

# AIR CONDITIONER BRANCH BOX

**CAUTION**

**R410A  
REFRIGERANT**

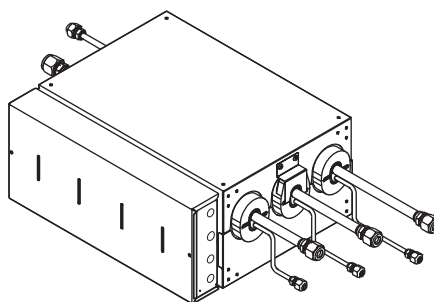
This Air Conditioner contains and operates  
with refrigerant R410A.

**THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED  
BY QUALIFIED PERSONNEL.**

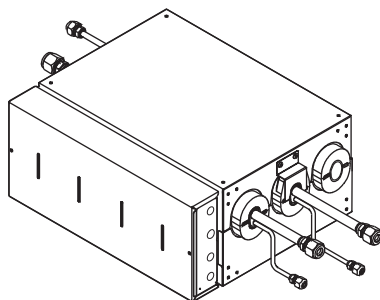
Refer to Commonwealth, State, Territory and local legislation,  
regulations, codes, installation & operation manuals, before  
the installation, maintenance and/or service of this product.

# INSTALLATION MANUAL

For authorized service personnel only.



[UTP-PY03A]



[UTP-PY02A]

English

Deutsch

Français

Español

Italiano

Ελληνικά

Português

Русский

Türkçe

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## 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

This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.
Never touch electrical components immediately after the power supply has been turned off. Electric shock may occur. After turning off the power, always wait 10 minutes or more before touching electrical components.
Request your dealer or a professional installer to install the indoor unit in accordance with this Installation Manual. An improperly installed unit can cause serious accidents such as water leakage, electric shock, or fire. If the indoor unit is installed in disregard of the instructions in the Installation 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 while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.
Installation work must be performed in accordance with national wiring standards by authorized personnel only.
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.
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.
Be sure to always use the parts accessories or the specified parts for installation. Failure to use the specified parts may cause the equipment to fail, water leakage, electric shock or fire.
Install the equipment in a location that is out of reach of children.
During installation and relocation of air conditioner, do not allow air or any substances other than the specified refrigerant (R410A) to enter the refrigerant cycle. Air or any other substances entered in the refrigerant cycle may cause abnormally high pressure in the refrigerant cycle, which could result in explosion or personal injury. For additional information, refer to the R410A MSDS.
Be sure to check that there are no refrigerant leaks after installation is completed. If there is refrigerant gas leak indoors and comes into contact with an open flame from such sources as a fan heater, Bunsen burner, or stove, it can generate toxic fumes.

### CAUTION

This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.
Read carefully all security information before use or install the air conditioner.
Do not attempt to install the air conditioner or a part of the air conditioner by yourself.
This unit must be installed by qualified personnel with a capacity certificate for handling refrigerant fluids. Refer to regulation and laws in use on installation place.
The installation must be carried out in compliance with regulations in force in the place of installation and the installation instructions of the manufacturer.
This unit is part of a set constituting an air conditioner. It must not be installed alone or with non-authorized 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 3mm for this unit.
The unit must be correctly grounded and the supply line must be equipped with a differential breaker in order to protect the persons.
The units are not explosion proof and therefore should not be installed in explosive atmosphere.
Do not turn on the power until all installation work is complete.
Never touch electrical components immediately after the power supply has been turned off. Electric shock may occur. After turning off the power, always wait 5 minutes before touching electrical components.
This unit contains no user-serviceable parts. Always consult authorized service personnel to repairs.
When moving, consult authorized service personnel for disconnection and installation of the unit.
Children should be monitored to ensure they do not play with the device.
This product is not intended to be used by people (including children) with physical, sensory or mental disability, or persons lacking experience or knowledge unless they have been given by the through a person responsible for their safety, supervision or instruction concerning the use of the device.
Do not install in a location where there is risk of leaking flammable gas. In the event that a gas leak should occur, gas build up around the equipment can cause fire.
It is not necessary to provide drainage for Branch box.
This equipment is for indoor use only.
Secure the flare nuts according to the specified method such as using a torque wrench. Over-tightening the flare nuts can result in cracking or breaking after a long period of time, and thus cause a refrigerant leak.

## 2. ABOUT THE UNIT




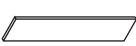
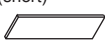


### 2.1. Precautions for using R410A refrigerant




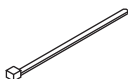



The basic installation work procedures are the same as conventional refrigerant models. However, pay careful attention to the following points:
1 Since the working pressure is 1.6 times higher than that of conventional refrigerant (R22) models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant (R22) model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.
2 Be careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.

### 2.2. Special tools for R410A

Tool name	Contents of change
Gauge manifold	Pressure is high and cannot be measured with a conventional (R22) gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with seals -0.1 to 5.3 MPa for high pressure. -0.1 to 3.8 MPa for low pressure.
Charge hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

### 2.3. Accessories

Name and shape	Q'ty	Application
Installation Manual 	1	This manual
Coupler heat insulation (large) 	[PY03A] 4 [PY02A] 3	For indoor and outdoor side pipe joint (gas pipe)
Coupler heat insulation (small) 	[PY03A] 4 [PY02A] 3	For indoor and outdoor side pipe joint (liquid pipe)
Insulation (long) 	[PY03A] 3 [PY02A] 2	For use on the section where the insulation fits onto this equipment (indoor unit side)
Insulation (short) 	3	For use on the section where the insulation fits onto this equipment (outdoor unit side)
Insulation 	[PY03A] 3 [PY02A] 2	To be used with this equipment's (indoor unit side) piping
Hanger 	4	For suspending the Branch box from ceiling

Name and shape	Q'ty	Application
Washer 	8	For suspending the Branch box from ceiling
Tapping screw (Ø 4×10) 	8	For installing the Hanger
Tapping screw (Ø 4×25) 	8	For installing the Branch box on the wall
Binder 	1	For remote controller cable binding
Seal 	1	To prevent small animals from entering inside
Adapter 12.7 → 9.52 	[PY03A] 3 [PY02A] 2	For indoor unit connection
Adapter 12.7 → 15.88 	2	For indoor unit connection

