

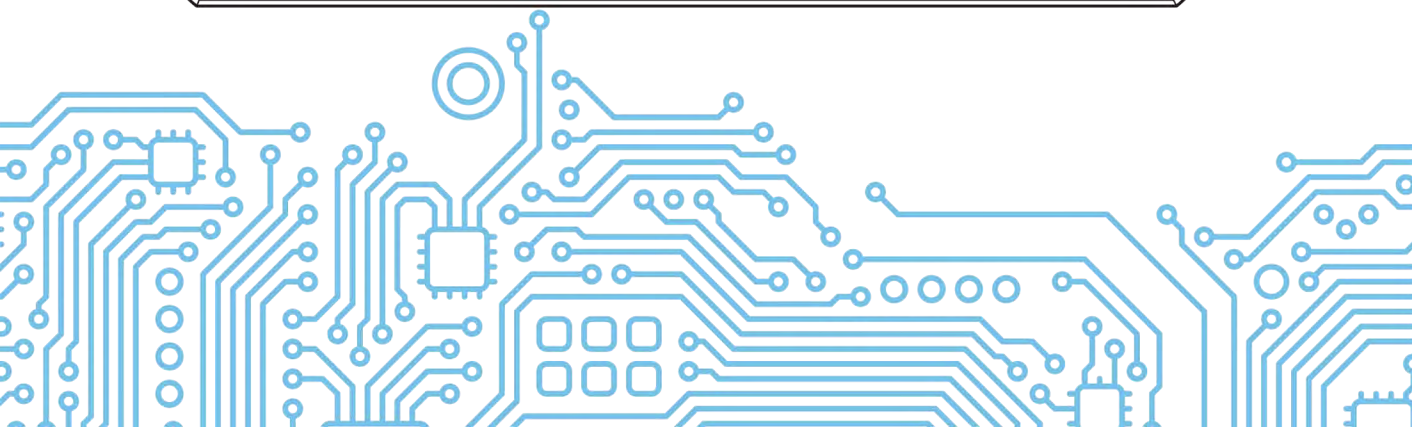
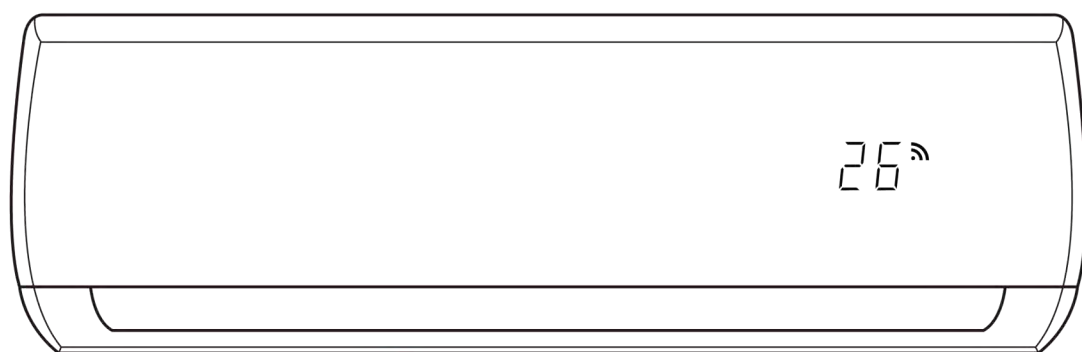


# Premium

## PREMIUM ON-OFF SERIES

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**Model : PAC36337**





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# Safety Precautions


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To prevent personal injury, or property or unit damage, adhere to all precautionary measures and instructions outlined in this manual. Before servicing a unit, refer to this service manual and its relevant sections.

Failure to adhere to all precautionary measures listed in this section may result in personal injury, damage to the unit or to property, or in extreme cases, death.


 **WARNING** indicates a potentially hazardous situation which if not avoided could result in serious personal injury, or death.

 **CAUTION** indicates a potentially hazardous situation which if not avoided could result in minor or moderate personal injury, or unit damage.

### 1. In case of Accidents or Emergency


 **WARNING**

- If a gas leak is suspected, immediately turn off the gas and ventilate the area if a gas leak is suspected before turning the unit on.
- If strange sounds or smoke is detected from the unit, turn the breaker off and disconnect the power supply cable.
- If the unit comes into contact with liquid, contact an authorized service center.
- If liquid from the batteries makes contact with skin or clothing, immediately rinse or wash the area well with clean water.
- Do not insert hands or other objects into the air inlet or outlet while the unit is plugged in.
- Do not operate the unit with wet hands.
- Do not use a remote controller that has previously been exposed to battery damage or battery leakage.


 **CAUTION**

- Clean and ventilate the unit at regular intervals when operating it near a stove or near similar devices.
- Do not use the unit during severe weather conditions. If possible, remove the product from the window before such occurrences.

### 2. Pre-Installation and Installation


 **WARNING**

- Use this unit only on a dedicated circuit.
- Damage to the installation area could cause the unit to fall, potentially resulting in personal injury, property damage, or product failure.
- Only qualified personnel should disassemble, install, remove, or repair the unit.
- Only a qualified electrician should perform electrical work. For more information, contact your dealer, seller, or an authorized service center.


 **CAUTION**

- While unpacking be careful of sharp edges around the unit as well as the edges of the fins on the condenser and evaporator.

### 3. Operation and Maintenance

 **WARNING**

- Do not use defective or under-rated circuit breakers.
- Ensure the unit is properly grounded and that a dedicated circuit and breaker are installed.
- Do not modify or extend the power cable. Ensure the power cable is secure and not damaged during operation.
- Do not unplug the power supply plug during operation.
- Do not store or use flammable materials near the unit.
- Do not open the inlet grill of the unit during operation.
- Do not touch the electrostatic filter if the unit is equipped with one.
- Do not block the inlet or outlet of air flow to the unit.
- Do not use harsh detergents, solvents, or similar items to clean the unit. Use a soft cloth for cleaning.
- Do not touch the metal parts of the unit when removing the air filter as they are very sharp.
- Do not step on or place anything on the unit or outdoor units.
- Do not drink water drained from the unit
- Avoid direct skin contact with water drained from the unit.
- Use a firm stool or step ladder according to manufacturer procedures when cleaning or maintaining the unit.

 **CAUTION**

- Do not install or operate the unit for an extended period of time in areas of high humidity or in an environment directly exposing it to sea wind or salt spray.
- Do not install the unit on a defective or damaged installation stand, or in an unsecure location.
- Ensure the unit is installed at a level position
- Do not install the unit where noise or air discharge created by the outdoor unit will negatively impact the environment or nearby residences.
- Do not expose skin directly to the air discharged by the unit for prolonged periods of time.
- Ensure the unit operates in areas water or other liquids.
- Ensure the drain hose is installed correctly to ensure proper water drainage.
- When lifting or transporting the unit, it is recommended that two or more people are used for this task.
- When the unit is not to be used for an extended time, disconnect the power supply or turn off the breaker.

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# Specifications

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# 1. Model Reference

Refer to the following table to determine the specific indoor and outdoor unit model number of your purchased equipment.

| Indoor Unit Model | Outdoor Unit Model | Capacity (Btu) | Power Supply               |
|-------------------|--------------------|----------------|----------------------------|
| PAC36337          | PAC36337           | 36K            | 220-230V~, 60Hz,<br>1Phase |

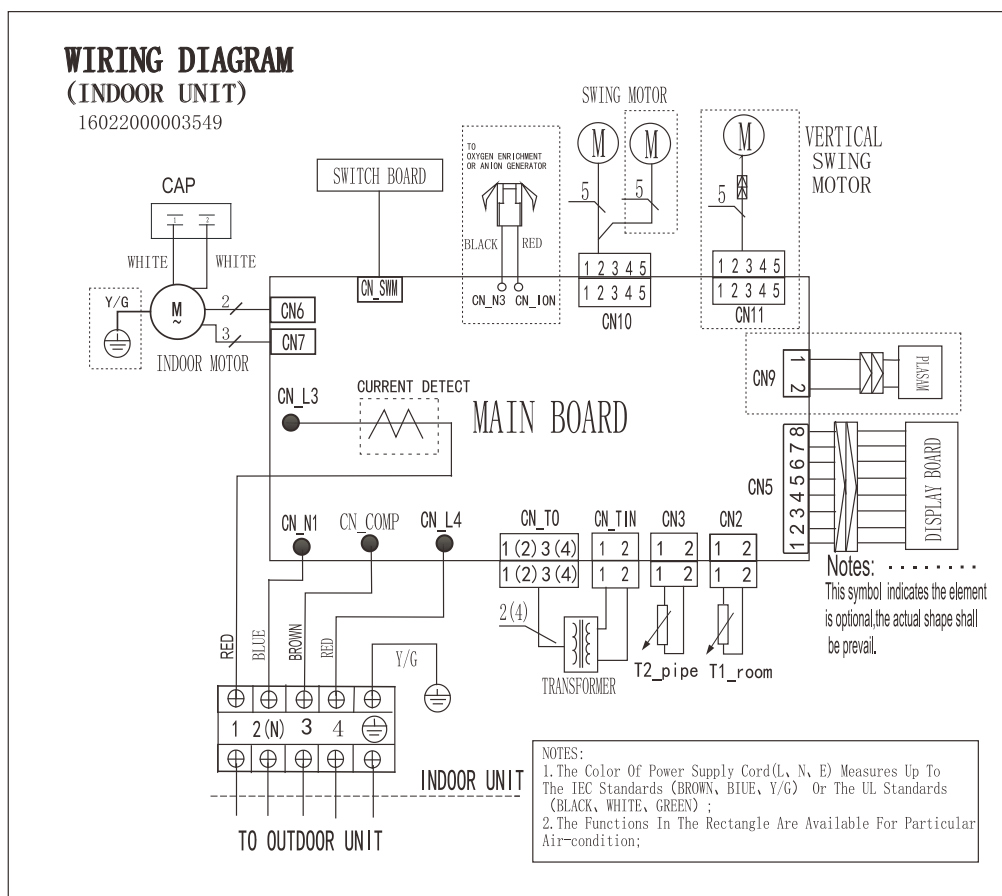


## 2. Electrical Wiring Diagrams

### 2.1 Indoor unit

| Abbreviation | Paraphrase                                       |
|--------------|--|
| Y/G          | Yellow-Green Conductor                           |
| ION          | Positive and Negative Ion Generator              |
| CAP          | Capacitor  |
| PLASMA       | Electronic Dust Collector                        |
| L            | LIVE   |
| N            | NEUTRAL  |
| Heater       | The Electric Heating Belt of Indoor Unit         |
| T1           | Indoor Room Temperature                          |
| T2           | Coil Temperature of Indoor Heat Exchanger Middle |

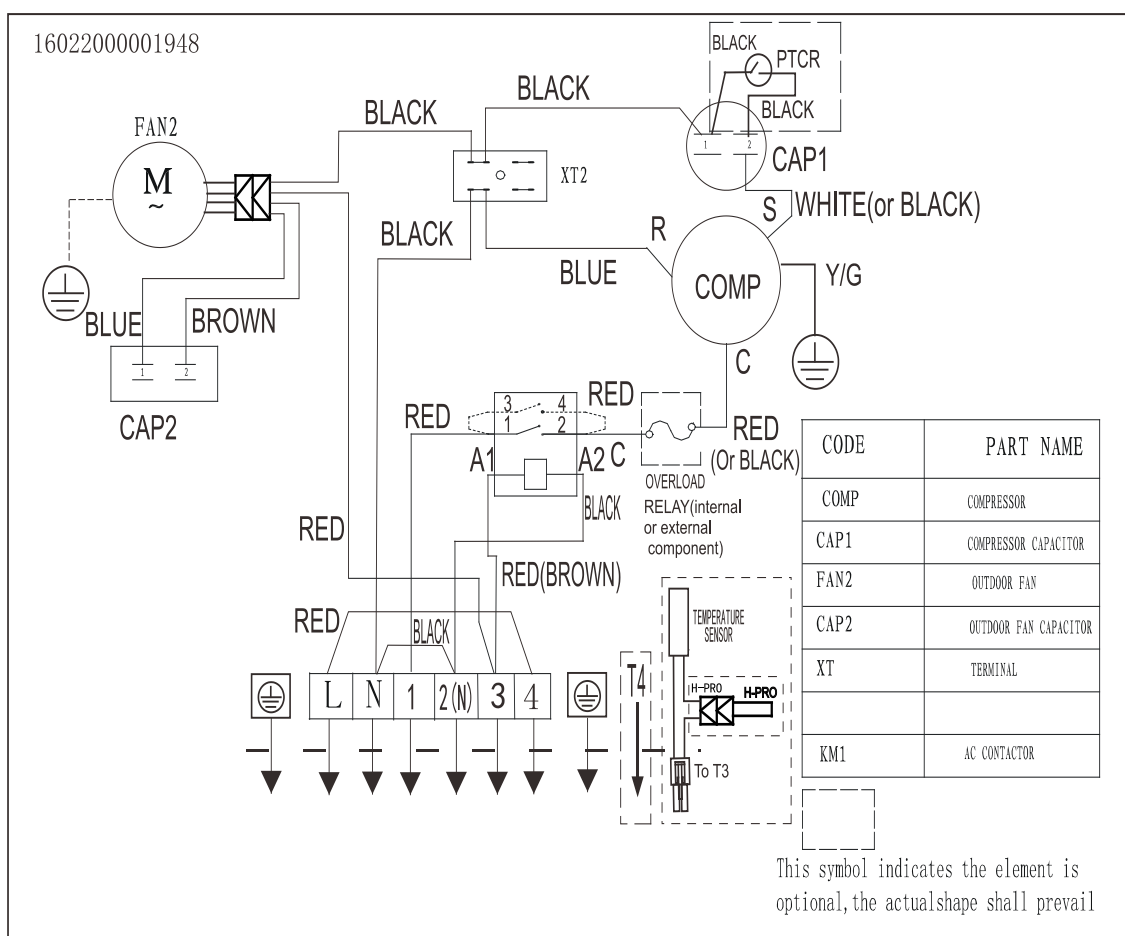
PAC36337



## 2.2 Outdoor Unit

| Abbreviation | Paraphrase                     |
|--------------|--------------------------------|
| 4-WAY        | Gas Valve Assembly/4-WAY VALVE |
| AC-FAN       | Alternating Current FAN        |
| DC-FAN       | Direct Current FAN             |
| CT1          | AC Current Detector            |
| COMP         | Compressor                     |
| L-PRO        | Low Pressure Switch            |
| H-PRO        | High Pressure Switch           |
| T3           | Coil Temperature of Condenser  |
| T4           | Outdoor Ambient Temperature    |
| TH           | Compressor Suction Temperature |
| OLP          | Overload Relay                 |

PAC36337



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# Product Features

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## 1. Operation Modes and Functions

### 1.1 Abbreviation

Unit element abbreviations

| Abbreviation | Element                        |
|--------------|--------------------------------|
| T1           | Indoor room temperature        |
| T2           | Coil temperature of evaporator |
| T3           | Coil temperature of condenser  |
| T4           | Outdoor ambient temperature    |
| TS           | Set temperature                |

### 1.2 Safety Features

#### Compressor three-minute delay at restart

Compressor functions are delayed for up to one minute upon the first startup of the unit, and are delayed for up to three minutes upon subsequent unit restarts.

#### Zero crossing detection error protection

If AC can not detect zero crossing signal for 4 minutes or the zero crossing signal time interval is not correct, the unit will stop and the LED will display the failure. The correct zero crossing signal time interval should be between 6-13ms.

#### Automatic shutoff based on fan speed

If the indoor fan speed registers below 300RPM for 2 minutes, the unit ceases operation and the corresponding error code is displayed on the indoor unit.

#### Current protection

The current exceeds setting value for certain time, the compressor and outdoor fan will shut off.

#### Indoor fan delayed operation

- When the unit starts, the louver is automatically activated and the indoor fan will operate after a period of 4 seconds.
- If the unit is in heating mode, the indoor fan is regulated by the anti-cold wind function.

#### Sensor redundancy and automatic shutoff

If one temperature sensor malfunctions, the air conditioner ceases operation.

#### Refrigerant leakage detection

This function is active only when cooling mode is selected. It will detect if the compressor is being damaged by refrigerant leakage or by compressor overload. This is measured using the coil temperature of evaporator T2

when the compressor is in operation.

### 1.3 Digital Display

Unit display functions



| Function  | Display               |
|---|-----------------------|
| Temperature   | Set temperature value |
| Temperature (fan and Drying mode)                         | Room temperature      |
| Activation of Timer ON, Fresh, Swing, Turbo, or Silent    | 0n (3s)               |
| Cancellation of Timer OFF, Fresh, Swing, Turbo, or Silent | 0F (3s)               |
| Defrost   | df                    |
| Warming in heating mode                                   | cf                    |
| Self-clean (available on select units only)               | sc                    |
| Heating in room temperature under 8°C                     | fp                    |

## 1.4 Fan Mode

When fan mode is activated:

- The outdoor fan and compressor are stopped.
- Temperature control is disabled and no temperature setting is displayed.
- The indoor fan speed can be set to high, med, low, or auto.
- The louver operations are identical to those in cooling mode.
- Auto fan: In fan-only mode, AC operates the same as auto fan in cooling mode with the temperature set at 24°C.

## 1.5 Cooling Mode

### 1.5.1 Compressor Control

When indoor room temp. T1 is lower than setting value, the compressor and outdoor fan will shut off.

### 1.5.2 Indoor Fan Control

In cooling mode, the indoor fan operates continuously. The fan speed can be set to high, medium, low, or auto.

### 1.5.3 Outdoor Fan Control

The On-off outdoor units have single fan speed. The outdoor fan will run following the compressor except when AC is in evaporator high temperature protection in heating mode, condenser high temperature protection in cooling mode, defrosting mode and the current protection.

### 1.5.4 Evaporator Temperature Protection

When evaporator temperature drops below a configured value for a certain period of time, the compressor and outdoor fan ceases operations..

## 1.6 Auto-mode

- This mode can be selected with the remote controller.
- In auto mode, the machine selects cooling, heating, or fan-only mode on the basis of  $\Delta T$  ( $\Delta T = T1 - T_s$ ).

| $\Delta T$                      | Running mode |
|---------------------------------|--------------|
| $\Delta T > 2^\circ\text{C}$    | Cooling      |
| $\Delta T \leq 2^\circ\text{C}$ | Fan-only     |
| $\Delta T < -3^\circ\text{C}$   | Heating*     |

Heating\*: In auto mode, cooling only models run the fan

- AC will run in auto mode in the below cases:
  - Pressing the forced auto button.
  - If AC is off, it will run in auto mode when the timer

on function is active.

- After setting the mode, AC will run in auto mode if the compressor keeps not running for certain time.

## 1.7 Drying mode

- The compressor is cycled running with 10 minutes on and then 5 minutes off. The indoor fan will keep running at low speed.
- In drying mode, if room temperature is lower than 10°C, the compressor will stop and not resume until room temperature exceeds 13°C.
- The evaporator anti-freezing protection is the same as that in cooling mode.

## 1.8 Forced operation function

- Forced cooling mode:

The compressor and outdoor fan continue to run and the indoor fan runs at low speed. After running for 30 minutes, the AC will switch to auto mode with a preset temperature of 24°C.

- Forced auto mode:

Forced auto mode operates the same as normal auto mode with a preset temperature of 24°C.

- The unit exits forced operation when it receives the following signals:
  - Switch on
  - Switch off
  - Timer on
  - Timer off
  - Changes in:
    - mode
    - fan speed
    - sleeping mode

## 1.9 Auto-Restart function

- The indoor unit has an auto-restart module that allows the unit to restart automatically. The module automatically stores the current settings (not including the swing setting) and, in the case of a sudden power failure, will restore those setting automatically within 3 minutes after power returns.
- If the unit was in forced cooling mode, it will run in this mode for 30 minutes and turn to auto mode with temperature set to 24°C.
- If there is a power failure while the unit is running, the compressor starts 3 minutes after the unit restarts. If the unit was already off before the power failure, the

compressor starts 20 seconds after the unit restarts.

### 1.10 Refrigerant Leakage Detection

- With this new technology, the display area will show "EC" when the outdoor unit detects refrigerant leakage.
- When compressor is active, the value of the Coil temperature of evaporator T2 has no change or very little change.
- 

### 1.11 Self clean(Optional)

- If you press "Self Clean" when the unit is in cooling or drying mode:
  - For cooling models, the indoor unit will run in low fan mode for a certain time, then ceases operation.
  - For heat pump models, the indoor unit will run in fan-only mode, then low heat, and finally in fan-only mode.
- Self Clean keeps the indoor unit dry and prevents mold growth.

### 1.12 Follow me(Optional)

- If you press "Follow Me" on the remote, the indoor unit will beep. This indicates the follow me function is active.
- Once active, the remote control will send a signal every 3 minutes, with no beeps. The unit automatically sets the temperature according to the measurements from the remote control.
- The unit will only change modes if the information from the remote control makes it necessary, not from the unit's temperature setting.
- If the unit does not receive a signal for 7 minutes or you press "Follow Me," the function turns off. The unit regulates temperature based on its own sensor and settings.

### 1.13 Information Inquiry

- To enter information inquiry status, complete the following procedure within ten seconds:
  - Press LED 3 times.
  - Press SWING 3 times.
- If you are successful, you will hear beeps for two seconds.
- Use the LED and SWING buttons to cycle through information displayed.
- Pressing LED will display the next code in the

sequence. Pressing SWING will show the previous.

