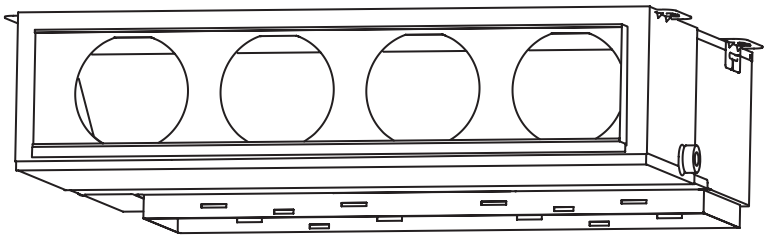
AIR CONDITIONER

English

INSTALLATION MANUAL

INDOOR UNIT (Duct Type)

For authorized service personnel only.



MADE IN THAILAND

PART No. 9381066056-03

AIR CONDITIONER

INSTALLATION MANUAL

PART No. 9381066056-03
Indoor Unit (Duct Type)

Contents

Note: This manual describes how to install the air conditioner described above. Handling and installation shall only be done by professionals as outlined in this manual.

1. SAFETY PRECAUTIONS

- Be sure to read this manual thoroughly before installation.
- The warnings and precautions indicated in this manual contain important information pertaining to your safety. Be sure to observe them.
- Hand this manual, together with the operating manual, to the customer. Request the customer to keep them on hand for future use, such as for relocating or repairing the unit.

⚠ WARNING	Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.

Installation of this product must be done by experienced service technicians or professional installers only in accordance with this manual. Installation by nonprofessional or improper installation of the product may cause serious accidents such as injury, water leakage, electric shock, or fire. If the product is installed in disregard of the instructions in this manual, it will void the manufacturer's warranty.

Do not turn on the power until all work has been completed. Turning on the power before the work is completed can cause serious accidents such as electric shock or fire.

If refrigerant leaks when you are working, ventilate the area. If the leaking refrigerant is exposed to a direct flame, it may produce a toxic gas.

Do not use this equipment with air or any other unspecified refrigerant in the refrigerant lines. Excess pressure can cause a rupture.

Installation must be performed in accordance with regulations, codes, or standards for electrical wiring and equipment in each country, region, or the installation place.

Do not touch the fins of the heat exchanger. Touching the heat exchanger fins could result in damage to the fins or personal injury such as skin rupture.

⚠ CAUTION	Indicates a potentially hazardous situation that may result in minor or moderate injury or damage to property.

Read carefully all safety information written in this manual before you install or use the air conditioner.

Install the product by following local codes and regulations in force at the place of installation, and the instructions provided by the manufacturer.

This product is part of a set constituting an air conditioner. The product must not be installed alone or be installed with non-authorized device by the manufacturer.

Always use a separate power supply line protected by a circuit breaker operating on all wires with a distance between contact of 3 mm for this product.

To protect the persons, earth (ground) the product correctly, and use the power cable combined with an Earth Leakage Circuit Breaker (ELCB).

The product is not explosion proof, and therefore should not be installed in explosive atmosphere.

To avoid getting an electric shock, never touch the electrical components soon after the power supply has been turned off. After turning off the power, always wait 5 minutes or more before you touch the electrical components.

This product contains no user-serviceable parts. Always consult experienced service technicians for repairing.

When moving or relocating the air conditioner, consult experienced service technicians for disconnection and reinstallation of the product.

Do not place any other electrical products or household belongings under the product. Condensation dripping from the product might get them wet, and may cause damage or malfunction of the property.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

2. ABOUT THIS PRODUCT

2. 1. Precautions for using R410A refrigerant

⚠ WARNING

Do not introduce any substance other than the prescribed refrigerant into the refrigeration cycle. If air enters the refrigeration cycle, the pressure in the refrigeration cycle will become abnormally high and cause the piping to rupture.

If there is a refrigerant leak, make sure that it does not exceed the concentration limit. If a refrigerant leak exceeds the concentration limit, it can lead to accidents such as oxygen starvation.

Do not touch refrigerant that has leaked from the refrigerant pipe connections or other area. Touching the refrigerant directly can cause frostbite.

If a refrigerant leak occurs during operation, immediately vacate the premises and thoroughly ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.

2. 2. Special tools for R410A refrigerant

⚠ WARNING

To install a unit that uses R410A refrigerant, use dedicated tools and piping materials that have been manufactured specifically for R410A use. Because the pressure of R410A refrigerant is approximately 1.6 times higher than the R22, failure to use dedicated piping material or improper installation can cause rupture or injury. Furthermore, it can cause serious accidents such as water leakage, electric shock, or fire.

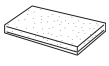
Tool name	Changes
Gauge manifold	The pressure in the refrigerant system is extremely high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended to use a gauge manifold with a high pressure display range of –0.1 to 5.3 MPa and a low pressure display range of –0.1 to 3.8 MPa.
Charging hose	To increase pressure resistance, the hose material and base size were changed. (The charging port thread diameter for R410A is 1/2-20 UNF.)
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter. Be sure that the pump oil does not backflow into the system. Use one capable for vacuum suction of –100.7 kPa (5 Torr, –755 mmHg).
Gas leakage detector	Special gas leakage detector for R410A refrigerant.

2. 3. Accessories

⚠ WARNING

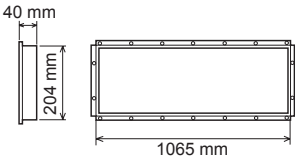
For installation purposes, be sure to use the parts supplied by the manufacturer or other prescribed parts.
The use of non-prescribed parts can cause serious accidents such as the unit falling, water leakage, electric shock, or fire.

- The following installation parts are furnished. Use them as required.
- Keep the Installation Manual in a safe place and do not discard any other accessories until the installation work has been completed.

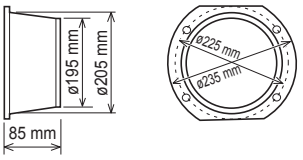
Name and Shape	Q'ty	Description
Operating Manual 	1	
Installation Manual 	2	
Specification Manual 	1	
Hanger 	4	For suspending the indoor unit from ceiling
Special nut A (large flange) 	4	For suspending the indoor unit from ceiling
Special nut B (small flange) 	4	
Coupler heat insulation (large) 	1	For indoor side pipe joint (gas pipe)
Coupler heat insulation (small) 	1	For indoor side pipe joint (liquid pipe)
Cable tie (large) 	1	For fixing the drain hose
Cable tie (small) 	1	For fixing the remote controller cable
Remote controller (WAE type) 	1	For air conditioner operation
Tapping screw (flush heads) 	2	For installing the remote controller
Remote controller cable 	1	For connecting the remote controller
Drain hose insulation 	1	Insulates the drain hose and vinyl hose

2. 4. Optional parts

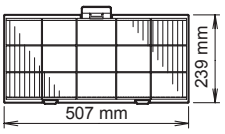
Square flange
Model name : UTD–SF045T
(P/N 9098180007)



Round flange
Model name : UTD–RF204
(P/N 9093160004)



Long-life filter
Model name : UTD–LF25NA
(P/N 9079892004)



Remote sensor
Model name: UTY-XSZX (P/N 9002763005)

External control wire set
Model name : UTD-ECS5A (P/N 9077359004)

3. GENERAL SPECIFICATION

3. 1. Type of copper pipe and insulation material

⚠ CAUTION

Refer to the Installation manual of the outdoor unit for description of the length of connecting pipe or for difference of its elevation.

Diameter [mm (in.)]	**Liquid**	6.35 (1/4)
	Gas	15.88 (5/8)

- Use pipe with water-resistant heat insulation.

⚠ 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).

3. 2. Electrical requirement

⚠ CAUTION

Before the electrical working, confirm electrical standards and regulations in each country, region, or installing place. Then select appropriate cables and breakers that comply with them.

