WARNING

- Daikin Industries, Ltd. ’s products are manufactured for export to numerous countries throughout the world. Daikin Industries, Ltd. does not have control over which products are exported to and used in a particular country. Prior to purchase, please therefore confirm with your local authorized importer, distributor and/or retailer whether this product conforms to the applicable standards, and is suitable for use in the region where the product will be used. This statement does not purport to exclude, restrict or modify the application of any local legislation.

- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.

- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorized parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.

- Read the User’s Manual carefully before using this product. The User’s Manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings.

- If you have any enquiries, please contact your local importer, distributor and/or retailer.

CAUTIONS ON PRODUCT CORROSION

1. Air conditioners should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.

2. If the outdoor unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided. If you need to install the outdoor unit close to the sea shore, contact your local distributor.

Specifications, designs and other content appearing in this brochure are current as of June 2009 but subject to change without notice.

Service Manual / SkyAir Inverter R-410A Heat Pump 60Hz / P Series

Split System Air Conditioners SkyAir Inverter

R-410A Heat Pump 60Hz P Series

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Dealers

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SiUS28 - 902_a
SkyAir Inverter P Series
R-410A Heat Pump 60Hz

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1. SAFETY CONSIDERATIONS

Read these SAFETY CONSIDERATIONS carefully before performing any repair work. Comply with these safety symbols without fail.

Meanings of DANGER, WARNING, CAUTION, and NOTE Symbols:

⚠️ DANGER ............. Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠️ WARNING ............. Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠️ CAUTION ............. Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

⚠️ NOTE ................. Indicates situations that may result in equipment or property-damage accidents only.

1.1 Safety Considerations for Repair

⚠️ DANGER

- If refrigerant gas leaks during repair or service, ventilate the area immediately. Refrigerant gas may produce toxic gas if it comes into contact with flames. Refrigerant gas is heavier than air and replaces oxygen. In the event of an accident, a massive leak could lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death.

- Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug if a plug is used. Plugging or unplugging the power cable plug to operate the equipment may cause an electrical shock or fire.

- Use parts listed in the service parts list and appropriate tools to conduct repair work. The use of inappropriate parts or tools may cause an electrical shock or fire.

- Disconnect power before disassembling the equipment for repairs. Working on the equipment that is connected to the power supply may cause an electric shock. If it is necessary to supply power to the equipment to conduct repairs or to inspect the circuits, do not touch any electrically charged sections of the equipment.

- The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Discharge the capacitor completely before conducting repair work. A charged capacitor may cause an electrical shock.

- If refrigerant gas is discharged during repair work, do not touch the discharged refrigerant gas. The refrigerant gas may cause frostbite.

- Use only pipes, flare nuts, tools, and other materials designed specifically for R410A refrigerant systems. Never use tools or materials designed for R22 refrigerant systems on an R410A refrigerant system. Doing so can cause a serious accident or an equipment failure.

- Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections may cause excessive heat generation, fire, or electrical shock.

⚠️ WARNING

- Prior to disconnecting the suction or discharge pipe from the compressor at the welded section, pump-down the refrigerant gas completely in a well-ventilated place first. If there is refrigerant gas or oil remaining inside the compressor, the refrigerant gas or oil can discharge when the pipe is being disconnected and it may cause an injury.

- Wear a safety helmet, gloves, and a safety belt when working at an elevated height of more than 6.5 ft (2 m). Insufficient safety measures may cause a fall resulting in injury.

- Do not mix air or gas other than the specified refrigerant R410A to the refrigerant system. If air enters the refrigerant systems, it can cause an excessive high pressure resulting in equipment damage and injury.

- When relocating the equipment, check if the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and the equipment is not properly secured, the equipment may fall and cause injury.

- Securely fasten the outside unit terminal cover (panel). If the terminal cover/panel is not fastened properly, dust or water may enter the outside unit causing fire or electric shock.

- When relocating the system, keep the refrigerant circuit free from substances other than the specified refrigerant (R-410A) such as air. Any presence of air or other foreign substance in the refrigerant circuit can cause an abnormal pressure rise or rupture, resulting in injury.

- If refrigerant gas leaks, locate the leaking point and repair it before charging refrigerant. After charging refrigerant, check for refrigerant leaks. If the leaking point cannot be located and the repair work must be stopped, perform a pump-down and close the service valve to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it may generate toxic gases if it comes into contact with flames.
CAUTION

- Do not repair the electrical components with wet hands. Working on the equipment with wet hands may cause an electrical shock.
- Do not clean the air conditioner by splashing water on it. Washing the unit with water may cause an electrical shock.
- Ground the unit when repairing equipment in a humid or wet place to avoid electrical shocks.
- Turn off the power when cleaning the equipment to prevent internal fans that rotate at high speed from starting suddenly as they can cause injury.
- Let the refrigerant lines cool down before performing any repair work. Working on the unit when the refrigerant lines are hot may cause burns.
- All welding and cutting operations must be done in a well-ventilated place to prevent the accumulation of toxic fumes or possibly oxygen deficiency to occur.
- Check the grounding and repair it if the equipment is not properly grounded. Improper grounding may cause an electrical shock.
- Measure the insulation resistance after the repair. The resistance must be 1MΩ or higher. Faulty insulation may cause an electrical shock.

NOTE

- Check the drainage of the indoor unit after finishing repair work. Faulty drainage may cause water to enter the room resulting in wet floors and furniture.
- Do not tilt the unit when removing it. The water inside the unit may spill resulting in wet floors and furniture.
- Dismantling of the unit, disposal of the refrigerant, oil, and additional parts, should be done in accordance with the relevant local, state, and national regulations.

1.2 Safety Considerations for Users

DANGER

- Never attempt to modify the equipment. Doing so can cause electrical shock, excessive heat generation, or fire.
- If the power cable and lead wires have scratches or have become deteriorated, have them replaced. Damaged cable and wires may cause an electrical shock or fire.
- Do not use a joined power cable or an extension cord, or share the same power outlet with other electrical appliances as it may cause an electrical shock or fire.
- Use an exclusive power circuit for the equipment. Insufficient circuit amperage capacity may cause an electrical shock or fire.

WARNING

- Do not damage or modify the power cable. Damaged or modified power cables may cause an electrical shock or fire. Placing heavy items on the power cable or pulling the power cable may damage the cable.
- Check the unit foundation for damage on a continual basis, especially if it has been in use for a long time. If left in a damaged condition, the unit may fall and cause injury. If the installation platform or frame has corroded, have it replaced. A corroded platform or frame may cause the unit to fall resulting in injury.
- If the unit has a power cable plug and it is dirty, clean the plug before securely inserting it into a power outlet. If the plug has a loose connection, tighten it or it may cause electrical shock or fire.

CAUTION

- After replacing the battery in the remote controller, dispose of the old battery to prevent children from swallowing it. If a child swallows the battery, see a doctor immediately.
- Never remove the fan guard of the unit. A fan rotating at high speed without the fan guard is very dangerous.
- Before cleaning the unit, stop the operation of the unit by turning the power off or by pulling the power cable plug out from its receptacle. Otherwise an electrical shock or injury may result.
- Do not wipe the controller operation panel with benzene, thinner, chemical dust cloth, etc. The panel may get discolored or the coating can peel off. If it is extremely dirty, soak a cloth in a water-diluted neutral detergent, squeeze it well, and wipe the panel clean. Then wipe it with another dry cloth.
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# 1. Model Names and Power Supply

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<th>Outdoor Unit</th>
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<td>RZQ18PVJU</td>
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2. External Appearance

2.1 Indoor Units

Ceiling mounted cassette type (Multi flow)

FCQ18PVJU
FCQ24PVJU
FCQ30PVJU

Ceiling suspended type

FHQ18PVJU
FHQ24PVJU
FHQ30PVJU

Wall mounted type

FAQ18PVJU
FAQ24PVJU

2.2 Outdoor Units

RZQ18PVJU
RZQ24PVJU
RZQ30PVJU
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# Specifications

## 1. Specifications

### 1.1 FCQ

**Ceiling Mounted Cassette Type (Multi flow)**

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<td>FCQ30PVJU</td>
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**Power supply**: 1 phase 60Hz 208-230V

**Cooling capacity**: 18,000 Btu/h, 24,000 Btu/h, 30,000 Btu/h

**Heating capacity**: 20,000 Btu/h, 27,000 Btu/h, 34,000 Btu/h

**Notes**:

1. The above data are based on the following conditions:
2. Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

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### Specifications

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<td>FCQ24PVJU</td>
<td>RZQ24PVJU</td>
<td>FCQ30PVJU</td>
</tr>
<tr>
<td>FCQ30PVJU</td>
<td>RZQ30PVJU</td>
<td>FCQ30PVJU</td>
</tr>
</tbody>
</table>

**Power supply**: 1 phase 60Hz 208-230V

**Cooling capacity**: 18,000 Btu/h, 24,000 Btu/h, 30,000 Btu/h

**Heating capacity**: 20,000 Btu/h, 27,000 Btu/h, 34,000 Btu/h

**Notes**:

1. The above data are based on the following conditions:
2. Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

---

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Indoor unit</th>
<th>Outdoor unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCQ18PVJU</td>
<td>RZQ18PVJU</td>
<td>FCQ24PVJU</td>
</tr>
<tr>
<td>FCQ24PVJU</td>
<td>RZQ24PVJU</td>
<td>FCQ30PVJU</td>
</tr>
<tr>
<td>FCQ30PVJU</td>
<td>RZQ30PVJU</td>
<td>FCQ30PVJU</td>
</tr>
</tbody>
</table>

**Power supply**: 1 phase 60Hz 208-230V

**Cooling capacity**: 18,000 Btu/h, 24,000 Btu/h, 30,000 Btu/h

**Heating capacity**: 20,000 Btu/h, 27,000 Btu/h, 34,000 Btu/h

**Notes**:

1. The above data are based on the following conditions:
2. Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

---

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Indoor unit</th>
<th>Outdoor unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCQ18PVJU</td>
<td>RZQ18PVJU</td>
<td>FCQ24PVJU</td>
</tr>
<tr>
<td>FCQ24PVJU</td>
<td>RZQ24PVJU</td>
<td>FCQ30PVJU</td>
</tr>
<tr>
<td>FCQ30PVJU</td>
<td>RZQ30PVJU</td>
<td>FCQ30PVJU</td>
</tr>
</tbody>
</table>

**Power supply**: 1 phase 60Hz 208-230V

**Cooling capacity**: 18,000 Btu/h, 24,000 Btu/h, 30,000 Btu/h

**Heating capacity**: 20,000 Btu/h, 27,000 Btu/h, 34,000 Btu/h

**Notes**:

1. The above data are based on the following conditions:
2. Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
# 1.2 FHQ

## Ceiling Suspended Type

<table>
<thead>
<tr>
<th>Model</th>
<th>Indoor unit</th>
<th>FHQ18PVJU</th>
<th>FHQ24PVJU</th>
<th>FHQ30PVJU</th>
<th>FHQ30PVJU</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1 phase 60Hz 208-230V</td>
<td>1 phase 60Hz 208-230V</td>
<td>1 phase 60Hz 208-230V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling capacity</td>
<td>Blt/h</td>
<td>18,000</td>
<td>24,000</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>Heating capacity</td>
<td>Blt/h</td>
<td>20,000</td>
<td>27,000</td>
<td>34,000</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>White (10Y9/0.5)</td>
<td>White (10Y9/0.5)</td>
<td>White (10Y9/0.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor unit</td>
<td>RZQ18PVJU</td>
<td>RZQ24PVJU</td>
<td>RZQ30PVJU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>1 phase 60Hz 208-230V</td>
<td>1 phase 60Hz 208-230V</td>
<td>1 phase 60Hz 208-230V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling capacity</td>
<td>Blt/h</td>
<td>18,000</td>
<td>24,000</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>Heating capacity</td>
<td>Blt/h</td>
<td>20,000</td>
<td>27,000</td>
<td>34,000</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>White (10Y9/0.5)</td>
<td>White (10Y9/0.5)</td>
<td>White (10Y9/0.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor unit</td>
<td>RZQ18PVJU</td>
<td>RZQ24PVJU</td>
<td>RZQ30PVJU</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:
1. The above data are based on the following conditions.
2. Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

### Specifications

**Cooling**
- Indoor : 80°FDB, 67°FWB
- Outdoor : 95°FDB

**Heating**
- Indoor : 70°FDB
- Outdoor : 47°FDB, 43°FWB

**Equivalent Piping Length**
- Hz, Volts

**Notes:**
1. The above data are based on the following conditions.
2. Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
### 1.3 FAQ

#### Wall Mounted Type

<table>
<thead>
<tr>
<th>Model</th>
<th>Indoor unit</th>
<th>Outdoor unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FAQ18PVJU</td>
<td>FAQ18PVJU</td>
</tr>
<tr>
<td></td>
<td>FAQ24PVJU</td>
<td>RZQ24PVJU</td>
</tr>
</tbody>
</table>

**Power supply**
- 1 phase 60Hz 208-230V
- 1 phase 60Hz 208-230V

**Cooling capacity**
- 18,000
- 24,000

**Heating capacity**
- 20,000
- 26,000

---

**Notes:**

1. The above data are based on the following conditions.
2. Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Model</th>
<th>Color</th>
<th>Dimensions H×WxD in (mm)</th>
<th>Power supply</th>
<th>Cooling capacity</th>
<th>Heating capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indoor</td>
<td></td>
<td>11–3/8 × 41–3/8 × 9 (290 × 1050 × 230)</td>
<td>1 phase 60Hz 208-230V</td>
<td>18,000</td>
<td>20,000</td>
</tr>
<tr>
<td></td>
<td>Outdoor</td>
<td></td>
<td></td>
<td>1 phase 60Hz 208-230V</td>
<td>24,000</td>
<td>26,000</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Model</th>
<th>Type</th>
<th>Model</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cross fin coil</td>
<td>CLC9686M</td>
<td>Crossflow fan</td>
<td>CLC9686M</td>
<td>Crossflow fan</td>
</tr>
<tr>
<td></td>
<td>2 × 14 × 16</td>
<td>2 × 14 × 18</td>
<td>2 × 14 × 18</td>
<td>2 × 14 × 18</td>
<td>2 × 14 × 18</td>
</tr>
<tr>
<td></td>
<td>2.29</td>
<td>2.29</td>
<td>2.29</td>
<td>2.29</td>
<td>2.29</td>
</tr>
</tbody>
</table>

---

**Remote controller**
- Wired: BRC1D71
- Wireless: BRC7E818

---

**Outdoor unit**
- Color: Ivory
- Dimensions H×WxD in (mm): 30–5/16 × 35–7/16 × 12–5/8 (770 x 900 x 320)

---

**Piping connections**
- Liquid in (mm) φ: 3/8 (9.5) (Flare connection) φ: 3/8" (9.5) (Flare connection)
- Gas in (mm) φ: 5/8 (15.8) (Flare connection) φ: 5/8" (15.8) (Flare connection)
- Drain in (mm) φ: 1 (25.4) (Hole) φ: 1 (25.4) (Hole)

---

**Safety devices**
- High pressure switch.
- Outdoor fan driver overload protector.
- Thermal protector for indoor fan motor.
- Inverter overload protector.
- Fusible plugs. Fuse.

---

**Capacity step %**
- 100-0
- 100-0

---

**Refrigerant control**
- Electronic expansion valve
- Electronic expansion valve

---

**Refrigerant**
- Charge (factory charge): 5.1 (2.3)
- Charge: 0.75

---

**Drawing Number**
- C : S20622150D
- C : S20622151D
Part 3
List of Electrical and Functional Parts

1. List of Electrical and Functional Parts.....................................................9
   1.1 Outdoor Units.....................................................................................9
   1.2 Indoor Units......................................................................................10
## 1. List of Electrical and Functional Parts

### 1.1 Outdoor Units

<table>
<thead>
<tr>
<th>Item</th>
<th>Name</th>
<th>Symbol</th>
<th>Model</th>
<th>Remark (P.C.B. terminal)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compressor</strong></td>
<td><strong>Inverter</strong></td>
<td>M1C</td>
<td>2YCd</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td><strong>Motor</strong></td>
<td>M1F</td>
<td>0.07kW</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td><strong>Overcurrent relay</strong></td>
<td>—</td>
<td>3.2A</td>
<td>—</td>
</tr>
<tr>
<td><strong>Functional parts</strong></td>
<td><strong>Electronic expansion valve</strong></td>
<td>Y1E</td>
<td>1400pl</td>
<td>A1P X21A</td>
</tr>
<tr>
<td></td>
<td><strong>Cooling</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Heating</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Four-way valve</strong></td>
<td>Y1S</td>
<td>STF-01AQ555A1</td>
<td>A1P X25A</td>
</tr>
<tr>
<td></td>
<td><strong>Solenoid valve (Hot gas)</strong></td>
<td>Y2S</td>
<td>TEV-MOAQ1684Y1</td>
<td>A1P X26A</td>
</tr>
<tr>
<td></td>
<td><strong>Solenoid valve (Injection)</strong></td>
<td>Y3S</td>
<td>TEV-MOAQ1685Y1</td>
<td>A1P X27A</td>
</tr>
<tr>
<td><strong>Pressure-related parts</strong></td>
<td><strong>Pressure switch (INV.)</strong></td>
<td>S1PH</td>
<td>ACB-4UB10</td>
<td>A1P X32A</td>
</tr>
<tr>
<td></td>
<td><strong>Fusible plug</strong></td>
<td>—</td>
<td>DFP-3L 158~167°F</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td><strong>Pressure sensor (HP)</strong></td>
<td>S1NPH</td>
<td>NSK-BD042D-212 0~602 psi</td>
<td>A1P X504A</td>
</tr>
<tr>
<td></td>
<td><strong>Pressure sensor (LP)</strong></td>
<td>S1NPL</td>
<td>NSK-BD017D-211 -7~247 psi</td>
<td>A1P X503A</td>
</tr>
<tr>
<td><strong>Thermistor</strong></td>
<td><strong>Main P.C.B.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>For outdoor air</strong></td>
<td>R1T</td>
<td>ST9303-4</td>
<td>A1P X11A</td>
</tr>
<tr>
<td></td>
<td><strong>For discharge</strong></td>
<td>R2T</td>
<td>ST9701-4</td>
<td>A1P X12A 1-2Pin</td>
</tr>
<tr>
<td></td>
<td><strong>For suction 1</strong></td>
<td>R3T</td>
<td>ST8602A-5</td>
<td>A1P X12A 3-4Pin</td>
</tr>
<tr>
<td></td>
<td><strong>For heat exchanger</strong></td>
<td>R4T</td>
<td>ST8604A-7</td>
<td>A1P X12A 5-6Pin</td>
</tr>
<tr>
<td></td>
<td><strong>For suction 2</strong></td>
<td>R5T</td>
<td>ST8604A-7</td>
<td>A1P X12A 7-8Pin</td>
</tr>
</tbody>
</table>
### 1.2 Indoor Units

<table>
<thead>
<tr>
<th>Parts Name</th>
<th>Symbol</th>
<th>Model</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Remote Controller</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wired Remote Control</td>
<td></td>
<td>FCQ 18PVJU</td>
<td></td>
</tr>
<tr>
<td>Wireless Remote Control</td>
<td></td>
<td>FCQ 24PVJU</td>
<td></td>
</tr>
<tr>
<td><strong>Meters</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fan Motor</td>
<td>M1F</td>
<td>FCQ 30PVJU</td>
<td>Option</td>
</tr>
<tr>
<td>Capacitor, fan motor</td>
<td>C1</td>
<td>FCQ 30PVJU</td>
<td></td>
</tr>
<tr>
<td>Drain Pump</td>
<td>M1P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swing Motor</td>
<td>M1S</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thermistors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermistor (Suction Air)</td>
<td>R1T</td>
<td>ST860A-1 φ4 L250</td>
<td></td>
</tr>
<tr>
<td>Thermistor (Heat Exchanger High Temp.)</td>
<td>R3T</td>
<td>ST8605-3 φ6 L630</td>
<td></td>
</tr>
<tr>
<td>Thermistor (Heat Exchanger)</td>
<td>R2T</td>
<td>ST8602A-3 φ6 L630</td>
<td></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Float Switch</td>
<td>S1L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuse</td>
<td>F1U</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transformer</td>
<td>T1R</td>
<td></td>
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</table>

**Remote Controller**

<table>
<thead>
<tr>
<th>Parts Name</th>
<th>Symbol</th>
<th>Model</th>
<th>Remark</th>
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<tbody>
<tr>
<td><strong>Meters</strong></td>
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<td></td>
</tr>
<tr>
<td>Fan Motor</td>
<td>M1F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacitor for Fan Motor</td>
<td>C1R</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swing Motor</td>
<td>M1S</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thermistors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermistor (Suction Air)</td>
<td>R1T</td>
<td>ST860A-1 φ4 L250</td>
<td></td>
</tr>
<tr>
<td>Thermistor (Heat Exchanger High Temp.)</td>
<td>R3T</td>
<td>ST8605-6 φ8 L = 1250</td>
<td></td>
</tr>
<tr>
<td>Thermistor (Heat Exchanger)</td>
<td>R2T</td>
<td>ST8602A-6 φ6 L = 1250</td>
<td></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Float Switch</td>
<td>S1L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuse</td>
<td>F1U</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transformer</td>
<td>T1R</td>
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**Remote Controller**

<table>
<thead>
<tr>
<th>Parts Name</th>
<th>Symbol</th>
<th>Model</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Meters</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fan Motor</td>
<td>M1F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swing Motor</td>
<td>M1S</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thermistors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermistor (Suction Air)</td>
<td>R1T</td>
<td>ST8601-2 φ4 L400</td>
<td></td>
</tr>
<tr>
<td>Thermistor (Heat Exchanger High Temp.)</td>
<td>R3T</td>
<td>ST8605-2 φ6 L400</td>
<td></td>
</tr>
<tr>
<td>Thermistor (Heat Exchanger)</td>
<td>R2T</td>
<td>ST8602-2 φ6 L400</td>
<td></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Float Switch</td>
<td>S1L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuse</td>
<td>F1U</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part 4
Refrigerant Circuit

1. Refrigerant Circuit ................................................................. 12
   1.1 RZQ18-24-30PVJU .............................................................. 12
2. Functional Parts Layout ....................................................... 14
   2.1 RZQ18-30PVJU ................................................................. 14
1. Refrigerant Circuit

