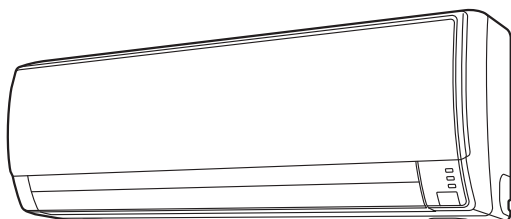


**AIR CONDITIONER
INDOOR UNIT
Compact Wall Mounted Type**

INSTALLATION MANUAL



INSTALLATION MANUAL

For authorized service personnel only.

English

INSTALLATIONSANLEITUNG

Nur für autorisiertes Personal.

Deutsch

MANUEL D'INSTALLATION

Pour le personnel agréé uniquement.

Français

MANUAL DE INSTALACIÓN

Solo para personal autorizado.

Español

MANUALE D'INSTALLAZIONE

Ad uso esclusivo del personale autorizzato.

Italiano

ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ

Για εξουσιοδοτημένο προσωπικό σέρβις.

Ελληνικά

MANUAL DE INSTALAÇÃO

Apenas para técnicos autorizados.

Português

РУКОВОДСТВО ПО УСТАНОВКЕ

Для уполномоченного персонала.

Русский

KURULUM KILAVUZU

Yetkili servis personeli içindir.


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.
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.	

 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.
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.

2. ABOUT THE UNIT

2.1. Precautions for using R410A refrigerant


The basic installation work procedures are the same as conventional refrigerant (R22) models. However, pay careful attention to the following points:
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.
Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant (R22) and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 inch.]
Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant (R22) models. Also, when storing the piping, securely seal the opening by pinching, taping, etc.
When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases. And always charge from the liquid phase where refrigerant composition is stable.

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 (-1 to 53 bar) for high pressure. -0.1 to 3.8 MPa (-1 to 38 bar) 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.

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 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 R410A materials.)
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 failure, injury, etc.

2.3. For authorized service personnel only.

⚠ WARNING

For the air conditioner to operate satisfactorily, install it as outlined in this installation manual.

Connect the indoor unit and outdoor unit with the air conditioner piping and cables available from your local distributor. This installation manual describes the correct connections using the installation set available from your local distributor.

Installation work must be performed in accordance with national wiring standards by authorized personnel only.

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



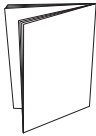
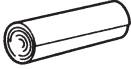
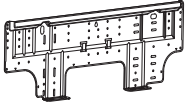

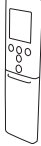

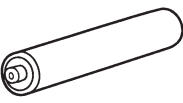

⚠ CAUTION

This installation manual describes how to install the indoor unit only. To install the outdoor unit, refer to the installation manual included with the outdoor unit.

- Be careful not to scratch the air conditioner when handling it.
- After installation, explain correct operation to the customer, using the operating manual.

2.4. Accessories

The following installation accessories are supplied. Use them as required.

Name and Shape	Q'ty	Name and Shape	Q'ty
Operating Manual 	1	Remote controller holder 	1
Installation Manual (This manual) 	1	Cloth tape 	1
Wall hook bracket 	1	Tapping screw (M4 × 25 mm) 	8
Remote controller 	1	Tapping screw (M3 × 12 mm) 	2
Battery 	2	Air cleaning filter 	2

The following items are necessary to install this air conditioner. (The items are not included with the air conditioner and must be purchased separately.)

Name	Q'ty	Name	Q'ty
Connection pipe assembly	1	Wall cap	1
Connection cable (4-conductor)	1	Saddle	1 set
Wall pipe	1	Drain hose	1
Decorative tape	1	Tapping screws	1 set
Vinyl tape	1	Sealant	1

2.5. Optional parts

Refer to each installation manual for the method of installing optional parts.

Parts name	Model No.	Application
Wired Remote Controller *	UTY-RNN*M	For air conditioner operation
Simple Remote Controller *	UTY-RSN*M	For air conditioner operation
External connect kit *	UTY-XWZX	For control input/output port
Communication kit	UTY-XCBXZ1	For the installation of optional parts

* Optional communication kit is necessary for the installation.

3. GENERAL

This INSTALLATION MANUAL briefly outlines where and how to install the air conditioning system. Please read over the entire set of instructions for the indoor and outdoor units and make sure all accessory parts listed are with the system before beginning.

3.1. Type of copper pipe and insulation material

⚠ CAUTION

Refer to the installation manual for the outdoor unit for description of allowable pipe length and height difference.

Diameter	
Liquid pipe	Gas pipe
6.35 mm (1/4 in.)	12.7 mm (1/2 in.)

⚠ 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 20 °C.

3.2. Additional materials required for installation

- A. Refrigeration (armored) tape
- B. Insulated staples or clamps for connecting wire (See your local electrical codes.)
- C. Putty
- D. Refrigeration lubricant
- E. Clamps or saddles to secure refrigerant piping

4. ELECTRICAL REQUIREMENT

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

⚠ WARNING

Refer to local codes for acceptable cable type.

Cable	Cable size	Remarks
Connection cable	Type 60245 IEC 57 (1.5 mm ²)	3 cable + Ground, 1 Ø 230 V

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

5. SELECTING THE MOUNTING POSITION

Decide the mounting position with the customer as follows:

5.1. Indoor unit

- (1) Install the indoor unit level on a strong wall which is not subject to vibration.
- (2) The inlet and outlet ports should not be obstructed : the air should be able to blow all over the room.
- (3) Install the unit a dedicated electrical branch circuit.
- (4) Do not install the unit where it will be exposed to direct sunlight.
- (5) Install the unit where connection to the outdoor unit is easy.
- (6) Install the unit where the drain pipe can be easily installed.
- (7) Take servicing, etc. into consideration and leave the spaces shown in [6.1. Installation dimensions]. Also install the unit where the filter can be removed.

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

WARNING

Select installation locations that can properly support the weight of the indoor. Install the units securely so that they do not topple or fall.

CAUTION

Do not install the unit 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 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.

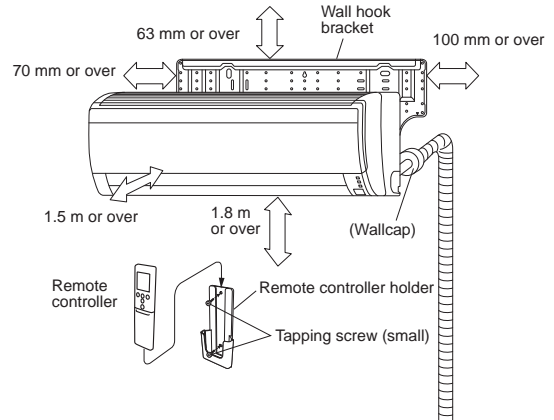
Install the indoor unit, outdoor unit, power supply cable, transmission cable, and remote control cable at least 1 m away from a television or radio receivers. The purpose of this is to prevent TV reception interference or radio noise. (Even if they are installed more than 1 m apart, you could still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

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 wall where the height from the floors more than 1800 mm.

