



# Floor and Ceiling Type Air-Conditioner

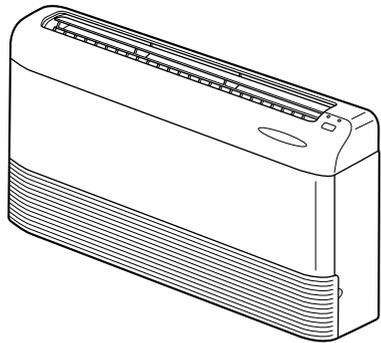
## MCFZ-A12WV

## MUZ-A12YV(H)

[FLARE CONNECTION TYPE]



# INSTALLATION MANUAL



**FOR INSTALLER**

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English

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Русский

# 1. THE FOLLOWING SHOULD ALWAYS BE OBSERVED FOR SAFETY

- Please provide an exclusive circuit for the air conditioner and do not connect other electrical appliances to it.
  - Be sure to read “THE FOLLOWING SHOULD ALWAYS BE OBSERVED FOR SAFETY” before installing the air conditioner.
  - Be sure to observe the cautions specified here as they include important items related to safety.
  - The indications and meanings are as follows.
- ⚠ **Warning:** Could lead to death, serious injury, etc.
- ⚠ **Caution:** Could lead to serious injury in particular environments when operated incorrectly.
- After reading this manual, be sure to keep it together with the instruction manual in a handy place on the customer’s site.

## ⚠ Warning

### ■ Do not install it by yourself (customer).

Incomplete installation could cause injury due to fire, electric shock, the unit falling or leakage of water. Consult the dealer from whom you purchased the unit or special installer.

### ■ Install the unit securely in a place which can bear the weight of the unit.

When installed in an insufficient strong place, the unit could fall causing injury.

### ■ Use the specified wires to connect the indoor and outdoor units securely and attach the wires firmly to the terminal block connecting sections so the stress of the wires is not applied to the sections.

Incomplete connecting and fixing could cause a fire.

### ■ Do not use intermediate connection of the power cord or the extension cord and do not connect many devices to one AC outlet.

It could cause a fire or an electric shock due to defective contact, defective insulation, exceeding the permissible current, etc.

### ■ Check that the refrigerant gas does not leak after installation has completed.

If refrigerant gas leaks indoors, and comes into contact with the fire of a fan heater, space heater, stove, etc., harmful substances will be generated.

### ■ Perform the installation securely referring to the installation manual.

Incomplete installation could cause a personal injury due to fire, electric shock, the unit falling or leakage of water.

### ■ Perform electrical work according to the installation manual and be sure to use an exclusive circuit.

If the capacity of the power circuit is insufficient or there is incomplete electrical work, it could result in a fire or an electric shock.

### ■ Attach the electrical part cover to the indoor unit and the service panel to the outdoor unit securely.

If the electrical part cover in the indoor unit and/or the service panel in the outdoor unit are not attached securely, it could result in a fire or an electric shock due to dust, water, etc.

### ■ Be sure to use the part provided or specified parts for the installation work.

The use of defective parts could cause an injury or leakage of water due to a fire, an electric shock, the unit falling, etc.

### ■ Be sure to cut off the main power in case of setting up the indoor electronic control P.C. board or wiring works.

It could cause an electric shock.

### ■ The appliance shall be installed in accordance with national wiring regulations.

### ■ When installing or relocating the unit, make sure that no substance other than the specified refrigerant (R410A) enters the refrigerant circuit.

Any presence of foreign substance such as air can cause abnormal pressure rise or an explosion.

## ⚠ Caution

### ■ Earth the unit.

Do not connect the earth to a gas pipe, water pipe, lightning rod or telephone earth. Defective earthing could cause an electric shock.

### ■ Do not install the unit in a place where an inflammable gas leaks.

If gas leak and accumulate in the area surrounding the unit, it could cause an explosion.

### ■ Install an earth leakage breaker depending on the installation place (Where it is humid).

If an earth leakage breaker is not installed, it could cause an electric shock.

### ■ Perform the drainage/piping work securely according to the installation manual.

If there is a defect in the drainage/piping work, water could drop from the unit and household goods could be wet and damaged.

### ■ Fasten a flare nut with a torque wrench as specified in this manual.

When fastened too tight, a flare nut may broken after a long period and cause a leakage of refrigerant.

# 2. SELECTING THE INSTALLATION LOCATION

## 2-1 INDOOR UNIT

- Where airflow is not blocked.
- Where cool air spreads over the entire room.
- Maximum refrigerant piping length between indoor unit and outdoor unit is 20 m and the difference of height of both units is 12 m.
- Rigid wall without vibration.
- Where it is not exposed to direct sunshine.
- Where easily drained.
- At a distance 1 m or more away from your TV and radio. Operation of the air conditioner may interfere with radio or TV reception in areas where reception is weak. An amplifier may be required for the affected device.
- In a place as far away as possible from fluorescent and incandescent lights (so the infrared remote control can operate the air conditioner normally).
- Where the air filter can be removed and replaced easily.

## 2-2 WIRELESS REMOTE CONTROLLER MOUNTING

- Place of mounting
  - Where it is easy to operate and easily visible.
  - Where children cannot touch.
- Mounting
  - Select a position about 1.2 m above the floor, check that signals from the controller are surely received by the indoor unit from that position (‘beep’ or ‘beep-beep’ receiving tone sounds), attach remote controller holder ④ to a pillar or wall, then set the wireless remote controller ③.

In rooms where inverter type fluorescent lamps are used, the signal from the wireless remote controller may not be received.

## 2-3 OUTDOOR UNIT

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

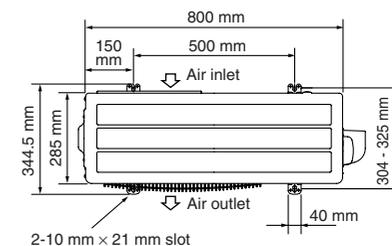
Note:

It is advisable to make a piping loop near outdoor unit so as to reduce vibration transmitted from there.