- The following table shows information codes. The screen will display this code for two seconds, then the information for 25 seconds.

| Displayed code | Explanation              | Displayed value | Meaning | Additional Notes  |
|----------------|--------------------------|-----------------|---------|---|
| T1             | Room temperature         | -14—70          | -14—70  | <ol style="list-style-type: none"><li>1. All displayed temperatures use actual values.</li><li>2. All temperatures are displayed in °C regardless of remote used.</li><li>3. If the actual value exceeds the range, it will display the maximum value or minimum value.</li></ol> |
| T2             | Indoor coil temperature  |                 |         |   |
| T3             | Outdoor coil temperature |                 |         |   |

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# Maintenance and Disassembly

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## 1. Maintenance

### 1.1 First Time Installation Check

Air and moisture trapped in the refrigerant system affects the performance of the air conditioner by:

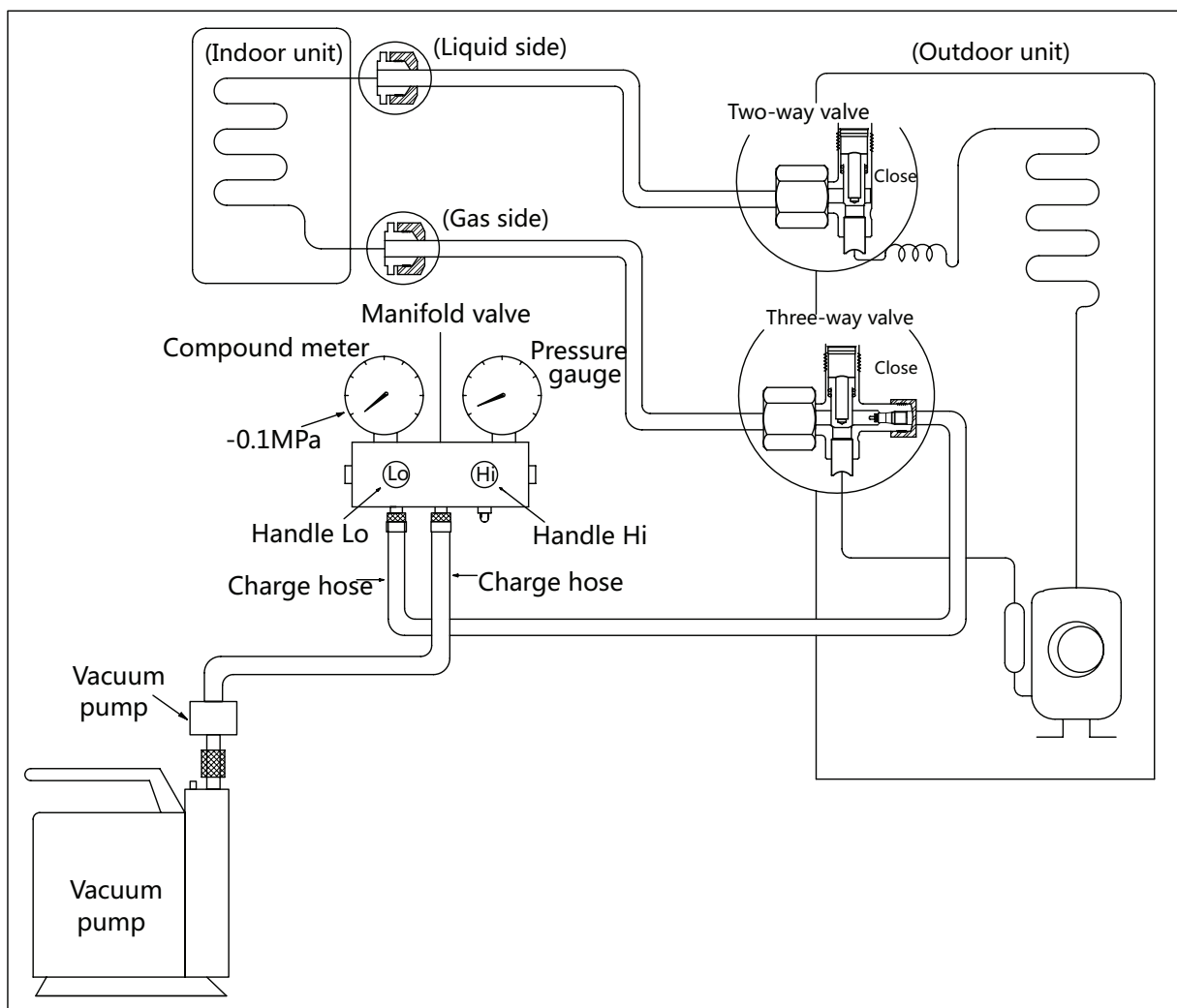
- Increasing pressure in the system.
- Increasing the operating current.
- Decreasing the cooling or heating efficiency.
- Congesting the capillary tubing due to ice build-up in the refrigerant circuit.
- Corroding the refrigerant system.

To prevent air and moisture from affecting the air conditioner's performance, the indoor unit, as well as the pipes between the indoor and outdoor unit, must be leak tested and evacuated.

#### Leak test (soap water method)

Use a soft brush to apply soapy water or a neutral liquid detergent onto the indoor unit connections and outdoor unit connections. If there is gas leakage, bubbles will form on the connection.

#### Air purging with vacuum pump

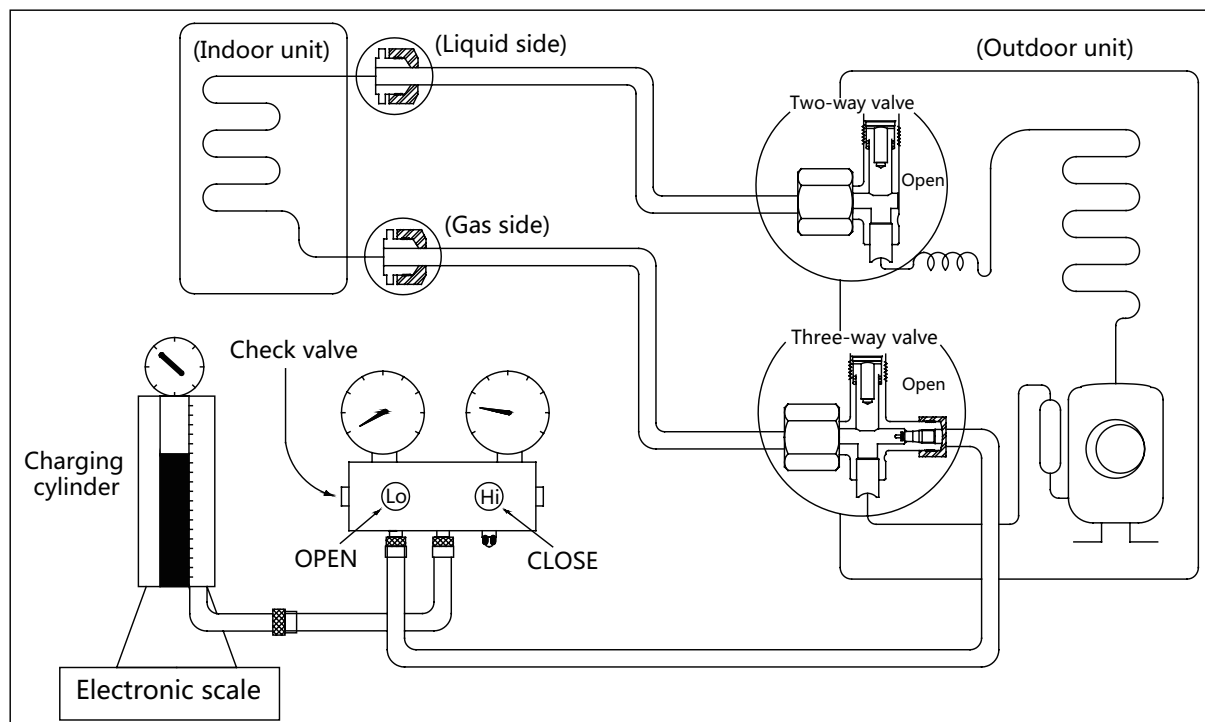


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**Procedure:**

1. Tighten the flare nuts of the indoor and outdoor units, and confirm that both the 2- and 3-way valves are closed.
2. Connect the charge hose with the push pin of Handle Lo to the gas service port of the 3-way valve.
3. Connect another charge hose to the vacuum pump.
4. Fully open the Handle Lo manifold valve.
5. Using the vacuum pump, evacuate the system for 30 minutes.
  - a. Check whether the compound meter indicates -0.1 MPa (14.5 Psi).
    - If the meter does not indicate -0.1 MPa (14.5 Psi) after 30 minutes, continue evacuating for an additional 20 minutes.
    - If the pressure does not achieve -0.1 MPa (14.5 Psi) after 50 minutes, check for leakage.
  - b. If the pressure successfully reaches -0.1 MPa (14.5 Psi), fully close the Handle Lo valve, then cease vacuum pump operations.
6. Wait for 5 minutes then check whether the gauge needle moves after turning off the vacuum pump. If the gauge needle moves backward, check whether there is gas leakage.
7. Loosen the flare nut of the 3-way valve for 6 or 7 seconds and then tighten the flare nut again.
  - a. Confirm the pressure display in the pressure indicator is slightly higher than the atmospheric pressure.
  - b. Remove the charge hose from the 3-way valve.
8. Fully open the 2- and 3-way valves and tighten the cap of the 2- and 3-way valves.

## 1.2 Refrigerant Recharge



Prior to recharging the refrigerant, confirm the additional amount of refrigerant required using the following table:

| Models   | Standard length | Max. elevation | Max. length | Additional refrigerant |
|----------|-----------------|----------------|-------------|------------------------|
| PAC36337 | 5m (16.4ft)     | 10m (32.8ft)   | 25m (82ft)  | 30g/m (0.32oz/ft)      |

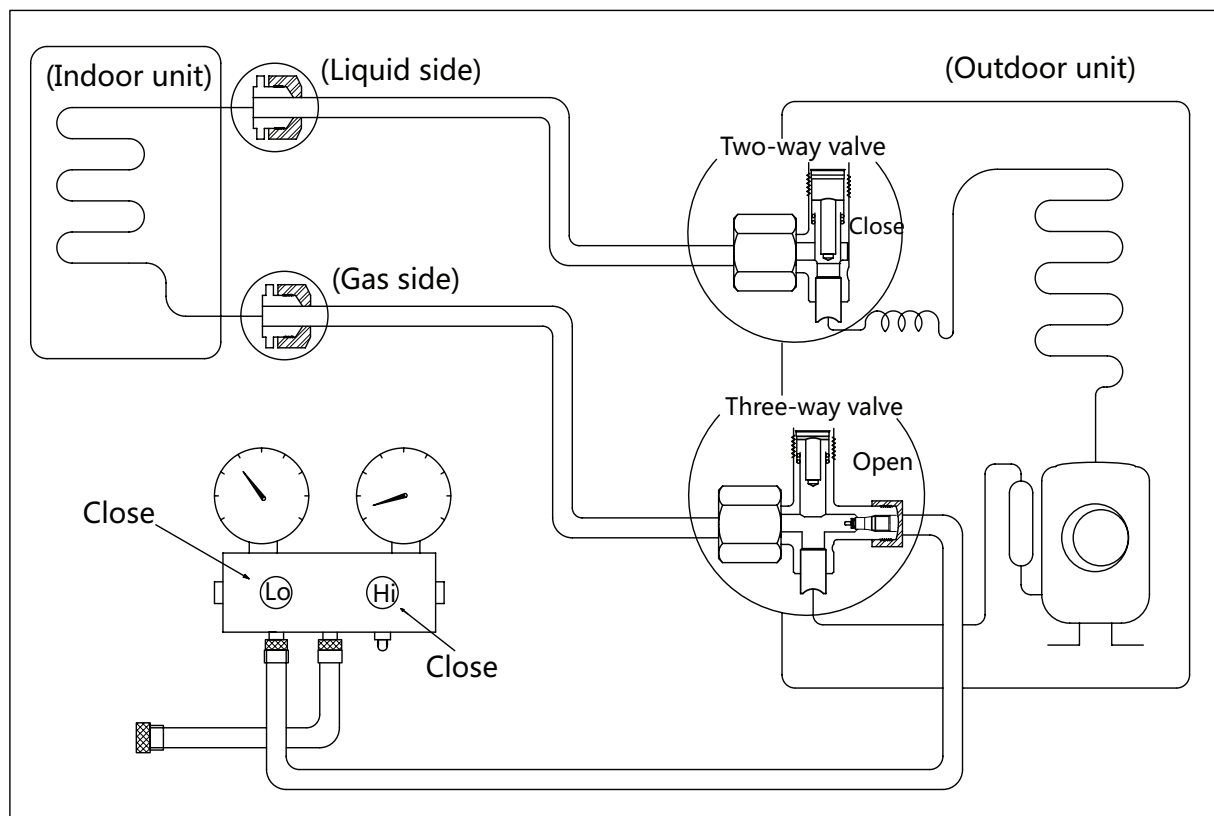
### Procedure:

1. Close both 2- and 3-way valves.
2. Slightly connect the Handle Lo charge hose to the 3-way service port.
3. Connect the charge hose to the valve at the bottom of the cylinder.
4. If the refrigerant is R410A, invert the cylinder to ensure a complete liquid charge.
5. Open the valve at the bottom of the cylinder for 5 seconds to purge the air in the charge hose, then fully tighten the charge hose with push pin Handle Lo to the service port of 3-way valve..
6. Place the charging cylinder onto an electronic scale and record the starting weight.
7. Fully open the Handle Lo manifold valve, 2- and 3-way valves.
8. Operate the air conditioner in cooling mode to charge the system with liquid refrigerant.
9. When the electronic scale displays the correct weight (refer to the gauge and the pressure of the low side to confirm), turn off the air conditioner, then disconnect the charge hose from the 3-way service port immediately..
10. Mount the caps of service port and 2- and 3-way valves.
11. Use a torque wrench to tighten the caps to a torque of 18 N.m.
12. Check for gas leakage.

## 1.3 Re-Installation

### 1.3.1 Indoor Unit

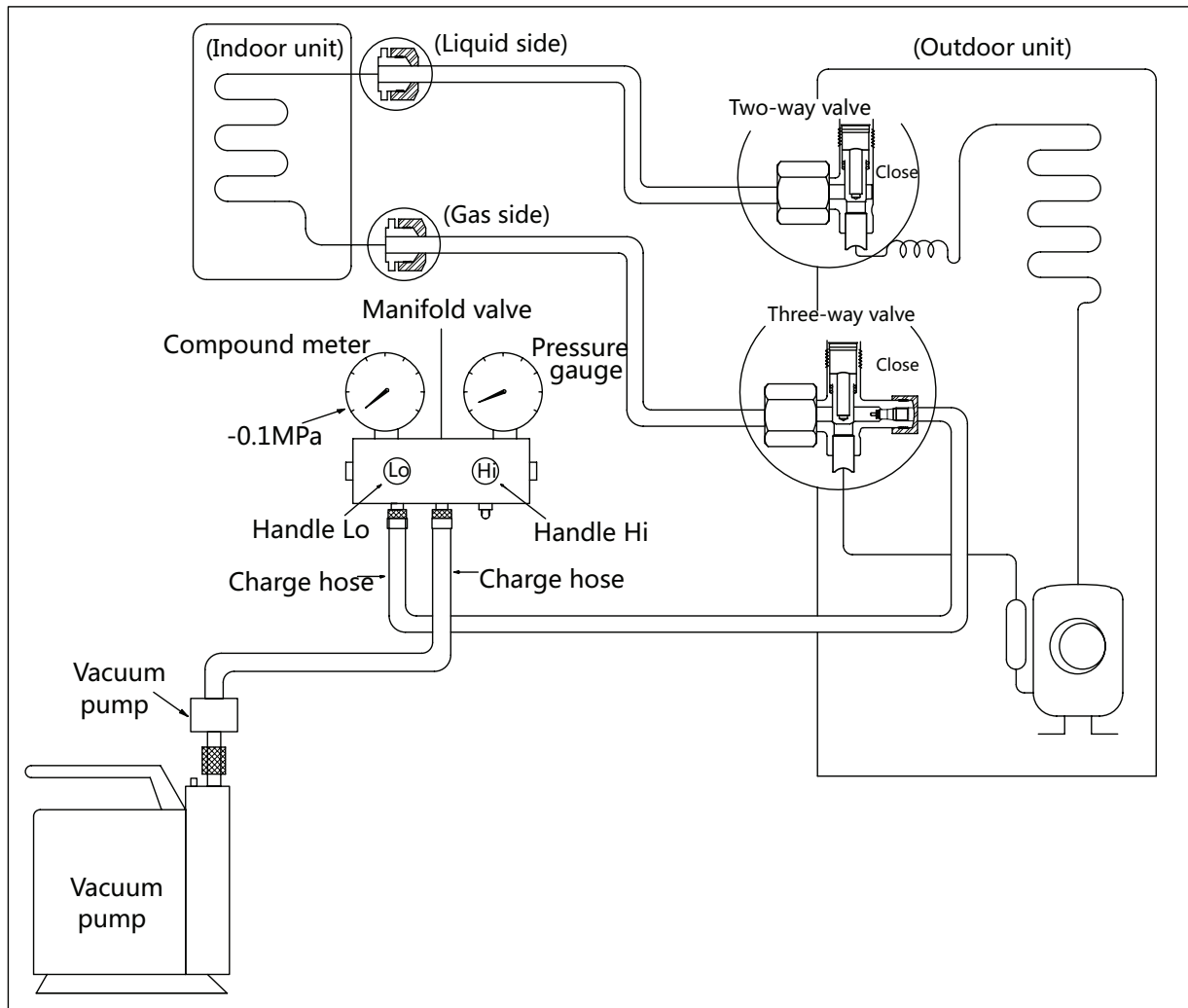
Collecting the refrigerant into the outdoor unit



#### Procedure:

1. Confirm that the 2- and 3-way valves are opened.
2. Connect the charge hose with the push pin of Handle Lo to the 3-way valve's gas service port.
3. Open the Handle Lo manifold valve to purge air from the charge hose for 5 seconds and then close it quickly.
4. Close the 2-way valve.
5. Operate the air conditioner in cooling mode. Cease operations when the gauge reaches 0.1 MPa (14.5 Psi).
6. Close the 3-way valve so that the gauge rests between 0.3 MPa (43.5 Psi) and 0.5 MPa (72.5 Psi).
7. Disconnect the charge set and mount the caps of service port and 2- and 3-way valves.
8. Use a torque wrench to tighten the caps to a torque of 18 N.m.
9. Check for gas leakage.

## Air purging with vacuum pump

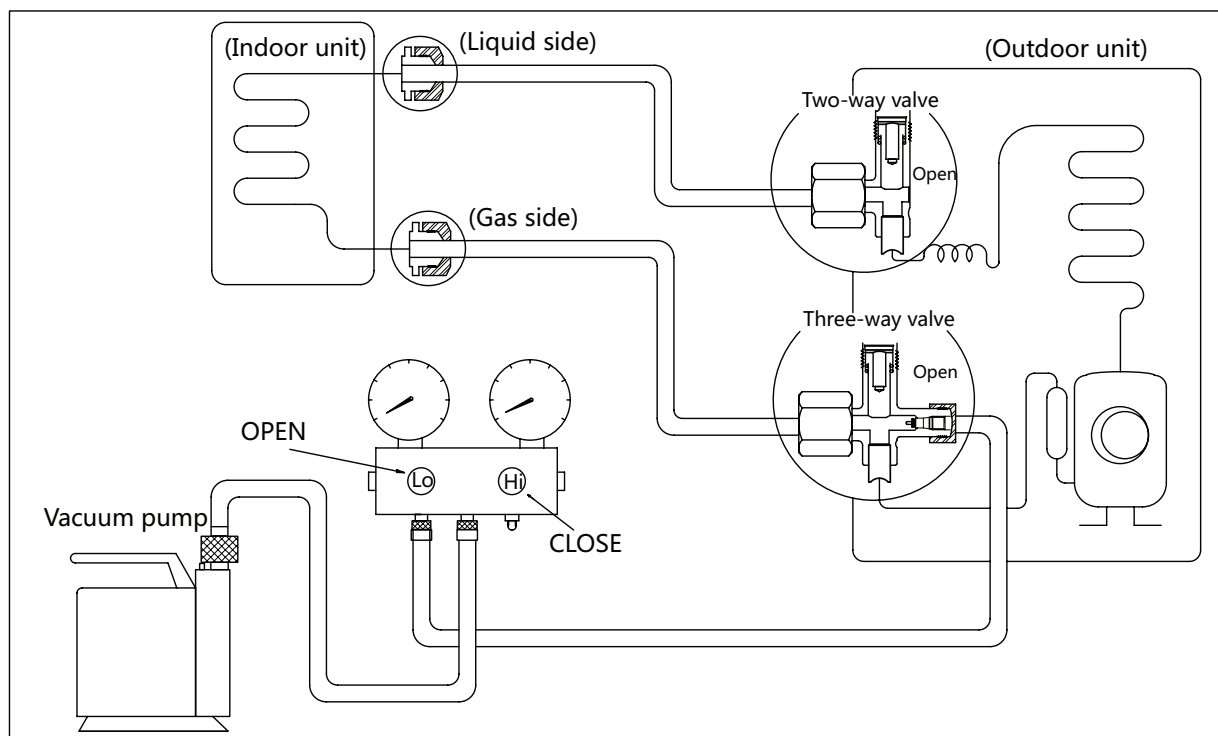


### Procedure:

1. Tighten the flare nuts of the indoor and outdoor units, and confirm that both the 2- and 3-way valves are closed.
2. Connect the charge hose with the push pin of Handle Lo to the gas service port of the 3-way valve.
3. Connect another charge hose to the vacuum pump.
4. Fully open the Handle Lo manifold valve.
5. Using the vacuum pump, evacuate the system for 30 minutes.
  - a. Check whether the compound meter indicates -0.1 MPa (14.5 Psi).
    - If the meter does not indicate -0.1 MPa (14.5 Psi) after 30 minutes, continue evacuating for an additional 20 minutes.
    - If the pressure does not achieve -0.1 MPa (14.5 Psi) after 50 minutes, check for leakage.
  - b. If the pressure successfully reaches -0.1 MPa (14.5 Psi), fully close the Handle Lo valve, then cease vacuum pump operations.
6. Wait for 5 minutes then check whether the gauge needle moves after turning off the vacuum pump. If the gauge needle moves backward, check whether there is gas leakage.
7. Loosen the flare nut of the 3-way valve for 6 or 7 seconds and then tighten the flare nut again.
  - a. Confirm the pressure display in the pressure indicator is slightly higher than the atmospheric pressure.
  - b. Remove the charge hose from the 3-way valve.
8. Fully open the 2- and 3-way valves and tighten the cap of the 2- and 3-way valves.