6. INSTALLATION WORK

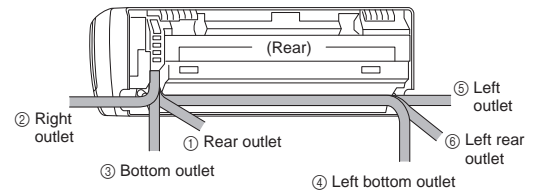
6.1. Installation dimensions



6.2. Indoor unit piping direction

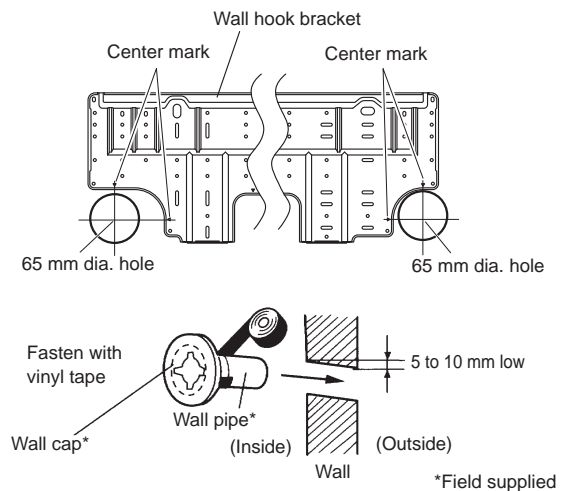
The piping can be connected in the 6 directions indicated in the following.

When the piping is connected in direction ②, ③, ④ or ⑤, cut along the piping groove in the side of the front cover with a hacksaw.



6.3. Cutting the hole in the wall for the connecting piping

- (1) Cut a 65 mm diameter hole in the wall at the position shown in the following.
- (2) Cut the hole so that the outside end is lower (5 to 10 mm) than the inside end.
- (3) Always align the center of the wall hole. If misaligned, water leakage will occur.
- (4) Cut the wall pipe to match the wall thickness, stick it into the wall cap, fasten the cap with vinyl tape, and stick the pipe through the hole.
- (5) For left piping and right piping, cut the hole a little lower so that drain water will flow freely.

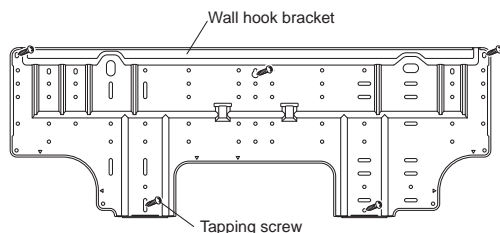


WARNING

If the wall pipe is not used, the cable interconnecting the indoor unit(s) and outdoor unit may touch metal and cause electric discharge.

6.4. Installing the wall hook bracket

- (1) Install the wall hook bracket so that it is correctly positioned horizontally and vertically. If the wall hook bracket is tilted, water will drip to the floor.
- (2) Install the wall hook bracket so that it is strong enough to support the weight of the unit.
 - Fasten the wall hook bracket to the wall with 5 or more screws through the holes near the outer edge of the bracket.
 - Check that there is no rattle at the wall hook bracket.



CAUTION

Install the wall hook bracket level, both horizontally and vertically.

6.5. Forming the drain hose and pipe

[Rear piping, Right piping, Bottom piping]

- Install the indoor unit piping in the direction of the wall hole and bind the drain hose and pipe together with vinyl tape.
- Install the piping so that the drain hose is at the bottom.
- Wrap the pipes of the indoor unit that are visible from the outside with decorative tape.

[For Left rear piping, Left piping]

Interchange the drain cap and the drain hose.

CAUTION

Insert drain hose and drain cap securely. Drain should slope down to avoid water leakage.

When inserting, be sure not to attach any material besides water. If any other material is attached, it will cause deterioration and water leakage.

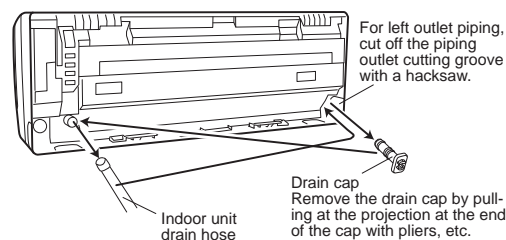
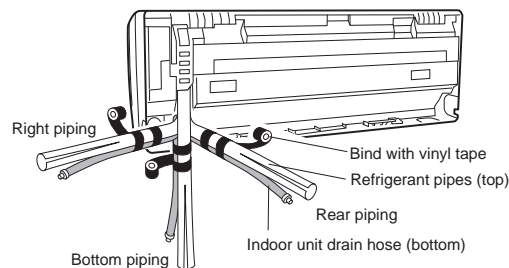
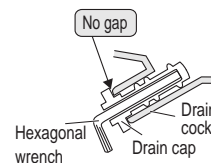
After removing drain hose, be sure not to forget mounting drain cap.

Be sure to fix the drain hose with tape to the bottom of piping.

Prevent drain water freezing under low temperature environment. When installing indoor unit's drain hose outdoors, necessary measure for frost protection should be taken to prevent drain water freezing. Under low temperature environment (when outdoor temperature under 0 °C), after cooling operation is executed, water in the drain hose could be frozen. Once drain water is frozen, the drain hose will be blocked and water leakage may result at the indoor unit.

Installation method of Drain cap

Use a hexagonal wrench 4 mm at opposite side to insert the drain cap, till the drain cap contacts the tip of drain cock.



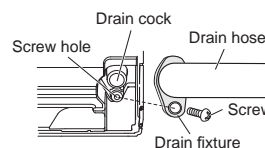
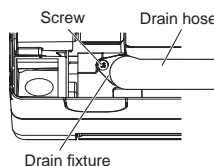
Removal method of drain hose

Remove the screw at the left of drain hose and pull out drain hose.

Installation method of drain hose

Vertically insert the drain hose toward the inside, so that the drain fixture (white) can accurately align with the screw hole around the drain cock.

After inserting and before replacing, please reinstall and fix the removed screws.

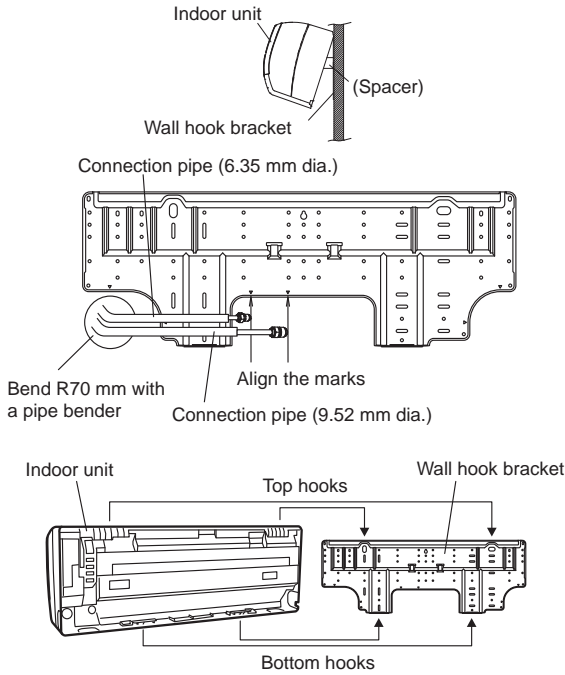


- Please hold around the joint of the drain hose during working.
- As the screw is inside, be sure to use screwdriver treated with magnet.