⚠ **Caution:**

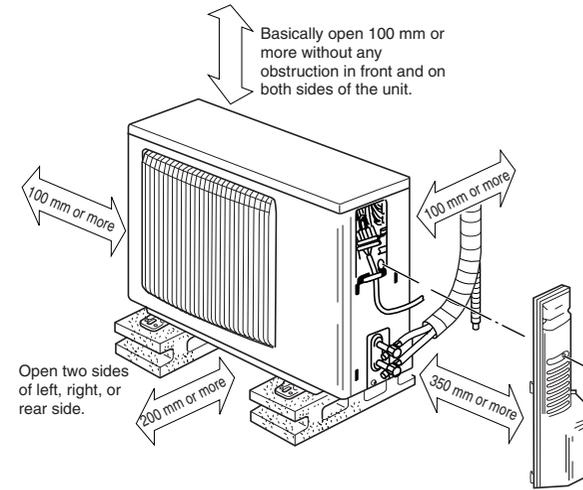
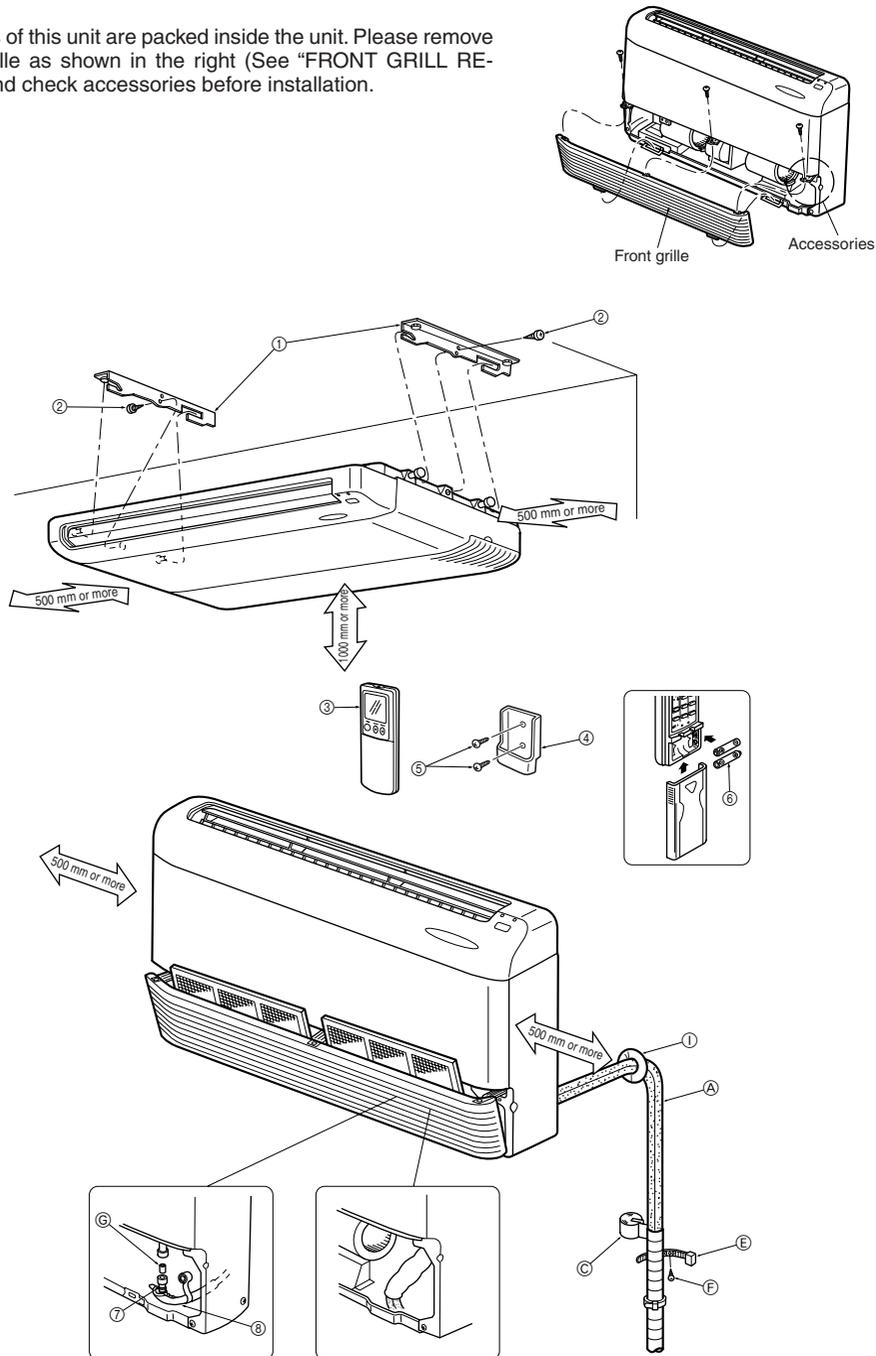
**Avoid the following places for installation where air conditioner trouble is liable to occur.**

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



### 3. INSTALLATION DIAGRAM & ACCESSORIES

Remark:  
Accessories of this unit are packed inside the unit. Please remove the front grille as shown in the right (See "FRONT GRILL REMOVAL"), and check accessories before installation.



When the piping is to be attached to a wall containing metals (tin plated) or metal netting, use a chemically treated wooden piece 20 mm or thicker between the wall and the piping or wrap 7 to 8 turns of insulation vinyl tape around the piping.

Units should be installed by licensed contractor according to local code requirement.

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

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

#### ACCESSORIES

Check the following parts before installation.  
<Indoor unit>

Item	Q'ty
① Installation plate	2
② Unit fixing screw 5 × 12 mm	2
③ Wireless remote controller	1
④ Remote controller holder	1
⑤ Fixing screw for ④ 3.5 × 16 mm (Black)	2
⑥ Battery (AAA) for remote controller	2
⑦ Drain hose	1
⑧ Drain pipe cover	1
⑨ Knockout cover	1
⑩ Screw for ⑨ 4 × 10 mm	2

<Outdoor unit: For YV type only>

⑪ Drain socket	1
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#### PARTS TO BE PROVIDED AT YOUR SIDE

Item	Q'ty
Ⓐ Refrigerant pipe	1 set
Ⓑ Indoor/outdoor connecting wire (4-core 1.0 mm <sup>2</sup> )	1
Ⓒ Piping tape	1
Ⓓ Drain pipe (PVC pipe : OD ø26)	1
Ⓔ Pipe fixing band for refrigerant pipe (The quantity depends on the pipe length.)	2 to 5
Ⓕ Fixing screw for Ⓔ (The quantity depends on the pipe length.)	2 to 5
Ⓖ Drain-joint pipe (PVC pipe : OD ø26, L=50 mm)	1
Ⓗ Power supply cord (3-core 1.0 mm <sup>2</sup> )	1
Ⓘ Piping hole repair parts (Putty and Wall hole cover)	1
Ⓙ Installation plate fixing bolt (M10)	4
Ⓚ Nut, Spring washer for Ⓙ (M10)	4 set

#### OPTIONAL PARTS

Name	Parts No.
Air cleaning filter	MAC-1200FT
Deodorizing filter	MAC-1700DF

#### REFRIGERANT AND DRAIN PIPE SIZES

Refrigerant pipe	Liquid	OD ø6.35
	Gas	OD ø9.52
Drain pipe	Hard PVC pipe : OD ø26	

## 4. INDOOR UNIT INSTALLATION

### FLARED CONNECTIONS

- This unit has flared connections on both indoor and outdoor sides.
- Refrigerant pipes are used to connect the indoor and outdoor units as shown in the figure below.
- Insulate both refrigerant and drain piping completely to prevent condensation.

Limits	
Pipe length	20 m max.
Height difference	12 m max.
No. of bends	10 max.

- Refrigerant adjustment ... If pipe length exceeds 7 m, additional refrigerant (R410A) charge is required. (The outdoor unit is charged with refrigerant for 7 m pipe length.)

Pipe length	Up to 7 m	No additional charge is required.
	Exceeding 7 m	Additional charge is required. (Refer to the table below.)
Refrigerant to be added		30 g/m × (refrigerant piping length (m) -5)

### PIPING PREPARATION

- ① Table below shows the specifications of pipes commercially available.

Pipe	Outside diameter	Insulation thickness	Insulation material
For liquid	6.35 mm	8 mm	Heat resisting foam plastic 0.045 specific gravity
For gas	9.52 mm	8 mm	

- Use a copper pipe or a copper-alloy seamless pipe with a thickness of 0.8 mm. Never use any pipe with a thickness less than 0.8 mm, as the pressure resistance is insufficient.
- ② Ensure that the 2 refrigerant pipes are well insulated to prevent condensation.
- ③ Refrigerant pipe bending radius must be 100 mm or more.

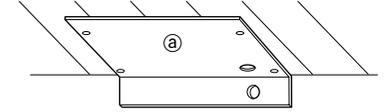
**⚠ Caution:**  
Be sure to use the insulation of specified thickness. Excessive thickness may cause incorrect installation of the indoor unit and lack of thickness may cause dew dripage.

### 4-1 A CASE OF SUSPENDING INDOOR UNIT FROM THE CEILING

#### 4-1-(1) MOUNTING INSTALLATION PLATE FIXING BOLTS

##### 1. Determine the locations of installation plate fixing bolts.

- Use installation pattern to determine the locations of installation plate fixing bolts ①.
- ① Installation pattern



\*Remove installation pattern after installation.

Details are printed on pattern.

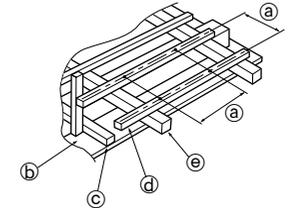
Attention: Surrounding temperature and humidity conditions may cause paper pattern to shrink or expand. (Measure dimensions before drilling holes.)

