

# AIR CONDITIONER

## Ceiling type



# INSTALLATION MANUAL



PART No. 9384330000-03

For authorized service personnel only.

[Original instructions]

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**NOTES:** 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.

### CAUTION

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

### WARNING

- The appliance shall be installed, operated and stored in a room with a floor area larger than X m<sup>2</sup>.

Amount of refrigerant charge M (kg)	Minimum room area X (m <sup>2</sup> )
M ≤ 1.22	-
1.22 < M ≤ 1.23	1.45
1.23 < M ≤ 1.50	2.15
1.50 < M ≤ 1.75	2.92
1.75 < M ≤ 2.0	3.82
2.0 < M ≤ 2.5	5.96
2.5 < M ≤ 3.0	8.59
3.0 < M ≤ 3.5	11.68
3.5 < M ≤ 4.0	15.26

(IEC 60335-2-40)

- Installation of this product must be done by experienced service technicians or professional installers only in accordance with this manual. Installation by non-professional or improper installation of the product might 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.
- Installation must be performed in accordance with regulations, codes, or standards for electrical wiring and equipment in each country, region, or the installation place.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- 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.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odour.

### CAUTION

- 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 a device not 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 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).
- This product is not explosion proof, and therefore should not be installed in an explosive atmosphere.
- To avoid getting an electric shock, never touch the electrical components soon after the power supply has been turned off. After turning off the power, always wait 5 minutes or more before you touch the electrical components.
- This product contains no user-serviceable parts. Always consult experienced service technicians for repairing.
- When moving or relocating the air conditioner, consult experienced service technicians for disconnection and reinstallation of the product.
- Do not touch the aluminum fins of heat exchanger built-in the indoor or outdoor unit to avoid personal injury when you install or maintain the unit.
- 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 to the property.

- Be careful not to scratch the air conditioner when handling it.

English

Deutsch

Français

Español

Italiano

Ελληνικά

Português

Русский

Türkçe

## Precautions for using R32 refrigerant

The basic installation work procedures are the same as conventional refrigerant (R410A, R22) models.

However, pay careful attention to the following points:

Since the working pressure is 1.6 times higher than that of refrigerant R22 models, some of the piping and installation and service tools are special. (Refer to "2. 1. Installation tools".)

Especially, when replacing a refrigerant R22 model with a new refrigerant R32 model, always replace the conventional piping and flare nuts with the R32 and R410A piping and flare nuts on the outdoor unit side.

For R32 and R410A, the same flare nut on the outdoor unit side and pipe can be used.

Models that use refrigerant R32 and R410A have a different charging port thread diameter to prevent erroneous charging with refrigerant R22 and for safety. Therefore, check beforehand. [The charging port thread diameter for R32 and R410A is 1/2-20 UNF.]

Be more careful than R22 so that foreign matter (oil, water, etc.) does not enter the piping. Also, when storing the piping, securely seal the opening by pinching, taping, etc. (Handling of R32 is similar to R410A.)

### CAUTION

#### 1-Installation (Space)

- That the installation of pipe-work shall be kept to a minimum.
- That pipe-work shall be protected from physical damage.
- The appliance shall not be installed in an unventilated space, if that space is smaller than X m<sup>2</sup>.

Amount of refrigerant charge M (kg)	Minimum room area X (m <sup>2</sup> )
M ≤ 1.22	-
1.22 < M ≤ 1.23	1.45
1.23 < M ≤ 1.50	2.15
1.50 < M ≤ 1.75	2.92
1.75 < M ≤ 2.0	3.82
2.0 < M ≤ 2.5	5.96
2.5 < M ≤ 3.0	8.59
3.0 < M ≤ 3.5	11.68
3.5 < M ≤ 4.0	15.26

(IEC 60335-2-40)

- That compliance with national gas regulations shall be observed.
- That mechanical connections shall be accessible for maintenance purposes.
- In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.
- When disposing of the product is used, be based on national regulations, properly processed.

#### 2- Servicing

##### 2-1 Service personnel

- Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
- Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- Servicing shall be performed only as recommended by the manufacturer.

##### 2-2 Work

- Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the refrigerating system, the precautions in 2-2 to 2-8 shall be complied with prior to conducting work on the system.
- Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapour being present while the work is being performed.
- All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out.
- Work in confined spaces shall be avoided.
- The area around the workspace shall be sectioned off.
- Ensure that the conditions within the area have been made safe by control of flammable material.

##### 2-3 Checking for presence of refrigerant

- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres.
- Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. nonsparking, adequately sealed or intrinsically safe.

### CAUTION

#### 2-4 Presence of fire extinguisher

- If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available at hand.
- Have a dry powder or CO<sub>2</sub> fire extinguisher adjacent to the charging area.

#### 2-5 No ignition sources

- No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion.
- All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space.
- Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

#### 2-6 Ventilated area

- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work.
- A degree of ventilation shall continue during the period that the work is carried out.
- The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

#### 2-7 Checks to the refrigeration equipment

- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification.
- At all times the manufacturer's maintenance and service guidelines shall be followed.
- If in doubt consult the manufacturer's technical department for assistance.
- The following checks shall be applied to installations using flammable refrigerants.
  - The charge size is in accordance with the room size within which the refrigerant containing parts are installed.
  - The ventilation machinery and outlets are operating adequately and are not obstructed.
  - If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
  - Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
  - Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

#### 2-8 Checks to electrical devices

- Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures.
- If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with.
- If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used.
- This shall be reported to the owner of the equipment so all parties are advised.
- Initial safety checks shall include.
  - That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.
  - That there no live electrical components and wiring are exposed while charging, recovering or purging the system.
  - That there is continuity of earth bonding.

#### 3-Repairs to sealed components

- During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc.
- If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
- Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected.
  - This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
  - Ensure that apparatus is mounted securely.
  - Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres.
  - Replacement parts shall be in accordance with the manufacturer's specifications.

NOTES: The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment.  
Intrinsically safe components do not have to be isolated prior to working on them.

 CAUTION

4-Repair to intrinsically safe components

- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.
- Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere.
- The test apparatus shall be at the correct rating.
- Replace components only with parts specified by the manufacturer.
- Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

5-Cabling

- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects.
- The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

6-Detection of flammable refrigerants

- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks.
- A halide torch (or any other detector using a naked flame) shall not be used.

7-Leak detection methods


- Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.)
- Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.
- Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.
- Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.
- If a leak is suspected, all naked flames shall be removed/extinguished.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

8-Removal and evacuation

- When breaking into the refrigerant circuit to make repairs – or for any other purpose –conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:
  - remove refrigerant
  - purge the circuit with inert gas
  - evacuate
  - purge again with inert gas
  - open the circuit by cutting or brazing
- The refrigerant charge shall be recovered into the correct recovery cylinders.
- The system shall be "flushed" with OFN to render the unit safe.
- This process may need to be repeated several times.
- Compressed air or oxygen shall not be used for this task.
- Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum.
- This process shall be repeated until no refrigerant is within the system.
- When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.
- This operation is absolutely vital if brazing operations on the pipe work are to take place.
- Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

9-Charging procedures

- In addition to conventional charging procedures, the following requirements shall be followed.
  - Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
  - Cylinders shall be kept upright.
  - Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
  - Label the system when charging is complete (if not already).
  - Extreme care shall be taken not to overfill the refrigeration system.
- Prior to recharging the system it shall be pressure tested with OFN.
- The system shall be leak tested on completion of charging but prior to commissioning.
- A follow up leak test shall be carried out prior to leaving the site.

 CAUTION

10-Decommissioning

- Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its details.
- It is recommended good practice that all refrigerants are recovered safely.
- Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant.
- It is essential that electrical power is available before the task is commenced.
  - a) Become familiar with the equipment and its operation.
  - b) Isolate system electrically.
  - c) Before attempting the procedure ensure that:
    - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
    - all personal protective equipment is available and being used correctly;
    - the recovery process is supervised at all times by a competent person;
    - recovery equipment and cylinders conform to the appropriate standards.
  - d) Pump down refrigerant system, if possible.
  - e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
  - f) Make sure that cylinder is situated on the scales before recovery takes place.
  - g) Start the recovery machine and operate in accordance with manufacturer's instructions.
  - h) Do not overfill cylinders. (No more than 80 % volume liquid charge).
  - i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
  - j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
  - k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.





11-Labeling

- Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant.
- The label shall be dated and signed.
- Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

12-Recovery

- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed.
- Ensure that the correct number of cylinders for holding the total system charge are available.
- All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant).
- Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order.
- Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants.
- In addition, a set of calibrated weighing scales shall be available and in good working order.
- Hoses shall be complete with leak-free disconnect couplings and in good condition.
- Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged.
- Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant.
- The evacuation process shall be carried out prior to returning the compressor to the suppliers.
- Only electric heating to the compressor body shall be employed to accelerate this process.
- When oil is drained from a system, it shall be carried out safely.

Explanation of symbols displayed on the indoor unit or outdoor unit.

	<b>WARNING</b>	This symbol shows that this appliance uses a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.
	<b>CAUTION</b>	This symbol shows that the operation manual should be read carefully.
	<b>CAUTION</b>	This symbol shows that a service personnel should be handling this equipment with reference to the installation manual.
	<b>CAUTION</b>	This symbol shows that information is available such as the operating manual or installation manual.

## 2. PRODUCT SPECIFICATION

### 2.1. Installation tools

Tool name	Change from R22 to R32 (R410A)
<b>Gauge manifold</b>	Pressure is high and cannot be measured with a R22 gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended to use gauge with seals -0.1 to 5.3 MPa (-1 to 53 bar) for high pressure. -0.1 to 3.8 MPa (-1 to 38 bar) for low pressure.
<b>Charge hose</b>	To increase pressure resistance, the hose material and base size were changed. (R32/R410A)
<b>Vacuum pump</b>	A conventional vacuum pump can be used by installing a vacuum pump adapter. (Use of a vacuum pump with a series motor is prohibited.)
<b>Gas leakage detector</b>	Special gas leakage detector for HFC refrigerant R410A or R32.

