a cutting pliers, then strip the insulation to expose the solid wire about 25 mm. (Fig. 3-36)

(2) Using a screwdriver, remove the terminal screw(s) on the terminal plate.

(3) Using the pliers, bend the solid wire to form a loop suitable for the terminal screw.

(4) Shape the loop wire properly, place it on the terminal plate and fix it securely with the removed terminal screw using a screwdriver.

- **For stranded wiring**

(1) Cut the wire end with a cutting pliers, then strip the insulation to expose the stranded wiring about 10 mm and tightly twist the wire ends. (Figs. 3-37 and 3-38)

(2) Using a screwdriver, remove the terminal screw(s) on the terminal plate.

(3) Using a ring connector fastener or pliers, securely clamp each stripped wire end with a ring connector. (Fig. 3-37)

(4) Place the ring connector wire, and replace and tighten the removed terminal screw using a screwdriver. (Fig. 3-39)

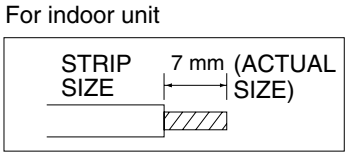


Fig. 3-35

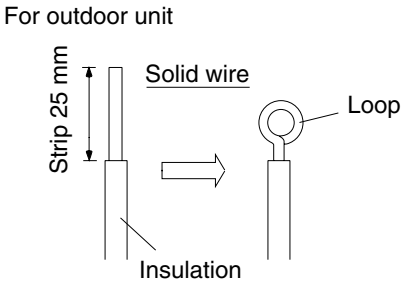


Fig. 3-36

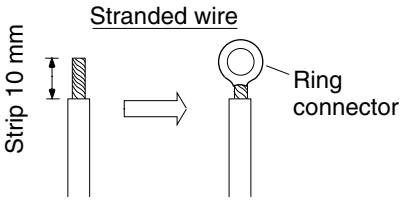


Fig. 3-37

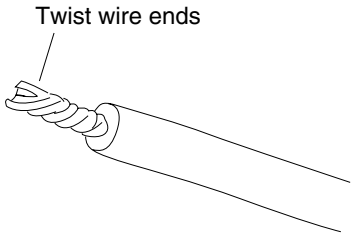


Fig. 3-38

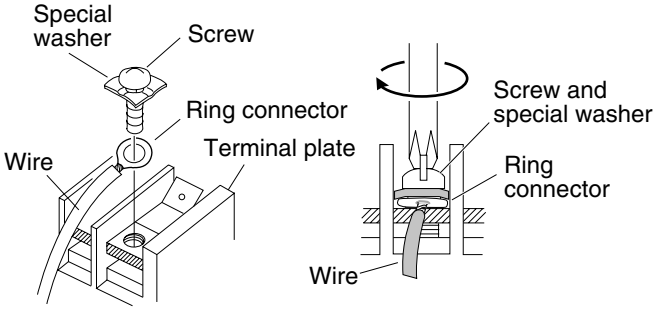


Fig. 3-39

3-13. Mounting

(1) To install the indoor unit, mount the indoor unit onto the 2 tabs on the upper part of the rear plate.

(2) Hold down the air discharge outlet and press the lower part of the indoor unit until it clicks to securely fasten to the 2 tabs on the lower part of the rear plate. (Fig. 3-40)

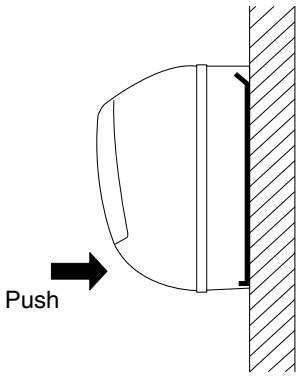


Fig. 3-40

NOTE

For tubing, choose either the right or left tubing direction and follow the steps below. This work can be made easier by placing padding material (such as styrofoam) at the rear right side of the indoor unit. (Fig. 3-41)

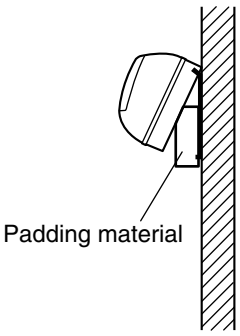


Fig. 3-41

- **Right-side tubing**

(1) Shape the refrigerant tubing so that it can easily go into the wall hole. (Fig. 3-42)

(2) Push the wiring, refrigerant tubing, and drain hose through the hole in the wall. Adjust the indoor unit so it is securely seated on the rear panel. (Fig. 3-43)

(3) Carefully bend the tubing (if necessary) to run along the wall in the direction of the outdoor unit and then tape as far as the fittings. The drain hose should come straight down the wall to a point where water run off won't stain the wall.

(4) Connect the refrigerant tubing to the outdoor unit. (After performing a leak test on the connecting part, insulate it with the tubing insulation. (Fig. 3-44))

(5) Assemble the refrigerant tubing, drain hose, and inter-unit wiring as shown in Fig. 3-44.

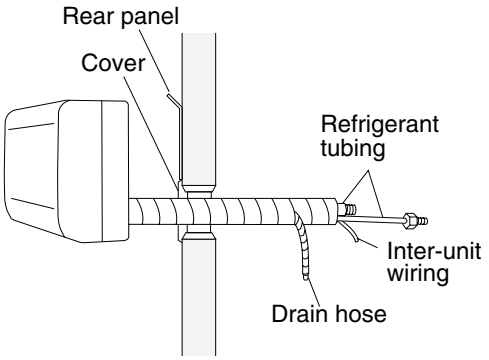


Fig. 3-42

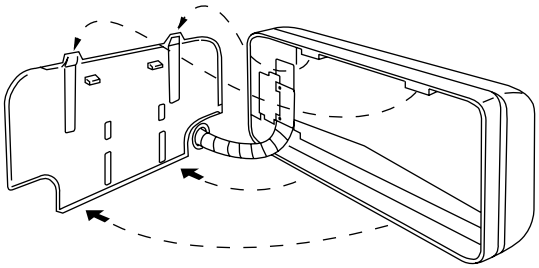


Fig. 3-43

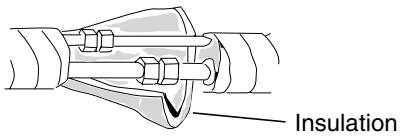


Fig. 3-44

XAV

XAV

● **Left-side tubing**

(1) Lead the tubing and drain hose through the wall, allowing sufficient length for connection. Then bend the tubing using a tube bender to make the attachment. (Fig. 3-45)

(2) Switch the drain hose and drain cap.

Switching drain hose and drain cap

a) Locate the drain hose and the drain cap. (Fig. 3-46)

b) Remove the screws fastening the drain hose on the right side, and pull out the drain hose to remove it. (Fig. 3-46)

c) Apply moderate force to pull off the drain cap on the left side. (If you cannot pull it off by hand, use a long-nose pliers.)

d) Reattach the drain hose to the left side and the drain cap to the right side. (Fig. 3-47)

Drain hose

Slide the drain hose fully onto the drain pan outlet until the drain hose edge is pushed into the insulation. Check that the screw holes in the drain bracket and the drain pan outlet are aligned and securely in contact, then fasten them with the screw. (After attaching the drain hose, check that it is attached securely.) (Fig. 3-48)

Drain cap

Use a Phillips screwdriver to push the drain cap in firmly. (If it is difficult to push in, wet the cap with water first.)

(3) Install the indoor unit on the rear panel.

(4) Connect the tubing and wiring led inside from outdoors.

(5) After completing a leak test, bundle the tubing together with armoring tape and store it inside the tubing storage area at the back of the indoor unit and hold it with clamps. (Fig. 3-49)

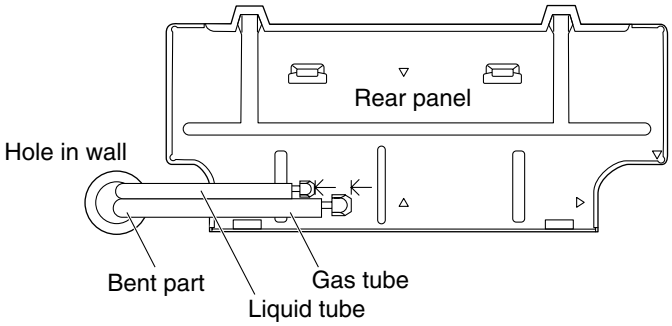


Fig. 3-45

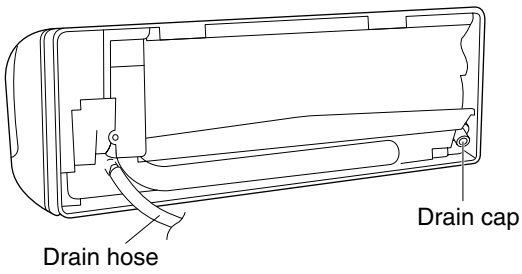


Fig. 3-46

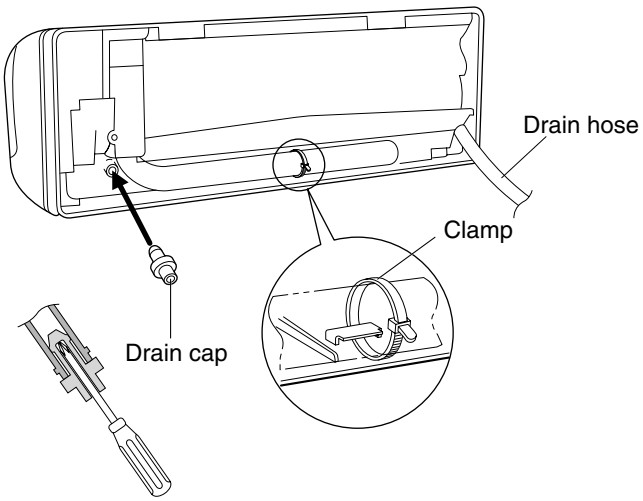


Fig. 3-47

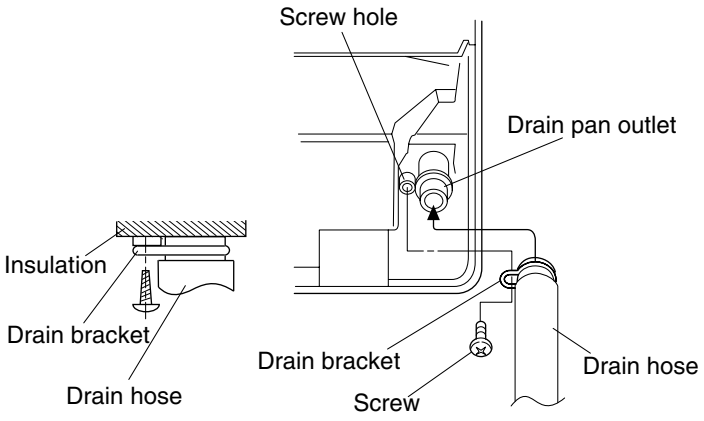


Fig. 3-48

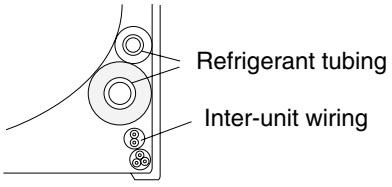


Fig. 3-49

To unmount indoor unit

Press the 2 △ marks on the lower part of the indoor unit and unlatch the tabs. Then lift the indoor unit and unmount. (Fig. 3-50)

3-14. Drain Hose

a) The drain hose should be slanted downward to the outdoors. (Fig. 3-51)

b) Never allow a trap to form in the course of the hose.

c) If the drain hose will run in the room, insulate the hose with insulation* so that chilled condensation will not damage furniture or floors. (Fig. 3-52)

*Foamed polyethylene or its equivalent is recommended.

WARNING **Do not supply power to the unit or operate it until all tubing and wiring to the outside unit are completed.**

Risk of Electric Shock

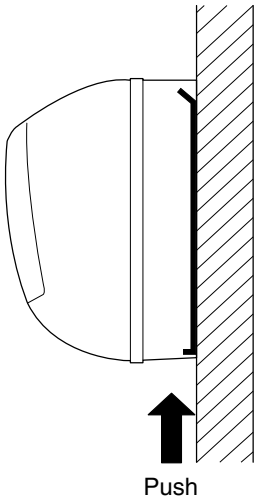


Fig. 3-50

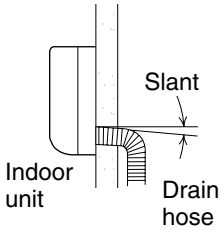


Fig. 3-51

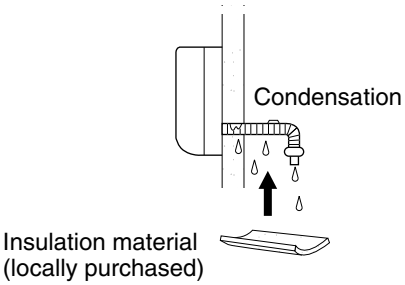


Fig. 3-52

XAV

■ Slim Concealed-Duct Type (DAV Type)

3-15. Required Minimum Space for Installation and Service

- This air conditioner is usually installed above the ceiling so that the indoor unit and ducts are not visible. Only the air intake and air outlet ports are visible from below.
- The minimum space for installation and service is shown in the diagram.
- *H dimension means the minimum height of the unit.
- Select the *H dimension such that a downward slope of at least 1/100 is ensured as indicated in "3-20. Installing the Drain Piping".

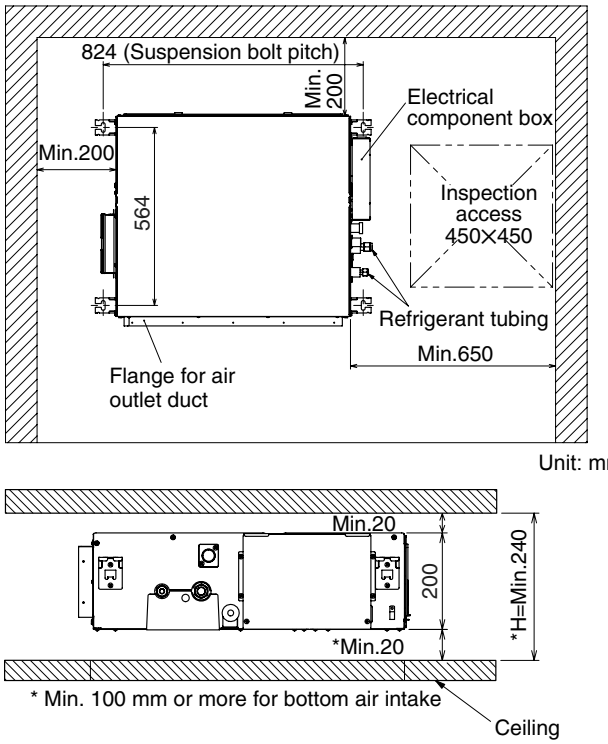


Fig. 3-53

- The diagram shows the detailed dimensions of the indoor unit.