##### 2. Suspension structure (Give site of suspension strong structure).

###### ■ Wood structure

- Select tie beam (one-story houses) or second-floor girder (two story houses) as reinforcement member.
- Use sturdy beams of at least 60 mm square for beam pitch of 900 mm or less or of at least 90 mm square for beam pitch of 900-1800 mm.

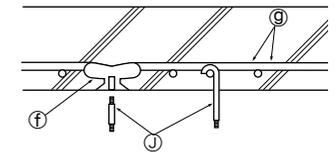
- ① Pitch
- ② Ceiling
- ③ Rafter
- ④ Bracket
- ⑤ Roof beam



###### ■ Ferroconcrete Structures

- Secure installation plate fixing bolts ① as shown at the right or use angle-stock bracework to install installation plate fixing bolts ①.

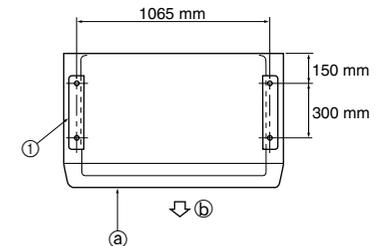
- ① Use inserts rated at 100-150 kg each
- ② Steel reinforcing rod
- ③ Installation plate fixing bolts



##### 3. Installation plate fixing bolts pitch.

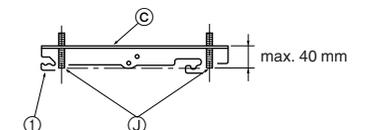
- Use the installation plate fixing bolts ① M10 (× 4 procure locally).

- ① Indoor unit
- ② Air outlet
- ③ Installation plate



- Projecting dimension of installation fixing bolts ① from horizontal base line against which you fix installation plate ③ as within at the right.

- ① Horizontal base line
- ② Installation fixing bolts
- ③ Installation plate



## 4-1-(2) FIXING OF INSTALLATION PLATES

### 1. Set installation plates to installation plate fixing bolts.

- Set installation plates ① to installation plate fixing bolts ② so that the distance between insides of installation plates is adjusted to length as shown in the right.

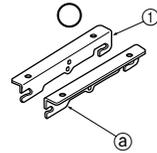
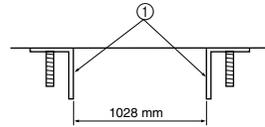
① Installation plate

- Installation plates ① should be fixed on one way direction, as shown in Fig. 1.  
Don't fix as shown in Fig. 2.

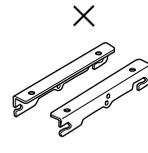
- Be sure to confirm letters "FRONT" in installation plates ①, set "FRONT" side to air outlet side of indoor unit.

Ⓐ "FRONT"

① Installation plate



(Fig. 1)



(Fig. 2)

### 2. In case of fixing installation plates ① above the ceiling, put installation plates fixing bolt through a nut, a spring washer, and double nut. (Fig. 3) In case of fixing installation plates ① forward the ceiling directly, also put installation plate fixing bolt through the installation plate, a spring washer, and double nuts. (Fig. 4)

Ⓐ Ceiling

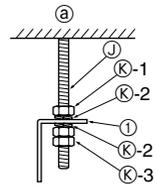
① Installation plate

② Installation plate fixing bolt

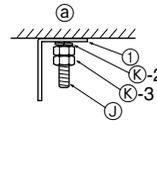
Ⓚ-1 Nut (M10)

Ⓚ-2 Spring washer

Ⓚ-3 Double nut (M10)



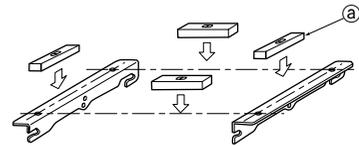
(Fig. 3)



(Fig. 4)

### 3. Check that the four corners are horizontal with level gauge. (Fig. 5)

Ⓐ Level gauge



(Fig. 5)

## 4-1-(3) DRILLING HOLE

Determine the locations of holes for refrigerant pipe ① and drain pipe ②.

- Use the installation pattern as mentioned in 4-1-(1).
- Be sure to confirm the dimensions as shown in the right.

Ⓐ Horizontal base line

Ⓛ Hole for refrigerant pipe

Ⓚ Hole for drain pipe

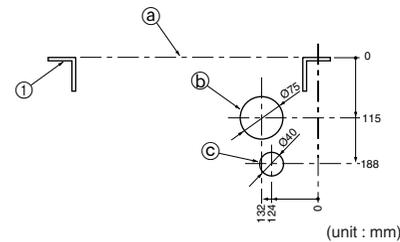
① Installation plate

- Specially, drill the hole for drain pipe with designate dimension to keep an inclination.

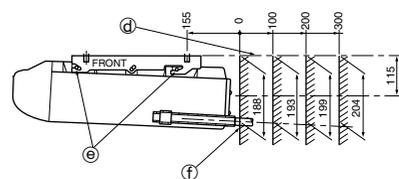
Ⓓ Horizontal base line

Ⓧ Hanging bolt

Ⓣ Wall



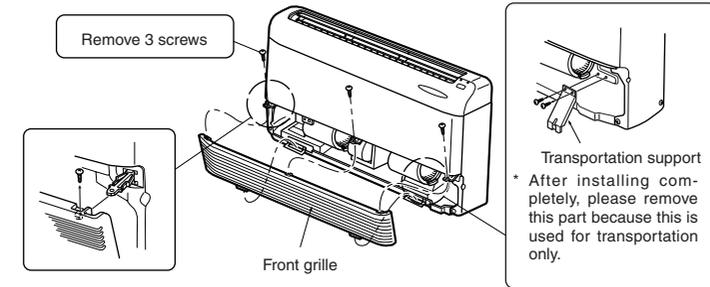
(unit : mm)



(unit : mm)

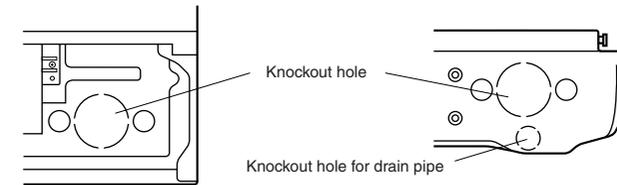
## 4-1-(4) FRONT GRILLE REMOVAL

- Remove front grille and transportation support.



## 4-1-(5) OPENING KNOCKOUT HOLE

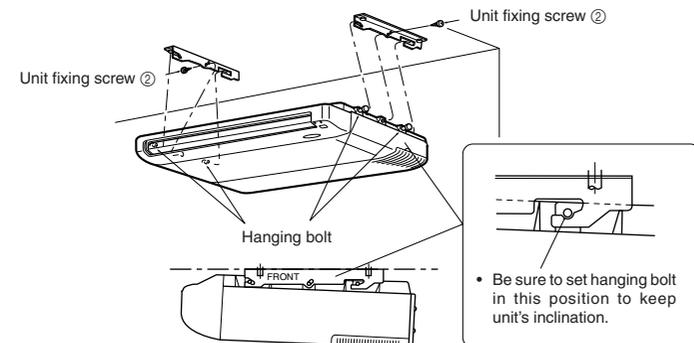
- Remove knockout holes with hammering it.



## 4-1-(6) FIXING UNIT TO INSTALLATION PLATES

### 1. Suspending unit from installation plates.

- Hoist unit so that hanging bolt (4) on the sides of unit fit into holes in installation plates ①.



### 2. Securing unit to installation plates.

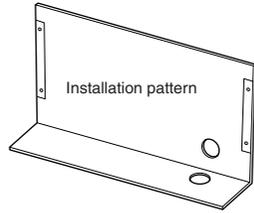
- Be sure to tighten unit fixing screw ② to unit securely.

