

# SPLIT TYPE AIR CONDITIONER Duct Type INSTALLATION INSTRUCTION SHEET

(PART NO. 9372633021)

For authorized service personnel only.

<b>WARNING!</b>	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.
<b>CAUTION!</b>	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

WARNING	
1	For the air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.
2	Connect the indoor unit and outdoor unit with the room air conditioner piping and cords available from our standard parts. This installation instruction sheet describes the correct connections using the installation set available from our standard parts.
3	Installation work must be performed in accordance with national wiring standards by authorized personnel only.
4	If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.
5	Do not turn on the power until all installation work is complete.

- Be careful not to scratch the air conditioner when handling it.
- After installation, explain correct operation to the customer, using the operating manual.
- Let the customer keep this installation instruction sheet because it is used when the air conditioner is serviced or moved.

## STANDARD PARTS

The following installation parts are furnished. Use them as required.

### INDOOR UNIT ACCESSORIES

Name and Shape	Q'ty	Application
Special nut A (large flange)	4	For suspending the indoor unit from ceiling
Special nut B (small flange)	4	
Coupler heat insulation (large)	1	For indoor side pipe joint (large pipe)
Coupler heat insulation (small)	1	For indoor side pipe joint (small pipe)
Binder (small)	1	For fixing the remote controller cord
Remote controller	1	
Tapping screw (flush heads)	2	For installing the remote controller
Remote controller cord	1	For connecting the remote controller

### OPTIONS

- Auxiliary pipe assembly
- Long-life filter
- Simple remote controller

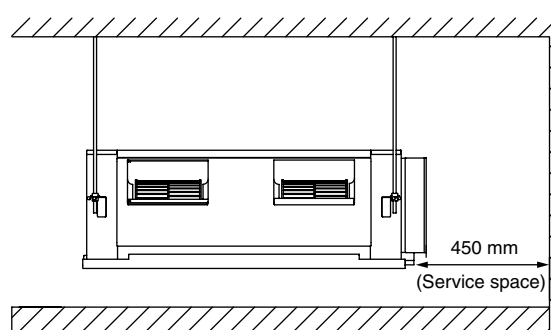
## SELECTING THE MOUNTING POSITION

Decide the mounting position with the customer as follows:

WARNING	
1	Do not install where there is the danger of combustible gas leakage.
2	Do not install the unit near heat source of heat, steam, or flammable gas.
3	If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

### INDOOR UNIT

- Install the indoor unit on a place having a sufficient strength so that it withstands against the weight of the indoor unit.
- The inlet and outlet ports should not be obstructed; the air should be able to blow all over the room.
- Leave the space required to service the air conditioner.
- Install the unit where the drain pipe can be easily installed.
- Providing as much space as possible between the indoor unit and the ceiling will make work much easier.



## INSTALLATION PROCEDURE

### 1 INDOOR UNIT INSTALLATION

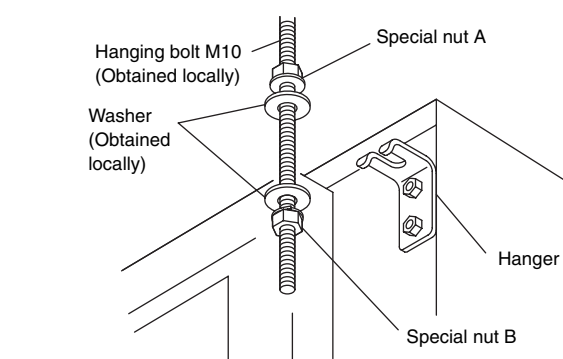
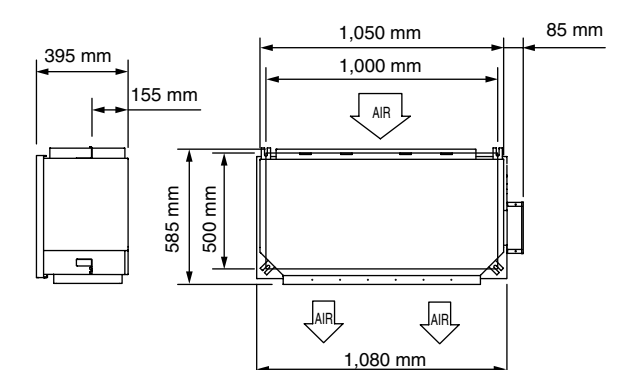
WARNING	
•	Install the air conditioner in a location which can withstand a load of at least five times the weight of the main unit and which will not amplify sound or vibration. If the installation location is not strong enough, the indoor unit may fall and cause injuries.
•	If the job is done with the panel frame only, there is a risk that the unit will come loose. Please take care.

CAUTION	
For installation, refer to the technical data.	

RECOMMENDED RANGE OF EXTERNAL STATIC PRESSURE	
100 Pa - 250 Pa	

#### 1. INSTALLING HANGERS

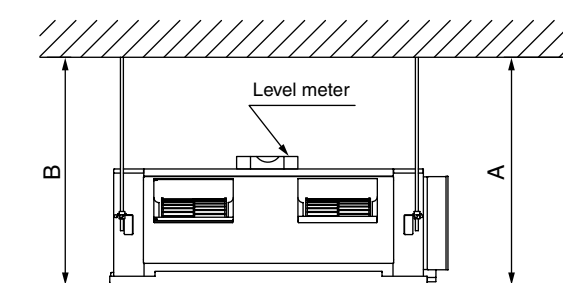
Hanging bolt installation diagram



CAUTION	
Fasten the unit securely with special nuts A and B.	

#### 2. LEVELING

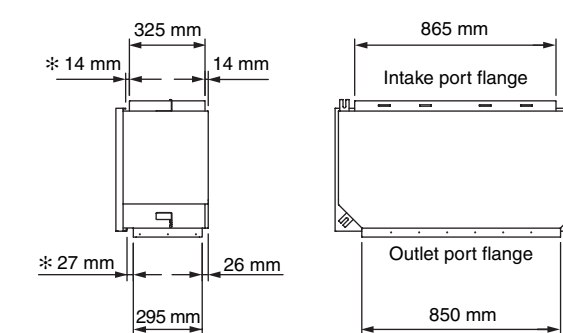
Use the procedure in the following figure to adjust the levelness.