English

### 3. SYSTEM CONFIGURATION

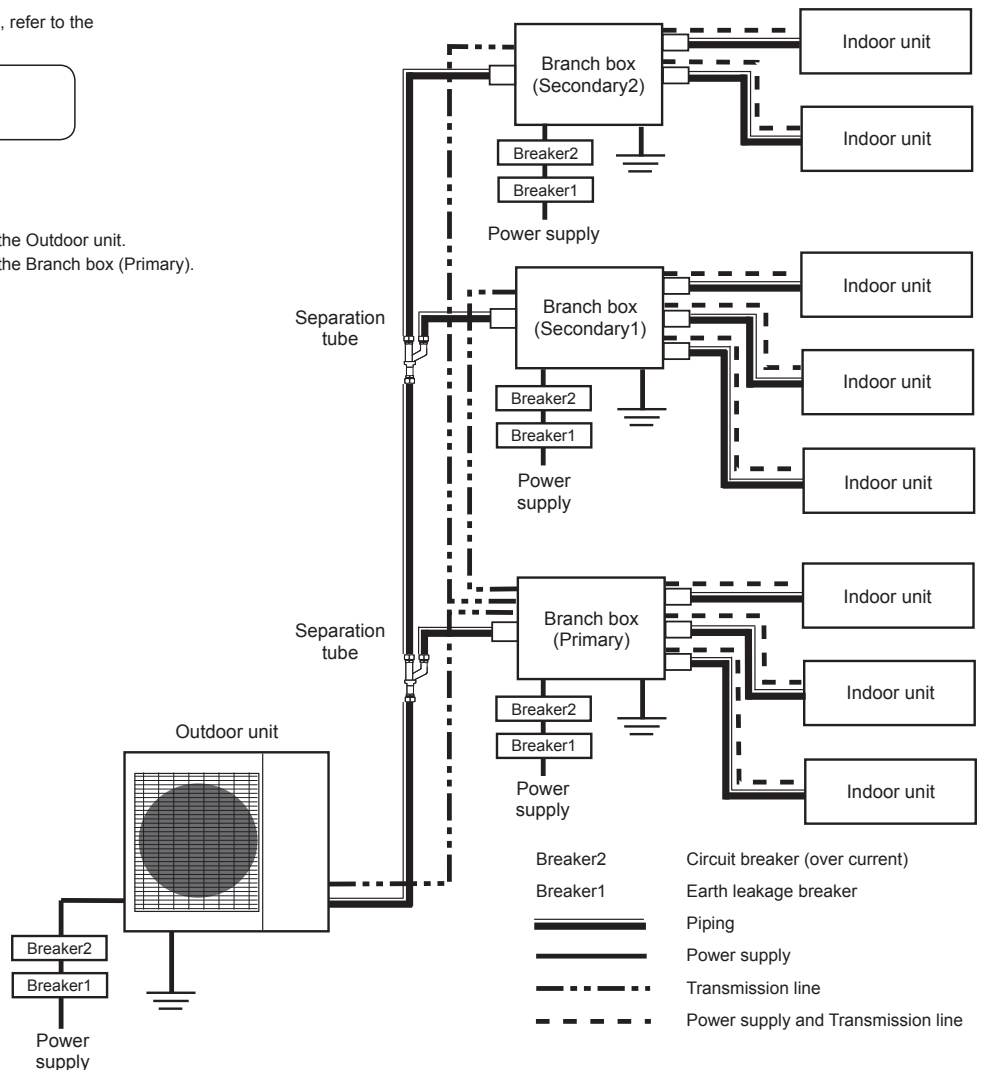
For the installation method of indoor and outdoor units, refer to the installation manuals that come with them.

Branch box  
3 branches type : UTP-PY03A  
2 branches type : UTP-PY02A

2 to 8 indoor units can be connected.

#### <Wiring rules>

Primary unit : Branch box that is connected to the Outdoor unit.  
Secondary unit : Branch box that is connected to the Branch box (Primary).



## 4. INSTALLATION WORK

### 4.1. Selecting an installation location

#### ⚠ CAUTION

Do not install the Branch box in the following areas:

- Area with high salt content, such as at the seaside. It will deteriorate metal parts, causing the parts to fail 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 fail 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 containing equipment that generates electromagnetic interference. It will cause the control system to malfunction, preventing the unit from operating normally.
- 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 small animals may live. It may cause failure, smoke or fire if small animals enter and touch internal electrical parts.
- Area where animals may urinate on the unit or ammonia may be generated.

When installing the unit in a location such as above the ceiling or on the wall, follow the conditions below.

- Install the branch box in a location that has strong support and no vibrations.
- Install in a location that has enough space for branch box installation.
- Install in a well-ventilated area.
- Install in a location that is not exposed to high temperatures or humidity over a long periods.
- **Do not install the unit near a bedroom. Refrigerant noise may be heard from the piping.**
- Refer to "4.2 Installation dimensions" for installation restrictions.

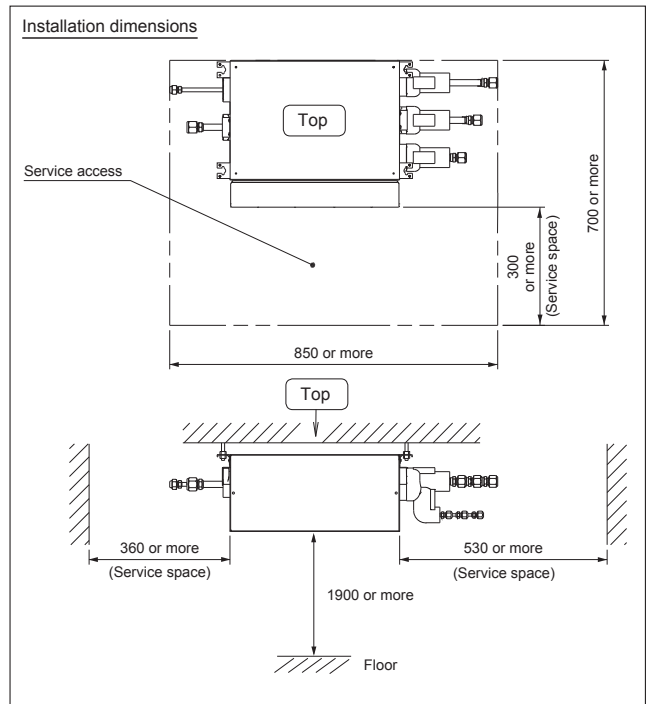
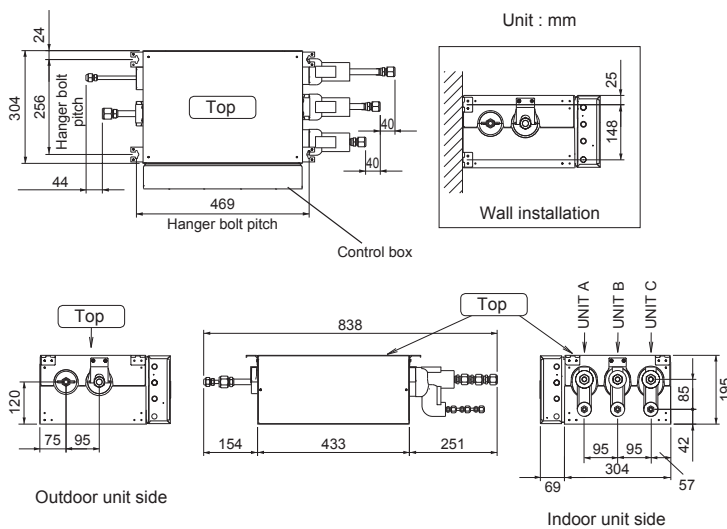
### 4.2. Installation dimensions

- The branch box can be installed onto the wall or hanging from the ceiling.
- The branch box can be installed and set horizontally or vertically.
- Provide a service hole for maintenance and inspection purposes as shown in the figure below.
- It is not necessary to provide drainage for the Branch box.
- The slope of the top side must be within  $\pm 5^\circ$  in all directions of the horizontal plane.
- Use M8 or M10 for the bolt size when hanging.

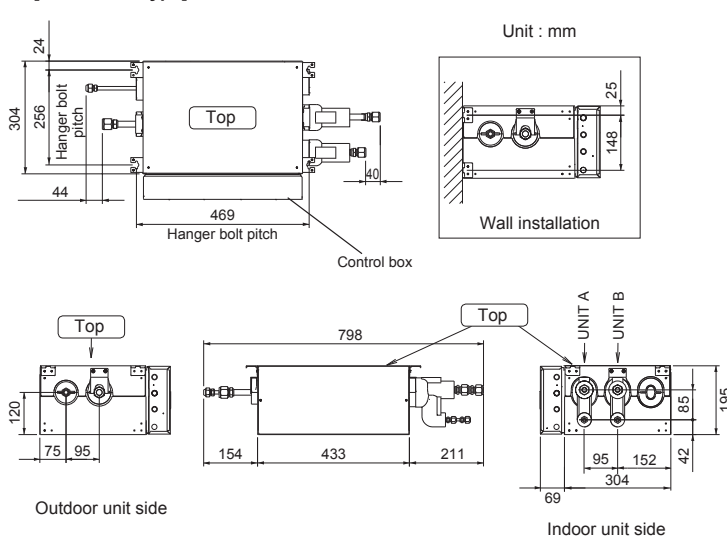
#### 4.2.1. Horizontal installation

Be sure to install so that the top side faces up.

