

3 CONNECTING THE PIPING

WARNING

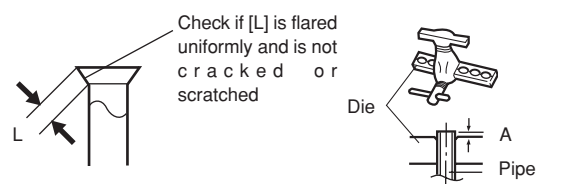
Do not use the existing piping and flare nuts. If the existing materials are used, the pressure inside the refrigerant cycle will rise and cause breakage, injury, etc. (Use the special R410A materials.)

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 the table in "CONNECTING PIPE REQUIREMENT" section. If the units are further apart than this, correct operation can not be guaranteed.

1. FLARING

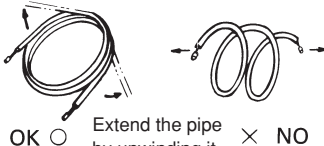
- Cut the connection pipe to the necessary length with a pipe cutter.
- Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
- Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool. Use the special R410A flare tool, or the conventional (for R22) flare tool.



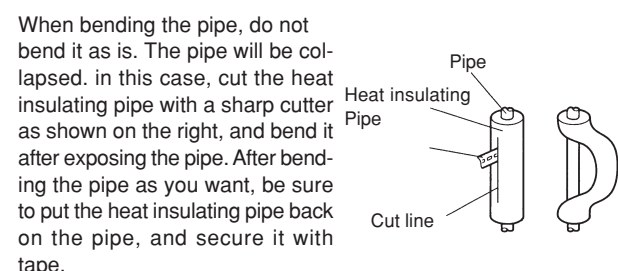
| Pipe outside diameter | A (mm) | | |
|-----------------------|-----------------------------------|-------------------------------------|---------------|
| | Flare tool for R410A, clutch type | Conventional flare tool Clutch type | Wing nut type |
| 9.52 mm (3/8 in.) | 0 to 0.5 | 1.0 to 1.5 | 1.5 to 2.0 |
| 15.88 mm (5/8 in.) | 0 to 0.5 | 1.0 to 1.5 | 2.0 to 2.5 |

2. BENDING PIPES

The pipes are shaped by your hands. Be careful not to collapse them.



Do not bend the pipes in an angle more than 90°. When pipes are repeatedly bent or stretched, the material will harden, making it difficult to bend or stretch them any more. Do not bend or stretch the pipes more than three times.



CAUTION

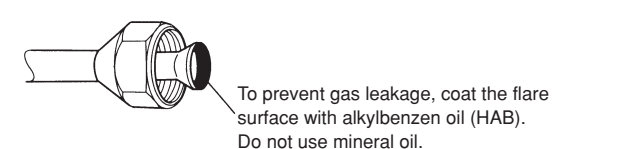
- To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or over.
- If the pipe is bent repeatedly at the same place, it will break.

3. CONNECTION PIPES

- Indoor unit side
Detach the caps and plugs from the pipes.

CAUTION

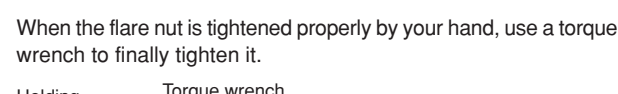
- Be sure to apply the pipe against the port on the indoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.
- Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.



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

CAUTION

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

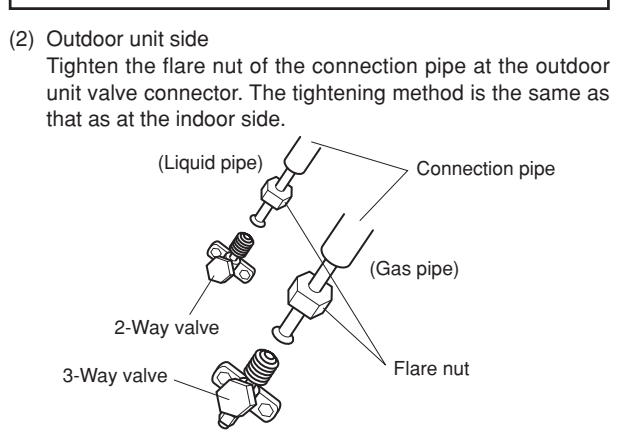


Flare nut tightening torque

| Flare nut | Tightening torque |
|-------------------------|----------------------------------|
| 9.52 mm (3/8 in.) dia. | 33 to 42 N·m (330 to 420 kgf·cm) |
| 15.88 mm (5/8 in.) dia. | 63 to 77 N·m (630 to 770 kgf·cm) |