Cable	Cable size (mm²)	Type	Remarks
Connection cable	1.5 (MIN.)	Type 60245 IEC57	3Cable+Earth (Ground), 1φ220 - 240V

Max. Cable Length: Limit voltage drop to less than 2%. Increase cable gauge if voltage drop is 2% or more.

4. INSTALLATION WORK

⚠ WARNING

Do not turn on the power until all installation work is complete.

Carrying and installation of the unit should be performed by a sufficient number of people and with sufficient equipment that is adequate for the weight of the unit. Performing such work with an insufficient number of people or with inadequate equipment could result in dropping of the unit or personal injury.

⚠ CAUTION

For installation details, refer to the technical data.

4. 1. Selecting an installation location

Decide the mounting position together with the customer as follows:

⚠ WARNING

Select installation locations that can properly support the weight of the indoor 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.

Install the units securely so that they do not topple or fall.

⚠ CAUTION

Do not install the indoor unit in the following areas:
- Area with high salt content, such as at the seaside.
  It will deteriorate metal parts, causing the parts to fall or the unit to leak water.
- Area filled with mineral oil or containing a large amount of splashed oil or steam, such as a kitchen.
  It will deteriorate plastic parts, causing the parts to fall or the unit to leak water.
- Area that generates substances that adversely affect the equipment, such as sulphuric gas, chlorine gas, acid, or alkali. It will cause the copper pipes and brazed joints to corrode, which can cause refrigerant leakage.
- Area that can cause combustible gas to leak, contains suspended carbon fibres or flammable dust, or volatile inflammables such as paint thinner or gasoline. If gas leaks and settles around the unit, it can cause a fire.
- Area where animals may urinate on the unit or ammonia may be generated.

Do not use the unit for special purposes, such as storing food, raising animals, growing plants, or preserving precision devices or art objects. It can degrade the quality of the preserved or stored objects.

Do not install where there is the danger of combustible gas leakage.

Do not install the unit near a source of heat, steam, or flammable gas.

Install the unit where drainage does not cause any trouble.

Install the indoor unit, outdoor unit, power supply cable, transmission cable, and remote control cable at least 1 m away from a television or radio receivers. The purpose of this is to prevent TV reception interference or radio noise.
(Even if they are installed more than 1 m apart, you could still receive noise under some signal conditions.)

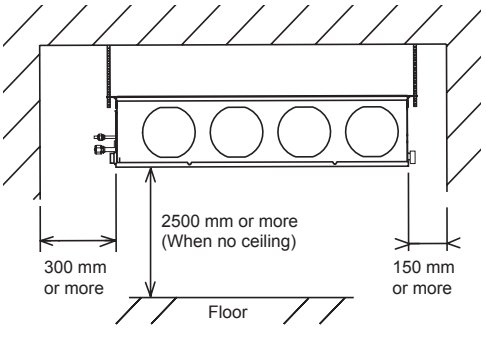
Install the unit where ambient temperature does not reach 60°C or more.
Take a measure such as ventilation for an environment in which heat is retained.

If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

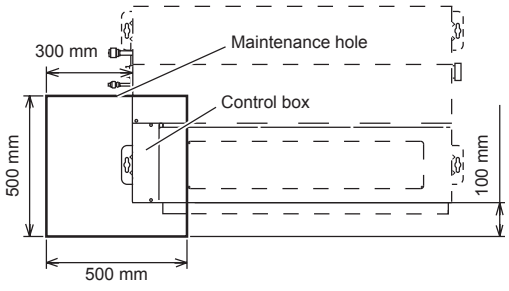
(1) Install the indoor unit in a place which can withstand a load of at least 5 times the weight of the unit.
(2) The inlet and outlet ports should not be obstructed; the air should be able to blow all over the room.
(3) Leave the space required to service the air conditioner.
(4) Install the unit where connection to the outdoor unit is easy.
(5) Install the unit where the connection pipe can be easily installed.
(6) Install the unit where the drain pipe can be easily installed.
(7) Install the unit where noise and vibrations are not amplified.
(8) Take servicing, etc., into consideration and leave the spaces. Also install the unit where the filter can be removed.
(9) Do not install the unit where it will be exposed to direct sunlight.

Correct initial installation location is important because it is difficult to move unit after it is installed.

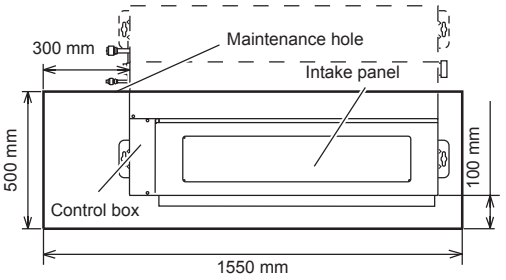
4. 2. Installation dimensions



Place the unit where it is possible to install or remove the control box.



Place the unit where it is possible to install or remove the control box, fan units and filter.



4. 3. Installing the unit

⚠ WARNING

Carrying and installation of the unit should be performed by a sufficient number of people and with sufficient equipment that is adequate for the weight of the unit. Performing such work with an insufficient number of people or with inadequate equipment could result in dropping of the unit or personal injury.

If the job is done with the panel frame only, there is a risk that the unit will come loose. Please take care.

When fastening the hangers, make the bolt positions uniform.

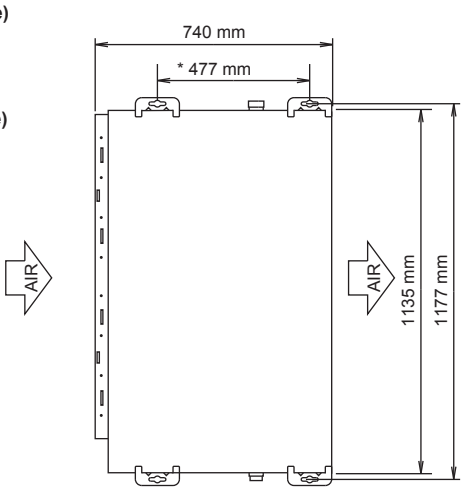
⚠ CAUTION

Confirm the directions of the air intake and outlet before installing the unit.

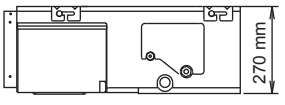
Hanging bolt installation diagram.

(Example)

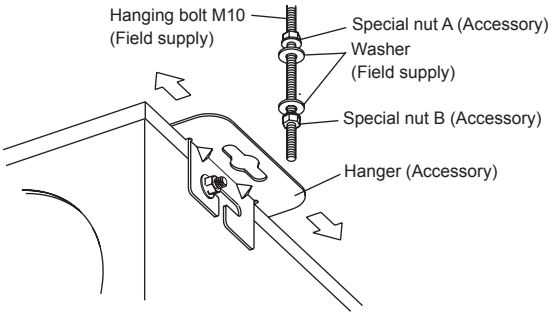
(Top side)



(Left side)



* The distance indicated is adjustable according to the place of the hanging bolts. (MAX : 550 mm, MIN : 410 mm)
Slide the unit in the direction of the arrow and fasten it.



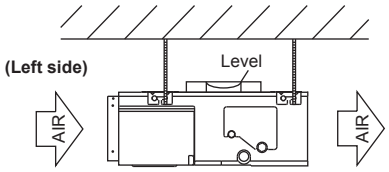
Bolt Strength	9.81 to 14.71 N·m (100 to 150 kgf·cm)

⚠ WARNING

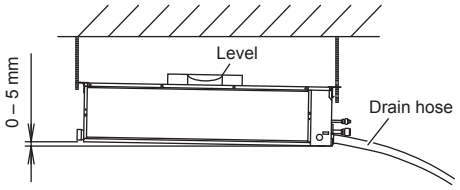
Fasten the unit securely with special nuts A and B so that the unit does not fall.

Levelling

Base vertical direction levelling on the unit (right and left).



Base horizontal direction levelling on top of the unit.



