

SPLIT TYPE ROOM AIR CONDITIONER INSTALLATION MANUAL

(PART NO. 9315342546-01)

This air conditioner uses new refrigerant R410A.

The basic installation work procedures are the same as conventional refrigerant (R22) models. However, pay careful attention to the following points:

- (1) Since the working pressure is 1.6 times higher than that of conventional refrigerant (R22) models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional piping and flare nuts with the R410A piping and flare nuts, Model always replace a conventional piping and flare nuts with the R410A piping and flare nuts.
- (2) 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 UNF-20 threads per inch.
- (3) 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.
- (4) When changing the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always change from the liquid phase side whose composition is stable.

Special tools for R410A

Tool name	Contents of change
Gauge manifold	Pressure is high and cannot be measured with a conventional gauge. To prevent erroneous measurement, use a special gauge. It is recommended the gauge with seals 0.1 to 5.3 MPa (-1 to 53 bar) for high pressure.
Charge hose	To increase pressure resistance, the hose material and hose 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/10m. 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 As an air conditioner using R410A, house pressure is higher than when using R22. It is necessary to choose adequate materials. Thicknesses of copper pipes used with R410A are as shown in the table below when it is available on the market.

Nominal diameter	Outer diameter	Thickness	Maximum height	
			Indoor unit	Outdoor unit
1/4in	6.35mm	0.8mm	25m(82ft)	20m(66ft)
1/2in	12.7mm	0.8mm	25m(82ft)	20m(66ft)

CONNECTION PIPE REQUIREMENT

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

When installing pipes shorter than 3m, sound of the outdoor unit will be transferred to the indoor unit, which will cause large operating sound or some abnormal sound.

SELECTING THE MOUNTING POSITION

Decide the mounting position with the customer as follows:

1. INDOOR UNIT
 - (1) The indoor unit level on a strong wall which is not subjected to vibration.
 - (2) The inlet and outlet ports should not be obstructed: the air should be able to blow all over the room.
 - (3) Do not install near a window or door.
 - (4) Do not install where the direct sunlight will be incident.
 - (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 precautions that the unit does not fall on the floor.
 - (8) The piping must be installed so that it can be removed.
2. OUTDOOR UNIT
 - (1) If possible, do not install the unit where it will be exposed to direct sunlight. If it is unavoidable, install the unit with a shade (UV inhibitor) on the air flow.
 - (2) Do not install the unit where a strong wind blows or where it is very noisy.
 - (3) Install the unit where people pass.
 - (4) Take your neighbors into consideration so that they are not disturbed by air blowing into their windows or by noise.
 - (5) Provide the space shown in the figure so that the air flow is not obstructed from front, rear, and both sides.

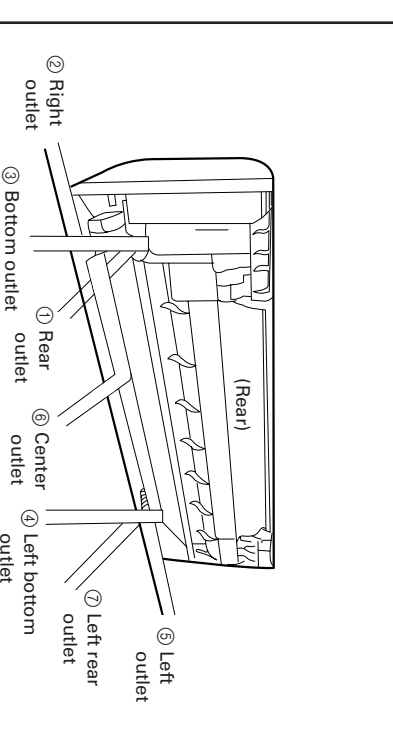
WARNING
Install at a place that can withstand the weight of the indoor and outdoor units and install positively so that the units will not topple or fall.

