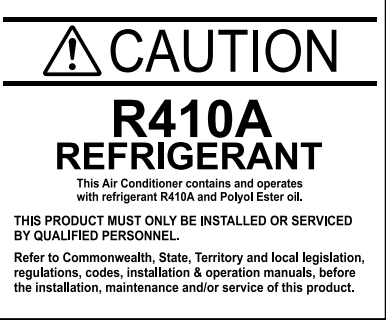


SPLIT TYPE AIR CONDITIONER INSTALLATION INSTRUCTION SHEET



(PART NO. 9374318117)

For authorized service personnel only.

DANGER	This mark indicates procedures which, if improperly performed, are most likely to result in the death of or serious injury to the user or service personnel.
WARNING	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.
CAUTION	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

This air conditioner uses new refrigerant HFC (R410A).

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

- Since the working pressure is 1.6 times higher than that of conventional refrigerant models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant 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 and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]
- Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.
- 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 (~76 cmHg to 53 kgf/cm ²) for high pressure. ~0.1 to 3.8 MPa (~76 cmHg to 38 kgf/cm ²) 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 Table 1. Never use copper pipes thinner than 0.8 mm (Nominal diameter is 1/4 in., 3/8 in., 1/2 in., 1.0 mm (Nominal diameter is 5/8 in.) even when it is available on the market.

Table 1 Thicknesses of Annealed Copper Pipes		
Nominal diameter (inch)	Outer diameter (mm)	Thickness (mm)
		R410A
1/4	6.35	0.80
3/8	9.52	0.80
1/2	12.70	0.80
5/8	15.88	1.00

STANDARD ACCESSORIES

The following accessories are supplied with the outdoor unit. Use them as required.

Name and Shape	Q'ty	Application
Drain pipe	1	For outdoor unit drain piping work [Heat & Cool model (Reverse cycle) only]
Drain cap	1	
Adapter assy 12.7 mm → 9.52 mm (1/2" → 3/8")	1	For use when connecting model 12,000 BTU/h

CONNECTION PIPE REQUIREMENT

CAUTION

Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks. Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only) In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker. If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation. In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

Connect the connection pipes according to **CONNECTING THE PIPING** in this installation instruction sheet.

Table 2		
MODEL	14000 BTU/h model	12000 BTU/h model
Diameter	Small 6.35 mm (1/4 in.)	6.35 mm (1/4 in.)
	Large 12.70 mm (1/2 in.)	9.52 mm (3/8 in.)
Maximum length	25 m (82 ft)	25 m (82 ft)
Maximum Height (between indoor and outdoor)	15 m (49 ft)	15 m (49 ft)

- Use pipe with water-resistant heat insulation.
- Use pipe that can withstand a pressure of 4,150 kPa.

ELECTRICAL REQUIREMENT

- Electric wire size and fuse capacity:

Table 3		
Power supply cord (mm ²)	MAX.	3.0
	MIN.	2.0
Connection cord (mm ²)	MAX.	2.5
	MIN.	1.5
Fuse capacity (A)		15

- Install the disconnect device with a contact gap of at least 3 mm nearby the units.
- 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.