## 4-2 A CASE OF INSTALLING INDOOR UNIT ON THE WALL

### 4-2-(1) MOUNTING INSTALLATION PLATE FIXING BOLTS

#### 1. Determine the locations of installation plate fixing bolts.

- Use installation pattern to determine the locations of installation plate fixing bolts ㉑.



\* Remove installation pattern after installing.

#### 2. Sturdy wall

- Find structural material (such as stud) in the wall.

#### 3. Installation plate fixing bolt pitch.

- See to 4-1-(1) 3. (Page 5)

### 4-2-(2) FIXING OF INSTALLATION PLATES

#### 1. Set installation plates ㉑ to installation plate fixing bolts ㉑.

- See to 4-1-(2) 1. (Page 5)

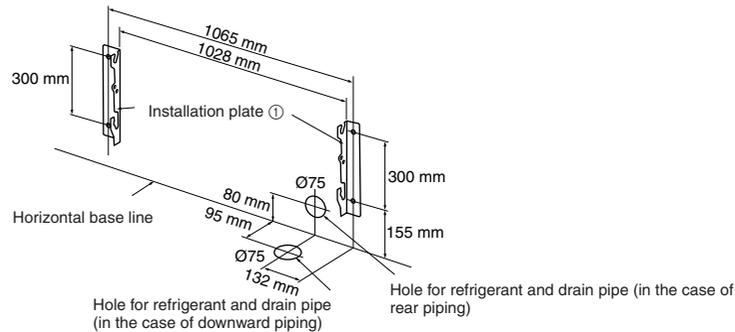
#### 2. Put installation plate fixing bolt through spring washer (2), and double nuts.

- See to 4-1-(2) 2 Fig. 4. (Page 5)

### 4-2-(3) DRILLING HOLE

Determine the location of hole for refrigerant pipes and drain pipe.

- Use the installation pattern as mentioned in 4-2-(1).
- Be sure to confirm the dimensions as below.



### 4-2-(4) FRONT GRILLE REMOVAL

- See to 4-1-(4). (Page 5)

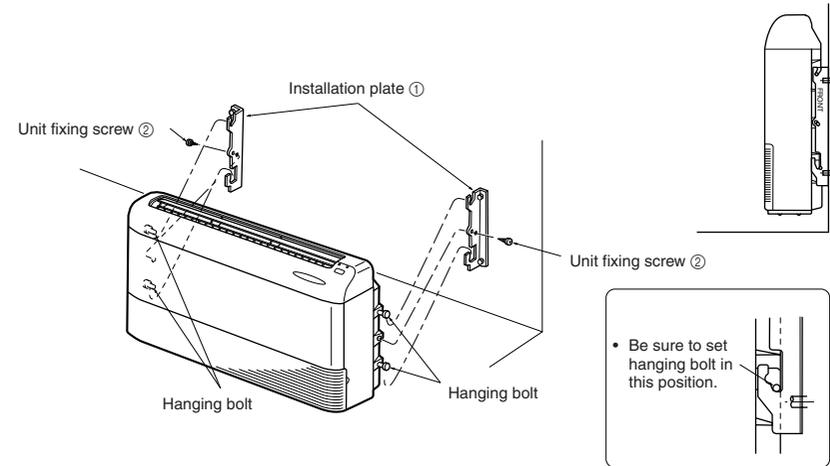
### 4-2-(5) OPENING KNOCKOUT HOLE

- See to 4-1-(5). (Page 5)

### 4-2-(6) FIXING UNIT TO INSTALLATION PLATES

#### 1. Suspending unit from installation plate.

- Hoist unit so that hanging bolt (4) on the sides of unit fit into holes in installation plate ㉑.

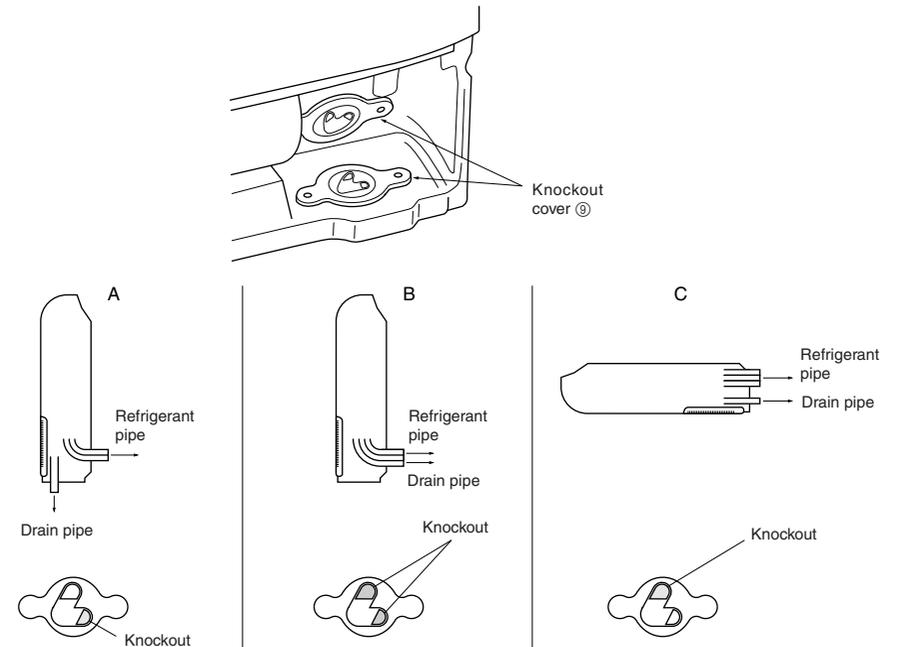


#### 2. Securing unit to installation plates.

- Be sure to tighten unit fixing screw ㉒ to unit securely.

### 4-3 KNOCKOUT COVER

- After removing the knockout holes, attach knockout cover ㉓ on the knockout hold edge (shown as below).



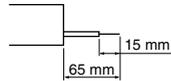
## 4-4 POWER SUPPLY AND CONNECTING WIRE SPECIFICATIONS

Use special room air conditioning circuit.

Rated voltage/Frequency	Breaker capacity	Power supply cord
230 V/50 Hz	10 A	3-core 1.0 mm <sup>2</sup> in conformity with Design 245 IEC 57

Indoor and Outdoor connecting wire Specification	Cable 4-core 1.0 mm <sup>2</sup> , in conformity with Design 245 IEC 57.
--------------------------------------------------	--------------------------------------------------------------------------

- Peel off both ends of connecting wire and power supply cord as shown in the right.
- Be careful not to contact connecting wire with piping.
- Make earth wire a little longer than the others. (more than 65 mm)



Connect to the plug, or to a power switch which has a gap of 3 mm or more when open to interrupt the source power phase.

### ⚠ Warning:

- **A** means for disconnection of the supply with an isolation switch, or similar device, in all active conductors shall be incorporated in the fixed wiring.
- **Never cut the power cord and connect it to other wires. It may cause a fire.**

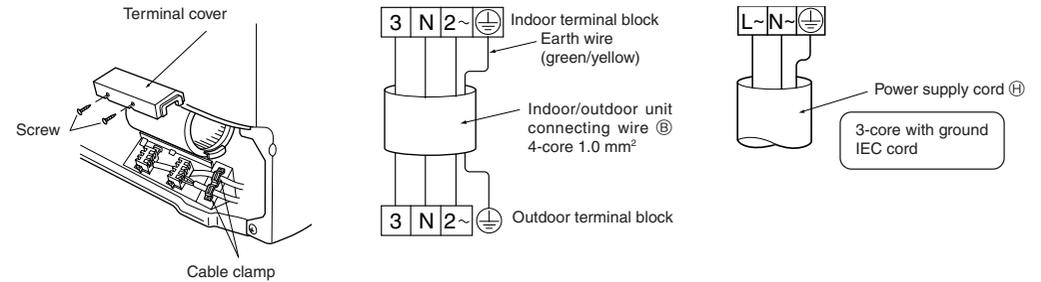
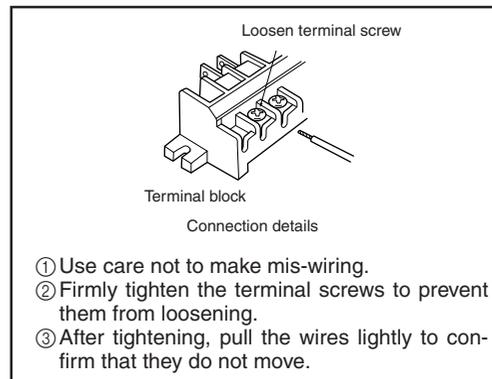
## 4-5 INDOOR AND OUTDOOR CONNECTING WIRE CONNECTION

- Wiring connections should be made following the diagram.