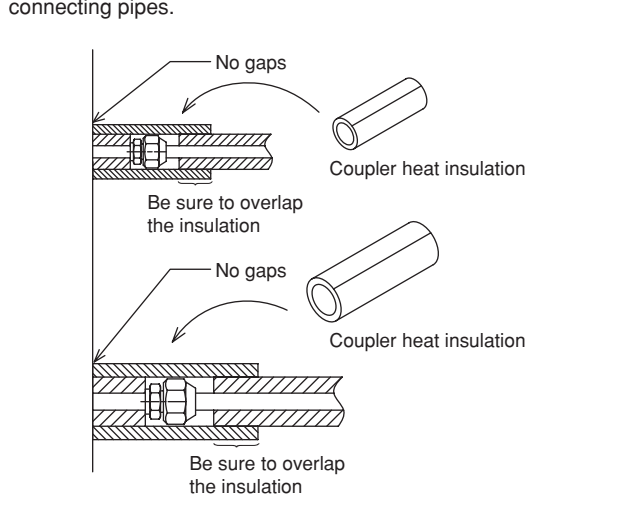
4 HEAT INSULATION ON THE PIPE JOINTS (INDOOR SIDE ONLY)

Stick coupler heat insulation (large and small) to the place where connecting pipes.



CAUTION

There should be no gaps between the insulation and the product.



CAUTION

Use a clean gauge manifold and charging hose for R410A exclusively.

4 VACUUM PROCESS

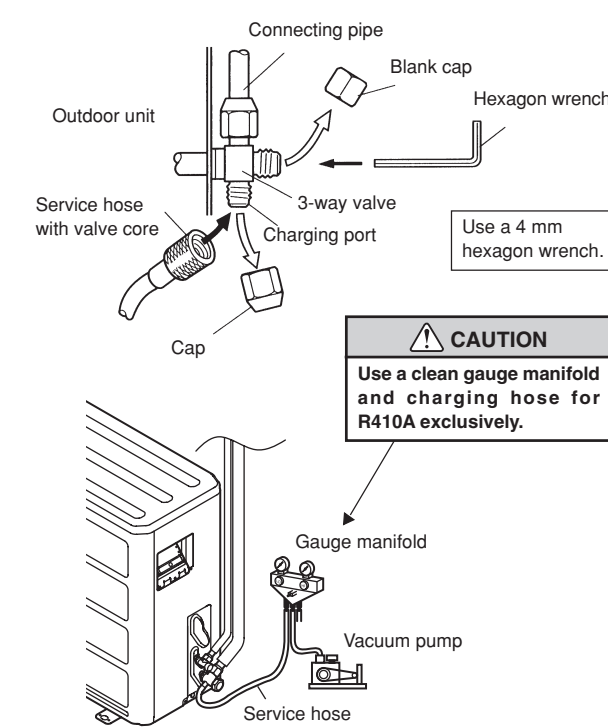
CAUTION

- Do not purge the air 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 for different refrigerants may damage the vacuum pump or 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.

| | Tightening torque |
|-------------------------|----------------------------------|
| Blank cap (2-way valve) | 20 to 25 N·m (200 to 250 kgf·cm) |
| Blank cap (3-way valve) | 30 to 35 N·m (300 to 350 kgf·cm) |
| Charging port cap | 10 to 12 N·m (100 to 120 kgf·cm) |



CAUTION

Use a clean gauge manifold and charging hose for R410A exclusively.