### 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 R32 (R410A) incurs pressure higher than when using R22, it is necessary to choose adequate materials.

### WARNING

- Do not use the existing (for R22) piping and flare nuts. If the existing materials are used, the pressure inside the refrigerant cycle will rise and cause failure, injury, etc. (Use the special R32/R410A materials.)
- Use (refill or replace with) specified refrigerant (R32) only. Use of unspecified refrigerant can cause product malfunction, burst, or injury.
- Do not mix any gas or impurities except specified refrigerant (R32). Inflow of air or application of unspecified material makes the internal pressure of the refrigerant cycle too high, and may cause product malfunction, burst of piping, or injury.
- For installation purposes, be sure to use the parts supplied by the manufacturer or other prescribed parts. The use of non-prescribed parts can cause serious accidents such as the unit falling, water leakage, electric shock, or fire.
- Do not turn on the power until all work has been completed.




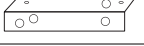



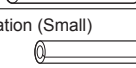




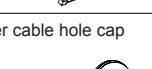



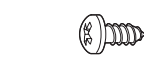

### CAUTION

- This manual describes how to install the indoor unit only. To install the outdoor unit or branch box, (if any), refer to the installation manual included in each product.

### 2.2. Accessories

### WARNING

- For installation purposes, be sure to use the parts supplied by the manufacturer or other prescribed parts.
- The use of non-prescribed parts can cause serious accidents such as the unit falling, water leakage, electric shock, or fire.
- The following installation parts are furnished. Use them as required.
- Keep the installation manual in a safe place and do not discard any other accessories until the installation work has been completed.

Name and Shape	Q'ty	Description
Installation manual 	1	(This book)
Operating manual 	1	-
CD-ROM 	1	-
Template 	1	For installing indoor unit
Special nut A (Large flange) 	4	For installing indoor unit
Special nut B (Small flange) 	4	
Washer 	8	
Coupler heat insulation (Large) 	1	For indoor side pipe joint (Gas pipe)
Coupler heat insulation (Small) 	1	For indoor side pipe joint (Liquid pipe)
Insulation 	1	For installing drain pipe
Drain hose 	1	For installing drain pipe VP25 (O.D.32, I.D.25)
Hose Band 	1	For installing drain hose
Cable tie (Large) 	4	For connection pipe fixing.
Cable tie (Small) 	1	For connection remote controller cable fixing.
Remote controller cable hole cap 	1	For attaching to the indoor unit body
Tapping screw (White) 	6	For the grille fixing
Casing guard 	24/30/36/45/54 Type 1	For left piping
Tapping screw 	3	For left piping

### 2.3. 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.

Model	Diameter [mm (in)]	
	Gas pipe	Liquid pipe
18/22/24	12.70 (1/2)	6.35 (1/4)
30/36/45/54	15.88 (5/8)	9.52 (3/8)

- 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).

## 2. 4. 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 <sup>2</sup> )	Type	Remarks
Connection cable	1.5 (MIN.)	Type 60245 IEC57	3Wire+Earth (Ground), 1φ230V

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

Cable	Conductor size (mm <sup>2</sup> )	Type	Remarks
Remote controller cable	0.33 to 1.25	Sheathed PVC cable	Non-polar 2 wire, twisted pair

## 2. 5. Optional parts

Parts name	Model No.	Application
Wired remote controller	UTY-RNR*Z*	For air conditioner operation
	UTY-RLR*	
Simple remote controller	UTY-RSR*	For air conditioner operation
	UTY-RHR*	
Compact remote controller	UTY-RCR*Z1	For air conditioner operation
IR receiver unit	UTY-LBT*H	For air conditioner operation
WLAN interface	UTY-TFSXZ1	For wireless LAN control
Drain pump unit	UTR-DPB24T	For installing the drain pump
Modbus convertor	UTY-VMSX	For air conditioner operation
KNX convertor	UTY-VKSX	For air conditioner operation
Network convertor	UTY-VTGX UTY-VTGXV	For air conditioner operation
External switch controller	UTY-TERX	For control external switches
External input and output PCB	UTY-XCSX	For connecting external devices
External input and output PCB box	UTZ-GXEA	For installing the External input and output PCB
External connect kit	UTY-XWZXZG	For control output port
Auxiliary pipe assembly	UTP-FX24A [Liquid/6.35 mm (1/4 in)] [Gas/12.70 mm (1/2 in)]	For piping upward only
	UTP-FX35A [Liquid/9.52 mm (3/8 in)] [Gas/15.88 mm (5/8 in)]	

## 3. 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.

## 3. 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

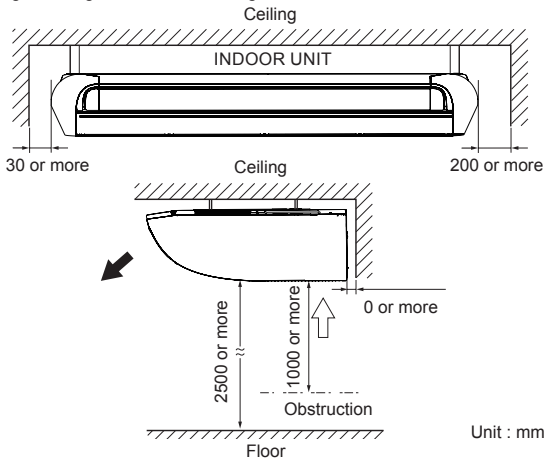
- Do not install the indoor unit in the following areas:
  - Area with high salt content, such as at the seaside. It will deteriorate metal parts, causing the parts to fall or the unit to leak water.
  - Area filled with mineral oil or containing a large amount of splashed oil or steam, such as a kitchen. 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, transmission cable, and remote control cable at least 1 m away from a television or radio receivers. The purpose of this is to prevent TV reception interference or radio noise. (Even if they are installed more than 1 m apart, you could still receive noise under some signal conditions.)
- Install the unit where ambient temperature does not reach 60°C or more. Take a measure such as ventilation for an environment in which heat is retained.
- If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.
- Install the indoor unit on the place where the height from the floor is more than 1.8 m.
- Use the "Insulation kit for high humidity" (option), when the condition under the roof is over 80% in humidity and over 30°C in temperature. Otherwise, there is a risk of condensation on the ceiling.

- Install the indoor unit on a place having a sufficient strength so that it withstands against the weight of the indoor unit.
- The inlet and outlet ports should not be obstructed; the air should be able to blow all over the room.
- Leave the space required to service the air conditioner.
- Install the unit where connection to the outdoor unit is easy.
- Install the unit where the connection pipe can be easily installed.
- Install the unit where the drain pipe can be easily installed.
- Install the unit where noise and vibrations are not amplified.
- Take servicing, etc., into consideration and leave the spaces. Also install the unit where the filter can be removed.
- 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.

### 3.2. Installation dimension

- The ceiling rear height as shown in the figure.



### 3.3. Installing the unit

#### ⚠ WARNING

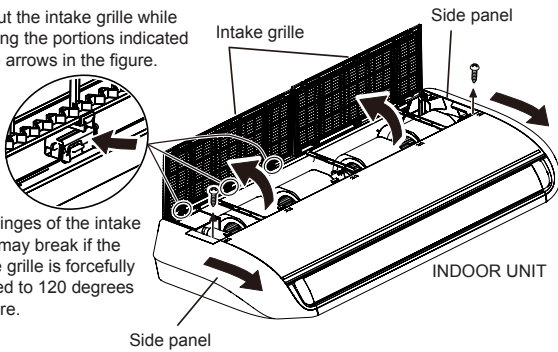
- Install the air conditioner in a location which can withstand a load of at least five times the weight of the main unit and which will not amplify sound or vibration. If the installation location is not strong enough, the indoor unit may fall and cause injuries.

#### 3.3.1. Preparing indoor unit installation

##### Remove the intake grille and side panel

- Remove the two Intake grilles.
- Remove two screws from both side panels (one screw from each side).
- Remove two side panels.

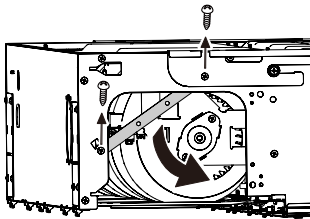
Pull out the intake grille while pressing the portions indicated by the arrows in the figure.



The hinges of the intake grille may break if the intake grille is forcefully opened to 120 degrees or more.

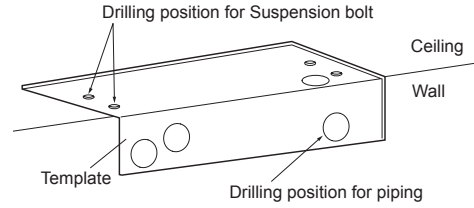
- Removing the casing guard

Remove two screws and remove the casing guard from the unit body. Remove both left and right casing guards in the same manner. These casing guards are attached when passing the connection pipe through the left side.