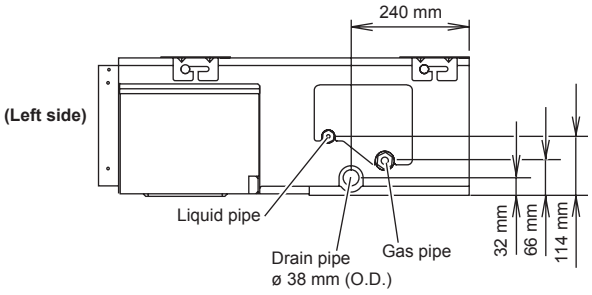
Give a slight tilt to the side to which the drain hose is connected. The tilt should be in the range of 0 mm to 5 mm.

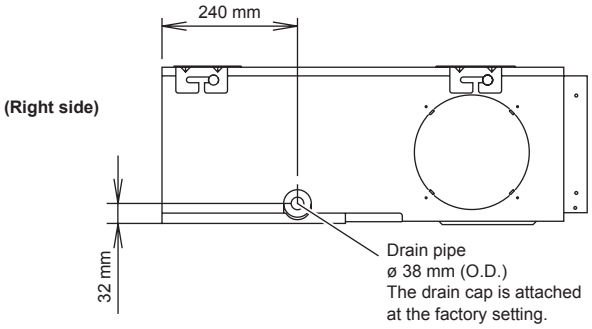
4. 4. Installing the drain hose

⚠ CAUTION

Install the drain hose in accordance with the instructions in this installation instruction sheet and keep the area warm enough to prevent condensation. Problems with the piping may lead to water leaks.

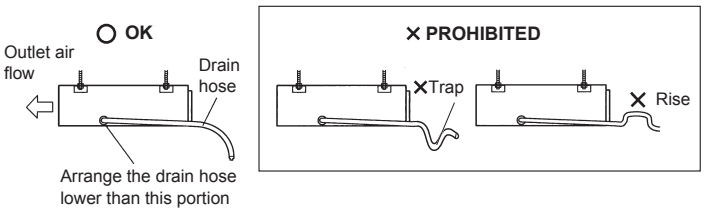
Install the drain hose according to the measurements given in the following figure.



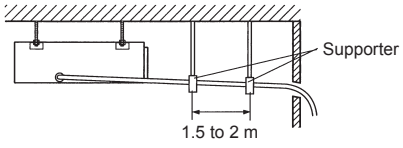


NOTE:

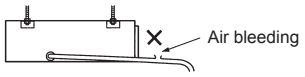
- Use general hard polyvinyl chloride pipe (VP25) [outside diameter 38 mm] and connect it with adhesive (polyvinyl chloride) so that there is no leakage.
- Install the drain hose with downward gradient (1/50 to 1/100) so there are no rises or traps in the hose.



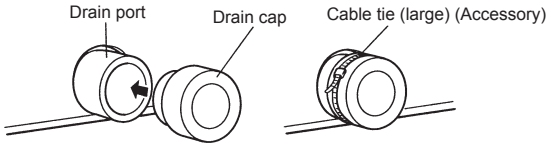
- When the hose is long, install supporters.



- Do not perform air bleeding.



- When the unit is shipped from the factory, the drain port is on the left side (control box side).
- When using the drain port on the right side of the unit, reinstall the drain cap to the left side drain port.



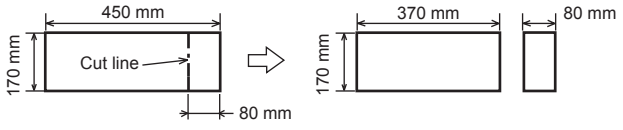
⚠ CAUTION

Always check that the drain cap is installed to the unused drain port and is fastened with the cable tie.
If the drain cap is not installed, or is not sufficiently fastened by the cable tie, water may drip during the cooling operation.

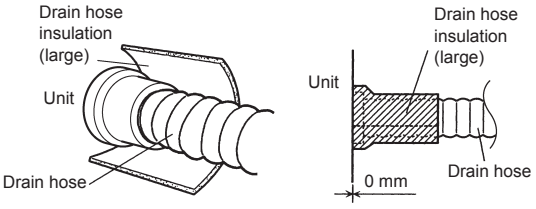
4. 5. Installing the drain hose heat insulation

- Always heat insulate the indoor side of the drain hose.

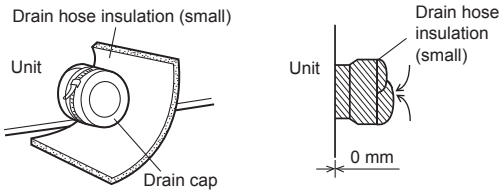
(1) Cut the drain hose insulation at a position approximately 80 mm from the end with cutters, etc.



(2) Stick the large drain hose insulation at the drain hose installation side.

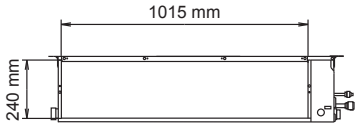


(3) Stick the small drain hose insulation at the drain cap side.
(4) Cover the drain cap with the drain hose insulation.

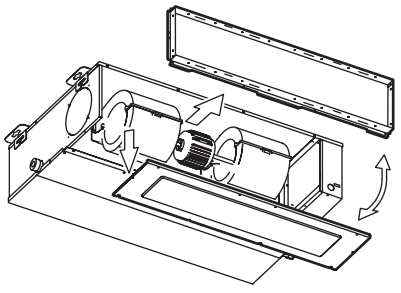


4. 6. Intake duct connection

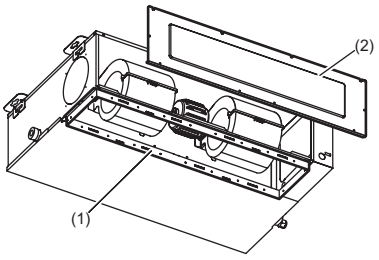
Follow the procedure in the following figure.



The air intake duct can be changed by replacing the intake grille and flange.



For the bottom air intake, position (1) the intake grille, and (2) the flange, as shown in the following figure. (The factory setting is back air intake.)



⚠ CAUTION

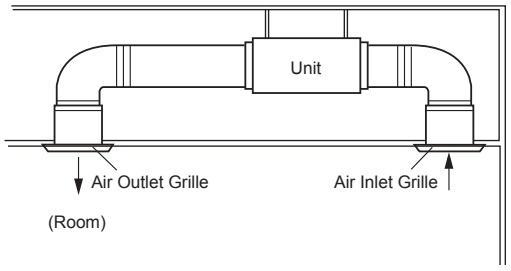
When air is taken in from the bottom side, the operating sound of the product will easily enter the room.
Install the product and intake grilles where the affect of the operating sound is small.

To prevent people from touching the parts inside the unit, be sure to install grilles on the inlet and outlet ports. The grilles must be designed in such a way that cannot be removed without tools.

Recommended range of static pressure is 35 Pa to 150 Pa.

If an intake duct is installed, take care not to damage the temperature sensor (the temperature sensor is attached to the intake port flange).

Be sure to install the air inlet grille and the air outlet grille for air circulation. The correct temperature cannot be detected.



When connecting the duct, perform duct-insulation appropriate for the installing environment.
Inappropriate insulation work may cause condensation on the surface of the insulating material, and may lead to condensation dripping.

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. 7. Outlet duct connection

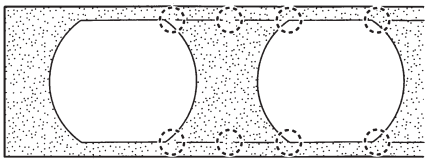
(1) Duct installation pattern (■ CUT PART)

- Round duct outlet ×4 (Factory setting)

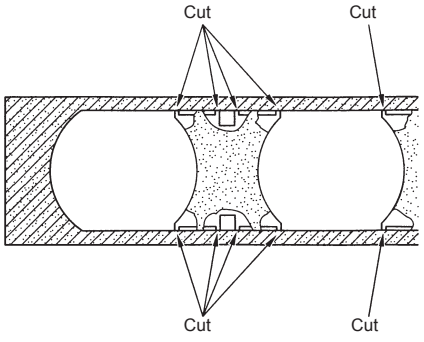
- Square duct

When using as a square duct

(1-1) Cut the slit seam ⌓ with a cutter.

