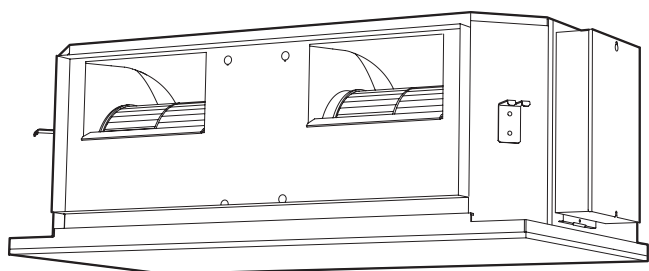


AIR CONDITIONER



INSTALLATION MANUAL

Indoor Unit (Duct type)
For authorized service personnel only.

English

INSTALLATIONSANLEITUNG

Innengerät (Für Luftkanalsysteme)
Nur für autorisiertes Fachpersonal.

Deutsch

MANUEL D'INSTALLATION

Unité intérieure (Type conduit)
Pour le personnel de service agréé uniquement.

Français

MANUAL DE INSTALACIÓN

Unidad interior (Tipo ducto)
Únicamente para personal de servicio autorizado.

Español

MANUALE D'INSTALLAZIONE

Unità interna (Tipo di condotto)
A uso esclusivo del personale tecnico autorizzato.

Italiano

ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ

Εσωτερική μονάδα (Τύπος αγωγού)
Μόνο για εξουσιοδοτημένο τεχνικό προσωπικό.

Ελληνικά

MANUAL DE INSTALAÇÃO

Unidade interior (Tipo conduta)
Somente para o pessoal do serviço técnico autorizado.

Português

РУКОВОДСТВО ПО УСТАНОВКЕ

Внутренний модуль (Канального типа)
Только для авторизованного обслуживающего персонала.

Русский

KURULUM KILAVUZU

İç Ünite (Kanal tipi)
Yalnızca yetkili servis personeli için.

Türkçe

[Original instructions]



PART NO. 9379123143

INSTALLATION MANUAL

PART NO. 9379123143
Indoor Unit (Duct Type)


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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.	
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.	
To avoid danger of suffocation, keep the plastic bag or thin film used as the packaging material away from young children.	

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.
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.
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.

2. ABOUT THIS PRODUCT

2.1. Precautions for using the 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 leakage, make sure that it does not exceed the concentration limit. If a refrigerant leakage 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 leakage 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 tool for R410A refrigerant

WARNING

- To install a unit that uses the R410A refrigerant, use dedicated tools and piping materials that have been manufactured specifically for R410A use. Because the pressure of the 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.






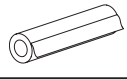





Tool name	Contents of change
Gauge manifold	<ul style="list-style-type: none"> • Pressure is huge and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended to use a gauge manifold with a high pressure display range -0.1 to 5.3 MPa and a low pressure display range -0.1 to 3.8 MPa.
Charging hose	<ul style="list-style-type: none"> • To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	<ul style="list-style-type: none"> • A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	<ul style="list-style-type: none"> • Special gas leakage detector for HFC refrigerant R410A.

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 to fall, 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.

Do not discard any accessories needed for installation until the installation work has been completed.

Name and Shape	Q'ty	Application
Installation Manual (Indoor unit) 	1	(This manual)
Operating Manual (Indoor unit) 	1	
Operating Manual (CD-ROM) 	1	
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 (Small) 	1	For fixing the remote controller cable
Remote controller 	1	
Screw (M4 × 16) 	2	For installing indoor unit remote controller
Remote controller cable 	1	For connecting the remote controller

2.4. Optional parts

Parts name	Model No.	Application
Simple remote controller	UTY-RSN*M	For air conditioner operation
Wired remote controller	UTY-RNN*M	For air conditioner operation (3-wire type)
Remote sensor unit	UTY-XSZX	Room temperature sensor
External connect kit	UTD-ECS5A	For control input/output port
Long life filter	UTD-LF60KA	

3. GENERAL SPECIFICATION

3.1. 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 sulfur, 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 discolored 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

3.2. Pipe requirement

⚠ 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	9.52 (3/8)
	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).

3.3. Electrical requirement

The indoor unit is powered from the outdoor unit. Do not power indoor unit from separate power source.

⚠ WARNING

Standard for electrical wiring and equipment differs in each country or region. Before you start electrical working, confirm related regulations, codes, or standards.

Cable	Conductor size (mm ²)	Type	Remarks
Connection cable	1.5 (MIN.)	Type 60245 IEC57	3Wire+Earth (Ground), 1φ 230V

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

Cable	Conductor size (mm ²)	Type	Remarks
Remote controller cable (3-wire type)	0.33	Use sheathed PVC cable. (Accessories)	Polar 3-wired

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 sulfuric 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 fibers 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, connection 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.

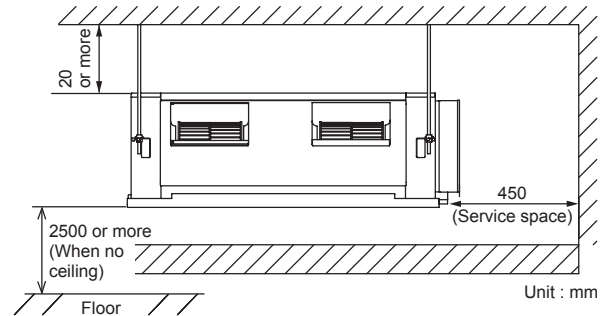
If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

- (1) The inlet and outlet ports should not be obstructed; the air should be able to blow all over the room.
- (2) Leave the space required to service the air conditioner.
- (3) Install the unit where connection to the outdoor unit is easy.
- (4) Install the unit where the connection pipe can be easily installed.
- (5) Install the unit where the drain pipe can be easily installed.
- (6) Install the unit where noise and vibrations are not amplified.
- (7) Take servicing, etc., into consideration and leave the spaces. Also install the unit where the filter can be removed.
- (8) 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.