### 1.3.2 Outdoor Unit

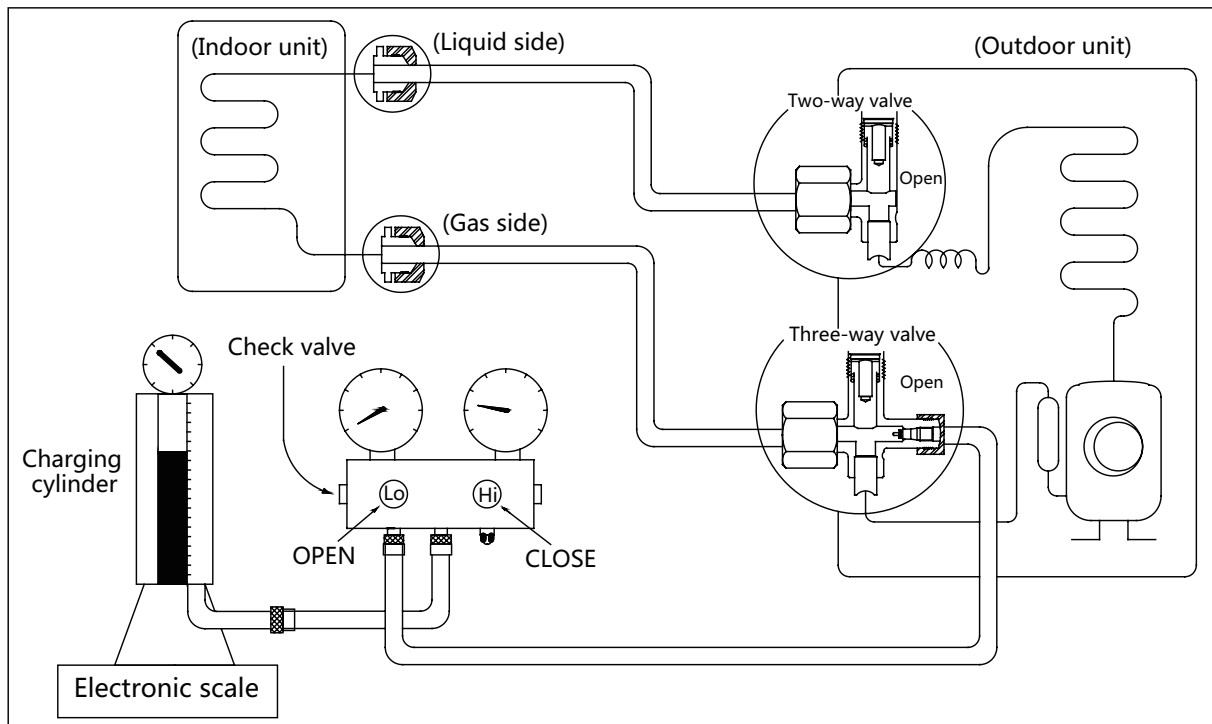
#### Evacuation for the whole system



#### Procedure:

1. Confirm that the 2- and 3-way valves are opened.
2. Connect the vacuum pump to the 3-way valve's service port.
3. Evacuate the system for approximately one hour. Confirm that the compound meter indicates -0.1 MPa (14.5Psi).
4. Close the valve (Low side) on the charge set and turn off the vacuum pump.
5. Wait for 5 minutes then check whether the gauge needle moves after turning off the vacuum pump. If the gauge needle moves backward, check whether there is gas leakage.
6. Disconnect the charge hose from the vacuum pump.
7. Mount the caps of service port and 2- and 3-way valves.
8. Use a torque wrench to tighten the caps to a torque of 18 N.m.

## Refrigerant charging



### Procedure:

1. Close both 2- and 3-way valves.
2. Slightly connect the Handle Lo charge hose to the 3-way service port.
3. Connect the charge hose to the valve at the bottom of the cylinder.
4. If the refrigerant is R410A, invert the cylinder to ensure a complete liquid charge.
5. Open the valve at the bottom of the cylinder for 5 seconds to purge the air in the charge hose, then fully tighten the charge hose with push pin Handle Lo to the service port of 3-way valve..
6. Place the charging cylinder onto an electronic scale and record the starting weight.
7. Fully open the Handle Lo manifold valve, 2- and 3-way valves.
8. Operate the air conditioner in cooling mode to charge the system with liquid refrigerant.
9. When the electronic scale displays the correct weight (refer to the gauge and the pressure of the low side to confirm), turn off the air conditioner, then disconnect the charge hose from the 3-way service port immediately..
10. Mount the caps of service port and 2- and 3-way valves.
11. Use a torque wrench to tighten the caps to a torque of 18 N.m.
12. Check for gas leakage.

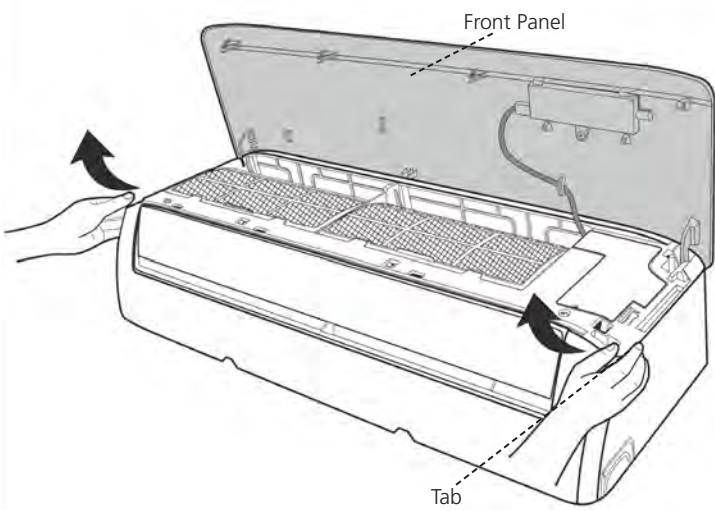
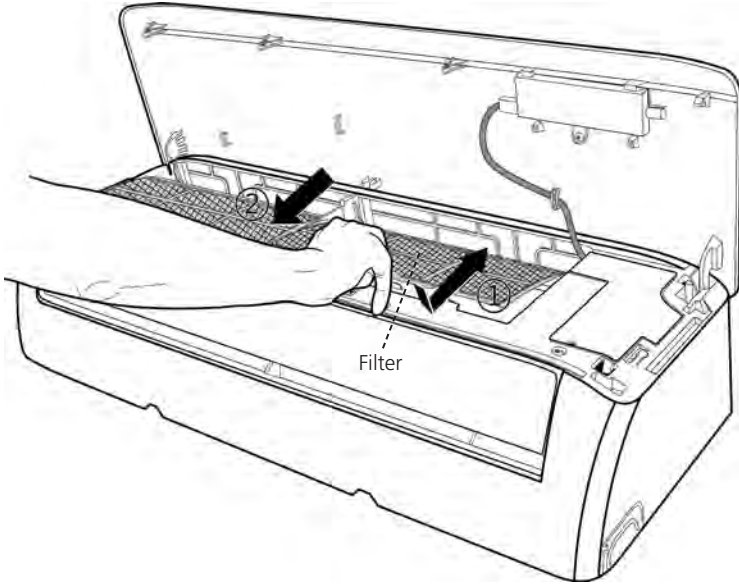
**Note: 1. Mechanical connectors used indoors shall comply with local regulations.**

**2. When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be re-fabricated.**

## 2. Disassembly

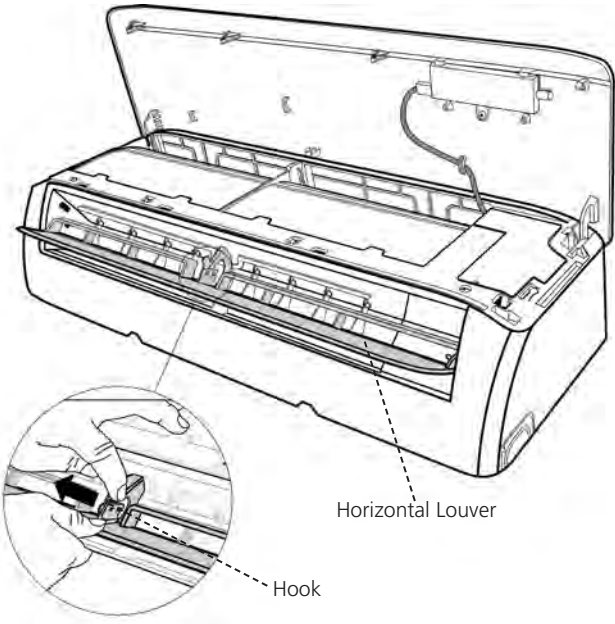
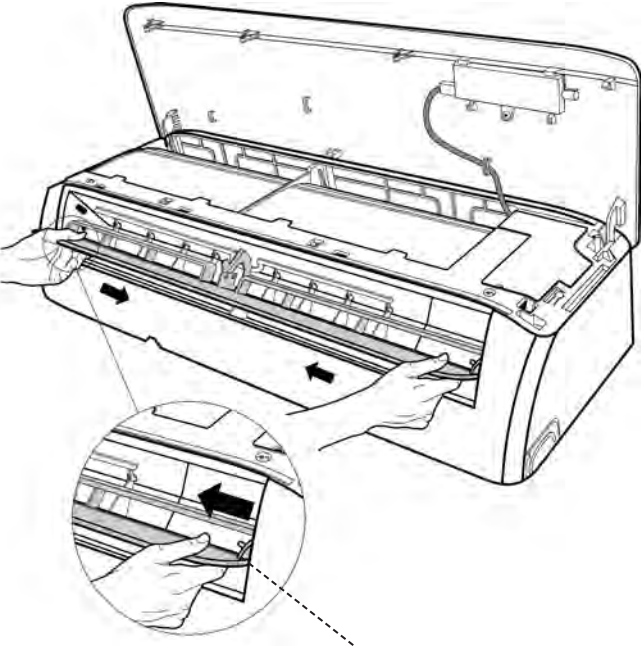
### 2.1 Indoor unit

#### 1. Front Panel

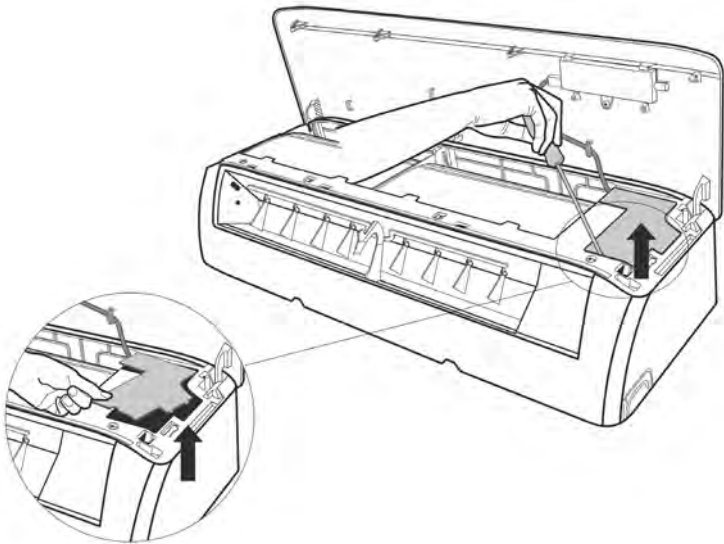
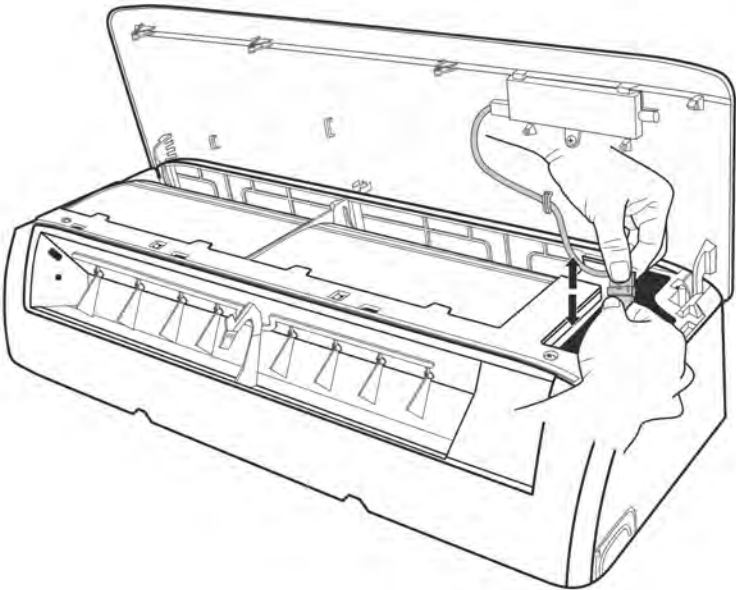
| Procedure   | Illustration  |
|---|---|
| 1) Hold the front panel by the tabs on the both sides and lift it (see CJ_AB_INV_001).                        |  <p>CJ_AB_INV_001</p>  |
| 2) Push up the bottom of an air filter (step 1), and then pull it out downwards (step 2) (see CJ_AB_INV_002). |  <p>CJ_AB_INV_002</p> |

Note: This section is for reference only. Actual unit appearance may vary.

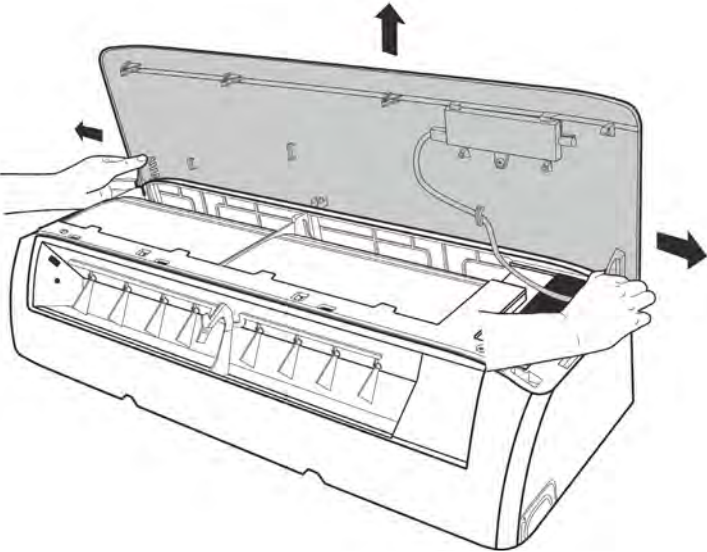
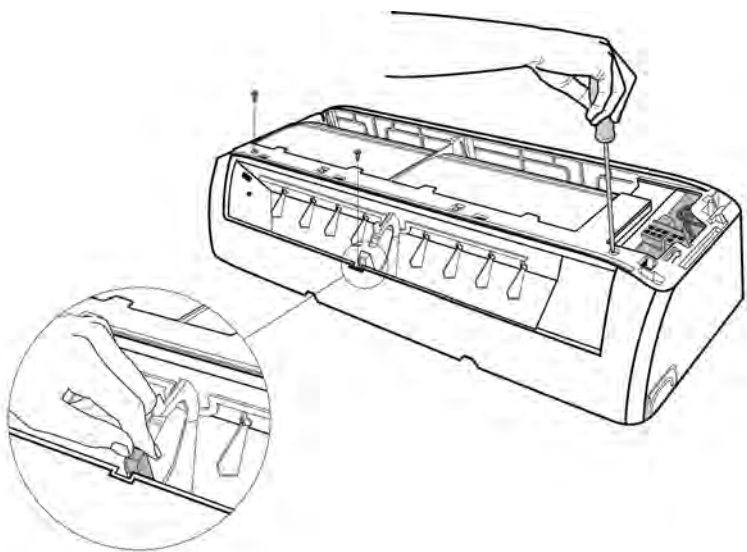


| Procedure  | Illustration   |
|--|--|
| <p>3) Open the horizontal louver and push the hook towards left to open it (see CJ_AB_INV_003).</p>                                    |  <p style="text-align: center;"><b>CJ_AB_INV_003</b></p>   |
| <p>4) Bend the horizontal louver lightly by both hands to loosen the hooks, then remove the horizontal louver (see CJ_AB_INV_004).</p> |  <p style="text-align: center;"><b>CJ_AB_INV_004</b></p> |

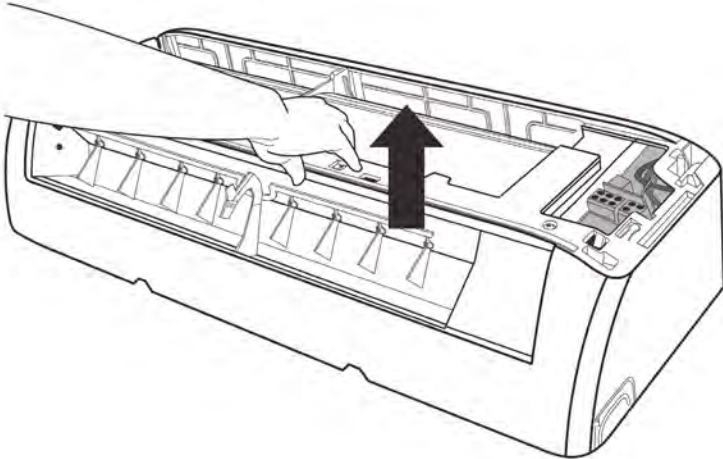
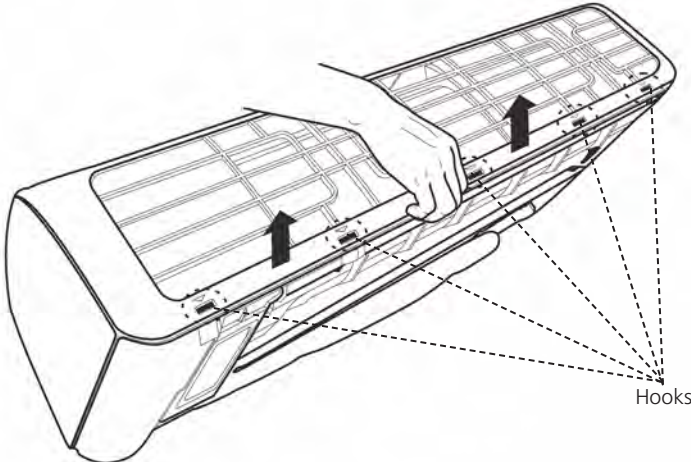
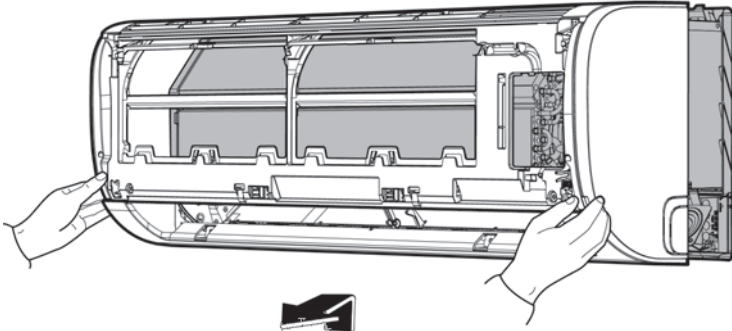
**Note:** This section is for reference only. Actual unit appearance may vary.

| Procedure  | Illustration  |
|--|---|
| <p>5) Pry the electrical cover by a screw driver, and rotate it towards left, then remove it. (see CJ_AB_INV_005).</p> |  <p>CJ_AB_INV_005</p>   |
| <p>6) Disconnect the connector for display board. (see CJ_AB_INV_006) .</p>  |  <p>CJ_AB_INV_006</p> |