CAUTION

- (1) Do not install where there is the danger of combustible gas leakage.
- (2) Do not install near heat sources.
- (3) If children under 10 years old may approach the unit, take preventive measures so that they can not touch the unit.
- (4) Install the unit on the wall where the height from the floors more than 180 cm.

Indoor unit piping direction!

The piping can be connected in the 7 directions in the figure. When connecting the piping, take precautions to prevent the piping from being damaged by the front panel with a backview.



For authorized service personnel only.

WARNING

- (1) For the room air conditioner to operate satisfactorily, install it as outlined in this installation manual.
- (2) Connect the indoor unit and outdoor unit with the air conditioner and cords available standards parts. This installation manual describes the correct connections using the standard accessories and the parts specified in this installation manual.
- (3) Have installation work done by authorized service personnel only.
- (4) Do not use an extension cord.
- (5) Do not turn on the power until all installation work is complete.
- (6) Be careful not to scratch the air conditioner when handling it.
- (7) After installation, verify correct operation to the customer, using the operating manual.
- (8) Let the customer keep this installation manual because it is used when the air conditioner is serviced or moved.
- (9) The maximum length of the piping is 25 m. The maximum height difference of the piping is 20 m, if the units are further apart than these, correct operation can not be guaranteed.

STANDARD ACCESSORIES

The following installation accessories are supplied.

Name and Shape	Qty	Name and Shape	Qty
Wall hook bracket	1	Cloth tape	1
Remove indoor unit	1	Tapping screw (big)	8
Battery	2	Tapping screw (small)	2
Remote control	1	Air cleaning filter	2
Drain pipe	1	Insulation (Drain hose)	2

Electrical Requirement

One set of following parts are necessary in installation of this product.

Name	MAX.	MIN.
Power supply cord (mm ²)	4.0	3.5
Power supply cord (mm ²)	MAX. 2.5	MIN. 1.5
Fuse capacity (A)	30	

Electrical Requirement

- Electric wire size and fuse capacity.
- Install the disconnect device with a contact gap of at least 3 mm nearby the units. (Both indoor unit and outdoor unit)
- Always make the air conditioner power supply a special branch circuit and provide a special breaker.
- Always use H02RN-F or equivalent as the power supply cord and the connection cord.

INDOOR UNIT

CUTTING THE HOLE IN THE WALL FOR THE CONNECTING PIPING

- (1) Cut a 90 mm diameter hole in the wall at the position shown in the figure, cutting the wall hole at the inside of the wall hook bracket, cut the hole to a point of intersection of corner marks.
- (2) When cutting the wall hole, be careful of the outside of the wall hook bracket, cut the hole to a point of 10mm below.
- (3) Inside the hole, so that the outside end is lower (5 to 10 mm) than the inside end.
- (4) Always align the center of the wall hole. If misaligned, water leakage will occur.
- (5) Install a pipe to match the wall thickness, stick it into the wall, fasten the cap with vinyl tape, and stick the pipe through the hole.
- (6) The connection pipe is supplied in this installation set.
- (7) For left piping and right piping, cut the hole a little lower so that drain water will flow freely.

INSTALLING THE WALL HOOK BRACKET

- (1) Install the wall hook bracket so that it is correctly positioned horizontally, 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 withstand the weight of an indoor unit.
- (3) Fasten the wall hook bracket to the wall with 6 or more screws through the hole.
- (4) Remove the outer edge of the bracket.
- (5) Check that there is no gap at the wall hole bracket.