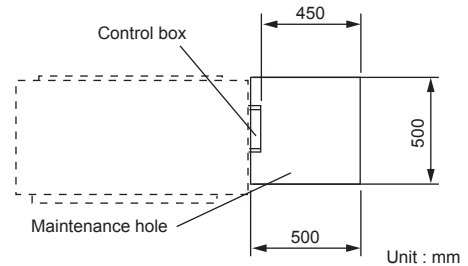
4.2. Installation dimension

Install at least 20mm from the ceiling.



(For maintenance)

- (1) Maintenance work of the control box is possible with the maintenance hole of the measurement shown in the figure.
- (2) If maintenance work is to be done from the bottom side, the maintenance hole needs to be larger than the outside dimension of the indoor unit.
- (3) If maintenance work is to be done from the top, keep the space of the more than 500 mm between the indoor unit and ceiling.



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. The unit takes in air from the fan side, and expels it from the evaporator side.

Check that duct work does not exceed the range of external static pressure of equipment.

Make sure to insulate ducts to avoid the dew condensation.

Make sure to insulate between ducts and walls if metal ducts are used.

Please explain handling and washing methods of locally purchased materials to the customer.

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.

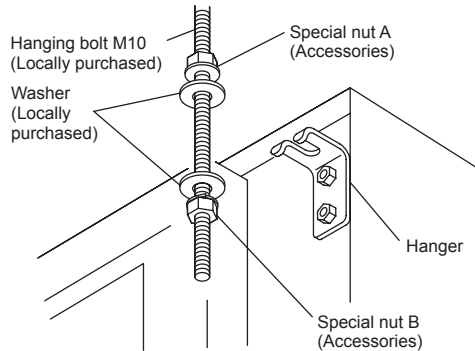
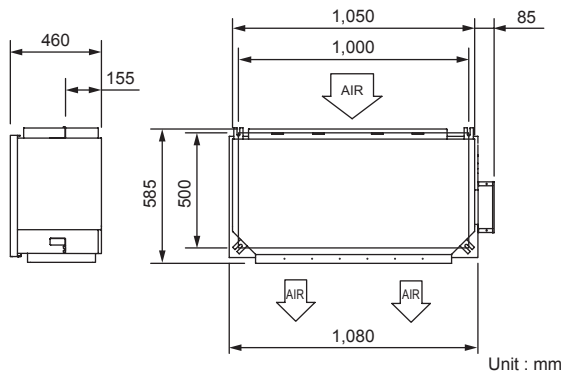
When connecting the duct to the outlet port of the indoor unit, be sure to insulate the outlet port and the installation screws to prevent water from leaking around the port.

RECOMMENDED RANGE OF EXTERNAL STATIC PRESSURE [Pa]

100 - 250

4.3.1. Installing the hangers

Hanging bolt installation diagram

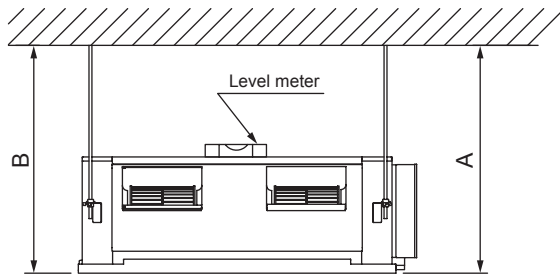


CAUTION

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

4.3.2. Leveling

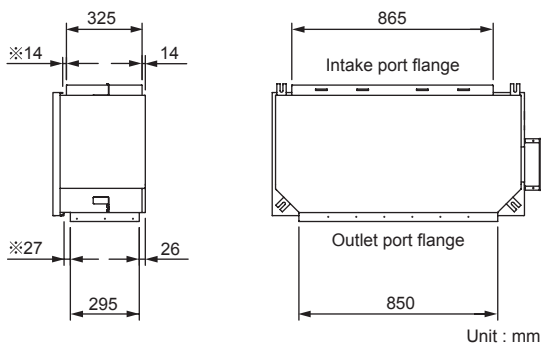
Use the procedure in the following figure to adjust the levelness.



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 20mm.

4.3.3. Mounting the duct

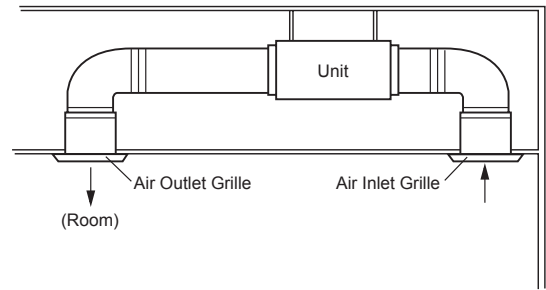
Follow the procedure in the following figure to install the ducts.



※ Spacing between flange and drain pan.

CAUTION

- 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. Grills must be installed so that man cannot touch unit fan, and cannot be removed by only hand operation with tool.



- 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.

4.4. Installing the drain hose

CAUTION

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

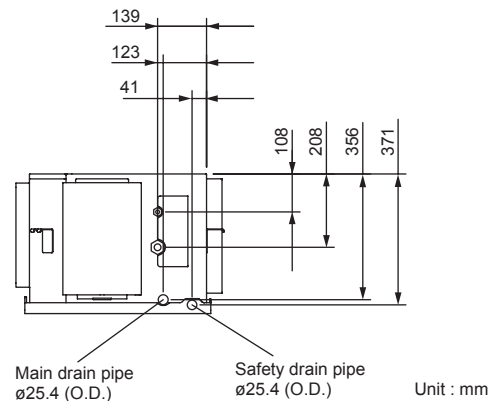
Be sure to properly insulate the drain hose so that the water will not drip from the connected parts.

