SPLIT TYPE ROOM AIR CONDITIONER INSTALLATION MANUAL

(PART No. 9315342027-01)

This air conditioner uses new refrigerant HFC (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 refrigerant (R22) model with a new refrigerant R410A
- model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts. (2) 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 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 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 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.			

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 value or capillary tube may become blocked with contaminants

Nominal diameter	Outer diameter	Thickness	Maximum length	Maximum height (between indoor and outdoor)	
3/8in	9.52mm	0.8mm	50m(165ft)	30m(99ft)	
5/8in	15.88mm		5011(10511)		
-					

CONNECTION PIPE REQUIREMENT

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 the table. Never use copper pipes thinner than that in the

table even when it is available on the market. (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) 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.

When installing pipes shorter than 5m, 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 \neg \neg INSTALLATION DIAGRAM OF POSITION

Decide the mounting position with the customer as follows:

- . 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 near an electric outlet or special 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 the figure. Also install the unit where the filter can be removed.

2. OUTDOOR UNIT

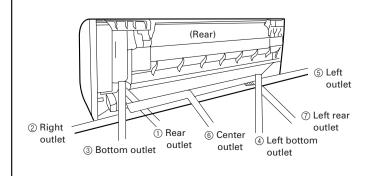
- 1) If possible, do not install the unit where it will be exposed to direct sunlight. (If necessary, install a blind that does not interfere with the air flow.)
- 2) Do not install the unit where a strong wind blows or where it is very dustv.
- 3) Do not install the unit where people pass. 4) Take your neighbors into consideration so that they are not dis-
- turbed by air blowing into their windows or by noise.) Provide the space shown in the 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 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.

- (1) Do not install where there is the danger of com-
- bustible 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 reach the unit. (4) Install the indoor unit on the wall where the height from the floors more than 230 cm.

[Indoor unit piping direction]

The piping can be connected in the 7 directions in the figure. When the piping is connected in direction (2), (3), (4) or (5), cut along the piping groove in the side of the front panel with a hacksaw.



INDOOR AND OUTDOOR UNITS [INDOOR UNIT] Wall hook bracket 6 cm or over 5 cm or over 150 cm or ove 230 cm or ove (Wall cap) control unit screv (smal [OUTDOOR UNIT] 10 cm or over 60 cm or over 10 cm or over 60 cm or ove Do not directly install it on the ground, otherwise it 5 cm or over will cause failure. • To obtain better operation efficiency, when the outdoor unit is installed, be sure to open the front and left side. 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

(1) For the room air conditioner to operate satisfactory, install it as outlined in this installation manual

(2) 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.

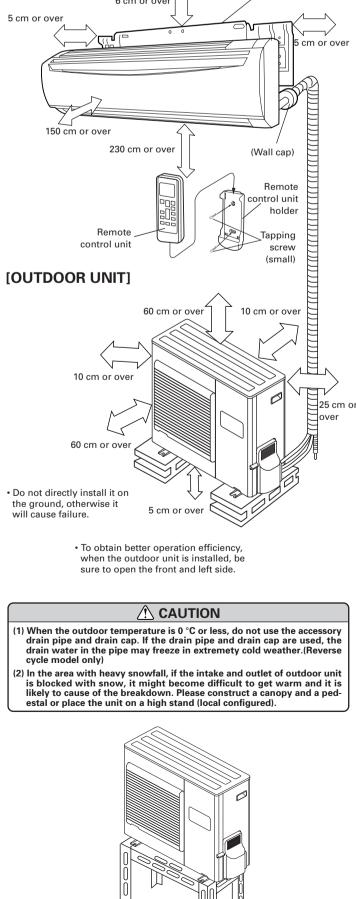
For authorized service personnel only.

- 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.
- 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.
- if the units are further apart than these, correct operation can not be guaranteed.

STANDARD ACCESSORIES

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

Name and Shape	Q'ty	Name and Shape	Q'ty
Wall hook bracket	1	Cloth tape	1
Remote control unit	1	Tapping screw (big)	8
		Tapping screw (small)	2
Battery	2	Air cleaning filter	2
Remote control unit holder	1	Air cleaning filter frame	2
Drain pipe	1	Insulation (Drain hose)	1
Drain cap 2		Insulation (seal)	1



• The maximum length of the piping is 50 m. The maximum height difference of the piping is 30 m,

One set of following parts are necessary in istallation of this product. Name Connection pipe assembly Connection cord Wall pipe Decorative tape Vinyl tape Wall cap Saddle Drain hose Tapping screws Sealant M10 bolt, nut