##### [3 branches type]



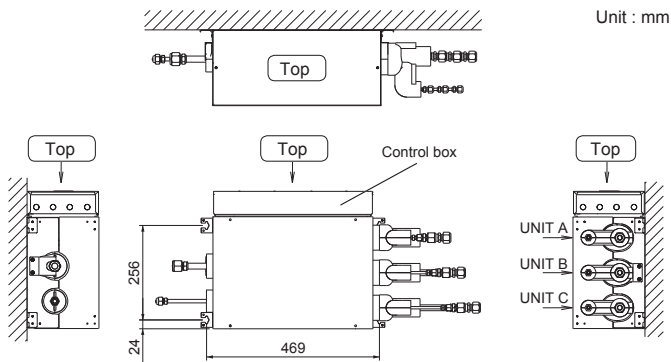
##### [2 branches type]



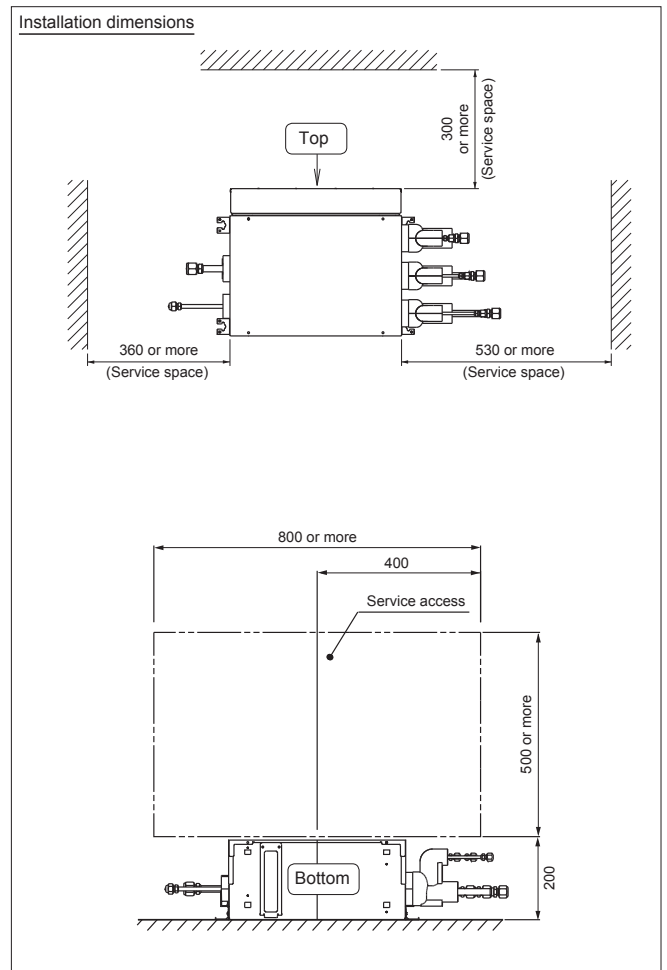
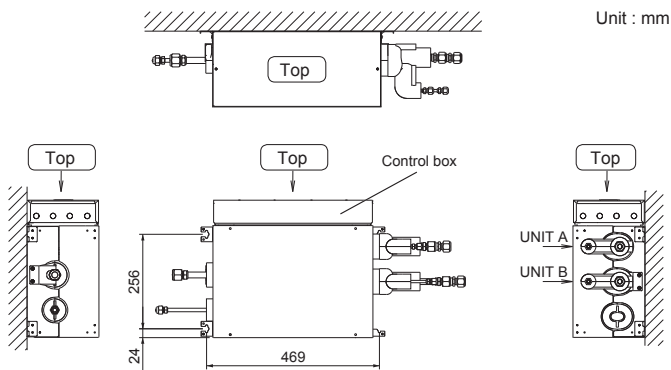
### 4.2.2. Vertical installation

- A vertical installation can only be performed when mounting on the wall.  
(A vertical installation cannot be hung from the ceiling.)
- Be sure to install the control box so that the top side faces up.
- The positioning of the control box cannot be changed when performing a vertical installation.

#### [3 branches type]



#### [2 branches type]



English

### 4.3. Installation of the unit

#### ⚠ WARNING

Perform installation in a location which can properly withstand the weight of the unit. Failure to install in a robust location or a faulty installation may cause the equipment to fail, water leakage, electric shock or fire.

During installation, secure the hanger bolt so it does not come off.

#### ⚠ CAUTION

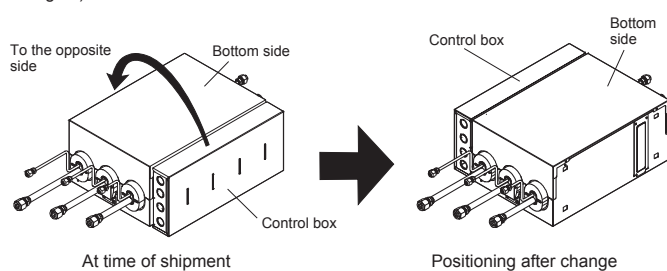
Be sure to provide adequate maintenance space when installing the unit above the ceiling.  
(Refer to the installation restrictions contained in "4.2 Installation dimensions".)

#### 4.3.1. Changing the positioning of the control box

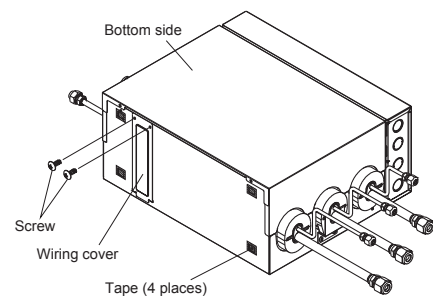
#### ⚠ CAUTION

Change the positioning of the control box on-site before performing the installation.

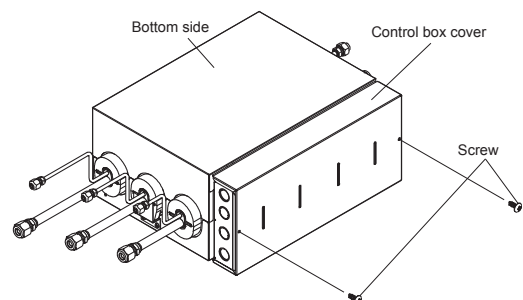
The positioning of the control box can be changed.  
(Only when installed horizontally. When vertically installed, the positioning cannot be changed.)



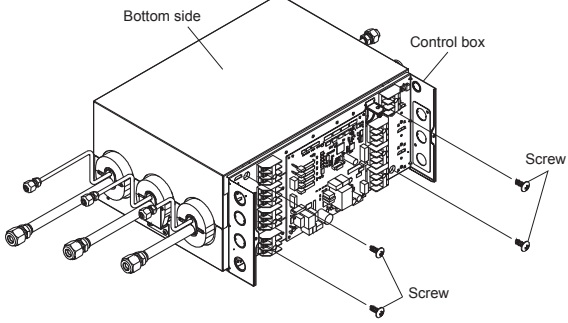
- (1) Remove the screws (2 pieces) to remove the wiring cover. Remove the tapes (4 places) on the main unit.



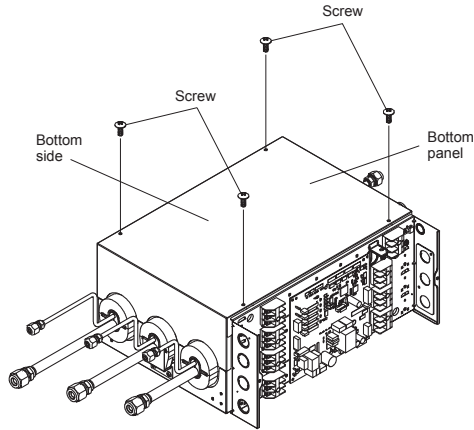
- (2) Remove the screws (2 pieces) to remove the control box cover.