1	Refrigerant tubing joint (narrow tube)
2	Refrigerant tubing joint (wide tube)
3	Upper and bottom drain port (O.D.26mm)
4	Suspension lug
5	Power supply outlet (ø30)
6	Flange for air outlet duct
7	Panel cover
8	Electrical component box
9	Frame filter
10	Signal output board (optional)

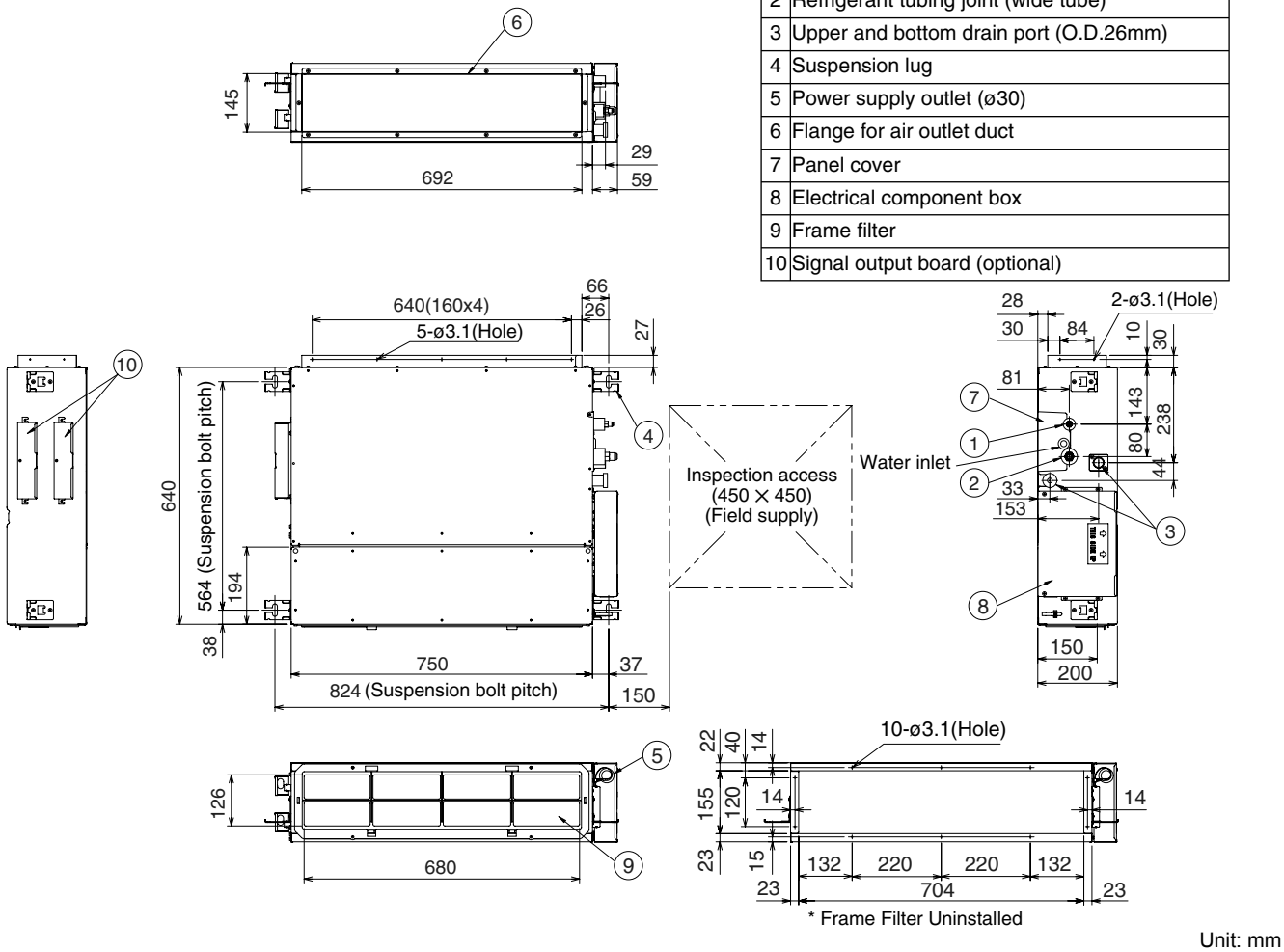
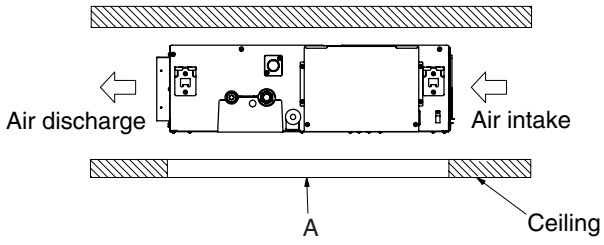


Fig. 3-54

3-16. Preparations Before Installation

(1) Confirm the positional relationship between the unit and suspension bolts. (Refer to the diagram.)

- Install the inspection opening on the control box side where maintenance and inspection of the control box are easy.
  The drain pump can only be inspected through the bottom of the unit.
  Install the inspection opening also in the lower part of the unit.



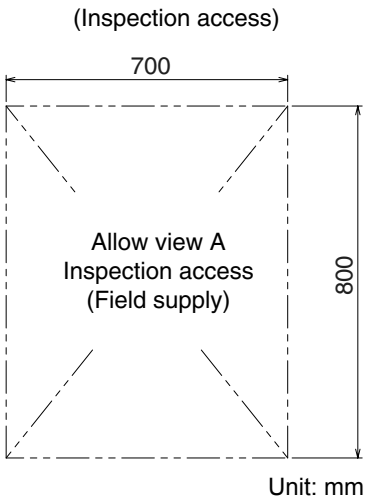


Fig. 3-55

(2) Make sure the range of the unit's external static pressure is not exceeded.
(See the technical documentation for the range of the external static pressure setting.)

(3) Open the installation hole. (Pre-set ceilings)

- Once the installation hole is opened in the ceiling where the unit is to be installed, pass refrigerant piping, drain piping, transmission wiring, and remote controller wiring (It is not necessary if using a wireless remote controller) to the unit's piping and wiring holes.
  See "5. HOW TO PROCESS TUBING, 3-20. Installing the Drain Piping" and "4. ELECTRICAL WIRING".
- After opening the ceiling hole, make sure ceiling is level if needed. It might be necessary to reinforce the ceiling frame to prevent shaking. Consult an architect or carpenter for details.

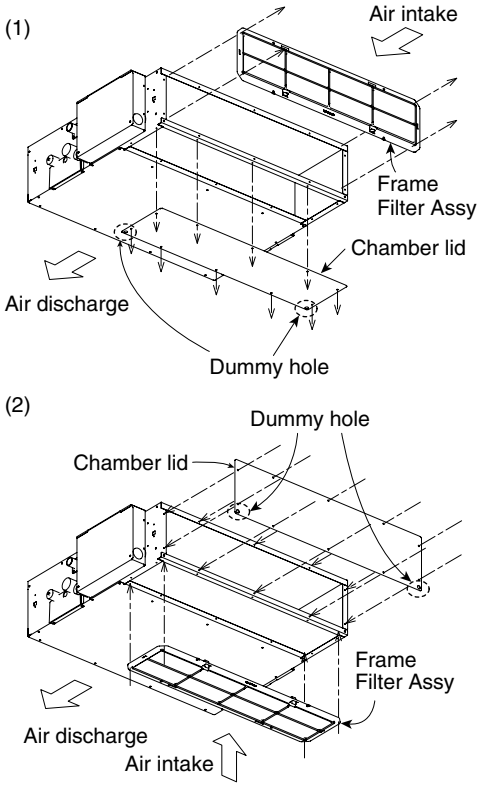
3-17. For Bottom Intake

For bottom intake, replace the chamber lid and protection net in the procedure shown in the diagram.

(1) Remove the Frame Filter Assy.
Remove the chamber lid.

(2) Refer to the diagram to attach the chamber lid and Frame Filter Assy in the direction of the arrow.
Note: Attach the lid with the dummy holes downward.

(3) Attach the Frame Filter Assy (supplied) in the manner shown in the diagram.



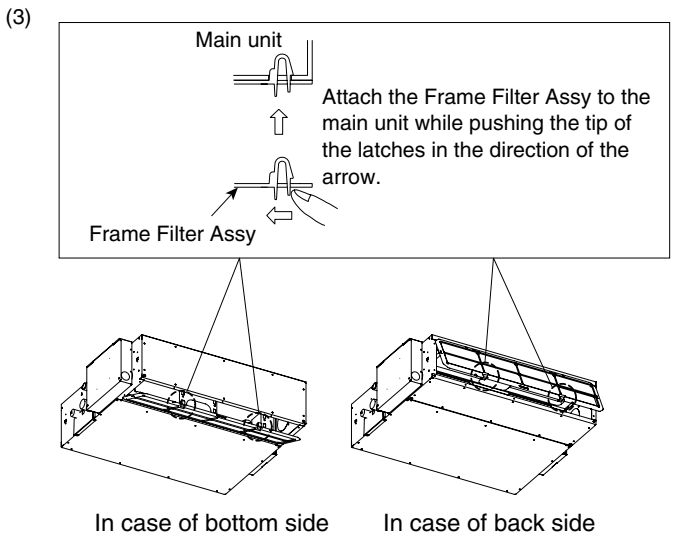


Fig. 3-56

3-18. Installing the Duct

Connect the duct supplied in the field.

Air inlet side

- Attach the duct and intake-side flange (field supply).
- Connect the flange to the main unit with 10 - ø3.1 (Hole) screws.
- Wrap the intake-side flange and duct connection area with aluminum tape or something similar to prevent air escaping.

CAUTION

When attaching a duct to the intake-side, be sure to attach an air filter inside the air passage on the intake-side. (Use an air filter whose dust collecting efficiency is at least 50% in a gravimetric technique.)
The included filter is not used when the intake duct is attached.

DAV

Air outlet side

- Connect the duct according to the air outside of the outlet-side flange.
- Wrap the outlet-side flange and the duct connection area with aluminum tape or something similar to prevent air escaping.

CAUTION

- Be sure to insulate the duct to prevent condensation from forming.
  (Material: glass wool or polyethylene foam, 25 mm thick)
- Use electric insulation between the duct and the wall when using metal ducts to pass metal laths of the net or fence shape or metal plating into wooden buildings.
- Be sure to explain about the way of maintaining and cleaning local procurements (air filter, grille [both air outlet and suction grille], etc.) to your customer.

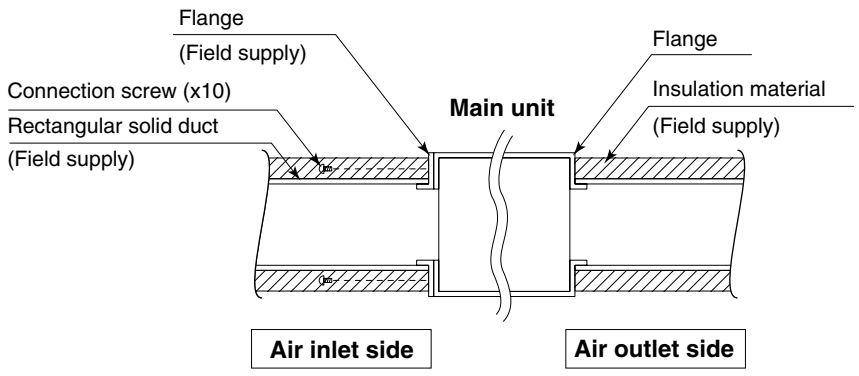


Fig. 3-57

3-19. Suspending the Indoor Unit

Depending on the ceiling type:

- Insert suspension bolts as shown in the diagram

or

- Use existing ceiling supports or construct a suitable support as shown in the diagram.

WARNING

It is important that you use extreme care in supporting the indoor unit inside the ceiling. Ensure that the ceiling is strong enough to support the weight of the unit. Before hanging the unit, test the strength of each attached suspension bolt.

(1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts referring to the dimensional data on the previous page.
Tubing must be laid and connected inside the ceiling when suspending the unit. If the ceiling is already constructed, lay the tubing into position for connection to the unit before placing the unit inside the ceiling.

(2) Screw in the suspension bolts allowing them to protrude from the ceiling as shown in the diagram. (Cut the ceiling material, if necessary.)

(3) Thread the 3 hexagonal nuts and 2 washers (field supply) onto each of the 4 suspension bolts as shown in the diagram. Use 1 nut and 1 washer for the upper part, and 2 nuts and 1 washer for the lower part, so that the unit will not fall off the suspension lugs.

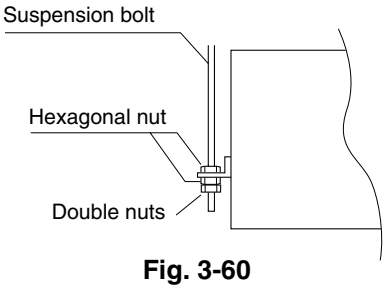


Fig. 3-60

(4) Adjust the height of the unit.

(5) Check the unit is horizontally level.

CAUTION

- Make sure the unit is installed level using a level or a plastic tube filled with water. In using a plastic tube instead of a level, adjust the top surface of the unit to the surface of the water at both ends of the plastic tube and adjust the unit horizontally.
(One thing to watch out for in particular is if the unit is installed so that the slope is not in the direction of the drain piping, this might cause leaking.)

(6) Tighten the upper nut.

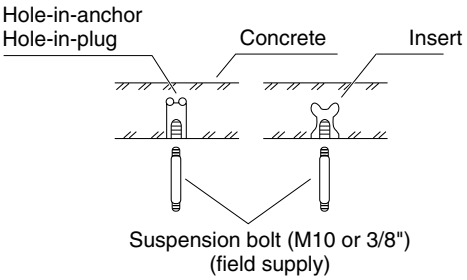


Fig. 3-58

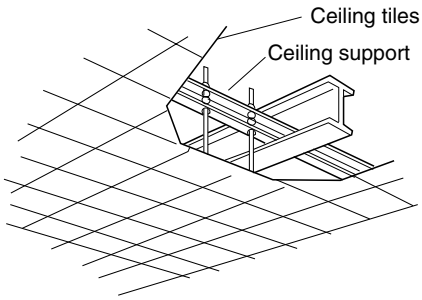


Fig. 3-59

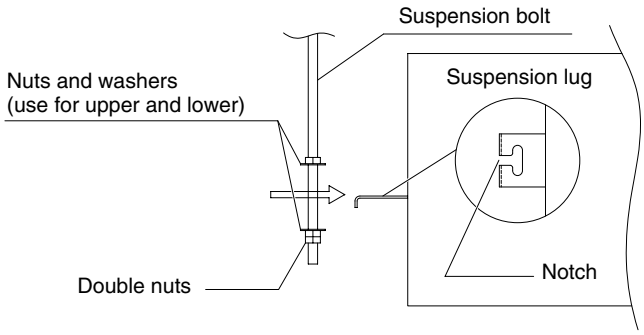


Fig. 3-61

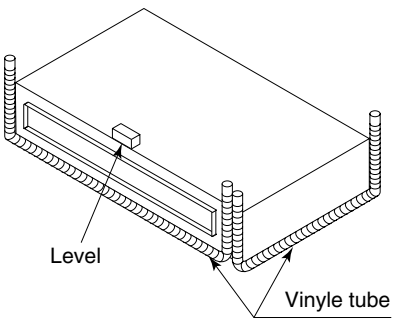


Fig. 3-62

DAV

3-20. Installing the Drain Piping

(1) Prepare standard hard PVC pipe (O.D. 26 mm) for the drain and use the supplied hose band to prevent water leaks.
The PVC pipe must be purchased separately.
The transparent drain part on the unit allows you to check drainage.

CAUTION

- **Do not use adhesive at the drain connection port on the indoor unit.**
- **Insert the drain pipe until it contacts the socket, as shown in the figure at right, then secure it tightly with the hose band.**
- **Do not use the supplied drain hose bent at a 90° angle. (The maximum permissible bend is 45°.)**
- **Tighten the hose clamps so their locking nuts face in the horizontal direction.**
- **Make sure that the drain port is not a downward gradient from the joint section (may lead to abnormal noise).**

NOTE

Make sure the drain pipe has a downward gradient (1/100 or more) and that there are no water traps.