2. ADDITIONAL CHARGE

Refrigerant suitable for a piping length of 7.5 m is charged in the outdoor unit at the factory. When the piping is longer than 7.5 m, additional charging is necessary. For the additional amount, see the table below.

| Pipe length | Additional refrigerant | | | | |
|---------------|-----------------------------|----------------|-----------------|-----------------|------------------|
| | Heat & Cool (Reverse cycle) | 100 g (3.5 oz) | 300 g (10.6 oz) | 500 g (17.6 oz) | 700 g (24.7 oz) |
| 7.5 m (25 ft) | None | 100 g (3.5 oz) | 300 g (10.6 oz) | 500 g (17.6 oz) | 700 g (24.7 oz) |
| 10 m (33 ft) | None | 50 g (1.8 oz) | 150 g (5.3 oz) | 250 g (8.9 oz) | 350 g (12.3 oz) |
| 15 m (49 ft) | None | 100 g (3.5 oz) | 300 g (10.6 oz) | 500 g (17.6 oz) | 700 g (24.7 oz) |
| 20 m (66 ft) | None | 150 g (5.3 oz) | 450 g (15.9 oz) | 750 g (26.5 oz) | 1050 g (37.1 oz) |
| 25 m (82 ft) | None | 200 g (7.1 oz) | 600 g (21.3 oz) | 900 g (31.9 oz) | 1200 g (42.5 oz) |

Between 7.5 m and 25 m, when using a connection pipe other than that in the table, charge additional refrigerant with 40 g (1.4 oz)/1 m (3.3 ft) (Reverse cycle model), 20 g (0.7 oz)/1 m (3.3 ft) (Cooling model) as the criteria.

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.

5 GAS LEAKAGE INSPECTION

CAUTION

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

6 ELECTRICAL WIRING

CAUTION

Do not bundle the remote controller cord, or wire the remote controller cord in parallel, with the indoor unit connection wire (to the outdoor unit) and the power supply cord. It may cause erroneous operation.

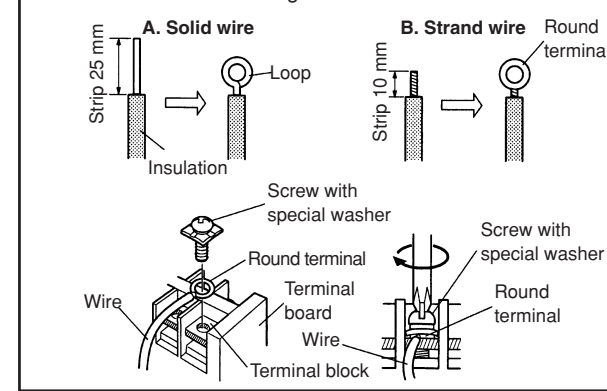
HOW TO CONNECT WIRING TO THE TERMINALS

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

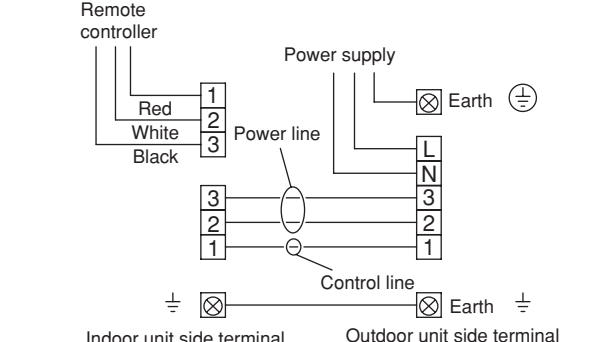
- Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm (1 5/16") to expose the solid wire.
- Using a screwdriver, remove the terminal screw(s) on the terminal board.
- Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
- Shape 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 (3/8") 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