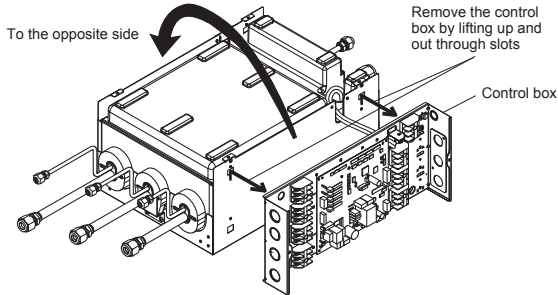
- (3) Remove the screws (4 pieces).  
(Note: Do not remove the control box.)



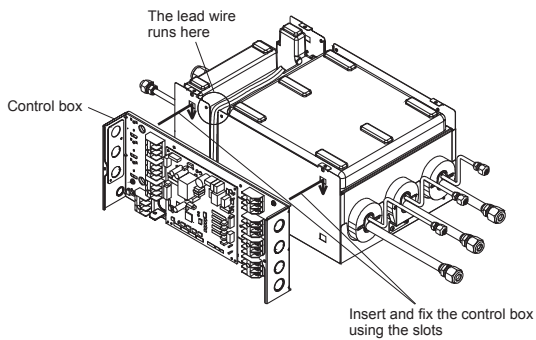
- (4) Remove the screws (4 pieces) to remove the bottom panel.



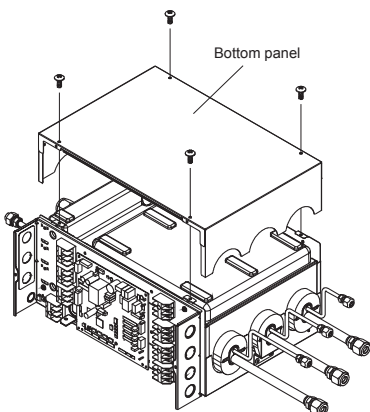
- (5) Remove the control box as shown in the figure, and then change the positioning to the opposite side.



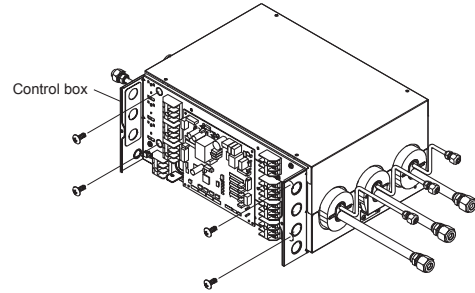
- (6) Attach the control box to the main unit as shown in the figure.



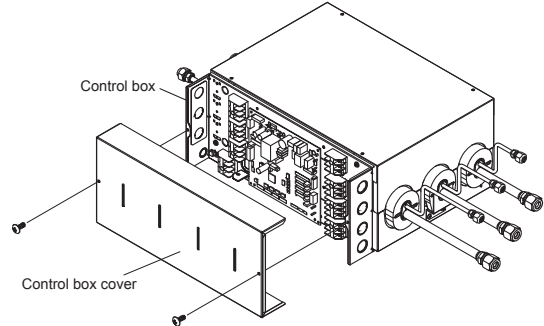
- (7) Attach the bottom panel and secure it with the screws (4 pieces).



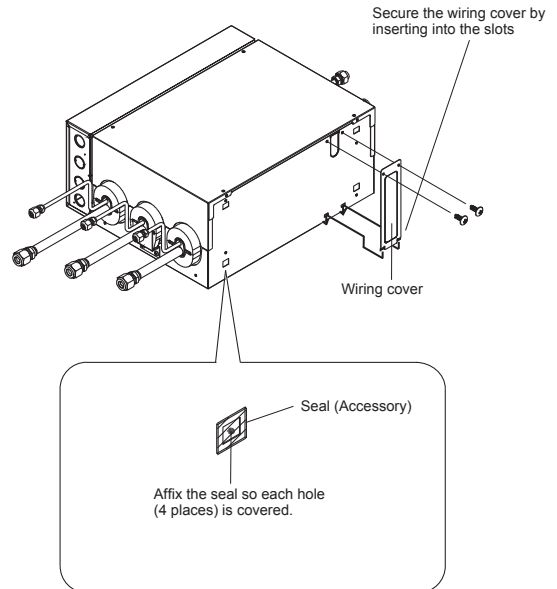
- (8) Secure the control box with the screws (4 pieces).



- (9) Attach the control box cover and secure it with the screws (2 places).



- (10) Attach the wiring cover and secure it with the screws (2 places).  
Affix the seals on the main unit (4 places).

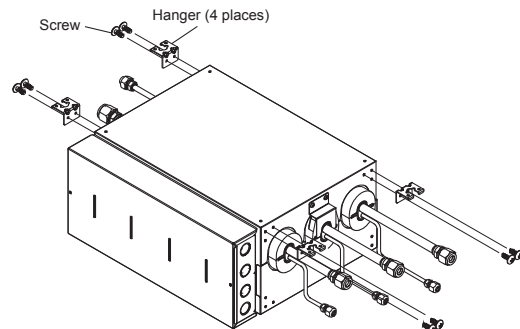


#### 4.3.2-A. Fix the unit (When hanging from the ceiling)

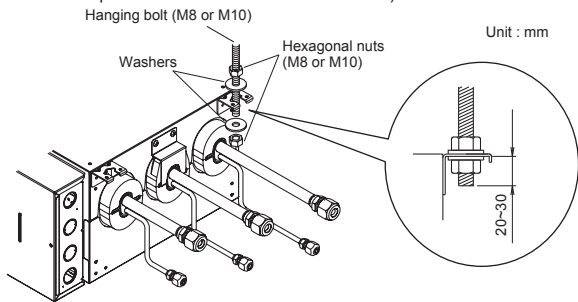
**CAUTION**

Do not hang from the ceiling when performing a vertical installation.

- (1) Secure the hangers (accessories) with the screws (2 pieces,  $\varnothing 4 \times 10$ , accessories). (4 places)



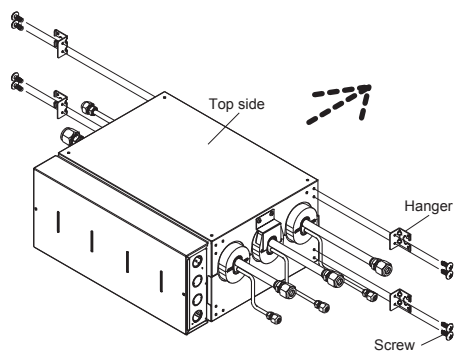
- (2) Secure the attachment section with the hanging bolt.  
(Use M8 or M10 for the hanging bolt)
- (3) Secure the hangers with hexagonal nuts (field supply) and the washers (accessories) as shown in the figure below.
- (4) Once you have checked the unit is flat, fasten the hexagonal nuts.  
(The unit's slope must be within  $\pm 5^\circ$  in all directions.)



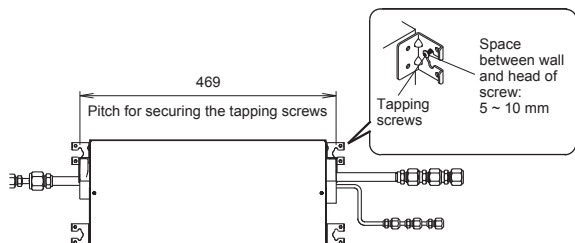
#### 4.3.2-B. Fix the unit (For wall installation)

##### <Horizontal installation>

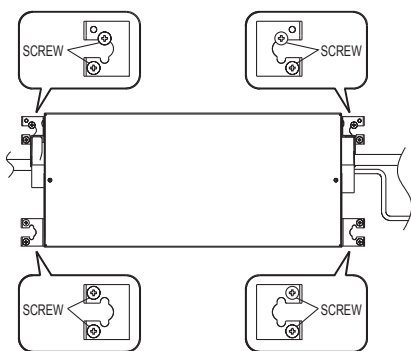
- (1) Secure the hangers (accessories) with the screws (2 pieces,  $\varnothing 4 \times 10$ , accessories). (4 places)
  - Install the unit with its top side facing upwards.