ELECTRICAL REQUIREMENT

• Electric wire size and fuse capacity:

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

- 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 H07RN-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 80 mm diameter hole in the wall at the position shown in the

- (2) When cutting the wall hole at the inside of the wall hook bracket, cut the hole to a point of intersection of center marks. When cutting the wall hole at the outside of the wall hook bracket, cut
- the hole at a point of 10mm below. (3) Cut 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) 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. (The connection pipe is supplied in the installation set.) (6) For left piping and right piping and center 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 horizon tally and vertically. If the wall hook bracket is tiled, water will drip to the floor
- (2) Install the wall hook bracket so that it is strong enough to withstand the weight of an adult. • Fasten the wall hook bracket to the wall with 6 or more screws through
- the holes near the outer edge of the bracket. • Check that there is no rattle at the wall hook bracket.

🛆 WARNING	
If the wall pipe is not used, the cord interconnecting	
the indoor and outdoor units may touch metal and	
cause electric leakage.	

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 vinvl 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

- (1) In order to align the drain hose and drain cap, be sure to insert securely and vertically. Incline insertion will cause water leakage.
- 2) When inserting, be sure not to attach any material besides water. If any other material is attached, it will cause deterioration and water leakage.
- 3) After removing drain hose, be sure not to forget mounting drain cap. 4) Be sure to fix the drain hose with tape to the bottom
- of piping.
- 5) Prevent drain water frozen under low temperature environment
- When installing indoor unit's drain hose outdoors, necessary measure for frost protection should be taken to prevent drain water frozen.
- · 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 be resulted for indoor unit.



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.

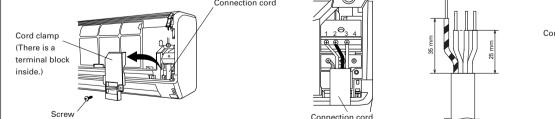
- FLARING (1) Cut the connection pipe to the necessary length Check if [L] is flared uniformly with a pipe cutter.
- (2) Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs. (3) Insert the flare nut onto the pipe and flare
- the pipe with a flaring tool. Insert the flare nut (always use the flare nut at-
- tached 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 conv-
- entional (for R22) flare tool. When using the conventional flare tool, always
- use an allowance adjustment gauge and secure the A dimension shown in the table.

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 150mm or over. (3) If the copper pipe is bend the pipe or pulled to often, it will become stiff.
- Do not bend the pipes more than three times at one place.

- INDOOR UNIT WIRING

(1) Remove the cord clamp. (2) Bend the end of the connection cord as shown in the figure



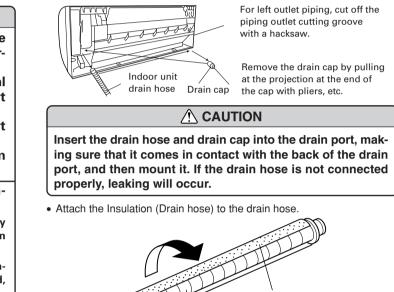
HOW TO CONNECT WIRING TO THE TERMINALS

- A. For solid core wiring (or F-cable)
- (1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm (1") to expose the solid wire. (2) Using a screwdriver, remove the terminal screw(s) on the terminal board. (3) Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
- (4) Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.

B. For strand wiring

parts.

- (1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 10 mm (3/8") to expose the strand wiring. (2) Using a screwdriver, remove the terminal screw(s) on the terminal board. (3) Using a round terminal fastener or pliers, securely clamp a round terminal to
- each stripped wire end. (4) Position the round terminal wire, and replace and tighten the terminal screw
- using a screwdriver



Wall hook bracket

mm hole

(Wall pipe

Wall hook bracket

Tapping screv

(size: large; quantity: 8

(Inside)

Wall (Outside

Wall hoo

bracket

Install the wall hook bracket horizontally and

Bind with vinyl tape

Pipe (top)

Bottom Indoor unit drain hose

piping (bottom)

Rear piping

asten with

vinyl tape

(Wall cap)

perpendicularly

Right piping

Centering marks

10 mm or

80 mm hole over

Veight

nsulation (Drain hose

CUSTOMER GUIDANCE

the low-pressure valve slightly.

When using the remote control unit

cooling operation.)

(5) Stop the operation.

POWER

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

PUMP DOWN OPERATION (FORCED COOLING OPERATION)

Press the TEST RUN button after starting the cooling operation by the remote control unit.