CAUTION

- Do not install an air bleeder as this may cause water to spray from the drain pipe outlet.
- **If it is necessary to increase the height of the drain pipe, the section directly after the connection port can be raised a maximum of 50 cm. Do not raise it any higher than 50 cm, as this could result in water leaks.**
- Do not install the pipe with an upward gradient from the connection port. This will cause the drain water to flow backward and leak when the unit is not operating.
- Do not apply force to the piping on the unit side when connecting the drain pipe. The pipe should not be allowed to hang unsupported from its connection to the unit.
Fasten the pipe to a wall, frame, or other support as close to the unit as possible.

3-21. Checking the Drainage

After wiring and drain piping are completed, use the following procedure to check that the water will drain smoothly. For this, prepare a bucket and wiping cloth to catch and wipe up spilled water.

(1) Connect power to the power terminal board (R, S terminals) inside the electrical component box.

(2) Remove the eyelet cap and through the opening, slowly pour about 500cc of water into the drain pan to check drainage.

(3) Short the check pin (CHK) on the indoor control board and operate the drain pump. Check the water flow through the transparent drain port and see if there is any leakage.

Unit: mm

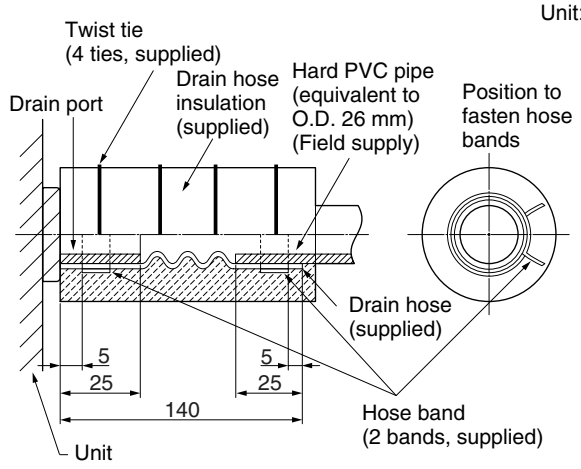


Fig. 3-63

CAUTION

- **Attach so that the hose band fastener is on the side of the drain port.**
- **Attach the hose bands so that each is approximately 5 to 25 mm from the end of the supplied drain hose.**

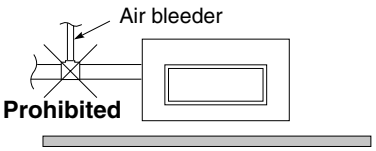


Fig. 3-64

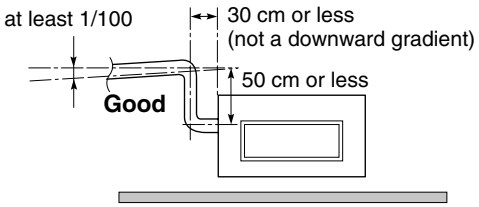


Fig. 3-65

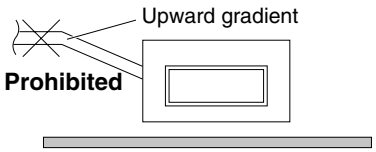


Fig. 3-66

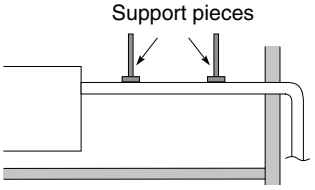


Fig. 3-67

DAV

CAUTION

Be careful since the fan will start when you short the pin on the indoor control board.

(4) When the check of drainage is complete, open the check pin (CHK) and remount the insulator and drain cap onto the drain inspection port.

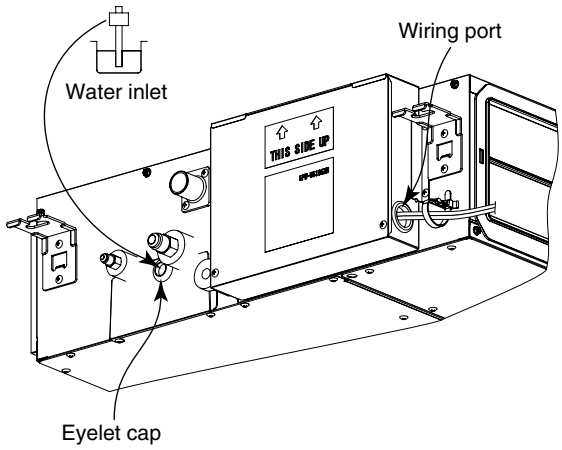


Fig. 3-68

■ Heat Exchager with DX coil Type (DEV Type)

3-22. Required Minimum Space for Installation and Service

- This air conditioner is usually installed above the ceiling so that the indoor unit and ducts are not visible. Only the air intake and air outlet ports are visible from below.
- The minimum space for installation and service is shown in Fig. 3-69a and Table 3-2.
- It is recommended that space is provided (450×450 mm) for checking and servicing the electrical system.
- Fig. 3-69b and Table 3-3 show the detailed dimensions of the indoor unit.

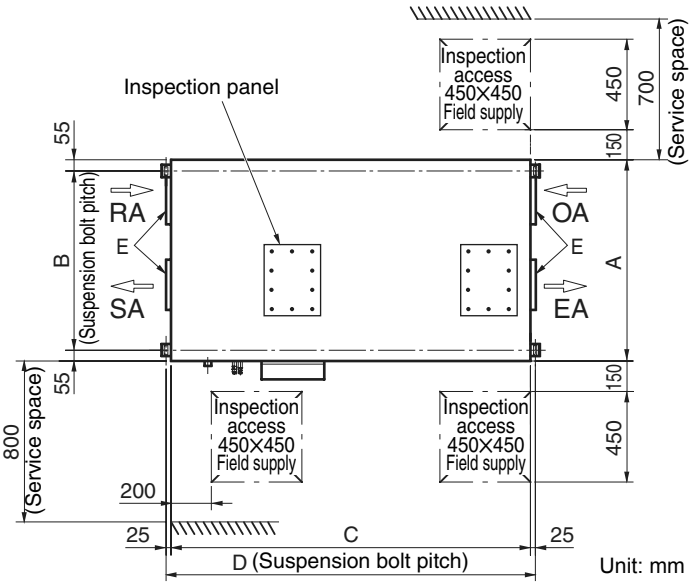


Fig. 3-69a

Table 3-2 Unit: mm

Type	A	B	C	D	E
AWSI-DEV018-N11	1000	890	1785	1835	ø250
AWSI-DEV024-N11	1120	1010	1903	1953	ø250
AWSI-DEV030-N11	1220	1110	1903	1953	ø300

Table 3-3 Unit: mm

Type	A	B	C
AWSI-DEV018-N11	425	205	175
AWSI-DEV024-N11	450	225	200
AWSI-DEV030-N11	450	225	200

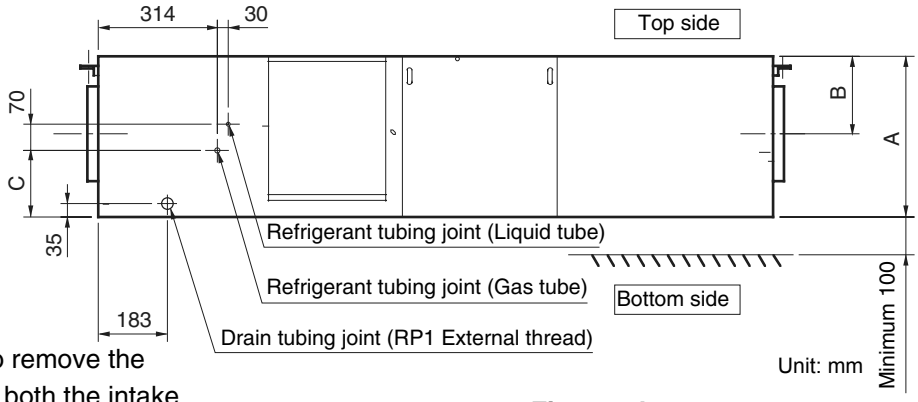


Fig. 3-69b

CAUTION

Before suspending the unit, be sure to remove the transport pads attached to the fan, on both the intake and discharge side.

Procedure:

<Intake side>

1. Remove the installation screws from the inspection panel, then remove the panel.
2. Remove all 4 pads on both sides of the fan casing.
3. Use the screws and the screws removed earlier to re-install the inspection panel onto the top of the unit.

<Discharge side>

1. Remove the pads on the fan discharge side through the discharge opening. (Fig. 3-70b)

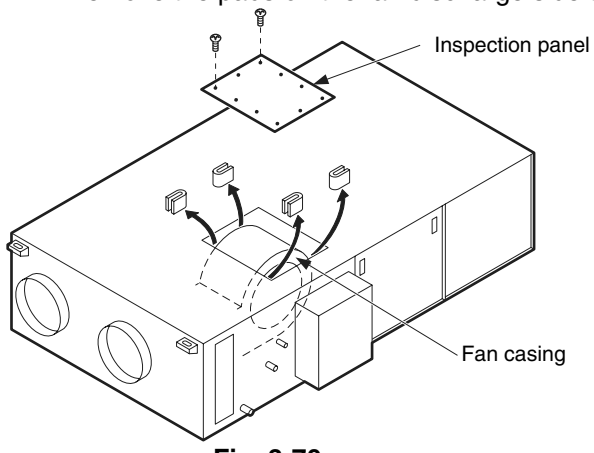


Fig. 3-70a

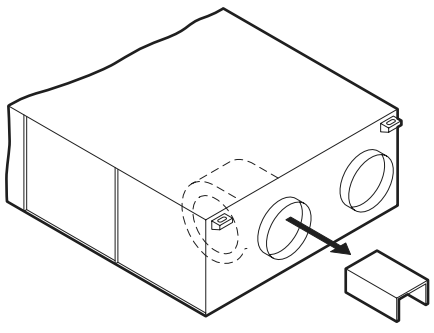
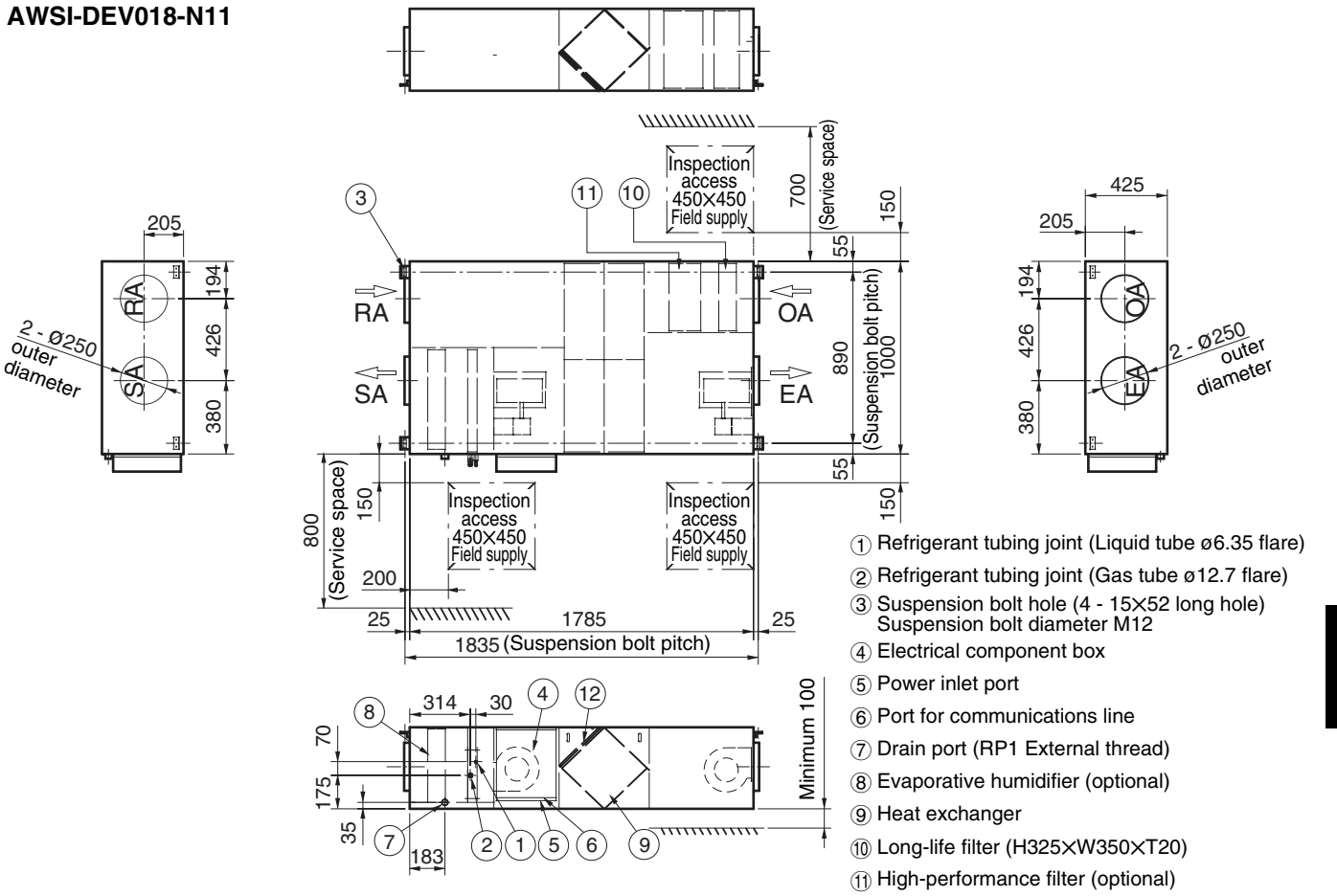


Fig. 3-70b

DEV

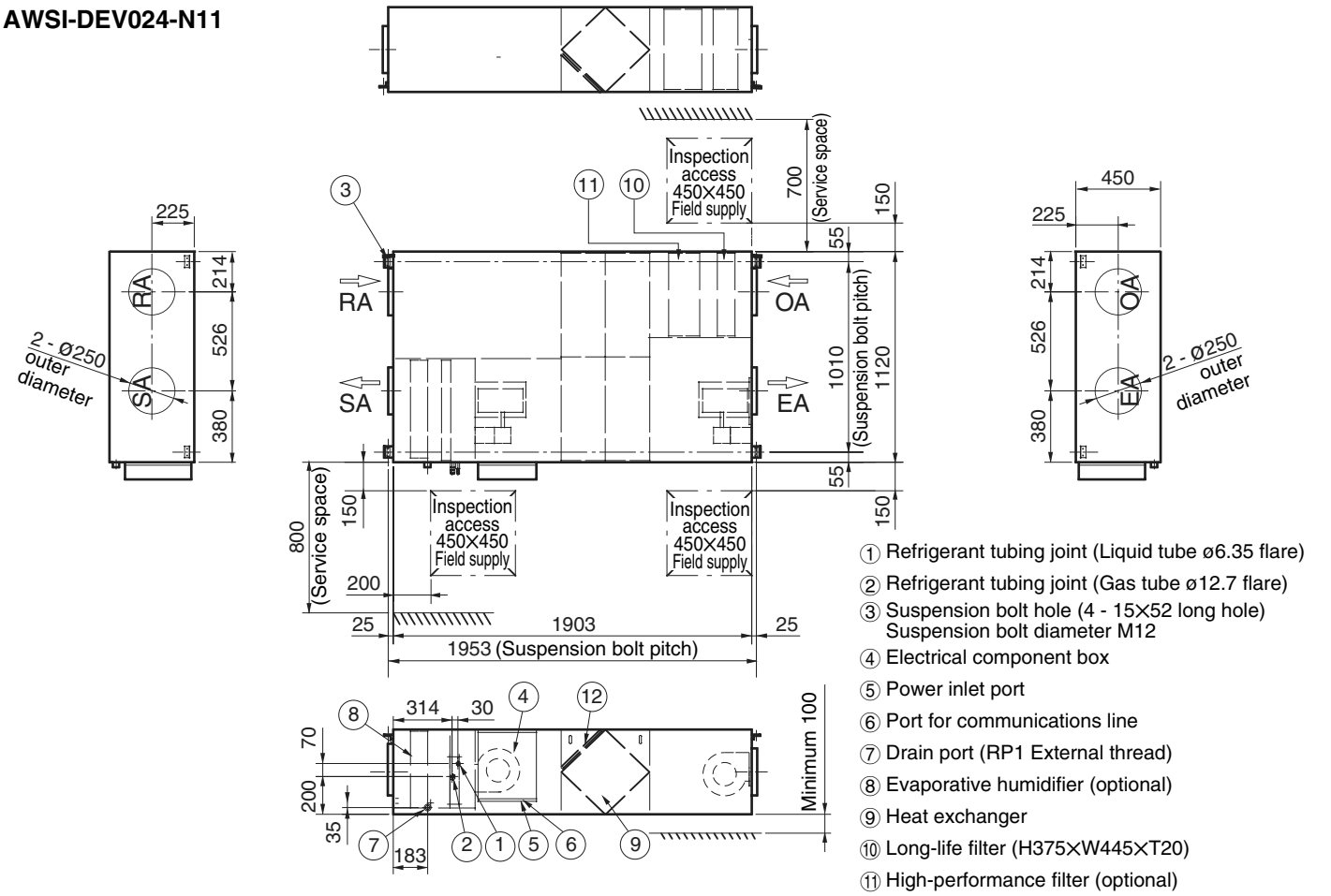
3-23. External Dimensions and Service Space

AWSI-DEV018-N11



① Refrigerant tubing joint (Liquid tube ø6.35 flare)
② Refrigerant tubing joint (Gas tube ø12.7 flare)
③ Suspension bolt hole (4 - 15×52 long hole)
Suspension bolt diameter M12
④ Electrical component box
⑤ Power inlet port
⑥ Port for communications line
⑦ Drain port (RP1 External thread)
⑧ Evaporative humidifier (optional)
⑨ Heat exchanger
⑩ Long-life filter (H325×W350×T20)
⑪ High-performance filter (optional)
⑫ Air filter (H230×W480×T10. Two filters are used.)