- For left piping and left rear piping, align the marks on the wall hook bracket and shape the connection pipe.
- Bend the connection piping at a bend radius of 70 mm or more and install no more than 35 mm from the wall.
- After passing the indoor piping and drain hose through the wall hole, hang the indoor unit on the hooks at the top and bottom of the wall hook bracket.

[Installing the indoor unit]

- Hang the indoor unit from the hooks at the top of the wall hook bracket.
- Insert the spacer, etc. between the indoor unit and the wall hook bracket and separate the bottom of the indoor unit from the wall.



After hooking the indoor unit to the top hook, hook the fittings of the indoor unit to the 2 bottom hooks while lowering the unit and pushing it against the wall.

6.6. Flare connection (Pipe connection)

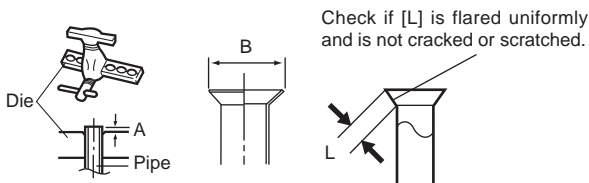
CAUTION

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 hazardous gas if the refrigerant comes into contact with a flame.

6.6.1. Flaring

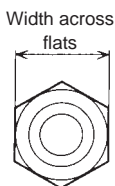
Use special pipe cutter and flare tool exclusive for R410A.

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



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

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



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

6.6.2. Bending pipes

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

CAUTION

To prevent breaking of the pipe, avoid sharp bends.

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

6.6.3. Pipe connection

CAUTION

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

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

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

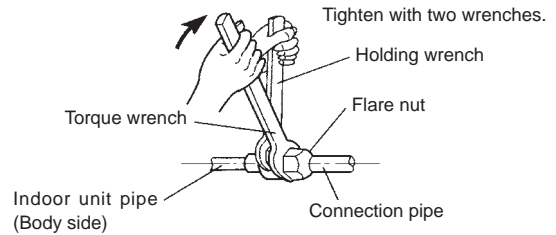
Tighten the flare nuts with a torque wrench using the specified tightening method. Otherwise, the flare nuts could break after a prolonged period, causing refrigerant to leak and generate hazardous gas if the refrigerant comes into contact with a flame.

CAUTION

Connect the piping so that the control box cover can easily be removed for servicing when necessary.

In order to prevent water from leaking into the control box, make sure that the piping is well insulated.

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



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)

7. ELECTRICAL WIRING

7.1. Wiring system diagram

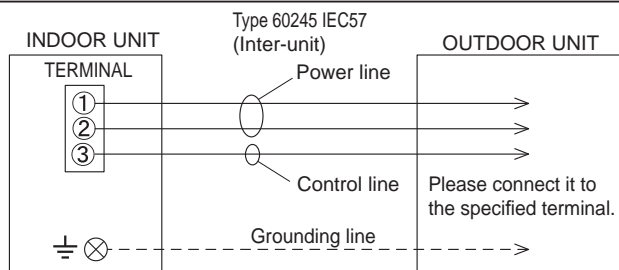
⚠ WARNING

Every wire must be connected firmly.

No wire should be allowed to touch refrigerant tubing, the compressor or any moving part.

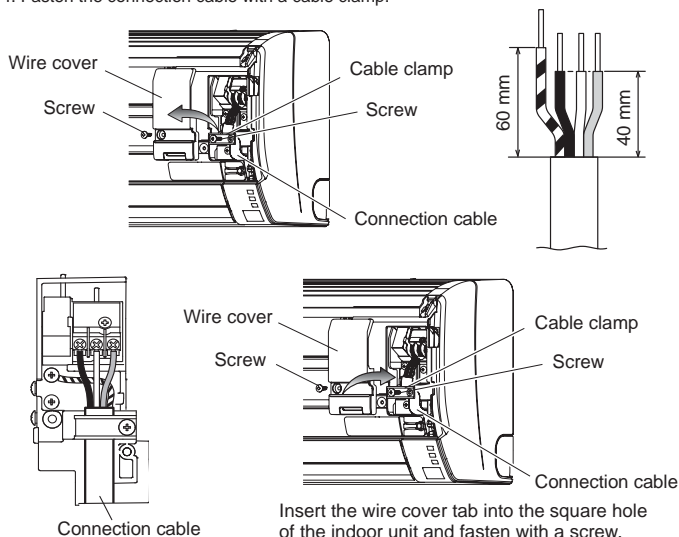
Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, be sure all wiring is tightly connected.

Connect wires to the matching numbers of terminals.



7.2. Indoor unit wiring

1. Remove the cable clamp.
2. Bend the end of the connection cable as shown in the figure.
3. Connect the end of the connection cable fully inserting into the terminal block.
4. Fasten the connection cable with a cable clamp.

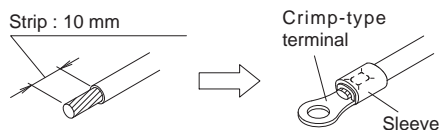


7.3. How to connect wiring to the terminals

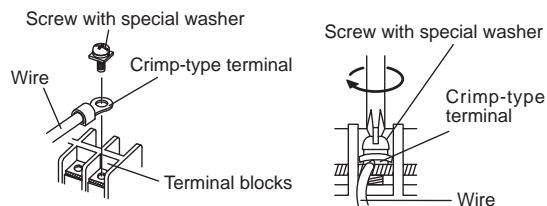
Caution when wiring cable

When stripping off the insulation of a lead wire, always use a special tool such as a wire stripper. If there is no special tool available, carefully strip the insulation with a knife etc.

- (1) Use crimp-type terminals with insulating sleeves as shown in the figure below to connect to the terminal block.
- (2) Securely clamp the crimp-type 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.

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

⚠ CAUTION

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

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

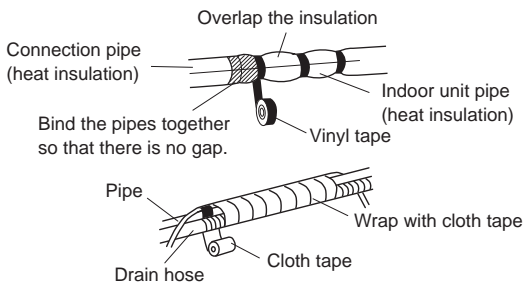
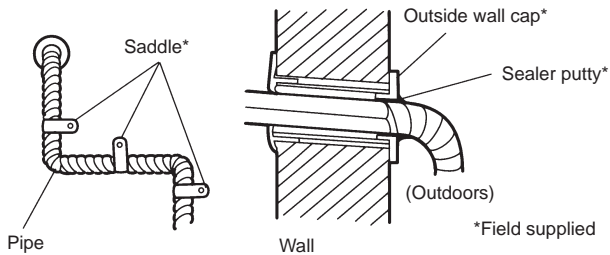
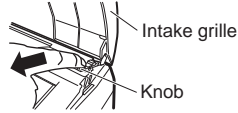
Always fasten the outside covering of the connection cable with the cable clamp. (If the insulator is chafed, electric discharge may occur.)

Always connect the ground wire.