INSTALLATION PROCEDURE

1 OUTDOOR UNIT INSTALLATION

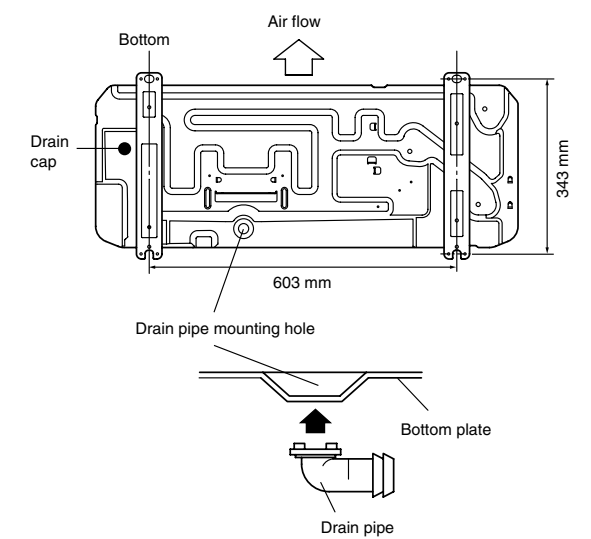
WARNING

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

- 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.
- Since the drain water flows out of the outdoor unit during heating operation, install the drain pipe and connect it to a commercial 16 mm hose. (Heat & Cool model (Reverse cycle) only)
- When installing the drain pipe, plug all the holes (+ hole at one place) other than the drain pipe mounting hole in the bottom of the outdoor unit with putty so there is no water leakage. (Heat & Cool model (Reverse cycle) only)

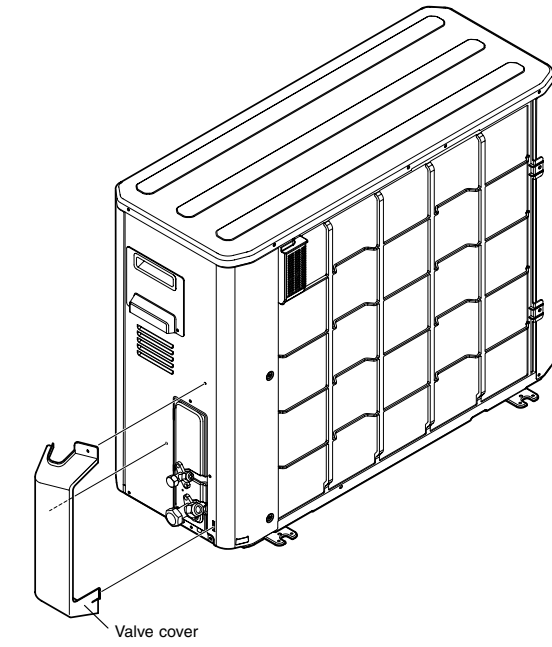
CAUTION

Installation in cold regions. 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 extremely cold weather.)

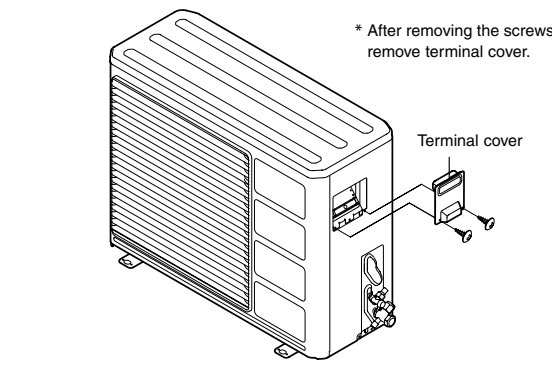


2. OUTDOOR UNIT CONNECTION CORD AND PIPE CONNECTION PREPARATIONS

Remove outdoor unit valve cover.



Remove outdoor unit terminal cover.



2 CONNECTING THE PIPING

WARNING

Do not use the existing 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.)

CAUTION

- Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.
- While welding the pipes, be sure to blow dry nitrogen gas through them.
- The maximum lengths of this product are shown in table 2. If the units are further apart than this, correct operation can not be guaranteed.

1. FLARING

- Cut the connection pipe to the necessary length with a pipe cutter.
- Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
- Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool. Use the special R410A flare tool, or the conventional flare tool. When using the conventional flare tool, always use an allowance adjustment gauge and secure the A dimension shown in table 4.

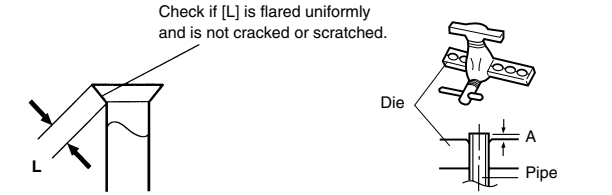


Table 4 Pipe outside diameter

Pipe outside diameter	A (mm)	
	Flare tool for R410A, clutch type	
6.35 mm (1/4 in.)	0 to 0.5	
9.52 mm (3/8 in.)	0 to 0.5	
12.70 mm (1/2 in.)	0 to 0.5	
15.88 mm (5/8 in.)	0 to 0.5	

2. BENDING PIPES

- When bending the pipe, be careful not to crush it.
- To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or over.
- 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.