Keep on pressing the MANUAL AUTO button of the indoor unit for more than 10 seconds.

• Press the MANUAL AUTO button when stopping the operation from indoor unit side.

• Press the START/STOP button of the remote control unit to stop the operation.

(It is not necessary to press on keeping for more than 10 seconds.)

refrigeration cycle that leads to breakage and even injury.

(1) The rated voltage of this product is 230 V AC 50 Hz.

cle to supply power to the room air condition

3) Always use a special branch circuit and install a special recepta-

4) Use a circuit breaker and receptacle matched to the capacity of

current contracted capacity is insufficient, change the contracted capacity.

Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only)

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

expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker.

220 V -10 % to 240 V +10 % range.

the air conditioner

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.)

During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping.

4) Close the valve stem of 3 way valve (large) when the reading on the compound pressure gage becomes 0.05~0 MPa (0.5~0 kg/cm²).

Do not remove the connection pipe while the compressor is in operation with 3 way valve open. This may cause abnormal pressure in the

n 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

When the voltage is low and the air conditioner is difficult to start, contact the power company the voltage raised

If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation.

Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks.

The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances. When the

Before turning on the power, check if the voltage is within the (6) Perform wiring work in accordance with standards so that the

(5) Do not extend the power cord.

air conditioner can be operated safely and positively.

laws and regulations and electric company standards.

Install a leakage circuit breaker in accordance with the related

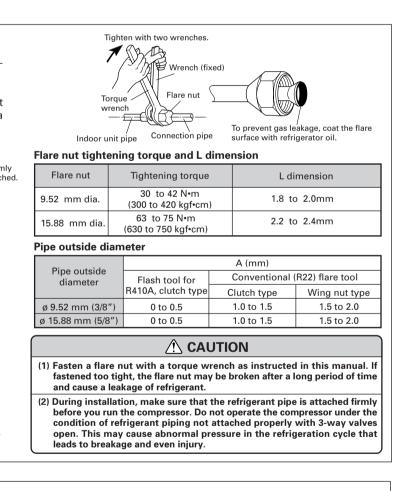
When using the MANUAL AUTO button of the indoor unit (The remote control unit is lost, and so on.)

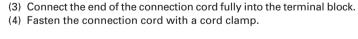
(2) Air filter removal and cleaning, and how to use the air louvers.

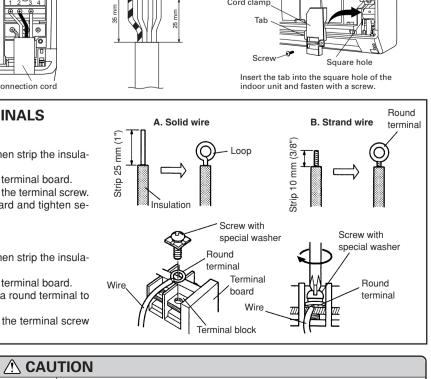
(3) Give the operating and installation manuals to the customer.

(2) Close the valve stem of 3 way valve (small) completely.

(3) Start the cooling operation or following forced cooling operation.