1.1 RZQ18·24·30PVJU

<table>
<thead>
<tr>
<th>No. in refrigerant system diagram</th>
<th>Symbol</th>
<th>Name</th>
<th>Major Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>M1C</td>
<td>Inverter compressor (INV.)</td>
<td>Inverter compressor is operated on frequencies between 52 Hz and 177 Hz by using the inverter. 17 steps</td>
</tr>
<tr>
<td>D</td>
<td>M1F</td>
<td>Inverter fan</td>
<td>Since the system is of air heat exchanging type, the fan is operated at 8-step rotation speed by using the inverter.</td>
</tr>
<tr>
<td>E</td>
<td>Y1E</td>
<td>Electronic expansion valve (Main: EV1)</td>
<td>While in heating operation, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.</td>
</tr>
<tr>
<td>G</td>
<td>Y1S</td>
<td>Solenoid valve (Hot gas: SVP)</td>
<td>Prevents the low pressure from transient falling.</td>
</tr>
<tr>
<td>J</td>
<td>Y2S</td>
<td>Solenoid valve (Receiver gas discharging: SVG)</td>
<td>Collects refrigerant to receiver.</td>
</tr>
<tr>
<td>M</td>
<td>Y3S</td>
<td>Four-way valve</td>
<td>Switches the operation mode between cooling and heating.</td>
</tr>
<tr>
<td>N</td>
<td>S1NPH</td>
<td>High pressure sensor</td>
<td>Detects high pressure.</td>
</tr>
<tr>
<td>O</td>
<td>S1NPL</td>
<td>Low pressure sensor</td>
<td>Detects low pressure.</td>
</tr>
<tr>
<td>P</td>
<td>S1PH</td>
<td>HP pressure switch (For INV. compressor)</td>
<td>Prevents the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 580 psi or more to stop the compressor operation.</td>
</tr>
<tr>
<td>S</td>
<td>—</td>
<td>Fusible plug</td>
<td>Prevents the increase of pressure when abnormal heating is caused by fire or other heat factors, the fusible part of the plug is molten at a temperature of 158 to 167°F to release the pressure into the atmosphere.</td>
</tr>
<tr>
<td>T</td>
<td>—</td>
<td>Pressure regulating valve 1 (Receiver to discharge pipe)</td>
<td>This valve opens at a pressure of 290 to 390 psi for prevention of pressure increase, thus resulting in no damage of functional parts due to the increase of pressure in transportation or storage.</td>
</tr>
<tr>
<td>1</td>
<td>R1T</td>
<td>Thermistor (Outdoor air: Ta)</td>
<td>Detects outdoor temperature, correct discharge pipe temperature, and other functions.</td>
</tr>
<tr>
<td>2</td>
<td>R2T</td>
<td>Thermistor (INV. discharge pipe: Tdi)</td>
<td>Detects discharge pipe temperature, make the temperature protection control of compressor, and others.</td>
</tr>
<tr>
<td>3</td>
<td>R3T</td>
<td>Thermistor (Suction pipe: Ts1)</td>
<td>Detects suction pipe temperature, keep the suction superheated degree constant in heating operation, and other functions.</td>
</tr>
<tr>
<td>4</td>
<td>R4T</td>
<td>Thermistor (Heat exchanger deicer: Tb)</td>
<td>Detects liquid pipe temperature of air heat exchanger, determine defrosting operation, and other functions.</td>
</tr>
<tr>
<td>5</td>
<td>R5T</td>
<td>Thermistor (Suction pipe: Ts2)</td>
<td>Calculates the internal temperature of the compressor.</td>
</tr>
</tbody>
</table>
Refrigerant Circuit

**Diagram Description:**
- **E** Electronic expansion valve
- **M** Four-way valve
- **S** Solenoid valve
- **J** Capillary tube
- **O** Low pressure sensor
- **N** High pressure sensor
- **STNPH** Low pressure switch
- **STNPL** High pressure switch
- **A** Compressor
- **Accumulator**
- **Filter**
- **Pressure regulating valve**
- **Check valve**
- **M Fan**
- **Outdoor heat exchanger**

**Text Note:** (with service port 5/16" flare)
2. Functional Parts Layout

2.1 RZQ18-30PVJU

Overview
Part 5
Function

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1. Operation Mode

- **Operation in stop mode**
  - Indoor unit stop or thermostat OFF
  - Pressure equalization prior to startup
  - Startup control
    - Cooling startup control
    - Heating startup control

- **Normal operation**
  - Compressor PI control
  - Electronic expansion valve PI control
  - Protection control

- **Cooling or heating operation**

- **Oil return IN conditions are met?**
  - Yes: Oil return operation
  - No: Defrosting operation

- **Defrost IN conditions are met?**
  - Yes: Defrosting operation
  - No: Operation mode change

- **Operation mode change**
  - Yes: Restart standby (Compressor stop)
  - No: Malfunction/Standby

**Note:**
In the event indoor unit stops or the thermostat turns OFF while in oil return operation or defrosting operation, pump-down residual operation is performed on completion of the oil return operation or defrosting operation.
2. Basic Control

2.1 Normal Operation

- Cooling Operation

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Operation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>Compressor PI control</td>
<td>Used for high pressure protection control, low pressure protection control, discharge pipe temperature protection control, and compressor operating frequency upper limit control with inverter protection control.</td>
</tr>
<tr>
<td>Outdoor unit fan</td>
<td>Cooling fan control</td>
<td>—</td>
</tr>
<tr>
<td>Four-way valve</td>
<td>OFF</td>
<td>—</td>
</tr>
<tr>
<td>Main electronic expansion valve (EV1)</td>
<td>1400 pls</td>
<td>—</td>
</tr>
<tr>
<td>Subcooling electronic expansion valve (EV2)</td>
<td>PI control</td>
<td>—</td>
</tr>
<tr>
<td>Hot gas bypass valve (SVP)</td>
<td>OFF</td>
<td>This valve turns on with low pressure protection control.</td>
</tr>
<tr>
<td>Receiver gas discharging valve (SVG)</td>
<td>OFF</td>
<td>—</td>
</tr>
</tbody>
</table>

- Heating Operation

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Operation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>Compressor PI control</td>
<td>Used for high pressure protection control, low pressure protection control, discharge pipe temperature protection control, and compressor operating frequency upper limit control with inverter protection control.</td>
</tr>
<tr>
<td>Outdoor unit fan</td>
<td>STEP8</td>
<td>The fan step changes to STEP1 with high pressure &gt; 454 psi.</td>
</tr>
<tr>
<td>Four-way valve</td>
<td>ON</td>
<td>—</td>
</tr>
<tr>
<td>Main electronic expansion valve (EV1)</td>
<td>PI control</td>
<td>—</td>
</tr>
<tr>
<td>Subcooling electronic expansion valve (EV2)</td>
<td>0 pls</td>
<td>—</td>
</tr>
<tr>
<td>Hot gas bypass valve (SVP)</td>
<td>OFF</td>
<td>This valve turns on with low pressure protection control.</td>
</tr>
<tr>
<td>Receiver gas discharging valve (SVG)</td>
<td>OFF</td>
<td>—</td>
</tr>
</tbody>
</table>

* Heating operation is not functional at an outdoor air temperature of 86°FDB or more.
2.2 Compressor PI Control

Compressor PI Control
Carries out the compressor capacity PI control to maintain $T_e$ at constant during cooling operation and $T_c$ at constant during heating operation to ensure stable unit performance.

**[Cooling operation]**
Controls compressor capacity to adjust $T_e$ to achieve target value ($T_eS$).

$T_e$ : Low pressure equivalent saturation temperature (°F)

$T_e$ setting (Set in Set-up mode 2)

<table>
<thead>
<tr>
<th>L</th>
<th>M (Normal) (factory setting)</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>37.5</td>
<td>43</td>
<td>48</td>
</tr>
</tbody>
</table>

**[Heating operation]**
Controls compressor capacity to adjust $T_c$ to achieve target value ($T_cS$).

$T_c$ : High pressure equivalent saturation temperature (°F)

$T_c$ setting

<table>
<thead>
<tr>
<th>L</th>
<th>M (Normal) (factory setting)</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>109.5</td>
<td>115</td>
<td>120</td>
</tr>
</tbody>
</table>

RZQ18 · 24 · 30P

<table>
<thead>
<tr>
<th>STEP</th>
<th>INV.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>52Hz</td>
</tr>
<tr>
<td>2</td>
<td>57Hz</td>
</tr>
<tr>
<td>3</td>
<td>62Hz</td>
</tr>
<tr>
<td>4</td>
<td>68Hz</td>
</tr>
<tr>
<td>5</td>
<td>74Hz</td>
</tr>
<tr>
<td>6</td>
<td>81Hz</td>
</tr>
<tr>
<td>7</td>
<td>88Hz</td>
</tr>
<tr>
<td>8</td>
<td>96Hz</td>
</tr>
<tr>
<td>9</td>
<td>104Hz</td>
</tr>
<tr>
<td>10</td>
<td>110Hz</td>
</tr>
<tr>
<td>11</td>
<td>116Hz</td>
</tr>
<tr>
<td>12</td>
<td>124Hz</td>
</tr>
<tr>
<td>13</td>
<td>133Hz</td>
</tr>
<tr>
<td>14</td>
<td>143Hz</td>
</tr>
<tr>
<td>15</td>
<td>158Hz</td>
</tr>
<tr>
<td>16</td>
<td>165Hz</td>
</tr>
<tr>
<td>17</td>
<td>177Hz</td>
</tr>
</tbody>
</table>

* Compressors may operate in a pattern other than those listed in above tables subject to the operating conditions.
2.3 Electronic Expansion Valve PI Control

Main Electronic Expansion Valve EV1 Control
Carries out the electronic expansion valve (Y1E) PI control to maintain the evaporator outlet superheated degree (SH) at constant during heating operation to make maximum use of the outdoor unit heat exchanger (evaporator).

\[ SH = Ts - Te \]

- \( SH \) : Evaporator outlet superheated degree (°F)
- \( Ts \) : Suction pipe temperature detected by thermistor R2T (°F)
- \( Te \) : Low pressure equivalent saturation temperature (°F)

The optimum initial value of the evaporator outlet superheated degree is 5°C (9°F), but varies depending on the discharge pipe superheated degree of inverter compressor.

Subcooling Electronic Expansion Valve EV2 Control
Makes PI control of the electronic expansion valve (Y2E) to keep the superheated degree (SH) of the outlet gas pipe on the evaporator side for the full use of the subcooling heat exchanger.

\[ SH = T_{sh} - Te \]

- \( SH \) : Outlet superheated degree of evaporator (°F)
- \( T_{sh} \) : Suction pipe temperature detected with the thermistor R5T (°F)
- \( Te \) : Low pressure equivalent saturation temperature (°F)
2.4 Cooling Operation Fan Control

In cooling operation with low outdoor air temperature, this control is used to provide the adequate amount of circulation air with liquid pressure secured by high pressure control using outdoor unit fan.

**Fan Steps**

<table>
<thead>
<tr>
<th>Step</th>
<th>M1F RPM</th>
<th>M2F RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEP 1</td>
<td>250 rpm</td>
<td>0 rpm</td>
</tr>
<tr>
<td>STEP 2</td>
<td>400 rpm</td>
<td>0 rpm</td>
</tr>
<tr>
<td>STEP 3</td>
<td>285 rpm</td>
<td>250 rpm</td>
</tr>
<tr>
<td>STEP 4</td>
<td>360 rpm</td>
<td>325 rpm</td>
</tr>
<tr>
<td>STEP 5</td>
<td>445 rpm</td>
<td>410 rpm</td>
</tr>
<tr>
<td>STEP 6</td>
<td>580 rpm</td>
<td>545 rpm</td>
</tr>
<tr>
<td>STEP 7</td>
<td>715 rpm</td>
<td>680 rpm</td>
</tr>
<tr>
<td>STEP 8</td>
<td>850 rpm</td>
<td>815 rpm</td>
</tr>
</tbody>
</table>

**Reference**

<table>
<thead>
<tr>
<th>Step</th>
<th>M1F RPM</th>
<th>M2F RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEP 1</td>
<td>250 rpm</td>
<td>0 rpm</td>
</tr>
<tr>
<td>STEP 8</td>
<td>850 rpm</td>
<td>815 rpm</td>
</tr>
</tbody>
</table>

There are 2 steps in heating operation.
# 3. Special Control

## 3.1 Startup Control

On activation, the following control is performed to lighten the load of the compressor with liquid refrigerant located at the compressor at startup. Also, the position of the four-way valve is defined.

### 3.1.1 Startup Control in Cooling Operation

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Operation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>Differential pressure control</td>
<td>Compressor operating frequency increases by 2 step / 20 sec. until Pc - Pe &gt; 58 psi.</td>
</tr>
<tr>
<td>Outdoor unit fan</td>
<td>High pressure control</td>
<td>Initial fan speed is set to STEP 0. 1-step increase with Pc&gt;305 psi 1-step decrease with Pc &lt; 261 psi</td>
</tr>
<tr>
<td>Four-way valve</td>
<td>OFF</td>
<td>—</td>
</tr>
<tr>
<td>Main electronic expansion valve (EV1)</td>
<td>1400 pls</td>
<td>—</td>
</tr>
<tr>
<td>Subcooling electronic expansion valve (EV2)</td>
<td>0 pls</td>
<td>—</td>
</tr>
<tr>
<td>Hot gas bypass valve (SVP)</td>
<td>ON</td>
<td>—</td>
</tr>
<tr>
<td>Receiver gas discharging valve (SVG)</td>
<td>OFF</td>
<td>—</td>
</tr>
<tr>
<td>Ending conditions</td>
<td>or</td>
<td>230 sec. &amp; Pc - Pe &gt; 58 psi &amp; 45 sec.</td>
</tr>
</tbody>
</table>

### 3.1.2 Startup Control in Heating Operation

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Operation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>Differential pressure control</td>
<td>Compressor operating frequency increases by 2 step / 20 sec. until Pc - Pe &gt; 58 psi.</td>
</tr>
<tr>
<td>Outdoor unit fan</td>
<td>STEP 8</td>
<td>—</td>
</tr>
<tr>
<td>Four-way valve</td>
<td>ON</td>
<td>—</td>
</tr>
<tr>
<td>Main electronic expansion valve (EV1)</td>
<td>180 pls</td>
<td>—</td>
</tr>
<tr>
<td>Subcooling electronic expansion valve (EV2)</td>
<td>0 pls</td>
<td>—</td>
</tr>
<tr>
<td>Hot gas bypass valve (SVP)</td>
<td>ON</td>
<td>—</td>
</tr>
<tr>
<td>Receiver gas discharging valve (SVG)</td>
<td>OFF</td>
<td>—</td>
</tr>
<tr>
<td>Ending conditions</td>
<td>or</td>
<td>145 sec. &amp; Pc - Pe &gt; 58 psi &amp; 15 sec.</td>
</tr>
</tbody>
</table>
3.2 Oil Return Operation

Oil discharged by the compressor to the field piping is collected by the oil return operation.

3.2.1 Oil Return Operation in Cooling Operation

[Conditions to start]

The cooling oil-returning operation is started under the following conditions:

- Integrated amount of displaced oil
- Timer

After the power is turned on, integrated operating time is 2 hours and subsequently every 8 hours.

In addition, the integrated amount of displaced oil is derived from Tc, Te, and the compressor load.

<table>
<thead>
<tr>
<th>Outdoor unit actuator</th>
<th>Oil return preparation operation</th>
<th>Oil return operation</th>
<th>Postoil-return operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>Upper limit control</td>
<td>124 Hz</td>
<td>124 Hz</td>
</tr>
<tr>
<td>Outdoor unit fan</td>
<td>Fan control</td>
<td>Fan control</td>
<td>Fan control</td>
</tr>
<tr>
<td>Four-way valve</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>Main electronic expansion valve (EV1)</td>
<td>1400 pls</td>
<td>1400 pls</td>
<td>1400 pls</td>
</tr>
<tr>
<td>Subcooling electronic expansion valve (EV2)</td>
<td>SH control</td>
<td>0 pls</td>
<td>0 pls</td>
</tr>
<tr>
<td>Hot gas bypass valve (SVP)</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>Receiver gas discharging valve (SVG)</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>Ending conditions</td>
<td>20 sec.</td>
<td>or • 6 min.</td>
<td>• Ts - Te&lt;5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 min.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indoor unit actuator</th>
<th>Cooling oil return operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan</td>
<td>Thermostat ON unit</td>
</tr>
<tr>
<td></td>
<td>Thermostat OFF unit</td>
</tr>
<tr>
<td></td>
<td>Set Air Volume</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>Normal opening</td>
</tr>
<tr>
<td></td>
<td>200 pls</td>
</tr>
<tr>
<td>Electronic expansion valve</td>
<td>Thermostat ON unit</td>
</tr>
<tr>
<td></td>
<td>Thermostat OFF unit</td>
</tr>
<tr>
<td></td>
<td>Stopping unit</td>
</tr>
<tr>
<td></td>
<td>Stopping unit</td>
</tr>
<tr>
<td></td>
<td>200 pls</td>
</tr>
</tbody>
</table>
### 3.2.2 Oil Return Operation in Heating Operation

**[Conditions to start]**

The heating oil-returning operation is started under the following conditions:
- Integrated amount of displaced oil
- Timer

(After the power is turned on, integrated operating-time is 2 hours and subsequently every 8 hours.)

In addition, the integrated amount of displaced oil is derived from Tc, Te, and the compressor load.

<table>
<thead>
<tr>
<th>Outdoor Unit Actuator</th>
<th>Oil return preparation operation</th>
<th>Oil return operation</th>
<th>Post-oil-return operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>Upper limit control</td>
<td>124 Hz</td>
<td>2-step increase from 52 Hz to (Pc - Pe&gt;58 psi) time</td>
</tr>
<tr>
<td>Outdoor unit fan</td>
<td>STEP 8</td>
<td>OFF</td>
<td>STEP 8</td>
</tr>
<tr>
<td>Four-way valve</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>Main electronic expansion valve (EV1)</td>
<td>SH control</td>
<td>1400 pls</td>
<td>200-400 pls</td>
</tr>
<tr>
<td>Subcooling electronic expansion valve (EV2)</td>
<td>0 pls</td>
<td>0 pls</td>
<td>0 pls</td>
</tr>
<tr>
<td>Hot gas bypass valve (SVP)</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>Receiver gas discharging valve (SVG)</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>Ending conditions</td>
<td>130 sec.</td>
<td>or 6 min.</td>
<td>or 160 sec.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or Ts - Te&lt;5</td>
<td>or Pc - Pe&gt;58 psi</td>
</tr>
</tbody>
</table>

* From the preparation of the oil-returning operation to the oil-returning operation, and from the oil-returning operation to the operation after oil-returning, the compressor stops for 1 minute to reduce noise when changing the position of the four-way valve.

<table>
<thead>
<tr>
<th>Indoor unit actuator</th>
<th>Heating oil return operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan</td>
<td></td>
</tr>
<tr>
<td>Thermostat ON unit</td>
<td>OFF</td>
</tr>
<tr>
<td>Stopping unit</td>
<td>OFF</td>
</tr>
<tr>
<td>Thermostat OFF unit</td>
<td>OFF</td>
</tr>
<tr>
<td>Electronic expansion valve</td>
<td></td>
</tr>
<tr>
<td>Thermostat ON unit</td>
<td>500 pls</td>
</tr>
<tr>
<td>Stopping unit</td>
<td>500 pls</td>
</tr>
<tr>
<td>Thermostat OFF unit</td>
<td>500 pls</td>
</tr>
</tbody>
</table>
### 3.3 Defrosting Operation

The defrost operation is performed to solve frost on the outdoor unit heat exchanger when heating, and the heating capacity is recovered.

**[Conditions to start]**

The defrost operation is started under the following conditions:
- Outdoor heat exchanger heat transfer co-efficiency
- Temperature of heat-exchange (Tb)
- Timer (2 hours at the minimum)

In addition, outdoor heat-exchange co-efficiency is derived from Tc, Te, and the compressor load.

<table>
<thead>
<tr>
<th>Outdoor unit actuator</th>
<th>Defrost preparation operation</th>
<th>Defrost operation</th>
<th>Post Defrost operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>52 Hz</td>
<td>177 Hz</td>
<td>2-step increase from 52 Hz to (Pc - Pe&gt;58 psi) every 20 sec.</td>
</tr>
<tr>
<td>Outdoor unit fan</td>
<td>STEP 8</td>
<td>OFF</td>
<td>STEP 8</td>
</tr>
<tr>
<td>Four-way valve</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>Main electronic expansion valve (EV1)</td>
<td>SH control</td>
<td>1400 pls</td>
<td>200~400 pls</td>
</tr>
<tr>
<td>Subcooling electronic expansion valve (EV2)</td>
<td>0 pls</td>
<td>0 pls</td>
<td>0 pls</td>
</tr>
<tr>
<td>Hot gas bypass valve (SVP)</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>Receiver gas discharging valve (SVG)</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>Ending conditions</td>
<td>130 sec.</td>
<td>or [15 min. ● Tb &gt;51.8°F]</td>
<td>or [160 sec. ● Pc - Pe&gt;58 psi]</td>
</tr>
</tbody>
</table>

* From the preparing operation to the defrost operation, and from the defrost operation to the operation after defrost, the compressor stops for 1 minute to reduce noise on changing of the four-way valve.

<table>
<thead>
<tr>
<th>Indoor unit actuator</th>
<th>During defrost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan</td>
<td></td>
</tr>
<tr>
<td>Thermostat ON unit</td>
<td>OFF</td>
</tr>
<tr>
<td>Stopping unit</td>
<td>OFF</td>
</tr>
<tr>
<td>Thermostat OFF unit</td>
<td>OFF</td>
</tr>
<tr>
<td>Electronic expansion valve</td>
<td>Thermostat ON unit</td>
</tr>
<tr>
<td>Stopping unit</td>
<td>500 pls</td>
</tr>
<tr>
<td>Thermostat OFF unit</td>
<td>500 pls</td>
</tr>
</tbody>
</table>
### 3.4 Pump-down Residual Operation

When activating the compressor, if the liquid refrigerant remains in the heat-exchanger, the liquid enters into the compressor and dilutes oil therein resulting in a decrease of lubricity. Therefore, the pump-down residual operation is performed to collect the refrigerant in the heat-exchanger when the compressor is down.