3. CONNECTION

- Install the outdoor unit wall cap (supplied with the optional installation set or procured at the site) to the wall hole pipe.
- Connect the outdoor unit and indoor unit piping.
- 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.

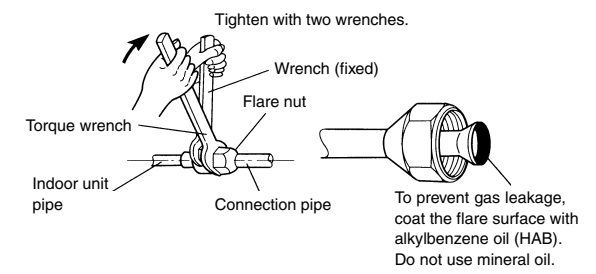


Table 5 Flare nut tightening torque

Flare nut	Tightening torque
6.35 mm (1/4 in.) dia.	14 to 18 N · m (140 to 180 kgf · cm)
9.52 mm (3/8 in.) dia.	33 to 42 N · m (330 to 420 kgf · cm)
12.70 mm (1/2 in.) dia.	50 to 62 N · m (500 to 620 kgf · cm)
15.88 mm (5/8 in.) dia.	63 to 77 N · m (630 to 770 kgf · cm)

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

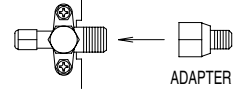
4. HOW TO USE ADAPTER (Connection ports of 12,000 BTU/h model outdoor unit)

- When using the ADAPTER, be careful not to overtighten the nut, or the smaller pipe may be damaged.
- Apply a coat of refrigeration oil to the threaded connection port of the outdoor unit where the flare nut comes in.
- Use appropriate wrenches to avoid damaging the connection thread by overtightening the flare nut.
- Apply wrenches on both of flare nut (local part), and ADAPTER to tighten them.

Adapter tightening torque

Adapter type	Tightening torque
ø12.7 mm → ø9.52 mm	50 to 62 [N·m] (500 to 620 kgf·cm)

ø12.7 → ø9.52 (1/2" → 3/8")



For authorized service personnel only.

DANGER

Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 5 minutes or more before touching electrical components.

WARNING

- For the air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.
- Connect the indoor unit and outdoor unit with the air conditioner piping and cords available standards parts. This installation instruction sheet describes the correct connections using the installation set available from our standard parts.
- Installation work must be performed in accordance with national wiring standards by authorized personnel only.
- Do not use an extension cord.
- Do not turn on the power until all installation work is complete.
- Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation.
- There is not extra refrigerant in the outdoor unit for air purging.
- Use a vacuum pump for R410A exclusively.
- Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.
- Use a clean gauge manifold and charging hose for R410A exclusively.
- If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.

CAUTION

This installation instruction sheet describes how to install the outdoor unit only. To install the indoor unit, refer to the installation instruction sheet 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 instruction sheet because it is used when the air conditioner is serviced or moved.

SELECTING THE MOUNTING POSITION

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.

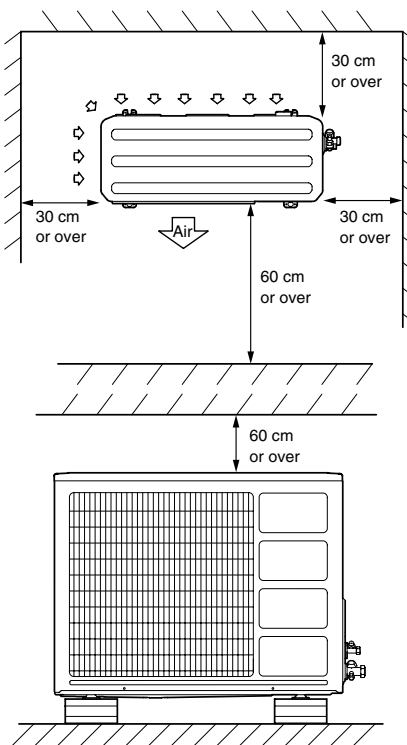
CAUTION

- Do not install where there is the danger of combustible gas leakage.
- Do not install near heat sources.
- If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

Decide the mounting position with the customer as follows:

- 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.