The side A of the unit with the drain port should be slightly lower than the opposite side B of the unit. The height difference between sides A and B should be from 0 to 20 mm.

#### 3. MOUNTING THE DUCT

Follow the procedure in the following figure to install the ducts.



\* Spacing between flange and drain pan.

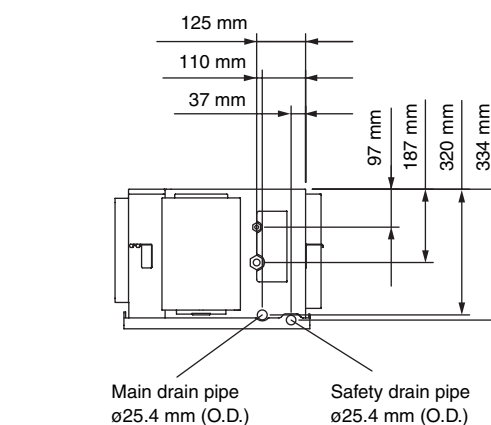
CAUTION	
1	If an intake duct is installed, take care not to damage the temperature sensor (the temperature sensor is attached to the intake port flange).
2	Install the air inlet grille for air circulation. The correct temperature can not be detected.

CAUTION	
3	Be sure to install the air filter in the air inlet. If the air filter is not installed, the heat exchanger may be clogged and its performance may decrease.

#### 4. INSTALLING THE DRAIN PIPES

Install the drain pipes according to the measurements given in the following figure.

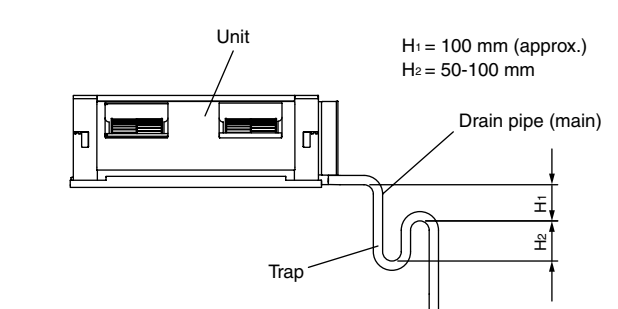
Flange positions for connecting the drain pipes



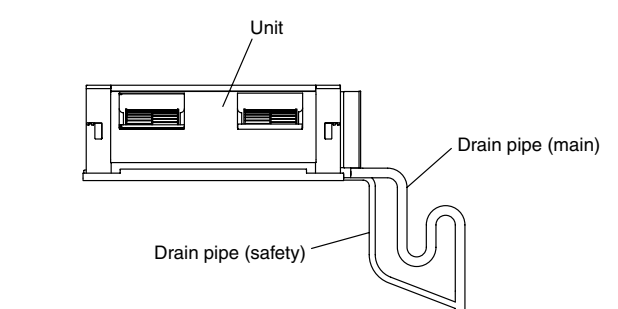
CAUTION	
1	This product has drain ports in two locations. Follow the procedure in the figure to connect drain pipes to each of them.
2	Be sure to properly insulate the drain pipes.

Use general hard polyvinyl chloride pipe (VP25) and connect it with adhesive (polyvinyl chloride) so that there is no leakage. Do not perform air bleeding.

- Main drain pipe  
Provide one trap on the main drain pipe near the indoor unit.



- Safety drain  
There is no need to provide a trap for the safety drain pipe. If the safety drain pipe is connected to the main drain pipe, make the connection below the trap on the main drain pipe.

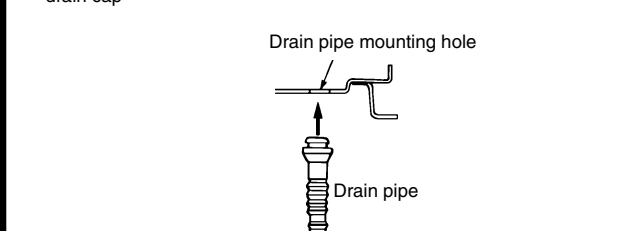
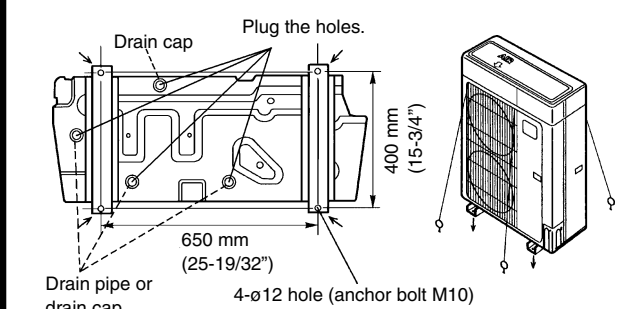


- Once installation is complete, check the flow of the drain water.

## 2 OUTDOOR UNIT INSTALLATION

### 1. OUTDOOR UNIT PROCESSING

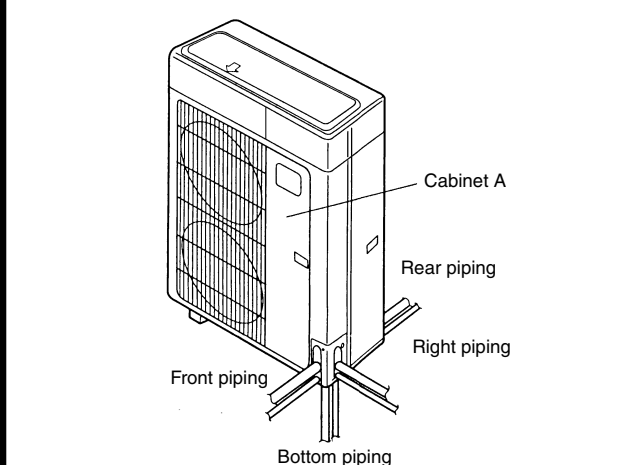
- When the outdoor unit will be exposed to strong wind, fasten it with bolts or wire at the four places indicated by the arrows.
- Since the drain water flows out of the outdoor unit during heating operation, install the drain pipe and connect it to a commercial 16 mm hose. (When heating when the outdoor temperature is 0 °C or less, construct so that the drain water drained from the outdoor unit will not freeze in the drain pipe.) (Reverse cycle model only)
- When installing the drain pipe, plug all the holes other than the drain pipe mounting hole in the bottom of the outdoor unit with putty so there is no water leakage. (Reverse cycle model only)