#### 3.4.1 Pump-down Residual Operation in Cooling Operation

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Master unit operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>124 Hz</td>
</tr>
<tr>
<td>Outdoor unit fan</td>
<td>Fan control</td>
</tr>
<tr>
<td>Four-way valve</td>
<td>OFF</td>
</tr>
<tr>
<td>Main electronic expansion valve (EV1)</td>
<td>2000 pls</td>
</tr>
<tr>
<td>Subcooling electronic expansion valve (EV2)</td>
<td>0 pls</td>
</tr>
<tr>
<td>Hot gas bypass valve (SVP)</td>
<td>OFF</td>
</tr>
<tr>
<td>Receiver gas discharging valve (SVG)</td>
<td>ON → OFF</td>
</tr>
</tbody>
</table>

**Ending conditions**

- 30 sec.
- $P_e < 73$ psi
- $T_d > 230^\circ F$

#### 3.4.2 Pump-down Residual Operation in Heating Operation

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Master unit operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>124 Hz</td>
</tr>
<tr>
<td>Outdoor unit fan</td>
<td>STEP 8</td>
</tr>
<tr>
<td>Four-way valve</td>
<td>ON</td>
</tr>
<tr>
<td>Main electronic expansion valve (EV1)</td>
<td>0 pls</td>
</tr>
<tr>
<td>Subcooling electronic expansion valve (EV2)</td>
<td>0 pls</td>
</tr>
<tr>
<td>Hot gas bypass valve (SVP)</td>
<td>OFF</td>
</tr>
<tr>
<td>Receiver gas discharging valve (SVG)</td>
<td>ON → OFF</td>
</tr>
</tbody>
</table>

**Ending conditions**

- 3 min.
- $P_e < 36$ psi
- $T_d > 230^\circ F$
### 3.5 Restart Standby

Restart is not possible to prevent frequent power-on/off and to equalize pressure in the refrigerant system.

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Operation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>Outdoor unit fan</td>
<td>Ta&gt;86°F: STEP 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ta≤86°F: OFF</td>
<td></td>
</tr>
<tr>
<td>Four-way valve</td>
<td>Keep former condition.</td>
<td></td>
</tr>
<tr>
<td>Main electronic expansion valve (EV1)</td>
<td>0 pls</td>
<td></td>
</tr>
<tr>
<td>Subcooling electronic expansion valve (EV2)</td>
<td>0 pls</td>
<td></td>
</tr>
<tr>
<td>Hot gas bypass valve (SVP)</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>Receiver gas discharging valve (SVG)</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>Ending conditions</td>
<td>5 min.</td>
<td></td>
</tr>
</tbody>
</table>
3.6 Stopping Operation
When the system is down the actuator stops/clears all operations.

3.6.1 When System is in Stop Mode

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>OFF</td>
</tr>
<tr>
<td>Outdoor unit fan</td>
<td>OFF</td>
</tr>
<tr>
<td>Four-way valve</td>
<td>Keep former condition.</td>
</tr>
<tr>
<td>Main electronic expansion valve (EV1)</td>
<td>0 pls</td>
</tr>
<tr>
<td>Subcooling electronic expansion valve (EV2)</td>
<td>0 pls</td>
</tr>
<tr>
<td>Hot gas bypass valve (SVP)</td>
<td>OFF</td>
</tr>
<tr>
<td>Receiver gas discharging valve (SVG)</td>
<td>OFF</td>
</tr>
<tr>
<td>Ending conditions</td>
<td>Indoor unit thermostat is turned ON.</td>
</tr>
</tbody>
</table>
### 3.7 Pressure Equalization Prior to Startup

Before activating the compressor, the activation load is lightened by equalization across the compressor. In addition, inverters turn on electricity and capacitors are charged.

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Operation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>OFF</td>
<td>—</td>
</tr>
<tr>
<td>Outdoor unit fan</td>
<td>Cooling: OFF Heating: Ta&gt;78.8°F; STEP 8, Ta≤78.8°F; OFF</td>
<td>—</td>
</tr>
<tr>
<td>Four-way valve</td>
<td>Keep former condition.</td>
<td>—</td>
</tr>
<tr>
<td>Main electronic expansion valve (EV1)</td>
<td>0 pls</td>
<td>—</td>
</tr>
<tr>
<td>Subcooling electronic expansion valve (EV2)</td>
<td>0 pls</td>
<td>—</td>
</tr>
<tr>
<td>Hot gas bypass valve (SVP)</td>
<td>ON</td>
<td>—</td>
</tr>
<tr>
<td>Receiver gas discharging valve (SVG)</td>
<td>OFF</td>
<td>—</td>
</tr>
<tr>
<td>Ending conditions</td>
<td>or [• 3 min, • Pc-Pe&lt;29 psi]</td>
<td>—</td>
</tr>
</tbody>
</table>
4. Protection Control

4.1 High Pressure Protection Control

This high pressure protection control is used to prevent the activation of protection devices due to abnormal increase of high pressure and to protect compressors against the transient increase of high pressure.

[In cooling operation]

When occurring 3 times within 30 minutes, HPS is activated without high pressure standby, thus outputting the malfunction code "E3".

[In heating operation]

When HPS is activated, the malfunction code "E3" is output.
4.2 Low Pressure Protection Control

This low pressure protection control is used to protect compressors against the transient decrease of low pressure.

**[In cooling operation]**

Low pressure not limited

- \( \text{Pe} \leq 36 \text{ psi} \)
- \( \text{Pe} > 57 \text{ psi} \)

Low pressure limited

- \( 57 \text{ Hz} \)

Low pressure standby

- When occurring 3 times within 60 min., the malfunction code "E4" is output.

**[In heating operation]**

Low pressure not limited

- \( \text{Pe} > 36 \text{ psi} \)
- \( \text{INV. upper limit frequency} \)

Low pressure limited

- Upper limit: \( 145.5 \text{ Hz} \)
- \( \text{Pe} < 19 \text{ psi} \)

Upper limit: \( 57 \text{ Hz} \)

- \( \text{Pe} < 19 \text{ psi} \)

Upper limit: 1-step up from current compressor frequency

- \( \text{Pe} < 28 \text{ psi} \)

- \( \text{Pe} > 28 \text{ psi} \) (every 20 sec.)

SVP = OFF

- \( \text{Pe} > 25 \text{ psi} \)

SVP = ON

- \( \text{Pe} < 15 \text{ psi} \)

- \( \text{Pe} < 10 \text{ psi} \)

When occurring 3 times within 60 min., the malfunction code "E4" is output.
4.3 Discharge Pipe Protection Control

This discharge pipe protection control is used to protect the compressor internal temperature against a malfunction or transient increase of discharge pipe temperature.

[INV. compressor]

HTdi : Value of INV. compressor discharge pipe temperature (Tdi) compensated with outdoor air temperature

Tp : Value of compressor port temperature calculated by Tc and Te, and suction superheated degree.

Discharge pipe protection control not limited

- or -

- HTdi > 221°F
- Tp > 266°F

- Not during defrost operation (preparation ~ post operation)
- Not during oil return operation in heating (preparation ~ post operation)
- Not during oil return operation in cooling (without preparation and post operation)

or

- HTdi < 203°F
- or
- Defrost operation (preparation ~ post operation)
- Oil return operation in heating (preparation ~ post operation)
- Oil return operation in cooling (without preparation and post operation)

In discharge pipe protection control

- IN. frequency 1-step down from current compressor frequency (lower limit: 57Hz)
- Cooling: 20 sec.
- Heating: 60 sec.
- Fix IN. frequency 57Hz

Exclusion of the right conditions

- or -

- HTdi > 266°F
- or
- HTdi > 239°F for 90sec. or more
- or

- HTdi > 275°F
- HTdi > 248°F for 10 min. or more.

- When occurring 3 times within 100 min., the malfunction code “F 3” is output.
4.4 Inverter Protection Control

Inverter current protection control and inverter fin temperature control are performed to prevent tripping due to a malfunction, or transient inverter overcurrent, and fin temperature increase.

**[Inverter overcurrent protection control]**

Not limited

Inverter current > XA

&

- Inverter current ≤ XA
- INV. upper limit frequency

Limited

Inverter current > XA

10 sec.

Matching of frequency

15 sec.

Inverter current ≤ XA continues for 3 min.

INV. upper limit frequency: 1-step up from current compressor frequency

INV. upper limit frequency: 1-step down from current compressor frequency

Inverter current ≥ 24.9 A

Inverter current standby

- When occurring 3 times within 60 min., the malfunction code "L8" is output.
- When occurring 4 times within 60 min., the malfunction code "L9" is output.

**[Inverter fin temperature control]**

Not limited

Tfin ≥ 179.6°F

&

- Tfin < 174.2°F
- INV. upper limit frequency

Limited

Tfin ≥ 179.6°F

10 sec.

Matching of frequency

15 sec.

Tfin ≤ 174.2°F continues for 3 min.

INV. upper limit frequency: 1-step up from current compressor frequency

INV. upper limit frequency: 1-step down from current compressor frequency

Tfin ≥ 180°F

Fin temp. standby

- When occurring 3 times within 60 min., the malfunction code "L4" is output.
5. Other Control

5.1 Heating Operation Prohibition

Heating operation is prohibited above 82°FDB outdoor air temperature. Outline of Control (Indoor Unit)

5.2 Drain Pump Control

1. The drain pump is controlled by the ON/OFF buttons (4 button (1) - (4) given in the figure below).

5.2.1 When the Float Switch is Tripped While the Cooling Thermostat is ON:

*1. (Normal operation):
The objective of residual operation is to completely drain any moisture adhering to the fin of the indoor unit heat exchanger when the thermostat goes off during cooling operation.

*2. (Malfunction residual):
The remote controller will display "A3" and the air conditioner will come to an abnormal stop if the float switch is turned OFF and not turned ON again within 5 minutes while the cooling thermostat is ON.

5.2.2 When the Float Switch is Tripped While the Cooling Thermostat is OFF:

*3. (Malfunction residual):
The remote controller will display "A3" and the air conditioner will come to an abnormal stop if the float switch is turned OFF and not turned ON again within 5 minutes while the cooling thermostat is OFF.
5.2.3 When the Float Switch is Tripped During Heating Operation:

During heating operation, if the float switch is not reset even after the 5 minutes operation, 5 seconds stop, 5 minutes operation cycle ends, operation continues until the switch is reset.

5.2.4 When the Float Switch is Tripped and “AF” is Displayed on the Remote Controller:

*4. (Malfunction residual): If the float switch is tripped five times in succession, a drain malfunction is determined to have occurred. “AF” is then displayed as operation continues.

*5. (Malfunction residual): The remote controller will display "A3" and the air conditioner will come to an abnormal stop if the float switch is OFF for more than 5 minutes in the case of "4."
5.3 Louver Control for Preventing Ceiling Dirt

We have added a control feature that allows you to select the range of air direction and adjust it to prevent the ceiling surrounding the air discharge outlet of ceiling mounted cassette type units from being soiled.

<table>
<thead>
<tr>
<th>Draft prevention position</th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>Same as existing position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard position</td>
<td>Prohibited P0'</td>
<td>P1'</td>
<td>P2'</td>
<td>P3'</td>
<td>P4'</td>
<td>Separated into 5 positions (P1 - 4)</td>
</tr>
<tr>
<td>Dirt prevention position</td>
<td>Prohibited P0''</td>
<td>P1''</td>
<td>P2''</td>
<td>P3''</td>
<td>P4''</td>
<td>Separated into 5 positions (P2 - 4)</td>
</tr>
</tbody>
</table>

The factory set position is the standard position.
5.4 Operation Range of Remote Controller Temperature Sensor

Room temperature is controlled by the remote controller temperature sensor and return-air temperature sensor (unit-mounted temperature sensor) on the indoor unit. When the remote controller temperature sensor is set to **Not Used** in a field setting, the unit can be controlled only by unit mounted temperature sensor (or remote sensor).

**Note:**

When between the room temperature and the setpoint temperature, fine adjustment control can be achieved using the unit-mounted temperature sensor. If the return-air temperature is close to the set-point temperature, the sensor mounted in the remote controller in the occupied space is used.

---

**Cooling**

(This example also assumes there are several other air conditioners, the VRV system is off, and that temperature changes even when the thermostat sensor is off.)

- **Unit-mounted temperature sensor** is used for temperatures from 64°F to 73°F (A → C).
- Remote controller thermostat sensor is used for temperatures from 73°F to 81°F (C → E).
- Unit-mounted temperature sensor is used for temperatures from 81°F to 86°F (E → F).

And, assuming return-air temperature has changed from 86°F to 64°F (F → A):

- Unit-mounted temperature sensor is used for temperatures from 86°F to 77°F (F → D).
- Remote controller thermostat sensor is used for temperatures from 77°F to 70°F (D → B).
- Unit-mounted temperature sensor is used for temperatures from 70°F to 64°F (B → A).

**NOTE:** When outdoor air (OA) and indoor return air are mixed, the room temperature may differ from the set-point temperature because the air temperature is out of the area of **operation range of the remote controller temperature sensor**. In this event, install the remote sensor (KRCS01-1) in the room where there is no influence of outdoor air.
Heating

When heating, hot air rises to the top of the room which results in a lower temperature close to the floor where occupants are. This can cause the thermostat to turn off the unit before the lower part of the room reaches set-point temperature. To ensure a more evenly distributed temperature, position a Remote Sensor, at body level, in the occupied space or use the high ceiling installation service code.

- **Ex: When heating**
  
  Assuming the preset temperature in the figure above is 75°F, and the return-air temperature has changed from 64°F to 82°F (A → D):
  
  (This example also assumes there are several other air conditioners, the VRV system is off, and that temperature changes even when the temperature sensor is off.)
  
  Unit-mounted thermostat sensor is used for temperatures from 64°F to 77°F (A → C).
  
  Remote controller temperature sensor is used for temperatures from 77°F to 82°F (C → D).
  
  And, assuming return-air temperature has changed from 82°F to 64°F (D → A):
  
  Remote controller temperature sensor is used for temperatures from 82°F to 73°F (D → B).
  
  Unit-mounted temperature sensor is used for temperatures from 73°F to 64°F (B → A).
5.5 Freeze Prevention

Freeze Prevention by Off Cycle (Indoor Unit)

When the temperature detected by the liquid pipe temperature thermistor (R2T) of the indoor unit heat exchanger drops too low, the unit enters freeze prevention operation in accordance with the following conditions, and is also set in accordance with the conditions given below.

Conditions for starting freeze prevention: Temperature is 30°F or less for total of 40 min., or temperature is 23°F or less for total of 10 min.

Conditions for stopping freeze prevention: Temperature is 45°F or more for 10 min. continuously.

Ex: Case where temperature is 23°F or less for total of 10 min.
## 5.6 View of Operations of Swing Flaps

Swing flaps work as following.

<table>
<thead>
<tr>
<th>Heating</th>
<th>Fan</th>
<th>Flap control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>FCQ</td>
</tr>
<tr>
<td>Hot-start from defrosting</td>
<td>swinging</td>
<td>OFF</td>
</tr>
<tr>
<td>Setting the wind direction</td>
<td>OFF</td>
<td>Level</td>
</tr>
<tr>
<td>Defrosting</td>
<td>swinging</td>
<td>OFF</td>
</tr>
<tr>
<td>Setting the wind direction</td>
<td>OFF</td>
<td>Level</td>
</tr>
<tr>
<td>Thermostat is off</td>
<td>swinging</td>
<td>LL</td>
</tr>
<tr>
<td>Setting the wind direction</td>
<td>LL</td>
<td>Level</td>
</tr>
<tr>
<td>Hot-start from the state that the thermostat is off</td>
<td>swinging</td>
<td>LL</td>
</tr>
<tr>
<td>Setting the wind direction</td>
<td>LL</td>
<td>Level</td>
</tr>
<tr>
<td>Halt</td>
<td>swinging</td>
<td>OFF</td>
</tr>
<tr>
<td>Setting the wind direction</td>
<td>OFF</td>
<td>Level</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cooling</th>
<th>Fan</th>
<th>Flap control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>FCQ</td>
</tr>
<tr>
<td>Thermostat of microcomputer-dry is on</td>
<td>swinging</td>
<td>L*¹</td>
</tr>
<tr>
<td>Setting the wind direction</td>
<td>L*¹</td>
<td>Set up</td>
</tr>
<tr>
<td>Thermostat of microcomputer-dry is off</td>
<td>swinging</td>
<td>OFF or L</td>
</tr>
<tr>
<td>Setting the wind direction</td>
<td>OFF or L</td>
<td>Set up</td>
</tr>
<tr>
<td>Cooling thermostat is off</td>
<td>swinging</td>
<td>Set up</td>
</tr>
<tr>
<td>Setting the wind direction</td>
<td>Set up</td>
<td>Set up</td>
</tr>
<tr>
<td>Halt</td>
<td>swinging</td>
<td>OFF</td>
</tr>
<tr>
<td>Setting the wind direction</td>
<td>OFF</td>
<td>Level</td>
</tr>
<tr>
<td>Microcomputer is controlled (including the cooling state)</td>
<td>swinging</td>
<td>L</td>
</tr>
<tr>
<td>Setting the wind direction</td>
<td>L</td>
<td>Set up</td>
</tr>
</tbody>
</table>

* 1. Only in FCQ case, L or LL.
# Part 6
## Test Operation

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1. Test Operation

1.1 Procedure and Outline

Follow the following procedure to conduct the initial test operation after installation.

1.1.1 Check Work Prior to Turn Power Supply On

Check the below items.
- Power wiring
- Control transmission wiring between units
- Ground wire

- Is the power supply single-phase 208-230V / 60Hz?
- Have you finished piping to the drain?
- Have you detached the transport brackets?
- Is the wiring installed as specified?
- Are the designated wires used?
- Is the grounding work completed?

Use a 500V megger tester to measure the insulation.
  - Do not use a megger tester for other circuits than 200-230V circuit.
- Are the setscrews of the wiring tight?
- Is the electrical component box completely covered with an insulation cover?
- Is pipe size correct? (The design pressure of this product is 478 psi.)
- Are pipe insulation materials installed securely?
  - Liquid and gas pipes need to be insulated to prevent condensation.
- Are respective stop valves on liquid and gas lines fully open?
- Is refrigerant charged up to the specified amount?
  - If insufficient, charge the refrigerant from the service port of the stop valve on the liquid side with the outdoor unit in stop mode after turning power on.
- Has the amount of refrigerant charge been recorded on “Record Chart of Additional Refrigerant Charge Amount”?

1.1.2 Turn Power On

- Turn outdoor unit power on.

- Be sure to turn the power on 6 hours before starting operation to protect compressors.
- Close outside panels of the outdoor unit.

- Turn indoor unit power on.

- Carry out field setting on outdoor P.C.B.
1.1.3 Check Operation

* During check operation, position the front panel in full view so as to avoid incorrect readings.*
Check operation is mandatory for normal unit operation.
(When the check operation is not executed, alarm code “U3” will be displayed.)

Press and hold the TEST button (BS4) on outdoor unit P.C.B. for 5 seconds.

- The test operation is started automatically.
- The following judgements are conducted within 15 minutes (about 30 minutes at the maximum).
  - Check for incorrect wiring.
  - Check that the stop valve is closed.
  - The system performs a self check to automatically determine pipe length.
  - The following indications are conducted while in test operation.
    - LED lamp on outdoor unit P.C.B. — H2P flickers (test operation)
    - Remote controller Indicates “Under Centralized Control” on upper right.

On completion of test operation, LED on outdoor unit P.C.B. displays the following.
H3P ON: Normal completion
H2P and H3P ON: Abnormal completion → Check the indoor unit remote controller for abnormal display and correct it.

(For normal completion) H1P H2P H3P H4P H5P H6P H7P
(For abnormal completion) ● ● ○ ● ● ● ● ○ ● ○ ● ● ● ● ● ●

Malfunction code
In case of an alarm code displayed on remote controller:

<table>
<thead>
<tr>
<th>Malfunction code</th>
<th>Nonconformity during installation</th>
<th>Remedial action</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3</td>
<td>The shutoff valve of an outdoor unit is left closed.</td>
<td>Open the gas-side shutoff valve and the liquid-side shutoff valve.</td>
</tr>
<tr>
<td></td>
<td>Refrigerant overcharge</td>
<td>Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.</td>
</tr>
<tr>
<td>F3</td>
<td>The shutoff valve of an outdoor unit is left closed.</td>
<td>Open the gas-side shutoff valve and the liquid-side shutoff valve.</td>
</tr>
<tr>
<td></td>
<td>Insufficient refrigerant</td>
<td>Check if the additional refrigerant charge has been finished correctly.</td>
</tr>
<tr>
<td></td>
<td>Refrigerant overcharge</td>
<td>Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant.</td>
</tr>
<tr>
<td>F5</td>
<td>The shutoff valve of an outdoor unit is left closed.</td>
<td>Open the gas-side shutoff valve and the liquid-side shutoff valve.</td>
</tr>
<tr>
<td></td>
<td>Insufficient refrigerant</td>
<td>Check if the additional refrigerant charge has been finished correctly.</td>
</tr>
<tr>
<td></td>
<td>Refrigerant overcharge</td>
<td>Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant.</td>
</tr>
<tr>
<td>U2</td>
<td>Insufficient supply voltage</td>
<td>Check to see if the supply voltage is supplied properly.</td>
</tr>
<tr>
<td>U3</td>
<td>If a check operation has not been performed.</td>
<td>Perform a check operation.</td>
</tr>
<tr>
<td>Code</td>
<td>Issue</td>
<td>Solution</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>UK</td>
<td>No power is supplied to the outdoor unit.</td>
<td>Turn the power on for the outdoor unit.</td>
</tr>
<tr>
<td>UF</td>
<td>The shutoff valve of an outdoor unit is left closed.</td>
<td>Open the gas-side shutoff valve and the liquid-side shutoff valve.</td>
</tr>
<tr>
<td>UF</td>
<td>If the right indoor unit piping and wiring are not properly connected to the outdoor unit.</td>
<td>Make sure that the right indoor unit piping and wiring are properly connected to the outdoor unit.</td>
</tr>
<tr>
<td>UH</td>
<td>If the interunit wiring has not been connected or it has shorted.</td>
<td>Make sure the interunit wiring is correctly attached to terminals (X2M) F1/F2 (TO IN/D UNIT) on the outdoor unit circuit board.</td>
</tr>
</tbody>
</table>

### 1.1.4 Confirmation on Normal Operation

- Conduct normal unit operation after the check operation has been completed. (When outdoor air temperature is 82°FDB or higher, the unit cannot be operated with heating mode. See the installation manual attached.)
- Confirm that the indoor/outdoor units can be operated normally. When an abnormal noise due to liquid compression by the compressor can be heard, stop the unit immediately, and turn on the crankcase heater to heat up it sufficiently, then start operation again.
- Operate indoor unit to check that the corresponding outdoor unit operates.
- Confirm that the indoor unit discharges cold air (or warm air).
- Operate the air direction control button and flow rate control button to check the function of the devices.
1.2 Operation when Power is Turned On

1.2.1 When Turning On Power First Time
The unit cannot be run for up to 12 minutes to automatically set the master power and address (indoor-outdoor address, etc.).