FORMING THE DRAIN HOSE AND PIPE

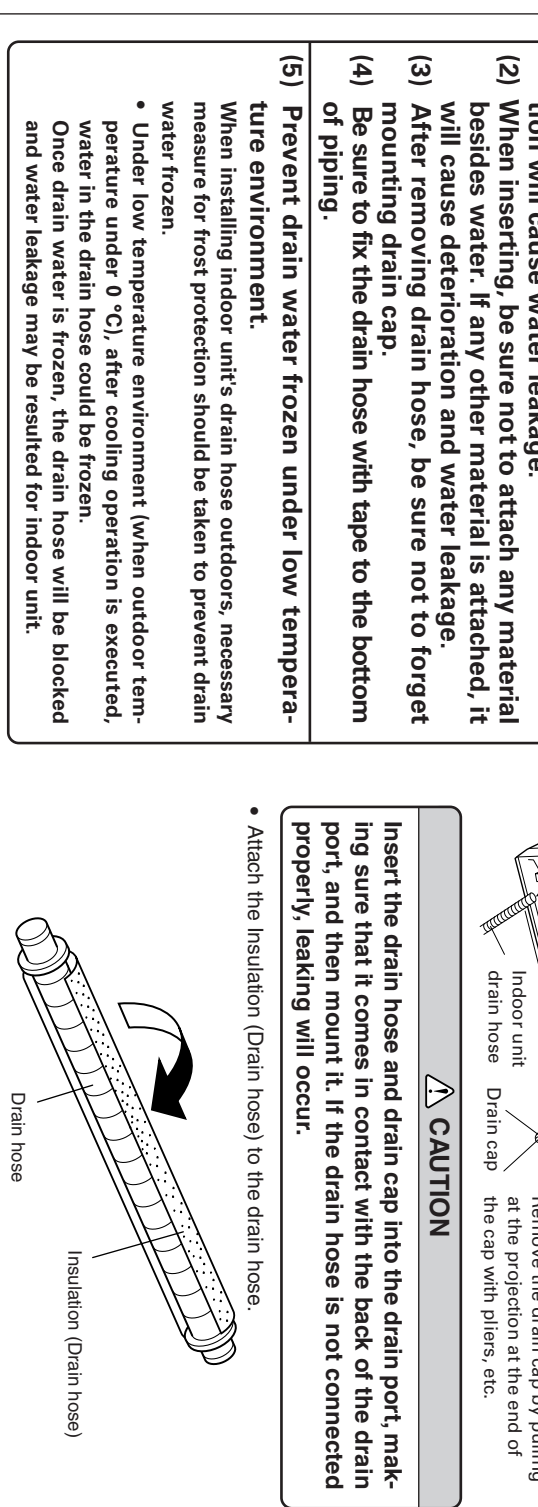
- (1) In order to align the drain hose and drain cap, be sure to insert securely and vertically. Inclined insertion will cause water leakage.
- (2) When inserting, be sure not to stretch any material besides water pipe and water leakage will occur.
- (3) After mounting the drain cap, be sure not to forget mounting drain cap.
- (4) Be sure to fix the drain hose with tape to the bottom of piping.
- (5) Remove drain water frozen under low temperature environment.

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CONNECTING THE PIPING

- (1) Connect the indoor unit wall cap (supplied with the optional installation set) or provided at the site to the wall pipe.
- (2) Connect the outdoor unit and indoor unit piping.
- (3) After matching the center of the face surface and tightening the nut torque wrench.



FRONT PANEL REMOVAL AND INSTALLATION

- 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 the bend radius of 100 mm or more after installation.
- After installation, position piping and drain hose using the wall hole, hang the piping on the hook 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.

THE INTAKE GRILLE REMOVAL

- (1) Open the intake grille.
- (2) Downward the grille upward, until the axle at the top of the intake grille is removed.
- (3) Lift the grille in removed.

THE INTAKE GRILLE INSTALLATION

- (1) Lay down the intake grille.
- (2) Push up the intake grille so that it is installed on the panel.

THE FRONT PANEL REMOVAL

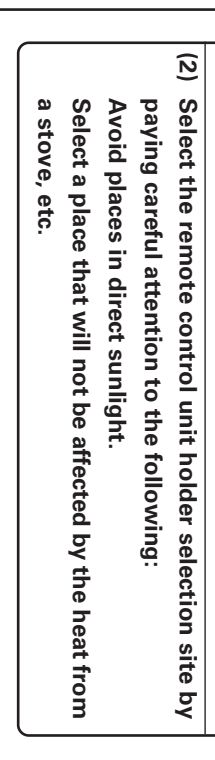
- (1) Remove intake grille (reference the intake grille removal).
- (2) The thumb is hung on the lower part as shown in the figure, and 1 pole is to the front, pushing 1 mark, and bottom hooks and 2 poles to the front, pushing 1 mark, and bottom hooks.
- (3) Two personnel is needed to lift and carry the upper surface, and a front panel is removed.