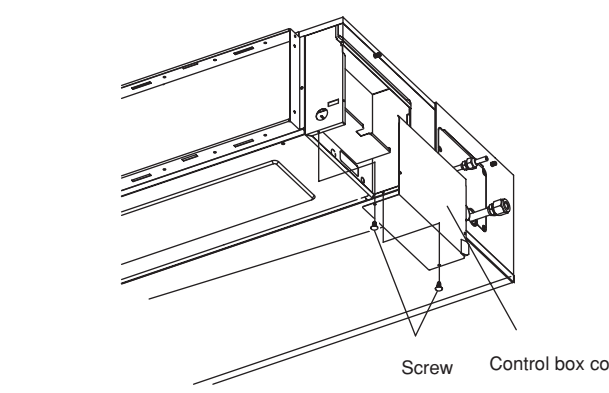


2. INDOOR UNIT SIDE

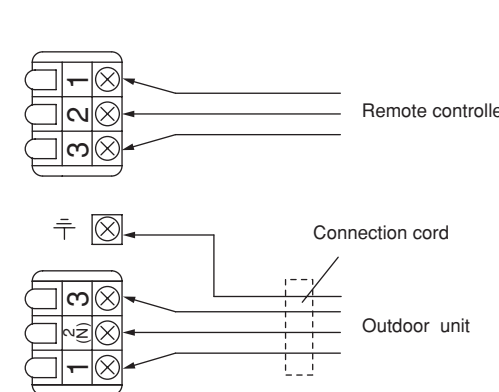
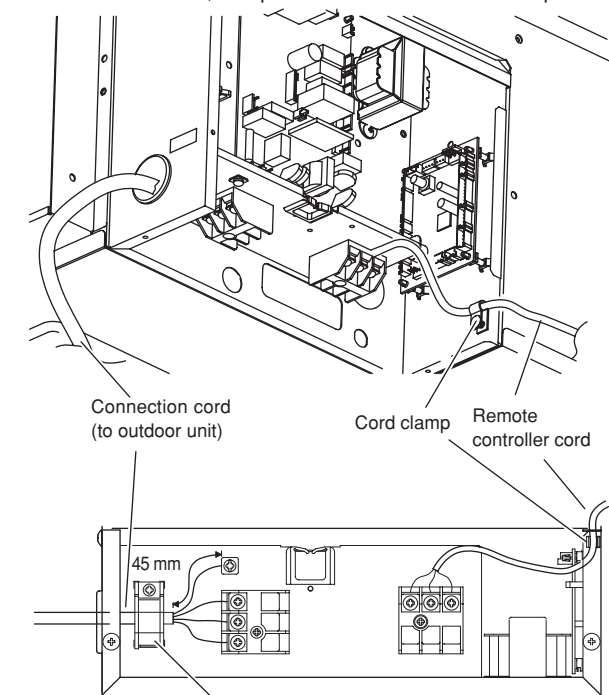
WARNING

- 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.

- Remove the control box cover and install each connection wire.

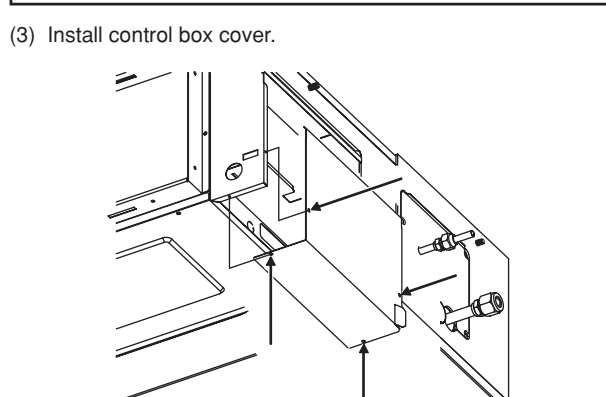


- After wiring is complete, secure the remote controller cord, connection cord, and power cord with the cord clamps.



CAUTION

- Use care not to mistake the power supply cord and connection wires when installing.
- Install so that the wires for the remote controller will not come in contact with other connection wires.
- If there is a risk of entering insects and small animals into the hole for cords, fill in the gap with putty.



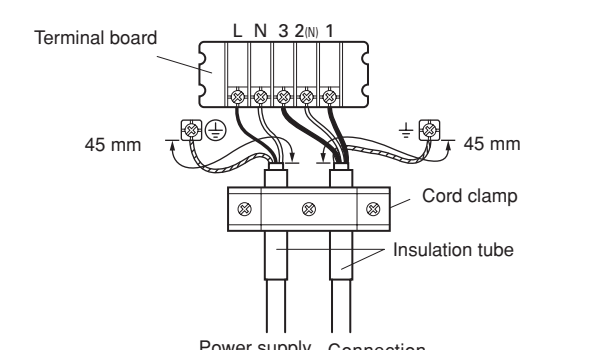
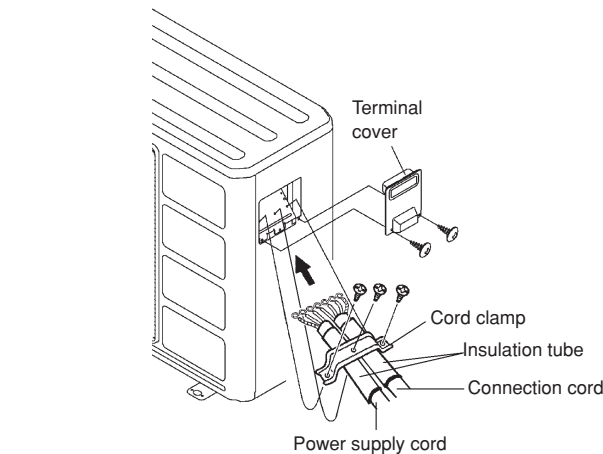
Adjust the position of the screws for control box cover according to the installation.