1. Remove two screws and pull the terminal cover forward.

2. Be sure to fix the cable by cable clamp.

3. Replace the terminal cover securely.



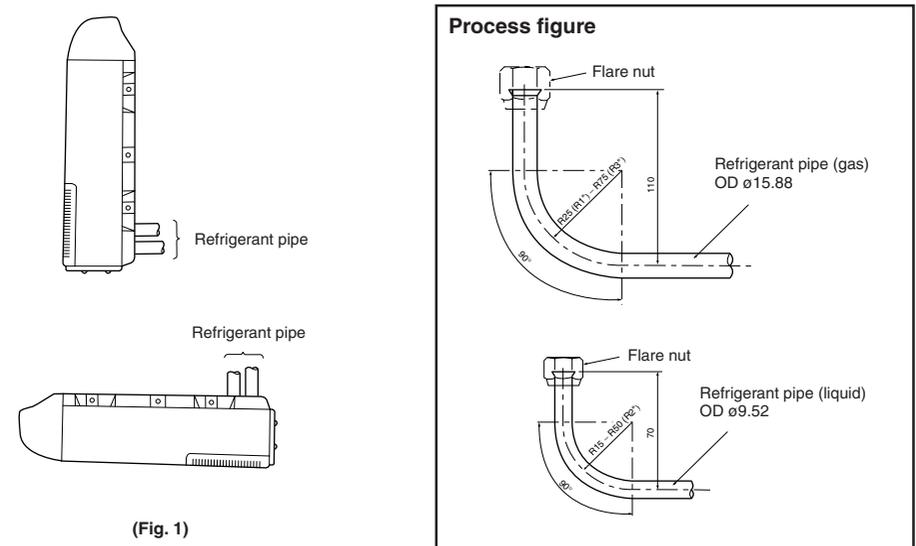
### ⚠ Warning:

- **Attach the electrical part cover securely. If it is attached incorrectly, it could result in a fire, an electric shock due to dust, water, etc.**
- **Use the specified indoor/outdoor unit connecting wire to connect the indoor and outdoor units and fix the wire to the terminal block securely so that no stress is applied to the connecting section of the terminal block. Incomplete connection or fixing of the wire could result in a fire.**
- **When connecting the power supply cord to the power supply source, be sure to connect each wire to the correct pole. Be sure to connect the Live wire side to the [L] terminal and connect the Neutral conductor side to the [N] terminal.**

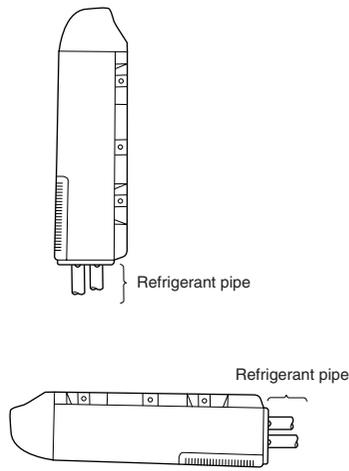
## 4-6 REFRIGERANT PIPE WORK

- Refrigerant pipes which are connected at side of indoor unit must be processed as below, and processed figure will be differently made means of which the indoor unit is installed or which direction refrigerant pipes are connected in.

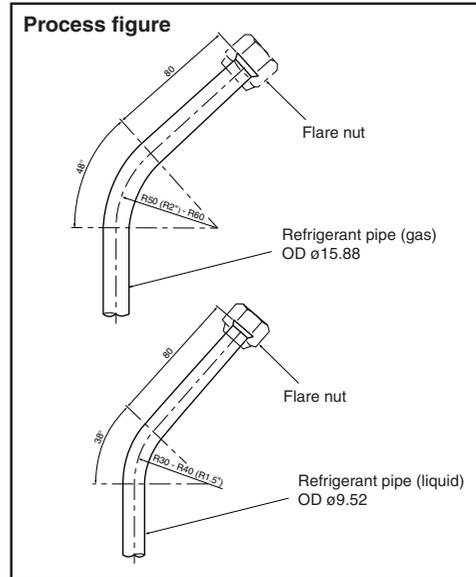
1. In case that pipes are cut out from back surface of the indoor unit. (Fig. 1)



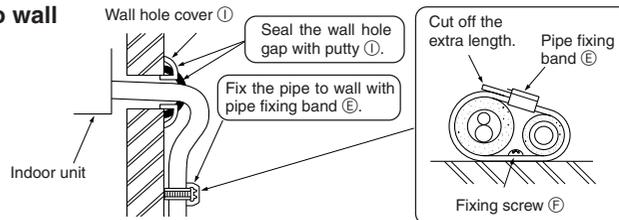
**2. In case that pipes jut out from bottom surface of the indoor unit. (Fig. 2)**



(Fig. 2)



**Wall hole sealing and fixing pipe to wall**



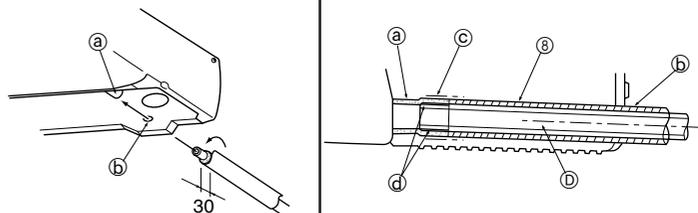
**4-7 DRAIN PIPE CONNECTION**

- Use hard PVC (ø26 mm O.D.) for drain pipe ④.
- Use drain pipe cover ⑧ which is provided in accessories, wind it around drain pipe ④ in the indoor unit side.
- Use vinyl chloride adhesive for joints prevent leakage.
- When the drain pipe ④ has to go through an indoor space, be sure to cover the drain pipe ④ with insulation readily available in the market.
- For drain pipe connection, use care so as no extra force applies to unit side piping.

**1. In case of connecting drain pipe ④ to drain-joint bush directly.**

- Be sure to connect drain pipe ④ to drain-joint bush securely as shown in the right.
- Be sure to pass drain pipe ④ with drain pipe cover through knockout hole on bottom surface so as to keep an inclination.