The position of the installed drain hose should have a downward gradient of 1/100 or more.

Do not connect the drain hose in which ammonia or other types of gas affecting the unit is generated. Heat exchange erosion may occur.

To prevent excessive force on drain hose, avoid bends or twists. (To bend or twist may cause water leaks.)

Install the drain pipes according to the measurements given in the following figure. Flange positions for connecting the drain pipes.



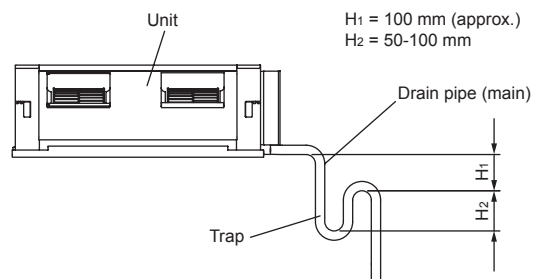
CAUTION

- This UNIT has drain ports in two locations. Follow the procedure in the figure to connect drain pipes to each of them.
- 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.

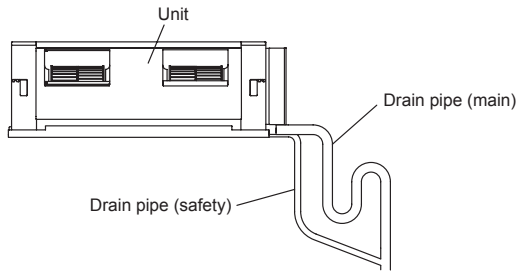
(1) Main drain pipe

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



(2) 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.

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 so 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 brazing the pipes, be sure to blow dry nitrogen gas through them.

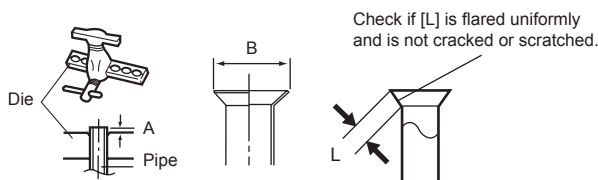
5.1. Flare connection (Pipe connection)

⚠ WARNING

- 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.

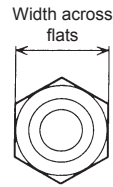
5.1.1. Flaring

- 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 _{0.4} [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

5.1.2. 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.
- If the pipe is bent repeatedly at the same place, it will break.

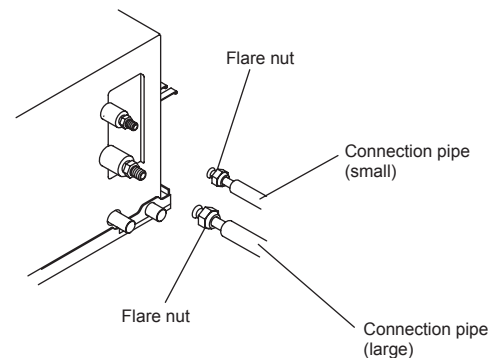
5.1.3. Pipe connection

⚠ CAUTION

- Be sure to install the pipe against the port on the indoor unit correctly. If the centering is improper, the flare nut cannot tighten 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.

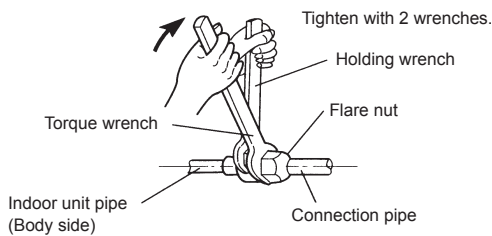
(2) Centering the pipe against port on the indoor unit, turn the flare nut with your hand.



(3) When the flare nut is tightened properly by your hand, hold the body side coupling with a separate spanner, then tighten with a torque wrench. (See the table below for the flare nut tightening torques.)

⚠ CAUTION

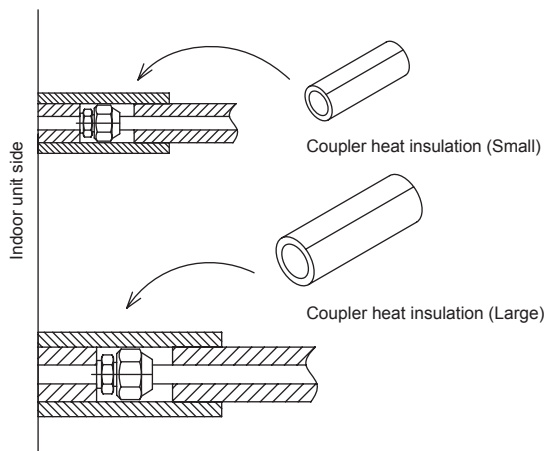
- Hold the torque wrench at its grip, keeping it at a right angle with the pipe, in order to tighten the flare nut correctly.
- Tighten the flare nuts with a torque wrench using the specified tightening method. Otherwise, the flare nuts could break after a prolonged period, causing refrigerant to leak and generate a hazardous gas if the refrigerant comes into contact with a flame.
- Connect the piping so that the control box cover can easily be removed for servicing when necessary.
- In order to prevent water from leaking into the control box, make sure that the piping is well insulated.



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)

5.2. Installing heat insulation

After checking for gas leaks, insulate by wrapping insulation around the two parts (Gas and Liquid) of the indoor unit coupling, using the coupler heat insulation. After installing the coupler heat insulation, wrap both ends with vinyl tape so that there is no gap. Secure both ends of the heat insulation material using nylon fasteners.