THE FRONT PANEL INSTALLATION

- (1) Push up the front panel.
- (2) Six screws is attached.
- (3) The intake grille is attached.

REMOTE CONTROL UNIT INSTALLATION

- (1) Check that the indoor unit correctly receives the signal from the remote control unit, then install the remote control unit holder.
- (2) Select the remote control unit 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.



CUSTOMER GUIDANCE

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

- (1) Start-up 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 filters.
- (3) Give the operating and installation manuals to the customer.

PUMP DOWN OPERATION (FORCED COOLING OPERATION)

- (1) Check the following operation at the atmosphere at the time of re-education or disposal, (recover) refrigerant by doing the cooling operation or forced cooling operation.
 - When the indoor unit is set to the "ON" position, the indoor unit will stop the operation.
 - When the outdoor unit is set to the "ON" position, the outdoor unit will stop the operation.
 - When the indoor unit is set to the "ON" position, the indoor unit will stop the operation.
 - When the outdoor unit is set to the "ON" position, the outdoor unit will stop the operation.
- (2) Start the cooling operation following forced cooling operation.
- (3) Start the cooling operation following forced cooling operation.
- (4) Stop the air purging of the change hose by connecting the changing hose of gauge manifold to the changing port of 3 way valve and opening the low-pressure valve slightly.
- (5) Press the START/STOP button of the remote control unit.
- (6) Press the MANUAL AUTO button of the remote control unit to stop the operation.
- (7) Press the MANUAL AUTO button of the remote control unit to stop the operation.
- (8) Press the MANUAL AUTO button of the remote control unit to stop the operation.
- (9) Press the MANUAL AUTO button of the remote control unit to stop the operation.
- (10) Press the MANUAL AUTO button of the remote control unit to stop the operation.

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.

POWER

WARNING

- (1) Do not extend the power cord.
- (2) Before turning on the power, check if the voltage is within the 220 ~ 240 V AC 50 Hz range.
- (3) Do not use a special transformer or special receptacle.
- (4) Do not use a power supply other than the one at all conditions.
- (5) Use a circuit breaker and receptacle matched to the capacity of the air conditioner.

CAUTION

The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances. When the current connected capacity is insufficient, change the connected capacity.

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. (reference 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 the humidity level is 80% or more, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C). In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

OUTDOOR UNIT INSTALLATION

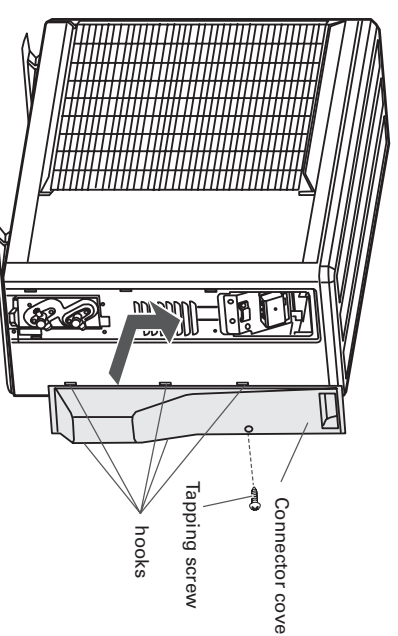
- Set the unit on a strong stand, such as one made of concrete blocks to minimize shock and vibration.
- Do not set the unit directly on the ground because it will cause trouble.

Connector cover removal

- Remove the tapping screws.
- After inserting the two front hooks, then insert the rear hook.
- Tighten the tapping screws.