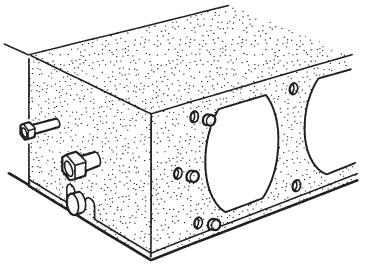


(1-2) Turn up the insulation around the points to be cut according to the outlet port shape working points so that the insulation does not stick out at the ▨ part.



(1-3) Cut with nippers and remove the sheet metal.

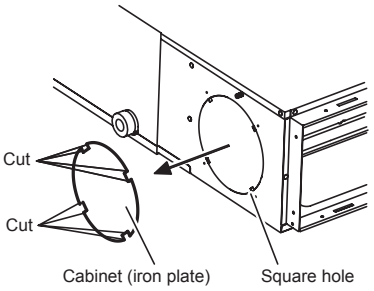
(2) Since there is a slit in the insulation, use radio pliers, tweezers, etc. to stretch the screw hole part used when installing the round flange and square flange when connecting the duct.



4. 8. Fresh air intake

(Processing before use)

(1) When taking in fresh air, cut a slit shaped cabinet in the left side of the outer case with nippers.

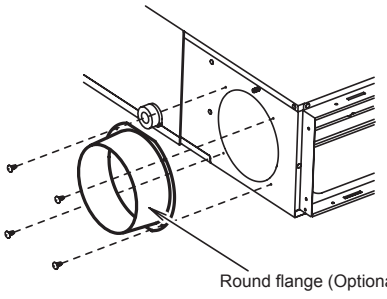


⚠ CAUTION

When removing the cabinet (iron plate), be careful not to damage the indoor unit internal parts and surrounding area (outer case).

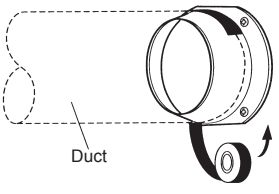
When processing the cabinet (iron plate), be careful not to injure yourself with burrs, etc.

(2) Install the round flange to the fresh air intake.



(3) Connect the duct to the round flange.

(4) Seal with a band, vinyl tape, etc. so that air does not leak from the connection.



5. PIPE INSTALLATION

⚠ WARNING

During installation, make sure that the refrigerant pipe is attached firmly before you run the compressor.
Do not operate the compressor under the condition of refrigerant piping not attached properly with 2-way or 3-way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.

During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping.
Do not remove the connection pipe while the compressor is in operation with 2-way or 3-way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.

When installing and relocating the air conditioner, do not mix gases other than the specified refrigerant (R410A) to enter the refrigerant cycle.
If air or other gas enters the refrigerant cycle, the pressure inside the cycle will rise to an abnormally high value and cause breakage, injury, etc.

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.

⚠ CAUTION

Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant R410A models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.

While welding the pipes, be sure to blow dry nitrogen gas through them.

5. 1. Selecting the pipe material

⚠ CAUTION

Do not use existing pipes.

Use pipes that have clean external and internal sides without any contamination which may cause trouble during use, such as sulphur, oxide, dust, cutting waste, oil, or water.

It is necessary to use seamless copper pipes.
Material : Phosphor deoxidized seamless copper pipes
It is desirable that the amount of residual oil is less than 40 mg/10 m.

Do not use copper pipes that have a collapsed, deformed, or discoloured portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants.

Improper pipe selection will degrade performance. As an air conditioner using R410A incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials.

- Thicknesses of copper pipes used with R410A are as shown in the table.
- Never use copper pipes thinner than those indicated in the table even if they are available on the market.

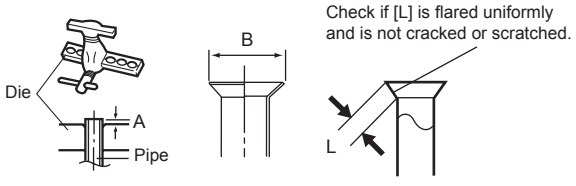
Pipe outside diameter [mm (in.)]	Thickness [mm]
6.35 (1/4)	0.8
9.52 (3/8)	0.8
12.70 (1/2)	0.8
15.88 (5/8)	1.0
19.05 (3/4)	1.2

5. 2. Pipe connection

5. 2. 1. Flaring

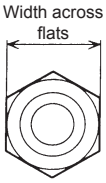
- Use special pipe cutter and flare tool exclusive for R410A.

(1) Cut the connection pipe to the necessary length with a pipe cutter.
(2) Hold the pipe downward so that cuttings will not enter the pipe and remove any burrs.
(3) Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool. Use the special R410A flare tool, or the conventional flare tool. Leakage of refrigerant may result if other flare nuts are used.
(4) Protect the pipes by pinching them or with tape to prevent dust, dirt, or water from entering the pipes.



Pipe outside diameter [mm (in.)]	Dimension A [mm]	Dimension $B^{0}_{-0.4}$ [mm]
	Flare tool for R410A, clutch type	
6.35 (1/4)	0 to 0.5	9.1
9.52 (3/8)		13.2
12.70 (1/2)		16.6
15.88 (5/8)		19.7
19.05 (3/4)		24.0

When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.



Pipe outside diameter [mm (in.)]	Width across flats of Flare nut [mm]
6.35 (1/4)	17
9.52 (3/8)	22
12.70 (1/2)	26
15.88 (5/8)	29
19.05 (3/4)	36

5. 2. 2. Bending pipes

- If pipes are shaped by hand, be careful not to collapse them.
- Do not bend the pipes in an angle more than 90°.
- When pipes are repeatedly bend or stretched, the material will harden, making it difficult to bend or stretch them any more.
- Do not bend or stretch the pipes more than 3 times.

⚠ CAUTION

To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or over.

If the pipe is bent repeatedly at the same place, it will break.

5. 2. 3. Connecting pipes

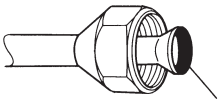
⚠ CAUTION

Be sure to apply the pipe against the port on the indoor unit correctly. If the centring is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.

Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.

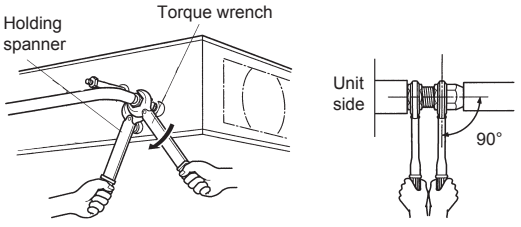
Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.

(1) Detach the caps and plugs from the pipes.
(2) Centring the pipe against port on the indoor unit, turn the flare nut with your hand.



To prevent gas leakage, coat the flare surface with alkylbenzene oil (HAB). Do not use mineral oil.

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.

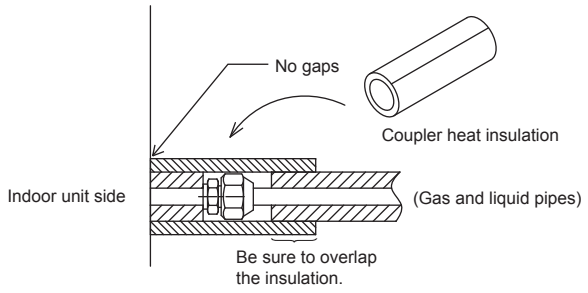
Tighten the flare nuts with a torque wrench using the specified tightening method. Otherwise, the flare nuts could break after a prolonged period, causing refrigerant to leak and generate a hazardous gas if the refrigerant comes into contact with a flame.