<table>
<thead>
<tr>
<th>Status</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor unit</td>
<td>Test lamp H2P .... Blinks&lt;br&gt;Can also be set during operation described above.</td>
</tr>
<tr>
<td>Indoor unit</td>
<td>If ON button is pushed during operation described above, the “UH” malfunction indicator blinks.&lt;br&gt;(Returns to normal when automatic setting is complete.)</td>
</tr>
</tbody>
</table>

1.2.2 When Turning On Power the Second Time and Subsequent
Tap the RESET(BS5) button on the outdoor unit P.C.B. Operation becomes possible for about 2 minutes. If you do not push the RESET button, the unit cannot be run for up to 10 minutes to automatically set master power.

<table>
<thead>
<tr>
<th>Status</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor unit</td>
<td>Test lamp H2P .... Blinks&lt;br&gt;Can also be set during operation described above.</td>
</tr>
<tr>
<td>Indoor unit</td>
<td>If ON button is pushed during operation described above, the operation lamp lights but the compressor does not operate. (Returns to normal when automatic setting is complete.)</td>
</tr>
</tbody>
</table>
2. Outdoor Unit P.C.B. Layout

Outdoor unit P.C.B.

(1) Service monitor (LED Green)
This monitor blinks while in normal operation, and turns on or off when a malfunction occurs.

(2) Set mode display (LED Orange)
LEDs display mode according to the setting.

(3) Mode setting switch
Used to change mode.
3. Field Setting

3.1 Field Setting from Remote Controller

Individual functions of indoor unit can be changed from the remote controller. At the time of installation or after service inspection / repair, make the local setting in accordance with the following description.
An incorrect setting may cause malfunction.

3.1.1 Wired Remote Controller <BRC1D71>

If optional accessories are mounted on the indoor unit, the indoor unit setting may have to be changed. Refer to the instruction manual for each optional accessory.

![Remote Controller Diagram](image)

1. When in the normal mode, push the “ ” button (1) for 4 seconds or more, and the FIELD SET MODE is entered.
2. Select the desired MODE NO. with the “ ” button (2).
3. During group control, when setting by each indoor unit (mode No. 20, 22 and 23 have been selected), push the “ ” button (3) and select the INDOOR UNIT NO. to be set. (This operation is unnecessary when setting by group.)
4. Push the “ ” upper button (4) and select FIRST CODE NO.
5. Push the “ ” lower button (5) and select the SECOND CODE NO.
6. Push the “ ” button (6) once and the present settings are SET.
7. Push the “ ” button (7) to return to the NORMAL MODE.

- Example
When setting the filter sign time to “Filter Contamination Heavy” in all group unit setting, set the Mode No. to “10”, first code No. to “0” and second code No. to “02”.

<table>
<thead>
<tr>
<th>UNIT NO.</th>
<th>SECOND CODE NO.</th>
<th>MODE NO.</th>
<th>FIRST CODE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2P068938</td>
<td>1</td>
<td>7</td>
<td>6</td>
</tr>
</tbody>
</table>
3.1.2 Wireless Remote Controller - Indoor Unit

BRC7C812
BRC7E83
BRC7E818

1. When in the normal mode, push the \button for 4 seconds or more, and operation then enters the “field set mode.”
2. Select the desired “mode No.” with the button.
3. Pushing the button, select the first code No.
4. Pushing the button, select the second code No.
5. Push the timer button and check the settings.
6. Push the button to return to the normal mode.

(Example)
When setting the filter sign time to “Filter Contamination-Heavy” in all group unit setting, set the Mode No. to “10”, Mode setting No. to “0” and setting position No. to “02”.
### 3.1.3 Simplified Remote Controller  
**BRC2A71**

#### REMOTE CONTROLLER: NAME AND FUNCTION OF EACH SWITCH AND DISPLAY

<table>
<thead>
<tr>
<th>Button/Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ON/OFF BUTTON</strong></td>
<td>Press the button and the system will start. Press the button again and the system will stop.</td>
</tr>
<tr>
<td><strong>DISPLAY “ ” (UNDER CENTRALIZED CONTROL)</strong></td>
<td>When this display shows, the system is UNDER CENTRALIZED CONTROL. (This is not a standard specification)</td>
</tr>
<tr>
<td><strong>OPERATION LAMP (RED)</strong></td>
<td>The lamp lights up during operation. Blinks in case of stop due to malfunction.</td>
</tr>
<tr>
<td><strong>DISPLAY “ ” (CHANGEOVER UNDER CONTROL)</strong></td>
<td>It is impossible to changeover heating/cooling with the remote controller when it shows this display. (As for details, see “SETTING OF MASTER REMOTE CONTROLLER” in the installation manual attached to the indoor unit.)</td>
</tr>
<tr>
<td><strong>DISPLAY “ ” (VENTILATION/AIR CLEANING)</strong></td>
<td>This display shows that the total heat exchanger and the air cleaning unit are in operation. (These are optional accessories).</td>
</tr>
<tr>
<td><strong>DISPLAY “ ” (DEFROST / HOT START)</strong></td>
<td>Indicates that defrost or hot start (during which the fan is stopped till the temperature of air supply rises enough at the start of a heating operation) is in progress.</td>
</tr>
</tbody>
</table>
| **TEMPERATURE SETTING BUTTON** | Use this button for SETTING TEMPERATURE of the thermostat.  
  ▲ : Each press raises the set temperature by 1°F.  
  ▼ : Each press lowers the set temperature by 1°F.  
  The variable temperature range is between 60°F and 90°F. |
| **FAN SPEED CONTROL BUTTON** | Press this button to select the fan speed, HIGH or LOW, of your choice. |
| **OPERATION MODE SELECTOR BUTTON** | Press this button to select OPERATION MODE. |
| **DISPLAY “ ” (MALFUNCTION)** | Indicates malfunction and blinks if the unit stops operating due to malfunction. (As for details, see “TROUBLE SHOOTING” in the operation manual attached to the outdoor unit.) |

For the sake of explanation, all indications are shown in the figure above contrary to actual running situations.
### 3.1.4 Setting Contents and Code No. – VRV Unit

#### Field Setting Contents and Code No.

<table>
<thead>
<tr>
<th>Mode No. Note)2</th>
<th>FIRST CODE No.</th>
<th>Description of Setting</th>
<th>SECOND CODE NO. Note)3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Filter Contamination-Heavy/Light (Setting for display time to clean air filter) (Sets display time to clean air filter to half when there is heavy filter contamination.)</td>
<td>Ultra-Long-Life Type</td>
<td>Approx. 10,000 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long-Life Type</td>
<td>Approx. 5,000 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard Type</td>
<td>Approx. 2,500 hours</td>
</tr>
<tr>
<td>1</td>
<td>Long-life filter type (Setting of filter sign indication time) (Change setting when Ultra-long-life filter is installed)</td>
<td>Long-Life Filter Ultra-Long-Life Filter</td>
<td>—</td>
</tr>
<tr>
<td>2</td>
<td>Thermostat Sensor in Remote Controller</td>
<td>Use Not Use</td>
<td>—</td>
</tr>
<tr>
<td>3</td>
<td>Display Time to Clean Air Filter Calculation (Set when filter sign is not to be displayed)</td>
<td>Display Do not Display</td>
<td>—</td>
</tr>
<tr>
<td>0</td>
<td>Optional accessories output selection (field selection of output for adapter for wiring)</td>
<td>Indoor Unit Turned ON by Thermostat</td>
<td>Operation Output Malfunction Output</td>
</tr>
<tr>
<td>1</td>
<td>ON/OFF Input from Outside (Set when ON/OFF is to be controlled from outside.)</td>
<td>Forced Off ON/OFF Control</td>
<td>External Protection Device Input</td>
</tr>
<tr>
<td>2</td>
<td>Thermostat Differential Changeover (Set when remote sensor is to be used.)</td>
<td>FCQ only 2°F 1°F</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td>Power failure automatic reset (Auto Restart)</td>
<td>No equipped Equipped</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td>Field set air flow position setting</td>
<td>Draft Prevention Standard Ceiling Soiling Prevention</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td>Field set fan speed selection (fan speed control by air discharge outlet for phase control)</td>
<td>Standard Optional Accessory 1 Optional Accessory 2</td>
<td>—</td>
</tr>
</tbody>
</table>

#### Notes:
1. Settings are made simultaneously for the entire group, however, if you select the mode No. inside parentheses, you can also set by each individual unit. Setting changes however cannot be checked except in the individual mode for those in parentheses.
2. The mode numbers inside parentheses cannot be used by wireless remote controllers, so they cannot be set individually. Setting changes also cannot be checked.
3. Marked are factory set.
4. Do not make settings other than those described above. Nothing is displayed for functions the indoor unit is not equipped with.
5. "88" may be displayed to indicate the remote controller is resetting when returning to the normal mode.
### 3.1.5 Applicable Range of Field Setting

<table>
<thead>
<tr>
<th>Mode No.</th>
<th>Setting Switch No.</th>
<th>Setting Contents</th>
<th>Ceiling mounted cassette type (Multi flow)</th>
<th>Ceiling suspended type</th>
<th>Wall mounted type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>FCQ</td>
<td>FHQ</td>
<td>FAQ</td>
</tr>
<tr>
<td>10 (20)</td>
<td>0</td>
<td>Filter sign</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Ultra long life filter sign</td>
<td>O</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Remote controller thermostat sensor</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>12 (22)</td>
<td>3</td>
<td>Set fan speed when thermostat OFF</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>Airflow adjustment Ceiling height</td>
<td>O</td>
<td>O</td>
<td>—</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Airflow direction</td>
<td>O</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>13 (29)</td>
<td>3</td>
<td>Airflow direction adjustment (Down flow operation)</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Airflow direction adjustment range</td>
<td>O</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Field set fan speed selection</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

O = Available  
— = Not Available
3.1.6 Detailed Explanation of Setting Modes

Filter Sign Setting
If switching the filter sign ON time, set as given in the table below.

<table>
<thead>
<tr>
<th>Filter Spec. Setting</th>
<th>Mode No.</th>
<th>Setting Switch No.</th>
<th>Setting Position No.</th>
<th>Lighting interval of the filter sign (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contamination Light</td>
<td>10(20)</td>
<td>0</td>
<td>01</td>
<td>Standard: 200 hrs., Long Life: 2,500 hrs., Ultra Long Life Filter: 10,000 hrs.</td>
</tr>
</tbody>
</table>

Fan Speed Changeover When Thermostat is OFF
By setting to Set Fan Speed, you can switch the fan speed to the set fan speed when the heating thermostat is OFF.

∗ Since there is concern about draft if using Fan speed up when thermostat is OFF, you should take the setup location into consideration.

On warming, the priority is given to Fan speed up when thermostat is OFF over Airflow OFF on thermostat OFF.

○ This is used to correspond with the improvement of the electrical collection capability.

Setting Table

<table>
<thead>
<tr>
<th>Mode No.</th>
<th>First Code No.</th>
<th>Second Code No.</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>12(22)</td>
<td>3</td>
<td>01</td>
<td>LL Fan Speed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02</td>
<td>Set Fan Speed</td>
</tr>
</tbody>
</table>

Auto Restart after Power Failure Reset
For the air conditioners with no setting for the function (same as factory setting), the units will be left in the stop condition when the power supply is reset automatically after power failure reset or the main power supply is turned on again after once turned off. However, for the air conditioners with the setting, the units may start automatically after power failure reset or the main power supply turned on again (return to the same operation condition as that of before power failure).

For the above reasons, when the unit is set enabling to utilize Auto Restart Function after Power Failure Reset, utmost care should be paid for the occurrence of the following situation.

Caution
1. The air conditioner starts operation suddenly after power failure reset or the when the main power supply turned on again, and the user should be informed about this.
2. When servicing, turn off the main power switch to stop operation and after completion of service, turn the switch on again to restart it.
Setting of Airflow Direction Adjustment Range

Make the following air flow direction setting according to the respective purpose.

<table>
<thead>
<tr>
<th>Mode No.</th>
<th>First Code No.</th>
<th>Second Code No.</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 (23)</td>
<td>4</td>
<td>01</td>
<td>Upward (Draft prevention)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02</td>
<td>Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>03</td>
<td>Downward (Ceiling soiling prevention)</td>
</tr>
</tbody>
</table>

3.1.7 Setting of Operation Control Mode from Remote Controller (Local Setting)

The operation control mode is compatible with a variety of controls and operations by limiting the functions of the operation remote controller. Furthermore, operations such as remote controller ON/OFF can be limited in accordance with the combination conditions. Refer to information in the table on the following page.
The centralized controller is normally available for operations. (Except when the centralized monitor is connected.)

3.1.8 Contents of Control Modes

Twenty modes consisting of combinations of the following five operation modes with temperature and operation mode setting by remote controller can be set and displayed by operation modes 0 through 19.

- **ON/OFF control impossible by remote controller**
  Used when you want to turn on/off by central remote controller only.
  (Cannot be turned on/off by remote controller.)

- **OFF control only possible by remote controller**
  Used when you want to turn on by central remote controller only, and off by remote controller only.

- **Centralized**
  Used when you want to turn on by central remote controller only, and turn on/off freely by remote controller during set time.

- **Individual**
  Used when you want to turn on/off by both central remote controller and remote controller.

- **Timer operation possible by remote controller**
  Used when you want to turn on/off by remote controller during set time and you do not want to start operation by central remote controller when time of system start is programmed.
How to Select Operation Mode

Whether operation by remote controller will be possible or not for turning on/off, controlling temperature or setting operation mode is selected and decided by the operation mode shown in the right column of the following table.

Example

ON by remote controller (Unified ON by central remote controller)
OFF by remote controller (Unified OFF by central remote controller)
OFF by remote controller
Temperature control by remote controller
Operation mode setting by remote controller

Control mode is “1.”

<table>
<thead>
<tr>
<th>Control mode</th>
<th>Operation</th>
<th>OFF</th>
<th>Temperature control</th>
<th>Operation mode setting</th>
<th>Control mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON/OFF control impossible by remote controller</td>
<td>Rejection</td>
<td>Rejection</td>
<td>Acceptance</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>OFF control only possible by remote controller</td>
<td>Rejection (Example)</td>
<td>Rejection (Example)</td>
<td>Acceptance (Example)</td>
<td>1(Example)</td>
<td></td>
</tr>
<tr>
<td>Centralized</td>
<td>Rejection (Example)</td>
<td>Acceptance</td>
<td>Acceptance (Example)</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Individual</td>
<td>Acceptance</td>
<td>Acceptance</td>
<td>Acceptance</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Timer operation possible by remote controller (During timer at ON position only)</td>
<td>Acceptance</td>
<td>Rejection</td>
<td>Acceptance</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Timer operation possible by remote controller (During timer at OFF position)</td>
<td>Acceptance</td>
<td>Acceptance</td>
<td>Acceptance</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Centralized</td>
<td>Acceptance</td>
<td>Acceptance</td>
<td>Acceptance</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Individual</td>
<td>Acceptance</td>
<td>Acceptance</td>
<td>Acceptance</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Timer operation possible by remote controller (During timer at ON position only)</td>
<td>Acceptance</td>
<td>Acceptance</td>
<td>Acceptance</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Timer operation possible by remote controller (During timer at OFF position)</td>
<td>Acceptance</td>
<td>Acceptance</td>
<td>Acceptance</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

Do not select “timer operation possible by remote controller” if not using a remote controller. Operation by timer is impossible in this case.

*1. Factory setting
### 3.2 Field Setting from Outdoor Unit

#### 3.2.1 Setting by push-button switches

The following settings are made by pushbutton switches on P.C.B.

<table>
<thead>
<tr>
<th>LED display</th>
<th>H1P</th>
<th>H2P</th>
<th>H3P</th>
<th>H4P</th>
<th>H5P</th>
<th>H6P</th>
<th>H7P</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Factory setting)</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

There are the following three setting modes.

1. **Setting mode 1 (H1P off)**
   - Initial status (when normal) : Also indicates during “abnormal”.

2. **Setting mode 2 (H1P on)**
   - Used to modify the operating status and to set program addresses, etc. Usually used in servicing the system.

3. **Monitor mode (H1P blinks)**
   - Used to check the program made in Setting mode 2.

#### Mode changing procedure

Using the MODE button, the modes can be changed as follows.

- **Setting mode 1**
  - Press BS1 (MODE button) one time.
  - **(Normal)**: Push and hold the BS1 (MODE button) for 5 seconds.
  - Push the BS1 (MODE button) one time.

- **Setting mode 2**
  - Press BS1 (MODE button) for more than 5 sec.
  - **(Set)**: Select mode with BS2 (SET button) in each selection step.

- **Monitor mode**
  - Press BS1 (MODE button) one time.
  - Press BS3 (RETURN button) one time.
  - **Contents display**
    - Press BS3 (RETURN button) one time.
  - **Press BS1 (MODE button) one time.**
a. “Setting mode 1”

Normally, “Setting mode 1” is set. In case of other status, push MODE button (BS1) one time and set to “Setting mode 1”.

* The current state is displayed.

Display for malfunction/preparing/test-run

<table>
<thead>
<tr>
<th>Setting (displaying) item</th>
<th>LED display example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>● ● ○ ● ● ● ● ●</td>
</tr>
<tr>
<td>Malfunction</td>
<td>● ○ ○ ● ● ● ● ●</td>
</tr>
<tr>
<td>Preparing/Test-run</td>
<td>● ● ○ ● ● ● ● ●</td>
</tr>
</tbody>
</table>

○: ON ●: OFF ○: Blink
b. “Setting mode 2”

Push and hold the MODE button (BS1) for 5 seconds and set to “Setting mode 2”.

**<Selection of setting items>**

Push the SET button (BS2) and set the LED display to a setting item shown in the table on the right.

Push the RETURN button (BS3) and decide on the item. (The present setting condition is blinking.)

**<Selection of setting conditions>**

Push the SET button (BS2) and set to the setting condition you want.

Push the RETURN button (BS3) and decide the condition.

Push the RETURN button (BS3) and set to the initial status of “Setting mode 2”.

* If you become unsure of how to proceed, push the MODE button (BS1) and return to setting mode 1.

---

<table>
<thead>
<tr>
<th>No.</th>
<th>Setting item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Indoor unit forced fan H</td>
<td>Allows forced operation of indoor unit fan while unit is stopped. (H tap)</td>
</tr>
<tr>
<td>6</td>
<td>Indoor unit forced operation</td>
<td>Allows forced operation of indoor unit.</td>
</tr>
<tr>
<td>8</td>
<td>Te setting</td>
<td>Target evaporation temperature for cooling</td>
</tr>
<tr>
<td>9</td>
<td>Tc setting</td>
<td>Target condensation temperature for heating</td>
</tr>
<tr>
<td>10</td>
<td>Defrost changeover setting</td>
<td>Changes the temperature condition for defrost and sets to quick defrost or slow defrost.</td>
</tr>
<tr>
<td>12</td>
<td>External low noise setting / Demand setting</td>
<td>Reception of external low noise or demand signal</td>
</tr>
<tr>
<td>21</td>
<td>Refrigerant recovery / vacuuming mode setting</td>
<td>Sets to refrigerant recovery / vacuuming mode.</td>
</tr>
<tr>
<td>22</td>
<td>Night-time low noise setting</td>
<td>Sets automatic nighttime low noise operation in a simple way. The operating time is based on “Starting set” and “Ending set”.</td>
</tr>
<tr>
<td>26</td>
<td>Night-time low noise operation start setting</td>
<td>Sets starting time of nighttime low noise operation. (Night-time low noise setting is also required.)</td>
</tr>
<tr>
<td>27</td>
<td>Night-time low noise operation end setting</td>
<td>Sets ending time of nighttime low noise operation. (Night-time low noise setting is also required.)</td>
</tr>
<tr>
<td>29</td>
<td>Capacity precedence setting</td>
<td>If the capacity control is required, the low noise control is automatically activated by this setting.</td>
</tr>
<tr>
<td>30</td>
<td>Demand setting 1</td>
<td>Changes target value of power consumption when demand control 1 is input.</td>
</tr>
<tr>
<td>32</td>
<td>Normal demand setting</td>
<td>Normally enables demand control 1 without external input. Effective to prevent a problem that circuit breaker of of small capacity is shut down due to large load.</td>
</tr>
<tr>
<td>No.</td>
<td>Setting item display</td>
<td>Setting condition display</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>5</td>
<td>Indoor unit forced fan H</td>
<td>Normal operation: ON&lt;br&gt;Indoor forced fan H: OFF</td>
</tr>
<tr>
<td>6</td>
<td>Indoor unit forced operation</td>
<td>Normal operation: ON&lt;br&gt;Indoor forced operation: OFF</td>
</tr>
<tr>
<td>8</td>
<td>Te setting</td>
<td>High&lt;br&gt;Normal&lt;br&gt;Low</td>
</tr>
<tr>
<td>9</td>
<td>Tc setting</td>
<td>High&lt;br&gt;Normal&lt;br&gt;Low</td>
</tr>
<tr>
<td>10</td>
<td>Defrost changeover setting</td>
<td>Quick defrost&lt;br&gt;Normal&lt;br&gt;Slow defrost</td>
</tr>
<tr>
<td>12</td>
<td>External low noise setting / Demand setting</td>
<td>External low noise/demand: NO&lt;br&gt;External low noise/demand: YES</td>
</tr>
<tr>
<td>21</td>
<td>Refrigerant recovery / vacuming mode setting</td>
<td>Refrigerant recovery/ vacuming: OFF&lt;br&gt;Refrigerant recovery/ vacuming: ON</td>
</tr>
<tr>
<td>22</td>
<td>Night-time low noise setting</td>
<td>OFF&lt;br&gt;Level 1&lt;br&gt;Level 2&lt;br&gt;Level 3</td>
</tr>
<tr>
<td>26</td>
<td>Night-time low noise start setting</td>
<td>About PM 8:00&lt;br&gt;About PM 10:00&lt;br&gt;About PM 0:00</td>
</tr>
<tr>
<td>27</td>
<td>Night-time low noise end setting</td>
<td>About AM 6:00&lt;br&gt;About AM 7:00&lt;br&gt;About AM 8:00</td>
</tr>
<tr>
<td>29</td>
<td>Capacity precedence setting</td>
<td>OFF&lt;br&gt;ON</td>
</tr>
<tr>
<td>30</td>
<td>Demand setting 1</td>
<td>60 % demand&lt;br&gt;70 % demand&lt;br&gt;80 % demand</td>
</tr>
<tr>
<td>32</td>
<td>Normal demand setting</td>
<td>OFF&lt;br&gt;ON</td>
</tr>
</tbody>
</table>
### c. Monitor mode

To enter the monitor mode, push the MODE button (BS1) when in “Setting mode 1”.

**<Selection of setting item>**

Push the SET button (BS2) and set the LED display to a setting item.

**<Confirmation on setting contents>**

Push the RETURN button (BS3) to display different data of set items.

Push the RETURN button (BS3) and switches to the initial status of “Monitor mode”.

* Push the MODE button (BS1) and returns to “Setting mode 1”.