Installing the connector cover

- (1) Install the unit where it will not be tilted by more than 5°.
- (2) When installing the outdoor unit where it may be exposed to strong wind, fasten it securely.



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.

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 valve core.) Valve stems with the projection for passing in the pressure gauge (See Fig. 10-10).
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 vacuum pump charges and the reading of the compound pressure gauge changes and the reading of the vacuum pump changes and the reading of the compound pressure gauge (See Fig. 10-10).
7. Pump down the system for at least 15 minutes, then check if the compound pressure gauge reads 0.1 MPa (0.76 cmHg, -1 bar).
8. At the end of pump down, check 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, from the 3-way valve charging port, the stem of the 3-way valve is opened fully before the stem of the 2-way valve is opened fully, before the the charge hose.)

Additional charge

Refrigerant suitable for a piping length of 15 m is charged in the outdoor unit at the factory.

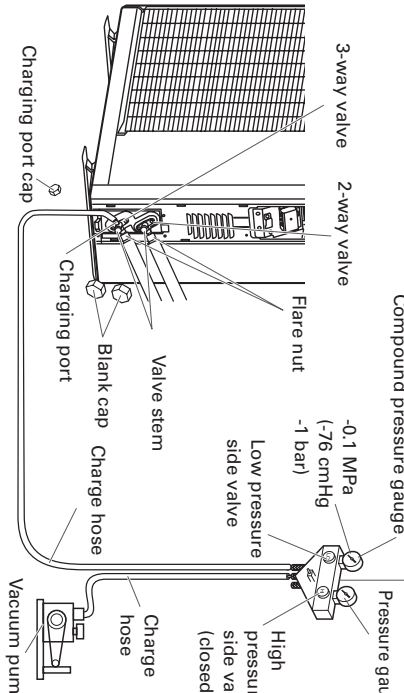
When the piping is longer than 15 m, additional charging is necessary. For the additional charging, see the table below.

Pipe length	20 m	25 m
Additional refrigerant	100 g	200 g

CAUTION

- (1) Refrigerant must not be discharged into atmosphere.
- (2) After connecting the piping, check the joints for gas leakage with gas leak detector.

10. Fully open the valve stems of the 2-way valve and 3-way valve blank cap with a torque of less than 2.9 Nm (20 kgf-cm) until it slope turning.)
11. Firmly tighten the 2-way valve and 3-way valve blank cap and the charging port cap.



Blank cap	6.35mm (1/4in)	20 to 25 Nm (20 to 200 kgf-cm)
Charging port cap	12.7mm (1/2in)	28 to 32 Nm (280 to 320 kgf-cm)
Charging port cap	12.5 to 18 Nm (125 to 180 kgf-cm)	