Flare nut [mm (in.)]	Tightening torque [N·m (kgf·cm)]
6.35 (1/4) dia.	16 to 18 (160 to 180)
9.52 (3/8) dia.	32 to 42 (320 to 420)
12.70 (1/2) dia.	49 to 61 (490 to 610)
15.88 (5/8) dia.	63 to 75 (630 to 750)
19.05 (3/4) dia.	90 to 110 (900 to 1,100)

5. 3. Installing heat insulation

Install the heat insulation material after performing a refrigerant leak check (see the Installation Manual for the outdoor unit for details).

COUPLER HEAT INSULATION



⚠ CAUTION

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

⚠ CAUTION

After connecting the piping, check the all joints for gas leakage with gas leak detector.

When inspecting gas leakage, always use the vacuum pump for pressure. Do not use nitrogen gas.

Install heat insulation around both the large (gas) and small (liquid) pipes. Failure to do so may cause water leaks.

6. ELECTRICAL WIRING

⚠ WARNING

Electrical work must be performed in accordance with this Manual by a person certified under the national or regional regulations. Be sure to use a dedicated circuit for the unit.
An insufficient power supply circuit or improperly performed electrical work can cause serious accidents such as electric shock or fire.

Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.

Use the included connection cables and power cables or ones specified by the manufacturer. Improper connections, insufficient insulation, or exceeding the allowable current can cause electric shock or fire.

For wiring, use the prescribed type of cables, connect them securely, making sure that there are no external forces of the cables applied to the terminal connections. Improperly connected or secured cables can cause serious accidents such as overheating the terminals, electric shock, or fire.

Do not modify the power cables, use extension cables, or use any branches in the wiring. Improper connections, insufficient insulation, or exceeding the allowable current can cause electric shock or fire.

Match the terminal board numbers and connection cable colours with those of the outdoor unit. Erroneous wiring may cause burning of the electric parts.

Securely connect the connection cables to the terminal board. In addition, secure the cables with wiring holders. Improper connections, either in the wiring or at the ends of the wiring, can cause a malfunction, electric shock, or fire.

Always fasten the outside covering of the connection cable with the cable clamp. (If the insulator is chafed, electric leakage may occur.)

Securely install the electrical box cover on the unit. An improperly installed electrical box cover can cause serious accidents such as electric shock or fire through exposure to dust or water.

Install sleeves into any holes made in the walls for wiring. Otherwise, a short circuit could result.

Install a ground leakage breaker. In addition, install the ground leakage breaker so that the entire AC main power supply is cut off at the same time. Otherwise, electric shock or fire could result.

Install a ground leakage breaker.
If a ground leakage breaker is not installed, it may cause electric shock or fire.

Always connect the earth (ground) cable.
Improper earthing (grounding) work can cause electric shocks.

Install the remote control cables so as not to be direct touched with your hand.

Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.

Connect the connection cable firmly to the terminal board. Imperfect installation may cause a fire.

⚠ CAUTION

Ground the unit.
Do not connect the earth (ground) cable to a gas pipe, water pipe, lightning rod, or a telephone earth (ground) cable.
Improper earthing (grounding) may cause electric shock.

Do not connect power supply cables to the transmission or remote control terminals, as this will damage the product.

Never bundle the power supply cable and transmission cable together. Bundling these cables together will cause miss operation.

When handling PCB, static electricity charged in the body may cause malfunction of the PCB. Follow the cautions below:
- Establish a ground for the indoor and outdoor units and peripheral devices.
- Cut power (breaker) off.
- Touch metal part of the indoor and outdoor units for more than 10 seconds to discharge static electricity charged in the body.
- Do not touch terminals of parts and patterns implemented on PCB.

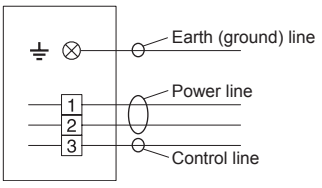
Install circuit breakers, which have the terminal spacing of more than 3 mm, in a place of near the indoor unit and outdoor unit.

Be sure to execute the electrical work according to the Laws of each country and the Installation Instructions. In addition, be sure to set as exclusive line and use the rated voltage and circuit breaker.

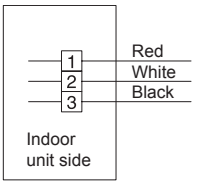
6. 1. Wiring method

6. 1. 1. Connection diagrams

Connection cable to outdoor unit

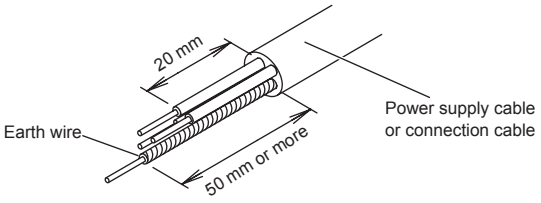


Wired remote controller cable



6. 1. 2. Connection cable preparation

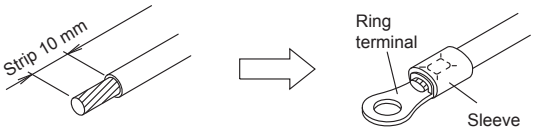
Keep the earth (ground) wire longer than the other wires.



Use a 4-core wire cable.

How to connect wiring to the terminals.

(1) Use ring terminals with insulating sleeves as shown in the figure below to connect to the terminal block.
(2) Securely clamp the ring terminals to the wires using an appropriate tool so that the wires do not come loose.

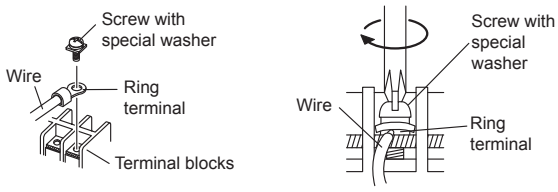


(3) Use the specified wires, connect them securely, and fasten them so that there is no stress placed on the terminals.
(4) Use an appropriate screwdriver to tighten the terminal screws.
Do not use a screwdriver that is too small, otherwise, the screw heads may be damaged and prevent the screws from being properly tightened.
(5) Do not tighten the terminal screws too much, otherwise, the screws may break.
(6) See the table below for the terminal screw tightening torques.

⚠ WARNING

Use ring terminals and tighten the terminal screws to the specified torques, otherwise, it may cause abnormal overheating and possibly cause serious damage inside the unit.

Tightening torque [N·m (kgf·cm)]	
M4 screw	1.2 to 1.8 (12 to 18)
M5 screw	2.0 to 3.0 (20 to 30)



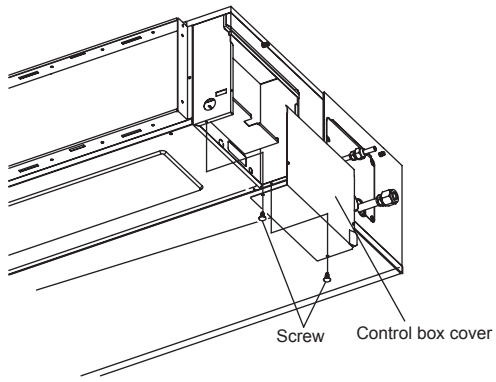
6. 1. 3. Connection wiring

⚠ CAUTION

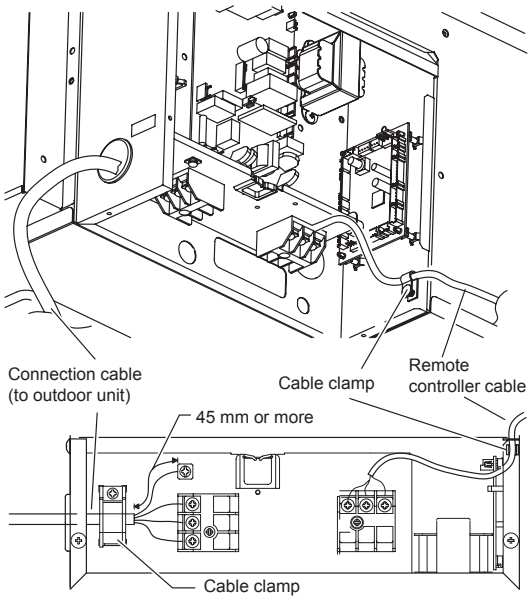
Be careful not to mistake the power supply cable and connection wires when installing.