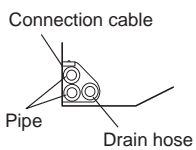
Do not use the earth screw of the indoor unit for the connection other than a specified outdoor unit.

8. FINISHING

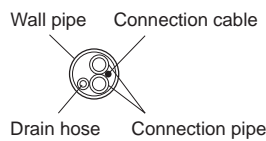
- Insulate between pipes.
 - Insulate suction and discharge pipes separately.
 - For rear, right, and bottom piping, overlap the connection pipe heat insulation and indoor unit pipe heat insulation and bind them with vinyl tape so that there is no gap.
 - For left and left rear piping, butt the connection pipe heat insulation and indoor unit pipe heat insulation together and bind them with and vinyl tape so that there is no gap.
 - For left and left rear piping, wrap the area which accommodates the rear piping housing section with cloth tape.
 - For left and left rear piping, bind the connection cable to the top of the pipe with vinyl tape.
 - For left and left rear piping, bundle the piping and drain hose together by wrapping them with cloth tape over the range within which they fit into the rear piping housing section.
- Temporarily fasten the connection cable along the connection pipe with vinyl tape. (Wrap to about 1/3 the width of the tape from the bottom of the pipe so that water does not enter.)
- Fasten the connection pipe to the outside wall with a saddle, etc.
- Fill the gap between the outside wall pipe hole and the pipe with sealer so that rain water and wind cannot blow in.
- Fasten the drain hose to the outside wall, etc.



Left piping



For connection from the left rear

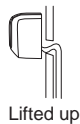


Check the following:

GOOD



NO GOOD



NO GOOD



NO GOOD



9. FRONT PANEL REMOVAL AND INSTALLATION

9.1. Intake grille removal

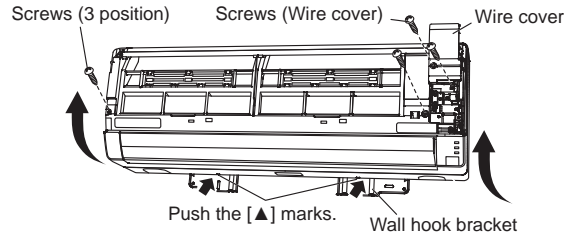
- Open the intake grille.
- Pull down the knob.
- Lift the intake grille upward, until the axle at the top of the intake grille is removed.

9.2. Intake grille installation

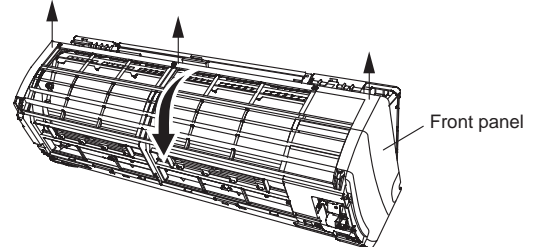
- The fixing axle of the intake grille is installed on the Panel.
- Lay down the intake grille.

9.3. Front panel removal

- Remove intake grille (Reference the intake grille removal.)
- Remove wire cover.
- Remove 3 screws.

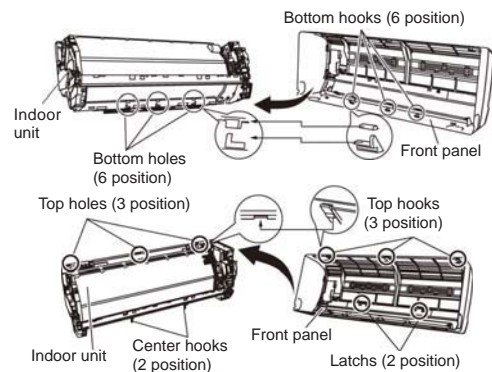


- The front panel is pulled to the front, raising the upper surface, and a front panel is removed.



9.4. Front panel installation

- First, fit the lower part of the front panel, and insert top and bottom hooks. (3 top sides, 6 bottom sides, 2 center)



- Attach the 3 screws.
- Attach the wire cover.
- Attach the intake grille.

CAUTION

Install the Front panel and Intake grille securely. If installation is imperfect, the Front panel or Intake grille may fall off and cause injury.

10. TEST RUN

Check items

- Is operation of each button on the remote control unit normal?
- Does each lamp light normally?
- Do air flow direction louvers operate normally?
- Is the drain normal?
- 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]

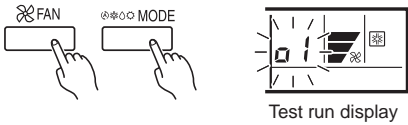
- For the operation method, refer to the operating manual.
- The outdoor unit, may not operate, depending on the room temperature. In this case, keep on pressing the MANUAL AUTO button of the indoor unit for more than 10 seconds. The operation indicator lamp and timer indicator lamp will begin to flash simultaneously during cooling test run. Then, heating test run will begin in about three minutes when HEAT is selected by the remote control operation. (Please follow the operating manual for remote control operation.)

- To end test operation, press the remote controller START/STOP button.
(When the air conditioner is running by pressing the test run button, the OPERATION Lamp and TIMER Lamp will simultaneously flash slowly.)

[Using the wired remote control] (Option)

For the operation method, refer to the operating manual.

- Stop the air conditioner operation.
- Press the master control button and the fan control button simultaneously for 2 seconds or more to start the test run.



- Press the start/stop button to stop the test run.

11.REMOTE CONTROLLER INSTALLATION

CAUTION

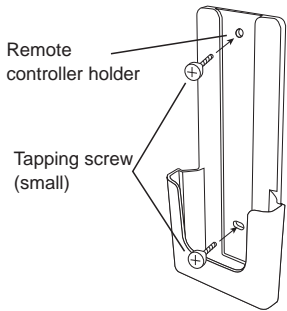
Check that the indoor unit correctly receives the signal from the remote controller, then install the remote controller holder.

Select the remote controller holder selection site by paying careful attention to the following:
Avoid places in direct sunlight.
Select a place that will not be affected by the heat from a stove, etc.

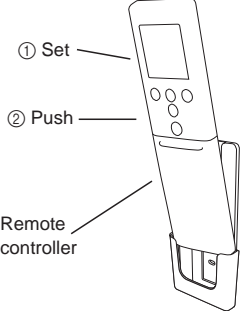
11.1. Remote controller holder installation

- Install the remote controller a maximum distance of 7 m from the remote control receiver. However, when installing the remote controller, check that it operates correctly.
- Install the remote controller holder to a wall, pillar, etc. with the tapping screw.

remote controller holder fixing



remote controller mounting



12.OPTIONAL KIT INSTALLATION (OPTION)

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

- Wired remote controller
- Simple remote controller
- External connect kit

NOTE:

Optional communication kit is required when connecting a wired remote controller or using the External Input/Output kit. See the communication kit for installation and operation instructions.

13.FUNCTION SETTING

Perform the "FUNCTION SETTING" according to the installation conditions using the remote controller.

CAUTION

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

Confirm that the cover for the electrical enclosure on the outdoor unit is in place.

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

Entering the Function Setting Mode

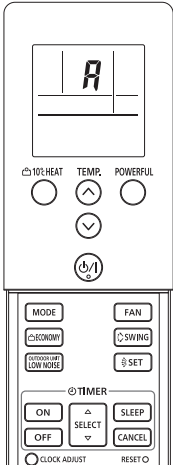
While pressing the POWERFUL button and SET TEMP. (Λ) simultaneously, press the RESET button to enter the function setting mode.