- (2) For temporary mounting of the unit, install 2 of the  $\varnothing 4 \times 25$  screws in the wall, allowing the space of 5~10mm between the wall and the screw heads. Then hook the unit over these 2 screws.

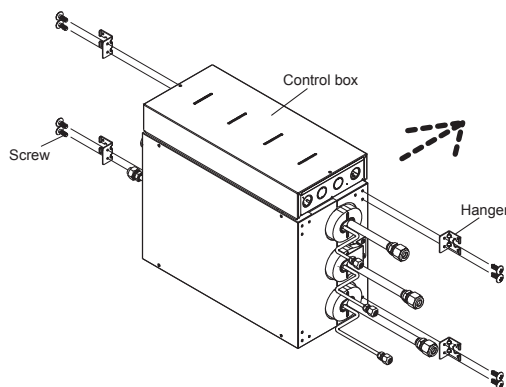


- (3) After checking that the unit is flat, secure and mount the branch box with the 8 screws ( $\varnothing 4 \times 25$ , accessories) provided including the tapping screws.  
(The unit's slope must be within  $\pm 5^\circ$  in all directions.)

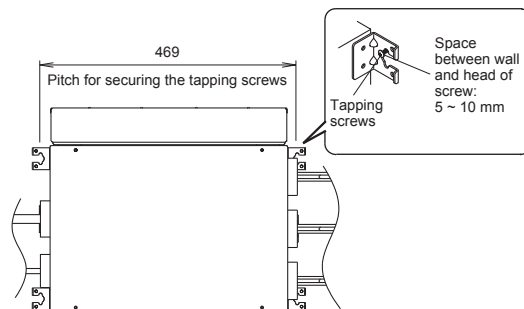


##### <Vertical installation>

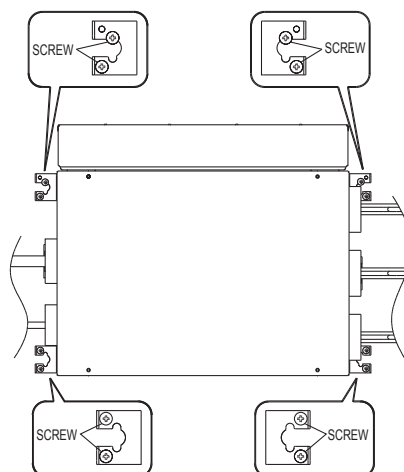
- (1) Secure the hangers (accessories) with the screws (2 pieces,  $\varnothing 4 \times 10$ , accessories). (4 places)
  - Install the unit with the control box facing upwards.



- (2) For temporary mounting of the unit, install 2 of the  $\varnothing 4 \times 25$  screws in the wall, allowing the space of 5~10mm between the wall and the screw heads. Then hook the unit over these 2 screws.



- (3) After checking that the unit is flat, secure and mount the branch box with the 8 screws ( $\varnothing 4 \times 25$ , accessories) provided including the tapping screws.  
(The unit's slope must be within  $\pm 5^\circ$  in all directions.)





## 5. PIPE INSTALLATION

### 5.1. Refrigerant pipe size and allowable piping length

#### ⚠ CAUTION

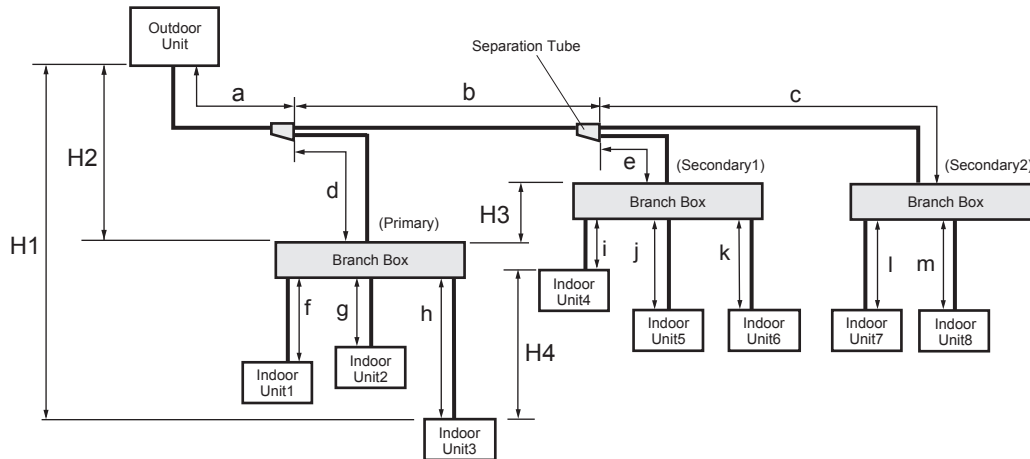
Do not mix with other air/gases except the specified refrigerant for the refrigerant cycle. Ventilate the area if there is a refrigerant leak while performing the installation.

Over-tightening when connecting the flare fittings can result in cracking or breaking of the flare nuts, and thus cause a refrigerant leak.

For on-site piping insulation, be sure that the insulation covers the entire unit's pipe connection. Pipe exposure can lead to water leaks from condensation and consequently cause burn injury from contact.

During flare connection, apply the refrigeration compressor oil (or equivalent) used for the outdoor unit to the flare section.

Secure the piping by taping it or performing pipe pinching so that impurities, water or dust do not penetrate inside the piping.



		Limitation m	Diagram	
Allowable pipe length (actual pipe length)	Maximum total equivalent pipe length	115 or less	Total	
	Between outdoor unit and the farthest indoor unit	70 or less	a + b + c + m	
	Between outdoor unit and branch boxes	55 or less	a + b + c + d + e	
	Between branch box and indoor unit	Total	60 or less	f + g + h + i + j + k + l + m
		Each unit	Between 3-15	f, g, h, i, j, k, l, m
	Between outdoor unit and the first separation tube	5 or more	a	
Allowable height difference	Between outdoor unit and indoor unit	30 or less	H1	
	Between outdoor unit and branch box	30 or less	H2	
	Between branch box and branch box	15 or less	H3	
	Between indoor unit and indoor unit	15 or less	H4	

Note) Install the separation tube close to the branch box. Keep the pipe length for sections c, d, and e as short as possible.

#### Pipe size selection

	Code	Condition (model code of indoor unit)	Gas pipe [mm]	Liquid pipe [mm]
From the outdoor unit to the first separation tube	a	—	Ø 15.88	Ø 9.52
From the separation tube to the next separation tube	b	—	Ø 15.88	Ø 9.52
From the separation tube to the branch box	c, d, e	—	Ø 15.88	Ø 9.52
From the branch box to the indoor unit	f, g, h, i, j, k, l, m	7, 9, 12	Ø 9.52	Ø 6.35
		14, 18	Ø 12.70	
		24	Ø 15.88	



## 5.2. Selecting the pipe material

### Copper pipes

It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10 m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants. As an air conditioner using R410A incurs pressure higher than when using conventional refrigerant (R22), 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 that in the table even when it is available on the market.

**Thicknesses of Annealed Copper Pipes (R410A)**

Pipe outside diameter [mm]	Thickness [mm]
6.35	0.80
9.52	0.80
12.70	0.80
15.88	1.00
19.05	1.20

## 5.3. Flare connection (Pipe connection)

### WARNING

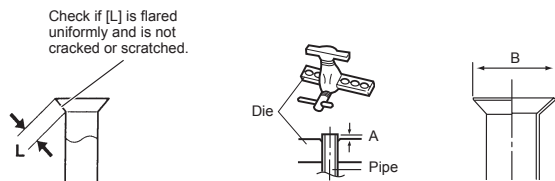
Be sure to perform flare connection. It causes a malfunction and a fire of this unit when connecting the pipes other than flare connection (brazing etc.).

### CAUTION

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.

### 5.3.1. Flaring

- Cut the connection pipe to the necessary length with a pipe cutter.
- Hold the pipe downward so that cuttings will not enter the pipe and remove any burrs.
- 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.
- Protect the pipes by pinching them or with tape to prevent dust, dirt, or water from entering the pipes.