⚠ 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.

Once the pressure checking has been completed using nitrogen, please refer to the outdoor unit installation manual to complete the evacuation process.

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.

• 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.

• 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.

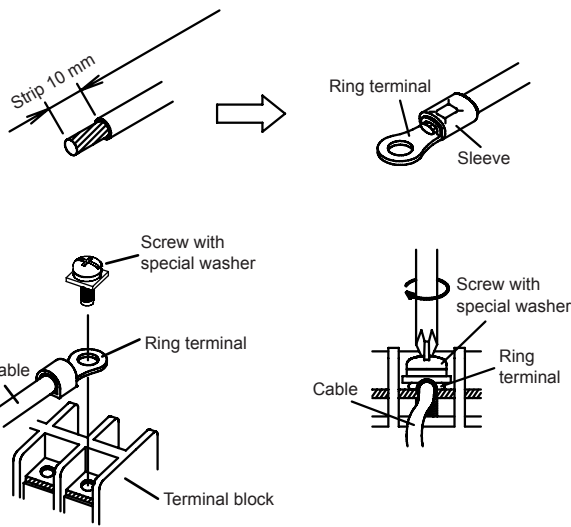
⚠ WARNING

- Install sleeves into any holes made in the walls for wiring. Otherwise, a short circuit could result.
- 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.
- 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 block numbers and connection cable colors 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.)
- Install a earth leakage breaker. In addition, install the earth leakage breaker so that the entire AC main power supply is cut off at the same time. Otherwise, electric shock or fire could result.
- Always connect the earth (ground) cable.
Improper earthing (grounding) work can cause electric shocks.
- Install the remote controller 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

- Earth (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 connection or remote controller terminals, as this will damage the product.
- Never bundle the power supply cable and connection cable, remote controller cable together.
Separate these cable by 50 mm or more.
Bundling these cables together will cause miss operation or breakdown.
- 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.

- (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 cables using an appropriate tool so that the cables do not come loose.
- (3) Use the specified cables, 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 for the terminal screw tightening torques.
- (7) Please do not fix 2 power supply cables with 1 screw.



⚠ WARNING

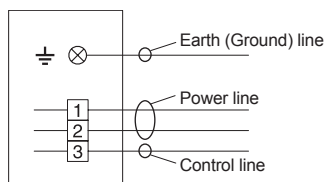
- Use ring terminals and tighten the terminal screws to the specified torques, otherwise, abnormal overheating may be produced and possibly cause heavy damage inside the unit.

Tightening torque [N·m (kgf·cm)]

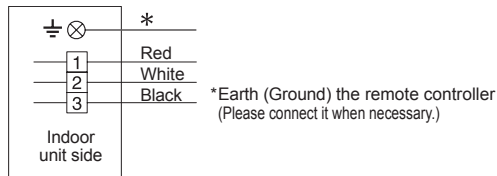
M4 screw	1.2 to 1.8 (12 to 18)
M5 screw	2.0 to 3.0 (20 to 30)

6.1. Wiring system diagram

- Connection cable (to outdoor unit)



- Wired remote controller cable



⚠ CAUTION

Tighten the indoor unit connection cable and power supply indoor and outdoor unit, terminal board connections firmly with the terminal board screws. Faulty connection may cause a fire.

If the indoor unit connection cable and power supply are wired incorrectly, the air conditioner may be damaged.

Connect the indoor unit connection cable by matching the numbers of the outdoor and indoor units terminal board numbers as shown in terminal label.

Earth (Ground) both the indoor and outdoor units by attaching an earth (ground) cable.

Unit shall be grounded in compliance with the country or region's regulations.

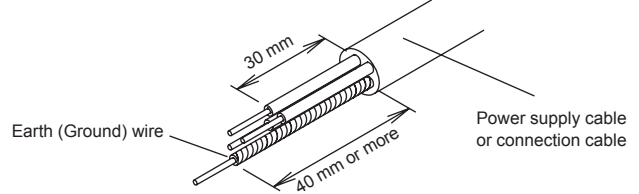
⚠ CAUTION

Be sure to refer to the above diagram for do correct field wiring. Wrong wiring causes malfunction of the unit.

Check local electrical rules and also any specific wiring instructions or limitation.

6.2. Connection cable preparation

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



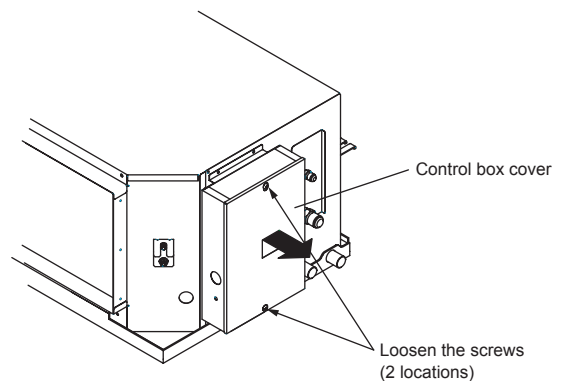
- Use a 4-core wire cable.

6.3. Connection of wiring

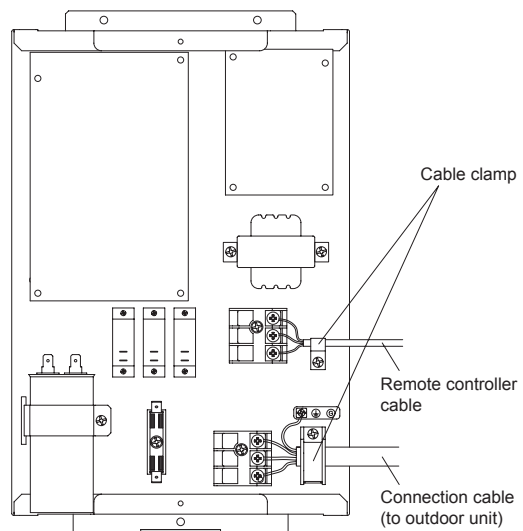
⚠ CAUTION

- Use care 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.