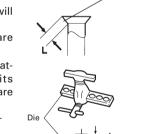


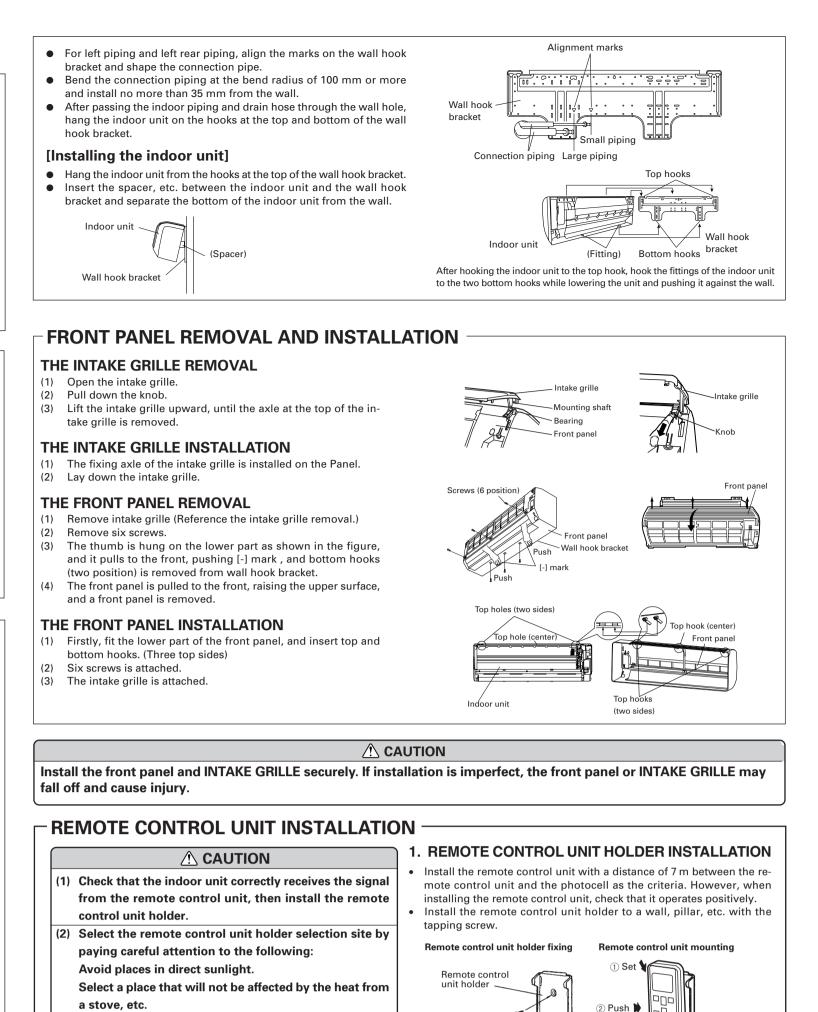




Only use for interconnection between two units.

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





Starting and stopping method, operation switching, temperat-ure adjustment, timer, air flow switching, and other remote control unit operations.

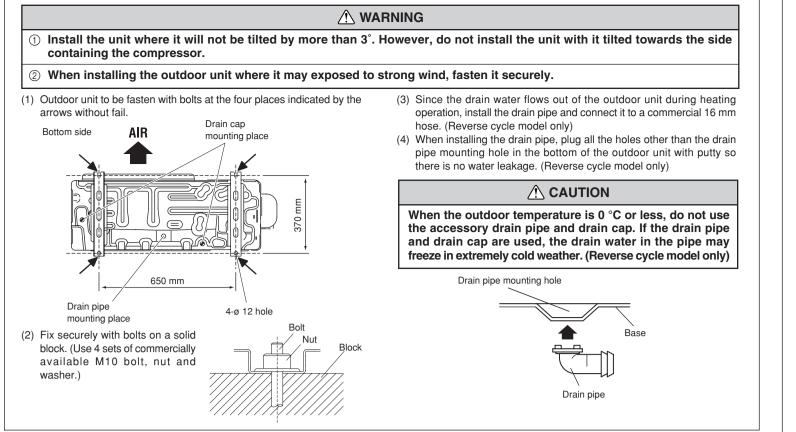
To avoid discharging refrigerant into the atmosphere at the time of relocation or disposal, recover refrigerant by doing the cooling operation or

(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 (large) and opening

forced cooling operation according to the following procedure. (When the cooling operation cannot start in winter, and so on, start the forced

Installation instruction on the back.

OUTDOOR UNIT OUTDOOR UNIT INSTALLATION



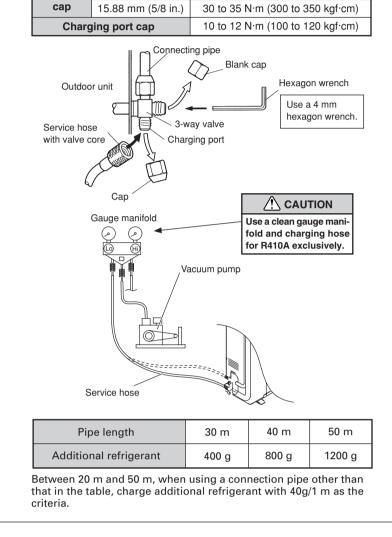
- AIR PURGE -

- (1) Remove the cap, and connect the gauge manifold and the vacuum pump to the charging valve by the service hoses. (2) Vacuum the indoor unit and the connecting pipes until the pressure
- gauge indicates -0.1 MPa (-76 cmHg). (3) When -0.1 MPa (-76 cmHg) is reached, operate the vacuum pump
- for at least 60 minutes. (4) Disconnect the service hoses and fit the cap to the charging valve to the specified torque.
- (5) Remove the blank caps, and fully open the spindles of the 3-way valves with a hexagon wrench [Torque: 6~7 N·m (60 to 70 kgf·cm)]. (6) Tighten the blank caps of the 3-way valve to the specified torque.