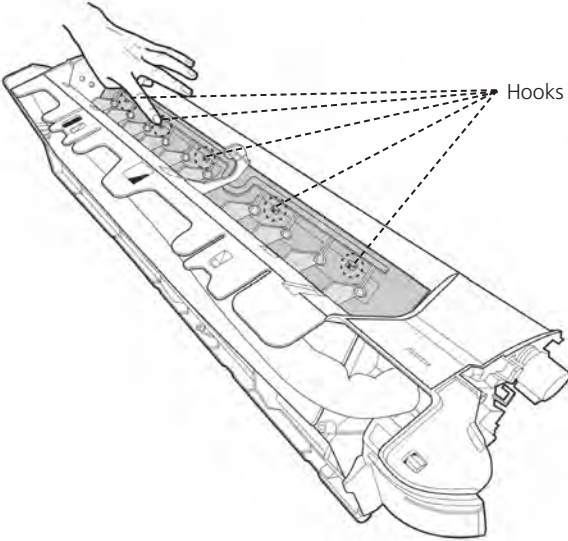
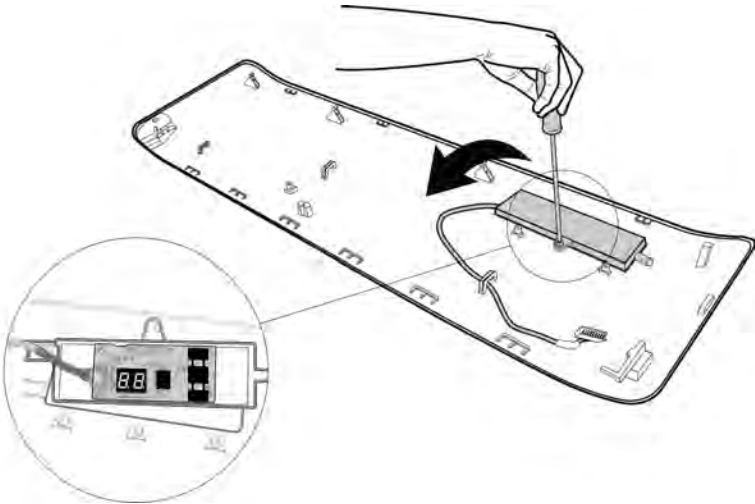
Note: This section is for reference only. Actual unit appearance may vary.

| Procedure  | Illustration   |
|--|--|
| <p>7) Slid the front panel side to side to release each axis (see CJ_AB_INV_007)</p> |  <p><b>CJ_AB_INV_007</b></p>   |
| <p>8) Open the screw cap and then remove the 3 screws (see CJ_AB_INV_008).</p>       |  <p><b>CJ_AB_INV_008</b></p> |

**Note:** This section is for reference only. Actual unit appearance may vary.

| Procedure   | Illustration  |
|---|---|
| <p>9) Release the hooks with hands. (see CJ_AB_INV_009)</p>   |  <p>CJ_AB_INV_009</p>   |
| <p>10)Release the 5 hooks in the back (see CJ_AB_INV_010).</p>  |  <p>CJ_AB_INV_010</p>  |
| <p>11)Pull out the panel frame while pushing the hook through a clearance between the panel frame and the heat exchanger. (see CJ_AB_INV_011)</p> |  <p>CJ_AB_INV_011</p> |

**Note:** This section is for reference only. Actual unit appearance may vary.

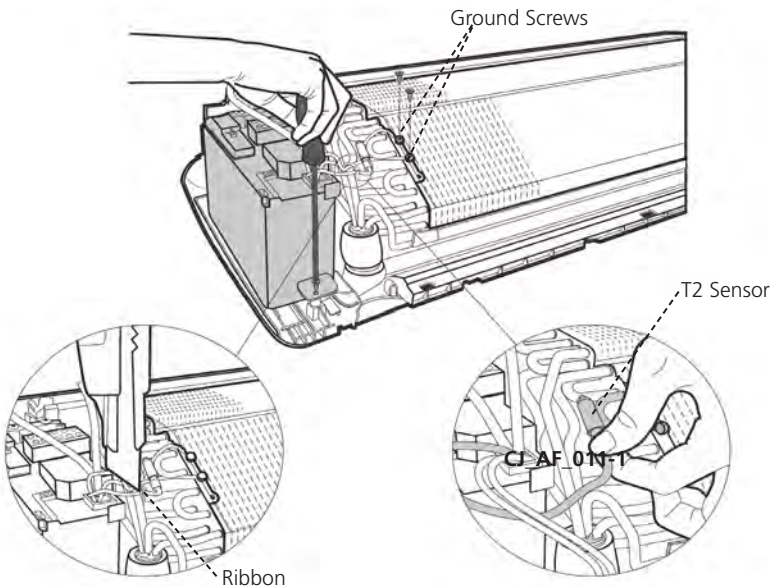
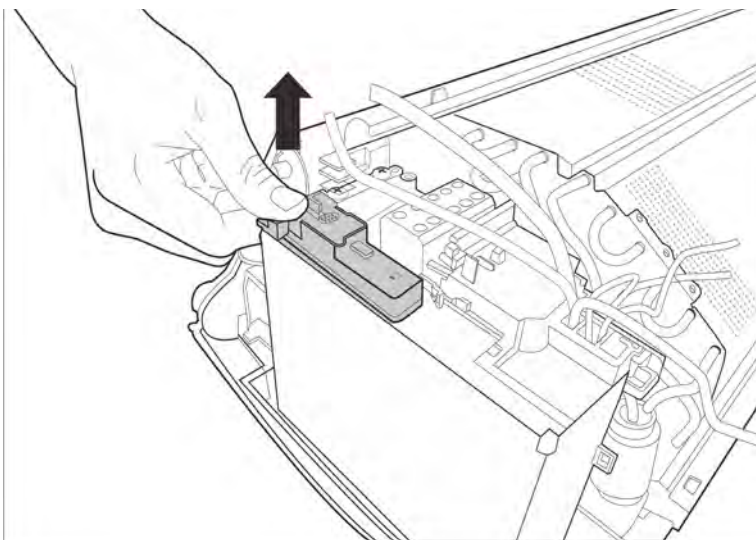
| Procedure  | Illustration  |
|--|---|
| <p>12)Release the 5 hooks of the vertical blades, then pull the vertical blades rightward and remove it (see CJ_AB_INV_012).</p>   |  <p>CJ_AB_INV_012</p>   |
| <p>13)Remove 1 screw of the display board.<br/>(see CJ_AB_INV_013).</p> <p>14)Rotate the display board in the direction shown in the right picture.<br/>(see CJ_AB_INV_013).</p> |  <p>CJ_AB_INV_013</p> |

**Note:** This section is for reference only. Actual unit appearance may vary.

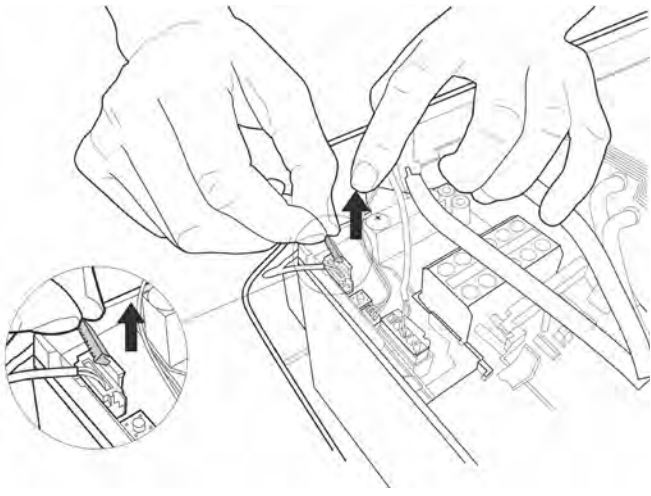
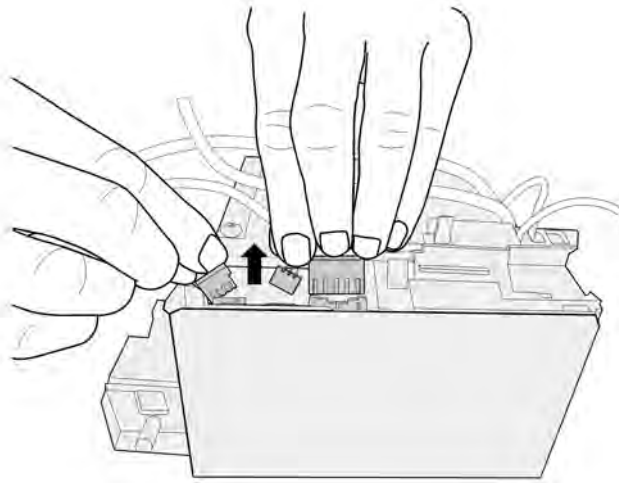
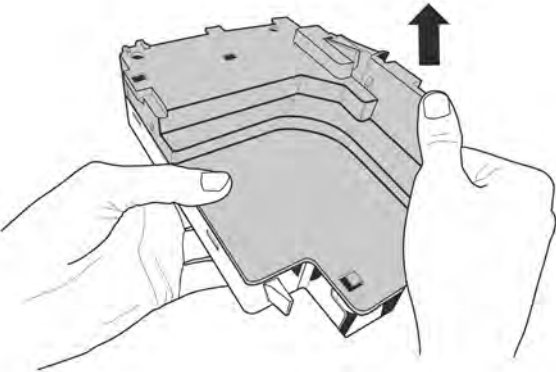


## 2. Electrical parts (Antistatic gloves must be worn.)

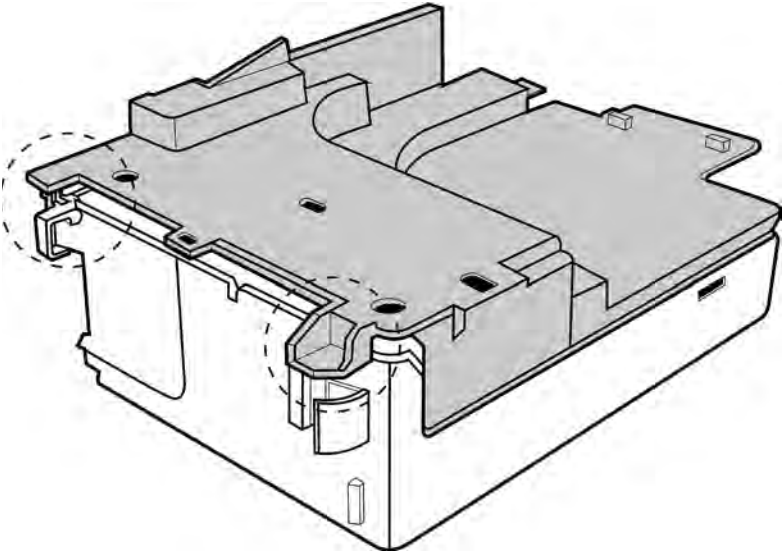
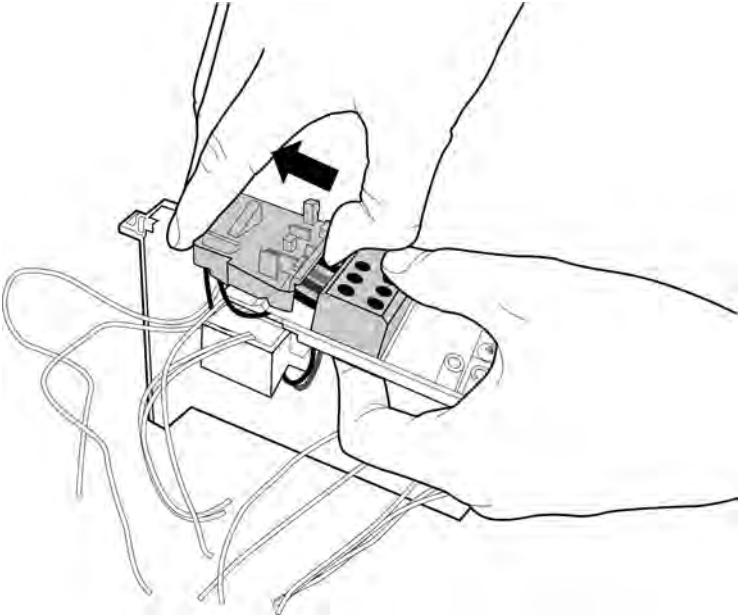
**Note:** Remove the front panel (refer to 1. Front panel) before disassembling electrical parts.

| Procedure   | Illustration   |
|---|--|
| <ol style="list-style-type: none"><li>1) Cut the ribbon by a shear, then pull out the coil temperature sensor (T2) (see CJ_AB_INV_014).</li><li>2) Remove one fixing screw of the electronic control box and two screws used for the ground connection (see CJ_AB_INV_014).</li></ol> |  <p style="text-align: center;"><b>CJ_AB_INV_014</b></p>  |
| <ol style="list-style-type: none"><li>3) An upward force is maintained until the cover of electronic control box is removed (see CJ_AB_INV_015).</li></ol>  |  <p style="text-align: center;"><b>CJ_AB_INV_015</b></p> |

**Note:** This section is for reference only. Actual unit appearance may vary.

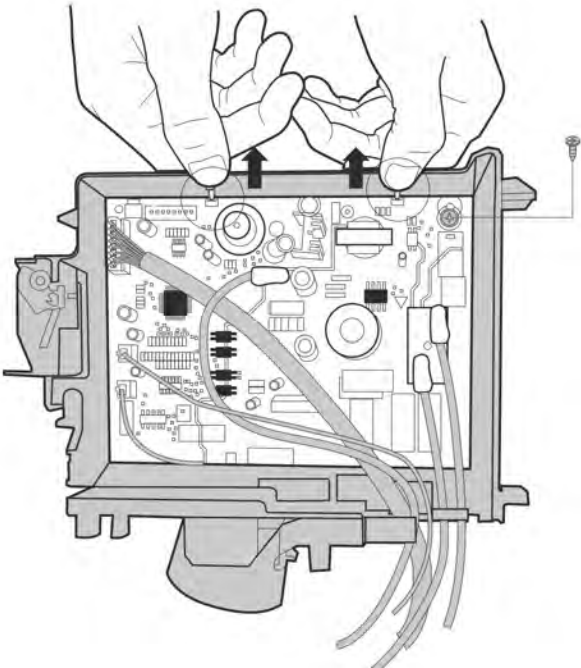
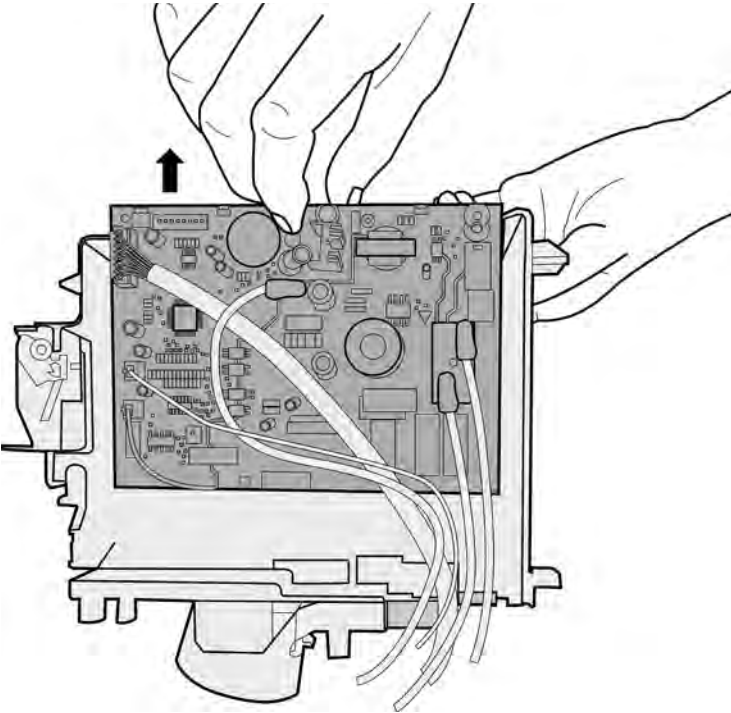
| Procedure  | Illustration  |
|--|---|
| 4) Remove the fixed devices of the connectors (see CJ_AB_INV_016).                               | <br>CJ_AB_INV_016   |
| 5) Disconnect the connectors of fan motor, the step motor and the T2 sensor (see CJ_AB_INV_017). | <br>CJ_AB_INV_017  |
| 6) Open the left side plate of electronic control box (see CJ_AB_INV_018).                       | <br>CJ_AB_INV_018 |

**Note:** This section is for reference only. Actual unit appearance may vary.

| Procedure   | Illustration  |
|---|---|
| <p>7) Open the two clips on the front of the electric box. (see CJ_AB_INV_019)</p>  |  <p>CJ_AB_INV_019</p>   |
| <p>8) Open the upper cover plate of electronic control box (see CJ_AB_INV_020).</p> |  <p>CJ_AB_INV_020</p> |

Note: This section is for reference only. Actual unit appearance may vary.

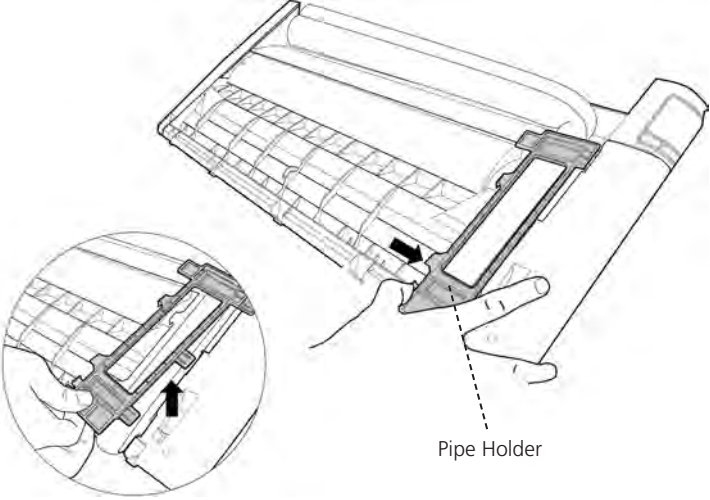
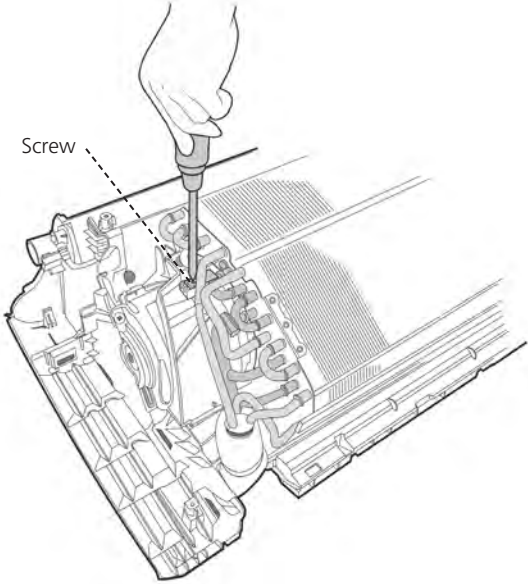


| Procedure  | Illustration  |
|--|---|
| <p>9) Remove 1 screw and open the 2 clips along the direction indicated in right image (see CJ_AB_INV_021).</p>              |  <p>CJ_AB_INV_021</p>  |
| <p>10) Pull out the electrical main board along the direction indicated in right image to remove it (see CJ_AB_INV_022).</p> |  <p>CJ_AB_INV_022</p> |

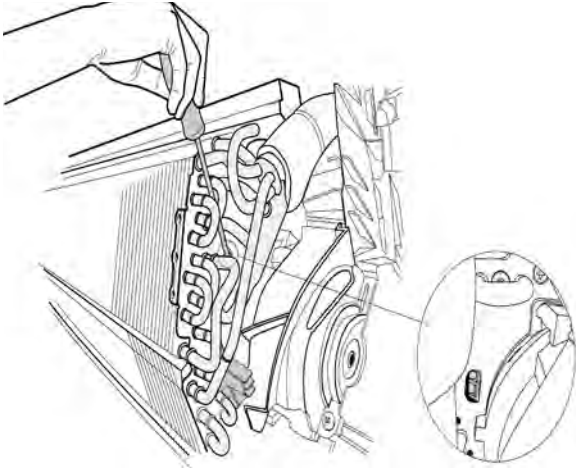
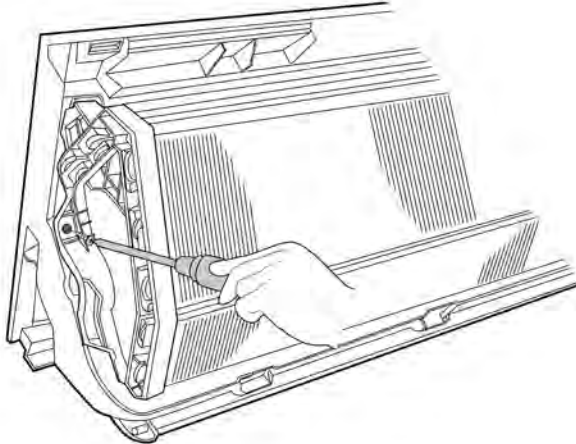
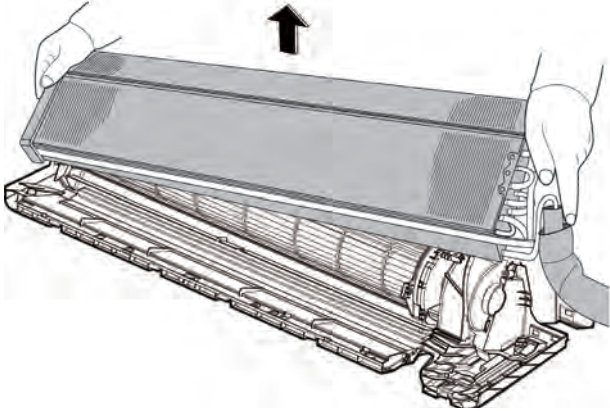
**Note:** This section is for reference only. Actual unit appearance may vary.