- Remove the control box cover and install each connection wire.



- After wiring is complete, secure the remote controller cable, connection cable, and power supply cable with the cable clamps.
- Install the control box cover.



⚠ 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.

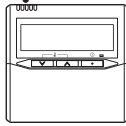
7. REMOTE CONTROLLER SETTING

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 located properly, the correct room temperature will not be detected, and thus abnormal conditions like "not cooled" or "not heated" will occur even if the air-conditioner is running normally.

- Locate where an average temperature for the room being air conditioned will be sensed.
- Do not locate directly exposed to the outlet air from the air-conditioner.
- Locate out of direct sunlight.
- Locate away from the influence of other heat sources.

Temperature sensor



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

Do not wire the remote controller cable together with or parallel to the connection cables, and power supply cable of the INDOOR UNIT and OUTDOOR UNIT. It may cause erroneous operation.

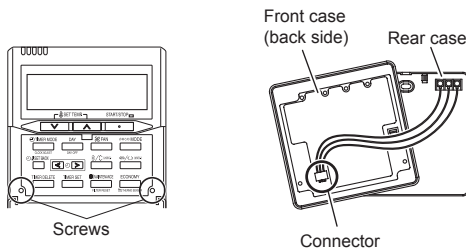
When installing the bus wire near a source of electromagnetic waves, use shielded wire.

Do not set the DIP switches, either on the air conditioner or the remote controller, in any way other than indicated in this manual that is supplied with the air conditioner. Doing so may result in improper operation.

7.1. Installing the remote controller

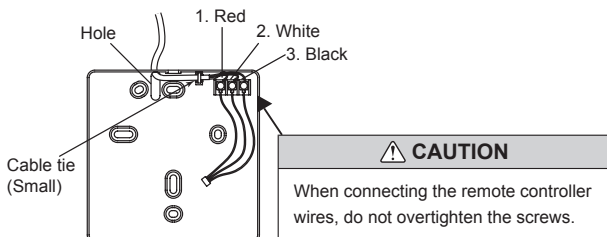
Open the operation panel on the front of the remote controller, remove the 2 screws indicated in the following figure, and then remove the front case of the remote controller.

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.

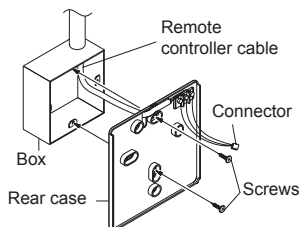


When remote controller cable is concealed

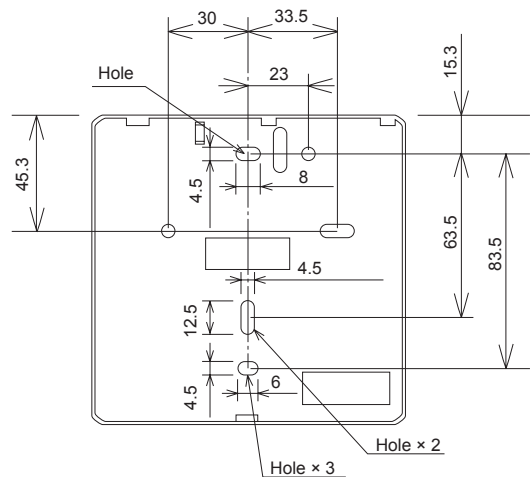
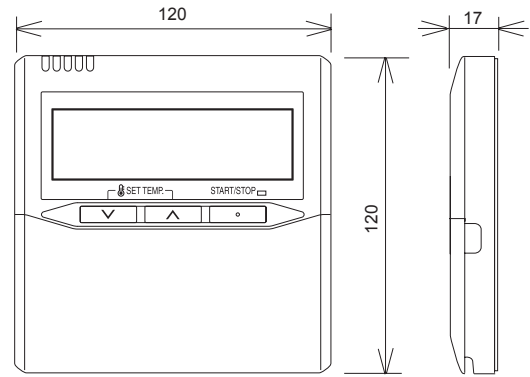
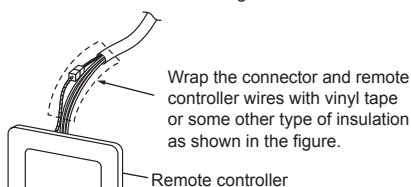
- (1) Conceal the remote controller cable.
- (2) Pass the remote controller cable through the hole in the rear case and connect the remote controller cable to the remote controller terminal board specified in figure.
- (3) Clamp the remote controller cable sheath with the cable tie as shown in figure.
- (4) Cut off the excess cable tie.
- (5) Install the rear case to the wall, box, etc., with 2 screws figure.



[Example]



Ground the remote controller if it has a ground wire.



Unit: mm

CAUTION

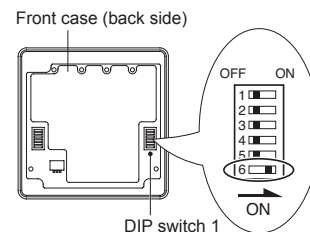
Install the remote controller wires so as not to be direct touched with your hands.

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

7.2. Setting the dip switches

Set the remote controller DIP switches.