- When selecting the installation location of the indoor unit, consult the customer and refer to the installation instruction sheet included with the indoor unit.



3 VACUUM PROCESS

CAUTION

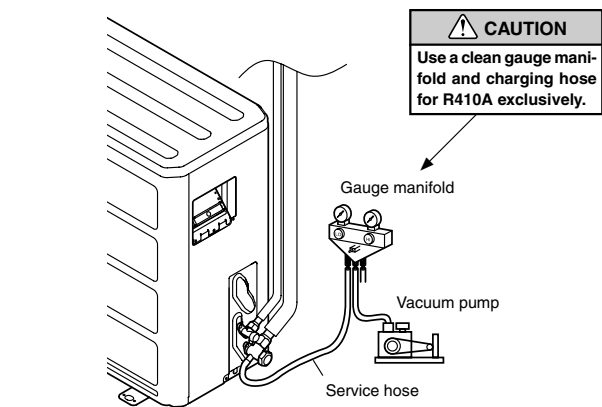
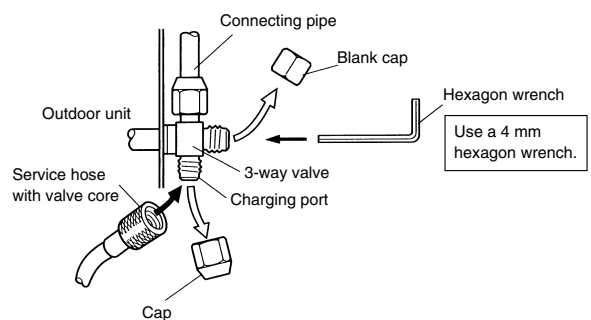
- Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation! There is no extra refrigerant in the outdoor unit for air purging!
- Use a vacuum pump for R410A exclusively. Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.

1. VACUUM

- Remove the cap, and connect the gauge manifold and the vacuum pump to the charging valve by the service hoses.
- Vacuum the indoor unit and the connecting pipes until the pressure gauge indicates ~0.1 MPa (~76 cmHg).
- When ~0.1 MPa (~76 cmHg) is reached, operate the vacuum pump for at least 15 minutes.
- Disconnect the service hoses and fit the cap to the charging valve to the specified torque.
- Remove the blank caps, and fully open the spindles of the 2-way and 3-way valves with a hexagon wrench (Torque : 6 to 7 N · m (60 to 70 kgf · cm).
- Tighten the blank caps of the 2-way valve and 3-way valve to the specified torque.

Table 6

Tightening torque		
Blank cap (2-way valve)	20 to 25 N · m (200 to 250 kgf · cm)	
Blank cap	12.70 mm (1/2 in.) 25 to 30 N · m (250 to 300 kgf · cm)	
(3-way valve)	15.88 mm (5/8 in.) 30 to 35 N · m (300 to 350 kgf · cm)	
Charging port cap	10 to 12 N · m (100 to 120 kgf · cm)	



2. ADDITIONAL CHARGE

Refrigerant suitable for a piping length of 10 m is charged in the outdoor unit at the factory. When the piping is longer than 10 m, additional charging is necessary. For the additional amount, see the table below.