3. Evaporator

**Note:** Remove the front panel and electrical parts (refer to 1. Front panel and 2. Electrical parts) before disassembling evaporator.

| Procedure  | Illustration   |
|--|--|
| 1) Disassemble the pipe holder located at the rear of the unit (see CJ_AB_INV_023).      |  <p>Pipe Holder</p> <p>CJ_AB_INV_023</p> |
| 2) Remove the 1 screws on the evaporator located at the fixed plate (see CJ_AB_INV_024). |  <p>Screw</p> <p>CJ_AB_INV_024</p>     |

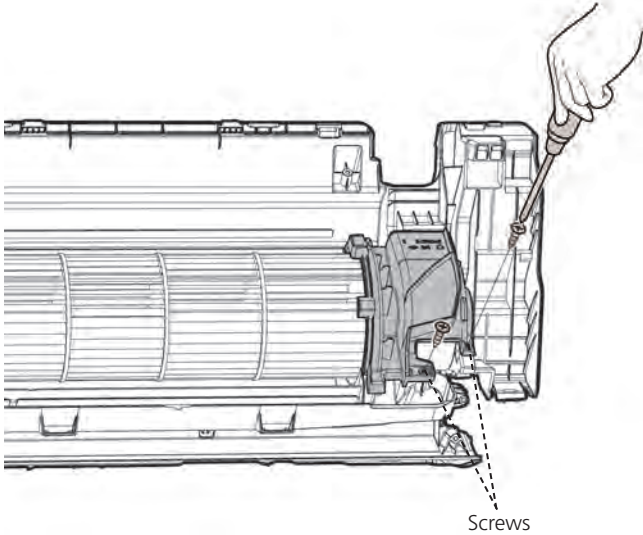
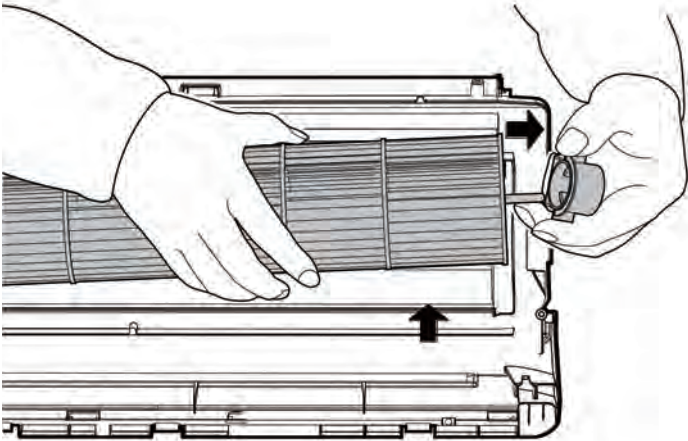
**Note:** This section is for reference only. Actual unit appearance may vary.

| Procedure   | Illustration  |
|---|---|
| 3) Release the hook on the evaporator (see CJ_AB_INV_025).                                | <br>CJ_AB_INV_025   |
| 4) Remote the one screw on the evaporator located at the fixed plate (see CJ_AB_INV_026). | <br>CJ_AB_INV_026  |
| 5) Pull out the evaporator (see CJ_AB_INV_027).   | <br>CJ_AB_INV_027 |

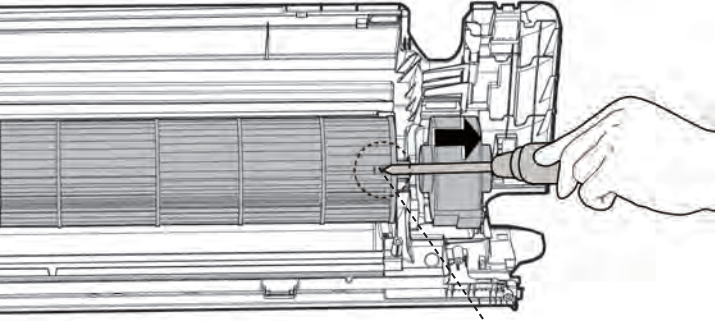
**Note:** This section is for reference only. Actual unit appearance may vary.

#### 4. Fan motor and fan

**Note:** Remove the front panel, electrical parts and evaporator (refer to 1. Front panel, 2. Electrical parts, and 3. Evaporator). before disassembling fan motor and fan.

| Procedure   | Illustration  |
|---|---|
| <p>1) Remove the two screws and remove the fixing board of the fan motor (see CJ_AB_INV_028).</p> |  <p>CJ_AB_INV_028</p>  |
| <p>2) Remove the bearing sleeve (see CJ_AB_INV_029).</p>  |  <p>CJ_AB_INV_029</p> |

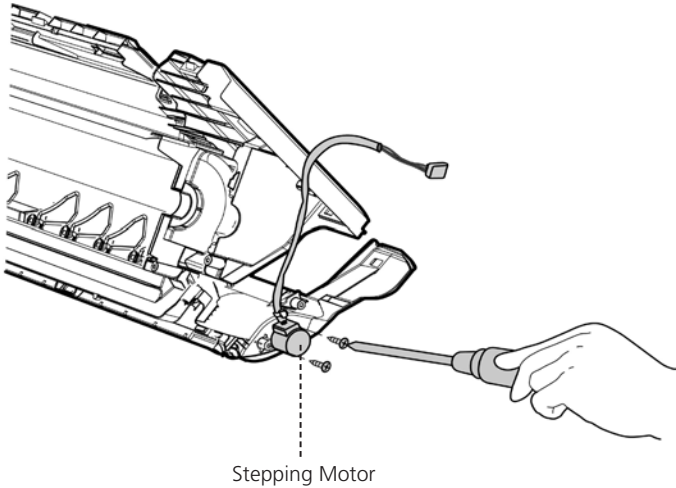
**Note:** This section is for reference only. Actual unit appearance may vary.

| Procedure   | Illustration  |
|---|---|
| <p>3) Remove the fixing screw (see CJ_AB_INV_030).</p> <p>4) Pull out the fan motor and fan assembly from the side.</p> |  <p>The diagram shows a side view of an air conditioning unit's internal components. A hand is using a screwdriver to remove a screw from the fan motor assembly. A dashed line points to the screw, which is labeled 'Fixing Screw'. A black arrow indicates the direction of removal. The label 'CJ_AB_INV_030' is positioned below the diagram.</p> <p data-bbox="938 772 1141 806"><b>CJ_AB_INV_030</b></p> |

**Note:** This section is for reference only. Actual unit appearance may vary.

5. Step motor

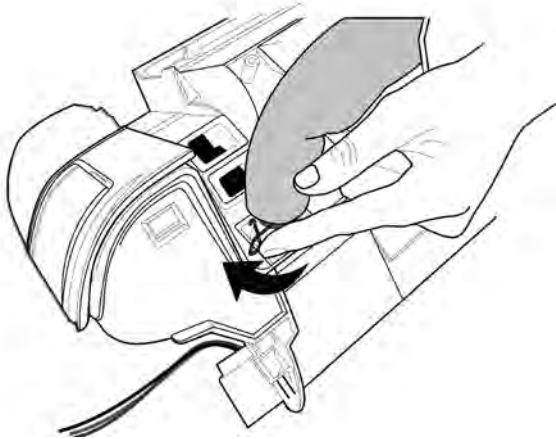
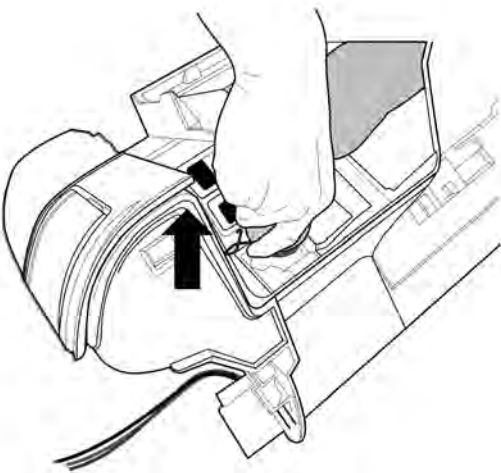
**Note:** Remove the front panel and electrical parts (refer to 1. Front panel, 2. Electrical parts) before disassembling step motor.

| Procedure   | Illustration  |
|---|---|
| 1) Remove the two screws, then remove the stepping motor (see CJ_AB_INV_031). |  <p>Stepping Motor</p> <p>CJ_AB_INV_031</p> |

**Note:** This section is for reference only. Actual unit appearance may vary.



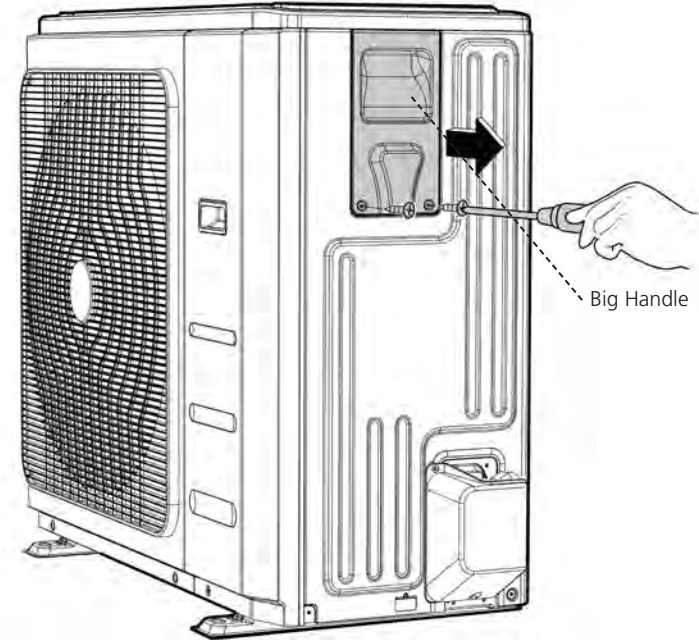
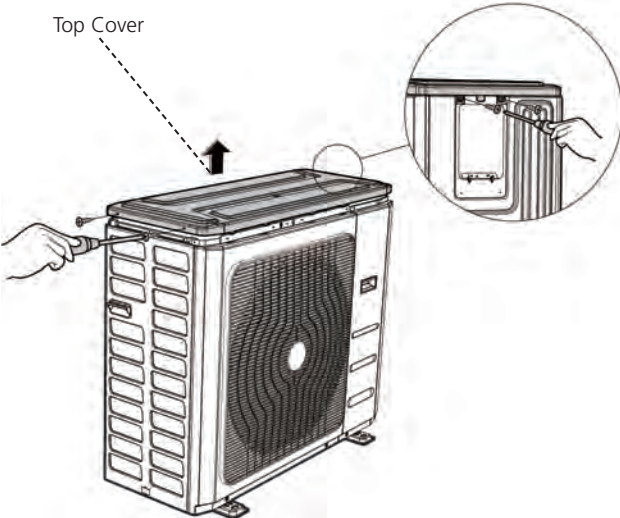
6. Drain Hose

| Procedure  | Illustration   |
|--|--|
| 1) Rotate the fixed wire clockwise indicated in right image (see CJ_AB_INV_032). |  <p>CJ_AB_INV_032</p>  |
| 2) Pull up the drain hose to remove it (see CJ_AB_INV_033).                      |  <p>CJ_AB_INV_033</p> |

Note: This section is for reference only. Actual unit appearance may vary.

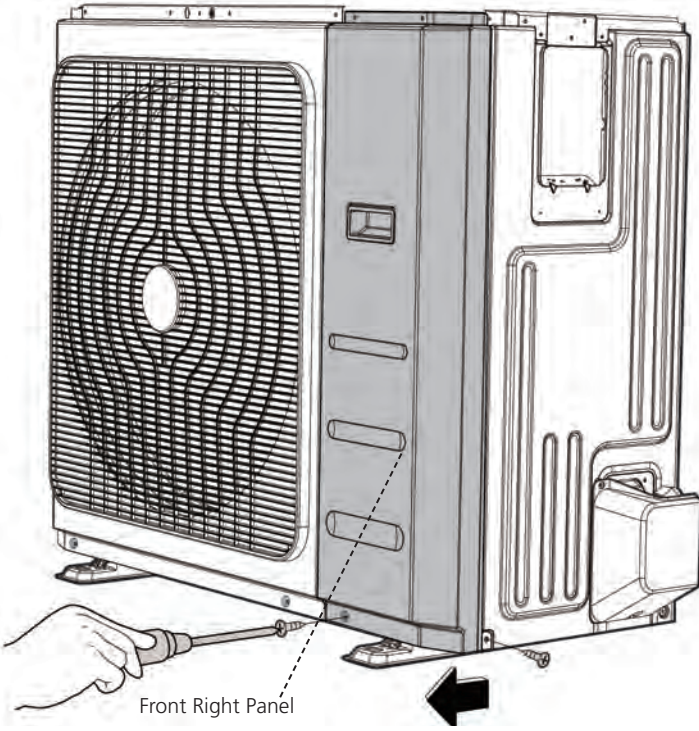
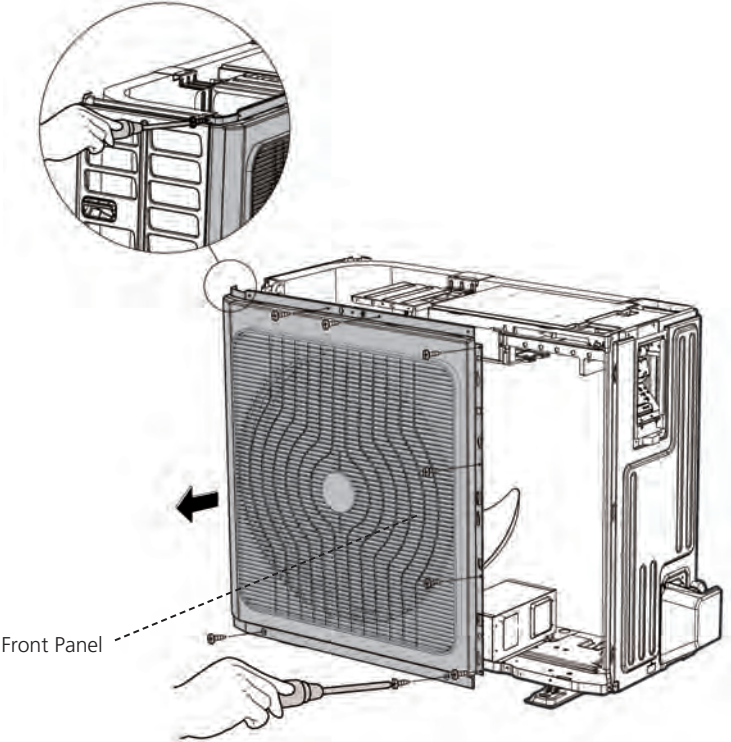
## 2.2 Outdoor unit

### 1. Panel Plate

| Procedure   | Illustration   |
|---|--|
| <p>1) Turn off the air conditioner and the power breaker.</p> <p>2) Remove the screws of the big handle and then remove the big handle (2 screws) (see CJ_D30_INV_001).</p> |  <p>For US models (3 screws)</p> <p><b>CJ_D30_INV_001</b></p> |
| <p>3) Remove the screws of the top cover and then remove the top cover (4 screws). Two of the screws is located underneath the big handle (see CJ_D30_INV_002).</p>         |  <p><b>CJ_D30_INV_002</b></p>                                |

Note: This section is for reference only. Actual unit appearance may vary.



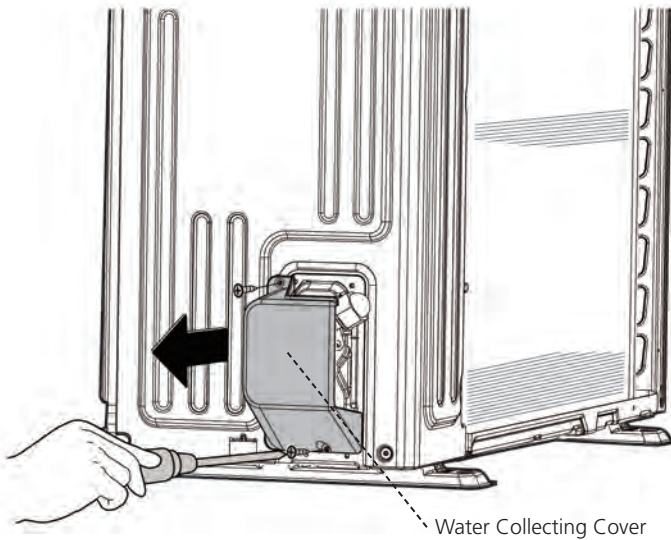
| Procedure   | Illustration   |
|---|--|
| <p>4) Remove the screws of the front right panel and then remove the front right panel (2 screws) (see CJ_D30_INV_003).</p> |  <p style="text-align: center;">CJ_D30_INV_003</p>  |
| <p>5) Remove the screws of the front panel and then remove the front panel (9 screws) (see CJ_D30_INV_004).</p>             |  <p style="text-align: center;">CJ_D30_INV_004</p> |

**Note:** This section is for reference only. Actual unit appearance may vary.

Procedure

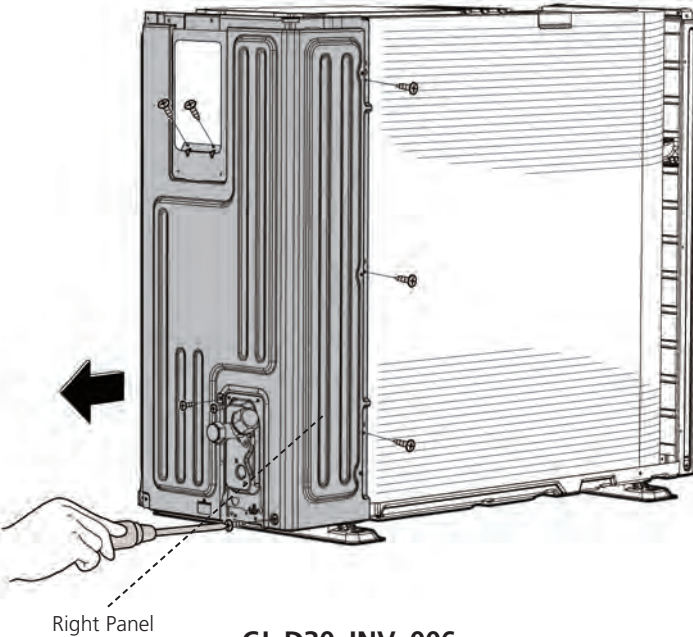
- 6) Remove the screws of water collecting cover and then remove the water collecting cover (2 screw) (see CJ\_D30\_INV\_005).

Illustration



CJ\_D30\_INV\_005

- 7) Remove the screws of the right panel and then remove the right panel (8 screws) (see CJ\_D30\_INV\_006).

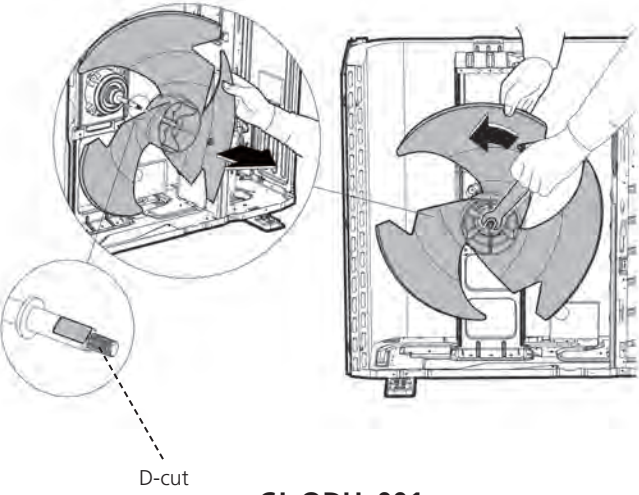
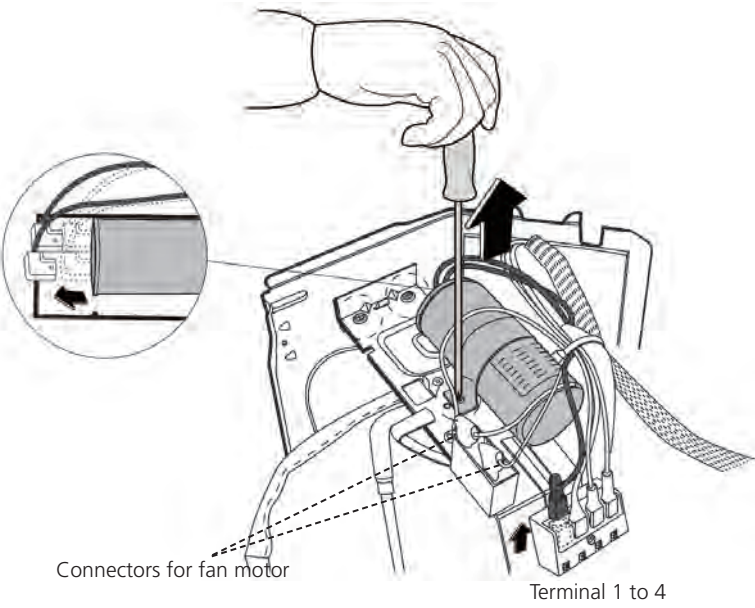


CJ\_D30\_INV\_006

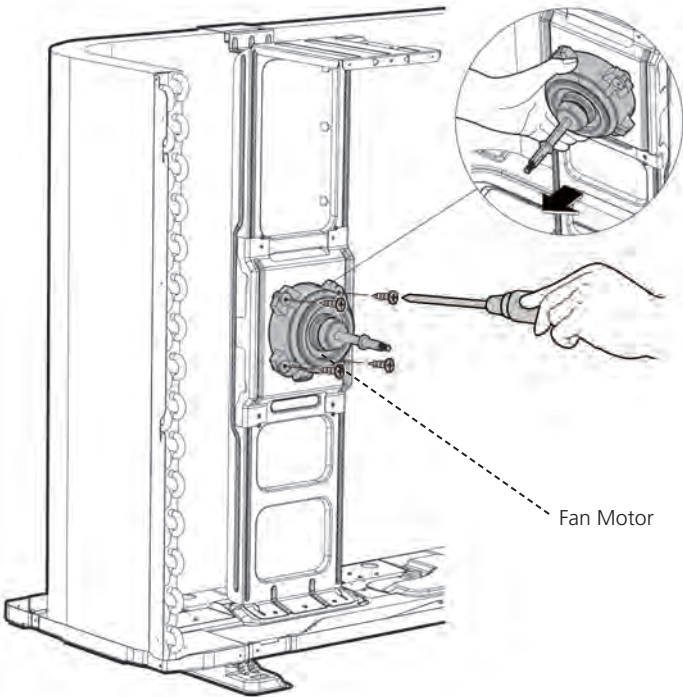
Note: This section is for reference only. Actual unit appearance may vary.