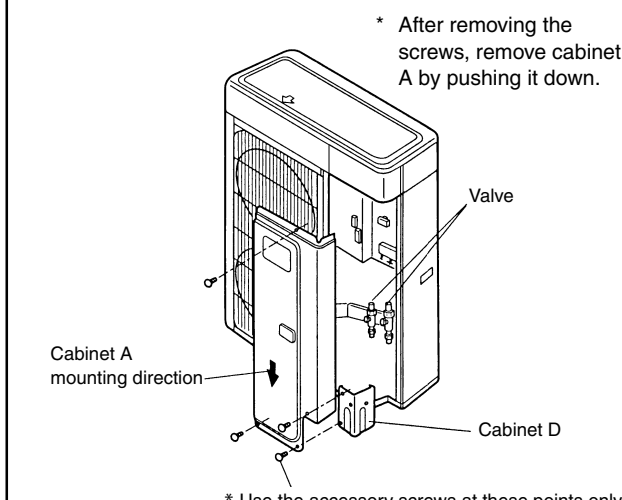
- Always use a drain pipe at two places.

### 2. OUTDOOR UNIT CONNECTION CORD AND PIPE CONNECTION PREPARATIONS

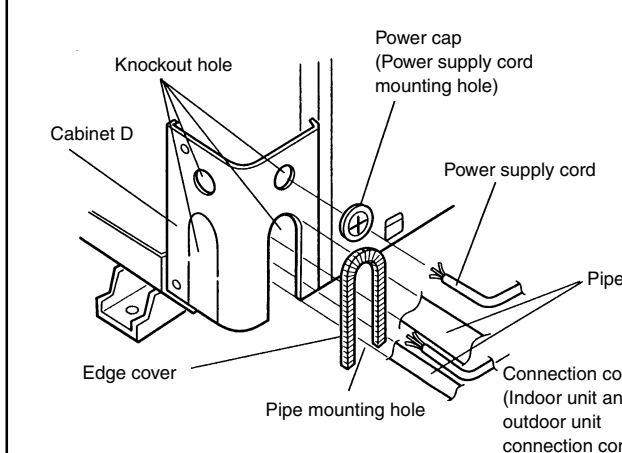
- Piping and connection cord mounting direction (4-way mounting possible).



- Remove outdoor unit cabinet A and cabinet D.

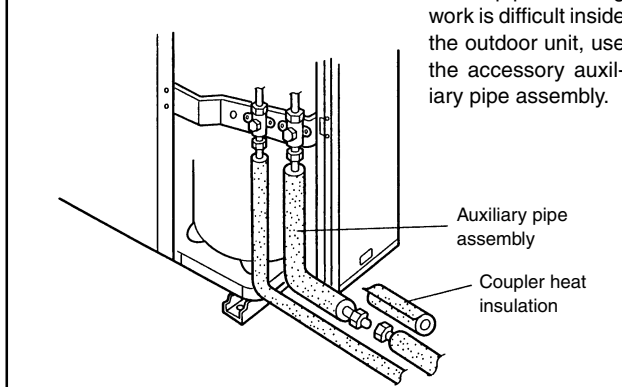


- Open the piping and connection cord knockout holes of the desired direction with nippers, etc. After opening the knockout holes, install the accessory edge cover and power cap to protect the opened places.



- Connect the piping and power supply cord from the mounting holes.

(Example)

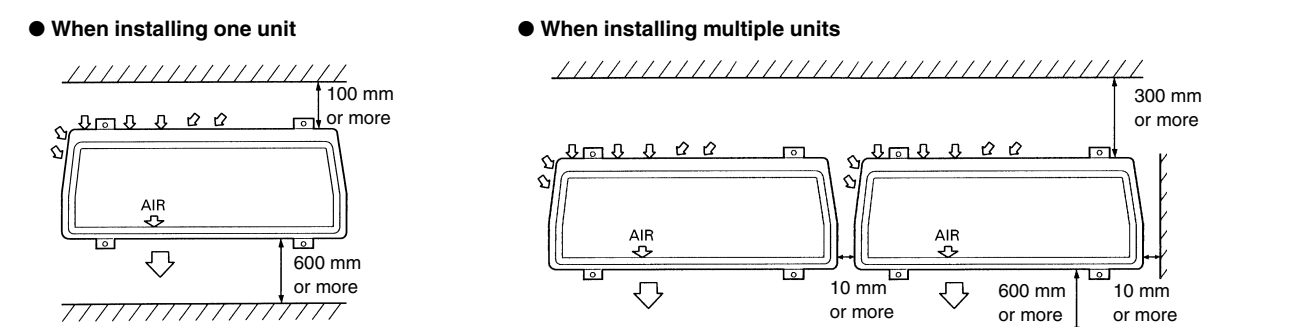


- When pipe bending work is difficult inside the outdoor unit, use the accessory auxiliary pipe assembly.

### OUTDOOR UNIT

WARNING	
1	Install the unit where it will not be tilted by more than 5°.
2	When installing the outdoor unit where it may be exposed to strong wind, fasten it securely.

- Provide the indicated space to ensure good airflow.