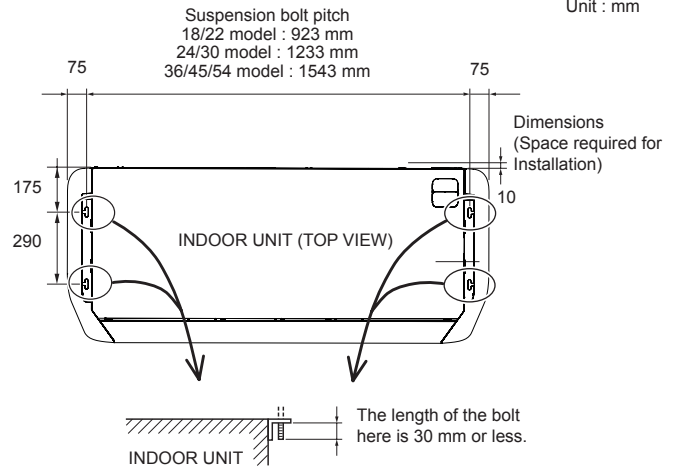


#### 3.3.2. Indoor unit installation

- You can use the accessory template to help you install the indoor unit.
- The template helps you determine the appropriate locations for suspension bolts and pipe opening (drain pipe and connection cable).

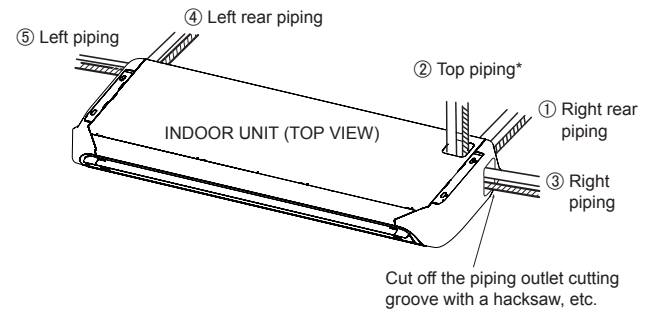


#### 3.3.3. Location of ceiling suspension bolts



#### 3.3.4. Select piping direction

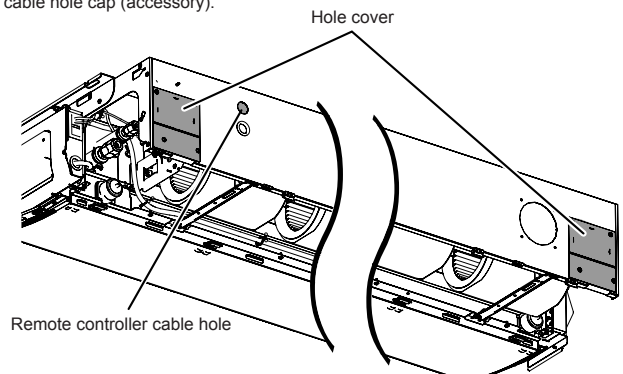
- Select connection piping and drain piping directions.
- The piping and drain piping can be arranged for piping through different positions from each other.



- \* ②, A Drain pump unit (Optional parts) and an Auxiliary pipe assembly (Optional parts) are required.

#### [FOR ① Right rear piping, ② Top piping, ③ Right piping, ④ Left rear piping, ⑤ Left piping]

- For piping through ②, an Auxiliary pipe assembly is required.
- (1) For piping through ① and ④, remove the hole covers and cut the piping and drain piping according to the piping location. Also, when using the wired remote controller, cut and remove the remote controller cable hole, then attach the remote controller cable hole cap (accessory).



- For piping through ③ and ⑤, cut the side panels.
- For piping through ②, cut the knockout hole.

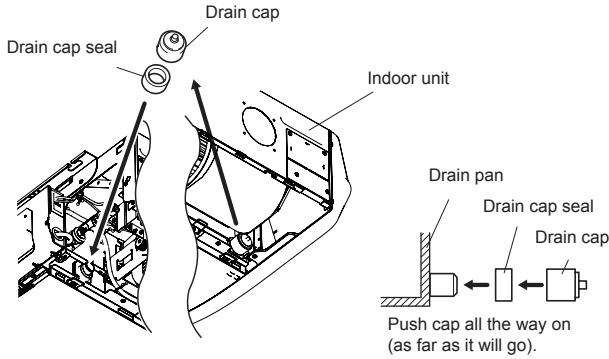
**[FOR ② Top drain piping]**

- When using a drain pump, the direction of the connection piping is also ② Top piping. A Drain pump unit (Optional parts) and an Auxiliary pipe assembly (Optional parts) are required.

For piping through ②, cut the knockout hole

**[FOR ④ Left rear drain piping, ⑤ Left drain piping]**

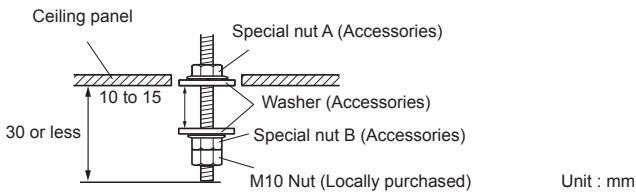
- Transfer the Drain cap and Drain cap seal.



**3.3.5. Drilling the holes and attaching the suspension bolts**

- Drill  $\varnothing 25$  mm holes at the suspension-bolt locations.
- Install the bolts, then temporarily attach Special nuts A and B and a normal M10 nut to each bolt. (The two special nuts are provided with the unit. The M10 nut must be obtained locally.) Refer to the figure.
- Ensure that the lengths of the lower sides of the suspension bolts are less than 30 mm.

<b>Bolt Strength [N (kgf)]</b>	980 to 1470 (100 to 150)
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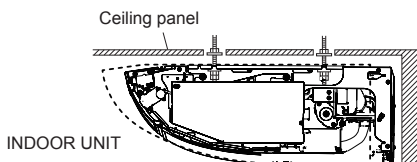
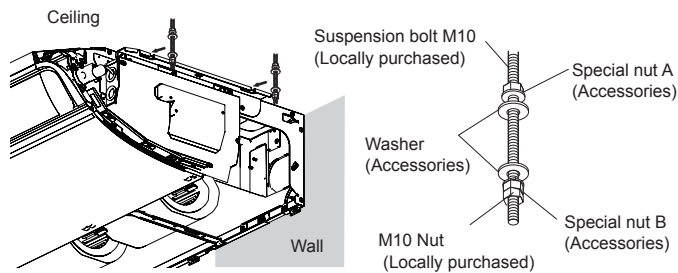


**3.3.6. Installing the indoor unit**

The indoor unit can be installed by using either of two procedures. Use a suitable procedure for the actual situation.

[To install the indoor unit with the suspension fittings attached]

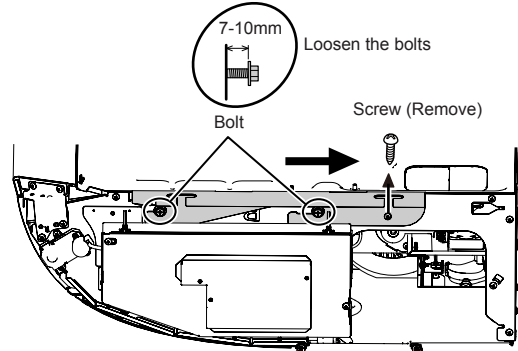
- Lift unit so that suspension bolts pass through the suspension fittings at the sides (four places), and slide the unit back.



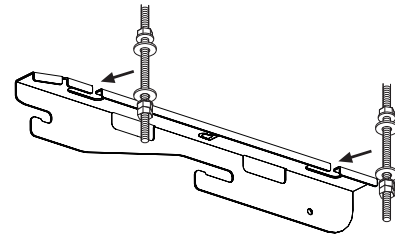
- Fasten the indoor unit into place by tightening-up the special "B" bolts and the M10 nuts. Make sure that unit is secure and will not shift back and forth.

[To install the indoor unit with the suspension fittings removed]

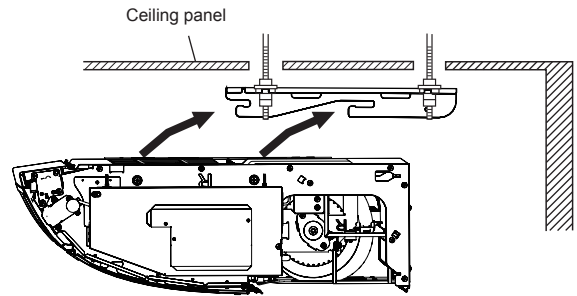
- Remove one screw and loosen two bolts to remove the suspension fittings. Repeat this step for the left side and the right side.



- Fix the removed suspension fittings with two suspension bolts.



- Attach the unit body to the fixed suspension fittings, tighten two bolts on each side.



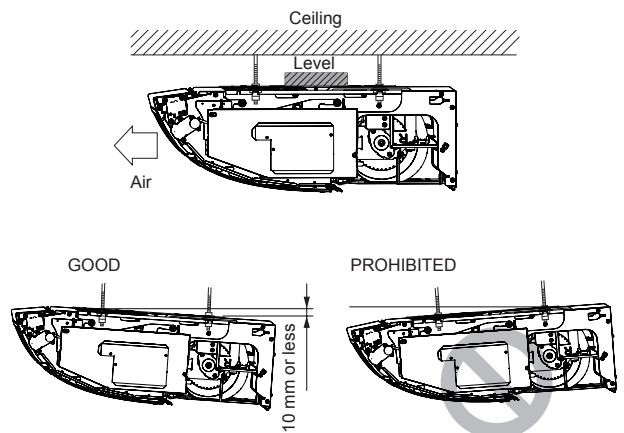
- Make sure that the unit is securely fixed.

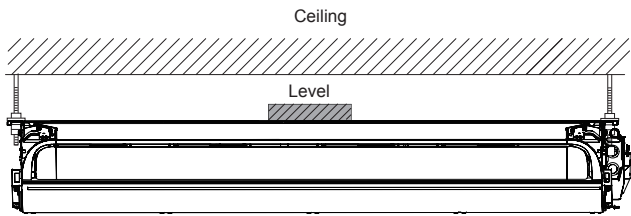
**CAUTION**

- In order to check the drainage, be sure to use a level during installation of the indoor unit. If the installation site of the indoor unit is not level, water leakage may occur.