STEP 1

Selecting the Remote Controller Signal Code

Use the following steps to select the signal code of the remote controller. (Note that the air conditioner cannot receive a signal code if the air conditioner has not been set for the signal code.)
The signal codes that are set through this process are applicable only to the signals in the FUNCTION SETTING. For details on how to set the signal codes through the normal process, refer to Remote controller signal code.

- Press SET TEMP. (Λ / ∨) button to change the signal code between A→b→c→d. Match the code on the display to the air conditioner signal code. (Initially set to A) (If the signal code does not need to be selected, press the 10°C HEAT button and proceed to STEP 2.)
- Press the MODE button and check that the indoor unit can receive signals at the displayed signal code.
- Press the 10°C HEAT button to accept the signal code, and proceed to STEP 2.



The air conditioner signal code is set to A prior to shipment. Contact your retailer to change the signal code.

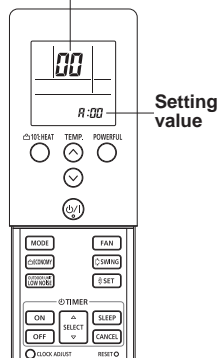
The remote controller resets to signal code A when the batteries in the remote controller are replaced. If you use a signal code other than signal code A, reset the signal code after replacing the batteries.
If you do not know the air conditioner signal code setting, try each of the signal codes (A→b→c→d) until you find the code which operates the air conditioner.

STEP 2

Selecting the Function Number and Setting Value

- Press the SET TEMP. (Λ / ∨) buttons to select the function number. (Press the 10°C HEAT button to switch between the left and right digits.)
- Press the POWERFUL button to proceed to setting the value. (Press the POWERFUL button again to return to the function number selection.)
- Press the SET TEMP. (Λ / ∨) buttons to select the setting value. (Press the 10°C HEAT button to switch between the left and right digits.)
- Press the MODE button, and START/STOP button, in the order listed to confirm the settings.
- Press the RESET button to cancel the function setting mode.
- After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.

Function number



CAUTION

After turning off the power, wait 10 seconds or more before turning on it again.

The Function Setting does not become active unless the power is turned off then on again.

Filter Sign

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

(⬇... Factory setting)

Setting Description	Function Number	Setting Value
Standard (400 hours)	11	00
Long interval (1,000 hours)		01
Short interval (200 hours)		02
◆ No indication		03

Cooling Room Temperature Correction

Depending on the installed environment, the room temperature sensor may require a correction.
The settings may be selected as shown in the table below.

(⬇... Factory setting)

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

Heating Room Temperature Correction

Depending on the installed environment, the room temperature sensor may require a correction.
The settings may be changed as shown in the table below.

(⬇... Factory setting)

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

Auto Restart

Enable or disable automatic system restart after a power outage.

(⬇... Factory setting)

Setting Description	Function Number	Setting Value
◆ Yes	40	00
No		01

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

Indoor room temperature sensor switching function

(Only for Wired remote controller)

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

(⬇... Factory setting)

Setting Description	Function Number	Setting Value
◆ No	42	00
Yes		01

* If setting value is "00" :
Room temperature is controlled by the indoor unit temperature sensor.
* If setting value is "01" :
Room temperature is controlled by either indoor unit temperature sensor or remote controller unit sensor.

Remote controller signal code

Change the indoor unit Signal Code, depending on the remote controllers.

(⬇... Factory setting)

Setting Description	Function Number	Setting Value
◆ A	44	00
B		01
C		02
D		03

External input control

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

(⬇... Factory setting)

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

Setting record

Record any changes to the settings in the following table.

Setting Description	Setting Value
Filter sign	
Cooler room temperature correction	
Heater room temperature correction	
Auto restart	
Indoor room temperature sensor switching function	
Remote controller signal code	
External input control	

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

14.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 control unit operations.
(2) Air filter removal and cleaning, and how to use the air louvers.
(3) Give the operating manual to the customer.

15.ERROR CODES

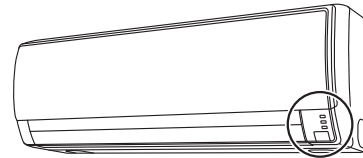
If you use a wireless remote controller, the lamp on the photo detector unit will output error codes by way of blinking patterns. If you use a wired remote controller, error codes will appear on the remote control display. See the lamp blinking patterns and error codes in the table. An error display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

Error display			Wired remote controller Error code	Description
OPERATION lamp (green)	TIMER lamp (orange)	ECONOMY lamp (green)		
●(1)	●(1)	◇	11	Serial communication error
●(1)	●(2)	◇	12	Wired remote controller communication error
●(1)	●(5)	◇	15	Check run unfinished
●(2)	●(2)	◇	22	Indoor unit capacity error
●(2)	●(3)	◇	23	Combination error
●(3)	●(2)	◇	32	Indoor unit PCB model information error
●(3)	●(5)	◇	35	Manual auto switch error
●(4)	●(1)	◇	41	Room temp. sensor error
●(4)	●(2)	◇	42	Indoor unit Heat Ex. Middle temp. sensor error
●(5)	●(1)	◇	51	Indoor unit fan motor error
●(5)	●(3)	◇	53	Drain pump error
●(5)	●(7)	◇	57	Damper error
●(5)	●(15)	◇	5U	Indoor unit error
●(6)	●(2)	◇	62	Outdoor unit main PCB model information error or communication error
●(6)	●(3)	◇	63	Inverter error
●(6)	●(4)	◇	64	Active filter error, PFC circuit error
●(6)	●(5)	◇	65	Trip terminal L error
●(6)	●(10)	◇	6A	Display PCB microcomputers communication error
●(7)	●(1)	◇	71	Discharge temp. sensor error
●(7)	●(2)	◇	72	Compressor temp. sensor error
●(7)	●(3)	◇	73	Outdoor unit Heat Ex. liquid temp. sensor error
●(7)	●(4)	◇	74	Outdoor temp. sensor error
●(7)	●(5)	◇	75	Suction Gas temp. sensor error
●(7)	●(6)	◇	76	• 2-way valve temp. sensor error • 3-way valve temp. sensor error
●(7)	●(7)	◇	77	Heat sink temp. sensor error
●(8)	●(2)	◇	82	• Sub-cool Heat Ex. gas inlet temp. sensor error • Sub-cool Heat Ex. gas outlet temp. sensor error
●(8)	●(3)	◇	83	Liquid pipe temp. sensor error
●(8)	●(4)	◇	84	Current sensor error
●(8)	●(6)	◇	86	• Discharge pressure sensor error • Suction pressure sensor error • High pressure switch error
●(9)	●(4)	◇	94	Trip detection
●(9)	●(5)	◇	95	Compressor rotor position detection error (permanent stop)

●(9)	●(7)	◇	97	Outdoor unit fan motor error
●(9)	●(9)	◇	99	4-way 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

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

[Troubleshooting with the indoor unit display]



OPERATION OPERATION lamp (green)
TIMER TIMER lamp (orange)
ECONOMY ECONOMY lamp (green)

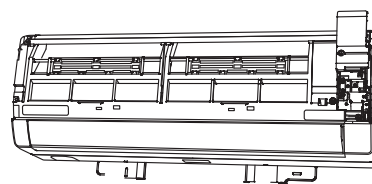
[Troubleshooting with the Wired Remote Controller Display (Option)]

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



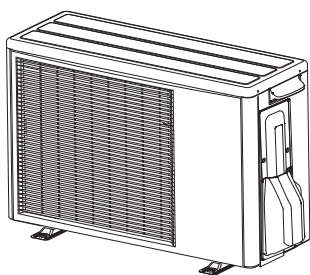
9.3. Rimozione del pannello frontale

- (1) Rimuovere la griglia di aspirazione (consultare le istruzioni per la rimozione della griglia di aspirazione).
- (2) Rimuovere la copertura del cavo.
- (3) Rimuovere le 3 viti.