Pipe outside diameter [mm]	Dimension A [mm]	Dimension B <sup>0-0.4</sup> [mm]
	Flare tool for R410A, clutch type	
6.35	0 to 0.5	9.1
9.52		13.2
12.70		16.6
15.88		19.7

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]	Width across flats of Flare nut [mm]
6.35	17
9.52	22
12.70	26
15.88	29

### 5.3.2. Bending pipes

The pipes are shaped by your hands. Be careful not to collapse them. Do not bend the pipes in an angle more than 90°. When pipes are repeatedly bent 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 100 mm or over.

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

### 5.3.3. Pipe connection

- Detach the caps and plugs from the pipes.

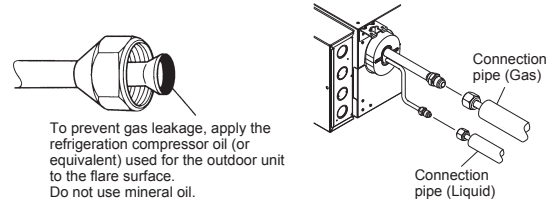
### CAUTION

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

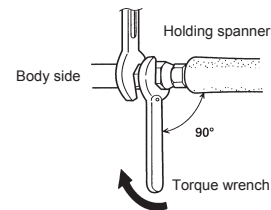
Do not remove the flare nut from the pipe until immediately before connecting the connection pipe.

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

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



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



Flare nut [mm]	Tightening torque [N·m (Kgf·cm)]
6.35 dia.	16 to 18 (160 to 180)
9.52 dia.	32 to 42 (320 to 420)
12.70 dia.	49 to 61 (490 to 610)
15.88 dia.	63 to 75 (630 to 750)

Do not remove the cap from the connection pipe before connecting the pipe.

### CAUTION

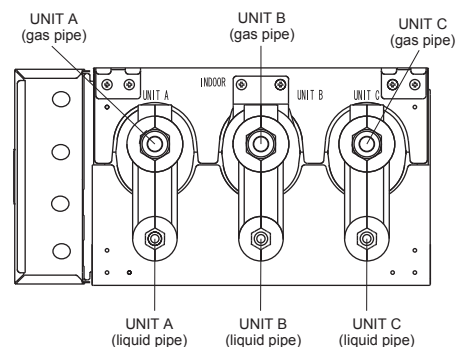
Be sure to connect the large pipe after connecting the small pipe completely.

- Branch box is marked with engraved letters indicating each corresponding indoor unit (UNIT A, UNIT B and UNIT C).  
UNIT A : Refrigerant pipe connection port for UNIT A  
UNIT B : Refrigerant pipe connection port for UNIT B  
UNIT C : Refrigerant pipe connection port for UNIT C

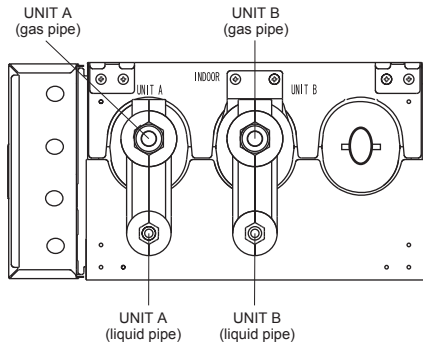
### CAUTION

Label all the refrigerant piping (liquid pipe, gas pipe) specifying to which indoor units they will be connected.

### [3 branches type]



[2 branches type]



5.3.4. Adapter installation

- Attach the adapters (accessories) to the ports on the gas pipe of the Branch box (Indoor unit side) according to the size of the pipe to be connected.
- Apply the refrigeration compressor oil (or equivalent) used for the outdoor unit to the attaching portion of the adapters.
- Tighten the adapter using a torque wrench according to the tightening torque values in the table below.

Adapter [mm]	Tightening torque [N·m (Kgf·cm)]
Ø 12.7 → Ø 9.52	49 to 61 (490 to 610)
Ø 12.7 → Ø 15.88	

5.4. Installing insulation

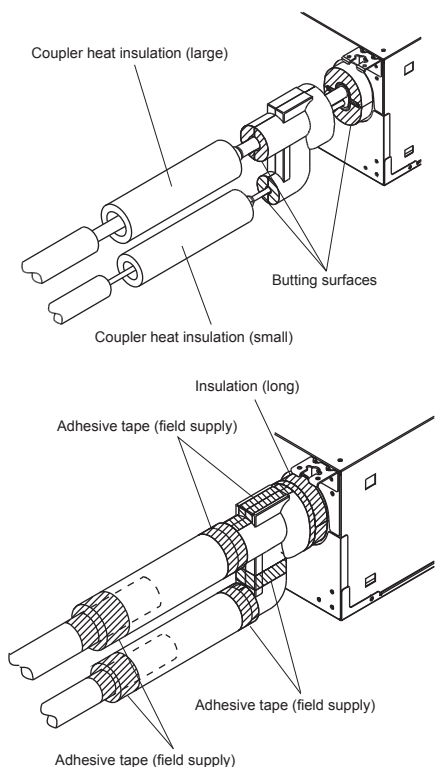
**CAUTION**

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, at 20 °C, use heat insulation with heat conductivity of 0.045 W/(m·K) or less.

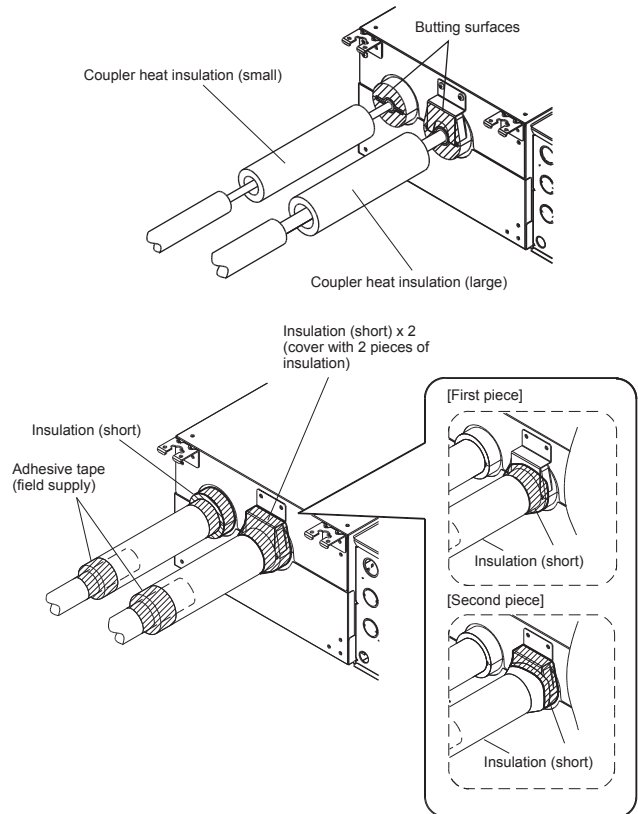
5.4.1. Piping insulation

- (1) Install the coupler heat insulation (large and small) and insulation (long and short) on each pipe as shown in the figures below.
- (2) Attach the butting surface with no gap to eliminate any gap between the insulations.
- (3) During the pipe insulation work, prevent air from getting inside the insulation with an adhesive tape (field supply).

(A) Indoor unit side

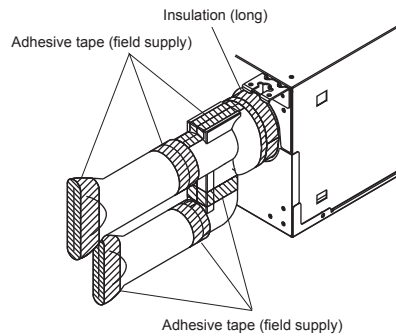


(B) Outdoor unit side



5.4.2. Non-connecting pipes

- (1) Install the coupler heat insulation (large and small) and insulation (long) as shown in the figure on the right.
- (2) Apply an adhesive tape (field supply) to prevent air from getting inside the insulation.