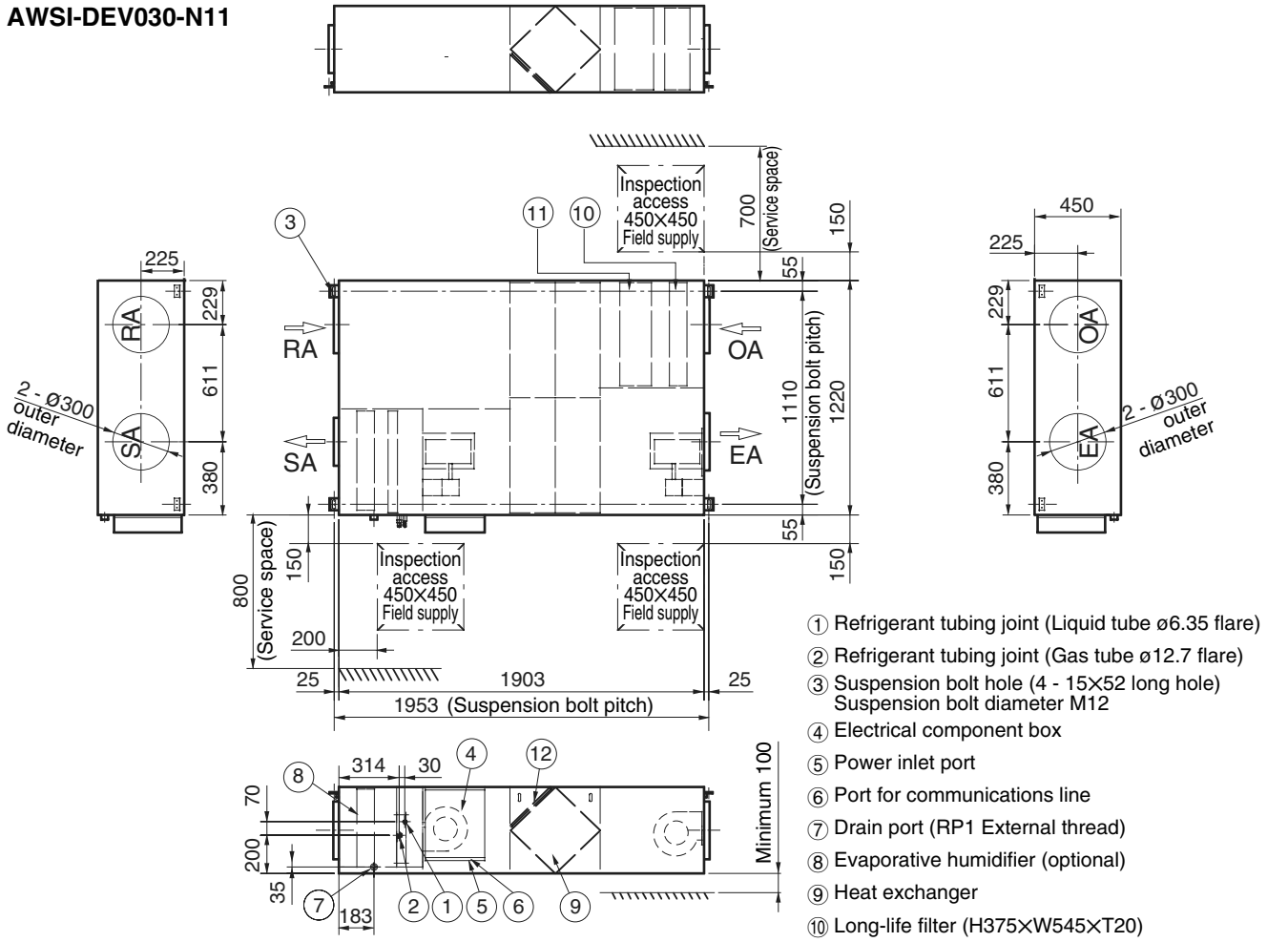
AWSI-DEV024-N11



① Refrigerant tubing joint (Liquid tube ø6.35 flare)
② Refrigerant tubing joint (Gas tube ø12.7 flare)
③ Suspension bolt hole (4 - 15×52 long hole)
Suspension bolt diameter M12
④ Electrical component box
⑤ Power inlet port
⑥ Port for communications line
⑦ Drain port (RP1 External thread)
⑧ Evaporative humidifier (optional)
⑨ Heat exchanger
⑩ Long-life filter (H375×W445×T20)
⑪ High-performance filter (optional)
⑫ Air filter (H247×W547×T10. Two filters are used.)

DEV

AWSI-DEV030-N11



① Refrigerant tubing joint (Liquid tube ø6.35 flare)
② Refrigerant tubing joint (Gas tube ø12.7 flare)
③ Suspension bolt hole (4 - 15×52 long hole)
Suspension bolt diameter M12
④ Electrical component box
⑤ Power inlet port
⑥ Port for communications line
⑦ Drain port (RP1 External thread)
⑧ Evaporative humidifier (optional)
⑨ Heat exchanger
⑩ Long-life filter (H375×W545×T20)
⑪ High-performance filter (optional)
⑫ Air filter (H247×W597×T10. Two filters are used.)

DEV

3-24. Suspending the Indoor Unit

Depending on the ceiling type:

- Insert suspension bolts as shown in Fig. 3-71

  or

- Use existing ceiling supports or construct a suitable support as shown in Fig. 3-72.

WARNING

It is important that you use extreme care in supporting the indoor unit inside the ceiling. Ensure that the ceiling is strong enough to support the weight of the unit. Before hanging the unit, test the strength of each attached suspension bolt.

(1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts referring to the dimensional data on the previous page. (Fig. 3-69 and Table 3-2)
Tubing must be laid and connected inside the ceiling when suspending the unit. If the ceiling is already constructed, lay the tubing into position for connection to the unit before placing the unit inside the ceiling.

(2) Screw in the suspension bolts allowing them to protrude from the ceiling as shown in Fig. 3-71. (Cut the ceiling material, if necessary.)

- To suspend the unit inside the ceiling, lift up the unit and attach it to the suspension bolts as shown in the figure at right.
- In order to ensure that the unit is level, adjust either by using a level gauge, or else by using the method shown in the figure at right.

(3) Thread the 3 hexagonal nuts and 2 washers (field supply) onto each of the 4 suspension bolts as shown in Fig. 3-74. Use 1 nut and 1 washer for the upper part, and 2 nuts and 1 washer for the lower part, so that the unit will not fall off the suspension lugs.

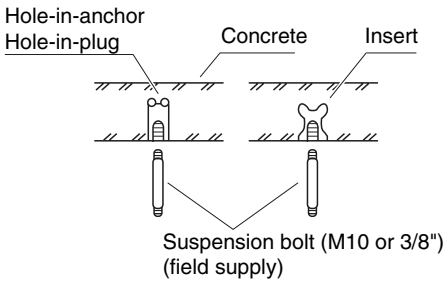


Fig. 3-71

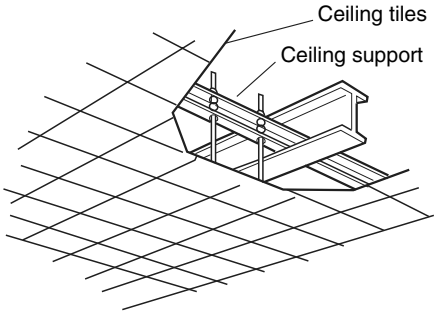


Fig. 3-72

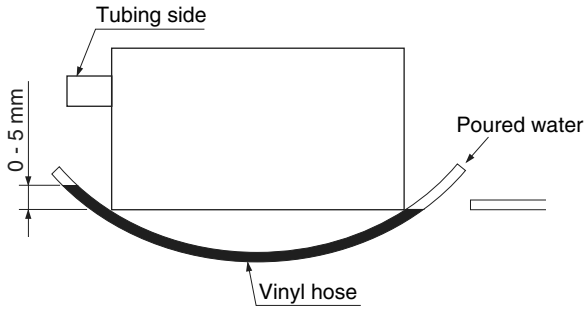


Fig. 3-73

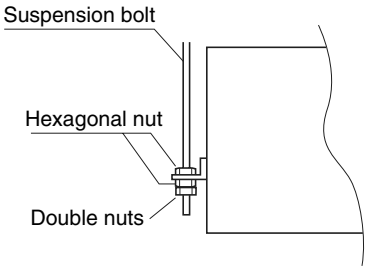


Fig. 3-74

DEV

3-25. Performing Duct Work

(1) Connect the OA and EA ducts so that there is a downward gradient (5 - 10°) leading to the suction/ discharge ports on the exterior (outdoor) side.

(2) At the time of shipping, both suction and discharge are set to “High”. Therefore, use the connector-with-plug provided inside the electrical component box in order to adjust the external static pressure.

(3) Be sure to thermally insulate the discharge and suction ducts in order to prevent condensation on the ducts.

(4) Although the unit includes filters on the suction side and discharge side, it is recommended that additional easily cleanable filters be installed at each of the suction grilles.

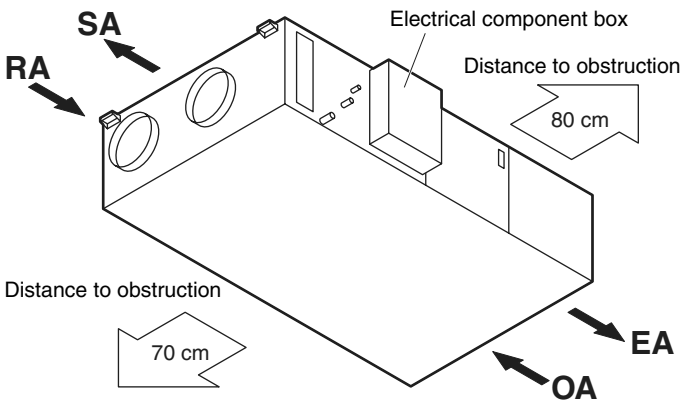


Fig. 3-75

3-26. Installing the Drain Piping

(1) The drain tube connection size is R1 (25A). Prepare standard hard PVC pipe VP25 (O.D. 32 mm) for the drain and use the supplied hose band to prevent water leaks. The PVC pipe must be purchased separately.

CAUTION

- **Do not use adhesive at the drain connection port on the indoor unit.**
- **Insert the drain pipe until it contacts the socket, as shown in the figure at right.**

(2) After connecting the drain piping securely, wrap the supplied packing and drain pipe insulator around the pipe, then secure it with the supplied vinyl clamps. (Fig. 3-76)

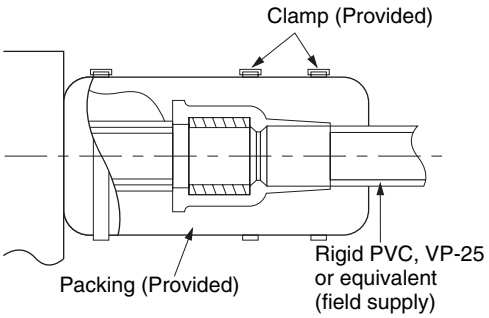


Fig. 3-76

NOTE

Make sure the drain pipe has a downward gradient (1/100 or more) and that there are no water traps. The portion of the drain tubing located on the inside must be thermally insulated.