#### Setting item 0 Display contents of “Various settings”

<table>
<thead>
<tr>
<th>No.</th>
<th>Setting item</th>
<th>LED display</th>
<th>Data display</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Various settings</td>
<td><img src="image" alt="LED Display" /></td>
<td>See below</td>
</tr>
<tr>
<td>5</td>
<td>Number of connected indoor units</td>
<td><img src="image" alt="LED Display" /></td>
<td>Lower 6 digits</td>
</tr>
<tr>
<td>14</td>
<td>Contents of malfunction (the latest)</td>
<td><img src="image" alt="LED Display" /></td>
<td>Malfunction code table</td>
</tr>
<tr>
<td>15</td>
<td>Contents of malfunction (1 cycle before)</td>
<td><img src="image" alt="LED Display" /></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Contents of malfunction (2 cycle before)</td>
<td><img src="image" alt="LED Display" /></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Contents of retry (the latest)</td>
<td><img src="image" alt="LED Display" /></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Contents of retry (1 cycle before)</td>
<td><img src="image" alt="LED Display" /></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Contents of retry (2 cycle before)</td>
<td><img src="image" alt="LED Display" /></td>
<td></td>
</tr>
</tbody>
</table>

#### Defrost select setting

- Short
- Medium
- Long

#### Te setting

- H
- M
- L

#### Tc setting

- H
- M
- L

Push the SET button and match with the LEDs No. 1 - 15, push the RETURN button, and enter the data for each setting.

★ Data such as addresses and number of units is expressed as binary numbers; the two ways of expressing are as follows:

The No. 5 cool/heat unified address is expressed as a binary number consisting of the lower 6 digits. (0 - 63)

In (1) the address is 000110 (binary number), which translates to 4 + 2 = 6 (base 10 number). In other words, the address is 6.
3.3 Detail of Setting Mode
3.3.1 Cool / Heat Mode Switching

The Cool / Heat Mode switching is carried out by remote controller fitted to indoor unit. This setting is not required for normal operation. (Factory set)

3.3.2 Setting of Low Noise Operation and Demand Operation

Setting of Low Noise Operation

By setting the low noise operation input to the outdoor unit P.C.B., you can lower operating noise by 2-3 dB.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode 1</td>
<td>Set the outdoor unit fan to Step 6 or lower.</td>
</tr>
<tr>
<td>Mode 2</td>
<td>Set the outdoor unit fan to Step 5 or lower.</td>
</tr>
<tr>
<td>Mode 3</td>
<td>Set the outdoor unit fan to Step 4 or lower.</td>
</tr>
</tbody>
</table>

The low noise operation is carried out automatically at night. (The external control adapter for the outdoor unit is not required.)

1. While in “Setting mode 2”, select the setting condition (i.e., "Mode 1", "Mode 2", or "Mode 3") for set item No. 22 (Setting of nighttime low noise level).
2. If necessary, while in "Setting mode 2", select the setting condition (i.e., "PM 8:00", "PM 10:00", or "PM 0:00") for set item No. 26 (Setting of start time of nighttime low noise operation).
   (Use the start time as a guide since it is estimated according to outdoor temperatures.)
3. If necessary, while in "Setting mode 2", select the setting condition (i.e., "AM 6:00", "AM 7:00", or "AM 8:00") for set item No. 27 (Setting of end time of nighttime low noise operation).
   (Use the end time as a guide since it is estimated according to outdoor temperatures.)
4. If necessary, while in "Setting mode 2", set the setting condition for set item No. 29 (Setting of capacity precedence) to "ON".
   (If the condition is set to "ON", when the air-conditioning load reaches a high level, the system will be put into normal operation mode even during nighttime.)

Image of operation

Test Operation
Setting of Demand Operation

By setting the demand input to the outdoor unit P.C.B., the power consumption of unit operation can be saved suppressing the compressor operating condition.

**[Demand setting]**

<table>
<thead>
<tr>
<th>Setting</th>
<th>Standard for upper limit of power consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand setting 1</td>
<td>Approx. 60%</td>
</tr>
<tr>
<td>Demand setting 2 (factory setting)</td>
<td>Approx. 70%</td>
</tr>
<tr>
<td>Demand setting 3</td>
<td>Approx. 80%</td>
</tr>
</tbody>
</table>

The normal demand operation is carried out. (Use of the external control adapter for outdoor unit is not required.)

1. Set the "Normal demand setting" on the outdoor unit P.C.B.
2. If the "Normal demand setting" is set to the "ON", set the "Demand 1 setting" on the outdoor unit P.C.B., as the need arises.
   (During the normal demand level 1 operation, the power consumption can be saved to 80 %, 70 % or 60 % of the rated value respectively.)

**Image of operation**

- Power consumption
- Forced thermostat OFF (Fan operation)

When the "Normal demand setting" is set to ON ("OFF" has been set at factory), the power consumption can be set with the "Demand 1 level setting". ("70 % of rated power consumption" has been set at factory.)

**Detailed Setting Procedure of Low Noise Operation and Demand Control**

1. **Setting mode 1 (H1P off)**
   ① In setting mode 2, push the BS1 (MODE button) one time. → Setting mode 1 is entered and H1P off.
   
   During the setting mode 1 is displayed, “In low noise operation” and “In demand control” are displayed.

2. **Setting mode 2 (H1P on)**
   ① In setting 1, push and hold the BS1 (MODE button) for more than 5 seconds. → Setting mode 2 is entered and H1P lights.
   ② Push the BS2 (SET button) several times and match the LED display with the Setting No. you want.
   ③ Push the BS3 (RETURN button) one time, and the present setting content is displayed.
      → Push the BS2 (SET button) several times and match the LED display with the setting content (as shown on next page) you want.
   ④ Push the BS3 (RETURN button) two times. → Returns to ①.
   ⑤ Push the BS1 (MODE button) one time. → Returns to the setting mode 1 and turns H1P off.
<table>
<thead>
<tr>
<th>Setting No.</th>
<th>Setting contents</th>
<th>Setting No. indication</th>
<th>Setting No. indication</th>
<th>Setting contents indication (Initial setting)</th>
<th>Setting contents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>H1P</td>
<td>H2P</td>
<td>H3P</td>
<td>H4P</td>
</tr>
<tr>
<td>12</td>
<td>External low noise / Demand setting</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>22</td>
<td>Night-time low noise setting</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mode 1</td>
<td>Mode 1</td>
<td>Mode 1</td>
<td>Mode 1</td>
</tr>
<tr>
<td>26</td>
<td>Night-time low noise start setting</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM 10:00</td>
<td>PM 10:00</td>
<td>PM 10:00</td>
<td>PM 10:00</td>
</tr>
<tr>
<td>27</td>
<td>Night-time low noise end setting</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AM 7:00</td>
<td>AM 7:00</td>
<td>AM 7:00</td>
<td>AM 7:00</td>
</tr>
<tr>
<td>29</td>
<td>Capacity precedence setting</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capacity precedence</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>30</td>
<td>Demand setting 1</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>70 % of rated power consumption (Factory setting)</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>32</td>
<td>Normal demand setting</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>

O: ON  ●: OFF  ●: Blink
3.3.3 Setting of Refrigerant Recovery Mode

When carrying out the refrigerant collection on site, fully open the respective expansion valves of indoor and outdoor units.
Both the outdoor unit and the indoor unit cannot be operated at this time.

[Operation procedure]
① In setting mode 2 with units in stop mode, set Refrigerant Recovery / Vacuuming mode to ON. The respective expansion valve of indoor and outdoor units are fully opened. (H2P turns to display TEST OPERATION (blinks), TEST OPERATION and UNDER CENTRALIZED CONTROL are displayed on the remote controller, and the operation is prohibited.
② Collect the refrigerant using a refrigerant recovery unit. (See the instruction attached to the refrigerant recovery unit for more detail.)
③ Press Mode button BS1 once and reset Setting Mode 2.

3.3.4 Setting of Vacuuming Mode

In order to perform vacuuming operation at site, fully open the expansion valves of indoor and outdoor units to turn on some solenoid valves.
Both the outdoor unit and the indoor unit cannot be operated at this time.

[Operating procedure]
① With Setting Mode 2 while the unit stops, set Refrigerant recovery / Vacuuming mode to ON. The expansion valves of indoor and outdoor units fully open and some of solenoid valves open.
(H2P blinks to indicate the test operation, and the remote controller displays TEST OPERATION and UNDER CENTRALIZED CONTROL, thus prohibiting operation.)
After setting, do not cancel Setting Mode 2 until completion of Vacuuming operation.
② Use the vacuum pump to perform vacuuming operation.
③ Press Mode button BS1 once and reset Setting Mode 2.
3.3.5 Check Operation

To prevent any trouble in the period of installation at site, the system is provided with a test operation mode enabling checks for incorrect wiring, stop valve left closed, and automatic determination of piping length.

CHECK OPERATION FUNCTION

Unit stopping

Step 1 Pressure equalizing

Press the TEST button (BS4) for 5 seconds.

10 sec to 10 minutes

Step 2 Cooling start control

20 sec to 2 minutes

Step 3 Stability waiting operation

10 minutes

Step 4-6 Judgement function

- Stop valve close check
- Wrong wiring check
- Piping length check

3 minutes

Step 7 Pump down residual operation

To 30 seconds

Step 8 Standby for restarting

5 minutes

Completion

LED display (H1P～H7P) (○:ON ●:BLINK ●:OFF)

- Step 1: ●●●●●●●
- Step 2: ●●●●●●●
- Step 3: ●●●●●●●
- Step 4-6: ●●●●●●●
- Step 7: ●●●●●●●
- Step 8: ●●●●●●●

Completion
Part 7
Troubleshooting

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# 1. Symptom-based Troubleshooting

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<th></th>
<th>Symptom</th>
<th>Supposed Cause</th>
<th>Countermeasure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The system does not start operation at all.</td>
<td>Blowout of fuse(s)</td>
<td>Turn Off the power supply and then replace the fuse(s).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cutout of breaker(s)</td>
<td>• If the knob of any breaker is in its OFF position, turn ON the power supply.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• If the knob of any circuit breaker is in its tripped position, do not turn ON the power supply.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Power failure</td>
<td>After the power failure is reset, restart the system.</td>
</tr>
<tr>
<td>2</td>
<td>The system starts operation but makes an immediate stop.</td>
<td>Blocked air inlet or outlet of indoor or outdoor unit</td>
<td>Remove obstacle(s).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clogged air filter(s)</td>
<td>Clean the air filter(s).</td>
</tr>
<tr>
<td>3</td>
<td>The system does not cool or heat air well.</td>
<td>Blocked air inlet or outlet of indoor or outdoor unit</td>
<td>Remove obstacle(s).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clogged air filter(s)</td>
<td>Clean the air filter(s).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enclosed outdoor unit(s)</td>
<td>Remove the enclosure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improper set temperature</td>
<td>Set the temperature to a proper degree.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Airflow rate set to &quot;LOW&quot;</td>
<td>Set it to a proper airflow rate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improper direction of air diffusion</td>
<td>Set it to a proper direction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open window(s) or door(s)</td>
<td>Shut it tightly.</td>
</tr>
<tr>
<td></td>
<td>[In cooling]</td>
<td>Direct sunlight received</td>
<td>Hang curtains or shades on windows.</td>
</tr>
<tr>
<td></td>
<td>[In cooling]</td>
<td>Too many persons staying in a room</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[In cooling]</td>
<td>Too many heat sources (e.g. OA equipment) located in a room</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>The system does not operate.</td>
<td>If the OPERATION lamp on the remote controller turns ON, the system will be normal. These symptoms indicate that the system is controlled so as not to put unreasonable loads on the system.</td>
<td>Normal operation. The system will automatically start operation after a lapse of five minutes.</td>
</tr>
<tr>
<td></td>
<td>The system stops and immediately restarts operation.</td>
<td>The system is controlled with centralized controller. Blinking display indicates that the system cannot be operated using the remote controller.</td>
<td>Operate the system using the COOL/HEAT centralized remote controller.</td>
</tr>
<tr>
<td></td>
<td>Pressing the TEMP ADJUST button immediately resets the system.</td>
<td>The system is in preparation mode of micro computer operation.</td>
<td>Wait for a period of approximately one minute.</td>
</tr>
<tr>
<td></td>
<td>The remote controller displays &quot;UNDER CENTRALIZED CONTROL&quot;, which blinks for a period of several seconds when the OPERATION button is depressed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>The system makes intermittent stops.</td>
<td>The system stops due to an interruption in communication between units caused by electrical noises coming from equipment other than air conditioners.</td>
<td>Remove causes of electrical noises. If these causes are removed, the system will automatically restart operation.</td>
</tr>
<tr>
<td>#</td>
<td>Symptom</td>
<td>Supposed Cause</td>
<td>Countermeasure</td>
</tr>
<tr>
<td>----</td>
<td>--------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>6</td>
<td>COOL-HEAT selection is disabled.</td>
<td>The remote controller displays &quot;UNDER CENTRALIZED CONTROL&quot;.</td>
<td>Use a remote controller with option to select cooling operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The remote controller displays &quot;UNDER CENTRALIZED CONTROL&quot;, and the COOL-HEAT selection remote controller is provided.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>COOL-HEAT selection is made using the COOL-HEAT selection remote controller.</td>
<td>Use the COOL-HEAT selection remote controller to select cool or heat.</td>
</tr>
<tr>
<td>7</td>
<td>The system conducts fan operation but not cooling or heating operation.</td>
<td>This symptom occurs immediately after turning ON the power supply.</td>
<td>Wait for a period of approximately 10 minutes.</td>
</tr>
<tr>
<td>8</td>
<td>The airflow rate is not reproduced according to the setting.</td>
<td>Even pressing the AIRFLOW RATE SET button makes no changes in the airflow rate.</td>
<td>Normal operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In heating operation, when the room temperature reaches the set degree, the outdoor unit will stop while the indoor unit is brought to fan LL operation so that no one gets cold air. Furthermore, if fan operation mode is selected when other indoor unit is in heating operation, the system will be brought to fan LL operation. (The fan LL operation is also enabled while in oil return mode in cooling operation.)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>The airflow direction is not reproduced according to the setting.</td>
<td>The airflow direction is not corresponding to that displayed on the remote controller.</td>
<td>Normal operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The fin does not swing.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>A white mist comes out from the system.</td>
<td>&lt;Indoor unit&gt; In cooling operation, the ambient humidity is high. (This indoor unit is installed in a place with a lot of oil or dust.)</td>
<td>Clean the inside of the indoor unit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;Indoor unit&gt; Immediately after cooling operation stopping, the ambient temperature and humidity are low.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;Indoor and outdoor units&gt; After the completion of defrosting operation, the system is switched to heating operation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uneven temperature distribution due to heavy stain of the inside of the indoor unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hot gas (refrigerant) flowing in the indoor unit becomes vapor from the unit.</td>
<td>Normal operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Defrosted moisture turns to vapor emitting from the units.</td>
<td>Normal operation.</td>
</tr>
<tr>
<td>Symptom</td>
<td>Supposed Cause</td>
<td>Countermeasure</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>----------------</td>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td>11 The system produces sounds.</td>
<td><strong>&lt;Indoor unit&gt;</strong> Immediately after turning ON the power supply, indoor unit produces &quot;ringing&quot; sounds.</td>
<td>These are operating sounds of the electronic expansion valve of the indoor unit.</td>
<td>Normal operation. This sound becomes low after a lapse of approximately one minute.</td>
</tr>
<tr>
<td></td>
<td><strong>&lt;Indoor and outdoor units&gt;</strong> &quot;Hissing&quot; sounds are continuously produced while in cooling or defrosting operation.</td>
<td>These sounds are produced from gas (refrigerant) flowing respectively through the indoor and outdoor units.</td>
<td>Normal operation.</td>
</tr>
<tr>
<td></td>
<td><strong>&lt;Indoor and outdoor units&gt;</strong> &quot;Hissing&quot; sounds are produced immediately after the startup or stop of the system, or the startup or stop of defrosting operation.</td>
<td>These sounds are produced when the gas (refrigerant) stops or changes flowing direction.</td>
<td>Normal operation.</td>
</tr>
<tr>
<td></td>
<td><strong>&lt;Indoor unit&gt;</strong> Faint sounds are continuously produced while in cooling operation or after stopping the operation.</td>
<td>These sounds are produced from the drain discharge device in operation.</td>
<td>Normal operation.</td>
</tr>
<tr>
<td></td>
<td><strong>&lt;Indoor unit&gt;</strong> &quot;Creaking&quot; sounds are produced while in heating operation or after stopping the operation.</td>
<td>These sounds are produced from resin parts expanding and contracting with temperature changes.</td>
<td>Normal operation.</td>
</tr>
<tr>
<td></td>
<td><strong>&lt;Indoor unit&gt;</strong> Sounds like &quot;trickling&quot; or the like are produced from indoor units in the stopped state.</td>
<td>On VRV systems, these sounds are produced when other indoor units in operation. The reason is that the system runs in order to prevent oil or refrigerant from dwelling.</td>
<td>Normal operation.</td>
</tr>
<tr>
<td></td>
<td><strong>&lt;Outdoor unit&gt;</strong> Pitch of operating sounds changes.</td>
<td>The reason is that the compressor changes the operating frequency.</td>
<td>Normal operation.</td>
</tr>
<tr>
<td>12 Dust emits from the system.</td>
<td>Dust emits from the system when it restarts after the stop for an extended period of time.</td>
<td>Dust, which has deposited on the inside of indoor unit, is blown out from the system.</td>
<td>Normal operation.</td>
</tr>
<tr>
<td>13 Odors emits from the system.</td>
<td>In operation Odors of room, such as cigarette smoke, are absorbed to the inside of indoor unit and are then blown out.</td>
<td>The inside of the indoor unit should be cleaned.</td>
<td></td>
</tr>
<tr>
<td>14 Outdoor unit fan does not rotate.</td>
<td>In operation The reason is that fan revolutions are controlled to put the operation to the optimum state.</td>
<td>Normal operation.</td>
<td></td>
</tr>
<tr>
<td>15 LCD display &quot;88&quot; appears on the remote controller.</td>
<td>Immediately after turning ON the power supply The reason is that the system is checking to be sure the remote controller is normal.</td>
<td>Normal operation. This code is displayed for a period of approximately one minute at maximum.</td>
<td></td>
</tr>
<tr>
<td>16 The outdoor unit compressor or the outdoor unit fan does not stop.</td>
<td>After stopping operation It stops in order to prevent oil or refrigerant from dwelling.</td>
<td>Normal operation. It stops after a lapse of approximately 5 to 10 minutes.</td>
<td></td>
</tr>
<tr>
<td>17 The outdoor gets hot.</td>
<td>While stopping operation The reason is that the compressor is warmed up to provide smooth startup of the system.</td>
<td>Normal operation.</td>
<td></td>
</tr>
<tr>
<td>18 Hot air comes out from the system even though it stops.</td>
<td>Hot air is felt while the system stops. On VRV systems, small quantity of refrigerant is fed to indoor units in the stopped state when other indoor units are in operation.</td>
<td>Normal operation.</td>
<td></td>
</tr>
<tr>
<td>19 The system does not cool air well.</td>
<td>The system is in dry operation. The reason is that the dry operation serves not to reduce the room temperature where possible.</td>
<td>Change the system to cooling operation.</td>
<td></td>
</tr>
</tbody>
</table>
2. Troubleshooting by Remote Controller

2.1 The INSPECTION / TEST Button

The following modes can be selected by using the [Inspection/Test Operation] button on the remote control.

- **Normal mode**
  - Push the **Inspection/Test Operation** button once.
  - After 10 seconds

- **Inspection mode**
  - Push the **Inspection/Test Operation** button once.

- **Test operation mode**
  - Push the **Inspection/Test Operation** button once.

- **Local setting mode**
  - Depress the **Inspection/Test Operation** button for more than 4 seconds.

- **Service mode**
  - Service data can be obtained.
    - Malfunction code history
    - Temperature data of various sections
  - Service settings can be made.
    - Forced fan ON
    - Airflow direction/volume setting

Indoor unit settings can be made:
- Filter sign time
- Airflow direction
- Others

Following codes can be checked:
- Malfunction codes
- Indoor model code
- Outdoor model code

Service data can be obtained:
- Malfunction code history
- Temperature data of various sections

Service settings can be made:
- Forced fan ON
- Airflow direction/volume setting

Thermostat is forcibly turned on.
2.2 Self-diagnosis by Wired Remote Controller

**Explanation**
If operation stops due to malfunction, the remote controller’s operation LED blinks, and the malfunction code is displayed. (Even if stop operation is carried out, malfunction contents are displayed when the inspection mode is entered.) The malfunction code enables you to tell what kind of malfunction caused operation to stop. Refer to P.79 for malfunction code and malfunction contents.

**Note:**
1. Pressing the **INSPECTION/TEST** button will blink the check indication.
2. While in check mode, pressing and holding the **ON/OFF** button for a period of five seconds or more will clear the failure history indication shown above. In this case, on the codes displayed, the malfunction code will blink twice and then change to “00” (=Normal), the Unit No. will change to “0”, and the operation mode will automatically switch from check mode to normal mode (displaying the set temperature).
2.3 Self-diagnosis by Wireless Remote Controller

In the Case of

BRC7C Type
BRC7E Type
BRC4C Type

If equipment stops due to a malfunction, the operation indicating LED on the light reception section flashes.

The malfunction code can be determined by following the procedure described below. The malfunction code is displayed when an operation error has occurred. In normal condition, the malfunction code of the last problem is displayed.

1. Push the INSPECTION/TEST button to select “Inspection.”
   The equipment enters the inspection mode. The “Unit” indication lights and the Unit No. display shows flashing “0” indication.
2. Set the Unit No.
   Push the UP or DOWN button and change the Unit No. display until the buzzer (*1) is generated from the indoor unit.
*1 Number of beeps
3 short beeps : Conduct all of the following operations.
1 short beep : Conduct steps 3 and 4.
Continue the operation in step 4 until a buzzer remains ON. The continuous buzzer indicates that the malfunction code is confirmed.

Continuous beep : No abnormality.
3. Push the MODE selector button.
   The left “0” (upper digit) indication of the malfunction code flashes.
4. Malfunction code upper digit diagnosis
   Push the UP or DOWN button and change the malfunction code upper digit until the malfunction code matching buzzer (*2) is generated.
   The upper digit of the code changes as shown below when the UP and DOWN buttons are pushed.

*2 Number of beeps
Continuous beep : Both upper and lower digits matched. (Malfunction code confirmed)
2 short beeps : Upper digit matched.
1 short beep : Lower digit matched.
5. Push the MODE selector button.
   The right “0” (lower digit) indication of the malfunction code flashes.
6. Malfunction code lower digit diagnosis
   Push the UP or DOWN button and change the malfunction code lower digit until the continuous malfunction code matching buzzer (*2) is generated.
The lower digit of the code changes as shown below when the UP and DOWN buttons are pressed.