[Example]



NO.	SW state		Detail
	OFF	ON	
1	★		Cannot be used. (Do not change)
2	★		Dual remote controller setting * Refer to 8.4. Dual remote controllers
3	★		Cannot be used. (Do not change)
4	★		Cannot be used. (Do not change)
5	★		Cannot be used. (Do not change)
6	★ Invalidity	Validity	Memory backup setting * Set to ON to use batteries for the memory backup. If batteries are not used, all of the settings stored in memory will be deleted if there is a power failure.

(★ Factory setting)

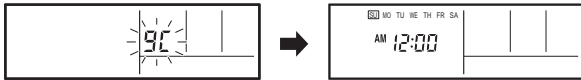
8. FUNCTION SETTING

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

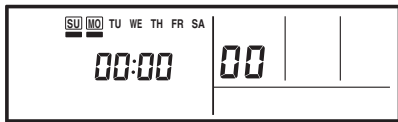
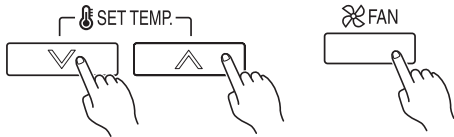
- (1) Check the remote controller wiring and DIP switch settings.
- (2) Install the front case.
When installing the front case, connect the connector to the front case.
- (3) Check the indoor and outdoor unit wiring and circuit board switch settings, and then turn on the indoor and outdoor units. After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



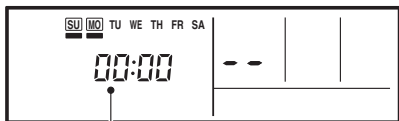
8.2. Function setting

This procedure changes the function settings used to control the indoor unit according to the installation conditions. Incorrect settings can cause the indoor unit to malfunction. This procedure should be performed by authorized installation or service personnel only. Perform the "FUNCTION SETTING" according to the installation conditions using the remote controller. (Refer to the indoor unit installation manual for details on the function numbers and setting values.)

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

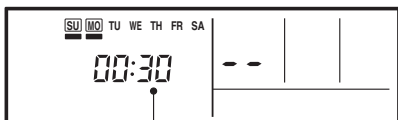
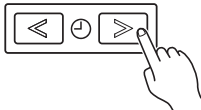


- (2) Press the SET BACK button to select the indoor unit number.



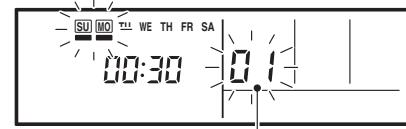
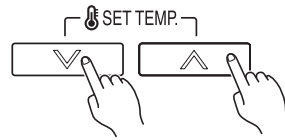
Unit number of INDOOR UNIT

- (3) Press the SET TIME (<) (>) buttons to select the function number.



Function number

- (4) Press the SET TEMP. buttons (V) (Λ) to select the setting value.
The display flashes as shown to the right during setting value selection.



Setting value

- (5) 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.)
- (6) Repeat steps 2 to 5 to perform additional settings.
Press the SET TEMP. buttons (V) (Λ) 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 canceled after 1 minute if no operation is performed.
- (7) 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.

• Function Details

(1) Filter sign

The indoor unit has a sign to inform the user that it is time to clean the filter. Select the time setting for the filter sign display interval in the table below according to the amount of dust or debris in the room. If you do not wish the filter sign to be displayed, select the setting value for "No indication".

(♦... Factory setting)

Function Number	Setting Value	Setting Description
11	00	Standard (2500 hours)
	01	Long interval (5000 hours)
	02	Short interval (1250 hours)
	03	No indication ♦

(2) Cooling room temperature correction

Depending on the installed environment, the room temperature sensor may require a correction.

The settings may be selected as shown in the table below.

(♦... Factory setting)

Function Number	Setting Value	Setting Description
30	00	Standard ♦
	01	Warmer control
	02	Slightly lower control
	03	Lower control

(3) Heating room temperature correction

Depending on the installed environment, the room temperature sensor may require a correction.

The settings may be changed as shown in the table below.

(♦... Factory setting)

Function Number	Setting Value	Setting Description
31	00	Standard ♦
	01	Warmer control
	02	Slightly warmer control
	03	Lower control

(4) Auto restart

Enable or disable automatic system restart after a power outage.

(◀... Factory setting)

Function Number	Setting Value	Setting Description
40	00	Yes
	01	No

* Auto restart is an emergency function such as for power failure etc. Do not start and stop the indoor unit by this function in normal operation. Be sure to operate by the control unit, or external input device.

(5) Indoor room temperature sensor switching function

(Only for Wired remote controller)

The following settings are needed when using the Wired remote controller temperature sensor.

(◀... Factory setting)

Function Number	Setting Value	Setting Description
42	00	No
	01	Yes

* If setting value is "00" :

Room temperature is controlled by the indoor unit temperature sensor.

* If setting value is "01" :

Room temperature is controlled by either indoor unit temperature sensor or remote controller unit sensor.

(6) External input control

"Operation/Stop" mode or "Forced stop" mode can be selected.

(◀... Factory setting)

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

(7) Room temperature control switching

* This setting is used to set the room temperature control method when the wired remote controller is selected by the Indoor Room Temperature Sensor Switching Function.

(◀... Factory setting)

Function Number	Setting Value	Setting Description
48	00	Control by the sensors of both the indoor unit and the wired remote controller.
	01	Control only by the sensor of the wired remote controller

(8) Indoor unit fan control for energy saving for cooling

Enables or disables the power-saving function by controlling the indoor unit fan rotation when the outdoor unit is stopped during cooling operation.

(◀... Factory setting)

Function Number	Setting Value	Setting Description
49	00	Disable
	01	Enable
	02	Remote controller

00: When the outdoor unit is stopped, the indoor unit fan operates continuously following the setting on the remote controller.

