

SPLIT TYPE ROOM AIR CONDITIONER INSTALLATION INSTRUCTION SHEET

(PART NO. 9373856003)

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 to 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 R410A.

- The basic installation work procedures are the same as conventional refrigerant models.
- 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 the refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant. It is necessary to check the thread diameter for safety. (The charging port thread diameter for R410A is 1/2" NPT 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 changing 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.

Tool name	Contents of change
Group manifold	Pressure is high and cannot be measured with conventional gauge. To prevent erroneous reading of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with each: 1) for 1.6 MPa, 2) for 0.5 MPa, 3) for 0.1 MPa, 4) for 0.05 MPa, 5) for 0.02 MPa.
Charge hose	Use a hose with a diameter of 1/2" NPT 20 threads per inch.
Manifold pump	A conventional vacuum pump can be used by attaching a vacuum gauge adapter.
Charge adapter	Use a special adapter for R410A.

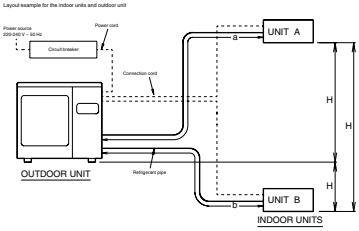
Copper pipes	Thickness of Annealed Copper Pipes (R410A)	
	Pipe outside diameter	Thickness
Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur after turning off the power, always wait 5 minutes or more before touching electrical components.	6.35 mm (1/4 in.)	0.50 mm
	9.52 mm (3/8 in.)	0.80 mm
	12.70 mm (1/2 in.)	0.90 mm
	15.88 mm (5/8 in.)	1.00 mm

STANDARD PARTS

Item	Qty	Use
Charge pipe	1	For outdoor unit from piping kit
Charge cap	1	For use when connecting standard R410A outdoor unit



SYSTEM LAYOUT



1. CONNECTABLE INDOOR UNIT CAPACITY TYPE

- If the total capacity of the connected indoor units, an error will be displayed and the units will not operate. (For information on error displays, refer to the installation instruction sheets included with the indoor unit.)
- To install an indoor unit, refer to the installation instruction sheet included with the indoor unit.
- All heat three indoor units must be connected to the outdoor unit.

Outdoor unit	Connectable indoor name
A	7-12
B	7-12-14

Outdoor unit	Connectable indoor name
A	7-12
B	7-12-14-18

*1 When connecting models 7-12 to the outdoor unit, the included adapter is necessary. (For more information, refer to 4 HOW TO USE ADAPTER.)

2. LIMITATION OF REFRIGERANT PIPING LENGTH

Item	Limitation
Total maximum piping length	32.0 (104' 7")
Max. length for each indoor unit (R410A)	20.0 (65' 6")
Max. height difference (ft)	10.0 (32' 8")
Max. length for each indoor unit (R410A) for heat insulation (ft)	5.0 (16' 4")

3. SELECTING PIPE SIZES

Capacity of indoor unit (kW)	Gas pipe size (Outside/Inside) (mm)	Liquid pipe size (Outside/Inside) (mm)
14-18	φ12 (3/8")	φ6.35 (1/4")

Operation cannot be guaranteed if the correct combination of pipe, valves, etc. is not used to connect the indoor and outdoor units.

4. HEAT INSULATION AROUND CONNECTION PIPES REQUIREMENTS

⚠ CAUTION
Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks.
The heat insulation must have resistance above 0.05 W/(m·K) (the view 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 5. ELECTRICAL REQUIREMENT.

Power supply cord (mm²)	MAX.	MIN.
MAX.	4.0	1.6
MIN.	2.5	1.6

Connection cord (mm²)	MAX.	MIN.
MAX.	2.5	1.6
MIN.	1.6	1.6

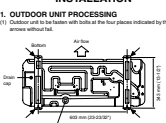
Fuse capacity (A)	INDOOR UNIT	OUTDOOR UNIT
INDOOR UNIT	10	10

* Install a disconnect device with a circuit breaker at least 3 mm nearby. * Always use the air conditioner power supply a specific circuit circuit and provide a ground terminal. * Always use RCD/ELCB or equivalent as the power supply cord and the connection cord.

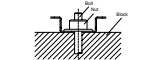
INSTALLATION PROCEDURE

1. OUTDOOR UNIT PROCESSING

(1) Outdoor unit is to be fixed with bolts at the four points indicated by the arrows without fail.