- If possible, do not install the unit where it will be exposed to direct sunlight. (If necessary, install a blind that does not interfere with the airflow.)
- Do not install the unit near a source of heat, steam, or flammable gas.
- During heating operation, drain water flows from the outdoor unit. Therefore, install the outdoor unit in a place where the drain water flow will not be obstructed. (Reverse cycle model only)
- Do not install the unit where a strong wind blows or where it is very dusty.
- Do not install the unit where people pass.
- Install the outdoor unit in a place where it will be free from being dirty or getting wet by rain as much as possible.
- Install the unit when connection to the indoor unit is easy.

## CONNECTION PIPE REQUIREMENT

CAUTION		
The maximum lengths of this product are shown in the following table. If the units are further apart than this, correct operation can not be guaranteed.		

Diameter		Maximum length	Maximum height (between indoor and outdoor)
Small	Large		
9.53 mm	19.05 mm	50 m	30 m

- Use 0.7 mm to 1.2 mm thick pipe.
- Use pipe with water-resistant heat insulation.
- Use pipe that can withstand a pressure of 3,040 kPa.

## ELECTRICAL REQUIREMENT

- Electric wire size and fuse capacity:

Power supply cord (mm <sup>2</sup> )		Connection cord (mm <sup>2</sup> )		Breaker capacity (A)
MAX.	MIN.	MAX.	MIN.	
4.0	2.5	2.5	1.0	20

- Install all electrical works in accordance with local regulation.
- Install the disconnect device with a contact gap of at least 3 mm nearby the units. (Both indoor unit and outdoor unit)

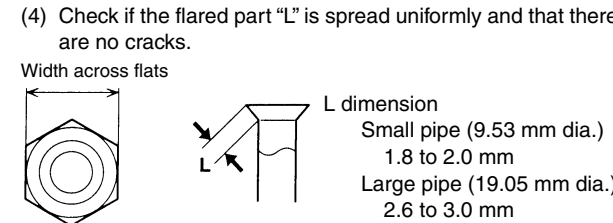
## 3 CONNECTING THE PIPING

CAUTION	
Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks. Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only)	
In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker.	
If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation.	
In addition, use heat insulation with heat conductivity of 0.045 W/m·k or less (at 20 °C).	

### 1. FLARE PROCESSING

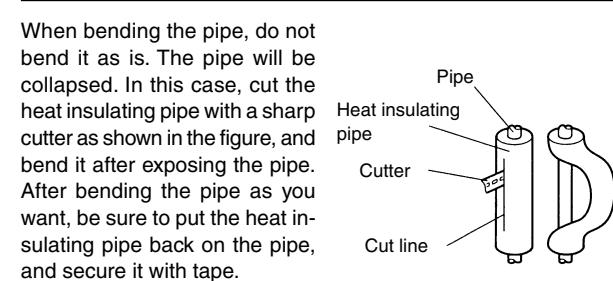
- Cut the connection pipe with pipe cutters so that the pipe is not deformed.
- Holding the pipe downward so that cuttings cannot enter the pipe, remove the burrs.
- Remove the flare nut from the indoor unit pipe and outdoor unit and assemble and insert the flare nut onto the pipe, and flare with a flaring tool.

Pipe	Flare nut
Small pipe	Small (width across flats 22 mm)
Large pipe	Large (width across flats 36 mm)



### 2. BENDING PIPES

CAUTION	
1	To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or over.
2	If the pipe is bent repeatedly at the same place, it will break.

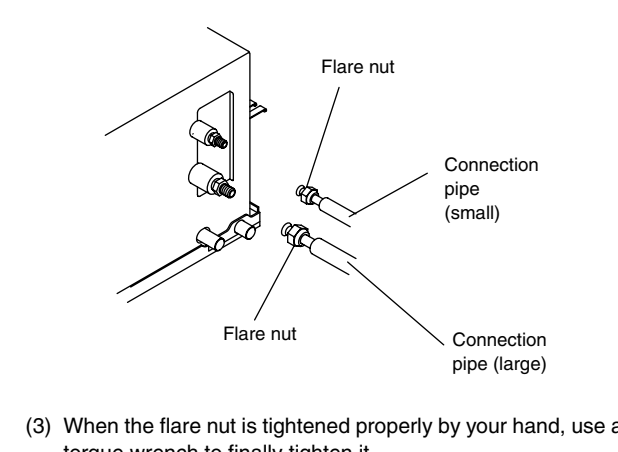


### 3. CONNECTION PIPES

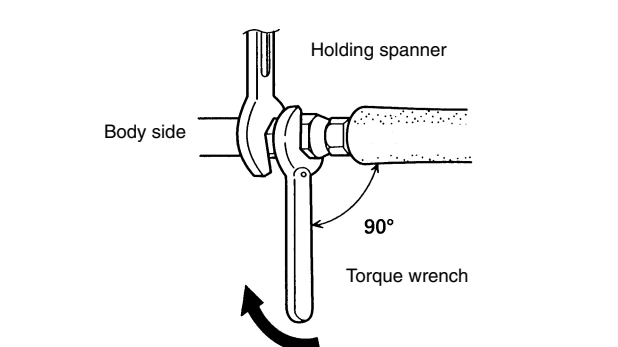
- Detach the caps and plugs from the pipes.

CAUTION	
1	Be sure to apply the pipe against the port on the indoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.
2	Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.

- Centering the pipe against port on the indoor unit, turn the flare nut with your hand.



- When the flare nut is tightened properly by your hand, use a torque wrench to finally tighten it.

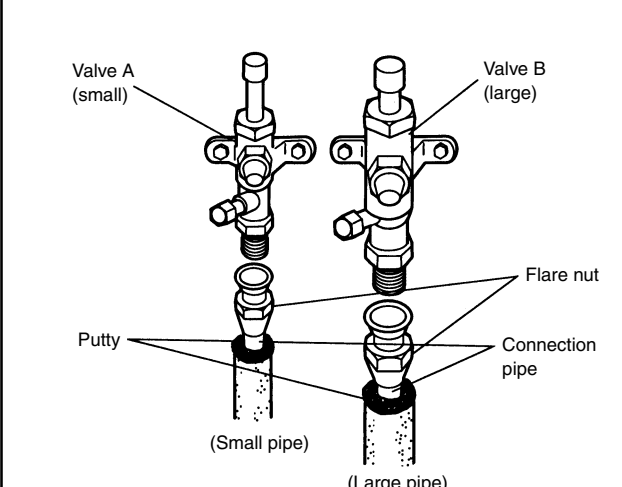


CAUTION	
Hold the torque wrench at its grip, keeping it in the right angle with the pipe, in order to tighten the flare nut correctly.	