01: When the outdoor unit is stopped, the indoor unit fan operates intermittently at a very low speed.

02: Enable or disable this function by remote controller setting.

* As the factory setting, this setting is initially activated.

* When connecting VRF system using network converter, this setting must be set to "00" or "01".

Setting record

Record any changes to the settings in the following table.

Setting	Setting Value
(1) Filter sign	
(2) Cooling room temperature correction	
(3) Heating room temperature correction	
(4) Auto restart	
(5) Indoor room temperature sensor switching function	
(6) External input control	
(7) Room temperature control switching	
(8) Indoor unit fan control for energy saving for cooling	

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

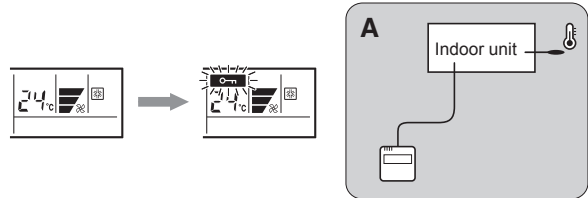
SETTING THE ROOM TEMPERATURE DETECTION LOCATION

The detection location of the room temperature can be selected from the following 2 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.

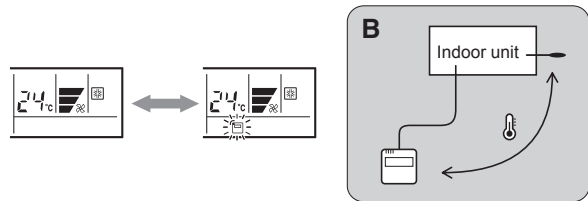


B. Indoor unit/remote controller setting (room temperature sensor selection)

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

(1) Enable the room temperature sensor selection in FUNCTION SETTING, which will be "(5) Indoor room temperature sensor switching function".

(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

① When select 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.

② 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.

③ 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.

NOTES

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

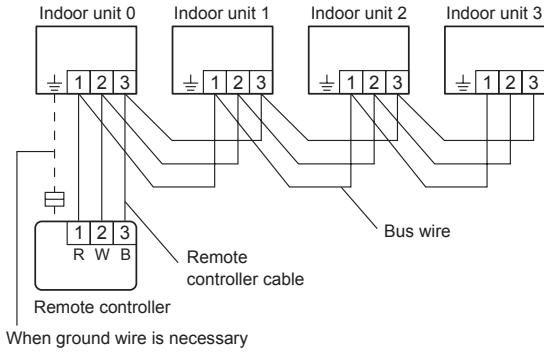
8.3. Group control system

⚠ CAUTION

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

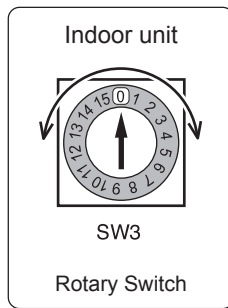
A number of indoor units can be operated at the same time using a single remote controller.

(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.



NOTE

Be sure to set the unit numbers sequentially.

(3) Remote controller setting

1. Turn on all of the indoor units.
 - * Turn on the indoor unit with the unit number 00 last. (Within 1 minute)
2. Set the refrigerant circuit address. (Assign the same number to all of the indoor units connected to an outdoor unit.)

Refrigerant circuit address	Function Number	Setting Value
	02	00~15

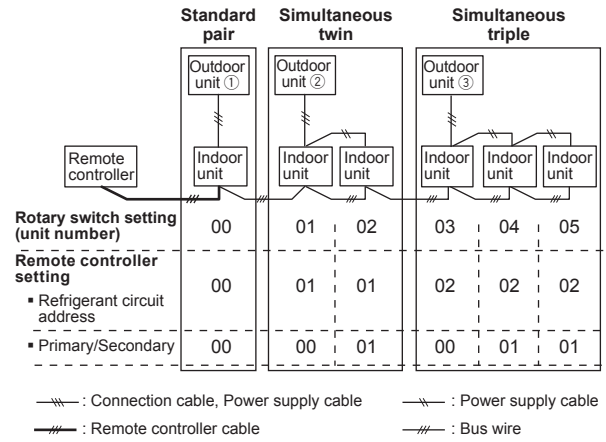
3. Set the "primary" and "secondary" settings. (Set the indoor unit that is connected to the outdoor unit using a connection cable as the "primary".)

	Function Number	Setting Value
Primary	51	00
Secondary		01

4. After completing the function settings, turn off all of the indoor units, and then turn them back on.
 - * If error code 21, 22, 24, or 27 is displayed, there may be an incorrect setting. Perform the remote controller setting again.

NOTE

- When different indoor unit models are connected using the group control system, some functions may no longer be available.
- If the group control system contains multiple units that are operated simultaneously, connect and set the units as shown below.
- Auto-changeover operates under the same mode with model unit number 00.
- It should not be connected to any other Gr that is not of the same series (A**G only).

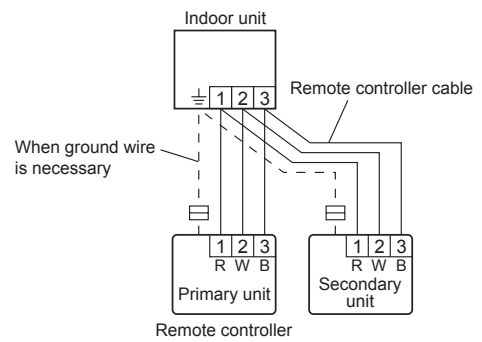


* Make sure that the indoor unit with the unit number 00 is connected to the outdoor unit using a connection cable.