6. ELECTRICAL WIRING

6.1. Safety precautions for electrical wiring

Power

<b>WARNING</b>
The rated voltage of this product is 230 V ~ 50 Hz.
Before turning on verify that the voltage is within the 198V to 264V range.
Use a dedicated power circuit and breaker matched to the capacity of the total of Branch boxes and Indoor units ratings. (Install in accordance with standard.)
Make sure to install Earth leakage breaker. Otherwise, it may cause electric shock or fire.
Perform wiring work in accordance with standards so that the air conditioner can be operated safely and correctly.

<b>CAUTION</b>
The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances. When the current contracted capacity is insufficient, change the contracted capacity.

## Electrical wiring

### **⚠ WARNING**

Before starting work, check that power is not being supplied to all units.

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

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

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

Always connect the ground wire.

Install the remote controller cables so that a hand cannot touch it directly.

Be sure to always turn the power off first before performing the installation. Otherwise, handling electrical parts without turning off the power first may cause electric shock.

Be sure to set up an earth (ground) during installation. An earth (ground) wire should not be connected to the gas pipe, water pipe, lightning rod, or telephone earth wiring (ground).  
A faulty earth can cause electric shock or fire.

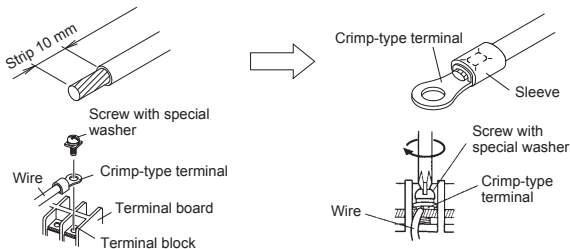
Make sure all wiring connections are secure, do not bundle power cables together, and do not use extension cables or circular power strips.  
Otherwise, a faulty installation may cause excessive heat and electric shock or fire.

Use the specified electrical wires for the wiring between the indoor unit and the branch box and for the power supply. Ensure proper connection of these wires and be sure to secure them in such manner that no external force of the electrical wires is applied to the terminals.

Arrange the electrical wires between the indoor unit and the branch box and for the power supply in such manner that the structures such as the service cover do not rise, and then install the cover securely.

### HOW TO CONNECT WIRING TO THE TERMINALS FOR STRAND WIRING.

- Use crimp-type terminals with insulating sleeves as shown in the figure below to connect to the terminal block.
- Securely crimp the crimp-type terminals to the wires using an appropriate tool so that the wires do not come loose.
- Use the specified wires, connect them securely, and fasten them so that there is no stress placed on the terminals.
- 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.
- Do not tighten the terminal screws too much, otherwise, the screws may break.
- See the table below for the terminal screw tightening torques.



#### Tightening torque

M4 screw	1.2 to 1.8 N·m (12 to 18 Kg·cm)
----------	---------------------------------

### **⚠ WARNING**

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

## 6.2. Selecting the cable and breaker

### **⚠ WARNING**

Be sure to install a breaker with the specified capacity.

Regulation of cables and breaker differs from each locality, refer in accordance with local rules.

Select the correct capacity of the power supply according to the load (total current value of the connected units).

<b>Voltage rating</b>	1Ø 230V (50Hz)
<b>Operating range</b>	198-264V

Cable	Cable size (mm <sup>2</sup> ) *1)	Remarks
Power supply cable	2.5	2 cable + Ground, 1Ø 230V
Connection cable	2.5	3 cable + Ground, 1Ø 230V

- Selected sample: Select the correct cable type and size according to the country or region's regulations.  
Max. wire length: Set a length so that the voltage drop is less than 2%. Increase the wire diameter when the wire length is long.

Breaker	Specification *2)
Circuit breaker (over current)	Current : 15 (A) *3)
Earth leakage breaker	Leakage current : 30mA 0.1sec or less *4)

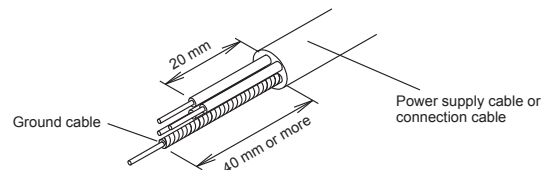
- Select the appropriate breaker of the described specification according to the national or regional standards.
- Selected sample (Select the one that the rush current when the power supply is turned on can be endured.)
- Select the breaker that enough load current can pass through it.

- Use conformed cable with Type245 IEC57.
- Before starting work check that power is not being supplied to all poles of the indoor unit and outdoor unit.
- Install all electrical works in accordance to standard.
- Install the disconnect device with a contact gap of at least 3 mm in all poles nearby the units. (Both branch box, indoor unit and outdoor unit)
- Wiring size must comply with the applicable local and national code.

## 6.3. Wiring

### 6.3.1. Cable preparation

Keep the ground cable longer than the other cables.

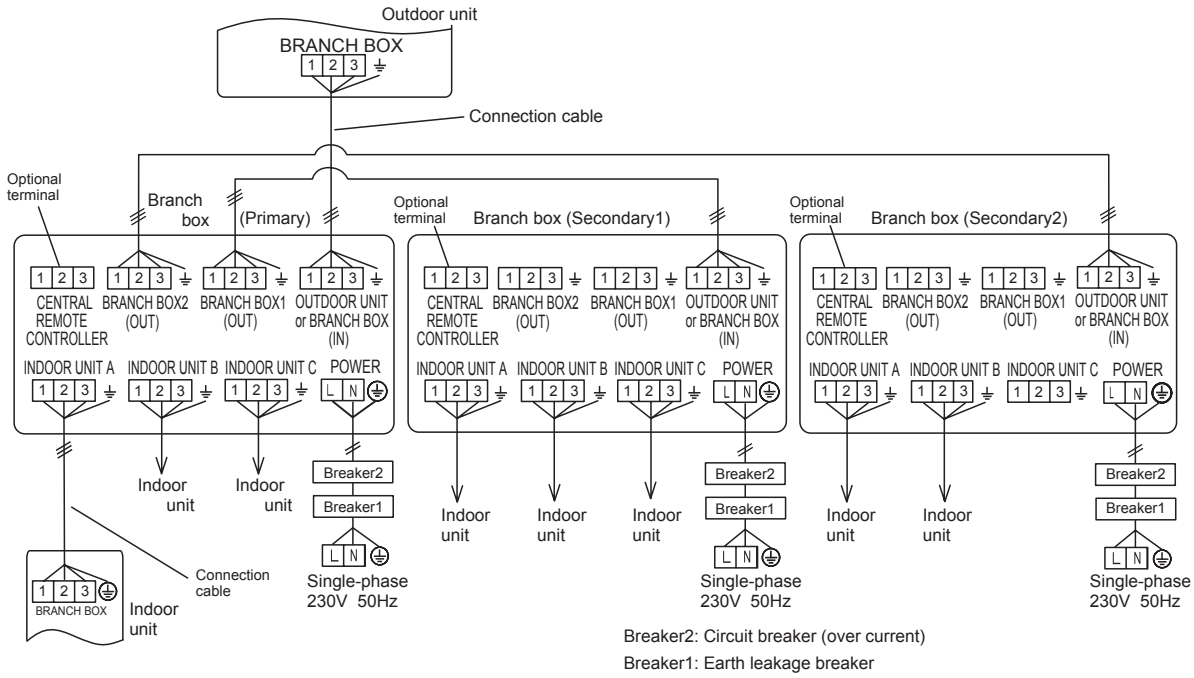


- Power supply cable : 3-core wire cable.
- Connection cable : 4-core wire cable.

### 6.3.2 Wiring method

Example) Wiring diagram when 3 branch boxes and 8 indoor units are connected

Example



### 6.3.3. Work procedure

- Remove the control box cover and install all the wiring.  
(Same for primary and secondary units)
- The cable holes are sealed with tape in order to prevent small animals from entering.  
Refer to the following figures, remove the tape which are covering the cable holes.