Install so that the wires for the remote controller will not come in contact with other connection wires.

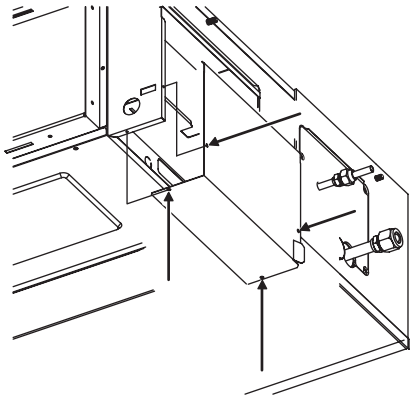
(1) Remove the control box cover and install each connection wire.



(2) After wiring is complete, secure the remote controller cable and connection cable with cable clamps.



(3) Install control box cover.
Adjust the position of the screws for control box cover according to the installation.



⚠ CAUTION

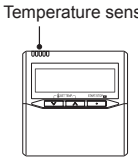
Do not bundle the remote controller cable, or wire the remote controller cable in parallel, with the indoor unit connection wire (to the outdoor unit) and the power supply cable. It may cause erroneous operation.

7. REMOTE CONTROLLER SETTING

⚠ CAUTION

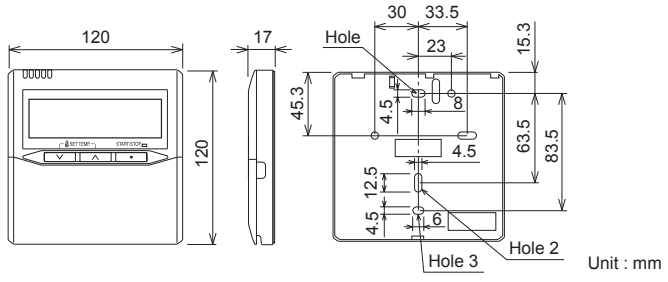
When detecting the room temperature using the remote controller, please set up the remote controller according to the following conditions.
If the remote controller is not well set, the correct room temperature will not be detected, and thus the abnormal conditions like “not cooled” or “not heated” will occur even if the air conditioner is running normally.

- A location with an average temperature for the room being air-conditioned.
- Not directly exposed to the outlet air from the air conditioner.
- Out of direct sunlight.
- Away from the influence of other heat sources.



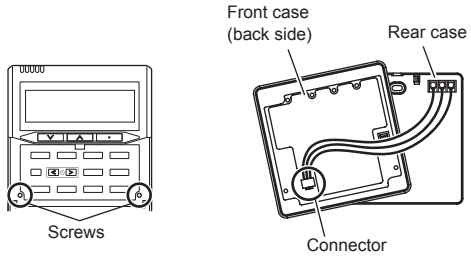
When installing the remote controller and cable near a source of electromagnetic waves, separate the remote controller from the source of the electromagnetic waves and use shielded cable.

Do not touch the remote controller PC board and PC board parts directly with your hands.



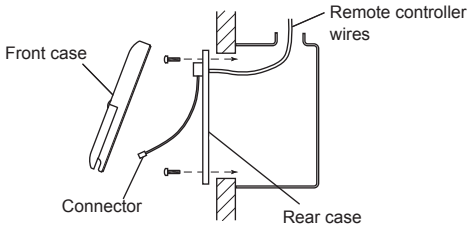
7. 1. Installing the remote controller

(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.

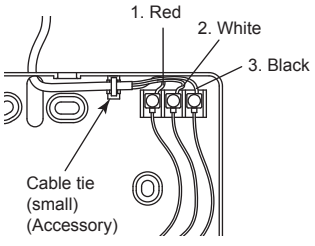


Install the remote controller wires so as not to be directly touched with your hand.

7. 2. Routing the remote controller wires

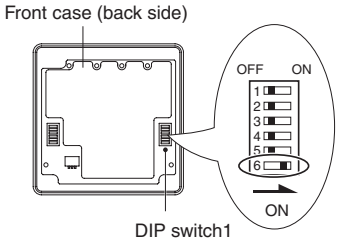
(1) Install the remote controller wires to the terminals on the top of the rear case as shown in the following figure.
(2) Fasten the wires with the cable tie.

(Example)



7. 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.

8. FUNCTION SETTING

⚠ CAUTION

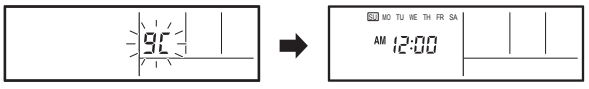
Confirm whether the wiring work for outdoor unit has been finished.

Confirm whether the cover for electric control box on the outdoor unit is close.

8. 1. Turning on the power

(1) Check the remote controller wiring and DIP switch settings.
(2) Install the front case. When installing the front case, connect the connector to the front case.
(3) Check the indoor and outdoor unit wiring and circuit board switch settings, and then turn on the indoor and outdoor units. After "9C" has flashed on the set temperature display for several seconds, the clock display will appear in the centre of the remote controller display.

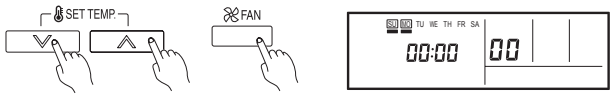
The clock display will appear in the centre of the remote controller display.



8. 2. Setting method

- This procedure changes to the function settings used to control the indoor unit according to the installation conditions.
- Incorrect settings can cause the indoor unit malfunction.
- After the power is turned on, perform the "FUNCTION SETTING" according to the installation conditions using the remote controller.
- The settings may be selected between the following two:
- Function Number or Setting Value.
- Settings will not be changed if invalid numbers or setting values are selected.

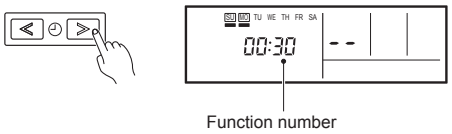
(1) Press the SET TEMP. buttons (▽) (△) and FAN button simultaneously for more than 5 seconds to enter the function setting mode.



Press the SET BACK button to select the indoor R.C. address.

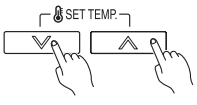
R.C. address of INDOOR UNIT

(2) Press the Set time buttons (◁) (▷) to select the function number.

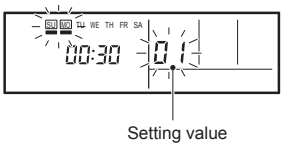


Function number

(3) Press the SET TEMP. buttons (▽) (△) to select the setting value.
The display flashes as shown to the right during setting value selection.



(4) Press the TIMER SET button to confirm the setting. Press the TIMER SET button for a few seconds until the setting value stops flashing.
If the setting value display changes or if "- -" is displayed when the flashing stops, the setting value has not been set correctly. (An invalid setting value may have been selected for the indoor unit.)



Setting value

(5) Repeat steps 2 to 4 to perform additional settings. Press the SET TEMP. buttons (▽) (△) and FAN button simultaneously again for more than 5 seconds to cancel the function setting mode. In addition, the function setting mode will be automatically cancelled after 1 minute if no operation is performed.
(6) After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.

⚠ CAUTION

After turning off the power, wait 30 seconds or more before turning on it again. The FUNCTION SETTING doesn't become effective if it doesn't do so.

8. 3. Function setting

The function settings are as follows.

Filter Sign

- Select appropriate intervals for displaying the filter sign on the indoor unit according to the estimated amount of dust in the air of the room.
  If the indication is not required, select "No indication" (03).

(♦...Factory setting)

	Setting Description	Function Number	Setting Value
	Standard (2500 hours)	11	00
	Long interval (4400 hours)		01
	Short interval (1250 hours)		02
♦	No indication		03

Static pressure

- Select appropriate static pressure according to the installation conditions.