Additional refrigerant	Pipe length					g/m (oz/ft)
	10 m (33 ft)	15 m (49 ft)	20 m (66 ft)	25 m (82 ft)		
Heat & Cool model (Reverse cycle)	12,000 BTU/h 14,000 BTU/h class	None	100 g (3-11 3/4 oz)	200 g (7-1/16 oz)	300 g (10-19/32 oz)	20 g/m (7/32 oz/ft)

CAUTION

- When moving and installing the air conditioner, do not mix gas other than the specified refrigerant (R410A) inside the refrigerant cycle.
- When charging the refrigerant R410A, always use an electronic balance for refrigerant charging (to measure the refrigerant by weight).
- 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.
- Add refrigerant from the charging valve after the completion of the work.
- If the units are further apart than the maximum pipe length, correct operation can not be guaranteed.

3. GAS LEAKAGE INSPECTION

CAUTION

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

WARNING

(1) Before starting work, check that power is not being supplied to indoor unit and the outdoor unit.

(2) Match the terminal block numbers and connection cord colors of the indoor unit and the outdoor unit. Erroneous wiring may cause burning of the electric parts.

(3) Connect the connection cords firmly to the terminal block. Imperfect installation may cause a fire.

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

(5) Always connect the ground wire.

HOW TO CONNECT WIRING TO THE TERMINALS

A. For solid core wiring

(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm (15/16") 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

(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.

A. Solid wire

Strip 25 mm (15/16")

Insulation

Loop

Screw with special washer

Round terminal

Wire

Terminal board

Terminal block

B. Strand wire

Strip 10 mm (3/8")

Round terminal

Screw with special washer

Round terminal

Wire

Terminal board

1. CONNECTION DIAGRAM

(1) Process the end of the connection cords to the dimensions shown in figure.

(2) Connect the end of the connection cord fully into the terminal block and fasten with the screws.

(3) Fasten the sheath with a cord clamp.

(4) Pass the connection cord and power cord through the hole of the 3-way valve bracket and run them to the outside of the cabinet. Do not block the ventilation slots in the cabinet when wiring the power cord and connection cords.

(5) Install the terminal cover and valve cover as shown in figure. Pass the power cord and connections cords through the valve cover when wiring them.

5

POWER

WARNING

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

(2) Before turning on the verify that the voltage is within the 198 V to 264 V range.

(3) Always use a special branch circuit and install a special breaker to supply power to the air conditioner.

(4) Use a circuit breaker matched to the capacity of the air conditioner. (Install in accordance with standard)

(5) The circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3 mm between the contacts of each pole.

(6) Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.

(7) Install a leakage circuit breaker in accordance with the related laws and regulations and electric company standards.

CAUTION

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

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

6

TEST RUNNING

CAUTION

Always turn on the power 4 hours prior to the start of the operation in order to ensure compressor protection.

- Perform test operation and check items (1) to (3) below.
- For the operation method, refer to the operating manual.
- The outdoor unit may not run, depending on the room temperature. In this case, the 'TEST RUN' signal is received during air conditioner operation. (For information on the 'TEST RUN', refer to the installation instruction sheet included with the indoor unit or the operating manual.)

Operation can be checked by lighting and flashing of the display section OPERATION and TIMER lamps.

Perform judgement in accordance with the following.

- Test running

When the air conditioner is run by pressing the remote control unit TEST RUN button, the OPERATION and TIMER lamps flash slowly at the same time.

- Error

The LED lamp of an outdoor unit operates as follows (Table 8) according to the contents of an error.

Table 8	
Error contents	LED (RED)
Serial signal error	1 time blink
Discharge pipe thermistor error	2 times blink
Heat exchanger thermistor error	3 times blink
Outdoor temperature thermistor error	4 times blink
Compressor thermistor error	7 times blink
Pressure switch error	8 times blink
Current trip error	10 times blink
CT error	11 times blink
Compressor position detection error	12 times blink
Compressor starting error	13 times blink
Timer error	14 times blink

CHECK ITEMS

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?

- Do not operate the air conditioner in the test running state for a long time.
- For the operation method, refer to the operating manual and perform operation check.

7

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 and installation instruction sheet to the customer.

PART NO. 9374318117