Pipe	Tightening torque
Small pipe	310 to 350 kgf·cm (30.4 to 34.3 N·m)
Large pipe	800 to 1,000 kgf·cm (78.4 to 98 N·m)

CAUTION	
Be sure to connect the large pipe after connecting the small pipe completely.	

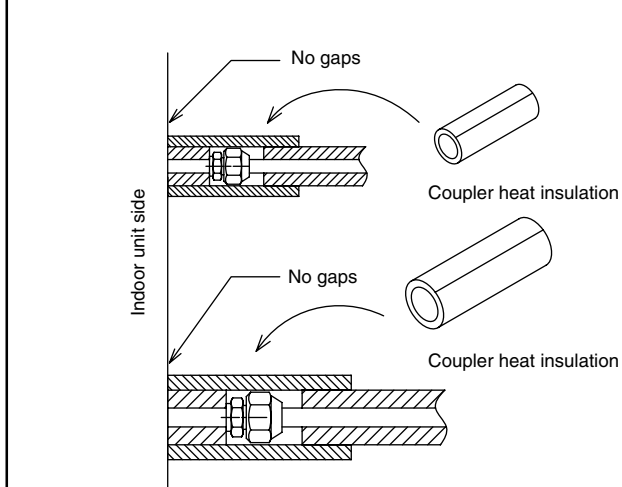
- Tighten the flare nut of the connection pipe at the outdoor unit valve connector. The tightening method is the same as that at the indoor side.
- Seal with the accessory putty so that water does not enter at the top of the pipe insulation installed to the connection pipe (large pipe and small pipe).



### 4. CHECKING THE PIPE CONNECTIONS FOR GAS LEAKING

For both the indoor and outdoor unit sides, check the joints for gas leaking by the use of a gas leakage detector without fail when the pipes are connected.

### 5. HEAT INSULATION ON THE PIPE JOINTS (INDOOR SIDE ONLY)



CAUTION	
There should be no gaps between the insulation and the product.	



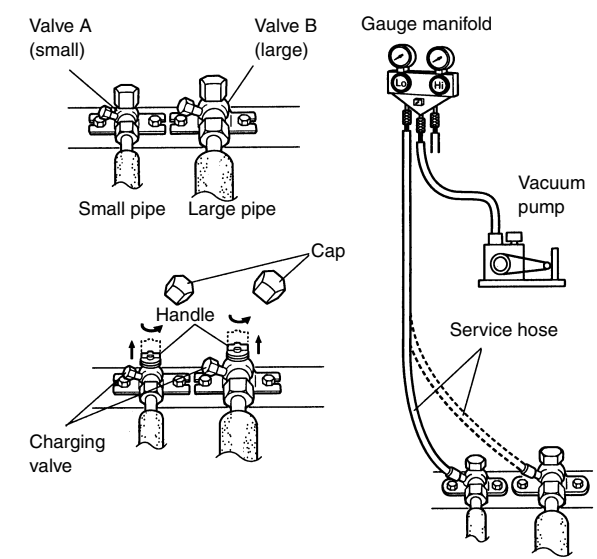
# 4 VACUUM PROCESS

### CAUTION

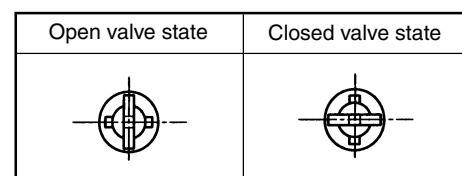
Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation! There is no extra refrigerant in the outdoor unit for air purging!

## 1. VACUUM

- (1) Vacuum inside the indoor unit and the piping to a pressure of 76 cmHg abs or less from the charging valve with a vacuum pump.
- (2) After vacuuming inside the indoor unit and the piping, remove the cap of the two valves.



- (3) Open the handle of the two valves from the closed state.



\* If the handle is not fully open, performance will drop and an abnormal sound will be generated.

- (4) Tighten the cap of the two valves to the specified torque.

	Tightening torque	
	Large valve	Small valve
Handle	1.47 N·m (15 kgf·cm) or less	
Cap	14.7 to 19.6 N·m (150 to 200 kgf·cm)	

## 2. ADDITIONAL CHARGE

Refrigerant suitable for a piping length of 7.5 m (Cooling model), 20 m (Reverse cycle model) is charged in the outdoor unit at the factory. When the piping is longer than 7.5 m (Cooling model), 20 m (Reverse cycle model) additional charging is necessary. For the additional amount, see the table below.

Additional refrigerant	Pipe length			
	7.5 m	10 m	20 m	g/m
Cooling model	None	100 g	500 g	40 g/m
Reverse cycle model	None			60 g/m

Additional refrigerant	Pipe length			
	30 m	40 m	50 m	g/m
Cooling model	900 g	1300 g	1700 g	40 g/m
Reverse cycle model	600 g	1200 g	1800 g	60 g/m

### CAUTION

- ① When moving and installing the air conditioner, do not mix gas other than the specified refrigerant (R22) inside the refrigerant cycle.
- ② When adding refrigerant, add the refrigerant from the charging valve at the completion of work.
- ③ If the units are further apart than the maximum pipe length, correct operation can not be guaranteed.