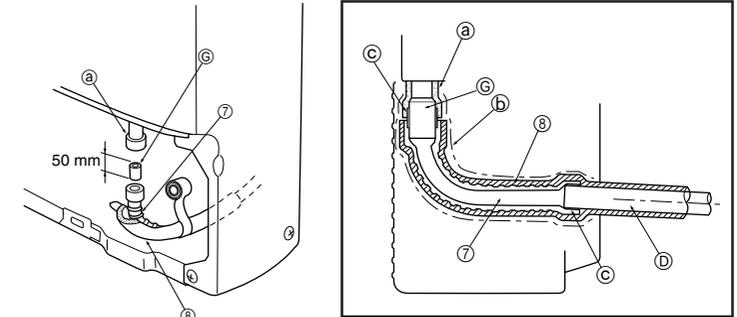
- ① Drain-joint bush
- ② Knockout
- ③ PVC adhesive tape
- ④ Adhesive
- ⑤ Drain pipe cover
- ⑥ Drain pipe (VP-20)



**2. In case of connecting drain pipe ④ to drain-joint bush through drain hose.**

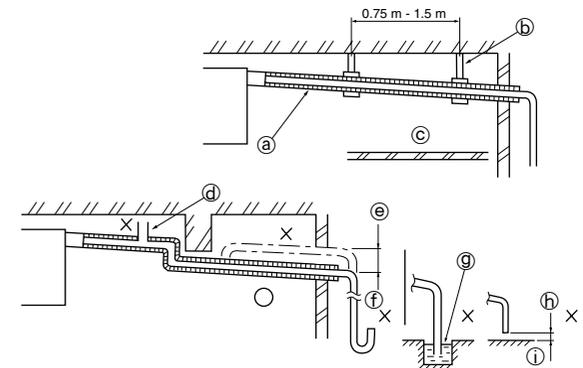
- Drain hose ⑦ which is contained in accessories is flexible, so use it when drain pipe ④ should be alternated direction.
- Be sure to wind pipe cover which is provided in accessories around drain hose with vinyl tape.
- Cut VP-20 in dimension as shown at the right, and connect drain-joint bush with drain hose with adhesive.

- ① Drain-joint bush
- ② Tape
- ③ Adhesive
- ⑦ Drain hose
- ⑧ Drain pipe cover
- ④ Drain pipe (VP-20)
- ⑥ Drain-joint pipe (VP-20)



- 3. • Be sure that drain pipe ④ tilts downward (1/100 or more) on outdoor side (drain side), and no traps or heaving exist.
- When the drain pipe ④ is relatively long, provide support metal fixtures midway to eliminate waving.
- Odor trap at the end of drain pipe ④ is not required.

- ① Insulation
- ② Supporting metal fixture
- ③ Downward inclination of 1/100 or more
- ④ Air bleeder
- ⑤ Do not raise
- ⑥ Odor trap
- ⑨ The end of drain hose is immersed in water
- ⑧ Gap from the ground level is 50 mm or less
- ① Sewage ditch

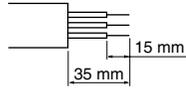


## 5. OUTDOOR UNIT INSTALLATION

### 5-1 INDOOR/OUTDOOR UNIT CONNECTING WIRE CONNECTION

- Connect the indoor/outdoor unit connecting wire ③ from the indoor unit correctly on the terminal block.
- For future servicing, give extra length to connecting wire.

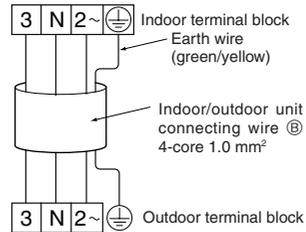
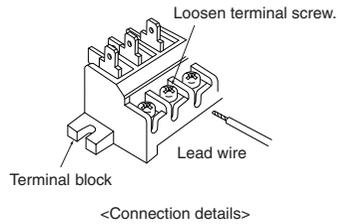
- Peel off both ends of connecting wire (extension wire).
- Be careful not to contact connecting wire with piping.
- Make earth wire a little longer than the others. (more than 35 mm)



- For the power supply cord and the indoor/outdoor unit connecting wires, be sure to use the ones in compliance with the standards.
- Be sure to push the core until it is hidden and pull each cable to make sure that it is not pulled up incomplete insertion may cause a risk of burning the terminal blocks.

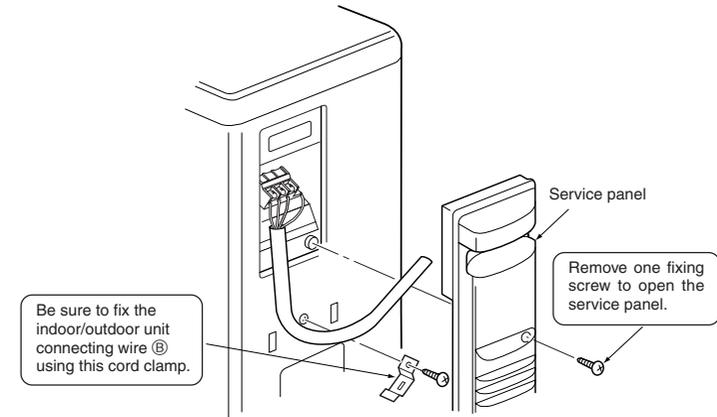
Indoor and Outdoor connecting wire Specification

Cable 4-core 1.0 mm<sup>2</sup>, in conformity with Design 245 IEC 57.



#### ⚠ Caution:

- Use care not to make mis-wiring.
- Firmly tighten the terminal screws to prevent them from loosening.
- After tightening, pull the wires lightly to confirm that they do not move.

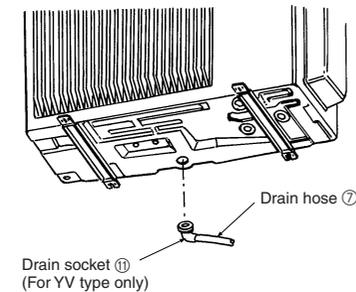


#### ⚠ Warning:

Be sure to attach the service panel of the outdoor unit securely. If it is not attached correctly, it could result in a fire or an electric shock due to dust, water, etc.

### 5-2 DRAIN PIPING FOR OUTDOOR UNIT

- Provide drain piping before indoor and outdoor piping connection. (It will be hard to install drain socket ⑪ if indoor and outdoor piping connection is conducted prior to drain piping as outdoor unit becomes immovable.)
- Connect the drain hose ⑦ (obtainable at a store, inside diameter: 15 mm) as shown in the figure for drainage.
- Make sure to provide drain piping with a downhill grade for easy drain flow.



#### Note:

Do not use the drain socket ⑪ in the cold region. Drain may freeze and it makes the fan stop.

## 6. INDOOR/OUTDOOR UNIT CONNECTION FINISHING AND TEST RUN

### 6-1 Tools dedicated for the air conditioner with R410A refrigerant

The following tools are required for R410A refrigerant. Some R22 tools can be substituted for R410A tools. The diameter of the service port on the stop valve in outdoor unit has been changed to prevent any other refrigerant being charged into the unit. (Cap size has been changed from 7/16 UNF with 20 threads to 1/2 UNF with 20 threads.)

R410A tools	Can R22 tools be used?	Description
Gauge manifold	No	R410A has high pressures beyond the measurement range of existing gauges. Port diameters have been changed to prevent any other refrigerant from being charged into the unit.
Charge hose	No	Hose material and cap size have been changed to improve the pressure resistance.
Gas leak detector	No	Dedicated for HFC refrigerant.
Torque wrench	Yes	1/4
Flare tool	Yes	Clamp bar hole has been enlarged to reinforce the spring strength in the tool.
Flare gauge	New	Provided for flaring work (to be used with R22 flare tool).
Vacuum pump adaptor	New	Provided to prevent the back flow of oil. This adapter enables you to use existing vacuum pumps.
Electronic scale for refrigerant charging	New	It is difficult to measure R410A with a charging cylinder because the refrigerant bubbles due to high pressure and high-speed vaporization.

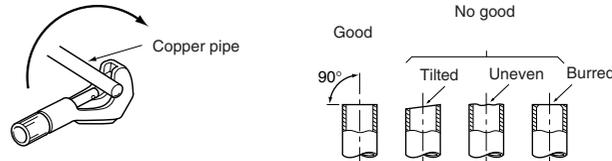
No: Not substitutable for R410A Yes: Substitutable for R410A

### 6-2 FLARING WORK

- Main cause of gas leakage is defect in flaring work. Carry out correct flaring work in the following procedure.

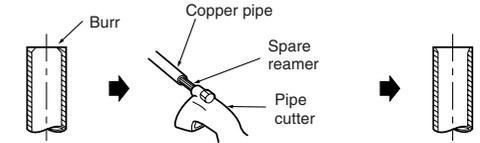
#### 1. Pipe cutting

- Cut the copper pipe correctly with pipe cutter.