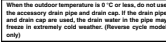


(2) Fix exactly with bolts on a solid block. Use 4 sets of commercially available bolts (not included).



(3) Since the sludge water flows out of the outdoor unit during heating operation, install the drain pipe and connect it to a commercial drain pipe. (Reverse cycle model only.)

(4) When installing the drain pipe, align it with the hole other than the drain pipe mounting hole in the bottom of the outdoor unit with jelly so there is no water leakage. (Reverse cycle model only.)

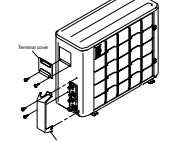


When the outdoor temperature is 0 °C or less, do not use the secondary drain pipe and drain cap. If the drain pipe and drain cap are used, the drain water in the pipe may freeze in extremely cold weather. (Reverse cycle model only.)



2. BENDING PIPES

The pipes are applied by your hands. Be careful not to collapse them. Do not bend the pipes on the other than the pipe.



(1) To prevent kinking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or more.

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

(3) Attach the connection pipe.

(4) When the flare nut is tightened properly by your hand, use a torque wrench to finally tighten it.



When the outdoor temperature is 0 °C or less, do not use the secondary 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. (Reverse cycle model only.)



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2. CONNECTING THE PIPE

⚠ CAUTION
Do not use mineral oil on flare nut. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.

(1) While welding the pipes, be sure to blow dry nitrogen gas through them.

(2) The maximum lengths of this product are shown in the table. If the units are further apart than this, correct operation can not be guaranteed.

1. FLARING

(1) Cut the connection pipe to the necessary length with a pipe cutter. Do not bend the pipes on the other than the pipe.

(2) Bend the pipe diameter so that the cutting will not enter the pipe and receive the burrs.

(3) Bend the pipe diameter so that the flare will be adapted to the indoor and outdoor units respectively into the pipe and perform the flare processing with a flare tool.

Use the special R410A flare tool, or the conventional flare tool. (See 2.2.1 for more details.)



Pipe outside diameter	Dimension A (mm)
6.35 mm (1/4 in.)	6.5
9.52 mm (3/8 in.)	9.5
12.70 mm (1/2 in.)	12.5
15.88 mm (5/8 in.)	15.7
19.05 mm (3/4 in.)	18.5

When using conventional flare tools for R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table for charging R410A gas. Refer to the specified charging pipe flare gauge to measure the dimension A.

Pipe outside diameter	Width across flats of flare nut
6.35 mm (1/4 in.)	17 mm
9.52 mm (3/8 in.)	22 mm
12.70 mm (1/2 in.)	25 mm
15.88 mm (5/8 in.)	28 mm
19.05 mm (3/4 in.)	32 mm

When using conventional flare tools for R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table for charging R410A gas. Refer to the specified charging pipe flare gauge to measure the dimension A.

3. CONNECTION PIPES

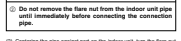
(1) Detach the caps and plugs from the pipes.

⚠ CAUTION
Be sure to apply the pipe against the port on the indoor unit and outdoor unit correctly. If the connecting is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.

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

(3) Connecting the pipe against port on the indoor unit, turn the flare nut with your hand.

To prevent gas leakage, use the flare nut with sealant (not included).



When the outdoor temperature is 0 °C or less, do not use the secondary 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. (Reverse cycle model only.)

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4. HOW TO USE ADAPTER (Connection ports of outdoor unit)

When using the ADAPTER, be careful not to over-tighten the nut, or the adapter pipe may be damaged.

Apply a coat of refrigerant oil to the threaded connection part of the low-temperature model to avoid damaging the connection thread by over-tightening the flare nut (R410A model, and ADAPTER is optional).

Apply refrigerant oil to the flare nut (R410A model, and ADAPTER is optional).

Adapter type	Tightening torque
φ12.7 mm × φ8.52 mm	55 to 62 (N·m) (500 to 550 kgf·cm)
φ16.25 mm × φ10.52 mm	65 to 72 (N·m) (600 to 650 kgf·cm)
φ19.7 mm × φ15.88 mm	55 to 62 (N·m) (500 to 550 kgf·cm)

Hold the torque wrench at the 90° keeping it in the right angle with the pipe, in order to tighten the flare nut correctly.