# 5 POWER

### WARNING

- ① The rated voltage of this product is 380-415 V 3ø 50 Hz.
- ② Before turning on verify that the voltage is within the 342 to 457 V range.
- ③ Always use a special branch circuit and install a special receptacle to supply power to the air conditioner.
- ④ Use a special branch circuit breaker and receptacle matched to the capacity of the air conditioner. (Install in accordance with standard.)
- ⑤ Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.
- ⑥ Install a leakage special branch circuit breaker in accordance with the related laws and regulations and electric company standards.

### CAUTION

- ① The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances. When the current contracted capacity is insufficient, change the contracted capacity.
- ② When the voltage is low and the air conditioner is difficult to start, contact the power company the voltage raised.

# 6 ELECTRICAL WIRING

### WARNING

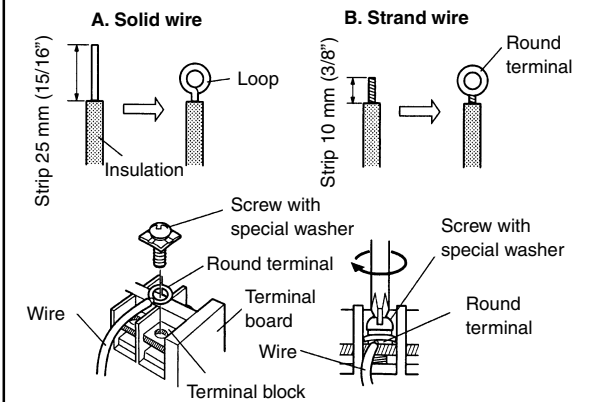
- ① Before starting work, check that power is not being supplied to the indoor and outdoor unit.
- ② Match the terminal board numbers and connection cord colors with those of the outdoor unit. Erroneous wiring may cause burning of the electric parts.
- ③ Connect the connection cord firmly to the terminal board. Imperfect installation may cause a fire.
- ④ Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)
- ⑤ Always connect the ground wire.

## 2. INDOOR UNIT

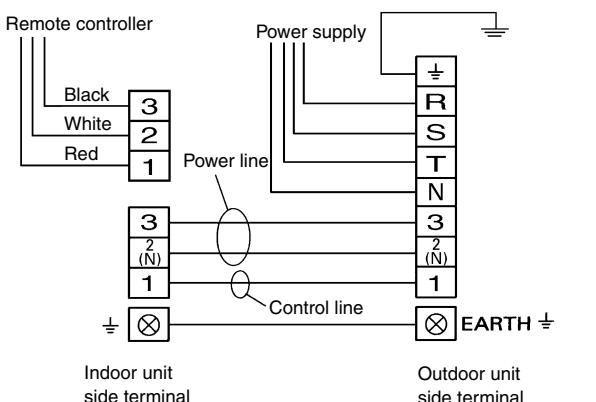
Do not bundle the remote controller cord, or wire the remote controller cord in parallel, with the indoor unit connection wire (to the outdoor unit) and the power supply cord. It may cause erroneous operation.

### HOW TO CONNECT WIRING TO THE TERMINALS

- A. For solid core wiring (or F-cable)**
  - (1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm (15/16") to expose the solid wire.
  - (2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
  - (3) Using 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 board and tighten securely with the terminal screw using a screwdriver.
- B. For strand wiring**
  - (1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 10 mm (3/8") to expose the strand wiring.
  - (2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
  - (3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
  - (4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

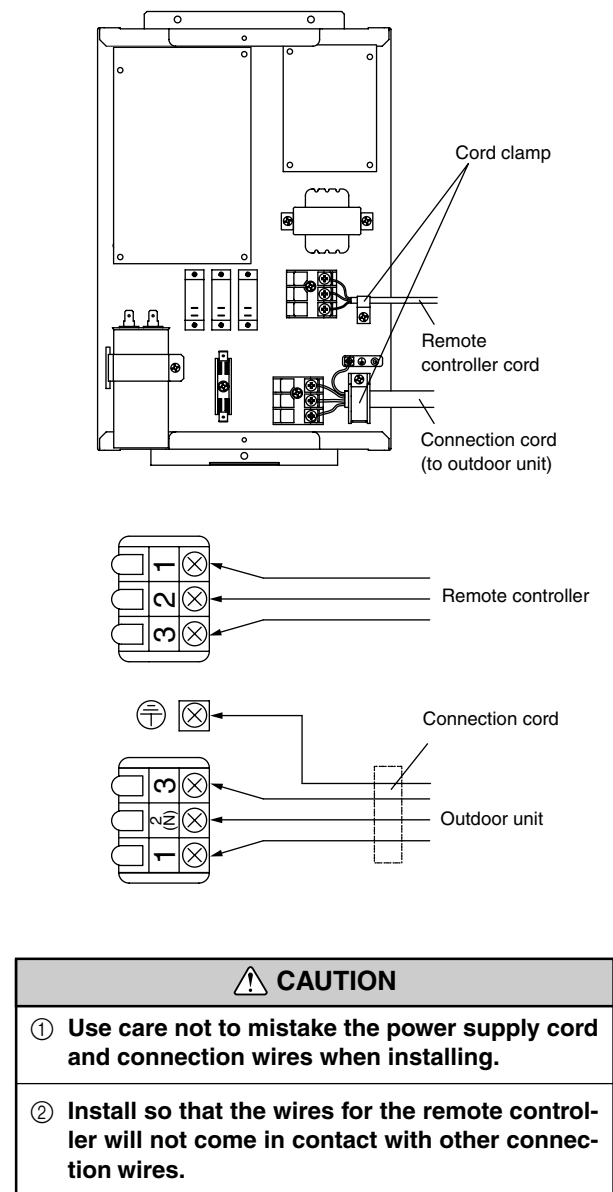


## 1. CONNECTIONS DIAGRAMS



## 3. OUTDOOR UNIT

- (1) Remove the control box cover and install each connection wire.
- (2) After wiring is complete, secure the remote controller cord, connection cord, and power supply cord with the cord clamps.
- (3) Install the control box cover.