(♦...Factory setting)

	Setting Description	Function Number	Setting Value
♦	Normal (35 Pa)	21	00
	High static pressure 1 (60 Pa)		01
	High static pressure 2 (95 Pa)		02
	High static pressure 3 (150 Pa)		03

Room temperature control for cooling

- Depending on the installed environment, correction of the room temperature sensor may be required.
- Select the appropriate control setting according to the installed environment.

(♦...Factory setting)

	Setting Description	Function Number	Setting Value
♦	Standard	30	00
	Lower control		01
	Slightly higher control		02
	Higher control		03

Room temperature control for heating

- Depending on the installed environment, correction of the room temperature sensor may be required.
- Select the appropriate control setting according to the installed environment.

(♦...Factory setting)

	Setting Description	Function Number	Setting Value
♦	Standard	31	00
	Lower control		01
	Slightly lower control		02
	Higher control		03

Auto Restart

- Enable or disable automatic restart after a power interruption.

(♦...Factory setting)

	Setting Description	Function Number	Setting Value
♦	Enable	40	00
	Disable		01

*Auto restart is an emergency function such as for power outage etc. Do not attempt to use this function in normal operation. Be sure to operate the unit by remote controller or external device.

Room temperature sensor switching

(Only for wired remote controller)

When using the Wired remote controller temperature sensor, change the setting to “Both” (01).

(♦...Factory setting)

	Setting Description	Function Number	Setting Value
♦	Indoor Unit	42	00
	Both		01

00: Sensor on the indoor unit is active.
01: Sensors on both indoor unit and wired remote controller are active.

Cold Air Prevention

• This setting is to disable the cold air prevention function during heating operation. When disabled, the fan setting will always follow the setting on the remote controller. (Excluding defrost mode)

(♦...Factory setting)

	Setting Description	Function Number	Setting Value
♦	Enable	43	00
	Disable		01

External input control

• “Operation/Stop” mode or “Forced stop” mode can be selected.

(♦...Factory setting)

	Setting Description	Function Number	Setting Value
♦	Operation/Stop mode	46	00
	(Setting prohibited)		01
	Forced stop mode		02

Room temperature sensor switching (Aux.)

• To use the temperature sensor on the wired remote controller only, change the setting to “Wired remote controller” (01). This function will only work if the function setting 42 is set at “Both” (00)

(♦...Factory setting)

	Setting Description	Function Number	Setting Value
♦	Both	48	00
	Wired remote controller		01

Setting record

Record any changes to the settings in the following table.

Function setting	Setting Value
Filter Sign	
Static Pressure	
Room temperature control for cooling	
Room temperature control for heating	
Auto restart	
Room temperature sensor switching	
Cold air prevention	
External input control	
Room Temperature Sensor Switching (Aux.)	

• After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.

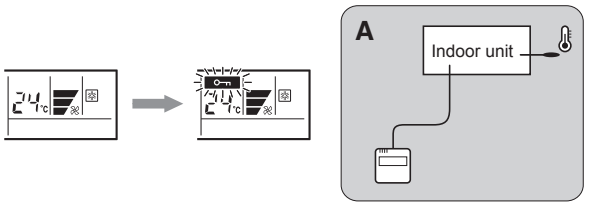
8. 4. Setting the room temperature detection location

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.

(1) When the THERMO SENSOR button is pressed, the lock display flashes because the function is locked at the factory.

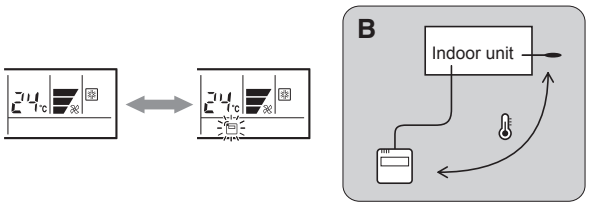


B. Remote controller setting

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

(1) Enable the room temperature sensor selection by changing the room temperature sensor switching in “8.3. Function setting” to “Both”.

(2) Press the THERMO SENSOR button for 5 seconds or more to select the temperature sensor of the indoor unit or the remote controller.



⚠ CAUTION

When selecting the “Remote controller setting”, if the detected temperature value between the temperature sensor of the indoor unit and the temperature sensor of the remote controller varies significantly, it is likely to return to the control status of temperature sensor of the indoor unit temporarily.

As the temperature sensor of remote controller detects the temperature near the wall, when there is a certain difference between the room temperature and the wall temperature, the sensor will not detect the room temperature correctly sometimes.

Especially when the outer side of the wall on which the sensor is positioned is exposed to the open air, it is recommended to use the temperature sensor of the indoor unit to detect the room temperature when the indoor and outdoor temperature difference is significant.

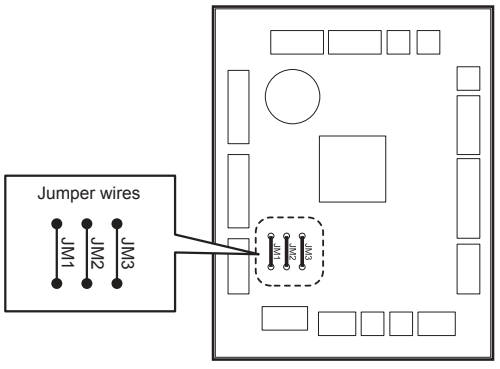
The temperature sensor of the remote controller is not only used when there is a problem in the detection of the temperature sensor of the indoor unit.

NOTE:

If the function to change the temperature sensor is used as shown in example A, 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. 5. Jumper wire setting

Change the following settings by using the jumpers.
This setting is made by cutting the jumper wires on the circuit board of the indoor unit.



Jumper wire	JM state		Details
	Connect	Disconnect	
JM1	-		Cannot be used (Do not change)
JM2			
JM3	Disable	Enable	Fan delay setting

9. SPECIAL INSTALLATION METHODS

⚠ CAUTION

Be sure to turn off the electrical breaker before making settings.

When setting the DIP switches, do not touch any other parts on the circuit board directly with your bare hands.

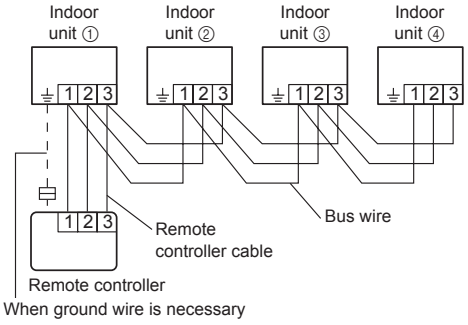
9. 1. Group control system

⚠ CAUTION

Group control is only possible between units with remote controllers of the same type. To confirm the type of remote controller, see the back of the remote controller or “2.3. Accessories”.

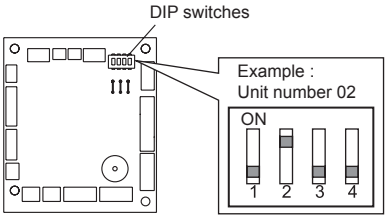
A number of indoor units can be operated at the same time using a single remote controller.

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



(2) DIP switch setting (Indoor unit)
Set the unit number of each indoor unit using the DIP switches on the indoor unit circuit board. (See the following table and figure.)
The DIP switches are normally set to make the unit number 00.

Indoor unit	Unit number	DIP SWITCH No.			
		1	2	3	4
①	00	OFF	OFF	OFF	OFF
②	01	ON	OFF	OFF	OFF
③	02	OFF	ON	OFF	OFF
④	03	ON	ON	OFF	OFF
⑤	04	OFF	OFF	ON	OFF
⑥	05	ON	OFF	ON	OFF
⑦	06	OFF	ON	ON	OFF
⑧	07	ON	ON	ON	OFF
⑨	08	OFF	OFF	OFF	ON
⑩	09	ON	OFF	OFF	ON
⑪	10	OFF	ON	OFF	ON
⑫	11	ON	ON	OFF	ON
⑬	12	OFF	OFF	ON	ON
⑭	13	ON	OFF	ON	ON
⑮	14	OFF	ON	ON	ON
⑯	15	ON	ON	ON	ON



Circuit board in the control box of indoor unit.

