AIR CONDITIONER OUTDOOR UNIT

Installation must be performed in accordance with the requirement of NEC and CEC by authorized personnel only.

1. SAFETY PRECAUTIONS

1.1. IMPORTANT! Please read before starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

For safe installation and trouble-free operation, you must:

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state, and national electrical codes.
- Pay close attention to all warning and caution notices given in this manual.

WARNING:
This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

CAUTION:
This symbol refers to a hazard or unsafe practice which can result in personal injury and the potential for product or property damage.

- Hazard alerting symbols
- Electrical
- Safety/Alert

If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

1.2. Special precautions

When Wiring

- ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.
- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully follow the wiring diagram and these instructions when wiring. Improper connections and inadequate earthing (grounding) can cause accidental injury or death.
- Earth (Ground) the unit following local electrical codes.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

When Installing...

- In a Ceiling or Wall
Make sure the ceiling/wall is strong enough to hold the unit’s weight. It may be necessary to construct a strong wood or metal frame to provide added support.

- In a Room
Properly insulate any tubing run inside a room to prevent “sweating” that can cause dripping and water damage to walls and floors.

- In Moist or Uneven Locations
Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

- In an Area with High Winds
Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

- In a Snowy Area (for Heat Pump-Type Systems)
Install the outdoor unit on a raised platform that is higher than drifting snow.
Thicknesses of annealed copper pipes

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 damaged portion (especially on the interior surface). Otherwise, the expansion value or oil is less than 40 mg/10 m. Do not use copper pipes having a collapsed, deformed or damaged portion (especially on the interior surface). Otherwise, the expansion value or oil is less than 40 mg/10 m.

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2. ABOUT THIS PRODUCT

• All Fujitsu General products are manufactured to metric units and tolerances.
• United States customary units are provided for reference only. In cases where exact dimensions and tolerances are required, always refer to metric units.

2.1. Special tools for R410A

Tool name Change from R22 to R410A

Gauge manifold Pressure is high and cannot be measured with a conventional (R22) gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended to use 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 high pressure.

Charge hose To increase pressure resistance, the hose material and base size were changed. (R410A)

Vacuum pump A conventional vacuum pump can be used by installing a vacuum pump. (Use of a vacuum pump with a series motor is prohibited.)

Gas leakage detector Special gas leakage detector for HFC refrigerant R410A.

2.2. Power

Voltage rating 1 ø 208/230 V (60 Hz)
Operating range 188-253 V

CAUTION

Always connect the circuit breaker and receptacle of the air conditioner to the capacity of the air conditioner. Always use a special branch circuit and install a special receptacle to supply power to the room air conditioner.

Use a circuit breaker and receptacle matched to the capacity of the air conditioner. Install a leakage circuit breaker in accordance with the related laws and regulations and electric company standards.

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.

2.3. Electric requirement

Voltage rating 1 ø 208/230 V (60 Hz)
Operating range 188-253 V

CAUTION

Be sure to install a breaker of the specified capacity. Regulation of cables and breaker differs from each locality, refer in accordance with local rules.

Cable Type Remarks

Power supply cable 14AWG 2 cable + Earth (Ground), 1 ø 208/230 V

Connection supply cable 14AWG 3 cable + Earth (Ground), 1 ø 208/230 V

Select the correct cable type and size according to the country or region’s regulations. Max. wire length: Set a length so that the voltage drop is less than 2%. Increase the wire diameter when the wire length is long.

CAUTION

Outdoor unit capacity 9,12 15
MINIMUM CIRCUIT AMPLACITY 14.4 A 18.2 A
MAX. CKT. BKRL. 15 A 20 A

Before starting work check that power is not being supplied to all poles of the indoor unit and outdoor unit.

Install all electrical works in accordance to the national standard.

Install the disconnected device with a contact gap of at least 3 mm in all poles nearby the units. (Both indoor unit and outdoor unit)

Install the circuit breaker nearby the units.

2.4. Pipe length

Pipe length Max. Min. Max. height

60ft. (20m) 10ft. (3m) 49ft. (15m)

CAUTION

The pipe lengths and height differences are not kept as shown in the table, correct operation cannot be guaranteed.

The outdoor unit with the refrigerant removed from the packaging is sealed. (Indoor unit, the refrigerant is not sealed.)
2.5. Additional charge

Refrigerant suitable for a piping length of 49 ft (15 m) is charged in the outdoor unit at the factory. When the piping is longer than 49 ft (15 m), additional charging is necessary. For the additional amount, see the table below.

<table>
<thead>
<tr>
<th>Pipe length</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>49 ft (15 m)</td>
<td>None</td>
</tr>
<tr>
<td>66 ft (20 m)</td>
<td>+3.5 oz (+100 g)</td>
</tr>
<tr>
<td>82 ft (25 m)</td>
<td>0.2 oz/ft (20 g/m)</td>
</tr>
</tbody>
</table>

When adding refrigerant, add the refrigerant from the charging port at the completion of work.