- (1) Do not purge the air with refrigerants, but use a vacuum pump to vacuum the installation! There is no extra refrigerant in the outdoor unit for air purging! (2) Use a vacuum pump and gauge manifold and charging hose for R410A exclusively. Using the same vacuum for different refrigerants may damage the vacuum pump or the unit.
- (3) After connecting the piping, check the all joints for gas leakage with gas leak detector.
- (4) When inspecting gas leakage, always use the vacuum pump for pressure. Do not use nitrogen gas.
- (5) When adding refrigerant, add the refrigerant from the charging port at the completion of work.
- (6) The maximum length of the piping is 50 m. If the units are further apart than this, correct operation can not be guaranteed.

Additional charge

Refrigerant suitable for a piping length of 20 m is charged in the outdoor unit at the factory. When the piping is longer than 20 m, additional charging is necessary. For the additional amount, see the table below.



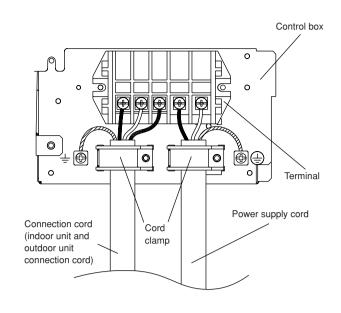
Overlap the insulation

 Blank
 9.52 mm (3/8 in.)
 20 to 25 N·m (200 to 250 kgf·cm)

Tightening torque

- ELECTRICAL WIRING (OUTDOOR UNIT)

- (1) Service cover removal • Remove the two mounting screws.
- Remove the service cover by pushing downwards. (2) Valve cover removal.
- Remove the one mounting screw. • Remove the valve cover by sliding upward.
- (3) Connect the power supply cord and the connection cord to terminal.
- (4) Fasten the power supply cord and connection cord with cord clamp. (5) Power supply cord and connection cord should be fixed with cable clip as shown in the figure.
- Fill in a gap at the entrance of the cords with insulation (seal).
- (6) Put the service cover and valve cover back after completion of the work.

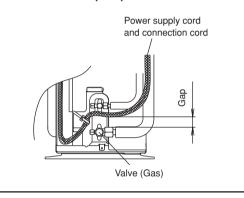


Keep the earth wire longer than the other wires.

Power supply cord or connection cord

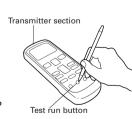
When connecting the power supply cord, make sure that the phase of the power supply matches with the phase of the terminal board. If the phases do not match, the compressor will rotate in reverse and will not be able to compress.

Do not make power supply cord and connection cord come in contact with valve (Gas).



- FINISHING -

- (1) Insulate between pipes. Connection pipe Indoor unit pipe • For rear, right, and bottom piping, overlap the connection pipe heat insulation and (heat insulation) indoor unit pipe heat insulation and bind them with vinyl tape so that there is no gap. • For left and left rear piping and center piping, butt the connection pipe heat insulatio Vinyl tape Bind the pipes together so / and indoor unit pipe heat insulation together and bind them with and vinyl tape so that that there is no gap. there is no gap.
 For left and left rear piping and center piping, wrap the area which accommodates the rear piping housing section with cloth tape. • For left and left rear piping and center piping, bind the connection cord to the top of the pipe with vinyl tape. loth tape • For left and left rear piping and center piping, bundle the piping and drain hose to-Left piping gether by wrapping them with cloth tape over the range within which they fit into the For connection from the left rear rear piping housing section. nnection cor Wall pipe (2) Temporarily fasten the connection cord 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 saddles, etc. (4) Fill the gap between the outside wall pipe hole and the pipe with sealer so that rain water and wind cannot blow in. Drain hos (5) Fasten the drain hose to the outside wall, etc. BAD Check the following / (Outside wall cap) (Sealer putty) Wave End in wate - TEST RUNNING • Perform test operation and check items 1 and 2 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, press the test run button on the remote control unit while the air conditioner is running, (Point the transmitter section of the remote control unit toward the air conditioner and press the test run button with the tip of a ball-point pen, etc.) • To end test operation, press the remote control unit START/STOP button. (When the air conditioner is run by pressing the test run button, the OPERATION indicator lamp and TIMER indicator lamp will simultaneously flash slowly.) 1. INDOOR UNIT (1) Is operation of each button on the remote control unit normal? Transmitter sec (2) Does each lamp light normally? (3) Do the air flow-direction louver operate normally?
- (4) Is the drain normal?
- 2. 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?



P/N 9315342027-01