![Diagram showing remote controller with arrows pointing to buttons labeled "Advance" and "Backward"]
Normal status
Enters inspection mode from normal status when the INSPECTION/TEST button is pressed.

1. Press INSPECTION/TEST button.

If no button is pressed for 1 minute, equipment returns to normal status.

3. Press MODE selector button.

When MODE selector button is pressed or no button is pressed for 1 minute, equipment returns to normal status.

If no button is pressed for 1 minute, equipment returns to normal status.

5. Press MODE selector button.
2.4 Operation of the Remote Controller’s Inspection / Test Operation Button

Normal display (No display)

Push the button.

Inspection/test operation

Unit
Malfunction code 0
Inspection

Inspection mode

Push the button.

Inspection/test operation

Indoor unit model code display

Example of capacity code display

<table>
<thead>
<tr>
<th>Example model</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCQ18</td>
<td>056</td>
</tr>
<tr>
<td>FHQ30</td>
<td>090</td>
</tr>
</tbody>
</table>

Indoor unit system code

- Display | Product classification | System classification |
- 04 | VRV system | (VAV indoor unit) |
- 02 | VRV system | Outdoor air processing unit |
- F | VRV system | Standard indoor unit |
- H | VRV system | New ceiling suspended cassette |

Indoor unit type code

- Display | Type | Model |
- A | Wall mounted | FAQ |
- C | Multi flow | FCQ |
- H | Ceiling suspended | FHQ |

Outdoor unit model code

- Display | Type | Model |
- A8 | Split system | RZQ-P |
2.5 Remote Controller Service Mode

How to Enter the Service Mode

1. Select the mode No.
   Set the desired mode No. with the button. (For wireless remote controller, Mode 43 only can be set.)

2. Select the unit No. (For group control only)
   Select the indoor unit No. to be set with the time mode button. (For wireless remote controller, button.)

3. Make the settings required for each mode. (Modes 41, 44, 45)
   In case of Mode 44, 45, push the button to be able to change setting before setting work. (LCD “code” blinks.)
   For details, refer to the table in next page.

4. Define the setting contents. (Modes 44, 45)
   Define by pushing the timer button.
   After defining, LCD “code” changes blinking to ON.

5. Return to the normal operation mode.
   Push the button one time.
<table>
<thead>
<tr>
<th>Mode No.</th>
<th>Function</th>
<th>Contents and operation method</th>
<th>Remote controller display example</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>Malfunction hysteresis display</td>
<td>Display malfunction history. The history No. can be changed with the button.</td>
<td>Unit 1 Malfunction code 2-U4 History No: 1 - 9 1: Latest</td>
</tr>
<tr>
<td>41</td>
<td>Display of sensor and address data</td>
<td>Display various types of data. Select the data to be displayed with the button. Sensor data 0: Thermostat sensor in remote controller. 1: Suction 2: Liquid pipe 3: Gas pipe Address data 4: Indoor unit address 5: Outdoor unit address 6: BS unit address 7: Zone control address 8: Cool/heat group address 9: Demand / low noise address</td>
<td>Unit No. Sensor type 1 1 2 7 Temperature ºC Unit No. Address type 1 8 Address 1</td>
</tr>
<tr>
<td>43</td>
<td>Forced fan ON</td>
<td>Manually turn the fan ON by each unit. (When you want to search for the unit No.) By selecting the unit No. with the button, you can turn the fan of each indoor unit on (forced ON) individually.</td>
<td>Unit 1</td>
</tr>
<tr>
<td>44</td>
<td>Individual setting</td>
<td>Set the fan speed and airflow direction by each unit Select the unit No. with the time mode button. Set the fan speed with the button. Set the airflow direction with the button.</td>
<td>Unit 1 Code 1 3 Fan speed 1: Low 3: High Airflow direction P0 - P4</td>
</tr>
<tr>
<td>45</td>
<td>Unit No. transfer</td>
<td>Transfer unit No. Select the unit No. with the button. Set the unit No. after transfer with the button.</td>
<td>Present unit No. Unit No. after transfer 0 2</td>
</tr>
</tbody>
</table>
2.6 Remote Controller Self-Diagnosis Function

The remote controller switches are equipped with a self-diagnosis function so that more appropriate maintenance can be carried out. If a malfunction occurs during operation, the operation lamp, malfunction code and display of malfunctioning unit No. let you know the contents and location of the malfunction.

When there is a stop due to malfunction, the contents of the malfunction given below can be diagnosed by a combination of operation lamp, INSPECTION display of the liquid crystal display, and display of malfunction code. It also lets you know the unit No. during group control.
<table>
<thead>
<tr>
<th>Malfunction code</th>
<th>Operation lamp</th>
<th>Inspection display</th>
<th>Unit No.</th>
<th>Malfunction contents</th>
<th>Page Referred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor Unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A0</td>
<td></td>
<td></td>
<td></td>
<td>Error of external protection device</td>
<td>85</td>
</tr>
<tr>
<td>A1</td>
<td></td>
<td></td>
<td></td>
<td>P.C.B. defect, E² PROM defect</td>
<td>86</td>
</tr>
<tr>
<td>A3</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of drain level control system (S1L)</td>
<td>87</td>
</tr>
<tr>
<td>A6</td>
<td></td>
<td></td>
<td></td>
<td>Fan motor (M1F) lock, overload</td>
<td>89</td>
</tr>
<tr>
<td>A7</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of louver motor (M1S)</td>
<td>90</td>
</tr>
<tr>
<td>A9</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of moving part of electronic expansion valve (Y1E)</td>
<td>92</td>
</tr>
<tr>
<td>AF</td>
<td></td>
<td></td>
<td></td>
<td>Drain level above limit</td>
<td>94</td>
</tr>
<tr>
<td>AJ</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of capacity determination device</td>
<td>95</td>
</tr>
<tr>
<td>C4</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of thermistor (R2T) for heat exchanger (loose connection, disconnection, short circuit, failure)</td>
<td>96</td>
</tr>
<tr>
<td>C5</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of thermistor (R3T) for gas pipes (loose connection, disconnection, short circuit, failure)</td>
<td>97</td>
</tr>
<tr>
<td>C9</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of thermistor (R1T) for suction air (loose connection, disconnection, short circuit, failure)</td>
<td>98</td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of thermistor for discharge air (loose connection, disconnection, short circuit, failure)</td>
<td>99</td>
</tr>
<tr>
<td>CJ</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of thermostat sensor in remote controller</td>
<td>100</td>
</tr>
<tr>
<td>Outdoor Unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E1</td>
<td></td>
<td></td>
<td></td>
<td>P.C.B. defect</td>
<td>101</td>
</tr>
<tr>
<td>E3</td>
<td></td>
<td></td>
<td></td>
<td>Actuation of high pressure switch</td>
<td>102</td>
</tr>
<tr>
<td>E4</td>
<td></td>
<td></td>
<td></td>
<td>Actuation of low pressure sensor</td>
<td>104</td>
</tr>
<tr>
<td>E5</td>
<td></td>
<td></td>
<td></td>
<td>Inverter compressor motor lock</td>
<td>106</td>
</tr>
<tr>
<td>E6</td>
<td></td>
<td></td>
<td></td>
<td>Standard compressor lock or overcurrent</td>
<td>—</td>
</tr>
<tr>
<td>E7</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of outdoor unit fan motor</td>
<td>108</td>
</tr>
<tr>
<td>E9</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of moving part of electronic expansion valve (Y1E)</td>
<td>109</td>
</tr>
<tr>
<td>F3</td>
<td></td>
<td></td>
<td></td>
<td>Abnormal discharge pipe temperature</td>
<td>111</td>
</tr>
<tr>
<td>F6</td>
<td></td>
<td></td>
<td></td>
<td>Refrigerant overcharged</td>
<td>112</td>
</tr>
<tr>
<td>H3</td>
<td></td>
<td></td>
<td></td>
<td>Failure of high pressure switch</td>
<td>—</td>
</tr>
<tr>
<td>H4</td>
<td></td>
<td></td>
<td></td>
<td>Actuation of low pressure switch</td>
<td>—</td>
</tr>
<tr>
<td>H7</td>
<td></td>
<td></td>
<td></td>
<td>Abnormal outdoor fan motor signal</td>
<td>—</td>
</tr>
<tr>
<td>H9</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of thermistor (R1T) for outdoor air (loose connection, disconnection, short circuit, failure)</td>
<td>113</td>
</tr>
<tr>
<td>J2</td>
<td></td>
<td></td>
<td></td>
<td>Current sensor malfunction</td>
<td>—</td>
</tr>
<tr>
<td>J3</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of discharge pipe thermistor (R2T) (loose connection, disconnection, short circuit, failure)</td>
<td>114</td>
</tr>
<tr>
<td>J5</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of thermistor (R3T, R5T) for suction pipe 1,2 (loose connection, disconnection, short circuit, failure)</td>
<td>115</td>
</tr>
<tr>
<td>J6</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of thermistor (R4T) for outdoor unit heat exchanger (loose connection, disconnection, short circuit, failure)</td>
<td>116</td>
</tr>
<tr>
<td>JA</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of high pressure sensor</td>
<td>117</td>
</tr>
<tr>
<td>JC</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of low pressure sensor</td>
<td>119</td>
</tr>
<tr>
<td>L0</td>
<td></td>
<td></td>
<td></td>
<td>Inverter system error</td>
<td>—</td>
</tr>
<tr>
<td>L1</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of P.C.B.</td>
<td>121</td>
</tr>
<tr>
<td>L4</td>
<td></td>
<td></td>
<td></td>
<td>Malfunction of inverter radiating fin temperature rise</td>
<td>122</td>
</tr>
<tr>
<td>L5</td>
<td></td>
<td></td>
<td></td>
<td>Inverter compressor abnormal</td>
<td>123</td>
</tr>
<tr>
<td>L8</td>
<td></td>
<td></td>
<td></td>
<td>Inverter current abnormal</td>
<td>124</td>
</tr>
<tr>
<td>L9</td>
<td></td>
<td></td>
<td></td>
<td>Inverter start up error</td>
<td>126</td>
</tr>
</tbody>
</table>
## Troubleshooting by Remote Controller

<table>
<thead>
<tr>
<th>Malfunction code</th>
<th>Operation lamp</th>
<th>Inspection display</th>
<th>Unit No.</th>
<th>Malfunction contents</th>
<th>Page Referred</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outdoor Unit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LA</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Malfunction of power unit</td>
<td>—</td>
</tr>
<tr>
<td>LC</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Malfunction of transmission between inverter and control P.C.B.</td>
<td>127</td>
</tr>
<tr>
<td>P4</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Malfunction of inverter radiating fin temperature rise sensor</td>
<td>128</td>
</tr>
<tr>
<td><strong>System</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U0</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>Low pressure drop due to refrigerant shortage or electronic expansion valve failure</td>
<td>129</td>
</tr>
<tr>
<td>U1</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>Reverse phase / open phase</td>
<td>—</td>
</tr>
<tr>
<td>U2</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>Power supply insufficient or instantaneous failure</td>
<td>131</td>
</tr>
<tr>
<td>U3</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>Check operation not executed</td>
<td>133</td>
</tr>
<tr>
<td>U4</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>Malfunction of transmission between indoor units and outdoor units</td>
<td>134</td>
</tr>
<tr>
<td>U5</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>Malfunction of transmission between remote controller and indoor unit</td>
<td>136</td>
</tr>
<tr>
<td>U5</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>Failure of remote controller P.C.B. or setting during control by remote controller</td>
<td>136</td>
</tr>
<tr>
<td>U7</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>Malfunction of transmission between outdoor units</td>
<td>—</td>
</tr>
<tr>
<td>U8</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>Malfunction of transmission between main and sub remote controllers (malfunction of sub remote controller)</td>
<td>137</td>
</tr>
<tr>
<td>UE</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>Malfunction of transmission between centralized remote controller and indoor unit</td>
<td>138</td>
</tr>
<tr>
<td>UF</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>System is not set</td>
<td>140</td>
</tr>
<tr>
<td>UH</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>Malfunction of system, refrigerant system address undefined</td>
<td>141</td>
</tr>
<tr>
<td><strong>Centralized Remote Controller and Schedule Timer</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UE</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>Malfunction of transmission between centralized remote controller and indoor unit</td>
<td>143</td>
</tr>
<tr>
<td>M1</td>
<td>○ or ●</td>
<td>○</td>
<td>●</td>
<td>P.C.B. defect</td>
<td>145</td>
</tr>
<tr>
<td>M8</td>
<td>○ or ●</td>
<td>○</td>
<td>○</td>
<td>Malfunction of transmission between optional controllers for centralized control</td>
<td>146</td>
</tr>
<tr>
<td>MA</td>
<td>○ or ●</td>
<td>○</td>
<td>○</td>
<td>Improper combination of optional controllers for centralized control</td>
<td>147</td>
</tr>
<tr>
<td>MC</td>
<td>○ or ●</td>
<td>○</td>
<td>○</td>
<td>Address duplication, improper setting</td>
<td>149</td>
</tr>
<tr>
<td><strong>Heat Reclaim Ventilation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>Indoor unit’s air thermistor error</td>
<td>—</td>
</tr>
<tr>
<td>65</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>Outside air thermistor error</td>
<td>—</td>
</tr>
<tr>
<td>68</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>Malfunction of HVU</td>
<td>—</td>
</tr>
<tr>
<td>6A</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>Damper system alarm</td>
<td>—</td>
</tr>
<tr>
<td>6F</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>Malfunction of simple remote controller</td>
<td>—</td>
</tr>
<tr>
<td>94</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>Internal transmission error</td>
<td>—</td>
</tr>
</tbody>
</table>

The system operates for malfunction codes indicated in gray squares, however, be sure to check and repair.
Malfunction code indication by outdoor unit P.C.B.

<Monitor mode>

To enter the monitor mode, push the MODE (BS1) button when in "Setting mode 1".

<Selection of setting item>

Push the SET (BS2) button and set the LED display to a setting item.

<Confirmation of malfunction 1>

Push the RETURN (BS3) button once to display "First digit" of malfunction code.

<Confirmation of malfunction 2>

Push the SET (BS2) button once to display "Second digit" of malfunction code.

<Confirmation of malfunction 3>

Push the SET (BS2) button once to display "Malfunction location".

<Confirmation of malfunction 4>

Push the SET (BS2) button once to display "Master or slave 1 or slave 2" and "Malfunction location".

Push the RETURN (BS3) button and switches to the initial status of "Monitor mode".

+ Push the MODE (BS1) button and returns to "Setting mode 1".

### Contents of malfunction

<table>
<thead>
<tr>
<th>Malfunction code</th>
<th>Malfunction code</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>In-phase malfunction of DIII-Net Detection of DIII-Net</td>
</tr>
<tr>
<td>E3</td>
<td>Abnormal discharge pressure HPS activated</td>
</tr>
<tr>
<td>E4</td>
<td>Abnormal suction pressure Abnormal Pe</td>
</tr>
<tr>
<td>E5</td>
<td>Compressor lock Detection of INV. compressor lock</td>
</tr>
<tr>
<td>E7</td>
<td>Over load, overcurrent Detection of DC fan 1 motor lock</td>
</tr>
<tr>
<td>E9</td>
<td>Malfunction of electronic expansion EV1</td>
</tr>
<tr>
<td>H9</td>
<td>Faulty sensor of outdoor air temperature Faulty Ta sensor (short)</td>
</tr>
<tr>
<td>F3</td>
<td>Abnormal discharge pipe temperature Abnormal Td</td>
</tr>
<tr>
<td>F6</td>
<td>Abnormal heat exchanger temperature Refrigerant over charge</td>
</tr>
<tr>
<td>J3</td>
<td>Faulty sensor of discharge pipe temperature Faulty Td1 sensor (short)</td>
</tr>
<tr>
<td>J5</td>
<td>Faulty sensor of suction pipe temperature Faulty Ts1 sensor (short)</td>
</tr>
<tr>
<td>J6</td>
<td>Faulty sensor of heat exchanger temperature Faulty Tb sensor (short)</td>
</tr>
<tr>
<td>JA</td>
<td>Faulty sensor of discharge pressure Faulty Pc sensor (short)</td>
</tr>
<tr>
<td>JC</td>
<td>Faulty sensor of suction pressure Faulty Pe sensor (short)</td>
</tr>
<tr>
<td>L1</td>
<td>Faulty Inverter P.C.B. Faulty IPM</td>
</tr>
<tr>
<td>L9</td>
<td>Faulty Current sensor Abnormal SP-PAM over-voltage</td>
</tr>
<tr>
<td>L4</td>
<td>Inverter radiation fin temperature rising Over heating of inverter radiation fin temperature</td>
</tr>
<tr>
<td>L5</td>
<td>DC output overcurrent Inverter instantaneous overcurrent</td>
</tr>
<tr>
<td>L8</td>
<td>Electronic thermal Electronic thermal switch 1</td>
</tr>
<tr>
<td>L9</td>
<td>Electronic thermal switch 2 Out-of-step Speed down after startup Lightening detection</td>
</tr>
<tr>
<td>L1</td>
<td>Stall prevention (Limit time) Stall prevention (Current increasing) Stall prevention (Faulty start up) Abnormal wave form in startup Out-of-step</td>
</tr>
<tr>
<td>LC</td>
<td>Transmission error between inverter and outdoor unit Inverter transmission error</td>
</tr>
</tbody>
</table>

*Push the MODE (BS1) button and returns to "Setting mode 1".*
<table>
<thead>
<tr>
<th>Malfunction code</th>
<th>Confirmation of malfunction 1</th>
<th>Confirmation of malfunction 2</th>
<th>Confirmation of malfunction 3</th>
<th>Confirmation of malfunction 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H1P H2P H3P H4P H5P H6P H7P</td>
<td>H1P H2P H3P H4P H5P H6P H7P</td>
<td>H1P H2P H3P H4P H5P H6P H7P</td>
<td>H1P H2P H3P H4P H5P H6P H7P</td>
</tr>
<tr>
<td>E1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E4</td>
<td></td>
<td></td>
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<tr>
<td>E5</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>E7</td>
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<tr>
<td>E9</td>
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<td></td>
</tr>
<tr>
<td>H9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F1</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>F3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L4</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>L5</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>L8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **ON**: Display of contents of malfunction (first digit)
- **OFF**: Display of contents of malfunction (second digit)
- **Blink**: Display 1 of malfunction in detail
- ****: Display 2 of malfunction in detail

*H1P H2P H3P H4P H5P H6P H7P: Master Slave1 Slave2 System*
<Monitor mode>
To enter the monitor mode, push the MODE (BS1) button when in "Setting mode 1".

<Selection of setting item>
Push the SET (BS2) button and set the LED display to a setting item.

<Confirmation of malfunction 1>
Push the RETURN (BS3) button once to display "First digit" of malfunction code.

<Confirmation of malfunction 2>
Push the SET (BS2) button once to display "Second digit" of malfunction code.

<Confirmation of malfunction 3>
Push the SET (BS2) button once to display "malfunction location".

<Confirmation of malfunction 4>
Push the SET (BS2) button once to display "master or slave 1 or slave 2" and "malfunction location".

Push the RETURN (BS3) button and switches to the initial status of "Monitor mode".

* Push the MODE (BS1) button and returns to "Setting mode 1".

### Contents of malfunction

<table>
<thead>
<tr>
<th>Malfunction code</th>
<th>Malfunction code</th>
</tr>
</thead>
<tbody>
<tr>
<td>P4</td>
<td>Faulty temperature sensor of inverter radiation fin</td>
</tr>
<tr>
<td>U0</td>
<td>Refrigerant shortage alarm</td>
</tr>
<tr>
<td>U2</td>
<td>Abnormal power supply voltage</td>
</tr>
<tr>
<td></td>
<td>Insufficient Inverter voltage</td>
</tr>
<tr>
<td></td>
<td>Faulty charge of capacitor in main inverter circuit</td>
</tr>
<tr>
<td></td>
<td>Malfunction due to SP-PAM overvoltage</td>
</tr>
<tr>
<td></td>
<td>Malfunction due to P-N short circuit</td>
</tr>
<tr>
<td>U3</td>
<td>No implementation of test-run</td>
</tr>
<tr>
<td>U4</td>
<td>Transmission error between indoor and outdoor unit</td>
</tr>
<tr>
<td></td>
<td>I/O transmission error</td>
</tr>
<tr>
<td></td>
<td>I/O transmission error</td>
</tr>
<tr>
<td>UH</td>
<td>Faulty system malfunction</td>
</tr>
<tr>
<td></td>
<td>Wiring error (Auto-address error)</td>
</tr>
<tr>
<td>UF</td>
<td>Conflict in wiring and piping, no setting for system</td>
</tr>
<tr>
<td></td>
<td>Conflict in wiring and piping</td>
</tr>
</tbody>
</table>

Detail description on next page.
### Troubleshooting by Remote Controller

#### Malfunction Code Confirmation

<table>
<thead>
<tr>
<th>Malfunction Code</th>
<th>Confirmation of Malfunction 1</th>
<th>Confirmation of Malfunction 2</th>
<th>Confirmation of Malfunction 3</th>
<th>Confirmation of Malfunction 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H1P</td>
<td>H2P</td>
<td>H3P</td>
<td>H4P</td>
</tr>
<tr>
<td>P4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>U0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>U2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>U3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>U4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>UH</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>UF</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- **ON**: malfunction
- **OFF**: normal
- **Blink**: malfunction

#### Display of Contents

- **Display of Contents of Malfunction (First Digit)**
- **Display of Contents of Malfunction (Second Digit)**
- **Display 1 of Malfunction in Detail**
- **Display 2 of Malfunction in Detail**

#### Notation

- **Master**
- **Slave1**
- **Slave2**
- **System**
3. Troubleshooting by Indication on the Remote Controller

3.1 “A0” Indoor Unit: Error of External Protection Device

**Remote Controller Display**

**Applicable Models**
All indoor unit models

**Method of Malfunction Detection**

**Malfunction Decision Conditions**

**Supposed Causes**
- Actuation of external protection device
- Improper field set
- Defect of indoor unit P.C.B.

**Troubleshooting**

**Caution**
Be sure to turn off the power switch before connecting or disconnecting the connector or parts could be damaged.