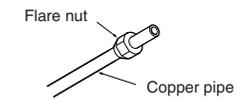
#### 2. Burrs removal

- Completely remove all burrs from the cut cross section of pipe.
- Put the end of the copper pipe to downward direction as you remove burrs in order to avoid to let burrs drop in the piping.



#### 3. Putting nut on

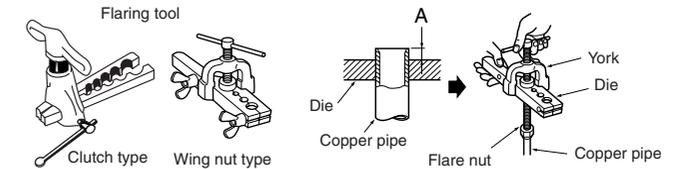
- Remove flare nuts attached to indoor and outdoor units, then put them on pipe having completed burr removal. (not possible to put them on after flaring work)
- Flare nut for R410A pipe may differ from R22 pipe depending on pipe diameter.



mm	inch	R410A	R22
ø6.35	1/4	17	17
ø9.52	3/8	22	22

#### 4. Flaring work

- Carry out flaring work using flaring tool as shown below.

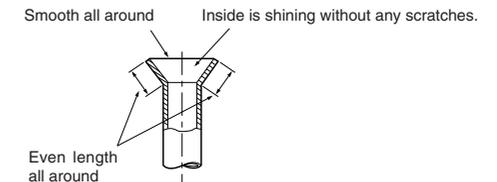


Outside diameter	Flare tool for R410A clutch type	A (mm)	
		Clutch type	Wing nut type
ø6.35 mm	0 to 0.5	1.0 to 1.5	1.5 to 2.0
ø9.52 mm	0 to 0.5	1.0 to 1.5	1.5 to 2.0

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

#### 5. Check

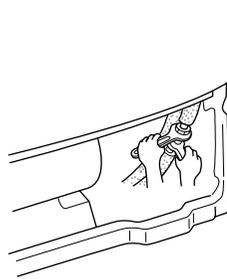
- Compare the flared work with figure below.
- If flare is noted to be defective, cut off the flared section and do flaring work again.



## 6-3 PIPE CONNECTION

### 1. Indoor unit connection

- Connect both liquid and gas piping to the indoor unit.
  - Apply a thin coat of refrigerant oil on the seat surface of pipe.
  - For connection first align the center, then hand tighten the first 3 to 4 turns of flare nut.
  - Use tightening torque table below as a guideline for the indoor unit side union joint section, and tighten using two wrenches. Excess tightening damages the flared section.



Pipe diameter mm	Tightening torque	
	N·m	kgf·cm
6.35	13.7 to 17.7	140 to 180
9.52	34.3 to 41.2	350 to 420

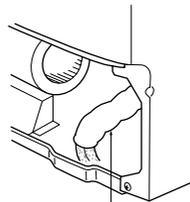
### 2. Outdoor unit connection

- Connect pipes to stop valve pipe joint of the outdoor unit in the same manner applied for the indoor unit.
  - For tightening, use a torque wrench or spanner, and use the same tightening torque applied for the indoor unit.

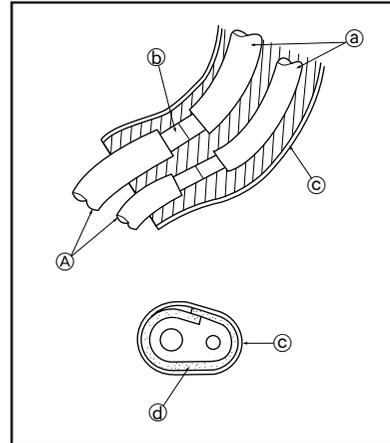
### 3. Refrigerant pipe insulation

- Use pipe cover (foam polyethylene 8 mm thickness) which is contained in accessories, insulate both liquid and gas pipes together. Put the refrigerant piping and apply piping tape ③.

- ① Indoor unit refrigerant pipe
- ② Flare joint
- ③ Pipe cover
- ④ Refrigerant pipe
- ⑤ Piping tape

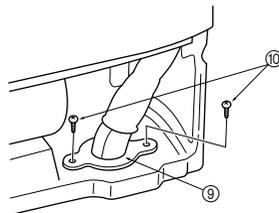


Connecting wire and refrigerant pipes must be separated.



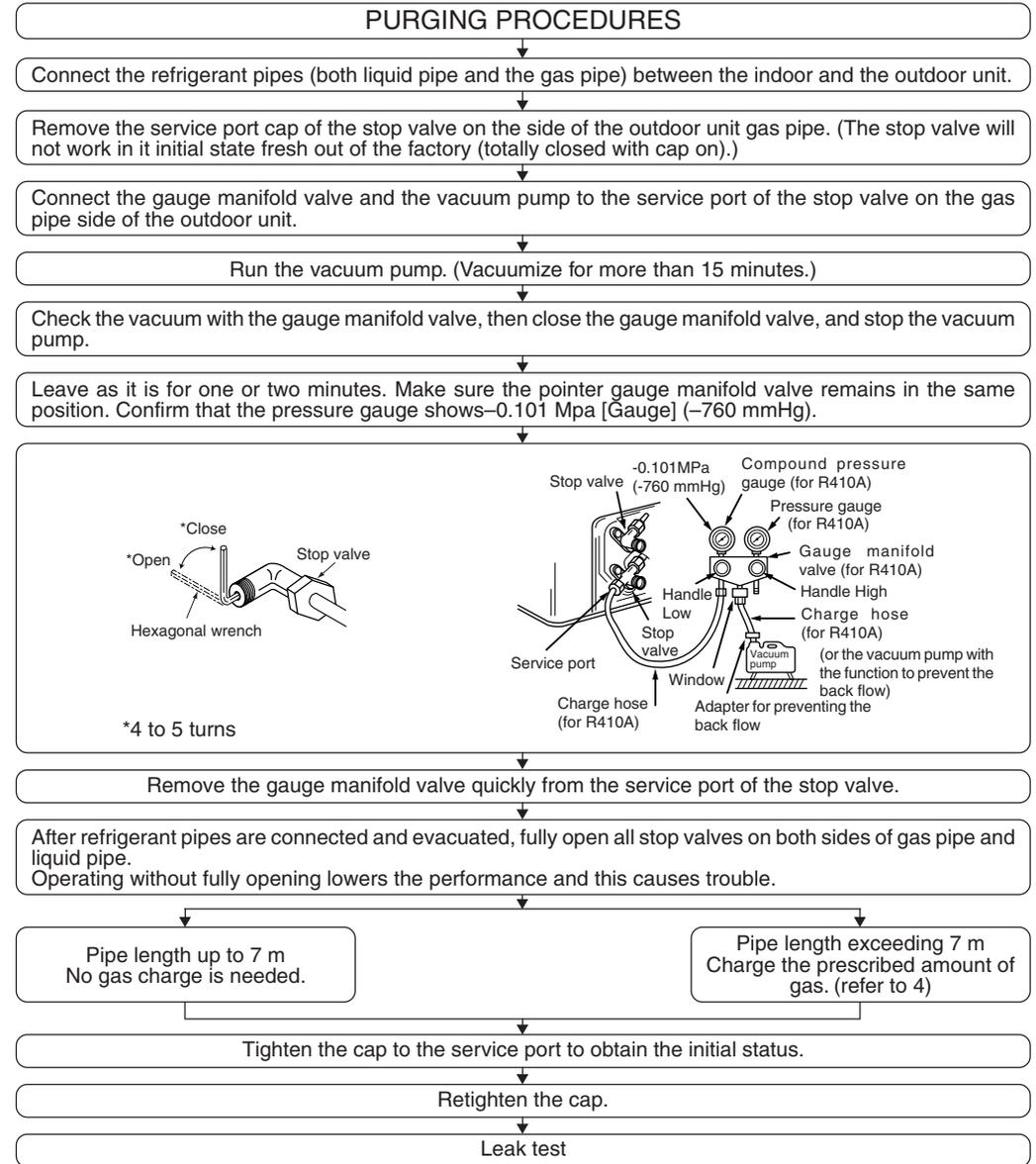
### 4. Knockout cover

- Attach knockout cover ⑨ to close knockout hole to prevent rat or something strange from getting into the indoor unit.
  - Knockout cover
  - Screw for ⑨ 4 × 10 mm



## 6-4 PURGING PROCEDURES · LEAK TEST

- Use the vacuum pump for air purging for the purpose of environmental protection.