CAUTION

- Do not install an air bleeder as this may cause water to spray from the drain pipe outlet. (Fig. 3-77)

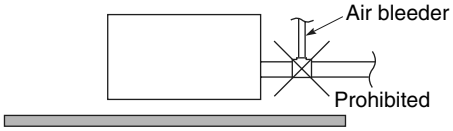


Fig. 3-77

- Do not install the pipe with an upward gradient from the connection port. This will cause the drain water to flow backward and leak when the unit is not operating. (Fig. 3-78)

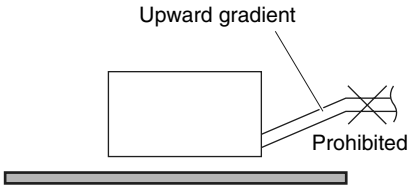


Fig. 3-78

- Do not apply force to the piping on the unit side when connecting the drain pipe. The pipe should not be allowed to hang unsupported from its connection to the unit. Fasten the pipe to a wall, frame, or other support as close to the unit as possible. (Fig. 3-79)

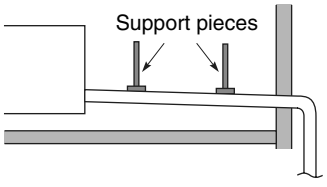
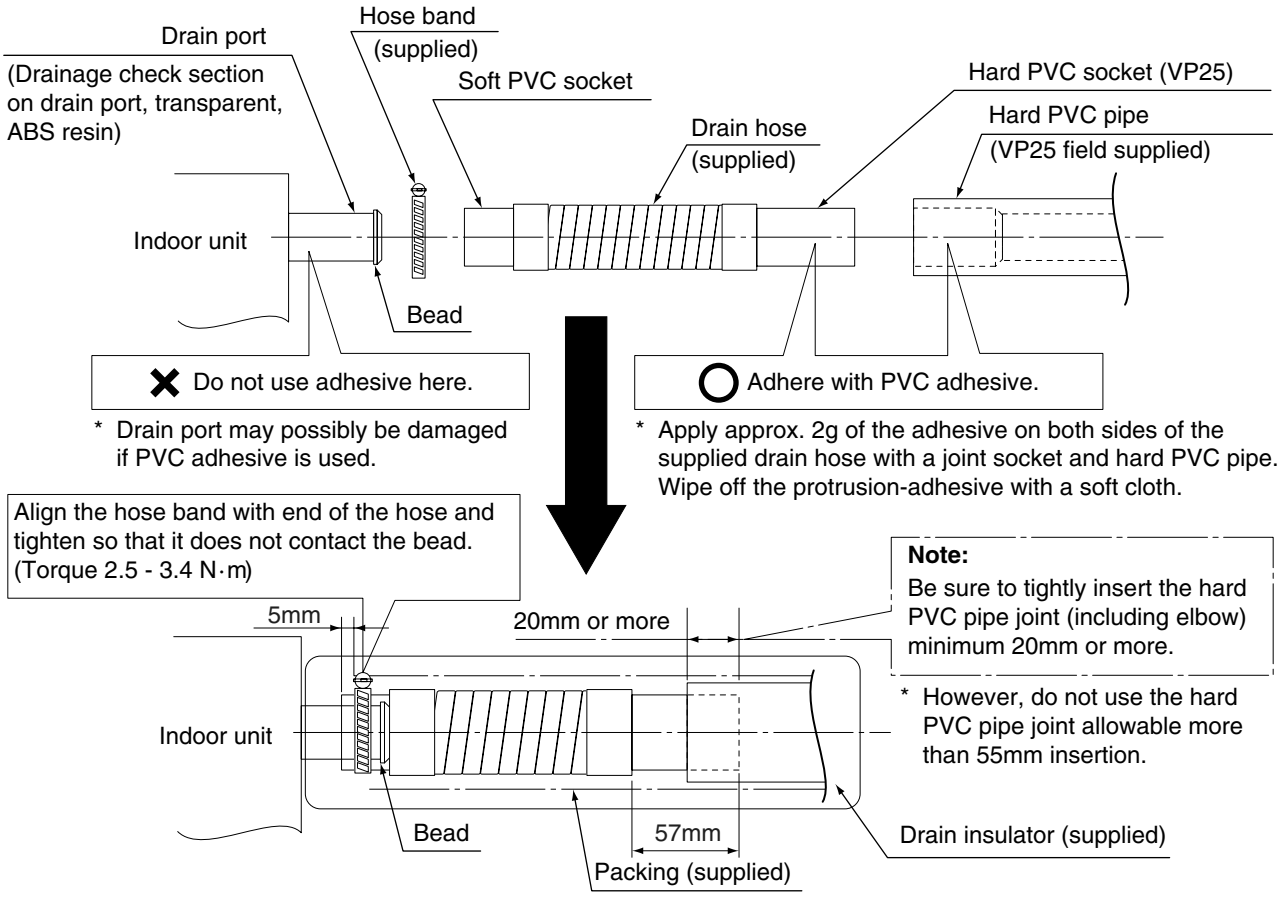


Fig. 3-79

■ SUPPLEMENT ON DRAIN PIPING

1. Drain hose installation



* After checking the drainage, wrap the supplied packing and drain pipe insulator around the pipe.

Note: There is possibility to cause water leakage unless the above steps are carried out.

2. Checkpoint after installation

After installation of indoor and outdoor units, panels and electrical wiring, check the following items.

	Checkpoint	Symptom	Check	Remark
1	Make sure whether indoor and outdoor units are correctly installed.	Fall, vibration, noise		
2	Make sure whether gas leakage is tested.	No cooling, no heating		
3	Make sure whether insulation is completed. (Refrigerant piping and drain piping)	Water leakage		
4	Make sure whether drain water is running smoothly.	Water leakage		
5	Make sure whether the power voltage matches the nameplate.	Inoperative, burnout		
6	Make sure whether there is miswiring or incorrect connection.	Inoperative, burnout		
7	Make sure whether the ground construction is completed.	Ground leakage		
8	Make sure whether the wire gauge is followed by the recommended specifications.	Inoperative, burnout		
9	Make sure whether the air intake and air outlet of the indoor and outdoor units are sealed by obstacles.	No cooling, no heating		

■ RAP (Refrigerant Accumulation Protector) Valve Kit (NRAP-FLR)

When installing a indoor unit, you must also install the RAP Valve Kit (NRAP-FLR).

- Secure the RAP valve kit using suspension bolts, etc. within 30 meters from the indoor unit.
- Do not place the RAP valve kit directly on the ceiling.

3-27. Installing the Refrigerant Tubing

For details on connecting the RAP valve kit, refer to the manual that came with the kit.

- Be sure to insulate both the gas tubing and liquid tubing. In addition, wrap the supplied insulation material around the tubing joints, and fasten in place with vinyl tape or other means.
  Failure to insulate the tubing may result in water leakage from condensation.
- Plug all gaps at tube through-holes in the unit with insulation or a similar substance to prevent air leakage.

NOTE

A solenoid valve kit is required in order to connect an indoor unit to FLOW LOGIC 3 Pipe System. In this case, the RAP valve kit is not necessary.

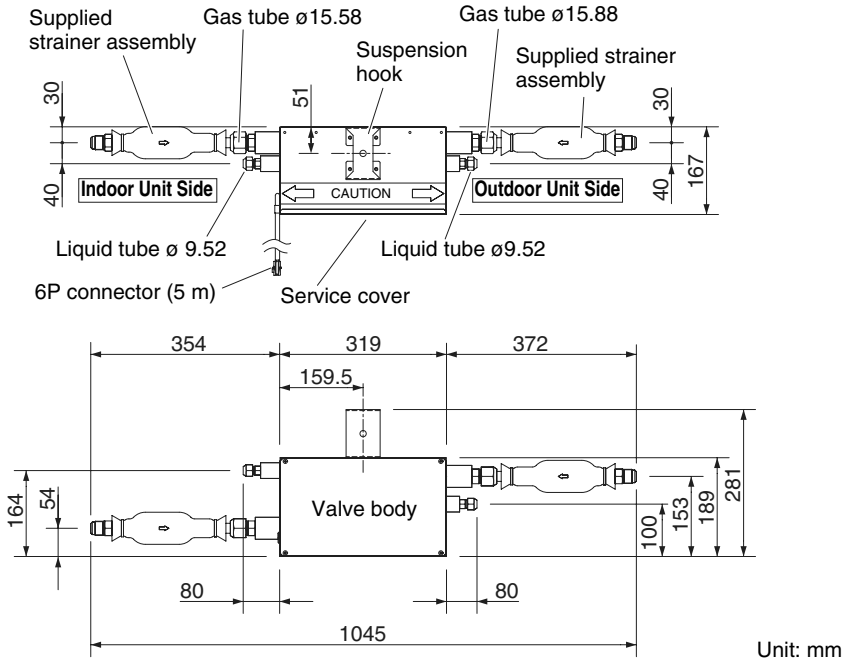


Fig. 3-80

Note:

This figure shows the valve body with the suspension hook and strainer assemblies installed.

4. ELECTRICAL WIRING

4-1. General Precautions on Wiring

(1) Before wiring, confirm the rated voltage of the unit as shown on its nameplate, then carry out the wiring closely following the wiring diagram.

(2) Provide a power outlet to be used exclusively for each unit, and a power supply disconnect and circuit breaker for overcurrent protection should be provided in the exclusive line.

(3) To prevent possible hazards from insulation failure, the unit must be grounded.

(4) Each wiring connection must be done in accordance with the wiring system diagram. Wrong wiring may cause the unit to misoperate or become damaged.

(5) Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.

(6) Unauthorized changes in the internal wiring can be very dangerous. The manufacturer will accept no responsibility for any damage or misoperation that occurs as a result of such unauthorized changes.

(7) Regulations on wire diameters differ from locality to locality. For field wiring rules, please refer to your LOCAL ELECTRICAL CODES before beginning.

You must ensure that installation complies with all relevant rules and regulations.

(8) To prevent malfunction of the air conditioner caused by electrical noise, care must be taken when wiring as follows:

- The remote control wiring and the inter-unit control wiring should be wired apart from the inter-unit power wiring.
- Use shielded wires for inter-unit control wiring between units and ground the shield on both sides.

(9) If the power supply cord of this appliance is damaged, it must be replaced by a repair shop appointed by the manufacturer, because special purpose tools are required.

4-2. Recommended Wire Length and Wire Diameter for Power Supply System

Indoor unit

Type	(B) Power supply	Time delay fuse or circuit capacity
	2.5 mm^2	
XAV	Max. 150 m	10 – 16 A
CAV, DAV	Max. 130 m	10 – 16 A
DEV (018)	Max. 85 m	10 – 16 A
DEV (024)	Max. 65 m	10 – 16 A
DEV (030)	Max. 60 m	10 – 16 A

Control wiring

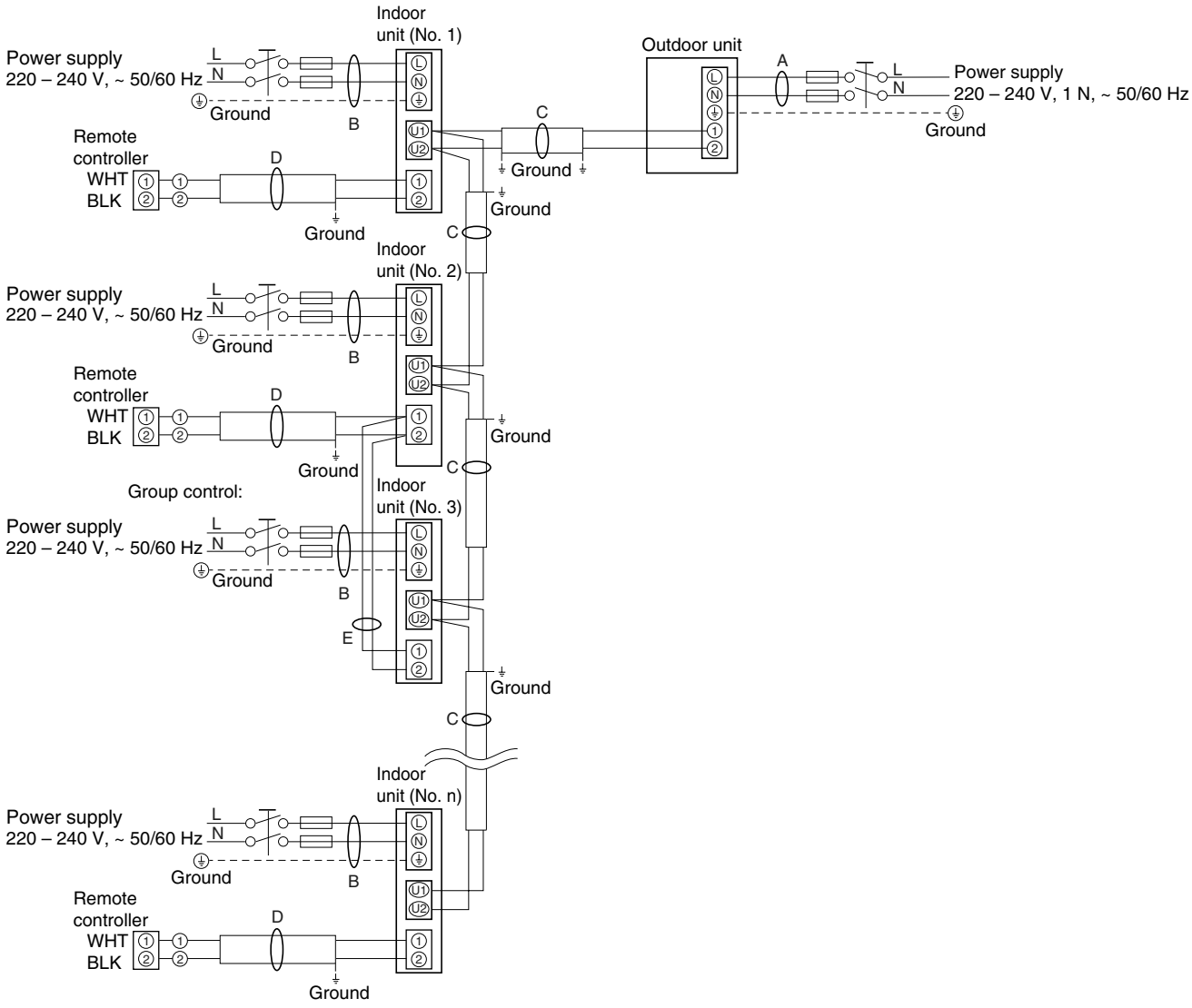
(C) Inter-unit (between outdoor and indoor units) control wiring	(D) Remote control wiring	(E) Control wiring for group control
0.75 mm^2 (AWG #18) **Use shielded wiring***	0.75 mm^2 (AWG #18) **Use shielded wiring***	0.75 mm^2 (AWG #18) **Use shielded wiring***
Max. 1,000 m	Max. 500 m	Max. 200 m (Total)

NOTE

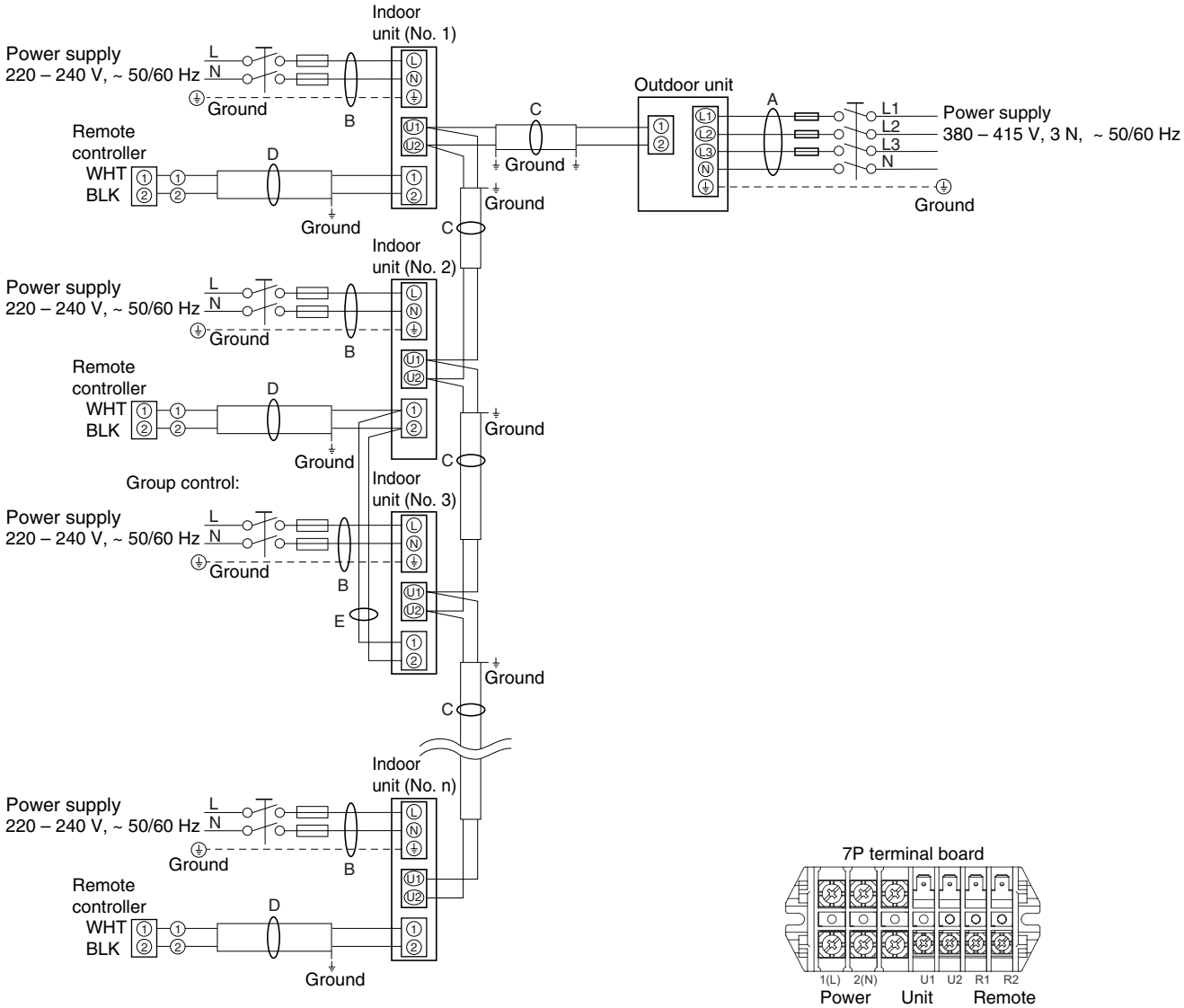
* With ring-type wire terminal.