2. Fan disassembly

**Note:** Remove the panel plate and (refer to 1. Panel plate) before disassembling fan.

| Procedure  | Illustration   |
|--|--|
| <p>1) Remove the nut securing the fan with a spanner (see CJ_ODU_001).</p> <p>2) Remove the fan.</p>   |  <p>CJ_ODU_001</p>   |
| <p>3) Disconnect the connectors for fan motor. (Blue wire, yellow wire, red wire, brown wire and black wire. The blue wire and red wire are on the capacitor. The black wire connects with terminal 4.) (see CJ_ODU_002)</p> |  <p>CJ_ODU_002</p> |

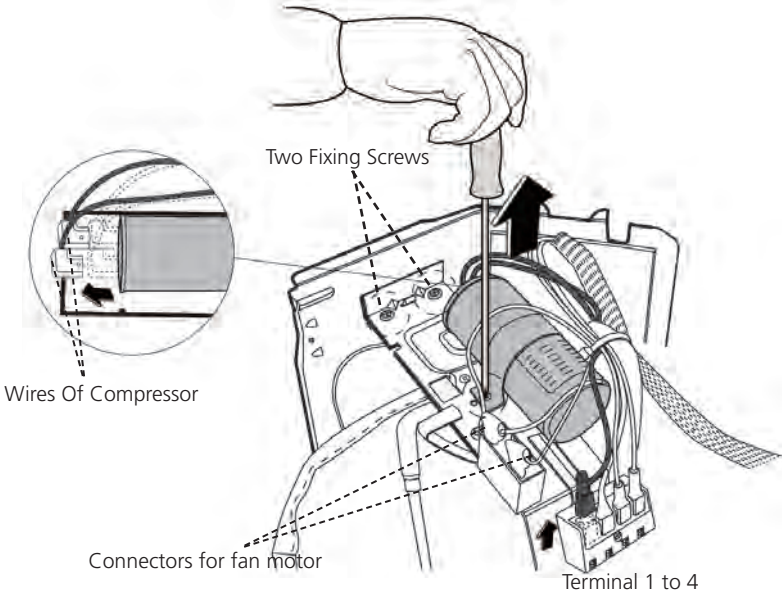
**Note:** This section is for reference only. Actual unit appearance may vary.

| Procedure  | Illustration  |
|--|---|
| <p>4) Remove the fixing screws of the fan motor (4 screws) (see CJ_ODU_003).</p> <p>5) Remove the fan motor.</p> |  <p data-bbox="1252 851 1348 873">Fan Motor</p> <p data-bbox="957 1086 1125 1131">CJ_ODU_003</p> |

Note: This section is for reference only. Actual unit appearance may vary.

3. Electrical parts

**Note:** Remove the air outlet grille(refer to 1. Panel plate) before disassembling electrical parts.

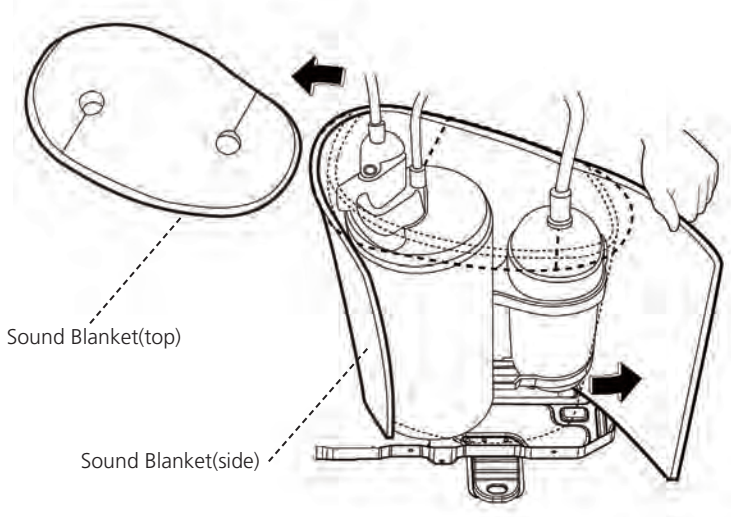
| Procedure  | Illustration   |
|--|--|
| <div>1) Remove the two screws fixed the electronic control board (see CJ_ODU_007).</div> <div>2) Disconnect the wires connected to the compressor. (Black wire connects with terminal 1,blue wire and red wire connect with the compressor capacitor) (see CJ_ODU_007)</div> <div>3) Disconnect the wires connected to 4-way valve.(Blue wires on terminal 2&amp;3) (see CJ_ODU_007)</div> <div>4) Remove the fixing screw of the compressor capacitor, then pull it out (see CJ_ODU_007)</div> <div>5) Remove the electrical parts (see CJ_ODU_007)</div> | <div></div> <div>CJ_ODU_007</div> |

**Note:** This section is for reference only. Actual unit appearance may vary.



**⚠ WARNING:** Recover refrigerant from the refrigerant circuit before remove the compressor.

**Note:** Remove the panel plate, electrical parts, and fan assembly (refer to 1. Panel plate, 2. Electrical parts, and 3. Fan assembly) before disassembling sound blanket.

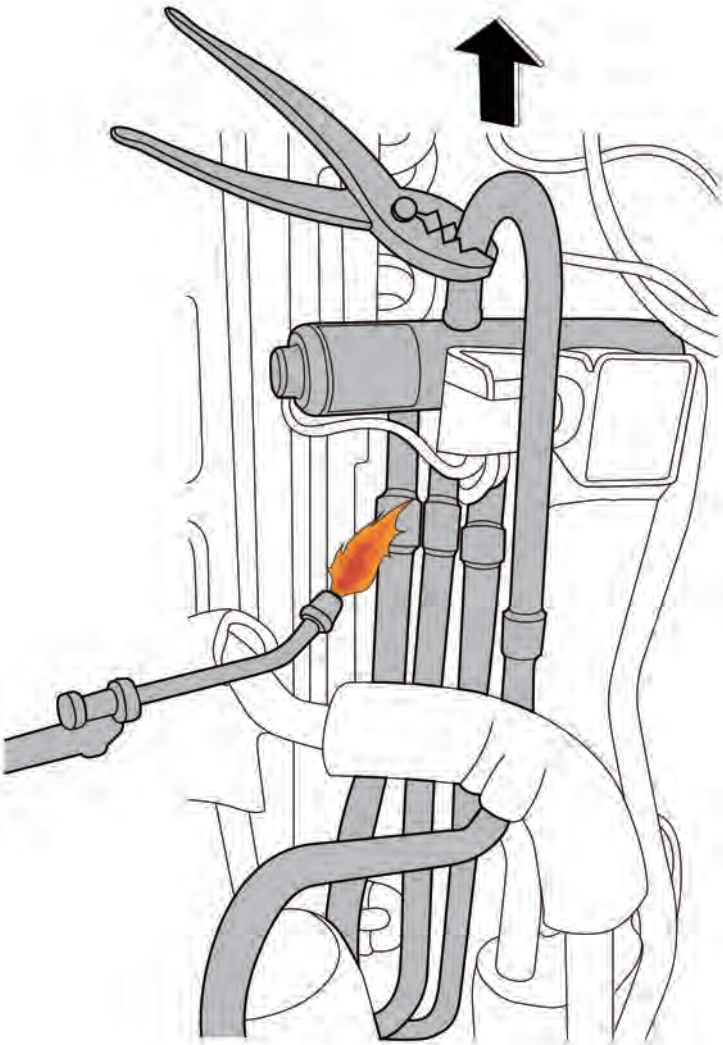
| Procedure  | Illustration  |
|--|---|
| 1) Remove the sound blanket (side and top) (see CJ_ODU_010). |  <p>Sound Blanket(top)</p> <p>Sound Blanket(side)</p> <p>CJ_ODU_010</p> |

**Note:** This section is for reference only. Actual unit appearance may vary.

4. Four-way valve

**⚠ WARNING:** Recover refrigerant from the refrigerant circuit before remove the four-way valve.

**Note:** Remove the panel plate, electrical parts, and fan assembly (refer to 1. Panel plate, 2. Electrical parts, and 3. Fan assembly) before disassembling four-way valve.

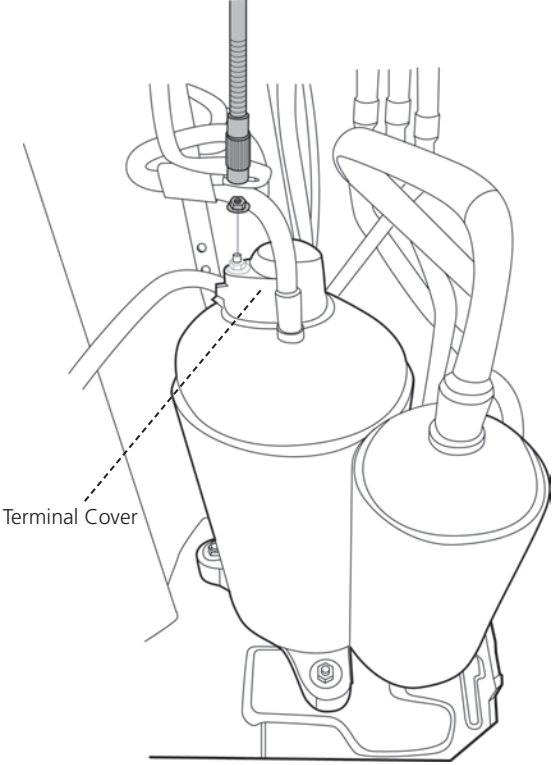
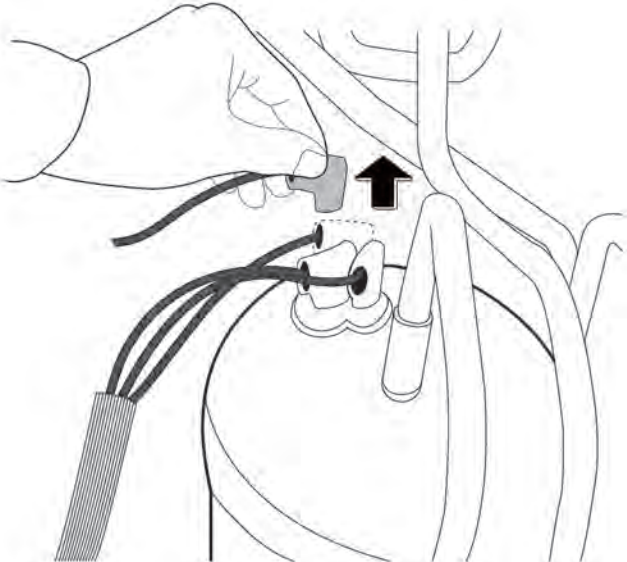
| Procedure  | Illustration   |
|--|--|
| <div>1) Heat up the brazed parts and then detach the the four-way valve and the pipe (see CJ_ODU_INV_018).</div> <div>2) Remove the four-way valve assembly with pliers.</div> | <div></div> <div>CJ_ODU_INV_018</div> |

**Note:** This section is for reference only. Actual unit appearance may vary.

5. Compressor

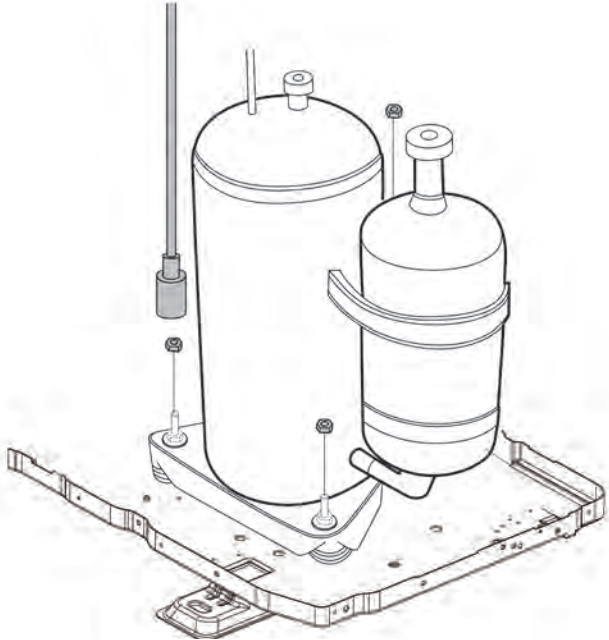
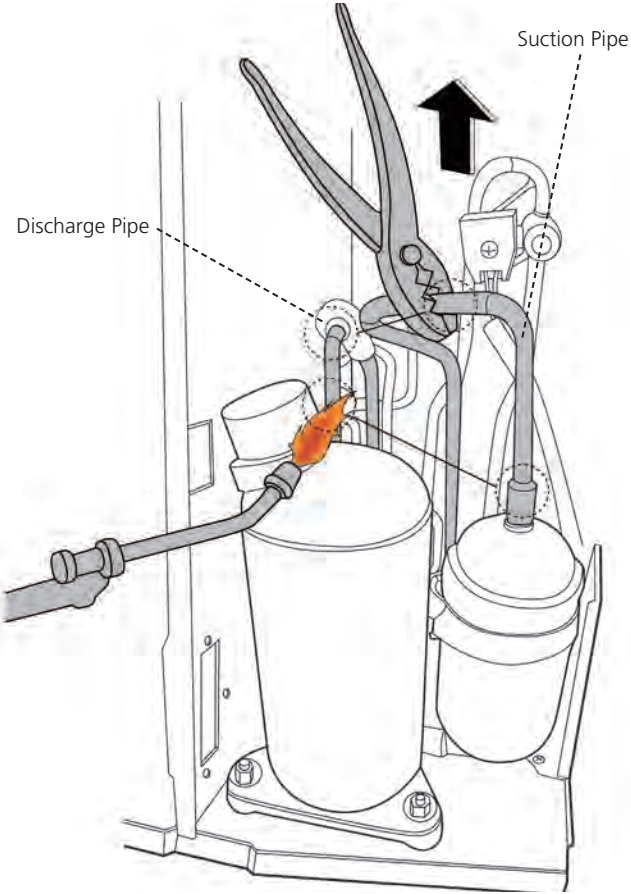
**!WARNING:** Recover refrigerant from the refrigerant circuit before remove the compressor.

**Note:** Remove the panel plate, electrical parts, and fan assembly (refer to 1. Panel plate, 2. Electrical parts, and 3. Fan assembly) before disassembling compressor.

| Procedure   | Illustration   |
|---|--|
| <p>1) Remove the flange nut of terminal cover and remove the terminal cover (see CJ_ODU_011).</p> |  <p>CJ_ODU_011</p>  |
| <p>2) Disconnect the connectors (see CJ_ODU_012).</p>   |  <p>CJ_ODU_012</p> |

**Note:** This section is for reference only. Actual unit appearance may vary.



| Procedure   | Illustration   |
|---|--|
| <p>3) Remove the hex nuts and washers securing the compressor, located on the bottom plate (see CJ_ODU_013).</p> <p>4) Heat up the brazed parts and then remove the the discharge pipe and the suction pipe (see CJ_ODU_014).</p> <p>5) Lift the compressor from the base pan assembly with pliers.</p> |  <p data-bbox="954 976 1123 1010"><b>CJ_ODU_013</b></p>  <p data-bbox="954 1939 1123 1973"><b>CJ_ODU_014</b></p> |

**Note:** This section is for reference only. Actual unit appearance may vary.

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# Troubleshooting

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## 1. Safety Caution

### WARNING

Be sure to turn off all power supplies or disconnect all wires to avoid electric shock before troubleshooting.

While checking indoor or outdoor PCB, please equip oneself with antistatic gloves or wrist strap to avoid damage to the board.

## 2. General Troubleshooting

### 2.1 Error Display (Indoor Unit)

When the indoor unit encounters a recognized error, the indicator light will flash in a corresponding series, the timer display may turn on or begin flashing, and an error code will be displayed. These error codes are described in the following table:

| Indicator flashes | Timer Display | Display | Error Information   | Solution |
|-------------------|---------------|---------|---|----------|
| 1 times           | OFF           | E1      | EEPROM parameter error  | Page 56  |
| 2 times           | OFF           | E2      | Zero-crossing signal detection error  | Page 57  |
| 3 times           | OFF           | E3      | The indoor fan speed is operating outside of the normal range                   | Page 58  |
| 5 times           | OFF           | E5      | Indoor room temperature sensor T1 open circuit or short circuit                 | Page 60  |
| 6 times           | OFF           | E6      | Evaporator coil temperature sensor T2 is in open circuit or has short circuited | Page 60  |
| 2 times           | ON            | EC      | Refrigerant leak detected   | Page 61  |

#### For other errors:

The display board may show a garbled code or a code undefined by the service manual. Ensure that this code is not a temperature reading.

#### Troubleshooting:

Test the unit using the remote control. If the unit does not respond to the remote, the indoor PCB requires replacement. If the unit responds, the display board requires replacement.

### 3. Error Diagnosis and Troubleshooting Without Error Code



#### WARNING

Be sure to turn off unit before any maintenance to prevent damage or injury.

#### 3.1 Remote maintenance

**SUGGESTION:** When troubles occur, please check the following points with customers before field maintenance.

| NO. | Problem  | Solution   |
|-----|--|------------|
| 1   | Unit will not start                                      | Page 51-52 |
| 2   | The power switch is on but fans will not start           | Page 51-52 |
| 3   | The temperature on the display board cannot be set       | Page 51-52 |
| 4   | Unit is on but the wind is not cold(hot)                 | Page 51-52 |
| 5   | Unit runs, but shortly stops                             | Page 51-52 |
| 6   | The unit start ups and stops frequently                  | Page 51-52 |
| 7   | Unit runs continuously but insufficient cooling(heating) | Page 51-52 |
| 8   | Cool can not change to heat                              | Page 51-52 |
| 9   | Unit is noisy  | Page 51-52 |

## 3.2 Field maintenance

| NO. | Problem   | Solution   |
|-----|---|------------|
| 1   | Unit will not start                                   | Page 53-54 |
| 2   | Compressor will not start but fans run                | Page 53-54 |
| 3   | Compressor and condenser (outdoor) fan will not start | Page 53-54 |
| 4   | Evaporator (indoor) fan will not start                | Page 53-54 |
| 5   | Condenser (Outdoor) fan will not start                | Page 53-54 |
| 6   | Unit runs, but shortly stops                          | Page 53-54 |
| 7   | Compressor short-cycles due to overload               | Page 53-54 |
| 8   | High discharge pressure                               | Page 53-54 |
| 9   | Low discharge pressure                                | Page 53-54 |
| 10  | High suction pressure                                 | Page 53-54 |
| 11  | Low suction pressure                                  | Page 53-54 |
| 12  | Unit runs continuously but insufficient cooling       | Page 53-54 |
| 13  | Too cool  | Page 53-54 |
| 14  | Compressor is noisy                                   | Page 53-54 |
| 15  | Horizontal louver can not revolve                     | Page 53-54 |

## 4. Quick Maintenance by Error Code

If you do not have the time to test whether specific parts are faulty, you can directly change the required parts according to the error code.