NOTE:

Be sure to set the unit numbers sequentially.

- When different indoor unit models are connected using the group control system, some functions may no longer be available.
- It should not be connected to any other Gr that is not of the same series.

9. 2. Fan delay setting

This setting can be used when the auxiliary heater is mounted.
When the operation is stopped when the indoor unit is operating with an auxiliary heater, the operation continues 1 minutes.
Refer to “8.5. Jumper wire setting” to change the settings.

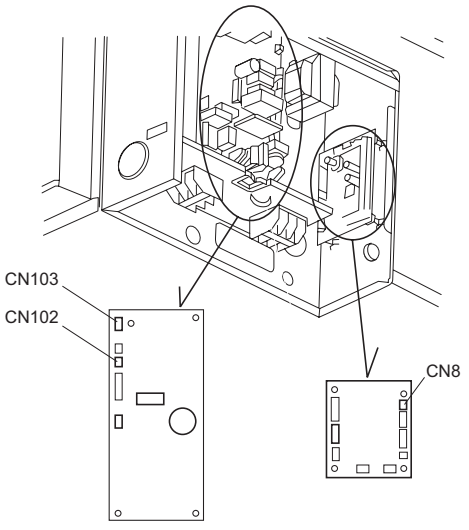
10. OPTIONAL PARTS

⚠ WARNING

Regulation of cable differs from each locality, refer in accordance with local rules.

This air conditioner can be connected with the following optional kits.

Option type	Connector No.
UTY-XSZX (Remote sensor unit)	CN8
UTD-ECS5A (External input)	CN102
UTD-ECS5A (External output)	CN103



Remote sensor

- Remove the existing connector and replace it with the remote sensor connector (ensure that the correct connector is used).
- The original connector should be insulated to ensure that it does not come into contact with other electrical circuitry.

Setting for room temperature correction
When a remote sensor is connected, set the function setting of indoor unit as indicated below.

- Set Function Number “30” (Room temperature control for cooling) to “01”
- Set Function Number “31” (Room temperature control for heating) to “01”

11. CHECK LIST

Pay special attention to the check items below when installing the indoor unit(s). After installation is complete, be sure to check the following check items again.

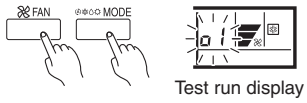
Check items	Check box
Has the indoor unit been installed correctly?	
Has there been a check for gas leaks (refrigerant pipes)?	
Has heat insulation work been completed?	
Does water drain easily from the indoor units?	
Is the voltage of the power source the same as that indicated on the label on the indoor unit?	
Are the wires and pipes all connected completely?	
Is the indoor unit grounded?	
Is the connection cable the specified thickness?	
Are the inlets and outlets free of any obstacles?	
After installation is completed, has the proper operation and handling been explained to the user?	
Operate the unit according to the operating manual provided, and check that it is operating normally.	

12. 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 MODE button and the FAN button simultaneously for 2 seconds or more to start the test run.



Test run display

(3) Press the START/STOP button to stop the test run.
If "C0" appears in the unit number display, there is a remote controller error. Refer to the installation manual included with the remote controller.

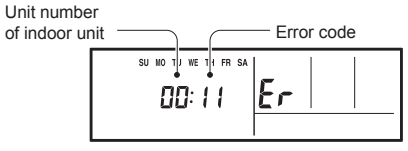
Unit number	Error code	Content
C0	15	Incompatible indoor unit is connected
C0	12	Indoor unit ↔ remote controller communication error

13. CUSTOMER GUIDANCE

Explain the following to the customer in accordance with the operating manual:
(1) Starting and stopping method, operation switching, temperature adjustment, timer, air flow switching, and other remote controller operations.
(2) Cleaning and maintenance of the product, and other items such as air filters and air louvers if applicable.
(3) Give the operating and installation manuals to the customer.

14. ERROR CODES

[SELF-DIAGNOSIS]
If an error occurs, the following display will be shown. ("Er" will appear in the set room temperature display.)



EX. Self-diagnosis

If you use a wired type remote controller, error codes will appear on the remote controller display. If you use a wireless remote controller, the lamps on the IR receiver unit will output error codes by way of blinking patterns. See the lamp blinking patterns and error codes in the table below. An error display is displayed only during operation.

Error display			Wired remote controller Error code	Description
OPERATION lamp (green)	TIMER lamp (orange)	ECONOMY lamp (green)		
●(1)	●(1)	◇	11	Serial communication error
●(1)	●(2)	◇	12	Wired remote controller communication error
●(1)	●(5)	◇	15	Check run unfinished
●(2)	●(1)	◇	21	Unit number or Refrigerant circuit address setting error [Simultaneous Multi]
●(2)	●(2)	◇	22	Indoor unit capacity error
●(2)	●(3)	◇	23	Combination error
●(2)	●(4)	◇	24	• Connection unit number error (indoor secondary unit) [Simultaneous Multi] • Connection unit number error (indoor unit or branch unit) [Flexible Multi]
●(2)	●(7)	◇	27	Primary unit, secondary unit setup error [Simultaneous Multi]
●(3)	●(1)	◇	31	Power supply interruption error
●(3)	●(2)	◇	32	Indoor unit PCB model information error
●(3)	●(5)	◇	35	Manual auto switch error
●(4)	●(1)	◇	41	Room temp. sensor error
●(4)	●(2)	◇	42	Indoor unit Heat Ex. Middle temp. sensor error
●(5)	●(1)	◇	51	Indoor unit fan motor error
●(5)	●(3)	◇	53	Drain pump error
●(5)	●(7)	◇	57	Damper error
●(5)	●(15)	◇	5U	Indoor unit error
●(6)	●(2)	◇	62	Outdoor unit main PCB model information error or communication error
●(6)	●(3)	◇	63	Inverter error
●(6)	●(4)	◇	64	Active filter error, PFC circuit error
●(6)	●(5)	◇	65	Trip terminal L error
●(6)	●(10)	◇	6A	Display PCB microcomputers communication error
●(7)	●(1)	◇	71	Discharge temp. sensor error
●(7)	●(2)	◇	72	Compressor temp. sensor error
●(7)	●(3)	◇	73	Outdoor unit Heat Ex. liquid temp. sensor error
●(7)	●(4)	◇	74	Outdoor temp. sensor error
●(7)	●(5)	◇	75	Suction Gas temp. sensor error
●(7)	●(6)	◇	76	• 2-way valve temp. sensor error • 3-way valve temp. sensor error
●(7)	●(7)	◇	77	Heat sink temp. sensor error
●(8)	●(2)	◇	82	• Sub-cool Heat Ex. gas inlet temp. sensor error • Sub-cool Heat Ex. gas outlet temp. sensor error
●(8)	●(3)	◇	83	Liquid pipe temp. sensor error
●(8)	●(4)	◇	84	Current sensor error
●(8)	●(6)	◇	86	• Discharge pressure sensor error • Suction pressure sensor error • High pressure switch error
●(9)	●(4)	◇	94	Trip detection
●(9)	●(5)	◇	95	Compressor rotor position detection error (permanent stop)
●(9)	●(7)	◇	97	Outdoor unit fan motor 1 error
●(9)	●(8)	◇	98	Outdoor unit fan motor 2 error
●(9)	●(9)	◇	99	4-way valve error
●(9)	●(10)	◇	9A	Coil (expansion valve) error
●(10)	●(1)	◇	A1	Discharge temp. error
●(10)	●(3)	◇	A3	Compressor temp. error
●(10)	●(4)	◇	A4	High pressure error
●(10)	●(5)	◇	A5	Low pressure error
●(13)	●(2)	◇	J2	Branch boxes error [Flexible Multi]

Display mode ● : 0.5s ON / 0.5s OFF
◇ : 0.1s ON / 0.1s OFF
( ) : Number of flashing