AIR CONDITIONER OUTDOOR UNIT

INSTALLATION MANUAL



INSTALLATION MANUAL

For authorized service personnel only.

English

INSTALLATIONSANLEITUNG

Nur für autorisiertes Personal.

Deutsch

MANUEL D'INSTALLATION

Pour le personnel agréé uniquement.

Français

MANUAL DE INSTALACIÓN

Solo para personal autorizado.

Español

MANUALE D'INSTALLAZIONE

Ad uso esclusivo del personale autorizzato.

Italiano

ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ

Για εξουσιοδοτημένο προσωπικό σέρβις.

Ελληνικά

MANUAL DE INSTALAÇÃO

Apenas para técnicos autorizados.

Português

РУКОВОДСТВО ПО УСТАНОВКЕ

Для уполномоченного персонала.

Русский

KURULUM KILAVUZU

Yetkili servis personeli içindir.

Türkçe

INSTALLATION MANUAL


9319205014


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1. SAFETY PRECAUTIONS

1.1. For authorized service personnel only

	WARNING	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.
For the room air conditioner to operate satisfactory, install it as outlined in this installation manual.		
Connect the indoor unit and outdoor unit with the air conditioner piping and cords available standards parts. This installation manual describes the correct connections using the standard accessories and the parts specified in this installation manual.		
Have installation work done by authorized service personnel only.		
Do not use an extension cord.		
Do not turn on the power until all installation work is complete.		

	CAUTION	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.
When installing pipes shorter than 3 m, sound of the outdoor unit will be transferred to the indoor unit, which will cause large operating sound or some abnormal sound.		
This installation manual describes how to install the outdoor unit only. To install the indoor unit, refer to the installation manual included with the indoor unit.		

- Be careful not to scratch the air conditioner when handling it.
- After installation, explain correct operation to the customer, using the operating manual.
- Let the customer keep this installation manual because it is used when the air conditioner is serviced or moved.
- The maximum length of the piping is 20 m. The maximum height difference of the piping is 15 m, if the units are further apart than these, correct operation can not be guaranteed.

2. ABOUT THE UNIT

2.1. Precautions for using R410A refrigerant

The basic installation work procedures are the same as conventional refrigerant (R22) models. However, pay careful attention to the following points:
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.
Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant (R22) and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 inch.]

Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant (R22) models. Also, when storing the piping, securely seal the opening by pinching, taping, etc.

When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases. And always charge from the liquid phase where refrigerant composition is stable.

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 (-1 to 53 bar) for high pressure. -0.1 to 3.8 MPa (-1 to 38 bar) 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.

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 R22, it is necessary to choose adequate materials.

Thicknesses of copper pipes used with R410A are as shown in Table1. Never use copper pipes thinner than 0.8mm even when it is available on the market.

Thicknesses of Annealed Copper Pipes


		Thickness (mm)	
Nominal diameter	Outer diameter (mm)	R410A	[ref.] R22
1/4 in.	6.35	0.80	0.80
3/8 in.	9.52	0.80	0.80
1/2 in.	12.7	0.80	0.80


	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 R410A materials.)	
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 failure, injury, etc.	

2.3. Power

- The rated voltage

230V AC 50Hz.

	WARNING
The rated voltage of this product is 230 V AC 50 Hz.	
Before turning on the power, check if the voltage is within the 220 V -10 % to 240 V +10 % range.	
Always use a special branch circuit and install a special receptacle to supply power to the room air conditioner.	
Use a circuit breaker and receptacle matched to the capacity of the air conditioner.	
Do not extend the power cable.	
Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.	
Install a leakage circuit breaker in accordance with the related laws and regulations and electric company standards.	

	CAUTION
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, <u>change the contracted capacity.</u>	
When the voltage is low and the air conditioner is difficult to start, contact the power company the voltage raised.	

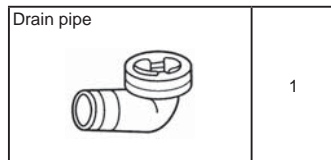
2.4. Electric requirement

- Electric wire size and fuse capacity:

MODEL	12,000 ~ 14,000 BTU class
Power supply cord (mm ²)	1.5
Connection cord (mm ²)	1.5 or 1
Fuse capacity (A)	15

- Use conformed cable with Type245 IEC57.
- Install all electrical works in accordance to the national standard.
- Install the disconnect device with a contact gap of at least 3 mm in all poles nearby the units. (Both indoor unit and outdoor unit)
- Install the circuit breaker nearby the units.

2.5. Accessories



2.6. Additional charge

Refrigerant suitable for a piping length of 15 m is charged in the outdoor unit at the factory. When the piping is longer than 15 m, additional charging is necessary. For the additional amount, see the table below.

Pipe length	15 m	20 m	Rate
Additional refrigerant	None	+100 g	20 g/m

CAUTION

When adding refrigerant, add the refrigerant from the charging port at the completion of work.

The maximum length of the piping is 20 m. If the units are further apart than this, correct operation can not be guaranteed.

Between 15 m and 20 m, when using a connection pipe other than that in the table, charge additional refrigerant with 20 g/1 m as the criteria.

3. SELECTING THE MOUNTING POSITION

- Decide the mounting position with the customer as follows:
- Do not set to a place where there is oily smoke, oil is used in the factory, the unit can contact sea breeze, sulfide gases will be generated in the hot spring area, corrosive gases will be generated, animal may urine on the unit and ammonia will be generated and a dusty place.

3.1. Outdoor unit

- If possible, do not install the unit where it will be exposed to direct sunlight. (If necessary, install a blind that does not interfere with the air flow.)
- Do not install the unit where a strong wind blows or where it is very dusty.
- Do not install the unit where people pass.
- Take your neighbors into consideration so that they are not disturbed by air blowing into their windows or by noise.
- Provide the space shown in figure so that the air flow is not blocked. Also for efficient operation, leave open three of the four directions front, rear, and both sides.
- Install the unit where keep away more than 3m from the antenna of TV set and Radio.
- Outdoor unit should be set to a place where both drainage and itself will not be affected when heating.

WARNING

Install at a place that can withstand the weight of the outdoor units and install positively so that the units will not topple or fall.