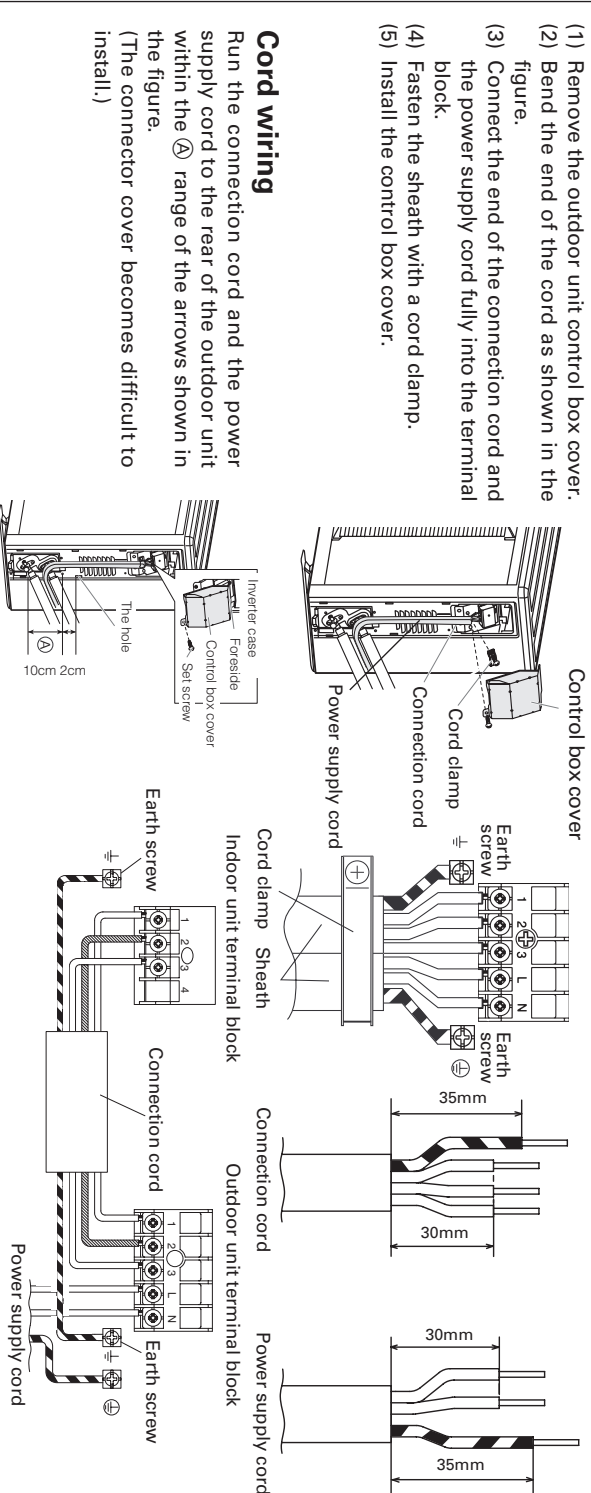
CAUTION

- (1) When adding refrigerant, add the refrigerant from the charging port at the completion of work.
- (2) The maximum length of the piping is 25 m. If erection can not be guaranteed.

Between 15 m and 25 m, additional charging is necessary. Refer to the table. Additional refrigerant with 200 g is the criteria.

OUTDOOR UNIT WIRING

- (1) Remove the outdoor unit control box cover.
- (2) Bend the end of the cord as shown in the figure.
- (3) Connect the end of the connection cord and the power supply cord fully into the terminal block. The sheath with a cord clamp.
- (4) Connect the sheath with a cord clamp.
- (5) Install the control box cover.



Cord wiring

Remove the outdoor unit control box cover and connect the power supply cord and the connection cord to the terminal block within the range of the arrows shown in the figure. The connector cover becomes difficult to install.

CAUTION

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

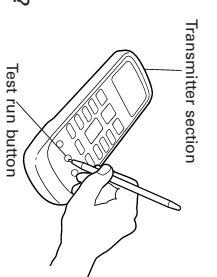
FINISHING

- (1) Insulate between outdoor piping, overlap the connection pipe heat insulation and indoor unit pipe heat insulation and bend them with very tape so that there is no gap. Use the heat insulation tape for indoor unit pipe heat insulation together and bend them with a very tape so that there is no gap for outdoor piping and center piping. Wrap the area which accommodates the new piping, bending sections with both tapes.
- (2) Fasten the connection cord along the connection pipe with very tape. When the connection cord is fastened, the connection cord should be fixed to the wall with very tape. Fasten the connection pipe to the outside wall with saddles, etc.
- (3) Fasten the drain hose to the wall pipe hole and the pipe will sealer so that rain water and wind cannot blow in.
- (4) Fasten the drain hose to the outside wall, etc.



TEST RUNNING

1. Perform test operation and check items 1 and 2 below.
 - (1) Does each lamp light normally?
 - (2) Does each lamp light normally?
 - (3) Do the air flow-direction blower operate normally?
 - (4) Is the drain normal?
2. OUTDOOR UNIT
 - (1) Will indoor unit and outdoor unit vibrate during operation?
 - (2) Will indoor unit or drain water from the unit disturb the neighbors?
 - (3) Is there any gas leakage?



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