## 9 SPECIAL INSTALLATION METHODS

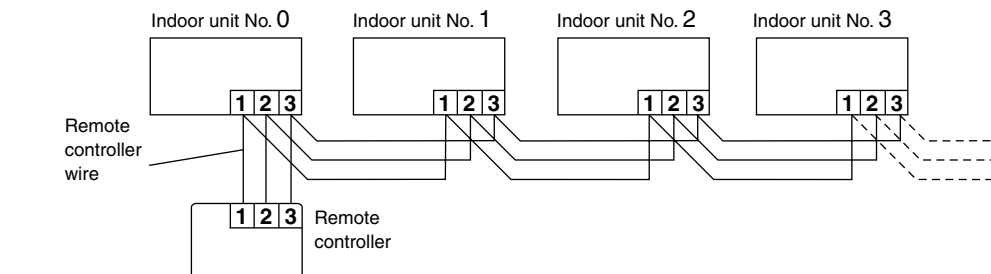
### CAUTION

- ① When setting the rotary switch and DIP switches, do not touch any other parts on the circuit board directly with your bare hands.
- ② Be sure to turn off the main power.

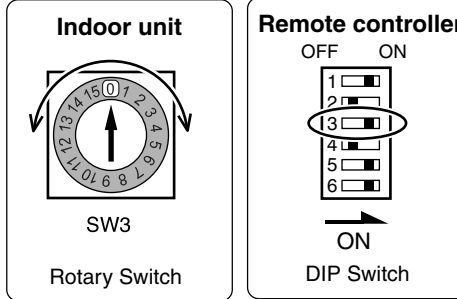
## 1. GROUP CONTROL SYSTEM

A number of indoor units can be operated at the same time using a single remote controller.

- (1) Wiring method (indoor unit to remote controller)



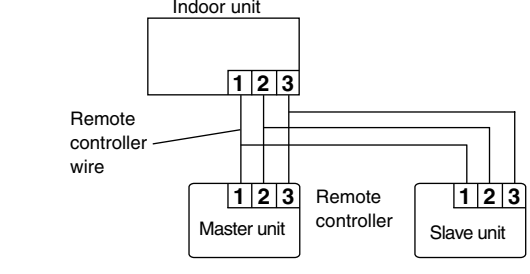
- (2) Rotary switch setting (indoor unit)  
Set the unit number of each indoor unit using the rotary switch on the indoor unit circuit board. The rotary switch is normally set to 0.
- (3) DIP switch setting (remote controller)  
Change DIP switch No. 3 on the remote controller from OFF to ON.



## 2. DUAL REMOTE CONTROLLERS (OPTIONAL)

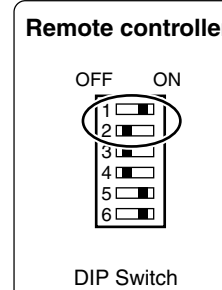
Two separate remote controllers can be used to operate the indoor units.

- (1) Wiring method (indoor unit to remote controller)



- (2) DIP switch setting (remote controller)  
Set the remote controller DIP switch Nos. 1 and 2 according to the following table.

Number of remote controllers	Master unit		Slave unit	
	DIP-SW No. 1	DIP-SW No. 2	DIP-SW No. 1	DIP-SW No. 2
1 (Normal)	ON	OFF	-	-
2 (Dual)	OFF	OFF	ON	ON



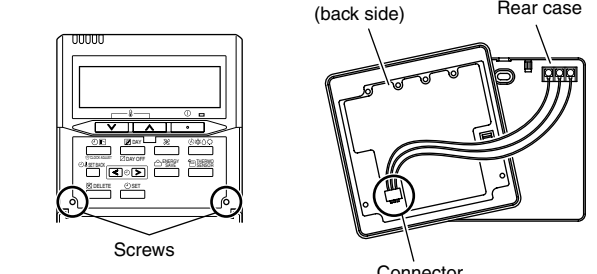
# 7 REMOTE CONTROLLER SETTING

### CAUTION

- ① In order to detect the room temperature correctly when using the temperature sensor of the remote controller, do not install the remote controller in a place where it will be exposed to direct sunlight or directly below the air outlet of the indoor unit.
- ② When installing the remote controller and cord near a source of electromagnetic waves, separate the remote controller from the source of the electromagnetic waves and use shielded cord.
- ③ Do not touch the remote controller PC board and PC board parts directly with your hands.

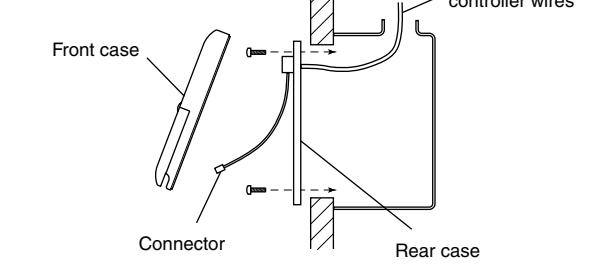
## 1. INSTALLING THE REMOTE CONTROLLER

- (1) Open the operation panel on the front of the remote controller, remove the two screws indicated in the following figure, and then remove the front case of the remote controller.



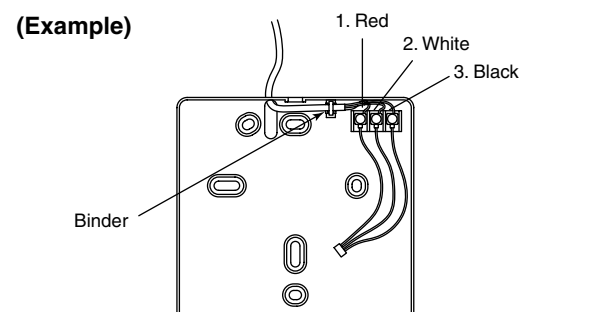
When installing the remote controller, remove the connector from the front case. The wires may break if the connector is not removed and the front case hangs down. When installing the front case, connect the connector to the front case.

- (2) Install the rear case to the wall, etc. with the two tapping screws. Refer to the following information to install the remote controller wires.