2.6. Operating range

<table>
<thead>
<tr>
<th>Mode</th>
<th>Outdoor temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling/Dry Mode</td>
<td>About 14 to 115°F</td>
</tr>
<tr>
<td>Heating Mode</td>
<td>About -15 to 75°F</td>
</tr>
</tbody>
</table>

2.7. Accessories

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

<table>
<thead>
<tr>
<th>Name</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection pipe assembly</td>
<td>Decorative tape</td>
<td>Saddle</td>
<td>Tapping screws</td>
</tr>
<tr>
<td>Connection cable</td>
<td>Vinyl tape</td>
<td>M10 bold, nut</td>
<td>Sealant</td>
</tr>
<tr>
<td>Wall pipe</td>
<td>Wall cap</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. SELECTING THE MOUNTING POSITION

- Decide the mounting position with the customer as follows.
- Do not set to a place where there is oily smoke, oil is used in the factory, the unit can contact sea breeze, sulfide gases will be generated in the hot spring area, corrosive gases will be generated, animal may urine on the unit and ammonia will be generated and a dusty place.

3.1. 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 dusty.
3. Do not install in an area that has heat sources, vapors, or the risk of leakage or accumulation of flammable gas.
4. Do not install the unit where people pass.
5. Take your neighbors into consideration so that they are not disturbed by air blowing into their windows or by noise.
6. Provide the space shown in figure so that the airflow is not blocked. Also for efficient operation, leave open three of the four directions front, rear, and both sides.
7. Install the unit where keep away more than 3 m from the antenna of TV set and Radio.
8. Outdoor unit should be set to a place where both drainage and itself will not be affected when heating.

4. INSTALLATION DIAGRAM

[OUTDOOR UNIT]

Outdoor unit to be fasten with bolts at the four places without fail.

- Do not directly install it on the ground, otherwise it will cause failure.
- To obtain better operation efficiency, when the outdoor unit is installed, be sure to open the front and left side.

CAUTION

- In places where the outdoor temperature drops to 32 °F (0 °C) or lower, the drain water may freeze and may stop up the drain or cause other outdoor unit trouble. Therefore take measures so that the drain water will not freeze and clog the drain.

- Please set up the outdoor unit in a high place and please do not arrange the frame of installed stand under the drain port, because the water dropped from the drain port repeats freezing and accumulating, and may block the drain port.

- In the area with heavy snowfall, if the intake and outlet of outdoor unit is blocked with snow, it might become difficult to get warm and it is likely to because of the breakdown. Please construct a canopy or baffle board. (local configured).

5. INSTALLATION

5.1. Connector cover remove

Connector cover removal
- Remove the tapping screw.
Installing the connector cover
1. After inserting the five hooks, then push upward.
2. Tighten the tapping screw.

WARNING

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

Install the unit where it will not be tilted by more than 5°.

When installing the outdoor unit where it may exposed to strong wind, fasten it securely.

CAUTION

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

Always use the screws as shown above.
5.2. HOW TO CONNECT THE WIRE TO THE TERMINALS

(1) Use ring terminals with insulating sleeves as shown in the figure below to connect to the wire.
(2) Securely crimp the ring terminals to the wires using an appropriate tool so that the wires do not come loose.
(3) Use the specified wires, connect them securely, and fasten them so that there is no stress placed on the terminals.
(4) Use an appropriate screwdriver to tighten the terminal screws. Do not use a screwdriver that is too small, otherwise, the screw heads may be damaged and prevent the screws from being properly tightened.
(5) Do not tighten the terminal screws too much, otherwise, the screws may break.
(6) See the table below for the terminal screw tightening torques.

<table>
<thead>
<tr>
<th>Screws</th>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3.5 screw</td>
<td>0.8 to 1.0 N•m</td>
</tr>
<tr>
<td>M4 screw</td>
<td>1.2 to 1.8 N•m</td>
</tr>
<tr>
<td>M5 screw</td>
<td>2.0 to 3.0 N•m</td>
</tr>
</tbody>
</table>

5.3. Outdoor unit wiring

- **CAUTION**
  Match the terminal block numbers and connection cable colors with those of the outdoor unit or branch box. Incorrect wiring may cause a fire.

  - Connect the connection cables firmly to the terminal block. Imperfect installation may cause a fire.
  - When fixing the connection cable with the cable clamp, always fasten the cable at the plastic jacket portion, but not at the insulator portion. If the insulator is chafed, electric leakage may occur.
  - Do not use an earth screw for an external connector. Only use for interconnection between two units.
  - Be careful not to generate a spark as follows for using a flammable refrigerant.
    - Do not remove the fuse while power is on.
    - Do not disconnect plug from the wall outlet and the wiring while the power is on.
    - It is recommended to position the outlet connection in a high position. Place the cords so that they do not get tangled.

5.4. Connecting the piping

- **CAUTION**
  When connecting the power supply cable, 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.