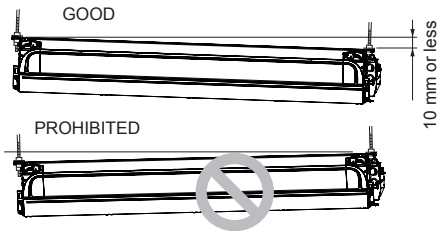
**3.3.7. Leveling**

Base horizontal direction leveling on top of the unit.





(1) For draining to the right side



(2) For draining to the left side



### 3. 4. 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 or R32 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

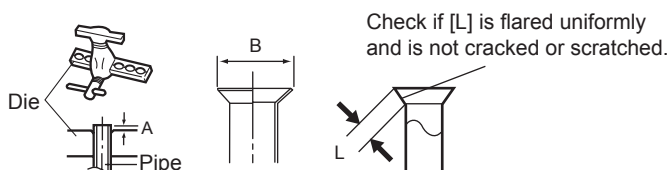
- Be more careful so that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant R410A or R32 models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.
- While brazing the pipes, be sure to purge with dry nitrogen gas.

#### 3.4.1. Pipe connection

##### ■ Flaring

Use special pipe cutter and flare tool designed for R410A or R32 pipework.

- (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 unit(s) and outdoor unit or branch box respectively) onto the pipe and perform the flare processing with a flare tool. Use the special R410A or R32 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 <sub>0.4</sub> [mm]
	Flare tool for R32, 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 R32 pipes, the dimension A should be approximately 0.5 mm more than indicated in the table (for flaring with R32 flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.

Width across flats



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

NOTES: The flare nut specification is compliant with ISO14903.

##### ■ Bending pipes

- If pipes are shaped by hand, be careful not to collapse them.
- Do not bend the pipes at 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.
- If the pipe is bent repeatedly at the same place, it will break.

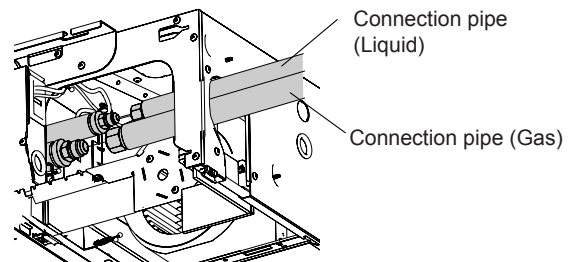
##### ■ Flare connection

#### ⚠ CAUTION

- Be sure to connect the pipe against the port on the indoor unit and the outdoor 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 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) Center the pipe against the port on the indoor unit, and then turn the flare nut by hand.

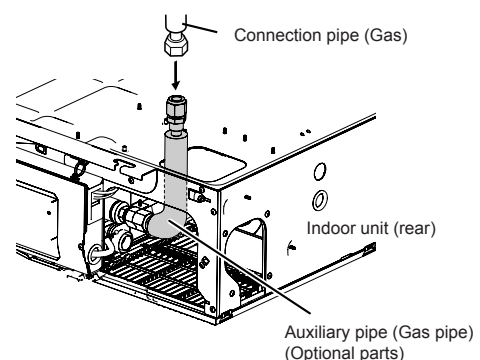


(3) When the flare nut is tightened properly by your hand, hold the body side coupling with a separate spanner, then tighten with a torque wrench. (See the table below for the flare nut tightening torques.)

(4) For ② Top piping connections, use the Auxiliary pipe (Optional parts).

• When the connection pipe for gas is attached (attach the liquid pipe in the same manner)

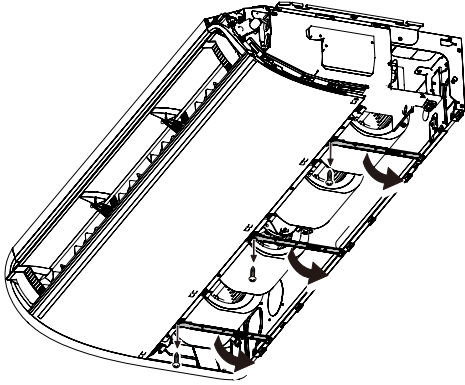
② Top piping





(5) For ④ Left rear piping and ⑤ Left piping, use the following procedure to install the connection pipe and attach the casing guard so that the fan motor and the casing do not contact the connection pipe.

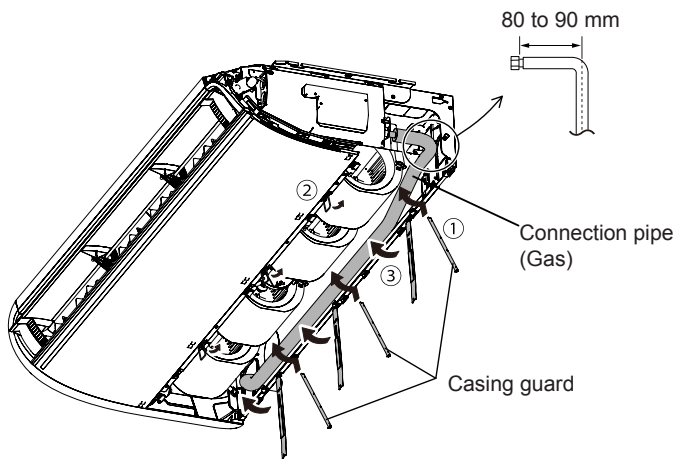
First, remove the screws and lower the plate.



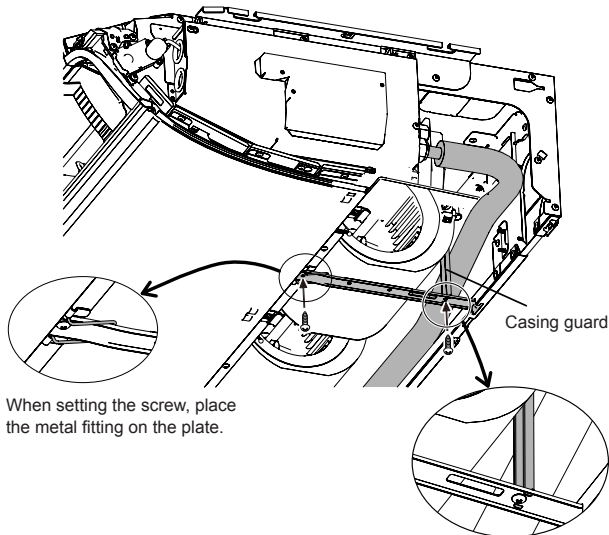
Install the connection pipe and fix it with the following order.

Perform this step on two positions for 18/22 Type, or three positions for 24/30/36/45/54 Type.

For the casing guard, use the one removed in 3.3. Installing the unit for 18/22 Type, and the accessory and the one removed for 24/30/36/45/54 Type.



Finally, fix two positions using the screw removed in the previous step and the accessory tapping screw.

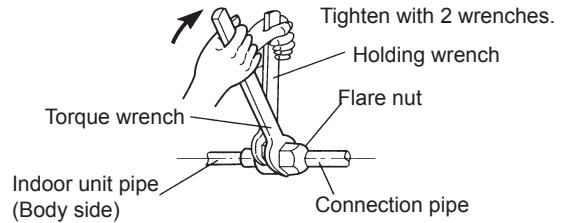


When setting the screw, place the metal fitting on the plate.

Insert into the upper and lower slits.

### ⚠ CAUTION

- Hold the torque wrench at its grip, keeping it in the right angle with the pipe, in order to tighten the flare nut correctly.
- Tighten the flare nuts with a torque wrench using the specified tightening method. Otherwise, the flare nuts could break after a prolonged period, causing refrigerant to leak and generate a hazardous gas if the refrigerant comes into contact with a flame.

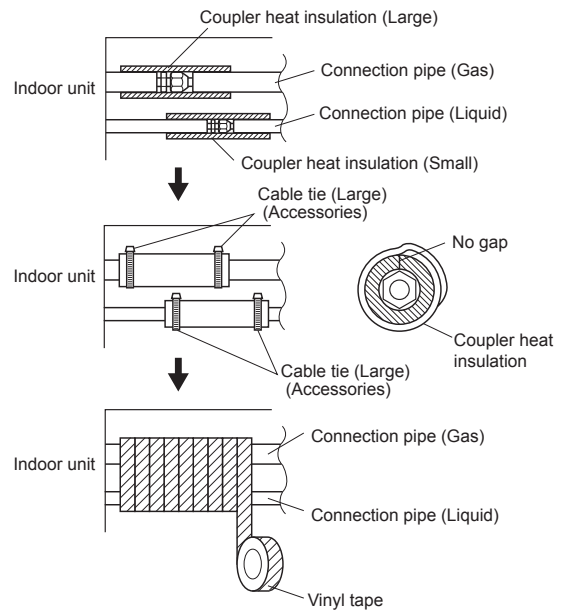


Flare nut [mm (in.)]	Tightening torque [N·m (kgf·cm)]
6.35 (1/4) dia.	16 to 18 (160 to 180)
9.52 (3/8) dia.	32 to 42 (320 to 420)
12.70 (1/2) dia.	49 to 61 (490 to 610)
15.88 (5/8) dia.	63 to 75 (630 to 750)
19.05 (3/4) dia.	90 to 110 (900 to 1,100)

### ■ Installing heat insulation

### ⚠ CAUTION

- After checking for gas leaks (refer to the Installation Manual of the outdoor unit), perform this section.
- Install heat insulation around both the large (gas) and small (liquid) pipes. Failure to do so may cause water leaks.
- After checking for gas leaks, insulate by wrapping insulation around the 2 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 cable tie.
- And finally fix connection pipe (Liquid) to connection pipe (Gas) by rolling vinyl tape over coupler heat insulation (Gas) and coupler heat insulation (Liquid).