3. OUTDOOR UNIT SIDE

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 indoor unit side. Erroneous wiring may cause burning of the electric parts.
- Connect the connection cord and the power supply cord firmly to the terminal board. Imperfect installation may cause a fire.
- Always fasten the outside covering of the connection cord and the power supply cord with cord clamps. (If the insulator is chafed, electric leakage may occur.)
- Always connect the ground wire.

- Remove the terminal cover of the outdoor unit, and insert the end of the connection cord and the power supply cord into the terminal board.
- Fasten the connection cord and the power supply cord with the cord clamps, and install the terminal cover.



CAUTION

When routing the ground wires, leave slack as shown in the illustrations.

7 POWER

WARNING

- The rated voltage of this product is 230 V A.C. 50 Hz.
- Before turning on the 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. (Fuse/Breaker capacity: 30 A)
- The special branch 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.
- 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.
- This air conditioner must be connected to a power source that has an electrical impedance of 0.159 Ω or less or has a supply current of 100 A or greater. If the power supply does not meet the specifications, contact the power company.

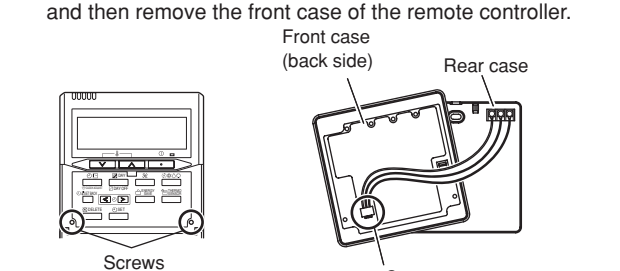
8 REMOTE CONTROLLER SETTING

CAUTION

- In order to detect the room temperature correctly when using the temperature sensor of the remote controller, do not install the remote controller in a place where it will be exposed to direct sunlight or directly below the air outlet of the indoor unit.
- When installing the remote controller and cord near a source of electromagnetic waves, separate the remote controller from the source of the electromagnetic waves and use shielded cord.
- Do not touch the remote controller PC board and PC board parts directly with your hands.

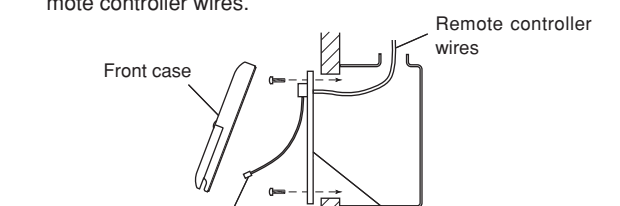
1. INSTALLING THE REMOTE CONTROLLER

- Open the operation panel on the front of the remote controller, remove the two screws indicated in the following figure, and then remove the front case of the remote controller.



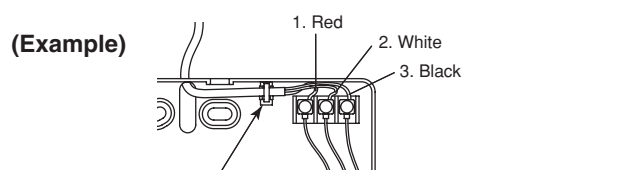
When installing the remote controller, remove the connector from the front case. The wires may break if the connector is not removed and the front case hangs down. When installing the front case, connect the connector to the front case.

- Install the rear case to the wall, etc. with the two tapping screws. Refer to the following information to install the remote controller wires.