CAUTION

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

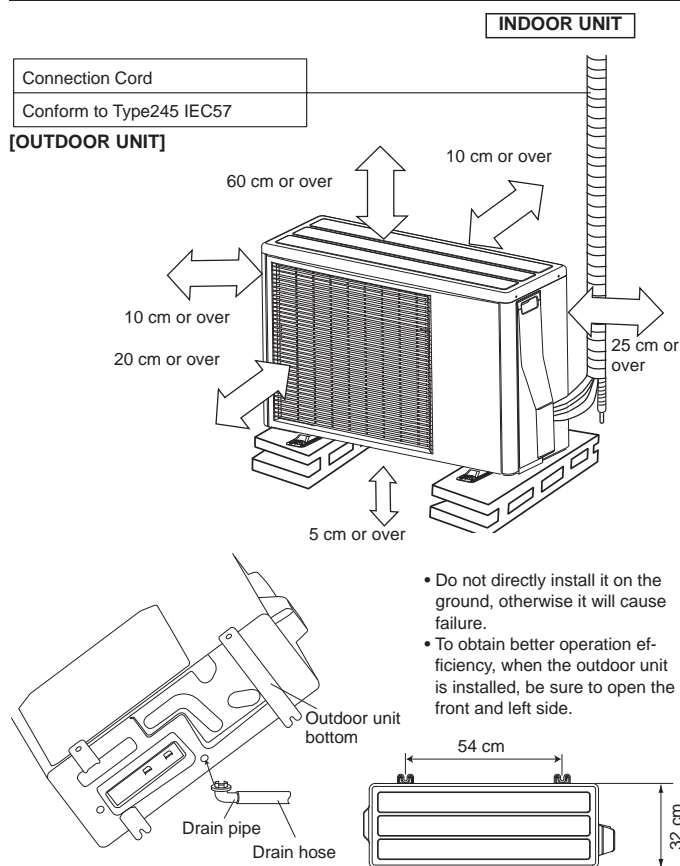
Do not install near heat sources.

In places where the outdoor temperature drops to 0 °C or lower, the drain water may freeze and may stop up the drain or cause other outdoor unit trouble. Therefore take measures so that the drain water will not freeze and clog the drain.

In the area with heavy snowfall, if the intake and outlet of outdoor unit is blocked with snow, it might become difficult to get warm and it is likely to cause of the breakdown. Please construct a canopy and a pedestal or place the unit on a high stand (local configured).

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

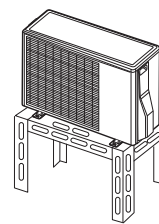
4. INSTALLATION DIAGRAM



CAUTION

When the outdoor temperature is 0 °C or less, do not use the accessory drain pipe and drain cap. If the drain pipe and drain cap are used, the drain water in the pipe may freeze in extreme cold weather. (Reverse cycle model only)

In the area with heavy snowfall, if the intake and outlet of outdoor units blocked with snow, it might become difficult to get warm and it is likely to cause of the breakdown. Please construct a canopy and a pedestal or place the unit on a high stand (local configured).



5. INSTALLATION

5.1. Outdoor unit installation

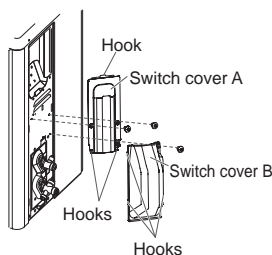
- Set the unit on a strong stand such as thing made of concrete blocks to minimize shock and vibration.
- Do not set the unit directly on the ground because it will cause trouble.

Switch cover A, B removal

- Remove the three tapping screws.
- Push downward the Switch cover B.
- Push upward the Switch cover A.

Installing the Switch cover A, B

- After inserting the three hooks of Switch cover A, then push upward, and then tighten the two tapping screws.
- After inserting the three hooks of Switch cover B, then push upward, and then tighten the one tapping screw.



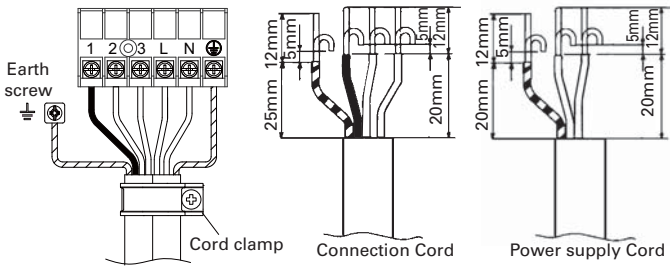
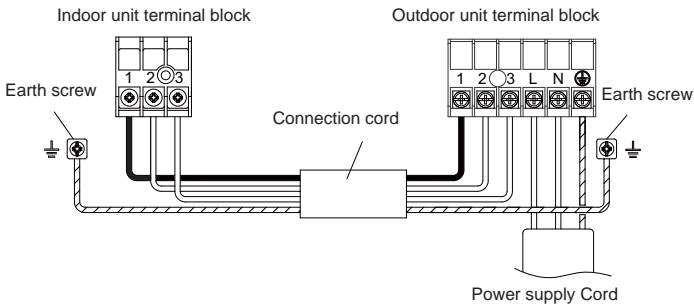
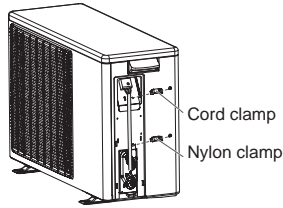
WARNING

Install the unit where it will not be tilted by more than 5°.

When installing the outdoor unit where it may exposed to strong wind, fasten it securely.

5.2. Outdoor unit wiring

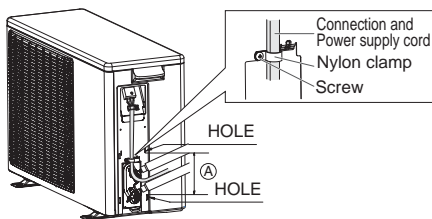
- (1) Remove the outdoor unit Switch cover A, B.
- (2) Remove the outdoor unit Cord clamp and Nylon clamp.
- (3) Bend the end of the cord as shown in the figure.
- (4) Connect the end of the connection cord fully into the terminal block.
- (5) Fasten the sheath with a cord clamp.
- (6) Fasten the sheath with a nylon clamp.
- (7) Install the Switch cover A, B.



Connection cord wiring

Run the connection cord to the rear of the outdoor unit within the (A) range of the arrows shown in the figure.

(The Switch cover B becomes difficult to install.)



CAUTION

- Match the terminal block numbers and connection cord colors with those of the indoor unit. Erroneous wiring may cause burning of the electric parts.
- Connect the connection cords firmly to the terminal block. Imperfect installation may cause a fire.
- Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)
- Securely earth the power cord.
- Do not use the earth screw for an external connector. Only use for interconnection between two units.

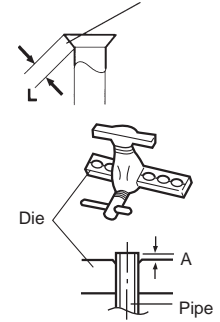
5.3. Connecting the piping

CONNECTION

- (1) Install the outdoor unit wall cap (supplied with the optional installation set or procured at the site) to the wall pipe.

- (2) Connect the outdoor unit and indoor unit piping.
- (3) After matching the center of the flare surface and tightening the nut hand tight, tighten the nut to the specified tightening torque with a torque wrench. (Table 1)

Check if [L] is flared uniformly and is not cracked or scratched.