- When using an auxiliary pipe, make sure that the cable tie used is insulated in the same way.

### ⚠ CAUTION

- There should be no gaps between the insulation and the unit.

### 3. 5. Drain installation

#### ⚠ WARNING

- Do not insert the drain piping into the sewer where sulfurous gas occurs. (Heat exchange erosion may occur.)
- Insulate the parts properly so that water will not drip from the connection parts.
- Check for proper drainage after the construction by using the visible portion of transparent drain port and the drain piping final outlet on the body.

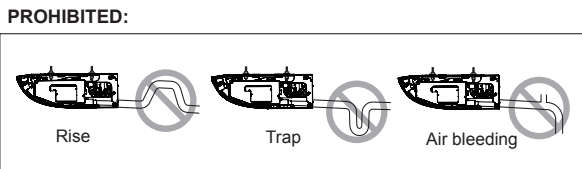
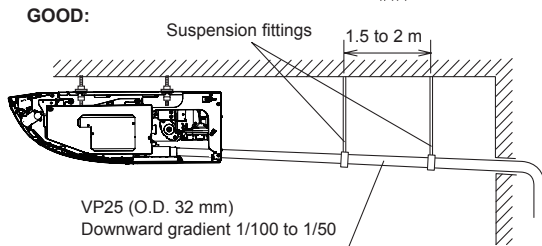
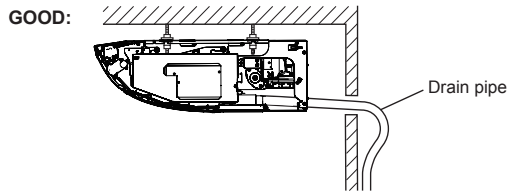
#### ⚠ CAUTION

- Do not apply adhesive agent on the drain port of the body. (Use the attached drain hose and connect the drain piping.)

#### 3.5.1. Installing the drain pipe:

- Install the drain pipe with downward gradient (1/50 to 1/100) and so there are no rises or traps in the pipe.
- Use general hard polyvinyl chloride pipe (VP25) [outside diameter 38 mm].
- During installation of the drain pipe, be careful to avoid applying pressure to the drain port of the indoor unit.
- When the pipe is long, install supporters.
- Do not perform air bleeding.
- Always heat insulate (8 mm or over thick) the indoor side of the drain pipe.
- If it is impossible to have sufficient gradient of pipe, perform drain lift-up.

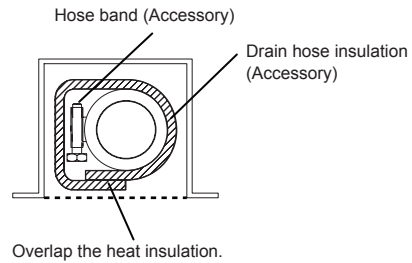
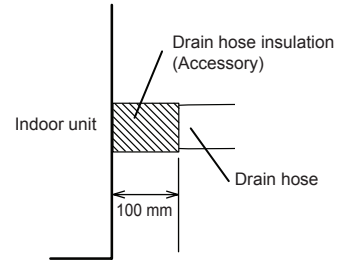
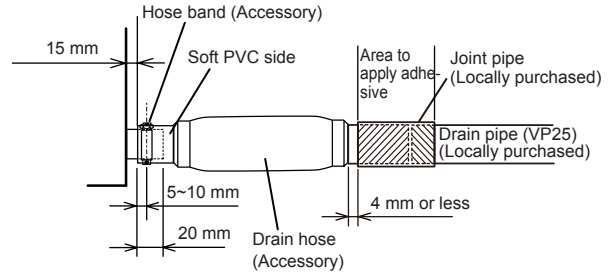
	Pipe size
Drain pipe	VP25 (O.D. 32 mm)



#### • How to install the drain hose

- (1) Install the drain hose (accessory) to the drain port of the indoor unit. Attach the hose band around the hose within the dimension shown. Secure firmly with the hose band.
- (2) Attach the drain pipe (locally purchased). Use general hard polyvinyl chloride pipe (VP25) [outside diameter 38 mm] and connect it with adhesive (polyvinyl chloride) so that there is no leakage.
- (3) Check the drainage.

- (4) Wrap the drain hose insulation around the drain hose connection.



### 3. 6. Electrical wiring

#### ⚠ WARNING

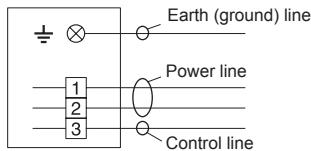
- Electrical work must be performed in accordance with this Manual by a person certified under the national or regional regulations. Be sure to use a dedicated circuit for the unit.  
An insufficient power supply circuit or improperly performed electrical work can cause serious accidents such as electric shock or fire.
- Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.
- Use the included connection cables and power cables or ones specified by the manufacturer. Improper connections, insufficient insulation, or exceeding the allowable current can cause electric shock or fire.
- For wiring, use the prescribed type of cables, connect them securely, making sure that there are no external forces of the cables applied to the terminal connections. Improperly connected or secured cables can cause serious accidents such as overheating the terminals, electric shock, or fire.
- Do not modify the power cables, use extension cables, or use any branches in the wiring. Improper connections, insufficient insulation, or exceeding the allowable current can cause electric shock or fire.
- Match the terminal board numbers and connection cable 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.)
- Securely install the electrical box cover on the unit. An improperly installed electrical box cover can cause serious accidents such as electric shock or fire through exposure to dust or water.
- Install sleeves into any holes made in the walls for wiring. Otherwise, a short circuit could result.
- Install a earth (ground) leakage breaker. In addition, install the earth (ground) leakage breaker so that the entire AC main power supply is cut off at the same time. Otherwise, electric shock or fire could result.
- Always connect the earth (ground) cable.  
Improper earthing (grounding) work can cause electric shocks.
- Install the remote controller cables so as not to be touched directly with your hand.
- Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.
- Unit shall be earthed (grounded) in compliance with the applicable local and national codes.

**CAUTION**

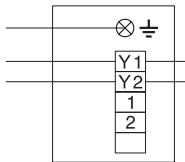
- If the indoor unit connection cable and power supply are wired incorrectly, the air conditioner may be damaged or cause malfunction.
- Ground the unit.  
Do not connect the earth (ground) cable to a gas pipe, water pipe, lightning rod, or a telephone earth (ground) cable.  
Improper earthing (grounding) may cause electric shock.
- Do not connect power supply cables to the transmission or remote controller terminals, as this will damage the product.
- Never bundle the power supply cable and transmission cable together. Bundling these cables together will cause miss operation.
- When handling PCB, static electricity charged in the body may cause malfunction of the PCB. Follow the cautions below:
  - Establish a ground for the indoor and outdoor units and peripheral devices.
  - Cut power (breaker) off.
  - Touch metal part of the indoor and outdoor units for more than 10 seconds to discharge static electricity charged in the body.
  - Do not touch terminals of parts and patterns implemented on PCB.
- Be careful not to generate a spark as follows for using a flammable refrigerant.
  - Do not remove the fuse while power is on.
  - Do not disconnect plug from the wall outlet and the wiring while the power is on.
  - It is recommended to position the outlet connection in a high position. Place the cords so that they do not get tangled.

**3.6.1. Wiring system diagram**

**Connection cable to outdoor unit**



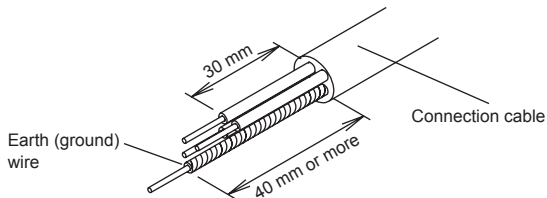
**Wired remote controller cable**



**3.6.2. Connection cable preparation**

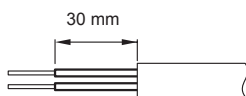
■ **Connection cable**

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



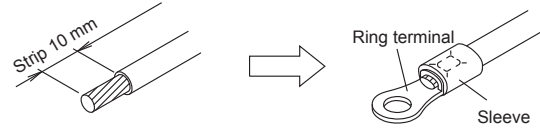
• Use a 4-core wire cable.

■ **Remote controller cable**



**3.6.3. How to connect wiring to the terminals.**

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

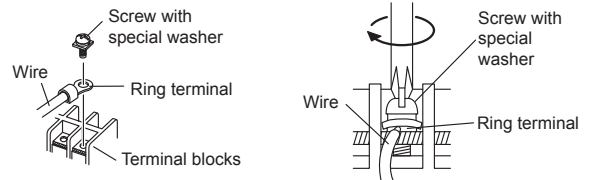


- (3) Use the specified wires, connect them securely, and fasten them so that there is no stress placed on the terminals.
- (4) Use an appropriate screwdriver to tighten the terminal screws.  
Do not use a screwdriver that is too small, otherwise, the screw heads may be damaged and prevent the screws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

**WARNING**

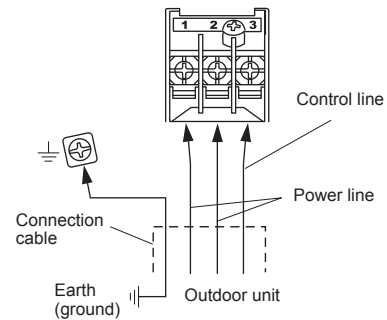
- Use ring terminals and tighten the terminal screws to the specified torques, otherwise, it may cause abnormal overheating and possibly cause serious damage inside the unit.