4-3. Wiring System Diagram

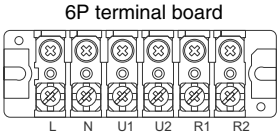
(for single-phase outdoor unit)



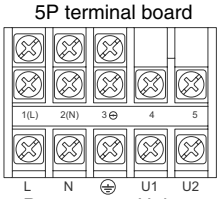
(for 3-phase outdoor unit)



DEV Type



CAV, DAV Types



XAV Type

NOTE

(1) Refer to Section 4-2. “Recommended Wire Length and Wire Diameter for Power Supply System” for the explanation of “A,” “B,” “C,” “D,” and “E,” in the above diagram.

(2) The basic connection diagram of the indoor unit shows the 7P terminal board, so the terminal boards in your equipment may differ from the diagram.

(3) Refrigerant Circuit (R.C.) address should be set before turning the power on.

CAUTION

(1) When linking outdoor units in a network (S-net link system), disconnect the terminal extended from the short plug (CN003, 2P Black, location: right bottom on the outdoor main control PCB) from all outdoor units except any one of the outdoor units.
(When shipping: In shorted condition.)

Otherwise the communication of S-net link system is not performed. For a system without link (no connection wiring between outdoor units), do not remove the short plug.

(2) Do not install the inter-unit control wiring in a way that forms a loop. (Fig. 4-1)

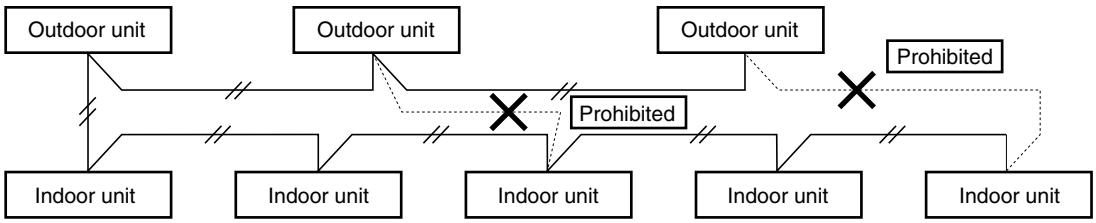


Fig. 4-1

(3) Do not install inter-unit control wiring such as star branch wiring. Star branch wiring causes mis-address setting.

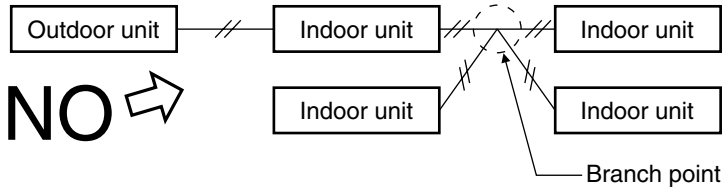


Fig. 4-2

(4) If branching the inter-unit control wiring, the number of branch points should be 16 or fewer. (Branches less than 1 m are not included in the total branch number.) (Fig. 4-3)

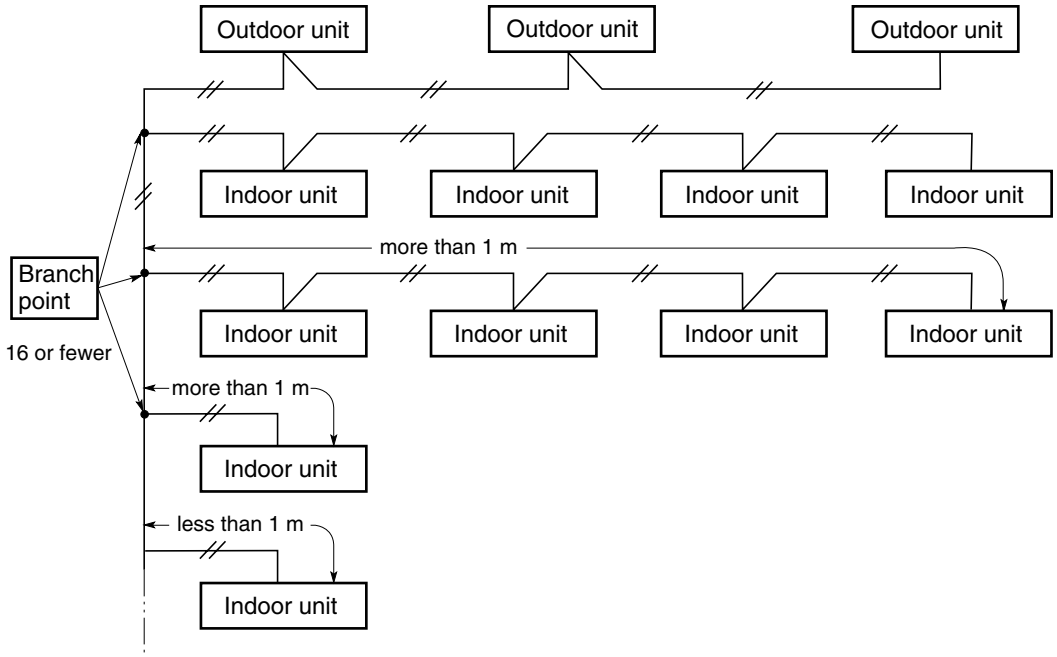


Fig. 4-3

(5) Use shielded wires for inter-unit control wiring (c) and ground the shield on one side, otherwise misoperation from noise may occur. (Fig. 4-4)
Connect wiring as shown in Section "4-3. Wiring System Diagram."

WARNING

Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, ensure that all wiring is tightly connected.

When connecting each power wire to the terminal, follow the instructions on "How to connect wiring to the terminal" and fasten the wire securely with the fixing screw of the terminal plate.

How to connect wiring to the terminal

■ For stranded wiring

(1) Cut the wire end with cutting pliers, then strip the insulation to expose the stranded wiring about 10 mm and tightly twist the wire ends. (Fig. 4-5)

(2) Using a Phillips head screwdriver, remove the terminal screw(s) on the terminal plate.

(3) Using a ring connector fastener or pliers, securely clamp each stripped wire end with a ring pressure terminal.

(4) Place the ring pressure terminal, and replace and tighten the removed terminal screw using a screwdriver. (Fig. 4-6)

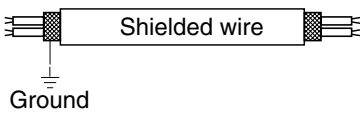


Fig. 4-4

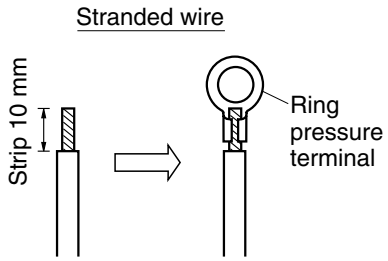


Fig. 4-5

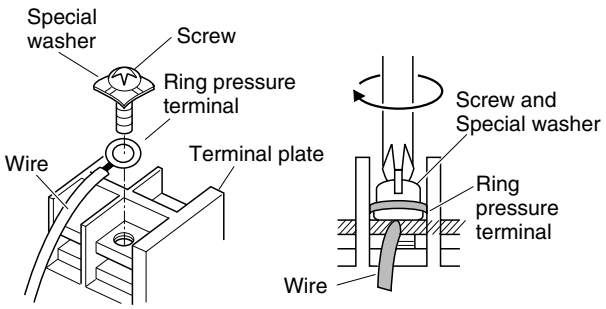


Fig. 4-6

5. HOW TO PROCESS TUBING

5-1. Connecting the Refrigerant Tubing

Use of the Flaring Method

Many of conventional split system air conditioners employ the flaring method to connect refrigerant tubes which run between indoor and outdoor units. In this method, the copper tubes are flared at each end and connected with flare nuts.

Flaring Procedure with a Flare Tool

(1) Cut the copper tube to the required length with a tube cutter. It is recommended to cut approx. 30 – 50 cm longer than the tubing length you estimate.

(2) Remove burrs at the end of the copper tube with a tube reamer or file. This process is important and should be done carefully to make a good flare. (Fig. 5-1)

NOTE

When reaming, hold the tube end downward and be sure that no copper scraps fall into the tube. (Fig. 5-2)

(3) Remove the flare nut from the unit and be sure to mount it on the copper tube.

(4) Make a flare at the end of copper tube with a flare tool. (Fig. 5-3)

NOTE

A good flare should have the following characteristics:

- inside surface is glossy and smooth
- edge is smooth
- tapered sides are of uniform length

Deburring

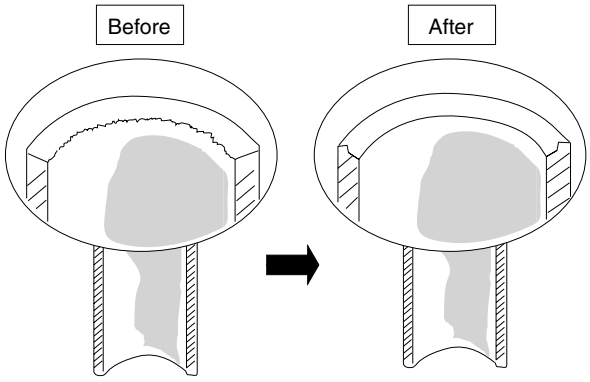


Fig. 5-1

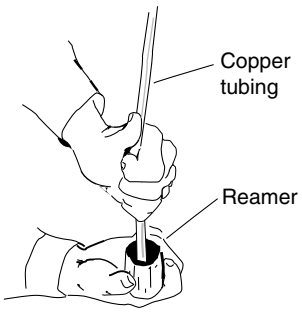


Fig. 5-2

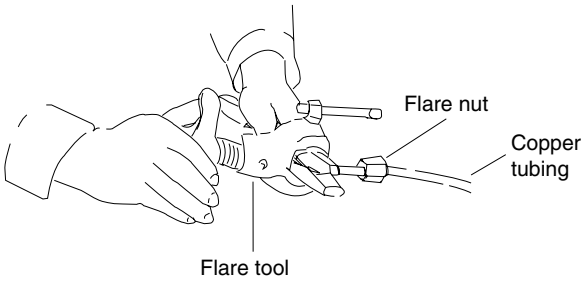


Fig. 5-3

Caution Before Connecting Tubes Tightly

(1) Apply a sealing cap or water-proof tape to prevent dust or water from entering the tubes before they are used.

(2) Be sure to apply refrigerant lubricant to the matching surfaces of the flare and union before connecting them together. This is effective for reducing gas leaks. (Fig. 5-4)

(3) For proper connection, align the union tube and flare tube straight with each other, then screw in the flare nut lightly at first to obtain a smooth match. (Fig. 5-5)

- Adjust the shape of the liquid tube using a tube bender at the installation site and connect it to the liquid tubing side valve using a flare.

Cautions During Brazing

- **Replace air inside the tube with nitrogen gas to prevent copper oxide film from forming during the brazing process. (Oxygen, carbon dioxide and Freon are not acceptable.)**
- **Do not allow the tubing to get too hot during brazing. The nitrogen gas inside the tubing may overheat, causing refrigerant system valves to become damaged. Therefore allow the tubing to cool when brazing.**
- **Use a reducing valve for the nitrogen cylinder.**
- **Do not use agents intended to prevent the formation of oxide film. These agents adversely affect the refrigerant and refrigerant oil, and may cause damage or malfunctions.**

5-2. Connecting Tubing Between Indoor and Outdoor Units

(1) Tightly connect the indoor-side refrigerant tubing extended from the wall with the outdoor-side tubing.

(2) To fasten the flare nuts, apply specified torque as at right:

- When removing the flare nuts from the tubing connections, or when tightening them after connecting the tubing, be sure to use 2 adjustable wrenches or spanners as shown. (Fig. 5-6)
  If the flare nuts are over-tightened, the flare may be damaged, which could result refrigerant leakage and cause in injury or asphyxiation to room occupants.
- For the flare nuts at tubing connections, be sure to use the flare nuts that were supplied with the unit, or else flare nuts for R410A (type 2). The refrigerant tubing that is used must be of the correct wall thickness as shown in the table at right.

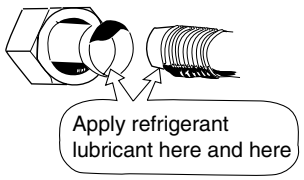


Fig. 5-4

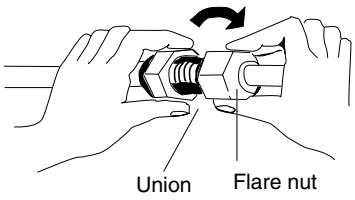


Fig. 5-5

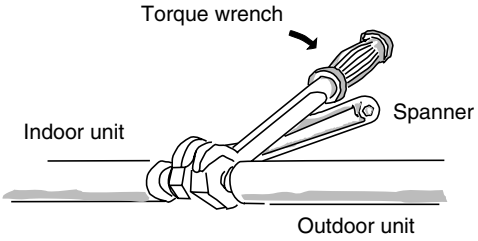


Fig. 5-6

Tube diameter	Tightening torque, approximate	Tube thickness
ø6.35 (1/4")	14 – 18 N · m (140 – 180 kgf · cm)	0.8 mm
ø9.52 (3/8")	34 – 42 N · m (340 – 420 kgf · cm)	0.8 mm
ø12.7 (1/2")	49 – 61 N · m (490 – 610 kgf · cm)	0.8 mm
ø15.88 (5/8")	68 – 82 N · m (680 – 820 kgf · cm)	1.0 mm
ø19.05 (3/4")	100 – 120 N · m (1000 – 1200 kgf · cm)	1.0 mm

Because the pressure is approximately 1.6 times higher than conventional refrigerant pressure, the use of ordinary flare nuts (type 1) or thin-walled tubes may result in tube rupture, injury, or asphyxiation caused by refrigerant leakage.

- In order to prevent damage to the flare caused by over-tightening of the flare nuts, use the table above as a guide when tightening.
- When tightening the flare nut on the liquid tube, use a adjustable wrench with a nominal handle length of 200 mm.

5-3. Insulating the Refrigerant Tubing

Tubing Insulation

- Thermal insulation must be applied to all unit tubing, including distribution joint (purchased separately).
  * For gas tubing, the insulation material must be heat resistant to 120°C or above. For other tubing, it must be heat resistant to 80°C or above.

  Insulation material thickness must be 10 mm or greater.

  If the conditions inside the ceiling exceed DB 30°C and RH 70%, increase the thickness of the gas tubing insulation material by 1 step.

CAUTION

If the exterior of the outdoor unit valves has been finished with a square duct covering, make sure you allow sufficient space to use the valves and to allow the panels to be attached and removed.

Taping the flare nuts

Wind the white insulation tape around the flare nuts at the gas tube connections. Then cover up the tubing connections with the flare insulator, and fill the gap at the union with the supplied black insulation tape. Finally, fasten the insulator at both ends with the supplied vinyl clamps. (Fig. 5-8)

Insulation material

The material used for insulation must have good insulation characteristics, be easy to use, be age resistant, and must not easily absorb moisture. (Fig. 5-9)

CAUTION

After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack.