8.4. Dual remote controllers

- Two separate remote controllers can be used to operate the indoor units.
- The timer and self-diagnosis functions cannot be used on the secondary units.

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



(2) Remote controller DIP switch 1 setting

Set the remote controller DIP switch 1 No. 2 according to the following table. (Refer to 7.2. Setting the dip switches)

Number of remote controllers	Primary unit	Secondary unit
	DIP SW 1 No. 2	DIP SW 1 No. 2
1 (Normal)	OFF	—
2 (Dual)	OFF	ON

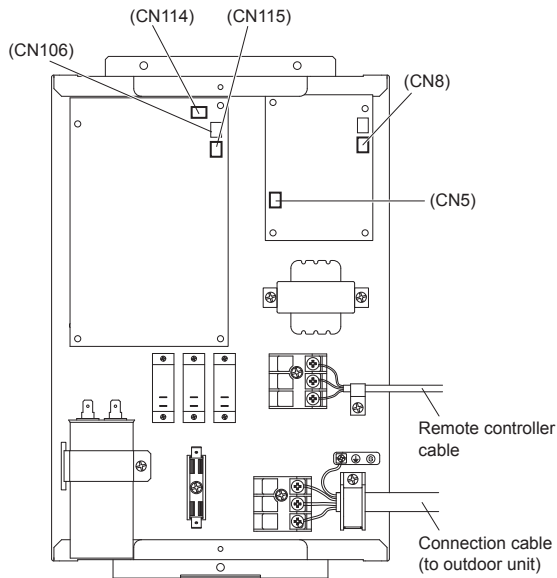
9. OPTIONAL KIT INSTALLATION (OPTION)

⚠ 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)	CN114
UTD-ECS5A (External output)	CN115
UTD-ECS5A (Preparation)	CN5, CN106



10. 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	If not performed correctly	CHECK BOX
Has the indoor unit been installed correctly?	Vibration, noise, indoor unit may drop	
Has there been a check for gas leaks (refrigerant pipes)?	No cooling, No heating	
Has heat insulation work been completed?	Water leakage	
Does water drain easily from the indoor units?	Water leakage	
Are the wires and pipes all connected completely?	No operation, heat or burn damage	
Is the connection cable the specified thickness?	No operation, heat or burn damage	
Are the inlets and outlets free of any obstacles?	No cooling, No heating	
After installation is completed, has the proper operation and handling been explained to the user?		

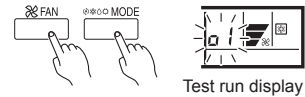
11. TEST RUN

CHECK ITEMS

- Is operation of each button on the remote controller normal?
 - Is the drain normal?
 - Is there any abnormal noise and vibration during operation?
- Do not operate the air conditioner in test run for a long time.

[OPERATION METHOD]

- For the operation method, refer to the operating manual.
- Stop the air conditioner operation.
 - Press the MODE button and the FAN button simultaneously for 2 seconds or more to start the test run.



- 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

12. CUSTOMER GUIDANCE

Explain the following to the customer in accordance with the operating manual:

- Starting and stopping method, operation switching, temperature adjustment, timer, air flow switching, and other remote controller operations.
- Air filter removal and cleaning, and how to use the air louvers.
- Give the operating and installation manuals to the customer.

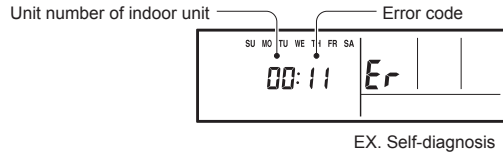
13. ERROR CODES

[Troubleshooting at the remote controller LCD]

This is possible only on the wired remote controller.

[Self-diagnosis]

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



Wired remote controller Error code	Description
11	Serial communication error
12	Wired remote controller communication error
15	Check run unfinished
21	Unit number or Refrigerant circuit address setting error [Simultaneous Multi]
22	Indoor unit capacity error
23	Combination error
24	<ul style="list-style-type: none"> • Connection unit number error (indoor secondary unit) [Simultaneous Multi] • Connection unit number error (indoor unit or branch unit) [Flexible Multi]
27	Primary unit, secondary unit set-up error [Simultaneous Multi]
31	Power supply interruption error
32	Indoor unit PCB model information error
35	Manual auto switch error
41	Room temp. sensor error
42	Indoor unit Heat Ex. Middle temp. sensor error
51	Indoor unit fan motor error
53	Drain pump error
57	Damper error
5U	Indoor unit error
62	Outdoor unit main PCB model information error or communication error
63	Inverter error
64	Active filter error, PFC circuit error
65	Trip terminal L error
6A	Display PCB microcomputers communication error
71	Discharge temp. sensor error
72	Compressor temp. sensor error
73	Outdoor unit Heat Ex. liquid temp. sensor error
74	Outdoor temp. sensor error
75	Suction Gas temp. sensor error

76	<ul style="list-style-type: none"> • 2-way valve temp. sensor error • 3-way valve temp. sensor error
77	Heat sink temp. sensor error
82	<ul style="list-style-type: none"> • Sub-cool Heat Ex. gas inlet temp. sensor error • Sub-cool Heat Ex. gas outlet temp. sensor error
83	Liquid pipe temp. sensor error
84	Current sensor error
86	<ul style="list-style-type: none"> • Discharge pressure sensor error • Suction pressure sensor error • High pressure switch error
94	Trip detection
95	Compressor rotor position detection error (permanent stop)
97	Outdoor unit fan motor 1 error
98	Outdoor unit fan motor 2 error
99	4-way valve error
9A	Coil (expansion valve) error
A1	Discharge temp. error
A3	Compressor temp. error
A4	High pressure error
A5	Low pressure error
J2	Branch boxes error [Flexible Multi]