1. **External protection device is connected to terminals T1 and T2 of the indoor unit terminal block.**
   - **YES:** Actuation of external protection device.
   - **NO:**
     - **ON/OFF input from outside (mode No. 12, first code No. 1) has been set to external protection device input (second code No. 03) by remote controller.**
       - **YES:** Change the second code No. to “01” or “02”.
       - **NO:** Indoor unit P.C.B. replacement.
# 3.2 “A1” Indoor Unit: P.C.B. Defect

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>All indoor unit models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method of Malfunction Detection</td>
<td>Check data from E²PROM.</td>
</tr>
<tr>
<td>Malfunction Decision Conditions</td>
<td>When data could not be correctly received from the E²PROM E²PROM: Type of nonvolatile memory. Maintains memory contents even when the power supply is turned off.</td>
</tr>
<tr>
<td>Supposed Causes</td>
<td>Defect of indoor unit P.C.B.</td>
</tr>
</tbody>
</table>

**Troubleshooting**

Be sure to turn off the power switch before connecting or disconnecting the connector or parts could be damaged.

- **Caution**

  - Turn power supply OFF, then power ON again.
  - Does the system return to normal?
    - YES: External factor other than malfunction (for example, noise etc.).
    - NO: Replace the indoor unit P.C.B.
### 3.3 “R3” Indoor Unit: Malfunction of Drain Level Control System (S1L)

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Applicable Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCQ, FHQ (Option), FAQ (Option)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method of Malfunction Detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Float switch OFF detection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Malfunction Decision Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>When rise of water level is not a condition and the float switch goes OFF.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supposed Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>208~230V power supply is not provided</td>
</tr>
<tr>
<td>Defect of float switch or short circuit connector</td>
</tr>
<tr>
<td>Defect of drain pump</td>
</tr>
<tr>
<td>Drain clogging, upward slope, etc.</td>
</tr>
<tr>
<td>Defect of indoor unit P.C.B.</td>
</tr>
<tr>
<td>Loose connection of connector</td>
</tr>
</tbody>
</table>
Troubleshooting

**Caution** Be sure to turn off the power switch before connecting or disconnecting the connector or parts could be damaged.

- Is power supply 208–230V provided?
  - NO Provide 208–230V power supply.
  - YES A short circuit connector is connected to X8A (X15A).
    - NO Connect either a short circuit connector or float switch and turn on again.
    - YES Defect of indoor unit P.C.B.

- The float switch is connected to X8A (or X15A) of the indoor unit P.C.B.?
  - NO Modify the float switch's connection and turn on again.
  - YES Loose connection of connector.

- The float switch contact is forming a short circuit (continuity check with X8A (or X15A) disconnected)?
  - NO Replace the float switch.
  - YES The drain pump works when the power supply is reset for the indoor unit.

- The drain pump is connected to X25A or terminals Y1 and Y2 of the indoor unit P.C.B.?
  - NO Connect the drain pump and turn on again.
  - YES The voltage of terminals Y1 and Y2 or X25A is 208–230V (within 5 minutes of resetting the power supply).
    - NO Replace the indoor unit P.C.B.
    - YES Replace the drain pump or check for dirt, etc.

FCQ only
3.4 “A6” Indoor Unit: Fan Motor (M1F) Lock, Overload

Remote Controller Display

Applicable Models
All indoor unit models

Method of Malfunction Detection
Detection by failure of signal for detecting number of turns to come from the fan motor

Malfunction Decision Conditions
When the number of turns cannot be detected even when output voltage to the fan is maximum

Supposed Causes
- Fan motor lock
- Disconnected or faulty wiring between fan motor and P.C.B.

Troubleshooting

**Caution**
Be sure to turn off the power switch before connecting or disconnecting the connector or parts could be damaged.

- Is the wiring from the fan motor securely connected to connectors on the indoor unit P.C.B.?
  - NO
    - Connect the wiring and turn on again.
  - YES
    - Wiring between the indoor unit P.C.B. and fan motor is disconnected.
    - YES
      - Fix the wiring and turn on again.
    - NO
      - Does the fan motor run?
        - YES
          - Replace the indoor unit P.C.B.
        - NO
          - Replace the fan motor.
### 3.5 “〇” Indoor Unit: Malfunction of Louver Motor (M1S)

| Remote Controller Display |  |
|---------------------------|--
| Applicable Models          | FCQ, FHQ, FAQ |
| Method of Malfunction Detection | Utilizes ON/OFF of the limit switch when the motor turns. |
| Malfunction Decision Conditions | When ON/OFF of the microswitch for positioning cannot be reversed even though the louver motor is energized for a specified amount of time (about 30 seconds). |
| Supposed Causes           | ■ Defect of louver motor  
                          | ■ Defect of connection cable (power supply and limit switch)  
                          | ■ Defect of airflow direction adjusting louver-cam  
                          | ■ Defect of indoor unit P.C.B. |
Troubleshooting

**Caution**
Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

1. Is power supply 208–230V provided?
   - **YES**
   - **NO**
      - Provide 208–230V power supply.

2. Indoor unit is a model equipped with a louver function?
   - **YES**
   - **NO**
      - Replace the indoor unit P.C.B.

3. The louver motor works when the power supply is turned off and then back on?
   - **YES**
   - **NO**
      - Connect the connector to X9A and turn on again.

4. The limit switch functions normally?
   - **YES**
   - **NO**
      - Replace the louver motor.

5. The connecting cable is short-circuited or disconnected?
   - **YES**
   - Replace the limit switch connecting cable.
   - **NO**
   - Replace the indoor unit P.C.B.

6. After turning the louver ON and then stopping with the remote controller, the voltage of X6A (or X29A) of the indoor unit P.C.B. is 208 – 230 VAC when turned on again (within 30 seconds of turning on again)?
   - **YES**
   - Replace the power supply connecting cable.
   - **NO**

7. When the airflow direction louver's cam mechanism is disconnected from the louver motor, operation is normal when turned on again?
   - **YES**
   - Take the cam mechanism apart, reassemble and turn on again.
   - **NO**
   - Replace the louver motor.
3.6 “R9” Indoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E)

Remote Controller Display

Applicable Models
All indoor unit models

Method of Malfunction Detection

Malfunction Decision Conditions

Supposed Causes
- Malfunction of moving part of electronic expansion valve
- Defect of indoor unit P.C.B.
- Defect of connecting cable

Troubleshooting

Caution Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

1. The electronic expansion valve is connected to X7A of the indoor unit P.C.B.
   - NO: After connecting, turn the power supply off and then back on.
   - YES: Normal when coil check (*) of the moving part of the electronic expansion valve is checked.

2. NO: Replace the moving part of the electronic expansion valve.
   - YES: The connecting cable is short-circuited or disconnected.

3. NO: If you turn the power supply off and turn on again, and it still does not help, replace the indoor unit P.C.B.
   - YES: Replace the connecting cable.
∗1: Coil check method for the moving part of the electronic expansion valve
Disconnect the electronic expansion valve from the P.C.B. and check the continuity between the connector pins.

(Normal)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. White</td>
<td>×</td>
<td></td>
<td>○ Approx. 300Ω</td>
<td>×</td>
<td>○ Approx. 150Ω</td>
<td>×</td>
</tr>
<tr>
<td>2. Yellow</td>
<td></td>
<td>×</td>
<td></td>
<td>○ Approx. 300Ω</td>
<td>×</td>
<td>○ Approx. 150Ω</td>
</tr>
<tr>
<td>3. Orange</td>
<td></td>
<td></td>
<td>×</td>
<td>○ Approx. 150Ω</td>
<td></td>
<td>×</td>
</tr>
<tr>
<td>4. Blue</td>
<td></td>
<td></td>
<td></td>
<td>×</td>
<td>○ Approx. 150Ω</td>
<td></td>
</tr>
<tr>
<td>5. Red</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>×</td>
</tr>
<tr>
<td>6. Brown</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

○: Continuity
×: No continuity
3.7 "#:e#" Indoor Unit: Drain Level above Limit

Remote Controller Display

Applicable Models

FCQ

Method of Malfunction Detection

Water leakage is detected based on float switch ON/OFF operation while the compressor is in non-operation.

Malfunction Decision Conditions

When the float switch changes from ON to OFF while the compressor is in non-operation.

Supposed Causes

- Humidifier unit (optional accessory) leaking
- Defect of drain pipe (upward slope, etc.)
- Defect of indoor unit P.C.B.

Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

- Field drain piping has a defect such as upward sloping.
  - YES: Modify the drain piping.
  - NO:

- A humidifier unit (optional accessory) is installed on the indoor unit.
  - YES: Check if the humidifier unit is leaking.
  - NO: Defect of indoor unit P.C.B.
3.8 “culo” Indoor Unit: Malfunction of Capacity Determination Device

Remote controller display

Applicable Models
All indoor unit models

Method of Malfunction Detection
Capacity is determined according to resistance of the capacity setting adaptor and the memory inside the IC memory on the indoor unit P.C.B., and whether the value is normal or abnormal is determined.

Malfunction Decision Conditions
Operation and:
1. When the capacity code is not contained in the P.C.B.’s memory, and the capacity setting adaptor is not connected.
2. When a capacity that doesn’t exist for that unit is set.

Supposed Causes
- You have forgotten to install the capacity setting adaptor.
- Defect of indoor unit P.C.B.

Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

- The indoor unit P.C.B. was replaced with a replacement P.C.B.
  - NO: Replace the indoor unit P.C.B.
  - YES:
    - The indoor unit is a model that requires installation of a capacity setting adaptor when replacing the P.C.B.
      - NO: Replace the indoor unit P.C.B.
      - YES: Install a capacity setting adaptor.
3.9 “ṭṣ” Indoor Unit: Malfunction of Thermistor (R2T) for Heat Exchanger

Remote Controller Display

- All indoor unit models

Applicable Models

Method of Malfunction Detection

- Malfunction detection is carried out by temperature detected by heat exchanger thermistor.

Malfunction Decision Conditions

- When the heat exchanger thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defect of thermistor (R2T) for liquid pipe
- Defect of indoor unit P.C.B.

Troubleshooting

- **Caution** Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

```
| Connector is connected to X12A of the indoor unit P.C.B. | NO | Connect the thermistor and turn on again. |
| Resistance is normal when measured after disconnecting the thermistor (R2T) from the indoor unit P.C.B. (3.5kΩ ~ 360kΩ) | YES | NO | KΩ | Replace the thermistor (R2T). |
| YES | Replace the indoor unit P.C.B. |
```

* Refer to thermistor resistance / temperature characteristics table on P.166.
3.10 “C5” Indoor Unit: Malfunction of Thermistor (R3T) for Gas Pipes

Remote Controller Display

Applicable Models
All indoor unit models

Method of Malfunction Detection
Malfunction detection is carried out by temperature detected by gas pipe thermistor.

Malfunction Decision Conditions
When the gas pipe thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes
- Defect of indoor unit thermistor (R3T) for gas pipe
- Defect of indoor unit P.C.B.

Troubleshooting

Caution
Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

* Refer to thermistor resistance / temperature characteristics table on P.166.
3.11 “C9” Indoor Unit: Malfunction of Thermistor (R1T) for Suction Air

Remote Controller Display

Applicable Models

All indoor unit models

Method of Malfunction Detection

Malfunction detection is carried out by temperature detected by suction air temperature thermistor.

Malfunction Decision Conditions

When the suction air temperature thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defect of indoor unit thermistor (R1T) for air inlet
- Defect of indoor unit P.C.B.

Troubleshooting

Caution

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Connector is connected to X13A of the indoor unit NO

Connect the thermistor and turn on again.

YES

Resistance is normal when measured after disconnecting the thermistor (R1T) from the indoor unit P.C.B. (7.2kΩ~112kΩ) NO

Replace the thermistor (R1T).

YES

Replace the indoor unit P.C.B.

* Refer to thermistor resistance / temperature characteristics table on P.166.
3.12 “CA” Indoor Unit: Malfunction of Thermistor for Discharge Air

Remote Controller Display

Applicable Models
All indoor unit models

Method of Malfunction Detection
Malfunction detection is carried out by temperature detected by discharge air temperature thermistor.

Malfunction Decision Conditions
When the discharge air temperature thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes
- Defect of indoor unit thermistor for air outlet
- Defect of indoor unit P.C.B.

Troubleshooting

⚠️ Caution
Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

-Connector is connected to the indoor unit P.C.B.
  -YES
  -Resistance is normal when measured after disconnecting the thermistor from the indoor unit P.C.B. (7.2kΩ ~ 112kΩ)
    -YES
    -Replace the indoor unit P.C.B.
  -NO
    -Replace the thermistor.
  -NO
  -Connect the thermistor and turn on again.

* Refer to thermistor resistance / temperature characteristics table on P.166.
3.13 “CJ” Indoor Unit: Malfunction of Thermostat Sensor in Remote Controller

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>CJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>All indoor unit models</td>
</tr>
<tr>
<td>Method of Malfunction Detection</td>
<td>Malfunction detection is carried out by temperature detected by remote controller air temperature thermistor. (Note)</td>
</tr>
<tr>
<td>Malfunction Decision Conditions</td>
<td>When the remote controller air temperature thermistor becomes disconnected or shorted while the unit is running.</td>
</tr>
</tbody>
</table>
| Supposed Causes            | ■ Defect of remote controller thermistor  
                              ■ Defect of remote controller P.C.B. |

**Troubleshooting**

⚠️ Caution: Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

- Turn power supply OFF, then power ON again.

  - Is “CJ” displayed on the remote controller?
    - YES: Replace the remote controller.
    - NO: External factor other than equipment malfunction. (for example, noise etc.)

**Note:** In case of remote controller thermistor malfunction, unit is still operable by suction air thermistor on indoor unit.

- Refer to thermistor resistance / temperature characteristics table on P.166.
3.14 “E1” Outdoor Unit: P.C.B. Defect

Remote Controller Display

Applicable Models

Method of Malfunction Detection

Malfunction Decision Conditions

Supposed Causes

Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Turn off the power once and turn on again.

Return to normal? YES

NO

External factor other than malfunction (for example, noise etc.).

Replace the outdoor unit main P.C.B. (A1P).
### 3.15 “E3” Outdoor Unit: Actuation of High Pressure Switch

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>E3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>RZQ18~30PVJU</td>
</tr>
<tr>
<td>Method of Malfunction Detection</td>
<td>Abnormality is detected when the contact of the high pressure protection switch opens.</td>
</tr>
</tbody>
</table>
| Malfunction Decision Conditions | Error is generated when the HPS activation count reaches the number specific to the operation mode. (Reference) Operating pressure of high pressure switch  
Operating pressure: 580 psi  
Reset pressure: 435 psi |
| Supposed Causes            |  
- Actuation of outdoor unit high pressure switch  
- Defect of High pressure switch  
- Defect of outdoor unit P.C.B.  
- Instantaneous power failure  
- Faulty high pressure sensor |
Troubleshooting

![Caution] Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Check for the points shown below.
1. Is the stop valve open?
2. Is the HPS connector properly connected to the main P.C.B.?
3. Does the high pressure switch have continuity?

![Diagram]

- Are the three points above OK?
  - NO: Rectify defective points, if any.
  - YES: Mount a pressure gauge on the high-pressure service port.
  - Connect the Service Checker.
  - Reset the operation using the remote controller, and then restart the operation.

- Does the stop due to malfunction (E3) recur?
  - NO: Replace the HPS.
  - YES: Is the HPS operating value normal (i.e., 580psi)?
    - NO: Replace the high pressure sensor.
    - YES: Are the characteristics of the high pressure sensor normal? (See *1.)
      - NO: Replace the main P.C.B.
      - YES: Is the pressure detected with the P.C.B. normal? (See *2.)
        - NO: Replace the high pressure sensor.
        - YES: The high pressure sensor is normal, and the pressure detected with the P.C.B. is also normal.
          - The high pressure has really become high.

CHECK 1 (Refer to P.156)

*1: Make a comparison between the voltage of the pressure sensor and that read by the pressure gauge.
(As to the voltage of the pressure sensor, take the measurement of voltage at the connector, and then convert it to pressure according to information on P.168.)

*2: Make a comparison between the high pressure value checked with the Service Checker and the voltage of the pressure sensor (see *1).

*3: Take measurement of voltage of the pressure sensor.

Take measurement of DC voltage between these wires.
### 3.16 “E4” Outdoor Unit: Actuation of Low Pressure Sensor

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>E4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>RZQ18-30PVJU</td>
</tr>
<tr>
<td>Method of Malfunction Detection</td>
<td>Abnormality is detected by the pressure value with the low pressure sensor.</td>
</tr>
<tr>
<td>Malfunction Decision Conditions</td>
<td>Error is generated when the low pressure is dropped under specific pressure.</td>
</tr>
<tr>
<td></td>
<td>Operating pressure: 10 psi</td>
</tr>
<tr>
<td>Supposed Causes</td>
<td>■ Abnormal drop of low pressure (Lower than 10 psi)</td>
</tr>
<tr>
<td></td>
<td>■ Defect of low pressure sensor</td>
</tr>
<tr>
<td></td>
<td>■ Defect of outdoor unit P.C.B.</td>
</tr>
<tr>
<td></td>
<td>■ Stop valve is not opened.</td>
</tr>
</tbody>
</table>
Troubleshooting

**Caution**
Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

1. Is the stop valve open?
   - NO: Open the stop valve.
   - YES: Mount a pressure gauge on the low-pressure service port.

2. Are the characteristics of the low pressure sensor normal? (See *1.)
   - NO: Replace the low pressure sensor.
   - YES: Is the pressure detected with the P.C.B. normal? (See *2.)

3. Replace the main P.C.B.

- The low pressure sensor is normal, and the pressure detected with the P.C.B. is also normal.
- The low pressure has really become low.

**CHECK 2** (Refer to P.157)
Remove the causes by which the low pressure has become low.

*1: Make a comparison between the voltage of the pressure sensor and that read by the pressure gauge. (As to the voltage of the pressure sensor, make measurement of voltage at the connector, and then convert it to pressure according to information on P.168.)

*2: Make a comparison between the low pressure value checked with the Service Checker and the voltage of the pressure sensor (see *1).

*3: Take measurement of voltage of the pressure sensor.

**Diagram:**
- Micro controller A/D input
- Connector for low pressure sensor (Blue)
- Red
- Black
- White
- +5V
- Low pressure sensor

Take measurement of DC voltage between these wires.
### 3.17 “E5” Inverter Compressor Motor Lock

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>E5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>RZQ18~30PVJU</td>
</tr>
</tbody>
</table>

#### Method of Malfunction Detection
Inverter P.C.B. takes the position signal from UVW line connected between the inverter and compressor, and the malfunction is detected when any abnormality is observed in the phase-current waveform.

#### Malfunction Decision Conditions
This malfunction will be output when the inverter compressor motor does not start up even in forced startup mode.

#### Supposed Causes
- Compressor lock
- High differential pressure (72psi or more)
- Incorrect UVW wiring
- Faulty inverter P.C.B.
- Stop valve is left in closed position.
### Troubleshooting

<table>
<thead>
<tr>
<th>Condition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check the installation conditions.</td>
<td>Warm up the air after connecting.</td>
</tr>
<tr>
<td>Is the stop valve open?</td>
<td>Open the stop valve.</td>
</tr>
<tr>
<td>NO</td>
<td>Connect correctly.</td>
</tr>
<tr>
<td>YES</td>
<td>Replace the compressor.</td>
</tr>
<tr>
<td>Is high differential pressure starting? (72 psi or more)</td>
<td>Replace the compressor.</td>
</tr>
<tr>
<td>YES</td>
<td>Replace the inverter P.C.B. (A1P).</td>
</tr>
<tr>
<td>NO</td>
<td>Replace the compressor.</td>
</tr>
<tr>
<td>Check and see whether compressor is short-circuited or grounded.</td>
<td>Remedy the cause.</td>
</tr>
<tr>
<td>YES</td>
<td>Replace the compressor.</td>
</tr>
<tr>
<td>Are inverter output voltages the same for 3 phases?</td>
<td>Replace the inverter P.C.B. (A1P).</td>
</tr>
<tr>
<td>YES</td>
<td>Replace the compressor.</td>
</tr>
<tr>
<td>Does low or high pressure vary even instantaneously when restarting compressor?</td>
<td>Replace the compressor.</td>
</tr>
</tbody>
</table>

**Caution:**

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.
3.18 “E7” Malfunction of Outdoor Unit Fan Motor

Remote Controller Display

Applicable Models

Method of Malfunction Detection

Malfunction of fan motor system is detected according to the fan speed detected by hall IC when the fan motor runs.

Malfunction Decision Conditions

- When the fan runs with speed less than a specified one for 6 seconds or more when the fan motor running conditions are met
- When malfunction is generated 4 times, the system shuts down.

Supposed Causes

- Malfunction of fan motor
- The harness connector between fan motor and P.C.B. is left in disconnected, or faulty connector
- Fan does not run due to foreign matters tangled
- Clearing condition: Operate for 5 minutes (normal)

Troubleshooting

Caution

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Connect the connector.

<table>
<thead>
<tr>
<th>Connect the connector.</th>
<th>Replace the fan motor of outdoor unit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connect the connector.</td>
<td>Replace the fan motor of outdoor unit.</td>
</tr>
<tr>
<td>Replace the outdoor unit P.C.B.</td>
<td>Replace the fan motor of outdoor unit.</td>
</tr>
</tbody>
</table>

Check 3 (P.158)
Check on connector of fan motor

Are the resistances between pins above judgement?

YES

NO

YES

NO

Connect the connector.

Remove the obstacle.

Replace the fan motor of outdoor unit.

Replace the fan motor of outdoor unit.

Replace the outdoor unit P.C.B.
### 3.19 “E9” Outdoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E)

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>E9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>RZQ18~30PVJU</td>
</tr>
</tbody>
</table>
| Method of Malfunction Detection | Check disconnection of connector  
  Check continuity of expansion valve coil |
| Malfunction Decision Conditions | Error is generated under no common power supply when the power is on. |
| Supposed Causes             | Defect of moving part of electronic expansion valve  
  Defect of outdoor unit P.C.B. (A1P)  
  Defect of connecting cable |
Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Turn power supply off, and turn power supply on again.

Return to normal?

YES

External factor other than malfunction (for example, noise etc.).

NO

Electronic expansion valve is connected to X21A and X22A of outdoor unit P.C.B. (A1P).

NO

After connecting, turn the power off and then back on again.

YES

Normal when coil check (*1) of the moving part of the electronic expansion valve is checked.

NO

Replace the moving part of the electronic expansion valve.

YES

The connecting cable is short-circuited or disconnected.

YES

Replace the connecting cable.

NO

Replace the outdoor unit P.C.B. (A1P).

*Make measurement of resistance between the connector pins, and then make sure the resistance falls in the range of 40 to 50kΩ.
3.20 “F3” Outdoor Unit: Abnormal Discharge Pipe Temperature

Remote Controller Display

Applicable Models
RZQ18~30PVJU

Method of Malfunction Detection
Abnormality is detected according to the temperature detected by the discharge pipe temperature sensor.