Never grasp the drain or refrigerant connecting outlets when moving the unit.

Two tubes arranged together

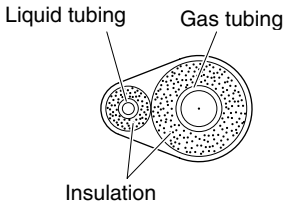


Fig. 5-7

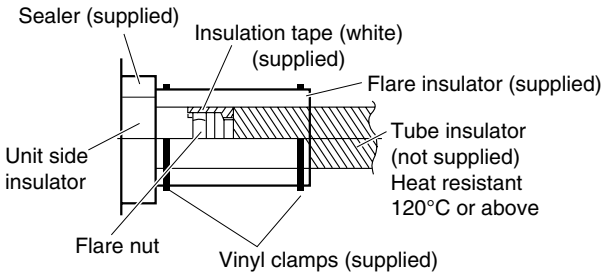


Fig. 5-8

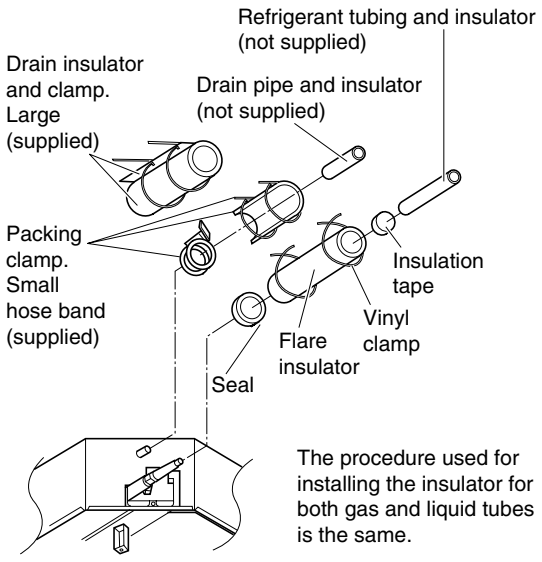


Fig. 5-9

5-4. Taping the Tubes

(1) At this time, the refrigerant tubes (and electrical wiring if local codes permit) should be taped together with armoring tape in 1 bundle. To prevent the condensation from overflowing the drain pan, keep the drain hose separate from the refrigerant tubing.

(2) Wrap the armoring tape from the bottom of the outdoor unit to the top of the tubing where it enters the wall. As you wrap the tubing, overlap half of each previous tape turn.

(3) Clamp the tubing bundle to the wall, using 1 clamp approx. each meter. (Fig. 5-10)

NOTE

Do not wind the armoring tape too tightly since this will decrease the heat insulation effect. Also ensure that the condensation drain hose splits away from the bundle and drips clear of the unit and the tubing.

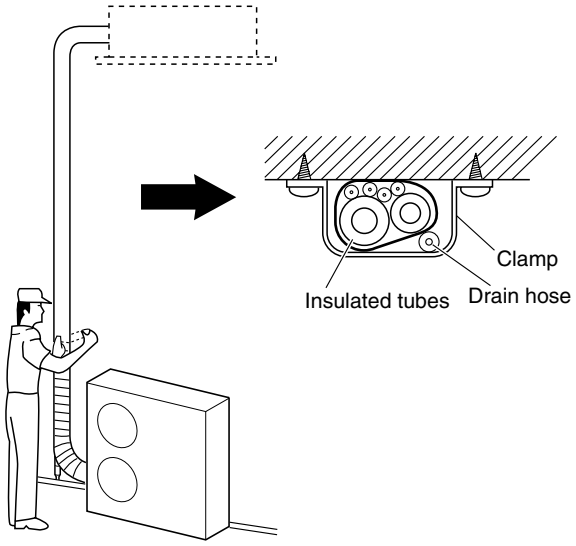


Fig. 5-10

5-5. Finishing the Installation

After finishing insulating and taping over the tubing, use sealing putty to seal off the hole in the wall to prevent rain and draft from entering. (Fig. 5-11)

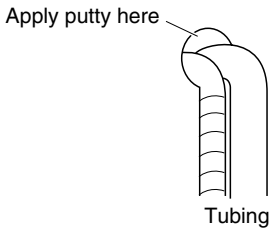


Fig. 5-11

6. HOW TO INSTALL THE REMOTE CONTROLLER: NRCT-FLR (OPTIONAL PART)

NOTE

Refer to the Instruction Manual attached to the optional Remote Control Unit.

7. HOW TO INSTALL THE CEILING PANEL

CAV

■ 4-Way Air Discharge Mini Semi-Concealed Type (CAV Type)

Checking the unit position

(1) Check that the ceiling hole is within this range: 600 × 600 mm

(2) Confirm that the position of the indoor unit and the ceiling as shown in the diagram. If the positions of the ceiling surface and unit do not match, air leakage, water leakage, flap operation failure, or other problems may occur.

Ⓐ must be within the range of 13 – 18 mm.
If not within this range, malfunction or other trouble may occur.

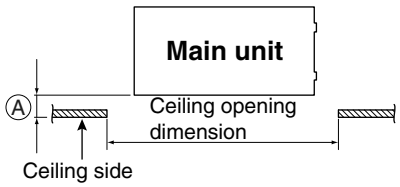


Fig. 7-1

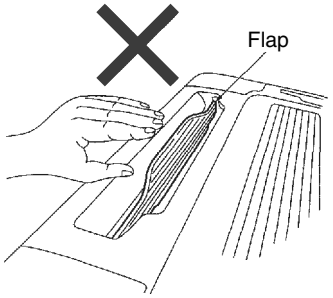


Fig. 7-2

CAUTION

- **Never place the panel face-down. Either hang it vertically or place it on top of a projecting object. Placing it face-down will damage the surface.**
- **Do not touch the flap or apply force to it. (This may cause flap malfunction.)**

7-1. Before Installing the Ceiling Panel

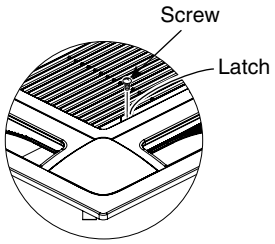
(1) Remove the air-intake grille and air filter from the ceiling panel. (See Fig.7-3)

a) Slide the air-intake grille catches in the direction shown by the arrows ① to open the grille.

b) With the air-intake grille opened, remove the grille hinge from the ceiling panel by sliding it in the direction shown by the arrow ②.

(2) Removing the corner cover (See Fig.7-4)

a) Remove the screws on the corner and slide the latches in the direction of the arrow ① to disconnect the hinges (3 locations). Then, remove the air-intake grille in the direction of the arrow ②.



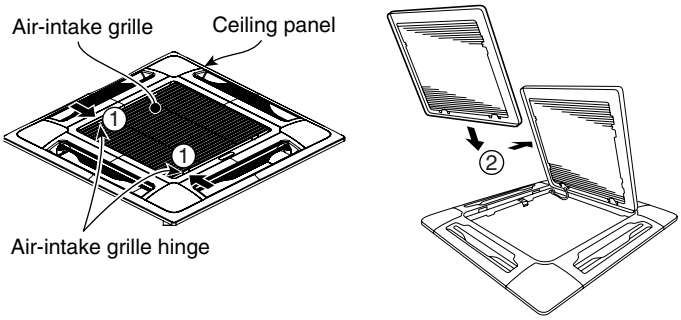


Fig. 7-3

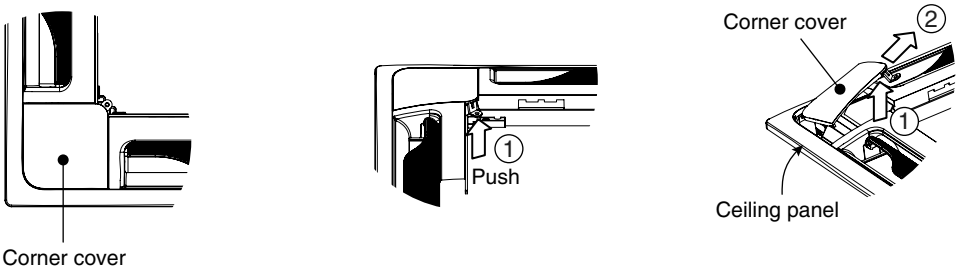


Fig. 7-4

7-2 Installing the Ceiling Panel

The power must be turned ON in order to change the flap angle. (Do not attempt to move the flap by hand. Doing so may damage the flap.)

(1) Hang the temporary latches on the inside of the ceiling panel to the receptacle on the unit to temporarily attach the ceiling panel in place.

- The ceiling panel must be installed in the correct direction relative to the unit. Align the REF. PIPE and DRAIN marks on the ceiling panel corner with the correct positions on the unit.

(2) Align the panel installation holes and the unit screw holes.

(3) Tighten the supplied washer head screws at the 4 panel installation locations so that the panel is attached tightly to the unit.

(4) Check that the panel is attached tightly to the ceiling.

- At this time, make sure that there are no gaps between the unit and the ceiling panel, or between the ceiling panel and the ceiling surface.
- If there is a gap between the panel and the ceiling, leave the ceiling panel attached and make fine adjustments to the installation height of the unit to eliminate the gap with the ceiling.

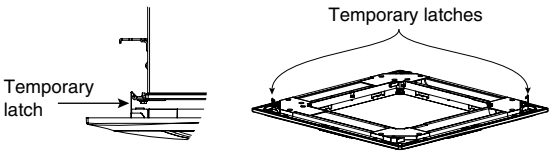


Fig. 7-5

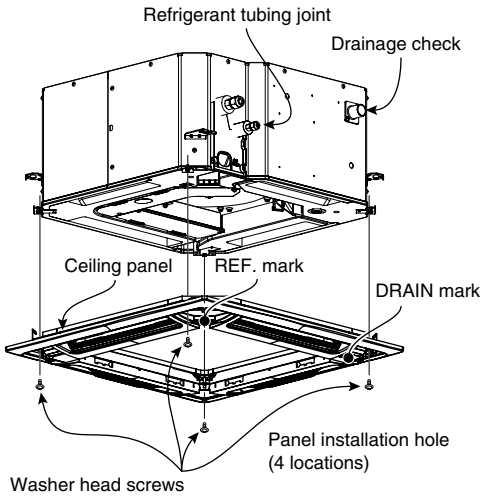


Fig. 7-6

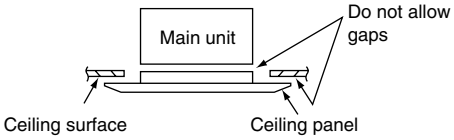
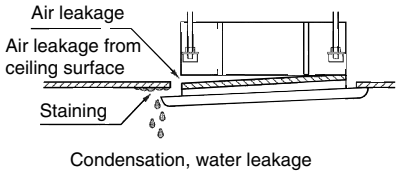


Fig. 7-7

CAUTION

- If the screws are not sufficiently tightened, trouble such as that shown in the figure below may occur. Be sure to tighten the screws securely.



- If a gap remains between the ceiling surface and the ceiling panel even after the screws are tightened, adjust the height of the unit again.

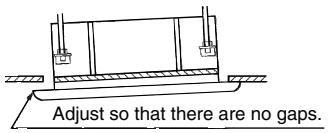


Fig. 7-8

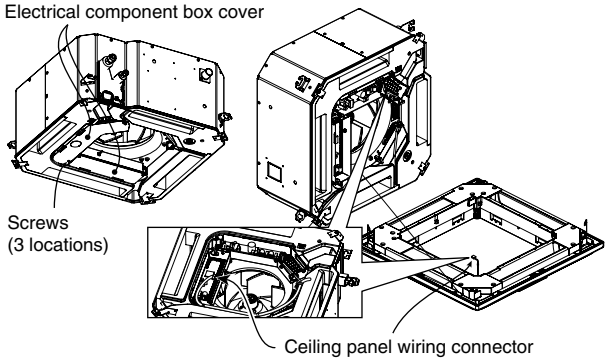
7-3. Wiring the Ceiling Panel

(1) Open the cover of the electrical component box for control PCB.

(2) Connect the 7P wiring connector (red) from the ceiling panel to the connector on the control PCB in the unit electrical component box.

- If the connectors are not connected, the Auto flap will not operate. Be sure to connect them securely.
- Check that the wiring connector is not caught between the electrical component box and the cover.
- Check that the wiring connector is not caught between the unit and the ceiling panel.

(Direction that the unit faces has been changed to facilitate explanation.)



* Pass the wiring connector through the clamp to fasten it in place, as shown in the figure.

Fig. 7-9

7-4. How to Attach the Corner & Air-Intake Grille

Attaching the corner cover and air-intake grille

A. Attaching the corner cover

(1) Check that the safety cord from the corner cover is fastened to the ceiling panel pin, as shown in the figure.

(2) Use the supplied screws to attach the corner cover to the ceiling panel.

B. Attaching the air-intake grille

- To install the air-intake grille, follow the steps for **Removing the grille** in the reverse order. By rotating the air-intake grille, it is possible to attach the grille onto the ceiling panel from any of 4 directions. Coordinate the directions of the air-intake grilles when installing multiple units, and change the directions according to customer requests.
- **When attaching the air-intake grille, be careful that the flap lead wire does not become caught.**
- **Be sure to attach the safety cord that prevents the air-intake grille from dropping off to the ceiling panel unit as shown in the figure at right.**
- With this ceiling panel, the directions of the air-intake grille lattices when installing multiple units, and the position of the label showing the company name on the corner panel, can be changed according to customer requests, as shown in the figure below. However, the optional wireless receiver kit can only be installed at the refrigerant-tubing corner of the ceiling unit.

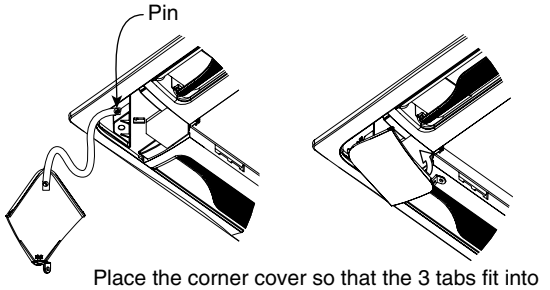


Fig. 7-10

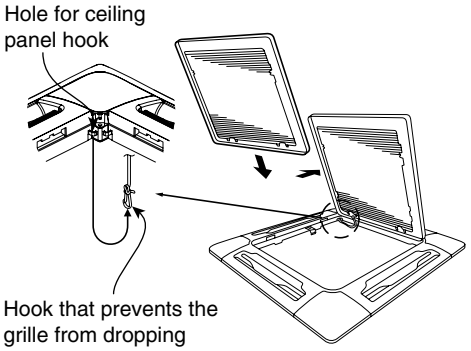


Fig. 7-11

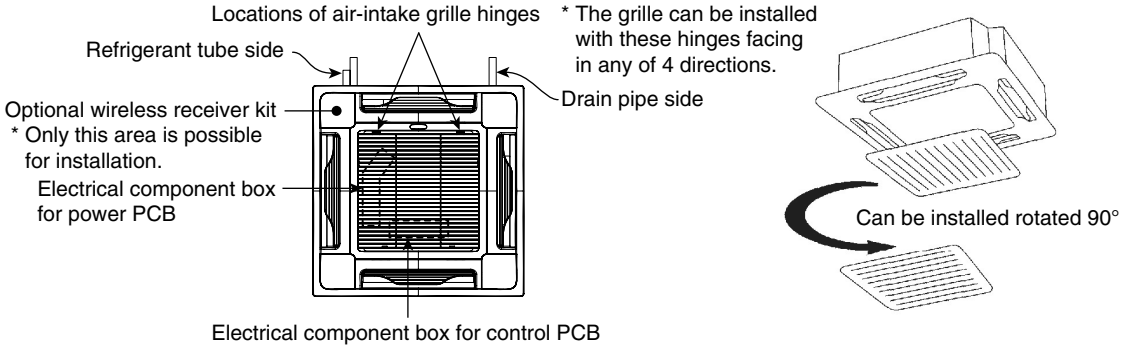


Fig. 7-12

7-5. Checking After Installation

- Check that there are no gaps between the unit and the ceiling panel, or between the ceiling panel and the ceiling surface.
  Gaps may cause water leakage and condensation.
- Check that the wiring is securely connected.
  If it is not securely connected, the auto flap will not operate. (“P09” is displayed on the remote controller.) In addition, water leakage and condensation may occur.