Tightening torque [N·m (kgf·cm)]	
M4 screw	1.2 to 1.8 (12 to 18)

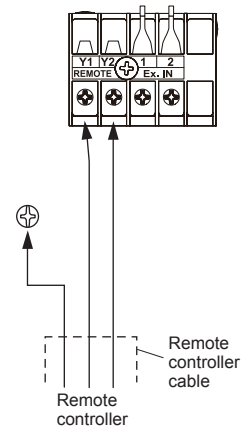


**3.6.4. Wiring procedure**

■ **Connection cable**



■ **Remote controller cable**



\*Earth (Ground) the remote controller if it has a earth (ground) wire.

**CAUTION**

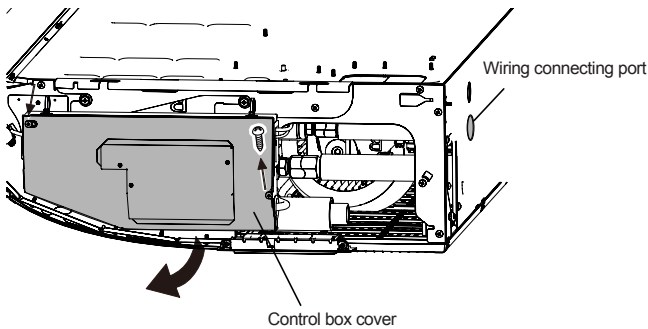
- Tighten the indoor unit connection wire and power supply indoor and outdoor unit, terminal board connections firmly with the terminal board screws. Faulty connection may cause a fire.
- Connect the indoor unit connection wire by matching the numbers of the outdoor and indoor units terminal board numbers as shown in terminal label.
- Be sure to refer to the connection diagram for the correct field wiring. Wrong wiring causes malfunction of the unit.

**3.6.5. Connection wiring**

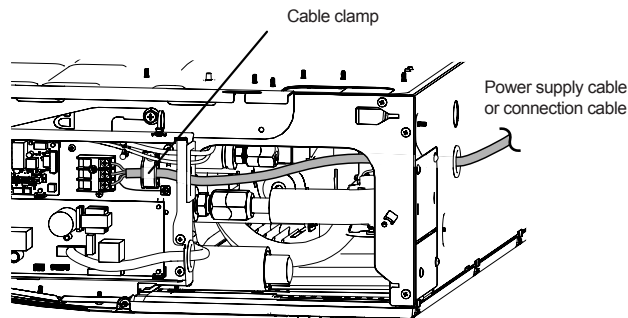
**CAUTION**

- Be careful not to mistake the power supply cable and connection wires when installing.
- Install so that the wires for the remote controller will not come in contact with other connection wires.

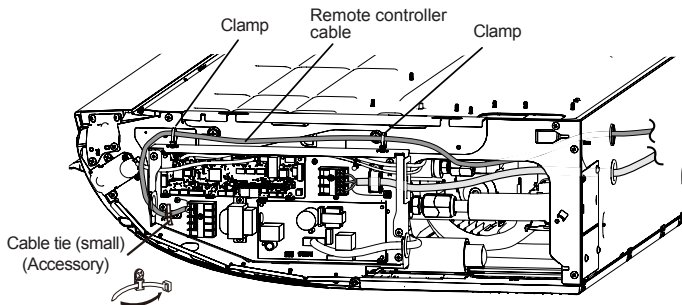
(1) Remove one screw and loosen another screw to slide down the control box cover.



(2) Thread each cable through the holes or indents of the cabinet and connect the wires.  
 (3) After wiring is complete, secure the cables with the cable clamps.



(4) Pass the remote controller cable through the knockout hole that you opened in the previous step, and fix the cable with the cable tie.



(5) Replace the Control box cover. Securely tighten the screws.

※ Cure the wiring connecting port and remote controller connecting port with paste or heat insulation so that insects or dust will not enter the unit

**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.

**3.7. Remote controller installation**

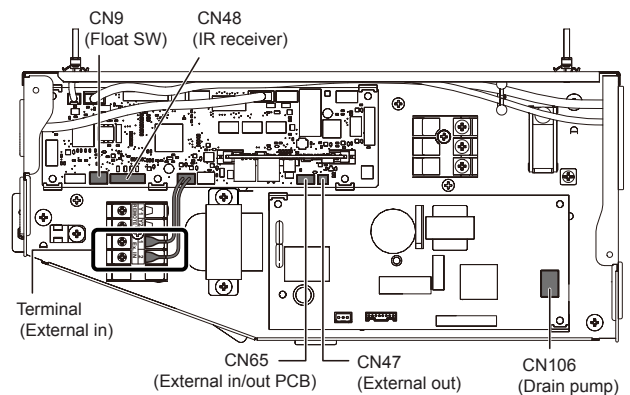
- Install according to the installation manual for remote controller.

**4. OPTIONAL INSTALLATION WORK**

**4.1. Optional kit installation**

**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. For details on how to install optional parts, refer to the installation manual included in each item.

Connector No.	Option type
CN48	IR Receiver (UTY-LBT*H)
CN47*1	Connect wire (UTY-XWZXZG)
CN47*1 (UTY-XCSX)*2	Fresh air intake
CN65*3	External input and output PCB (UTY-XCSX)
CN106	Drain pump (UTR-DPB24T)
CN9	Float SW (UTR-DPB24T)

\*1: For external output terminal setting, refer to Function No.60 in "6. FUNCTION SETTING".

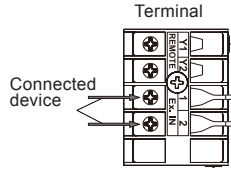
\*2: Refer to the installation manual of the External input and output PCB.

\*3: Other options (WLAN adapter, converters, etc.) may be available by using the optional External input and output PCB.

## 4.2. External input and output

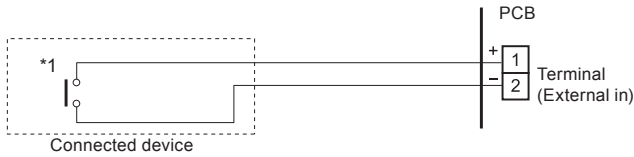
### 4.2.1. External input

- Indoor unit functions such as Operation/Stop or Forced stop can be done by using indoor unit terminals.
- "Operation/Stop" mode or "Forced stop" mode can be selected with function setting of indoor unit.
- A twisted pair cable (22 AWG) should be used. Maximum length of cable is 150 m (492 ft.).
- Use an external input and output cable with appropriate external dimension, depending on the number of cables to be installed.
- The wire connection should be separate from the power cable line.



#### • Dry contact terminal

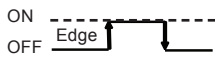
When a power supply is unnecessary at the input device you want to connect, use the Dry contact terminal.



\*1: The switch can be used on the following condition: DC 12 V to 24 V, 1 mA to 15 mA.

#### ■ Operation behavior

##### • Input signal type



#### When function setting is "Operation/Stop" mode 1.

Input signal	Command
OFF → ON	Operation
ON → OFF	Stop

#### When function setting is "Forced stop" mode.

Input signal	Command
OFF → ON	Forced stop
ON → OFF	Normal

\* When the forced stop is triggered, indoor unit stops and Operation/Stop operation by a remote controller is restricted.

#### When function setting is "Operation/Stop" mode 2.

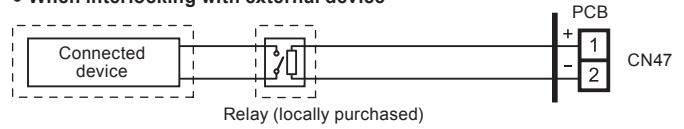
Input signal	Command
OFF → ON	Operation
ON → OFF	Stop (R.C. disabled)

### 4.2.2. External output

- A twisted pair cable (22AWG) should be used. Maximum length of cable is 25 m (82 ft.).
- Use an external input and output cable with appropriate external dimension, depending on the number of cables to be installed.
- Output voltage: Hi DC12V±2V, Lo 0V.
- Permissible current: 50mA

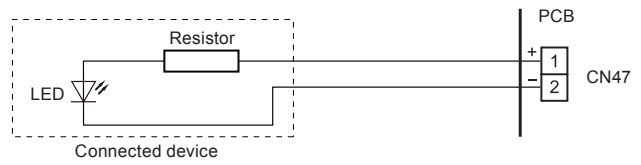
### ■ Output select

#### • When interlocking with external device



OR

#### • When displaying "Operation/Stop"



### ■ Operation behavior

\*If function setting "60" is set to "00"

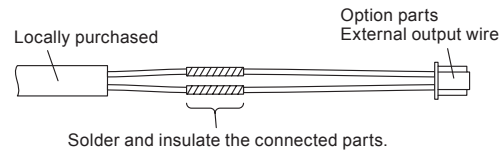
Function setting	Status	Output voltage
00	Stop	0V
	Operation	DC 12 V
09	Normal	0V
	Error	DC 12 V
10	Indoor unit fan stop	0V
	Indoor unit fan operation	DC 12 V
11	External heater OFF	0 V
	External heater ON	DC 12V

### 4.2.3. Connection methods

#### Wire modification

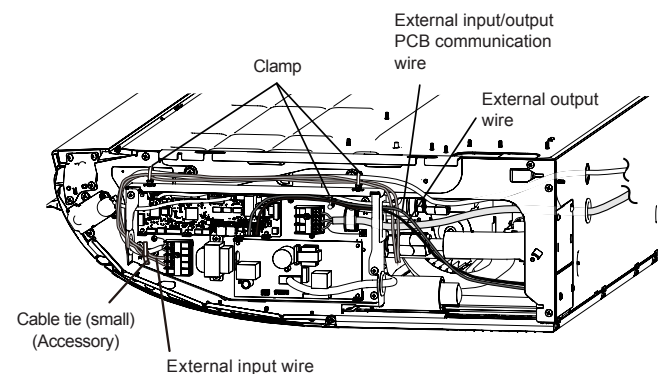
- Remove insulation from wire attached to wire kit connector.
- Remove insulation from locally purchased cable. Use crimp type insulated butt connector to join field cable and wire kit wire.
- Connect the wire with connecting wire with solder.