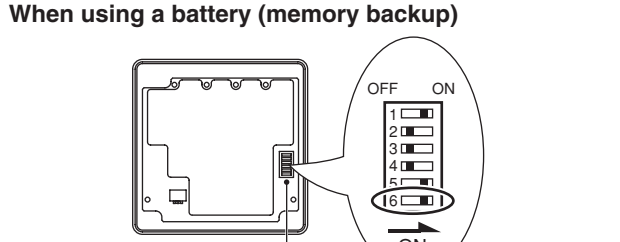
2. ROUTING THE REMOTE CONTROLLER WIRES

- Install the remote controller wires to the terminals on the top of the rear case as shown in the following figure.
- Fasten the wires with the binder.



3. SETTING THE DIP SWITCHES

When using a battery (memory backup)



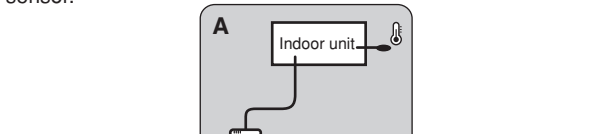
Change the DIP switch setting to use batteries. (The DIP switch is not set to use batteries at the factory.) Change DIP switch No. 6 from OFF to ON. If batteries are not used, all of the settings stored in memory will be deleted if there is a power failure.

4. SETTING THE ROOM TEMPERATURE DETECTION LOCATION

The detection location of the room temperature can be selected from the following three examples. Choose the detection location that is best for the installation location.

A. Indoor unit setting (factory setting)

The room temperature is detected by the indoor unit temperature sensor.

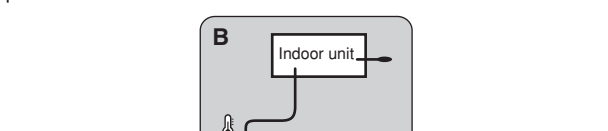


- When the THERMO SENSOR button is pressed, the lock display flashes because the function is locked at the factory.



B. Remote controller setting

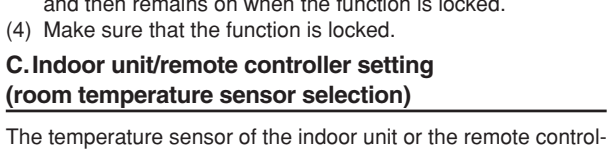
The room temperature is detected by the remote controller temperature sensor.



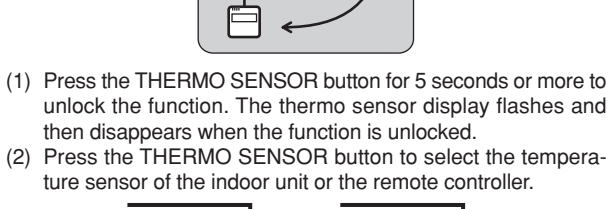
- Press the THERMO SENSOR button for 5 seconds or more to unlock the function. The thermo sensor display flashes and then disappears when the function is unlocked.
- Press the THERMO SENSOR button. The thermo sensor display appears.
- Press the THERMO SENSOR button again for 5 seconds or more to lock the function. The thermo sensor display flashes and then disappears when the function is locked.
- Make sure that the function is locked.

C. Indoor unit/remote controller setting (room temperature sensor selection)

The temperature sensor of the indoor unit or the remote controller can be used to detect the room temperature.



- Press the THERMO SENSOR button for 5 seconds or more to unlock the function. The thermo sensor display flashes and then disappears when the function is unlocked.
- Press the THERMO SENSOR button to select the temperature sensor of the indoor unit or the remote controller.



NOTES

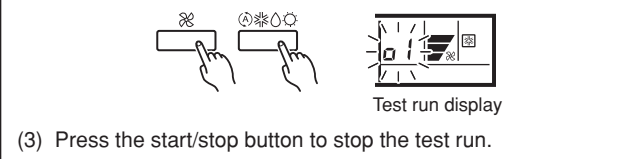
If the function to change the temperature sensor is used as shown in examples A and B (other than example C), be sure to lock the detection location. If the function is locked, the lock display will flash when the THERMO SENSOR button is pressed.

9 TEST RUN

CAUTION

Supply power to the crankcase heater for at least 12 hours before the start of operation in winter.