FLARING

- (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 the burrs.
- (3) Insert the flare nut onto the pipe and flare the pipe with a flaring tool.

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 (for R22) flare tool.

When using the conventional flare tool, always use an allowance adjustment gauge and secure the A dimension shown in table 2.

BENDING PIPES

- (1) When bending the pipe, be careful not to crush it.
- (2) To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 70mm or over.
- (3) If the copper pipe is bent the pipe or pulled to often, it will become stiff. Do not bend the pipes more than three times at one place.

Tighten with two wrenches.

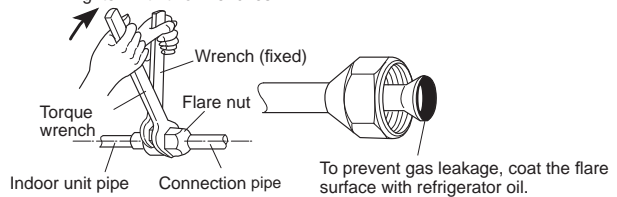


Table 1 Flare nut size and tightening torque

Flare nut	Diameter (mm) × Torque (N·m)
6.35 mm dia.	17 × 16 ~ 18
9.52 mm dia.	22 × 32 ~ 42
12.7 mm dia.	26 × 49 ~ 61

Table 2 Pipe outside diameter

Pipe outside diameter	Flare tool for R410A, clutch type	A (mm)	
		Clutch type	Wing nut type
ø 6.35 mm (1/4")	0 to 0.5	1.0 to 1.5	1.5 to 2.0
ø 9.52 mm (3/8")	0 to 0.5	1.0 to 1.5	1.5 to 2.0
ø 12.7 mm (1/2")	0 to 5	1.0 to 1.5	1.5 to 2.0

CAUTION

Fasten a flare nut with a torque wrench as instructed in this manual. If fastened too tight, the flare nut may be broken after a long period of time and cause a leakage of refrigerant.

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.

5.4. Air purge

Always use a vacuum pump to purge the air.

Refrigerant for purging the air is not charged in the outdoor unit at the factory.

Close the high pressure side valve of the gauge manifold fully and do not operate it during the following work.

CAUTION

Refrigerant must not be discharged into atmosphere.

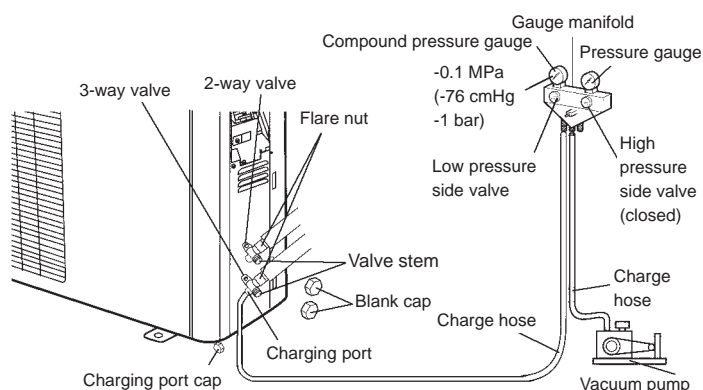
After connecting the piping, check the joints for gas leakage with gas leak detector.

- (1) Check if the piping connections are secure.
- (2) Check that the stems of 2-way valve and 3-way valve are closed fully.
- (3) Connect the gauge manifold charge hose to the charging port of the 3-way valve (side with the projection for pushing in the valve core).
- (4) Open the low pressure side valve of the gauge manifold fully.
- (5) Operate the vacuum pump and start pump down.
- (6) Slowly loosen the flare nut of the 3-way valve and check if air enters, then retighten the flare nut.
(When the flare nut is loosened the operating sound of the vacuum pump changes and the reading of the compound pressure gauge goes from minus to zero.)
- (7) Pump down the system for at least 15 minutes, then check if the compound pressure gauge reads -0.1 MPa (-76 cmHg, -1 bar).
- (8) At the end of pump down, close the low pressure side gauge of the gauge manifold fully and stop the vacuum pump.
- (9) Slowly loosen the valve stem of the 3-way valve. When the compound pressure

gauge reading reaches 0.1-0.2 MPa, retighten the valve stem and disconnect the charge hose from the 3-way valve charging port.

(If the stem of the 3-way valve is opened fully before the charge hose is disconnected, it may be difficult to disconnect the charge hose.)

- (10) Fully open the valve stems of the 2-way valve and 3-way valve using a hexagon wrench. (After the valve stem begins to turn, turn it with a torque of less than $2.9 \text{ N} \cdot \text{m}$ (30 kgf \cdot cm) until it stops turning.)
- (11) Firmly tighten the 2-way valve and 3-way valve blank cap and the charging port cap.



	Tightening torque
Blank cap	20.0 to 25.0 N \cdot m (200 to 250 kgf \cdot cm)
Charging port cap	12.5 to 16.0 N \cdot m (125 to 160 kgf \cdot cm)

5.5. Test run

- Perform test operation and check items below.
- For the test operation method, refer to the operating manual.
- The outdoor unit, may not operate, depending on the room temperature. In this case, keep on pressing the MANUAL AUTO button of the indoor unit for more than 10 seconds. The operation indicator lamp and timer indicator lamp will begin to flash simultaneously during cooling test run. Then, heating test run will begin in about three minutes when HEAT is selected by the remote control operation. (Please follow the operating manual for remote control operation.)
- To end test operation, keep on pressing the MANUAL AUTO button of the indoor unit for more than 3 seconds.
(When the air conditioner is run by pressing the test run button, the OPERATION indicator lamp and TIMER indicator lamp of the indoor unit will simultaneously flash slowly.)

OUTDOOR UNIT

- (1) Is there any abnormal noise and vibration during operation?
- (2) Will noise, wind, or drain water from the unit disturb the neighbors?
- (3) Is there any gas leakage?

6. PUMP DOWN

6.1. Pump down

PUMP DOWN OPERATION (FORCED COOLING OPERATION)

To avoid discharging refrigerant into the atmosphere at the time of relocation or disposal, recover refrigerant by doing the cooling operation or forced cooling operation according to the following procedure. (When the cooling operation cannot start in winter, and so on, start the forced cooling operation.)

- (1) Do the air purging of the charge hose by connecting the charging hose of gauge manifold to the charging port of 3 way valve and opening the low-pressure valve slightly.
- (2) Close the valve stem of 2 way valve completely.
- (3) Start the cooling operation or following forced cooling operation. Keep on pressing the MANUAL AUTO button of the indoor unit for more than 10 seconds. The operation indicator lamp and timer indicator lamp will begin to flash simultaneously during test run. (The forced cooling operation cannot start if the MANUAL AUTO button is not kept on pressing for more than 10 seconds.)
- (4) Close the valve stem of 3 way valve when the reading on the compound pressure gage becomes 0.05~0 Mpa(0.5~0 kg/cm²).
- (5) Stop the operation.
 - Press the START/STOP button of the remote control unit to stop the operation.
 - Press the MANUAL AUTO button when stopping the operation from indoor unit side. (It is not necessary to press on keeping for more than 10 seconds.)

CAUTION

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.