**IMPORTANT:** Be sure to insulate the connection between the wires.



- Connecting wires to the terminals.  
Use ring terminals with insulating sleeves to connect to the terminal block.
- Connection terminals and wiring arrangement

In following figure, all the possible connections are done for description. In actual installation, connections will differ according to each installation requirements.



## 5. REMOTE CONTROL INSTALLATION

### CAUTION

- Be sure to turn off the electrical breaker before making settings.
- Do not set the DIP switch or rotary switch of this unit except as specified in this manual or the operating manual supplied with the air conditioner.
- Setting the switches other than specified will cause an accident or trouble.
- Do not touch the circuit board and circuit board parts directly with your hands. Otherwise, injury or electric shock could result.
- Use an insulated screwdriver to set the dip switches.

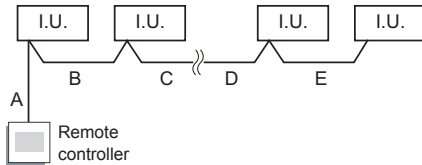
### 5.1. Group control

### CAUTION

- Group control is only possible between units with remote controllers of the same type. To confirm the type of remote controller, see the back of the remote controller or "2. 5. Optional parts".

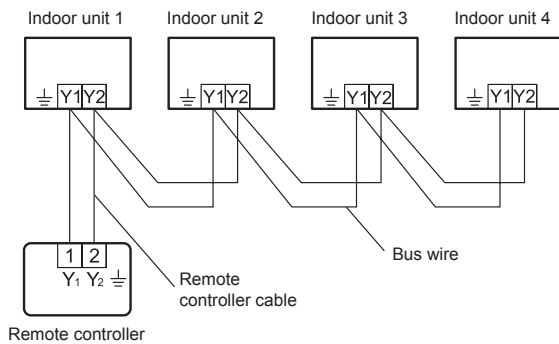
A number of indoor units can be operated at the same time using a single remote controller.

(1) Connect up to 16 indoor units in a system. (indoor unit to remote controller)



A, B, C, D, E : Remote controller cable. (Refer to "2. 4. Electrical requirement")  
 $A+B+C+D+E \leq 500$  m.

Example of wiring method



(2) Set the R.C. address

DIP switch (RC AD SW)...Factory setting "00"

Since the remote controller address settings are automatically configured, you do not need to configure them.

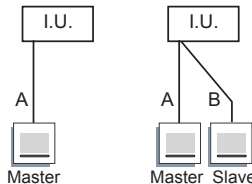
If configuring manually, it is necessary to configure both the indoor unit and the remote controller. For details, please refer to the remote controller installation manual.

### 5.2. Multiple remote control

Up to 2 remote controllers can be used to operate the indoor units.

### CAUTION

- Multiple installation method described above is prohibited to combine 3 Wired type with 2 Wired Type.



A, B : Remote controller cable. (Refer to "2. 4. Electrical requirement".)  
 $A \leq 500$  m,  $A+B \leq 500$  m

## 6. FUNCTION SETTING

Refer to the installation manual of remote controller for setting method.

### 6.1. Function details

#### Filter sign

Select appropriate intervals for displaying the filter sign on the indoor unit according to the estimated amount of dust in the air of the room.

If the indication is not required, select "No indication" (03).

(♦... Factory setting)

Function number	Setting value	Setting description
11	00	Standard (2500 hours)
	01	Long interval (4400 hours)
	02	Short interval (1250 hours)
	03	No indication

#### Ceiling height

Select the appropriate ceiling height according to the place of installation.

(♦... Factory setting)

Function number	Setting value	Setting description
20	00	Standard (2.7 m : 18/22/24/30 type) (3.5 m : 36/45/54 type)
	01	High ceiling (3.5 m : 18/22/24/30 type) (4.3 m : 36/45/54 type)

The ceiling height values are for the 4-way outlet.

Do not change this setting in the 3-way outlet mode.

#### Horizontal louver direction switching for dew condensation prevention

Automatically switches the position of the horizontal louver if the airflow direction is set at lower than the dew condensation limit position in cooling or drying operation.

Select suitable adjustment position according to the customer's preference.

(♦... Factory setting)

Function number	Setting value	Setting description
28	00	Adjust to dew condensation limit position
	01	Adjust to cooling standard position

#### Room temperature control for indoor unit sensor

Depending on the installed environment, correction of the room temperature sensor may be required.

Select the appropriate control setting according to the installed environment.

The temperature correction values show the difference from the Standard setting "00" (manufacturer's recommended value).

(♦... Factory setting)

Function number	Setting value	Setting description
30 (For cooling)	00	Standard setting
	01	No correction 0.0 °C (0 °F)
	02	-0.5 °C (-1 °F)
	03	-1.0 °C (-2 °F)
	04	-1.5 °C (-3 °F)
	05	-2.0 °C (-4 °F)
	06	-2.5 °C (-5 °F)
	07	-3.0 °C (-6 °F)
	08	-3.5 °C (-7 °F)
	09	-4.0 °C (-8 °F)
	10	+0.5 °C (+1 °F)
	11	+1.0 °C (+2 °F)
	12	+1.5 °C (+3 °F)
	13	+2.0 °C (+4 °F)
	14	+2.5 °C (+5 °F)
	15	+3.0 °C (+6 °F)
	16	+3.5 °C (+7 °F)
17	+4.0 °C (+8 °F)	

■ **Room temperature control for wired remote controller sensor**

Depending on the installed environment, correction of the wire remote temperature sensor may be required.

Select the appropriate control setting according to the installed environment.

To change this setting, set Function 42 to Both "01".

Ensure that the Thermo Sensor icon is displayed on the remote controller screen.

(◆... Factory setting)

Function number	Setting value	Setting description	
35 (For cooling)	36 (For heating)	00	No correction
		01	No correction 0.0 °C (0 °F)
		02	-0.5 °C (-1 °F)
		03	-1.0 °C (-2 °F)
		04	-1.5 °C (-3 °F)
		05	-2.0 °C (-4 °F)
		06	-2.5 °C (-5 °F)
		07	-3.0 °C (-6 °F)
		08	-3.5 °C (-7 °F)
		09	-4.0 °C (-8 °F)
		10	+0.5 °C (+1 °F)
		11	+1.0 °C (+2 °F)
		12	+1.5 °C (+3 °F)
		13	+2.0 °C (+4 °F)
		14	+2.5 °C (+5 °F)
		15	+3.0 °C (+6 °F)
		16	+3.5 °C (+7 °F)
17	+4.0 °C (+8 °F)		

More Cooling  
Less Heating

Less Cooling  
More Heating

■ **Auto restart**

Enable or disable automatic restart after a power interruption.

(◆... Factory setting)

Function number	Setting value	Setting description
40	00	Enable
	01	Disable

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

■ **Room temperature sensor switching**

(Only for wireless remote controller)

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

(◆... Factory setting)

Function number	Setting value	Setting description
42	00	Indoor unit
	01	Both

00: Sensor on the indoor unit is active.

01: Sensors on both indoor unit and wired remote controller are active.

\* Remote controller sensor must be turned on by using the remote controller

■ **Remote controller custom code**

(Only for wireless remote controller)

The indoor unit custom code can be changed.

Select the appropriate custom code.

(◆... Factory setting)

Function number	Setting value	Setting description
44	00	A
	01	B
	02	C
	03	D

■ **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 1
	01	(Setting prohibited)
	02	Forced stop mode
	03	Operation/Stop mode 2

■ **Room temperature sensor switching (Aux.)**

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

(◆... Factory setting)

Function number	Setting value	Setting description
48	00	Both
	01	Wired remote controller

■ **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.

Set to "00" or "01" when connecting a remote controller that cannot set the Fan control for energy saving function or connecting a network converter.

To confirm if the remote controller has this setting, refer to the operating manual of each remote controller.

■ **Switching functions for external output terminal**

Functions of the external output terminal can be switched.

(◆... Factory setting)

Function number	Setting value	Setting description
60	00	Operation status
	09	Error status
	10	Indoor unit fan operation status
	11	External heater

■ **Setting record**

• Record any changes to the settings in the following table.

Function number	Setting	Setting value
11	Filter sign	
20	Ceiling height	
28	Horizontal louver direction switching for dew condensation prevention	
30	Room temperature control for indoor unit sensor	Cooling
31		Heating
35	Room temperature control for wired remote controller sensor	Cooling
36		Heating
40	Auto restart	
42	Room temperature sensor switching	
44	Remote controller custom code	
46	External input control	
48	Room temperature sensor switching (Aux.)	
49	Indoor unit fan control for energy saving for cooling	
60	Switching function for external outlet terminal	

After completing the function setting, be sure to turn off the power and turn it on again.

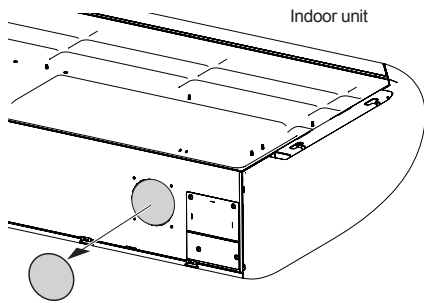
## 7. CHECK LIST

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?		