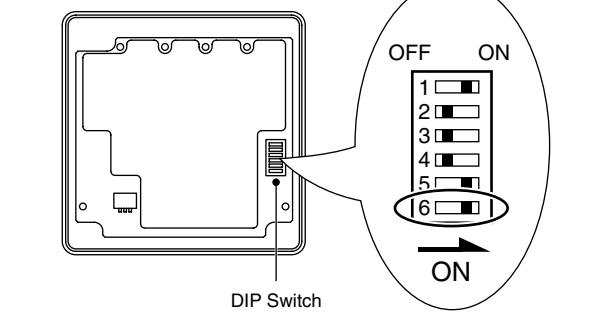
## 2. ROUTING THE REMOTE CONTROLLER WIRES

- (1) Install the remote controller wires to the terminals on the top of the rear case as shown in the following figure.
- (2) Fasten the wires with the binder.
- (3) If the remote controller wires run through the room, use a tool to cut away the thin area on the upper center of the front case.



## 3. SETTING THE DIP SWITCHES

When using a battery (memory backup)



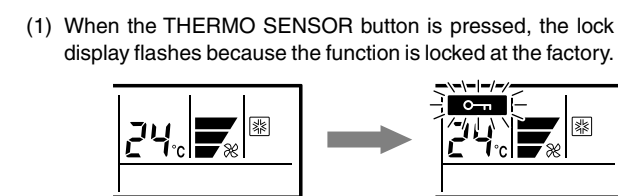
Change the DIP switch setting to use batteries. (The DIP switch is not set to use batteries at the factory.) Change DIP switch No. 6 from OFF to ON. If batteries are not used, all of the settings stored in memory will be deleted if there is a power failure.

## 4. SETTING THE ROOM TEMPERATURE DETECTION LOCATION

The detection location of the room temperature can be selected from the following three examples. Choose the detection location that is best for the installation location.

### A. Indoor unit setting (factory setting)

The room temperature is detected by the indoor unit temperature sensor.



### B. Remote controller setting

The room temperature is detected by the remote controller temperature sensor.

- (1) Press the THERMO SENSOR button for 5 seconds or more to unlock the function. The thermo sensor display flashes and then disappears when the function is unlocked.
- (2) Press the THERMO SENSOR button. The thermo sensor display appears.
- (3) Press the THERMO SENSOR button again for 5 seconds or more to lock the function. The thermo sensor display flashes and then remains on when the function is locked.
- (4) Make sure that the function is locked.

### C. Indoor unit/remote controller setting (room temperature sensor selection)

The temperature sensor of the indoor unit or the remote controller can be used to detect the room temperature.

- (1) Press the THERMO SENSOR button for 5 seconds or more to unlock the function. The thermo sensor display flashes and then disappears when the function is unlocked.
- (2) Press the THERMO SENSOR button to select the temperature sensor of the indoor unit or the remote controller.

### NOTES

If the function to change the temperature sensor is used as shown in examples A and B (other than example C), be sure to lock the detection location. If the function is locked, the lock display will flash when the THERMO SENSOR button is pressed.

# 8 TEST RUN

### CAUTION

Supply power to the crankcase heater for at least 12 hours before the start of operation in winter.

- (1) Stop the air conditioner operation.
- (2) Press the master control button and the fan control button simultaneously for 2 seconds or more to start the test run.
- (3) Press the start/stop button to stop the test run.

### [SELF-DIAGNOSIS]

When the error indication "E:EE" is displayed, follow the following items to perform the self-diagnosis. "E:EE" indicates an error has occurred.

## 1. REMOTE CONTROLLER DISPLAY

- (1) Stop the air conditioner operation.
- (2) Press the set temperature buttons  $\Delta/\nabla$  simultaneously for 5 seconds or more to start the self-diagnosis. Refer to the following tables for the description of each error code.
- (3) Press the set temperature buttons  $\Delta/\nabla$  simultaneously for 5 seconds or more to stop the self-diagnosis.

Error code	Error contents
00	Communication error (indoor unit ↔ remote controller)
01	Communication error (indoor unit ↔ outdoor unit)
02	Room temperature sensor open
03	Room temperature sensor short-circuited
04	Indoor heat exchanger temperature sensor open
05	Indoor heat exchanger temperature sensor short-circuited
06	Outdoor heat exchanger temperature sensor open
07	Outdoor heat exchanger temperature sensor short-circuited
08	Power source connection error

Error code	Error contents
09	Floot switch operated
0A	Outdoor temperature sensor open
0b	Outdoor temperature sensor short-circuited
0c	Discharge pipe temperature sensor open
0d	Discharge pipe temperature sensor short-circuited
0E	Outdoor high pressure abnormal
0F	Discharge pipe temperature abnormal
11	Model abnormal
12	Indoor fan abnormal
13	Outdoor signal abnormal
14	Outdoor EEPROM abnormal

## 2. OUTDOOR UNIT LEDS

Heat & Cool model (reverse cycle) only

When a malfunction occurs in the outdoor unit, the LEDs on the circuit board light to indicate the error. Refer to the following table for the description of each error according to the LEDs.

Error contents	LED1	LED2	LED3	LED4	LED5	LED6
Signal abnormal	-	-	X	○	X	X
Indoor unit abnormal	-	-	X	X	○	X
Discharge pipe temperature abnormal	-	-	X	X	X	○
Outdoor heat exchanger temperature abnormal	-	-	X	X	○	○
Outdoor temperature abnormal	-	-	X	○	X	○
Power source connection error	-	-	○	X	X	X
EEPROM abnormal	-	-	○	○	○	○
Outdoor high pressure abnormal	○	-	-	-	-	-
Discharge pipe temperature abnormal	-	○	-	-	-	-

○: 0.5s ON/0.5s OFF (flash)    X: OFF  
○: 0.1s ON/0.1s OFF (flash)    -: Indefinite

When the fault is cleared, the LED lamp goes off. However, for discharge pipe temperature abnormal and high pressure abnormal, the LED lamp lights continuously for 24 hours, as long as the power is not turned off.

\*: Factory setting