Pipe nut	Tightening torque
φ12.7 mm (1/2 in.)	14 to 16 (N·m) (130 to 140 kgf·cm)
φ15.88 mm (5/8 in.)	16 to 18 (N·m) (150 to 160 kgf·cm)
φ19.05 mm (3/4 in.)	20 to 22 (N·m) (180 to 200 kgf·cm)
φ22.22 mm (7/8 in.)	22 to 24 (N·m) (200 to 220 kgf·cm)
φ25.40 mm (1 in.)	24 to 26 (N·m) (220 to 240 kgf·cm)

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

Connecting the pipe against port on the indoor unit, turn the flare nut with your hand.

To prevent gas leakage, use the flare nut with sealant (not included).

When the outdoor temperature is 0 °C or less, do not use the secondary 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. (Reverse cycle model only.)

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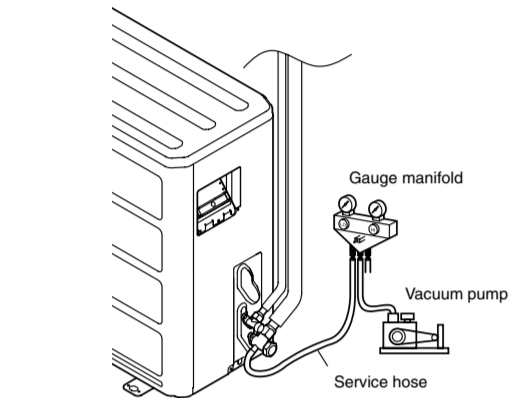
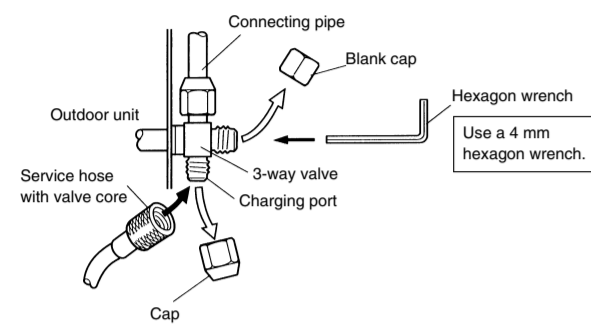
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5. VACUUM

- 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 30 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: 6-7 N·m (60 to 70 kgf·cm)].
- Tighten the blank caps of the 2-way valve and 3-way valve to the specified torque.

	Tightening torque	
Blank cap	6.35 mm (1/4 in.)	20 to 25 N·m (200 to 250 kgf·cm)
	9.52 mm (3/8 in.)	20 to 25 N·m (200 to 250 kgf·cm)
	12.70 mm (1/2 in.)	25 to 30 N·m (250 to 300 kgf·cm)
	15.88 mm (5/8 in.)	30 to 35 N·m (300 to 350 kgf·cm)
Charging port cap	19.05 mm (3/4 in.)	35 to 40 N·m (350 to 400 kgf·cm)
	10 to 12 N·m (100 to 120 kgf·cm)	



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 and gauge manifold and charging hose for R410A exclusively. Using the same vacuum for different refrigerants may damage the vacuum pump or the unit.
- Charging of additional refrigerant (R410A) according to the piping length is unnecessary.

6. GAS LEAKAGE INSPECTION

CAUTION

- After connecting the piping, check the all joints for gas leakage with gas leak detector.
- When inspecting gas leakage, always use the vacuum pump for pressure. Do not use nitrogen gas.

7. RECHARGING THE REFRIGERANT

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

POWER

WARNING

- The rated voltage of this product is 220-240 V A.C. 50 Hz.
- Before turning on verify that the voltage is within the 198 V to 264 V range.
- Always use a special branch circuit and install a special receptacle to supply power to the air conditioner.
- Use a special branch circuit breaker and receptacle matched to the capacity of the air conditioner. (Install in accordance with standard.)
- Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.
- Install a leakage special branch 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, change the contracted capacity.
- When the voltage is low and the air conditioner is difficult to start, contact the power company the voltage raised.

4

ELECTRICAL WIRING

WARNING

- Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.
- Match the terminal board numbers and connection cord colors with those of the outdoor unit. Erroneous wiring may cause burning of the electric parts.
- Connect the connection cords firmly to the terminal board. 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.)
- Always connect the ground wire.