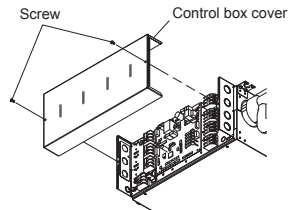


Fig. A

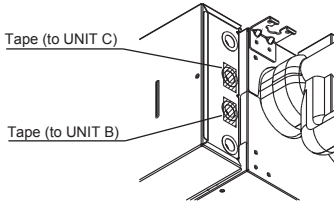
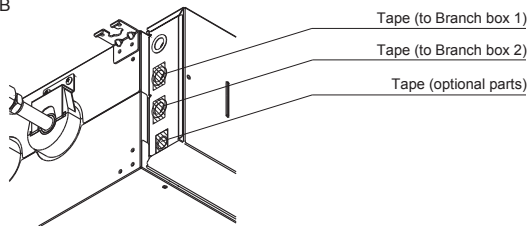


Fig. B

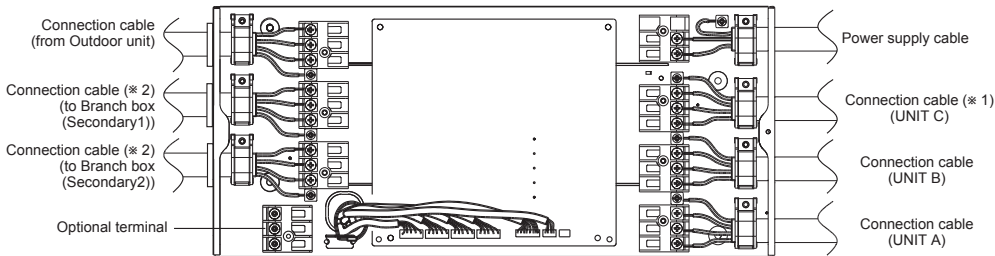


- Refer to the drawing for cable connection.

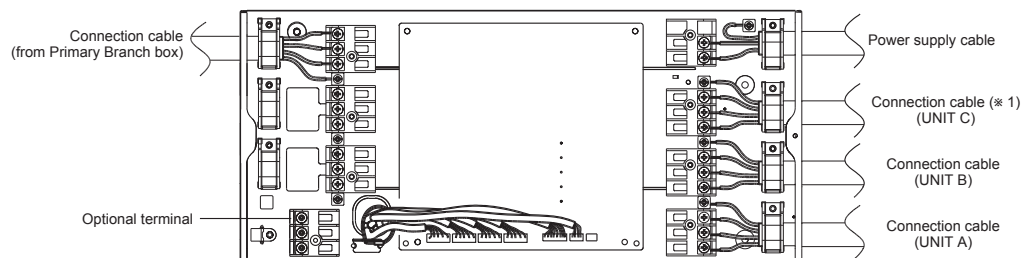
#### ⚠ CAUTION

Be sure to connect the cables to the Primary unit and the Secondary unit correctly. Otherwise, it may cause malfunction (damaging the fuse etc.).

#### [Primary unit]

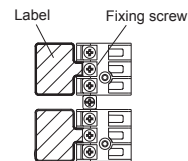


#### [Secondary unit]

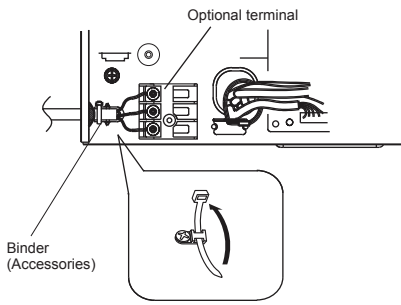


#### ⚠ CAUTION

Some parts of the terminal block are covered with the labels as shown below. When connecting the connection cable to this terminal of the Primary unit, remove the labels as needed. To remove the label, remove the fixing screw first. For the Secondary type, do not remove the labels to prevent faulty wiring.



(\* 1) Not used for 2 branches type (UTP-PY02A).  
(\* 2) Be sure to wire according to the number of Branch box used.

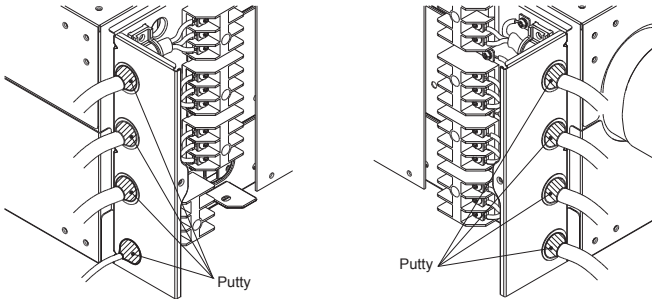


- When connecting a cable to the optional terminal, secure the cable with the binder (Accessories). Seal the hole that passes the cable with putty so that there is no space.

**CAUTION**

Do not bundle the remote controller cable, or wire the remote controller cable in parallel, with the connection cable and the power supply cable. It may cause erroneous operation.

- (4) Fill the cable holes with putty in order to prevent small animals from entering.



- (5) Install the Control box cover.

## 7. TEST RUN AND CHECK LIST

Conduct the check run and test run according to the Installation Manual of the outdoor unit. Check the following items before conducting the check run and test run.

Check Item	Check Column	Troubles in the event of failure
Has the branch box been installed firmly?		Drop, vibration or noise
Was there any refrigerant leak found through a refrigerant leak inspection?		Function stop, no cooling or no heating
Has the insulation been perfectly installed on the pipes and pipe joints without any gap?		Water leak
Has the piping been installed properly?		Unable to operate
Has the wiring been installed properly?		Unable to operate
Was power cable that meets the specifications used?		Fire or unable to operate
Were breakers that meets the specifications used?		Fire or unable to operate
Has proper grounding been performed?		Electric shock or fire

## 8. MALFUNCTION DIAGNOSTICS

When an error occurs, an error description displays in the LED (No. 401 ~ 405).

●	Lit
⊙ (n)	Flashing (number of flashing)
○	Unlit

### Normal status

Green	Red				Comment
LED401	LED402	LED403	LED404	LED405	
●	○	○	○	○	The branch box is functioning properly.

### Error status

Green	Red				Error description
LED401	LED402	LED403	LED404	LED405	
●	●	●	●	●	Combination error
●	●	●	●	○	Power supply frequency error
Branch box identifying display	⊙(1)	○	○	○	EEPROM access error
	⊙(3)	○	○	○	Serial communication error between outdoor unit and branch box Serial communication error between branch boxes
	⊙(4)	○	○	○	Serial communication error between branch boxes
		○	●	○	Serial communication error between Indoor Unit A and branch box
Primary unit : ⊙(1)	⊙(5)	○	●	○	Serial communication error between Indoor Unit B and branch box
		○	○	○	Serial communication error between Indoor Unit C and branch box *1)
Secondary unit1 : ⊙(2)	⊙(6)	●	○	○	Indoor Unit A, liquid pipe temp. sensor error (CN309)
		○	●	○	Indoor Unit B, liquid pipe temp. sensor error (CN309)
Secondary unit2 : ⊙(3)	⊙(7)	○	○	●	Indoor Unit C, liquid pipe temp. sensor error (CN310) *1)
		○	○	○	Indoor Unit A, gas pipe temp. sensor error (CN309)
		○	○	○	Indoor Unit B, gas pipe temp. sensor error (CN309)
Secondary unit2 : ⊙(3)	⊙(8)	○	○	●	Indoor Unit C, gas pipe temp. sensor error (CN310) *1)
		○	○	○	Indoor Unit A, Expansion valve full closure operation error (CN305)
		○	○	○	Indoor Unit B, Expansion valve full closure operation error (CN306)
	⊙(9)	○	○	○	Indoor Unit C, Expansion valve full closure operation error (CN307) *1)
		○	○	○	Remote controller communication error

\*1) Not displayed for 2 Branches type.