You can find the parts to replace by error code in the following table.

| Part requiring replacement | Error Code |    |    |    |    |    |
|----------------------------|------------|----|----|----|----|----|
|                            | E1         | E2 | E3 | E5 | E6 | EC |
| Indoor PCB                 | ✓          | ✓  | ✓  | ✓  | ✓  | ✓  |
| Indoor fan motor           | x          | ✓  | ✓  | x  | x  | x  |
| T1 Sensor                  | x          | x  | x  | ✓  | x  | x  |
| T2 Sensor                  | x          | x  | x  | x  | ✓  | ✓  |
| Additional refrigerant     | x          | x  | x  | x  | x  | ✓  |
| Compressor                 | x          | x  | x  | x  | x  | ✓  |
| Capacitor of compressor    | x          | x  | x  | x  | x  | ✓  |
| Capacitor of fan motor     | x          | x  | x  | x  | x  | ✓  |

| 1.Remote Maintenance                                     |  |  |  |  | Electrical Circuit |                        |                               |                        | Refrigerant Circuit                |   |                            |                  |                      |  |  |                     |  |                                    |
|--|--|--|--|--|--------------------|------------------------|-------------------------------|------------------------|------------------------------------|---|----------------------------|------------------|----------------------|--|--|---------------------|--|------------------------------------|
| Possible causes of trouble                               |  |  |  |  | Power failure      | The main power tripped | Loose connections             | Faulty transformer     | The voltage is too high or too low | The remote control is powered off         | Broken remote control      | Dirty air filter | Dirty condenser fins | The setting temperature is higher/lower than the room's(cooling/heating) | The ambient temperature is too high/low when the mode is cooling/heating | Fan mode            | SILENCE function is activated(optional function) | Frosting and defrosting frequently |
| Unit will not start                                      |  |  |  |  | ☆                  | ☆                      | ☆                             | ☆                      |                                    |   |                            |                  |                      |  |  |                     |  |                                    |
| The power switch is on but fans will not start           |  |  |  |  |                    |                        | ☆                             | ☆                      | ☆                                  |   |                            |                  |                      |  |  |                     |  |                                    |
| The temperature on the display board cannot be set       |  |  |  |  |                    |                        |                               |                        |                                    | ☆   | ☆                          |                  |                      |  |  |                     |  |                                    |
| Unit is on but the wind is not cold(hot)                 |  |  |  |  |                    |                        |                               |                        |                                    |   |                            |                  |                      | ☆  | ☆  | ☆                   |  |                                    |
| Unit runs, but shortly stops                             |  |  |  |  |                    |                        |                               |                        | ☆                                  |   |                            |                  |                      | ☆  | ☆  |                     |  |                                    |
| The unit startup and stop frequently                     |  |  |  |  |                    |                        |                               |                        | ☆                                  |   |                            |                  |                      |  | ☆  |                     |  | ☆                                  |
| Unit runs continuously but insufficient cooling(heating) |  |  |  |  |                    |                        |                               |                        |                                    |   |                            | ☆                | ☆                    | ☆  | ☆  |                     | ☆  |                                    |
| Cool can not change to heat                              |  |  |  |  |                    |                        |                               |                        |                                    |   |                            |                  |                      |  |  |                     |  |                                    |
| Unit is noisy  |  |  |  |  |                    |                        |                               |                        |                                    |   |                            |                  |                      |  |  |                     |  |                                    |
| Test method / remedy                                     |  |  |  |  | Test voltage       | Close the power switch | Inspect connections - tighten | Change the transformer | Test voltage                       | Replace the battery of the remote control | Replace the remote control | Clean or replace | Clean                | Adjust the setting temperature   | Turn the AC later  | Adjust to cool mode | Turn off SILENCE function.                       | Turn the AC later                  |

| Others   |   |  |  |  |  |   |  |  |   |   |  |
|--|---|--|--|--|--|---|--|--|---|---|--|
| Check heat load  | ☆ |  |  |  |  |   |  |  |   | Heavy load condition                                    |  |
| Tighten bolts or screws  | ☆ |  |  |  |  |   |  |  |   | Loosen hold down bolts and / or screws                  |  |
| Close all the windows and doors  |   |  |  |  |  |   |  |  |   | Bad airproof  |  |
| Remove the obstacles   |   |  |  |  |  | ☆ |  |  |   | The air inlet or outlet of either unit is blocked       |  |
| Reconnect the power or press <b>ON/OFF</b> button on remote control to restart |   |  |  |  |  |   |  |  | ☆ | Interference from cell phone towers and remote boosters |  |
| Remove them  | ☆ |  |  |  |  |   |  |  |   | Shipping plates remain attached                         |  |



| 2.Field Maintenance                                   | Electrical Circuit |                          |                               |                           |                                  |   |   |                                   |                             |  |                                    |              |                            |                                  |                                  |
|---|--------------------|--------------------------|-------------------------------|---------------------------|----------------------------------|---|---|-----------------------------------|-----------------------------|--|------------------------------------|--------------|----------------------------|----------------------------------|----------------------------------|
| Possible causes of trouble                            | Power failure      | Blown fuse or varistor   | Loose connections             | Shorted or broken wires   | Safety device opens              | Faulty thermostat / room temperature sensor     | Wrong setting place of temperature sensor                           | Faulty transformer                | Shorted or open capacitor   | Faulty magnetic contactor for compressor | Faulty magnetic contactor for fan  | Low voltage  | Faulty stepping motor      | Shorted or grounded compressor   | Shorted or grounded fan motor    |
| Unit will not start                                   | ☆                  | ☆                        | ☆                             | ☆                         | ☆                                |   |   | ☆                                 |                             |  |                                    |              |                            |                                  |                                  |
| Compressor will not start but fans run                |                    |                          |                               | ☆                         |                                  | ☆   |   |                                   | ☆                           | ☆  |                                    |              |                            | ☆                                |                                  |
| Compressor and condenser (outdoor) fan will not start |                    |                          |                               | ☆                         |                                  | ☆   |   |                                   |                             | ☆  |                                    |              |                            |                                  |                                  |
| Evaporator (indoor) fan will not start                |                    |                          |                               | ☆                         |                                  |   |   |                                   | ☆                           |  | ☆                                  |              |                            |                                  | ☆                                |
| Condenser (Outdoor) fan will not start                |                    |                          |                               | ☆                         |                                  | ☆   |   |                                   | ☆                           |  | ☆                                  |              |                            |                                  | ☆                                |
| Unit runs, but shortly stops                          |                    |                          |                               |                           |                                  |   |   |                                   |                             | ☆  |                                    | ☆            |                            |                                  |                                  |
| Compressor short-cycles due to overload               |                    |                          |                               |                           |                                  |   |   |                                   |                             | ☆  |                                    | ☆            |                            |                                  |                                  |
| High discharge pressure                               |                    |                          |                               |                           |                                  |   |   |                                   |                             |  |                                    |              |                            |                                  |                                  |
| Low discharge pressure                                |                    |                          |                               |                           |                                  |   |   |                                   |                             |  |                                    |              |                            |                                  |                                  |
| High suction pressure                                 |                    |                          |                               |                           |                                  |   |   |                                   |                             |  |                                    |              |                            |                                  |                                  |
| Low suction pressure                                  |                    |                          |                               |                           |                                  |   |   |                                   |                             |  |                                    |              |                            |                                  |                                  |
| Unit runs continuously but insufficient cooling       |                    |                          |                               |                           |                                  |   |   |                                   |                             |  |                                    |              |                            |                                  |                                  |
| Too cool  |                    |                          |                               |                           |                                  | ☆   | ☆   |                                   |                             |  |                                    |              |                            |                                  |                                  |
| Compressor is noisy                                   |                    |                          |                               |                           |                                  |   |   |                                   |                             |  |                                    |              |                            |                                  |                                  |
| Horizontal louver can not revolve                     |                    |                          | ☆                             | ☆                         |                                  |   |   |                                   |                             |  |                                    |              | ☆                          |                                  |                                  |
| Test method / remedy                                  | Test voltage       | Inspect fuse type & size | Inspect connections - tighten | Test circuits with tester | Test continuity of safety device | Test continuity of thermostat / sensor & wiring | Place the temperature sensor at the central of the air inlet grille | Check control circuit with tester | Check capacitor with tester | Test continuity of coil & contacts       | Test continuity of coil & contacts | Test voltage | Replace the stepping motor | Check resistance with multimeter | Check resistance with multimeter |

| Refrigerant Circuit   |  |  |  |  |  |  |  |  |  |  |  |  |  | Others |   |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--------|---|
| Replace the compressor  |  |  |  |  |  |  |  |  |  |  |  |  |  | ☆      | Compressor stuck                                      |
| Leak test   |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Shortage of refrigerant                               |
| Replace restricted part   |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Restricted liquid line                                |
| Clean or replace  |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Dirty air filter                                      |
| Clean coil  |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Dirty evaporator coil                                 |
| Check fan   |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Insufficient air through evaporator coil              |
| Change charged refrigerant volume                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Overcharge of refrigerant                             |
| Clean condenser or remove obstacle                                    |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Dirty or partially blocked condenser                  |
| Purge, evacuate and recharge  |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Air or incompressible gas in refrigerant cycle        |
| Remove obstruction to air flow  |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Short cycling of condensing air                       |
| Remove obstruction in air or water flow                               |  |  |  |  |  |  |  |  |  |  |  |  |  |        | High temperature condensing medium                    |
| Remove obstruction in air or water flow                               |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Insufficient condensing medium                        |
| Replace compressor  |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Broken compressor internal parts                      |
| Test compressor efficiency  |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Inefficient compressor                                |
| Replace valve   |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Expansion valve obstructed                            |
| Replace valve   |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Expansion valve or capillary tube closed completely   |
| Replace valve   |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Leaking power element on expansion valve              |
| Fix feeler bulb   |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Poor installation of feeler bulb                      |
| Check heat load   |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Heavy load condition                                  |
| Tighten bolts or screws   |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Loosen hold down bolts and / or screws                |
| Remove them   |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Shipping plates remain attached                       |
| Choose AC of larger capacity or add the number of AC                  |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Poor choices of capacity                              |
| Rectify piping so as not to contact each other or with external plate |  |  |  |  |  |  |  |  |  |  |  |  |  |        | Contact of piping with other piping or external plate |

---

## 5. Troubleshooting by Error Code

### 5.1 Common Check Procedures

#### 5.1.1 Temperature Sensor Check

Disconnect the temperature sensor from PCB, measure the resistance value with a tester.

Temperature Sensors.

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

Outdoor ambient temp.(T4) sensor,

Measure the resistance value of each winding by using the multi-meter.

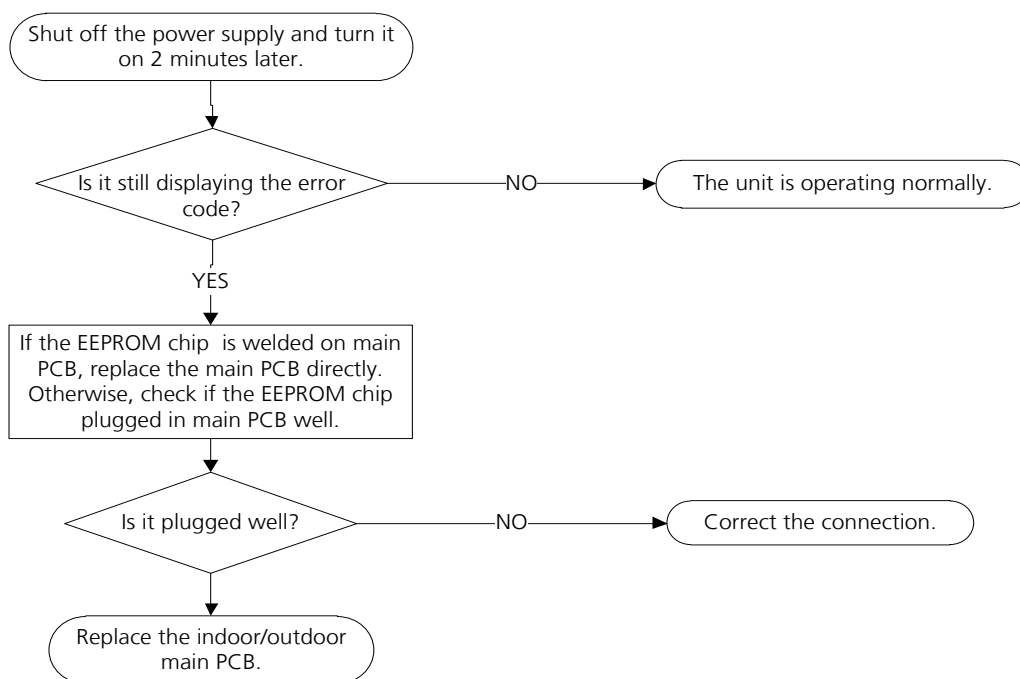
## 5.2 E1 (EEPROM parameter error diagnosis and solution)

**Description:** Indoor or outdoor PCB main chip does not receive feedback from EEPROM chip.

**Recommended parts to prepare:**

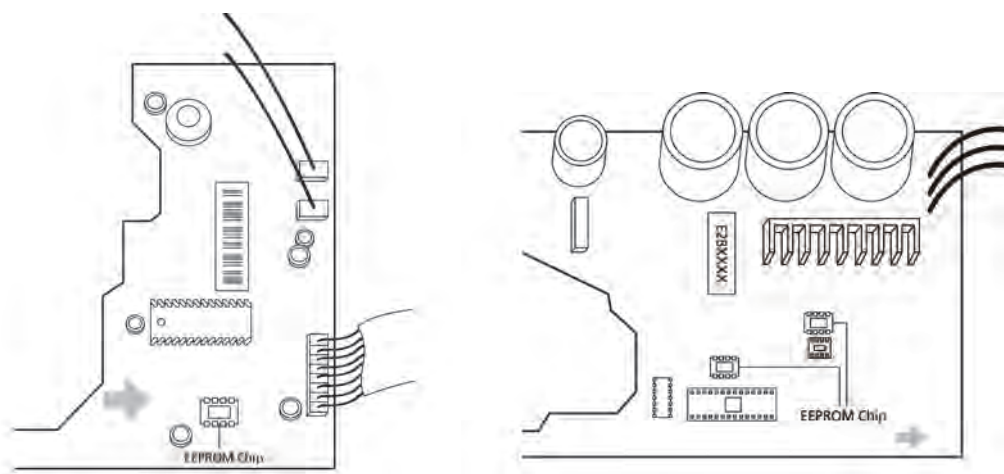
- Indoor PCB
- Outdoor PCB

**Troubleshooting and repair:**



**Remarks:**

The location of the EEPROM chip on the indoor and outdoor PCB is shown in the following two images:



**Note:** These images are for reference only.

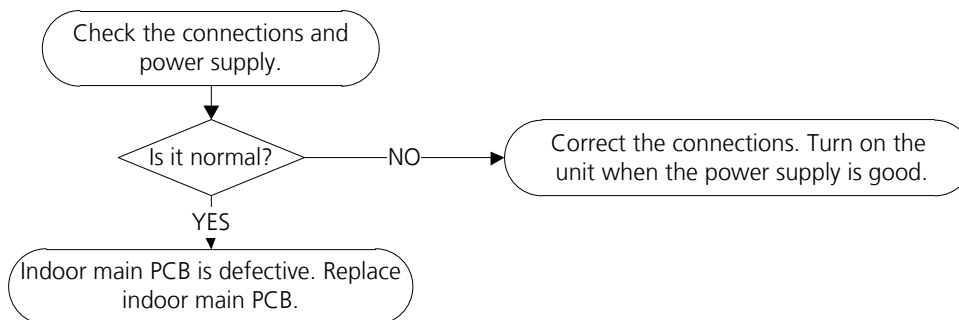
### 5.3 E2 (Zero crossing detection error diagnosis and solution)

**Description:** When PCB does not receive zero crossing signal feedback for 4 minutes or the zero crossing signal time interval is abnormal.

**Recommended parts to prepare:**

- Connection mistake
- PCB faulty

**Troubleshooting and repair:**



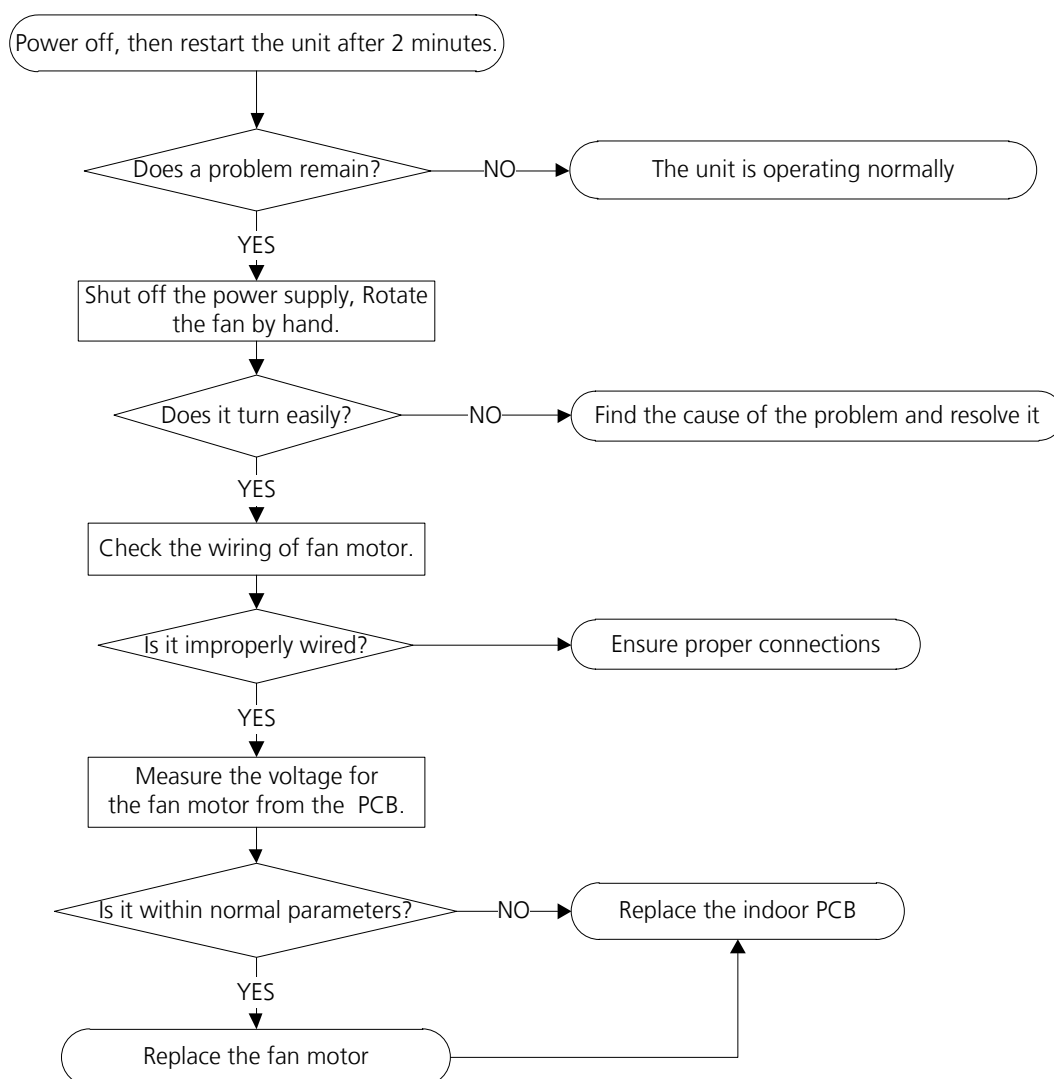
## 5.4 E3(Fan speed has been out of control diagnosis and solution)

**Description:** When indoor fan speed keeps too low (300RPM) for certain time, the unit will stop and the LED will display the failure.

### Recommended parts to prepare:

- Wiring mistake
- Faulty fan assembly'y faulty
- Faulty fan motor
- Faulty PCB

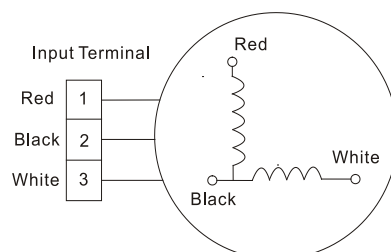
### Troubleshooting and repair:



## Index:

### 1. Indoor AC Fan Motor

Power on and set the unit running in fan mode at high fan speed. After running for 15 seconds, measure the voltage of pin1 and pin2. If the value of the voltage is less than 100V(208~240V power supply) or 50V(115V power supply), the PCB must has problems and need to be replaced.