	Tightening torque	
	N·m	kgf·cm
Cap for service port	13.7 to 17.7	140 to 180
Cap for stop valve	19.6 to 29.4	200 to 300

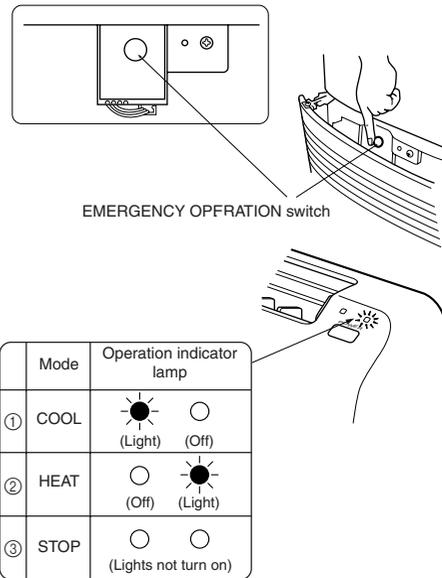
## 6-5 TEST RUN

- Before performing the test run, recheck for any wrong wiring. Wrong wiring prevents normal operation or results in blown fuse disabling operation.
- The test run can be initiated by using EMERGENCY OPERATION switch (press button switch). The EMERGENCY OPERATION switch is pressed, the unit will start the test run (continuous operation) for 30 minutes in COOL MODE or HEAT MODE, depending on which mode is selected. During this 30 minutes a thermostat does not work. After 30 minutes the unit will start the EMERGENCY OPERATION at fixed temperature setting of 24°C in COOL MODE or HEAT MODE.
- Perform test run in the following procedure.

### PROCEDURE

- Press the EMERGENCY OPERATION switch.
  - ① Press it once, and the EMERGENCY COOL MODE starts.
 

If the left side lamp of the operation indicator blinks every 0.5 seconds, inspect the in/out connecting wire Ⓑ for mis-wiring.
  - ② Press it once more, and the EMERGENCY HEAT MODE starts.
  - ③ Press it once more, and the operation stops. (The operation mode changes in order of ① - ③ every press of the EMERGENCY OPERATION switch.)



### Checking the remote (infrared) signal reception

Press the ON/OFF button on the remote control and check that an electronic sound is heard from the indoor unit. Press the ON/OFF button again to turn the air conditioner off.

If the indoor unit is operated with the remote control, both the trial and emergency operations are released by commands from the remote control.

- Once the compressor stops, the restart preventive device operates so the compressor will not operate for 3 minutes to protect the air conditioner.

## 6-6 AUTO RESTART FUNCTION

- These models are equipped with an auto restart function. If you do not want to use this function, please consult the service representative because the setting of the unit needs to be changed.
- When the indoor unit is controlled with the remote controller, the operation mode, the set temperature, and the fan speed are memorized by the indoor electronic control P.C. board. The auto restart function sets to work the moment the power has restored after power failure, then, the unit will restart automatically. If the unit is operated in "I FEEL..." or "AUTO" mode before power failure, the operation mode (COOL, DRY or HEAT) is not stored in the memory. When the main power is turned on, the unit decides the operation mode by the initial room temperature at restart and starts operation again.

### Operation

- ① If the main power has been cut, the operation settings remain.
- ② When three minutes have passed after power was restored, the unit will restart automatically according to the memory.

### Notes:

- The operation settings are memorized when 10 seconds have passed after the remote controller was operated.
- If the main power is turned off or a power failure occurs while AUTO START/STOP timer is active, the timer setting is cancelled. As these models are equipped with an auto restart function, the air conditioner starts operating with timer cancelled at the same time that power is restored.
- If the unit has been off with the remote controller before power failure, the auto restart function does not work as the power button of the remote controller is off.
- To prevent breaker off due to the rush of starting current, systematize other home appliances not to turn on at the same time.

## 6-7 EXPLANATION TO THE CUSTOMER

- Using the instruction manual, explain the following to the customer how to control temperature, how to remove the air filters, how to remove or put the remote controller in the remote controller holder, how to clean, precautions, etc.
- Recommend the customer to carefully read the Operating Instruction Book.

## 7. FOR MOVEMENT AND MAINTENANCE

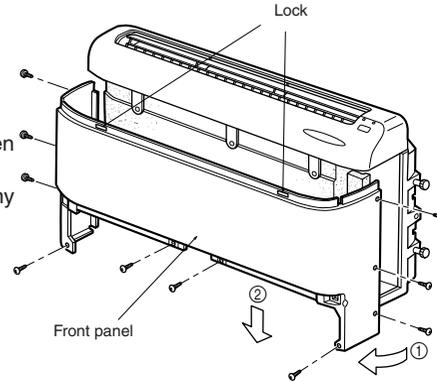
### 7-1 FRONT PANEL REMOVAL

#### 1. Remove front grill.

- Remove 3 screws. (See to 4-1-(4)) (Page 5).

#### 2. Remove front panel.

- Remove 10 screws as shown in the right.
- Unlock front panel by pulling it toward yourself (①) and then pull it down as the arrow (②).
- After removing the front panel, it is possible to service many parts.



### 7-2 GAS CHARGE

1. Connect gas cylinder to the service port of stop valve (3-way).
2. Execute air purge of the pipe (or hose) coming from refrigerant gas cylinder.
3. Replenish specified amount of the refrigerant, while operating the air conditioner for cooling.

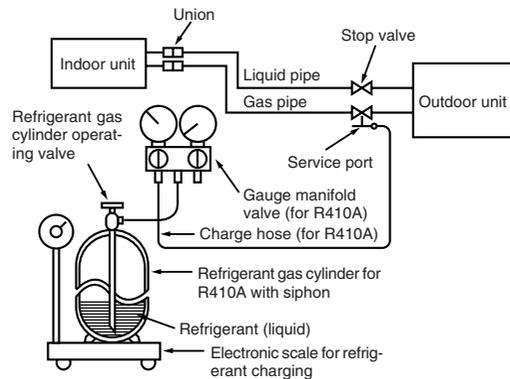
#### Note:

In case of adding refrigerant, comply with the quantity specified for the refrigerating cycle.

#### ⚠ Caution:

- **Do not discharge the refrigerant into the atmosphere.**  
Take care not to discharge refrigerant into the atmosphere during installation, reinstallation, or repairs to the refrigerant circuit.
- **For additional charging, charge the refrigerant from liquid phase of the gas cylinder.**  
If the refrigerant is charged from the gas phase, composition change may occur in the refrigerant inside the cylinder and the outdoor unit. In this case, ability of the refrigerating cycle decreases or normal operation can be impossible. However, charging the liquid refrigerant all at once may cause the compressor to be locked. Thus, charge the refrigerant slowly.

To maintain the high pressure of the gas cylinder, warm the gas cylinder with warm water (under 40°C) during cold season. But never use naked fire or steam.



This product is designed and intended for use in the residential, commercial and light-industrial environment.

The product at hand is based on the following EU regulations:

- Low Voltage Directive 73/23/ EEC
- Electromagnetic Compatibility Directive 89/336/ EEC



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