## 8. FRESH-AIR INTAKE

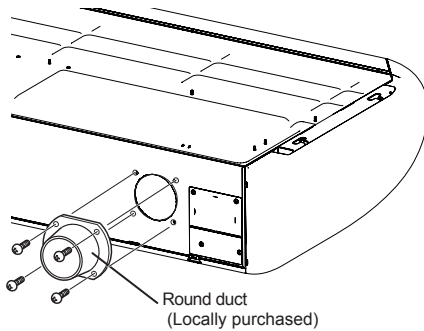
(1) Open up the knockout hole for the fresh-air intake, as shown in the figure.



### CAUTION

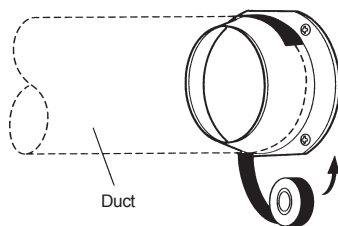
- When removing the cabinet (iron plate), be careful not to damage the indoor unit internal parts and surrounding area (outer case).
- When processing the cabinet (iron plate), be careful not to injure yourself with burrs, etc.

(2) Fasten the round flange (optional) to the fresh-air intake, as shown in the figure. (If using half-concealed installation, attach to the top.)



[After completing "3. INSTALLATION WORK"]

- (3) Connect the duct to the round flange.
- (4) Seal with a band and vinyl tape, etc. so that air does not leak from the connection.



## 9. TEST RUN

### Check items

- (1) Is operation of each button on the remote control unit normal?
- (2) Do airflow direction louvers operate normally?
- (3) Is the drain normal?
- (4) Do not have an abnormal noise and vibration during operation?

Do not operate the air conditioner in test run for a long time.

### [Operation method]

Depending on your installation, choose from the following:

By the wireless remote controller (with [TEST RUN] button)

- To start test run, press the [START/STOP] button and the [TEST RUN] button on the remote controller.
- To end test run, press the remote controller [START/STOP] button.

By the indoor unit or IR receiver unit

- To start test run, press the [MANUAL AUTO] button of the unit for more than 10 seconds (forced cooling).
- To end test run, press the [MANUAL AUTO] button for more than 3 seconds or press the remote controller [START/STOP] button.

By the wired remote controller

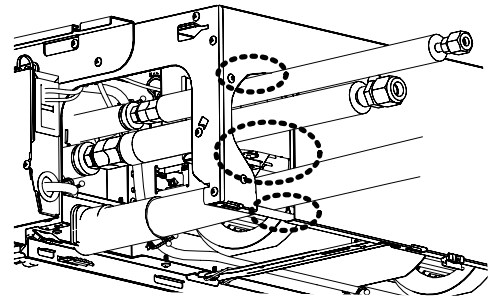
- For the operation method, refer to the installation manual and the operating manual of the wired remote controller.

Heating test run will begin in a few minutes when HEAT is selected by the remote controller [reverse cycle model only].

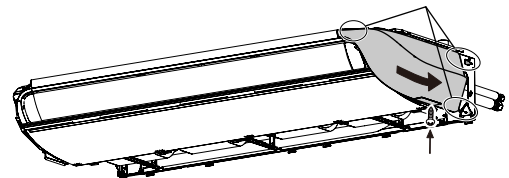
## 10. FINISHING

When all installation procedures complete, fill the gap around the pipe/drain with the putty, attach the side panels, then fix the grilles and the screws.

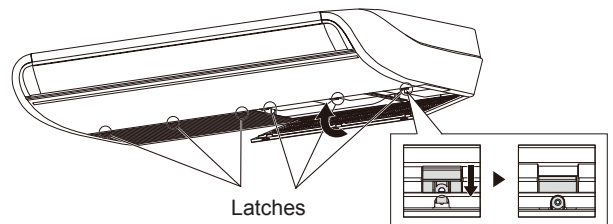
(1) Putty the pipe/drain gaps



(2) Align three hooks of the side panel, and fix it to the backward. Then, fix it with the screw.  
Attach both left and right side panels.

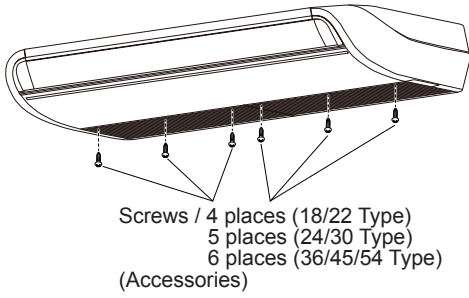


(3) Attach the grille and lock it with the latches.





(4) Finally, fix the grille with the accessory tapping screws.



## 11. CUSTOMER GUIDANCE

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

- (1) Starting and stopping method, operation switching, temperature adjustment, timer, air flow switching, and other remote controller unit operations.
- (2) Cleaning and maintenance of the product, and other items such as air filters and air louvers if applicable.
- (3) Give the operating and installation manuals to the customer.
- (4) If the signal code is changed, explain to the customer how it changed (the system returns to signal code A when the batteries in the remote controller unit are replaced).  
\*(4) is applicable to using wireless remote controller.

## 12. ERROR CODES

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

The error code table contains errors irrelevant to this product as well.

Error display			Wired remote controller Error code	Description
OPERATION lamp (green)	TIMER lamp (orange)	ECONOMY lamp (green)		
●(1)	●(1)	◇	11	Serial communication error
●(1)	●(2)	◇	12	Wired remote controller communication error
●(1)	●(5)	◇	15	Check run unfinished
●(1)	●(6)	◇	16	Peripheral unit transmission PCB connection error
●(1)	●(8)	◇	18	External communication error
●(2)	●(1)	◇	21	Unit number or Refrigerant circuit address setting error [Simultaneous Multi]
●(2)	●(2)	◇	22	Indoor unit capacity error
●(2)	●(3)	◇	23	Combination error
●(2)	●(4)	◇	24	• Connection unit number error (indoor secondary unit) [Simultaneous Multi] • Connection unit number error (indoor unit or branch unit) [Flexible Multi]
●(2)	●(6)	◇	26	Indoor unit address setting error
●(2)	●(7)	◇	27	Primary unit, secondary unit setup error [Simultaneous Multi]

Error display			Wired remote controller Error code	Description
OPERATION lamp (green)	TIMER lamp (orange)	ECONOMY lamp (green)		
●(2)	●(9)	◇	29	Connection unit number error in wired remote controller system
●(3)	●(1)	◇	31	Power supply interruption error
●(3)	●(2)	◇	32	Indoor unit PCB model information error
●(3)	●(5)	◇	35	Manual auto switch error
●(3)	●(9)	◇	39	Indoor unit power supply error for fan motor
●(3)	●(10)	◇	3A	Indoor unit communication circuit (wired remote controller) error
●(4)	●(1)	◇	41	Room temp. sensor error
●(4)	●(2)	◇	42	Indoor unit Heat Ex. Middle temp. sensor error
●(4)	●(4)	◇	44	Human sensor error
●(5)	●(1)	◇	51	Indoor unit fan motor error
●(5)	●(3)	◇	53	Drain pump error
●(5)	●(7)	◇	57	Damper error
●(5)	●(15)	◇	5U	Indoor unit error
●(6)	●(1)	◇	61	Outdoor unit reverse/missing phase and wiring error
●(6)	●(2)	◇	62	Outdoor unit main PCB model information error or communication error
●(6)	●(3)	◇	63	Inverter error
●(6)	●(4)	◇	64	Active filter error, PFC circuit error
●(6)	●(5)	◇	65	Trip terminal L error
●(6)	●(8)	◇	68	Outdoor unit rush current limiting resistor temp. rise error
●(6)	●(10)	◇	6A	Display PCB microcomputers communication error
●(7)	●(1)	◇	71	Discharge temp. sensor error
●(7)	●(2)	◇	72	Compressor temp. sensor error
●(7)	●(3)	◇	73	Outdoor unit Heat Ex. liquid temp. sensor error
●(7)	●(4)	◇	74	Outdoor temp. sensor error
●(7)	●(5)	◇	75	Suction Gas temp. sensor error
●(7)	●(6)	◇	76	• 2-way valve temp. sensor error • 3-way valve temp. sensor error
●(7)	●(7)	◇	77	Heat sink temp. sensor error
●(8)	●(2)	◇	82	• Sub-cool Heat Ex. gas inlet temp. sensor error • Sub-cool Heat Ex. gas outlet temp. sensor error

Error display			Wired remote controller Error code	Description
OPERATION lamp (green)	TIMER lamp (orange)	ECONOMY lamp (green)		
●(8)	●(3)	◇	83	Liquid pipe temp. sensor error
●(8)	●(4)	◇	84	Current sensor error
●(8)	●(6)	◇	86	• Discharge pressure sensor error • Suction pressure sensor error • High pressure switch error
●(9)	●(4)	◇	94	Trip detection
●(9)	●(5)	◇	95	Compressor rotor position detection error (permanent stop)
●(9)	●(7)	◇	97	Outdoor unit fan motor 1 error
●(9)	●(8)	◇	98	Outdoor unit fan motor 2 error
●(9)	●(9)	◇	99	4-way valve error
●(9)	●(10)	◇	9A	Coil (expansion valve) error
●(10)	●(1)	◇	A1	Discharge temp. error
●(10)	●(3)	◇	A3	Compressor temp. error
●(10)	●(4)	◇	A4	High pressure error
●(10)	●(5)	◇	A5	Low pressure error
●(13)	●(2)	◇	J2	Branch boxes error [Flexible Multi]

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