  - (1) Remove the tapping screw, then remove the control box cover.
  - (2) Fasten the inter-unit wire harness and power supply to the conduit holder using the lock nut.
  - (3) Connect inter-unit wire harness and power supply to the terminal.
  - (4) Use the tapping screw to install the control box cover.

- **NOTE:**
  - Connector trade size for this unit is 1/2"(12.7 mm). The connector can be bought at a hard ware store. Refer to “How to connect wiring to the terminals” for instructions on connecting depending on the wire type you are using.
  - The fuse located in the outdoor unit provides power supply protection and may blow when power is applied if the system has been in correctly wired.

- **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. (Table 1)

- **flaring**
  (1) Cut the connection pipe to the necessary length 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 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 R22 flare tool.
  - When using the conventional flare tool, always use an allowance adjustment gauge and secure the A dimension shown in table 2.
BENDING PIPES
(1) When bending the pipe, be careful not to crush it.
(2) To prevent breaking of the pipe, avoid sharp bends.
(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.

Table 1 Flare nut tightening torque

<table>
<thead>
<tr>
<th>Flare nut [mm (in.)]</th>
<th>Tightening torque [N • m (lbf • ft)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.35 (1/4) dia.</td>
<td>16 to 18 (11.8 to 13.3)</td>
</tr>
<tr>
<td>9.52 (3/8) dia.</td>
<td>32 to 42 (23.6 to 31.0)</td>
</tr>
<tr>
<td>12.70 (1/2) dia.</td>
<td>49 to 61 (36.1 to 45.0)</td>
</tr>
</tbody>
</table>

Table 2 Pipe outside diameter

<table>
<thead>
<tr>
<th>Pipe outside diameter [mm (in.)]</th>
<th>A [mm (in.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.35 (1/4)</td>
<td>Flare tool for R410A, clutch type</td>
</tr>
<tr>
<td>9.52 (3/8)</td>
<td>0 to 0.5 (0 to 1/32)</td>
</tr>
<tr>
<td>12.70 (1/2)</td>
<td></td>
</tr>
</tbody>
</table>

CAUTION
Fasten a flare nut with a torque wrench as instructed in this manual. If fastened too tight, the flare nut may be broken after a long period of time and cause a leakage of refrigerant.

5.5. Vacuum
(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) 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.
(4) Disconnect the service hoses and fasten the flare nut with a torque wrench as instructed in this manual. If fastened too tight, the flare nut may be broken after a long period of time and cause a leakage of refrigerant.
(5) Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks.
(6) Use heat insulation with heat resistance above 248 °F. (Reverse cycle model only)
(7) Add refrigerant from the charging valve after the completion of the work.
(8) Do purging by refrigerant will damage the vacuum pump or the outdoor unit.

ADDITIONAL CHARGE
When moving and installing the air conditioner, do not mix gas other than the specified refrigerant R410A inside the refrigerant cycle.

GAS LEAKAGE INSPECTION
After connecting the piping, check all joints of gas leakage with gas leak detector.

5.7. TEST RUN
- Perform test operation and check items 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, keep on pressing the MANUAL AUTO button of the indoor unit for more than 10 seconds. The operation indicator lamp and timer indicator lamp will begin to flash simultaneously during cooling test run. Then, heating test run will begin in about three minutes, and the operation indicator lamp and timer indicator lamp will begin to flash simultaneously during heating test run. (Please follow the operating manual for remote control operation.)
- To end test operation, keep on pressing the MANUAL AUTO button of the indoor unit for more than 3 seconds. (When the air conditioner is run by pressing the MANUAL AUTO button, the OPERATION indicator lamp and TIMER indicator lamp of the indoor unit will simultaneously flash slowly.)

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?

**CAUTION**
Always turn on the power 12 hours prior to the start of the operation in order to ensure compressor protection.
6. PUMP DOWN

6.1. Pump down

PUMP DOWN OPERATION (FORCED COOLING OPERATION)
To avoid discharging refrigerant into the atmosphere at the time of relocation or disposal, recover refrigerant by doing the forced cooling operation according to the following procedure.

(1) Conduct preliminary operation for 5 to 10 minutes using the forced cooling operation. Start the forced cooling operation. Keep on pressing the MANUAL AUTO button of the indoor unit for more than 10 seconds. 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.)

(2) Close the valve stem of 2-way valve completely.

(3) Continue the forced cooling operation for 2 to 3 minutes, then close all the valve stems on the 3-way valves.

(4) Stop the operation.
   • Press the START/STOP button of the remote controller to stop the operation.
   • Press the MANUAL AUTO button when stopping the operation from the indoor unit side. (It is not necessary to press down for more than 10 seconds.)

CAUTION
Please check the refrigerant circuit for any leaks before starting the pump down operation.
Do not proceed with the pump down operation if there is no refrigerant left in the circuit due to bent or broken piping.
During the pump down operation, be sure to turn off the compressor before removing the refrigerant piping.