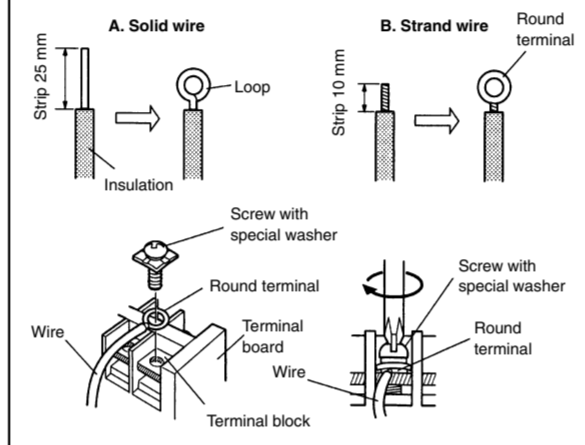
HOW TO CONNECT WIRING TO THE TERMINALS

A. For solid core wiring (or F-cable)

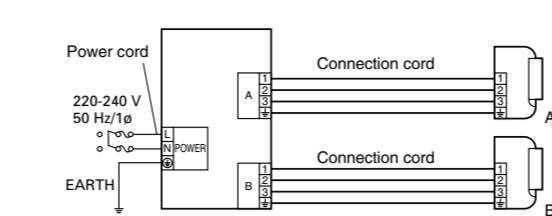
- Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm to expose the solid wire.
- Using a screwdriver, remove the terminal screw(s) on the terminal board.
- Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
- Shape the loop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

B. For strand wiring

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

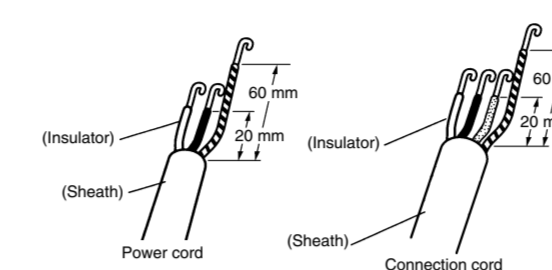


1. CONNECTION DIAGRAMS



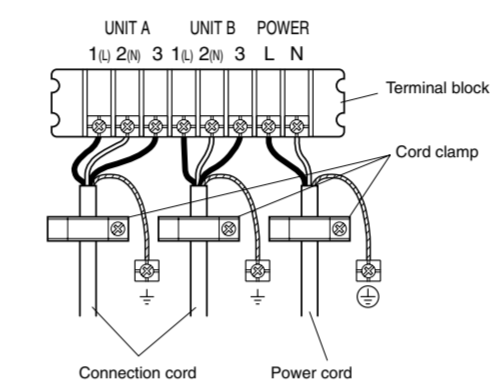
2. CORD PREPARATION

Keep the earth wire longer than the other wires.

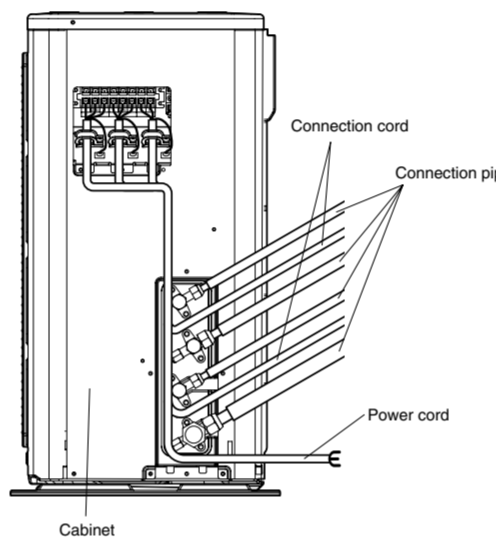


3. OUTDOOR UNIT

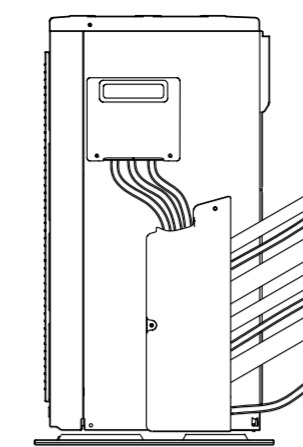
- Connect the power supply cord and the connection cord to terminal.
- Fasten the power supply cord and connection cord with cord clamp.



- 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.



- Install the valve cover and terminal cover as shown. Pass the power cord and connections cords through the valve cover when wiring them.



5

TEST RUNNING

The test run method may be different for each indoor unit that is connected. Refer to the installation instruction sheet included with each indoor unit.

6

CUSTOMER GUIDANCE

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

- Starting and stopping method, operation switching, temperature adjustment, timer, air flow adjustment, and other remote control unit operations.
- Air filter removal and cleaning.
- Give the operating manual and installation instruction sheet to the customer.