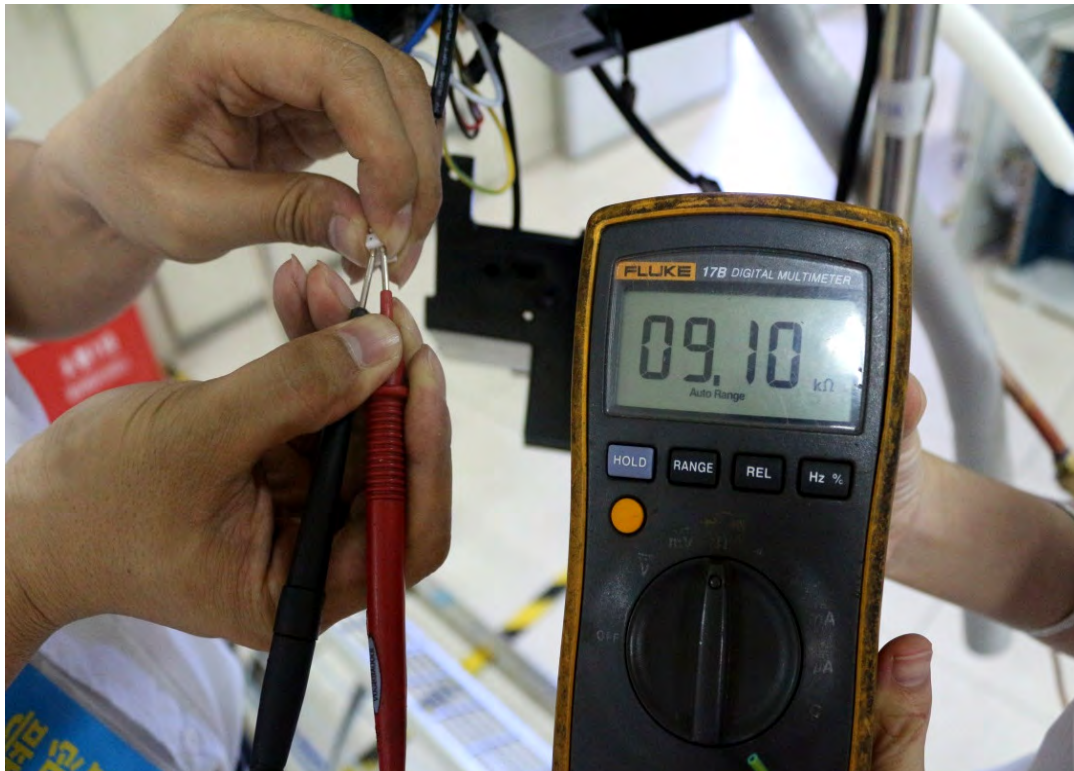
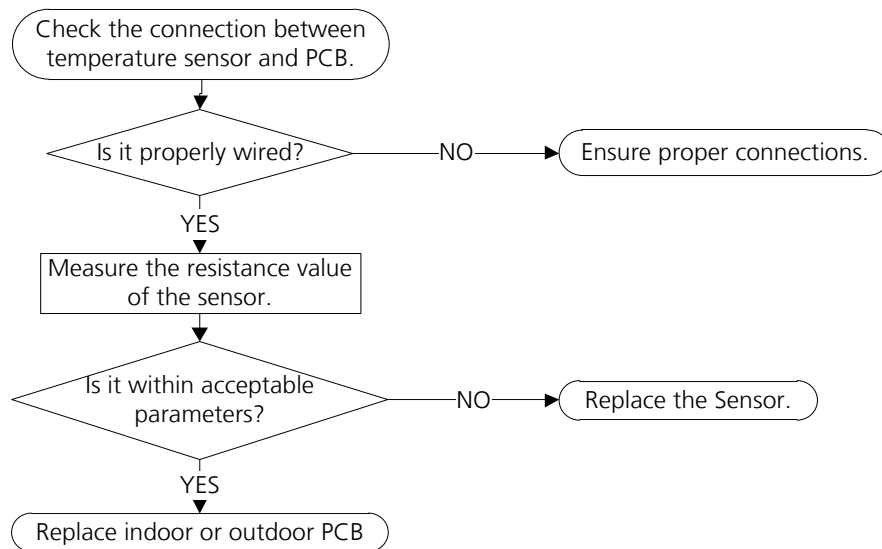
## 5.5 E5/E6 (Open circuit or short circuit of temperature sensor diagnosis and solution)

**Description:** If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED will display the failure.

**Recommended parts to prepare:**

- Wiring mistake
- Faulty sensor
- Faulty PCB

**Troubleshooting and repair:**





## 5.6 EC (Refrigerant Leakage Detection diagnosis and solution)

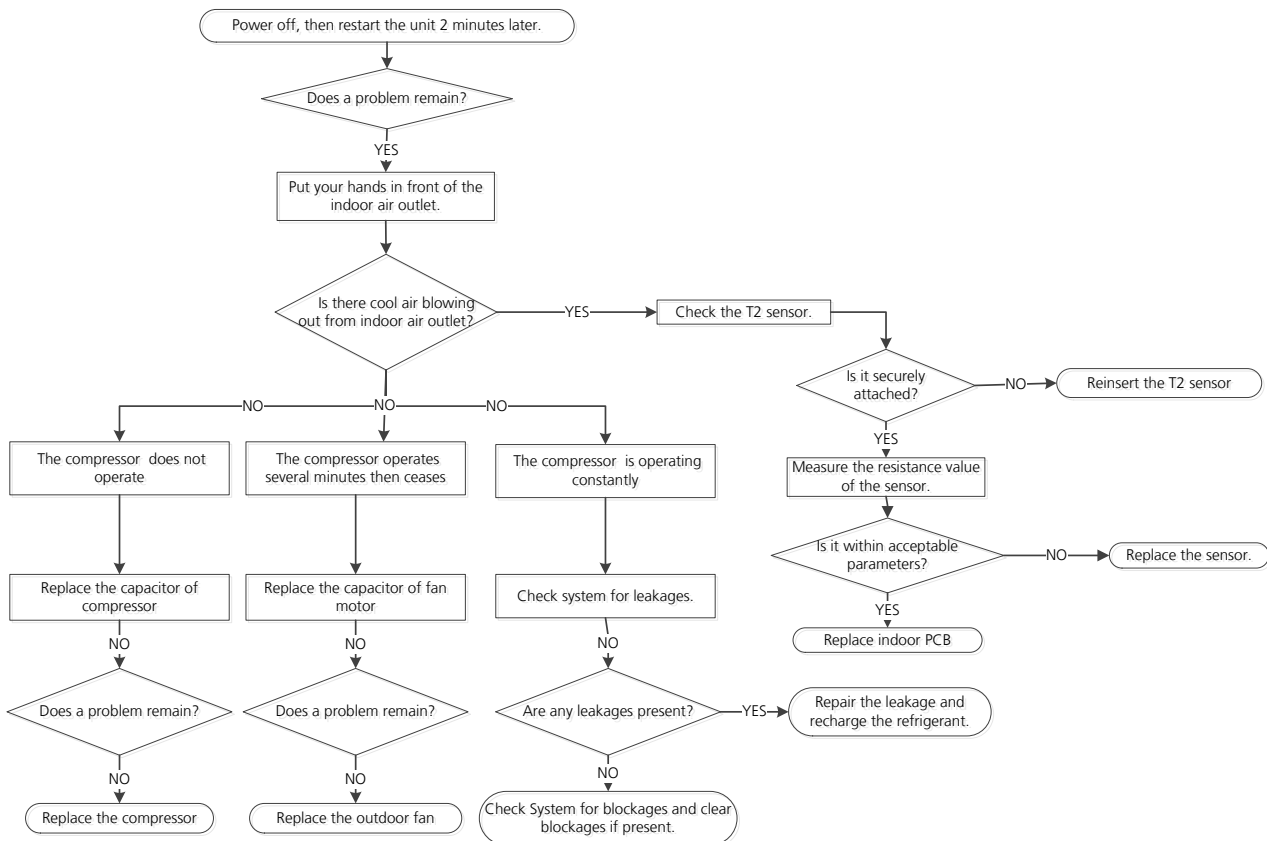
**Description:** Define the evaporator coil temp.T2 of the compressor just starts running as Tcool.

In the beginning 5 minutes after the compressor starts up, if  $T2 < T_{cool} - 2^{\circ}\text{C}$  does not keep continuous 4 seconds and this situation happens 3 times, the display area will show "EC" and AC will turn off.

### Recommended parts to prepare:

- T2 sensor
- Compressor
- Capacitor of compressor
- Indoor PCB
- System problems, such as leakage or blockages
- Capacitor of fan motor
- Outdoor fan

### Troubleshooting and repair:



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# Appendix

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|     |  |    |
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| i)  | Temperature Sensor Resistance Value Table for T1, T2, T3, and T4 (°C – K) .... | 63 |
| ii) | Pressure On Service Port .....   | 64 |

## i) Temperature Sensor Resistance Value Table for T1,T2,T3 and T4 (°C – K)

| °C  | °F | K Ohm   | °C | °F  | K Ohm   | °C | °F  | K Ohm   | °C  | °F  | K Ohm   |
|-----|----|---------|----|-----|---------|----|-----|---------|-----|-----|---------|
| -20 | -4 | 115.266 | 20 | 68  | 12.6431 | 60 | 140 | 2.35774 | 100 | 212 | 0.62973 |
| -19 | -2 | 108.146 | 21 | 70  | 12.0561 | 61 | 142 | 2.27249 | 101 | 214 | 0.61148 |
| -18 | 0  | 101.517 | 22 | 72  | 11.5    | 62 | 144 | 2.19073 | 102 | 216 | 0.59386 |
| -17 | 1  | 96.3423 | 23 | 73  | 10.9731 | 63 | 145 | 2.11241 | 103 | 217 | 0.57683 |
| -16 | 3  | 89.5865 | 24 | 75  | 10.4736 | 64 | 147 | 2.03732 | 104 | 219 | 0.56038 |
| -15 | 5  | 84.219  | 25 | 77  | 10      | 65 | 149 | 1.96532 | 105 | 221 | 0.54448 |
| -14 | 7  | 79.311  | 26 | 79  | 9.55074 | 66 | 151 | 1.89627 | 106 | 223 | 0.52912 |
| -13 | 9  | 74.536  | 27 | 81  | 9.12445 | 67 | 153 | 1.83003 | 107 | 225 | 0.51426 |
| -12 | 10 | 70.1698 | 28 | 82  | 8.71983 | 68 | 154 | 1.76647 | 108 | 226 | 0.49989 |
| -11 | 12 | 66.0898 | 29 | 84  | 8.33566 | 69 | 156 | 1.70547 | 109 | 228 | 0.486   |
| -10 | 14 | 62.2756 | 30 | 86  | 7.97078 | 70 | 158 | 1.64691 | 110 | 230 | 0.47256 |
| -9  | 16 | 58.7079 | 31 | 88  | 7.62411 | 71 | 160 | 1.59068 | 111 | 232 | 0.45957 |
| -8  | 18 | 56.3694 | 32 | 90  | 7.29464 | 72 | 162 | 1.53668 | 112 | 234 | 0.44699 |
| -7  | 19 | 52.2438 | 33 | 91  | 6.98142 | 73 | 163 | 1.48481 | 113 | 235 | 0.43482 |
| -6  | 21 | 49.3161 | 34 | 93  | 6.68355 | 74 | 165 | 1.43498 | 114 | 237 | 0.42304 |
| -5  | 23 | 46.5725 | 35 | 95  | 6.40021 | 75 | 167 | 1.38703 | 115 | 239 | 0.41164 |
| -4  | 25 | 44      | 36 | 97  | 6.13059 | 76 | 169 | 1.34105 | 116 | 241 | 0.4006  |
| -3  | 27 | 41.5878 | 37 | 99  | 5.87359 | 77 | 171 | 1.29078 | 117 | 243 | 0.38991 |
| -2  | 28 | 39.8239 | 38 | 100 | 5.62961 | 78 | 172 | 1.25423 | 118 | 244 | 0.37956 |
| -1  | 30 | 37.1988 | 39 | 102 | 5.39689 | 79 | 174 | 1.2133  | 119 | 246 | 0.36954 |
| 0   | 32 | 35.2024 | 40 | 104 | 5.17519 | 80 | 176 | 1.17393 | 120 | 248 | 0.35982 |
| 1   | 34 | 33.3269 | 41 | 106 | 4.96392 | 81 | 178 | 1.13604 | 121 | 250 | 0.35042 |
| 2   | 36 | 31.5635 | 42 | 108 | 4.76253 | 82 | 180 | 1.09958 | 122 | 252 | 0.3413  |
| 3   | 37 | 29.9058 | 43 | 109 | 4.5705  | 83 | 181 | 1.06448 | 123 | 253 | 0.33246 |
| 4   | 39 | 28.3459 | 44 | 111 | 4.38736 | 84 | 183 | 1.03069 | 124 | 255 | 0.3239  |
| 5   | 41 | 26.8778 | 45 | 113 | 4.21263 | 85 | 185 | 0.99815 | 125 | 257 | 0.31559 |
| 6   | 43 | 25.4954 | 46 | 115 | 4.04589 | 86 | 187 | 0.96681 | 126 | 259 | 0.30754 |
| 7   | 45 | 24.1932 | 47 | 117 | 3.88673 | 87 | 189 | 0.93662 | 127 | 261 | 0.29974 |
| 8   | 46 | 22.5662 | 48 | 118 | 3.73476 | 88 | 190 | 0.90753 | 128 | 262 | 0.29216 |
| 9   | 48 | 21.8094 | 49 | 120 | 3.58962 | 89 | 192 | 0.8795  | 129 | 264 | 0.28482 |
| 10  | 50 | 20.7184 | 50 | 122 | 3.45097 | 90 | 194 | 0.85248 | 130 | 266 | 0.2777  |
| 11  | 52 | 19.6891 | 51 | 124 | 3.31847 | 91 | 196 | 0.82643 | 131 | 268 | 0.27078 |
| 12  | 54 | 18.7177 | 52 | 126 | 3.19183 | 92 | 198 | 0.80132 | 132 | 270 | 0.26408 |
| 13  | 55 | 17.8005 | 53 | 127 | 3.07075 | 93 | 199 | 0.77709 | 133 | 271 | 0.25757 |
| 14  | 57 | 16.9341 | 54 | 129 | 2.95896 | 94 | 201 | 0.75373 | 134 | 273 | 0.25125 |
| 15  | 59 | 16.1156 | 55 | 131 | 2.84421 | 95 | 203 | 0.73119 | 135 | 275 | 0.24512 |
| 16  | 61 | 15.3418 | 56 | 133 | 2.73823 | 96 | 205 | 0.70944 | 136 | 277 | 0.23916 |
| 17  | 63 | 14.6181 | 57 | 135 | 2.63682 | 97 | 207 | 0.68844 | 137 | 279 | 0.23338 |
| 18  | 64 | 13.918  | 58 | 136 | 2.53973 | 98 | 208 | 0.66818 | 138 | 280 | 0.22776 |
| 19  | 66 | 13.2631 | 59 | 138 | 2.44677 | 99 | 210 | 0.64862 | 139 | 282 | 0.22231 |

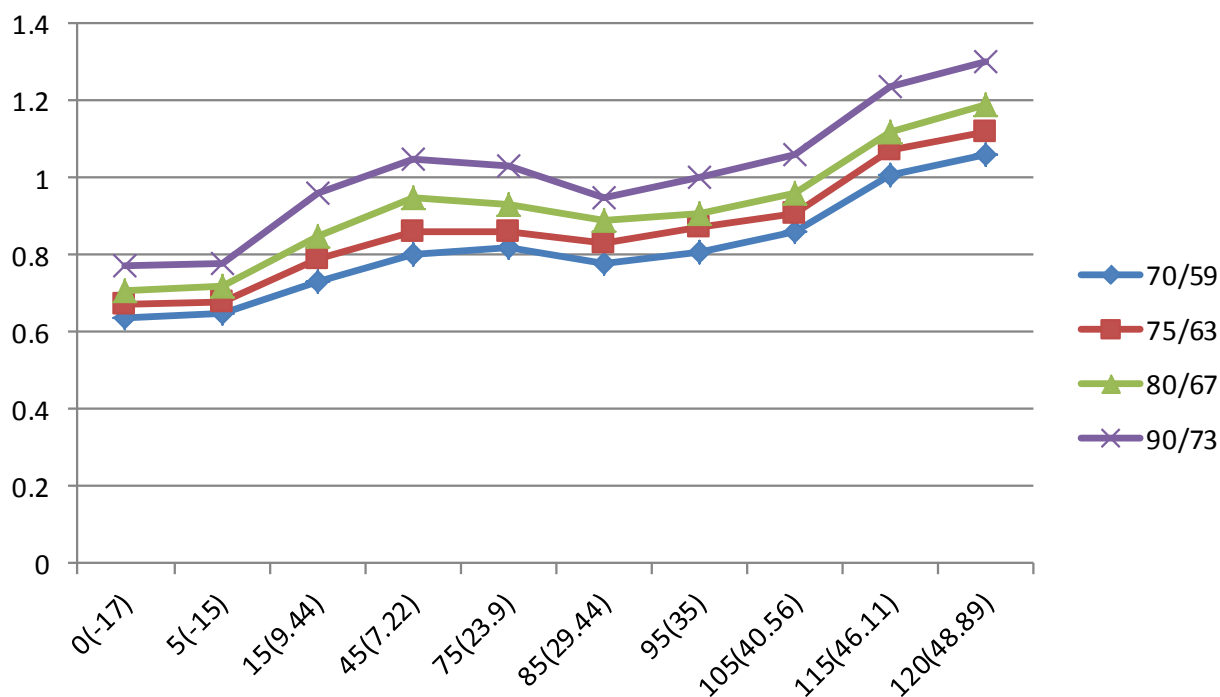
## ii) Pressure On Service Port(R410A)

Cooling chart:

| °F(°C) | ODT<br>IDT | 0(-17) | 5(-15) | 15<br>(9.44) | 45<br>(7.22) | 75<br>(23.89) | 85<br>(29.44) | 95 (35) | 105<br>(40.56) | 115<br>(46.11) | 120<br>(48.89) |
|--------|------------|--------|--------|--------------|--------------|---------------|---------------|---------|----------------|----------------|----------------|
| BAR    | 70/59      | 6.4    | 6.5    | 7.3          | 8.0          | 8.2           | 7.8           | 8.1     | 8.6            | 10.1           | 10.6           |
| BAR    | 75/63      | 6.7    | 6.8    | 7.9          | 8.6          | 8.6           | 8.3           | 8.7     | 9.1            | 10.7           | 11.2           |
| BAR    | 80/67      | 7.1    | 7.2    | 8.5          | 9.5          | 9.3           | 8.9           | 9.1     | 9.6            | 11.2           | 11.9           |
| BAR    | 90/73      | 7.7    | 7.8    | 9.6          | 10.5         | 10.3          | 9.5           | 10.0    | 10.6           | 12.4           | 13.0           |

| °F(°C) | ODT<br>IDT | 0(-17) | 5(-15) | 15<br>(9.44) | 45<br>(7.22) | 75<br>(23.89) | 85<br>(29.44) | 95 (35) | 105<br>(40.56) | 115<br>(46.11) | 120<br>(48.89) |
|--------|------------|--------|--------|--------------|--------------|---------------|---------------|---------|----------------|----------------|----------------|
| PSI    | 70/59      | 93     | 94     | 106          | 116          | 119           | 113           | 117     | 125            | 147            | 154            |
| PSI    | 75/63      | 97     | 99     | 115          | 125          | 124           | 120           | 126     | 132            | 155            | 162            |
| PSI    | 80/67      | 103    | 104    | 123          | 138          | 135           | 129           | 132     | 140            | 162            | 173            |
| PSI    | 90/73      | 112    | 113    | 139          | 152          | 149           | 138           | 145     | 154            | 180            | 189            |

| °F(°C) | ODT<br>IDT | 0(-17) | 5(-15) | 15<br>(9.44) | 45<br>(7.22) | 75<br>(23.89) | 85<br>(29.44) | 95 (35) | 105<br>(40.56) | 115<br>(46.11) | 120<br>(48.89) |
|--------|------------|--------|--------|--------------|--------------|---------------|---------------|---------|----------------|----------------|----------------|
| MPA    | 70/59      | 0.64   | 0.65   | 0.73         | 0.8          | 0.82          | 0.78          | 0.81    | 0.86           | 1.01           | 1.06           |
| MPA    | 75/63      | 0.67   | 0.68   | 0.79         | 0.86         | 0.86          | 0.83          | 0.87    | 0.91           | 1.07           | 1.12           |
| MPA    | 80/67      | 0.71   | 0.72   | 0.85         | 0.95         | 0.93          | 0.89          | 0.91    | 0.96           | 1.12           | 1.19           |
| MPA    | 90/73      | 0.77   | 0.78   | 0.96         | 1.05         | 1.03          | 0.95          | 1       | 1.06           | 1.24           | 1.3            |



Heating chart:

| °F(°C) | ODT<br>IDT | 57/53<br>(13.89/11.67) | 47/43<br>(8.33/6.11) | 37/33<br>(2.78/0.56) | 27/23<br>(-2.78/-5) | 17/13 (-8.33/<br>-10.56) | 0/-2(-17/-19) | -17/-18<br>(-27/-28) |
|--------|------------|------------------------|----------------------|----------------------|---------------------|--------------------------|---------------|----------------------|
| BAR    | 55         | 30.3                   | 28.5                 | 25.3                 | 22.8                | 20.8                     | 18.5          | 16.5                 |
| BAR    | 65         | 32.5                   | 30.0                 | 26.6                 | 25.4                | 23.3                     | 20.5          | 19.0                 |
| BAR    | 75         | 33.8                   | 31.5                 | 27.8                 | 26.3                | 24.9                     | 21.5          | 20.0                 |

| °F(°C) | ODT<br>IDT | 57/53<br>(13.89/11.67) | 47/43<br>(8.33/6.11) | 37/33<br>(2.78/0.56) | 27/23<br>(-2.78/-5) | 17/13 (-8.33/<br>-10.56) | 0/-2(-17/-19) | -17/-18<br>(-27/-28) |
|--------|------------|------------------------|----------------------|----------------------|---------------------|--------------------------|---------------|----------------------|
| PSI    | 55         | 439                    | 413                  | 367                  | 330                 | 302                      | 268           | 239                  |
| PSI    | 65         | 471                    | 435                  | 386                  | 368                 | 339                      | 297           | 276                  |
| PSI    | 75         | 489                    | 457                  | 403                  | 381                 | 362                      | 312           | 290                  |

| °F(°C) | ODT<br>IDT | 57/53<br>(13.89/11.67) | 47/43<br>(8.33/6.11) | 37/33<br>(2.78/0.56) | 27/23<br>(-2.78/-5) | 17/13 (-8.33/<br>-10.56) | 0/-2(-17/-19) | -17/-18<br>(-27/-28) |
|--------|------------|------------------------|----------------------|----------------------|---------------------|--------------------------|---------------|----------------------|
| MPA    | 55         | 3.03                   | 2.85                 | 2.53                 | 2.28                | 2.08                     | 1.85          | 1.65                 |
| MPA    | 65         | 3.25                   | 3.00                 | 2.66                 | 2.54                | 2.33                     | 2.05          | 1.90                 |
| MPA    | 75         | 3.38                   | 3.15                 | 2.78                 | 2.63                | 2.49                     | 2.15          | 2.00                 |