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

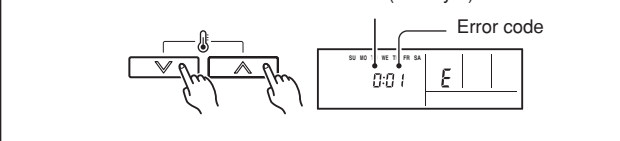


[SELF-DIAGNOSIS]

When the error indication "E:EE" is displayed, follow the following items to perform the self-diagnosis. "E:EE" indicates an error has occurred.

1. REMOTE CONTROLLER DISPLAY

- Stop the air conditioner operation.
- Press the set temperature buttons Δ / ∇ simultaneously for 5 seconds or more to start the self-diagnosis.



2. OUTDOOR UNIT LEDS

Heat & Cool model (reverse cycle) only

When a malfunction occurs in the outdoor unit, the LEDs on the circuit board light to indicate the error. Refer to the following table for the description of each error according to the LEDs.

| Error code | Error contents |
|------------|---|
| 00 | Communication error (indoor unit ← remote controller) |
| 01 | Communication error (indoor unit → outdoor unit) |
| 02 | Room temperature sensor open |
| 03 | Room temperature sensor short-circuited |
| 04 | Indoor heat exchanger temperature sensor open |
| 05 | Indoor heat exchanger temperature sensor short-circuited |
| 06 | Outdoor heat exchanger temperature sensor open |
| 07 | Outdoor heat exchanger temperature sensor short-circuited |
| 08 | Power source connection error |
| 09 | Float switch operated |
| 0A | Outdoor temperature sensor open |
| 0b | Outdoor temperature sensor short-circuited |

When the fault is cleared, the LED lamp goes off. However, for discharge pipe temperature abnormal and high pressure abnormal, the LED lamp lights continuously for 24 hours, as long as the power is not turned off.

10 SPECIAL INSTALLATION METHODS

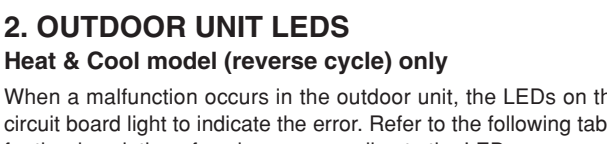
CAUTION

- When setting the rotary switch and DIP switches, do not touch any other parts on the circuit board directly with your bare hands.
- Be sure to turn off the main power.

1. GROUP CONTROL SYSTEM

A number of indoor units can be operated at the same time using a single remote controller.

- Wiring method (indoor unit to remote controller)

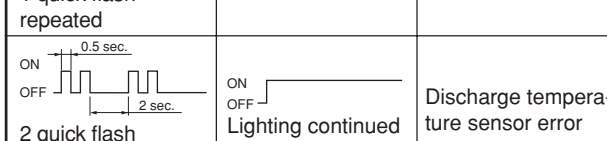


- Rotary switch setting (indoor unit)

Set the unit number of each indoor unit using the rotary switch on the indoor unit circuit board. The rotary switch is normally set to 0.

- DIP switch setting (remote controller)

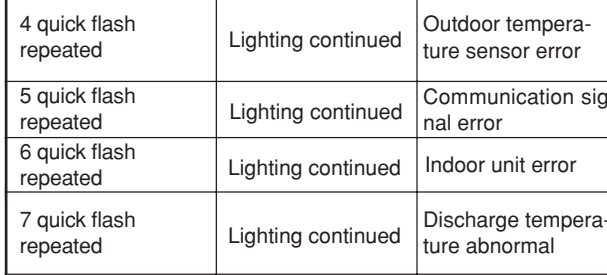
Change DIP switch No. 3 on the remote controller from OFF to ON.



2. DUAL REMOTE CONTROLLERS (OPTIONAL)

Two separate remote controllers can be used to operate the indoor units.

- Wiring method (indoor unit to remote controller)



2. OUTDOOR UNIT LEDS

Heat & Cool model (reverse cycle) only

When a malfunction occurs in the outdoor unit, the LEDs on the circuit board light to indicate the error. Refer to the following table for the description of each error according to the LEDs.

| Error code | Error contents |
|------------|---|
| 0c | Discharge pipe temperature sensor open |
| 0d | Discharge pipe temperature sensor short-circuited |
| 0E | Outdoor high pressure abnormal |
| 0F | Discharge pipe temperature |