7-6. When Removing the Ceiling Panel for Servicing

When removing the ceiling panel for servicing, remove the air-intake grille and air filter, disconnect the wiring connector inside the electrical component box, and then remove the 4 mounting screws.

7-7. Adjusting the Auto Flap

The air-direction louver on the ceiling panel outlet can be adjusted as follows.

- Adjust the louver to the desired angle using the remote controller. The louver also has an automatic air-sweeping mechanism.

NOTE

- Never attempt to move the louver by hand.
- Proper air flow depends on the location of the air conditioner, the layout of the room and furniture, etc. If cooling or heating seems inadequate, try changing the direction of the air flow.

8. HOW TO INSTALL WIRELESS REMOTE CONTROLLER RECEIVER (OPTIONAL PART)

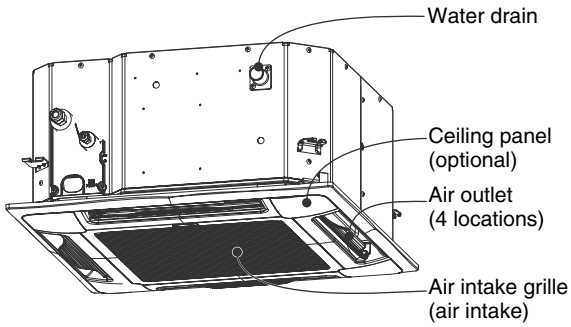
NOTE

Refer to the Instruction Manual attached to the optional Wireless Remote Control Unit and the optional Wireless Remote Control Receiver regarding the operation and installation.

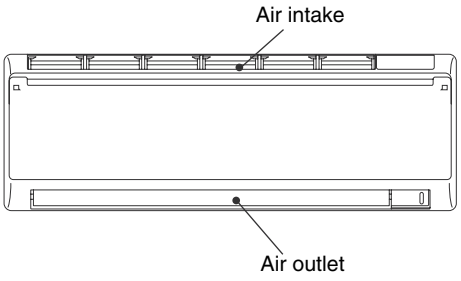
9. APPENDIX

■ Name of Parts

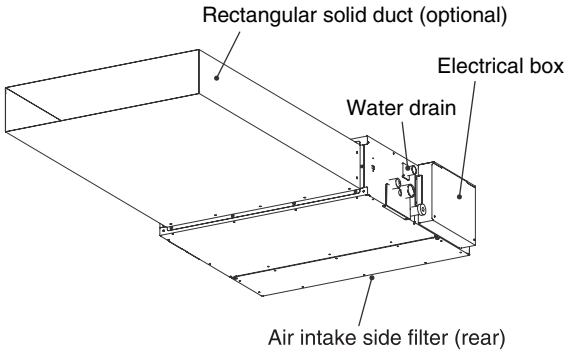
CAV Type (4-Way Air Discharge Mini Semi-Concealed)



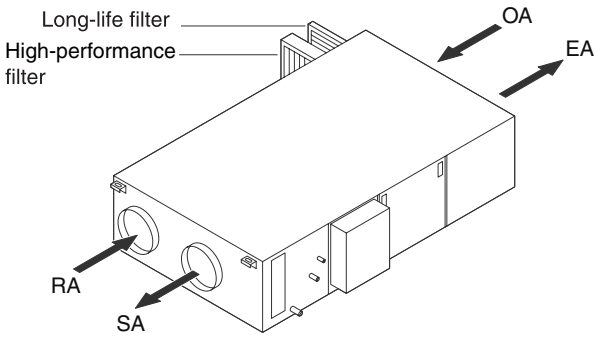
XAV Type (Flat Wall-Mounted)



DAV Type (Slim Concealed-Duct)



DEV type (Heat Exchanger with DX coil)



■ Care and Cleaning

WARNING

- **For safety, be sure to turn the air conditioner off and also to disconnect the power before cleaning.**
- **Do not pour water on the indoor unit to clean it. This will damage the internal components and cause an electric shock hazard.**

1. Air intake and outlet side (Indoor unit)

Clean the air intake and outlet side of the indoor unit with a vacuum cleaner brush, or wipe them with a clean, soft cloth.

If these parts are stained, use a clean cloth moistened with water. When cleaning the air outlet side, be careful not to force the vanes out of place.

CAUTION

- **Never use solvents or harsh chemicals when cleaning the indoor unit. Do not wipe plastic parts using very hot water.**
- **Some metal edges and the fins are sharp and may cause injury if handled improperly; be especially careful when you clean these parts.**
- **The internal coil and other components of outdoor unit must be cleaned regularly. Consult your dealer or service center.**

2. Air filter

The air filter collects dust and other particles from the air and should be cleaned at regular intervals as indicated in the table below or when the filter indication (▦) on the display of the remote control unit (wired type) shows that the filter needs cleaning. If the filter gets blocked, the efficiency of the airconditioner drops greatly.

Type	CAV	XAV	DAV*	DEV
Period	6 months	2 weeks	(Depends on filter specifications)	3 months

*** Slim Concealed-Duct (DAV):**

An air filter is not provided with this air conditioner at the time of shipment. To get clean air and to extend the service life of the air conditioner, an air filter must be installed in the air intake.
For installation and cleaning the air filter, consult your dealer or service center.

NOTE

The frequency with which the filter should be cleaned depends on the environment in which the unit is used.

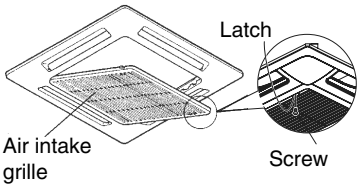
3. How to clean the filter

1. Remove the air filter from the air intake grille.
2. Use a vacuum cleaner to remove light dust. If there is sticky dust on the filter, wash the filter in lukewarm, soapy water, rinse it in clean water, and dry it.

4. How to remove the filter

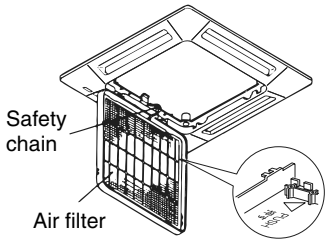
● **4-Way Air Discharge Mini Semi-Concealed Type (CAV):**

1. Use a screwdriver to remove the bolt screw on each side for the two latches. (Be sure to reattach the two bolt screws after cleaning.)
2. Press on the two latches of the air intake grille with your thumbs in the direction of the arrow to open the grille.
3. Open the air intake grille downward.



CAUTION

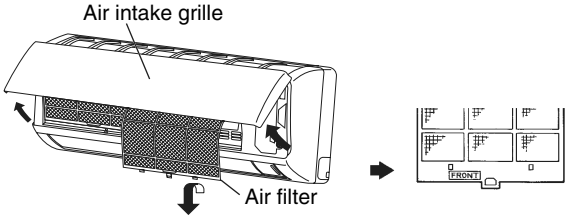
- **When cleaning the air filter, never remove the safety chain. If it is necessary to remove it for servicing and maintenance inside, be sure to reinstall the safety chain securely (hook on the grille side) after the work.**
- **When the filter has been removed, rotating parts (such as the fan), electrically charged areas, etc. will be exposed in the unit's opening. Bear in mind the dangers that these parts and areas pose, and proceed with the work carefully.**



4. Remove the air filter attached to the air intake grille.

● **Flat Wall-Mounted Type (XAV):**

1. Move the flap on the air outlet grille to its lowest position with the remote control unit.
2. The filter is disengaged by pushing the tab up gently. Hold the air filter by the tab at the bottom, and pull downward.



When replacing the filter, make sure that the FRONT mark is facing you. Push it up until you hear it click back into position.

● **Heat Exchanger with DX coil Type (DEV):**

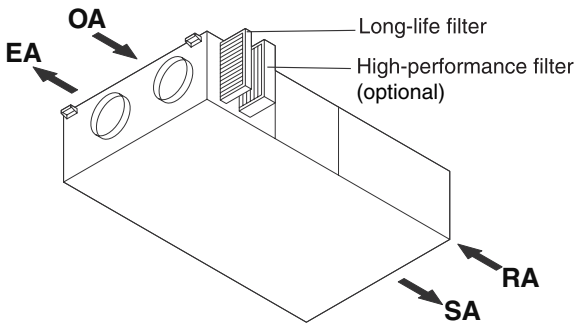
Long-life filter

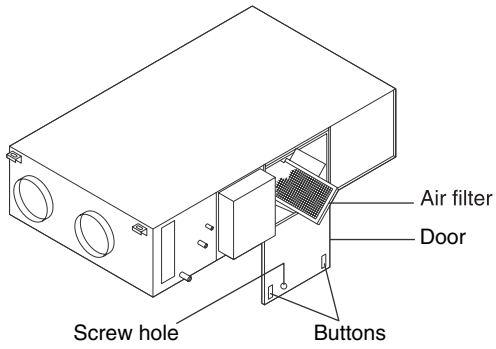
Remove the four screws at the location where the filter is housed, and pull the filter out toward you.

Air filters

Remove the screw at the top of the location where the filters are housed, and push the two buttons to open the door.
Now pull the filters out toward you.

The two filters are connected.





CAUTION

1. **Certain metal edges and the condenser fins are sharp and may cause injury if handled improperly; special care should be taken when you clean these parts.**
2. **Periodically check the outdoor unit to see if the air outlet or air intake is clogged with dirt or soot.**
3. **The internal coil and other components of the outdoor unit must also be cleaned periodically. Consult your dealer or service center.**

Care: After a prolonged idle period

Check the indoor and outdoor unit air intakes and outlets for blockage; if there is a blockage, remove it.

Care: Before a prolonged idle period

- Operate the fan for half a day to dry out the inside.
- Disconnect the power supply and also turn off the circuit breaker.
- Clean the air filter and replace it in its original position.
- Outdoor unit internal components must be checked and cleaned periodically. Contact your local dealer for this service.

■ Troubleshooting

If your air conditioner does not work properly, first check the following points before requesting service.
If it still does not work properly, contact your dealer or a service center.

Trouble	Possible Cause	Remedy
Air conditioner does not run at all	1. Power failure. 2. Leakage circuit breaker has tripped. 3. Line voltage is too low. 4. Operation button is turned off. 5. The wired remote control unit or heat pump is malfunctioning. (The inspection mark ⚠ and the letters E, F, H, L, P in combination with numbers appear on the LCD of the wired remote control unit.)	1. After a power outage, press ON/OFF operation button on the wired remote control unit. 2. Contact service center. 3. Consult your electrician or dealer. 4. Press the button again. 5. Consult your dealer.
Compressor runs but soon stops	1. Obstruction in front of condenser coil	1. Remove obstruction
Poor cooling (or heating) performance	1. Dirty or clogged air filter. 2. Heat source or many people in room. 3. Doors and/or windows are open. 4. Obstacle near air intake or air discharge port. 5. Thermostat is set too high for cooling (or too low for heating). 6. (Defrosting system does not work.)	1. Clean air filter to improve the airflow. 2. Eliminate heat source if possible. 3. Shut them to keep the heat (or cold) out. 4. Remove it to ensure good airflow. 5. Set the temperature lower (or higher). 6. (Consult your dealer.)

■ Tips for Energy Saving

Avoid

- **Do not block the air intake and outlet of the unit.**
  If either is obstructed, the unit will not work well, and may be damaged.
- Do not let direct sunlight into the room. Use sunshades, blinds or curtains.
  If the walls and ceiling of the room are warmed by the sun, it will take longer to cool the room.

Do

- Always try to keep the air filter clean. (Refer to “Care and Cleaning”.)
  A clogged filter will impair the performance of the unit.
- To prevent conditioned air from escaping, keep windows, doors and any other openings closed.

NOTE

Should the power fail while the unit is running

If the power supply for this unit is temporarily cut off, the unit will automatically resume operation once power is restored using the same settings before the power was interrupted.

Instructions for venting fluorinated gas

EN (English)

Do not vent **R407C** into atmosphere : **R407C** is a fluorinated greenhouse gas, covered by Kyoto Protocol, with a Global Warming Potential (GWP) = **1530**

Do not vent **R410A** into atmosphere : **R410A** is a fluorinated greenhouse gas, covered by Kyoto Protocol, with a Global Warming Potential (GWP) = **1730**

IT (Italian)

Non disperdere **R407C** nell'atmosfera : **R407C** è un gas fluorinato a effetto serra, coperto dal protocollo di Kyoto, con potenziale di riscaldamento globale (GWP) = **1530**

Non disperdere **R410A** nell'atmosfera : **R410A** è un gas fluorinato a effetto serra, coperto dal protocollo di Kyoto, con potenziale di riscaldamento globale (GWP) = **1730**

FR (French)

Ne déchargez pas **R407C** dans l'atmosphère : **R407C** est un gaz fluoré à effet serre, couvert par le protocole de Kyoto, avec un potentiel de chauffage global (GWP) = **1530**

Ne déchargez pas **R410A** dans l'atmosphère : **R410A** est un gaz fluoré à effet serre, couvert par le protocole de Kyoto, avec un potentiel de chauffage global (GWP) = **1730**

DE (German)

Zerstreuen Sie **R407C** in Atmosphäre nicht : **R407C** ist ein fluoriertes Gas, abgedeckt durch Kyoto Protokoll, mit einem globalen wärmenden Potential (GWP) = **1530**

Zerstreuen Sie **R410A** in Atmosphäre nicht : **R410A** ist ein fluoriertes Gas, abgedeckt durch Kyoto Protokoll, mit einem globalen wärmenden Potential (GWP) = **1730**

ES (Spanish)

No expulsar **R407C** a la atmósfera : el **R407C** es un gas fluorado de efecto invernadero, cubierto por el protocolo de Kyoto, con potencial de calentamiento global (GWP) = **1530**

No expulsar **R410A** a la atmósfera : el **R410A** es un gas fluorado de efecto invernadero, cubierto por el protocolo de Kyoto, con potencial de calentamiento global (GWP) = **1730**

PO (Portuguese)

Não exale **R407C** na atmosfera : **R407C** é um fluorinated gás, coberto pelo protocolo de Kyoto, com um global Protencial Aquecendo-se (GWP) = **1530**

Não exale **R410A** na atmosfera : **R410A** é um fluorinated gás, coberto pelo protocolo de Kyoto, com um global Protencial Aquecendo-se (GWP) = **1730**

GR (Greek)

Μην αερίστε **R407C** στην ατμόσφαιρα : **R407C** είναι ένα φθοριωμένο θερμοκήπιο αέριο, που καλύπτεται από το πρωτόκολλο του Κιότο, με έναν σφαιρικό Δυνατότητα θέρμανσης (GWP) = **1530**

Μην αερίστε **R410A** στην ατμόσφαιρα : **R410A** είναι ένα φθοριωμένο θερμοκήπιο αέριο, που καλύπτεται από το πρωτόκολλο του Κιότο, με έναν σφαιρικό Δυνατότητα θέρμανσης (GWP) = **1730**