Malfunction Decision Conditions
- When the discharge pipe temperature rises to an abnormally high level
- When the discharge pipe temperature rises suddenly

Supposed Causes
- Faulty discharge pipe temperature sensor
- Faulty connection of discharge pipe temperature sensor
- Faulty outdoor unit P.C.B.

Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Discharge pipe temperature is 248°F or higher when the unit stops by malfunction

YES

Refrigerant shortage, compression defect, etc. Defect of the refrigerant system.

NO

Pull out the discharge pipe thermistor from the outdoor P.C.B., and then make measurement of resistance using a multiple meter.

Are the characteristics of the discharge pipe thermistor normal? (3.5～400kΩ)

NO

Replace the discharge pipe thermistor.

YES

Replace the outdoor unit P.C.B. (A1P).

Refer to “Thermistor Resistance / Temperature Characteristics” table on P.166.
3.21 “F6” Outdoor Unit: Refrigerant Overcharged

Remote Controller Display

Applicable Models
RZQ18~30PVJU

Method of Malfunction Detection
Excessive charging of refrigerant is detected by using the heat exchanging deicer temperature during a check operation.

Malfunction Decision Conditions
When the amount of refrigerant, which is calculated by using the heat exchanging deicer temperature during a check run, exceeds the standard.

Supposed Causes
- Refrigerant overcharge
- Misalignment of the thermistor for heat exchanger
- Defect of the thermistor for heat exchanger

Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Check the mounting condition of the temperature sensors of the heat exchanging deicer thermistor in the piping.

Are the above thermistor installed on pipes correctly?

NO → Install the thermistor correctly.

YES → Remove the heat exchanging deicer thermistor from the outdoor P.C.B. and measure resistance with a tester.

Is the characteristic of the above thermistor normal?

NO → Replace the thermistor.

YES → Refrigerant overcharged.

Refer to “Thermistor Resistance / Temperature Characteristics” table on P.166.
3.22 “H9” Outdoor Unit: Malfunction of Thermistor (R1T) for Outdoor Air

Remote Controller Display

Applicable Models
RZQ18-30PVJU

Method of Malfunction Detection
Malfunction is detected from the temperature detected by the outdoor air thermistor.

Malfunction Decision Conditions
When the outside air temperature thermistor has short circuit or open circuit.

Supposed Causes
- Defect of thermistor (R1T) for outdoor air
- Defect of outdoor unit P.C.B. (A1P)

Troubleshooting

**Caution**  Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Refer to “Thermistor Resistance / Temperature Characteristics” table on P.166.
### 3.23 “J3” Outdoor Unit: Malfunction of Discharge Pipe Thermistor (R2T)

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>RZQ18~30PVJU</td>
</tr>
<tr>
<td>Method of Malfunction Detection</td>
<td>Malfunction is detected from the temperature detected by discharge pipe temperature thermistor.</td>
</tr>
<tr>
<td>Malfunction Decision Conditions</td>
<td>When a short circuit or an open circuit in the discharge pipe temperature thermistor is detected.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supposed Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defect of thermistor (R2T) for outdoor unit discharge pipe</td>
</tr>
<tr>
<td>Defect of outdoor unit P.C.B. (A1P)</td>
</tr>
</tbody>
</table>

#### Troubleshooting

- **Connector is connected to outdoor unit P.C.B. (A1P),**
  - **YES**
  - **NO**
    - Connect the thermistor and turn on again.

- **Resistance is normal when measured after disconnecting the thermistor R2T from the outdoor unit P.C.B. (5.0kΩ~640kΩ),**
  - **YES**
  - **NO**
    - Replace the thermistor (R2T).

**Refer to Thermistor Resistance / Temperature Characteristics table on P.167.**
3.24 “.Err” Outdoor Unit: Malfunction of Thermistor (R3T, R5T) for Suction Pipe 1, 2

**Remote Controller Display**

**Applicable Models**

RZQ18~30PVJU

**Method of Malfunction Detection**

Malfunction is detected from the temperature detected by the thermistor for suction pipe 1, 2.

**Malfunction Decision Conditions**

When a short circuit or an open circuit in the thermistor for suction pipe 1, 2 are detected.

**Supposed Causes**

- Defect of thermistor (R3T, R5T) for outdoor unit suction pipe
- Defect of outdoor unit P.C.B. (A1P)

**Troubleshooting**

*Caution*

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Refer to *Thermistor Resistance / Temperature Characteristics* table on P.166.
3.25 "وظ" Outdoor Unit: Malfunction of Thermistor (R4T) for Outdoor Unit Heat Exchanger

Remote Controller Display

Applicable Models

RZQ18-30PVJU

Method of Malfunction Detection

Malfunction is detected from the temperature detected by the heat exchanger thermistor.

Malfunction Decision Conditions

When a short circuit or an open circuit in the heat exchange thermistor is detected.

Supposed Causes

- Defect of thermistor (R4T) for outdoor unit heat exchanger
- Defect of outdoor unit P.C.B. (A1P)

Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Refer to Thermistor Resistance / Temperature Characteristics table on P.166
### 3.26 “xhr” Outdoor Unit: Malfunction of High Pressure Sensor

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applicable Models</strong></td>
<td>RZQ18-30PVJU</td>
</tr>
</tbody>
</table>

**Method of Malfunction Detection**

Malfunction is detected from the pressure detected by the high pressure sensor.

**Malfunction Decision Conditions**

When the high pressure sensor is short circuit or open circuit.

**Supposed Causes**

- Defect of high pressure sensor
- Connection of low pressure sensor with wrong connection.
- Defect of outdoor unit P.C.B.
**Troubleshooting**

**Caution**
Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

![Diagram showing troubleshooting flowchart]

1. Voltage measurement point

   - YES: The high pressure sensor is connected to X17A of outdoor unit P.C.B. (A1P).
   - NO: Connect the high pressure sensor and turn on again.

   - YES: The relationship between the *1 VH and high pressure is normal (see *2) when voltage is measured between X17A pins (1) and (3) of outdoor unit P.C.B. (A1P) (see *1).
   - NO: Replace the high pressure sensor.

   **NOTES:**
   - Replace the outdoor unit P.C.B. (A1P).
   - Replace the outdoor unit P.C.B. (A1P).

2. Refer to *Pressure Sensor, Pressure / Voltage Characteristics* table on P.168.
3.27 "JC" Outdoor Unit: Malfunction of Low Pressure Sensor

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>RZQ18~30PVJU</td>
</tr>
<tr>
<td>Method of Malfunction Detection</td>
<td>Malfunction is detected from pressure detected by low pressure sensor.</td>
</tr>
<tr>
<td>Malfunction Decision Conditions</td>
<td>When the low pressure sensor is short circuit or open circuit.</td>
</tr>
<tr>
<td>Supposed Causes</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>Defect of low pressure sensor</td>
</tr>
<tr>
<td>-</td>
<td>Connection of high pressure sensor with wrong connection.</td>
</tr>
<tr>
<td>-</td>
<td>Defect of outdoor unit P.C.B.</td>
</tr>
</tbody>
</table>
Troubleshooting

**Caution**  Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

The low pressure sensor is connected to X18A (blue) of outdoor unit P.C.B. (A1P).

- **NO**
  - Connect the low pressure sensor property and restart system.

- **YES**
  - The relationship between the *1 VL and low pressure is normal (see *2) when voltage is measured between X18A pins (2) and (3) of outdoor unit P.C.B. (A1P) (see *1).

  - **YES**
    - Replace the outdoor unit P.C.B. (A1P).

  - **NO**
    - Replace the low pressure sensor.

*1: Voltage measurement point

*2: Refer to *Pressure Sensor, Pressure / Voltage Characteristics* table on P.168.
3.28 “L1” Outdoor Unit: Malfunction of P.C.B.

Remote Controller Display

L1

Applicable Models

RZQ18~30PVJU

Method of Malfunction Detection

- Detect malfunctions by current value during waveform output before compressor startup.
- Detect malfunctions by current sensor value during synchronized operation at the time of startup.
- Detect malfunctions using an SP-PAM series capacitor overvoltage sensor.

Malfunction Decision Conditions

- In case of overcurrent (OCP) during waveform output
- When the current sensor malfunctions during synchronized operation
- When overvoltage occurs in SP-PAM
- In case of IGBT malfunction

Supposed Causes

- Faulty outdoor P.C.B. (A1P)
  - IPM failure
  - Current sensor failure
  - SP-PAM failure
  - Failure of IGBT or drive circuit

Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Turn OFF the power supply once and then turn it ON again.

Does it return normally?

YES

External factor other than malfunction (for example, noise etc.).

NO

Replace the outdoor P.C.B. (A1P).

P.C.B. equipped with a resin case
3.29 “L4” Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise

Remote Controller Display

Applicable Models
RZQ18-30PVJU

Method of Malfunction Detection
Fin temperature is detected by the thermistor of the radiation fin.

Malfunction Decision Conditions
When the temperature of the inverter radiation fin increases above 180°F.

Supposed Causes
- Actuation of fin thermal (Actuates above 180°F)
- Defect of inverter P.C.B.
- Defect of fin thermistor

Troubleshooting

Caution
Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

![Troubleshooting Flowchart]

1. **The radiator fin temperature is supposed to have risen to 180°F or more.**
   - YES: Faulty heat radiation of power unit
     - Air suction opening blocked
     - Dirty radiator fin
     - High outdoor temperature
   - NO: Proceed to step 2

2. **Is the connector X111A of the fin thermistor properly connected to the outdoor P.C.B.?**
   - NO: Connect properly.
   - YES: Proceed to step 3

3. **Turn ON the power supply, and then press the remote controller check button once.**
   - YES: To “P4” troubleshooting
   - NO: Proceed to step 4

4. **Does the malfunction code “L4” recur when the unit starts operation?**
   - NO: Continue operation.
   - YES: Replace the outdoor P.C.B. (A1P) as well.
### 3.30 “L5” Outdoor Unit: Inverter Compressor Abnormal

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>L5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>RZQ18~30PVJU</td>
</tr>
<tr>
<td>Method of Malfunction Detection</td>
<td>Malfunction is detected from current flowing in the power transistor.</td>
</tr>
<tr>
<td>Malfunction Decision Conditions</td>
<td>When an excessive current flows in the power transistor. (Instantaneous overcurrent also causes activation.)</td>
</tr>
</tbody>
</table>
| Supposed Causes | • Defect of compressor coil (disconnected, defective insulation)  
• Compressor start-up malfunction (mechanical lock)  
• Defect of inverter P.C.B. |

### Troubleshooting

**Caution** Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Compressor inspection

- The compressor’s coil is disconnected or the insulation is defective. **YES** Replace the compressor.
  - **NO** Disconnect the connection between the compressor and inverter. Make the power transistor check mode setting ON by service mode.

- Inverter output voltage check  
  - **YES** Replace the inverter unit.
  - **NO** There is instantaneous power drop.
    - **YES** Correct power supply.
    - **NO** Compressor inspection

Higher voltage than actual is displayed when the inverter output voltage is checked by tester.
### 3.31 “L8” Outdoor Unit: Inverter Current Abnormal

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>L8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>RZQ18~30PVJU</td>
</tr>
<tr>
<td>Method of Malfunction Detection</td>
<td>Malfunction is detected by current flowing in the power transistor.</td>
</tr>
<tr>
<td>Malfunction Decision Conditions</td>
<td>When overload in the compressor is detected.</td>
</tr>
</tbody>
</table>
| Supposed Causes | • Compressor overload  
• Compressor coil disconnected  
• Defect of outdoor unit P.C.B. (A1P) |
Troubleshooting

**Caution**

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Output current check

- **The secondary current of the inverter is higher than X16.8A, 260sec. for each phase.**
  - YES: Compressor overload inspection of the compressor and refrigerant system is required.
  - NO: Compressor inspection
    - YES: Replace the compressor.
    - NO: Disconnect the connection between the compressor and inverter. Make the power transistor check mode setting ON by service mode.

Inverter output voltage check

- Inverter output voltage is not balanced (Normal if within ±5V). Must be measured when frequency is stable.
  - NO: Replace the outdoor unit P.C.B. (A1P).
  - YES: After turning on again, "L8" blinks again.
    - NO: Reset and restart.
    - YES: Compressor inspection
      - Inspect according to the diagnosis procedure for odd noises, vibration and operating status of the compressor.
3.32 "L9" Outdoor Unit: Inverter Start up Error

Remote Controller Display

Applicable Models
RZQ18-30PVJU

Method of Malfunction Detection
Malfunction is detected from current flowing in the power transistor.

Malfunction Decision Conditions
When overload in the compressor is detected during startup

Supposed Causes
- Defect of compressor
- Pressure differential start
- Defect of outdoor unit P.C.B. (A1P)

Troubleshooting

Caution
Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

- The difference between high and low pressure when starting is above 30psi.
  - NO
  - Unsatisfactory pressure equalization Check refrigerant system.
  - YES
- Disconnect the connection between the compressor and inverter. Make the power transistor check mode ON by service mode.
  - YES
- Inverter output voltage check. Inverter output voltage is not balanced. (Normal if within ±5V) Must be measured when frequency is stable.
  - NO
  - YES
- After turning on again, "L9" blinks again.
  - NO
  - Reset and restart.
  - YES
- Compressor inspection Inspect according to the diagnosis procedure for odd noises, vibration and operating status of the compressor.
3.33 “LC” Outdoor Unit: Malfunction of Transmission between Inverter and Control P.C.B.

Remote Controller Display

Applicable Models
RZQ18~30PVJU

Method of Malfunction Detection
Check the communication state between inverter P.C.B. and control P.C.B. by micro-computer.

Malfunction Decision Conditions
When the correct communication is not conducted in certain period.

Supposed Causes
- Malfunction of connection between the inverter microcomputer and outdoor control microcomputer
- Defect of outdoor unit P.C.B.
- Defect of noise filter
- External factor (Noise etc.)

Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

<table>
<thead>
<tr>
<th>Question</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the connector for the fan motor properly connected to the indoor unit P.C.B.?</td>
<td>Connect correctly.</td>
</tr>
<tr>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>Disconnect the connection for the fan motor, and turn on again.</td>
</tr>
<tr>
<td>YES</td>
<td>Replace the fan motor. Failure of the inverter transmission occurs due to the fan motor malfunction.</td>
</tr>
<tr>
<td>NO</td>
<td>Replace the outdoor unit P.C.B. (A1P).</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.34 “msgid” Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise Sensor

Remote Controller Display

Applicable Models
RZQ18~30PVJU

Method of Malfunction Detection
Resistance of radiation fin thermistor is detected when the compressor is not operating.

Malfunction Decision Conditions
- When the resistance value of thermistor becomes a value equivalent to open or short circuited status.
- Malfunction is not decided while the unit operation is continued.
  
  "msgid" will be displayed by pressing the inspection button.

Supposed Causes
- Defect of radiator fin temperature sensor
- Defect of outdoor unit P.C.B. (A1P)

Troubleshooting

Caution
Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Power OFF
- Disconnect the cable from the compressor, and then check the compressor for the insulation resistance.
- The insulation resistance is low (i.e., not more than 100kΩ).
  - YES
    - Replace the compressor.
  - NO
    - Remove and insert the fin thermistor connector [X111A].

Power ON
- Turn ON the power supply, and then check whether or not the malfunction recurs.
  - YES
    - Replace the outdoor unit P.C.B. (A1P).
  - NO
    - End
### 3.35 “U0” Outdoor Unit: Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>U0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>RZQ18-30PVJU</td>
</tr>
<tr>
<td>Method of Malfunction Detection</td>
<td>Short of gas malfunction is detected by discharge pipe temperature thermistor and low pressure saturation temperature.</td>
</tr>
<tr>
<td>Malfunction Decision Conditions</td>
<td>Microcomputer judge and detect if the system is short of refrigerant.</td>
</tr>
<tr>
<td></td>
<td>★Malfunction is not decided while the unit operation is continued.</td>
</tr>
<tr>
<td>Supposed Causes</td>
<td>Out of gas or refrigerant system clogging (incorrect piping)</td>
</tr>
<tr>
<td></td>
<td>Defect of pressure sensor</td>
</tr>
<tr>
<td></td>
<td>Defect of outdoor unit P.C.B. (A1P)</td>
</tr>
<tr>
<td></td>
<td>Defect of thermistor R3T</td>
</tr>
</tbody>
</table>
Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Low pressure is 36psi or less.

- YES: Out of gas, closing of stop valve or refrigerant system is clogged. Requires check of refrigerant system.
- NO: The voltage of X18A pins (2) and (3) on main outdoor unit P.C.B. (A1P) is 1.0 VDC or less. (Low pressure sensor output voltage)

The suction pipe1 temp. minus low pressure saturation temp. is 36 °F or higher.

- YES: Replace the main outdoor unit P.C.B. (A1P).
- NO: Resistance is normal when measured with the thermistor (R3T) for suction pipe1 disconnected from the outdoor unit P.C.B.

Is the low pressure sensor correct?

- YES: Replace the low pressure sensor.
- NO: Replace the low pressure sensor.

- YES: Replace the low pressure sensor.
- NO: Replace the low pressure sensor.

⇒ 2: Voltage measurement point

⇒ 1: Refer to **Thermistor Resistance / Temperature Characteristics** table on P.166.
⇒ 2: Refer to **Pressure Sensor, Pressure / Voltage Characteristics** table on P.168.
### 3.36 "U2" Power Supply Insufficient or Instantaneous Failure

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>U2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applicable Models</strong></td>
<td>RZQ18~30PVJU</td>
</tr>
<tr>
<td><strong>Method of Malfunction Detection</strong></td>
<td>Detection of voltage of main circuit capacitor built in the inverter and power supply voltage.</td>
</tr>
<tr>
<td><strong>Malfunction Decision Conditions</strong></td>
<td>When the abnormal voltage of main circuit capacitor built in the inverter and abnormal power supply voltage are detected.</td>
</tr>
</tbody>
</table>
| **Supposed Causes**       | - Power supply insufficient  
                           - Instantaneous power failure  
                           - Defect of outdoor unit fan motor  
                           - Defect of outdoor control P.C.B. (A1P) |
Troubleshooting

**Caution**
Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

1. **Is the power supply voltage 208~230V ±10%?**
   - **NO**: Correct power supply.
   - **YES**: Continue to the next step.

2. **CHECK (P.158)**
   - **Check the inverter power transistor.**
     - **YES**: Replace the inverter P.C.B.
     - **NO**: Proceed to the next step.

3. **Has the power transistor malfunctioned?**
   - **YES**: Replace the inverter P.C.B.
   - **NO**: Continue to the next step.

4. **CHECK (P.158)**
   - **Is the resistance above standard value?**
     - **NO**: Replace the fan motor.
     - **YES**: Proceed to the next step.

5. **When the compressor is running, measure the voltage between + and - of electrolytic capacitor (C+, C-).**

6. **Is the measured voltage 220 VDC or more?**
   - **YES**: Monitor the voltage. (Instantaneous voltage drop)
   - **NO**: Replace the inverter P.C.B. (A1P).
3.37 “U3” Check Operation not Executed

Remote Controller Display

<table>
<thead>
<tr>
<th>Applicable Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>RZQ18~30PVJU</td>
</tr>
</tbody>
</table>

Method of Malfunction Detection

- Check operation is executed or not

Malfunction Decision Conditions

- Malfunction is decided when the unit starts operation without check operation.

Supposed Causes

- Check operation is not executed.

Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

**Caution**

- Push the BS4 on P.C.B. on the master outdoor unit for 5 seconds or more to execute check operation.
- Replace the main P.C.B. on the outdoor unit.

Troubleshooting by Indication on the Remote Controller
### "U4" Malfunction of Transmission between Indoor Units and Outdoor Units

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<th>Remote Controller Display</th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>U4</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Applicable Models</th>
<th>All indoor unit models</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RZQ18-30PVJU</td>
</tr>
</tbody>
</table>

| Method of Malfunction Detection | Microcomputer checks if transmission between indoor and outdoor units is normal. |

| Malfunction Decision Conditions | When transmission is not carried out normally for a certain amount of time. |

<table>
<thead>
<tr>
<th>Supposed Causes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor to outdoor, outdoor to outdoor transmission wiring F1, F2 disconnection, short circuit or wrong wiring</td>
<td></td>
</tr>
<tr>
<td>Outdoor unit power supply is OFF</td>
<td></td>
</tr>
<tr>
<td>System address doesn't match</td>
<td></td>
</tr>
<tr>
<td>Defect of outdoor unit P.C.B.</td>
<td></td>
</tr>
<tr>
<td>Defect of indoor unit P.C.B.</td>
<td></td>
</tr>
</tbody>
</table>
Troubleshooting

**Caution** Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

- If the indoor or outdoor unit P.C.B. has been replaced or has been modified, the indoor - outdoor or outdoor - outdoor unit transmission wiring is normal? 
  - **YES** Push and hold the RESET button on the master outdoor unit P.C.B. for 5 seconds. *The unit will not operate for up to 12 minutes.
  - **NO** Fix the indoor/outdoor unit transmission wiring.

- All indoor unit remote controllers of the same refrigerant system display "U4"? 
  - **YES** Replace the indoor unit P.C.B.
  - **NO** Fix the indoor/outdoor unit transmission wiring.

- Outdoor unit P.C.B. microcomputer monitor (HAP) blinks? 
  - **YES** Supply 208–230 V.
  - **NO** The voltage between terminals L1 and N of the outdoor unit P.C.B. is 208–230 V.

- The fuse on the outdoor unit's P.C.B. is burnt? 
  - **YES** Replace the fuse.
  - **NO** Replace the outdoor unit P.C.B. (A1P).

- Operation ready lamp (H2P) is blinking? 
  - **YES** Push and hold the RESET button on the outdoor unit P.C.B. for 5 seconds.
  - **NO** Fix the indoor/outdoor unit transmission wiring.

- Lamp does not go off for 12 minutes or more? 
  - **YES** Replace the outdoor unit P.C.B. (A1P).
  - **NO** Fix the indoor/outdoor unit transmission wiring.

- Is indoor - outdoor and outdoor - outdoor unit transmission wiring normal? 
  - **YES** Replace the outdoor unit P.C.B. (A1P).
3.39 “U5” Malfunction of Transmission between Remote Controller and Indoor Unit

Remote Controller Display

Applicable Models

All indoor unit models

Method of Malfunction Detection

In case of controlling with 2-remote controller, check the system using microcomputer is signal transmission between indoor unit and remote controller (main and sub) is normal.

Malfunction Decision Conditions

Normal transmission does not continue for specified period.

Supposed Causes

- Malfunction of indoor unit remote controller transmission
- Connection of two main remote controllers (when using 2 remote controllers)
- Defect of indoor unit P.C.B.
- Defect of remote controller P.C.B.
- Malfunction of transmission caused by noise

Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Using 2-remote controllers control.

YES

SS1 of both remote controllers is set to "MAIN."

YES

Set one remote controller to "SUB"; turn the power supply off once and then back on.

NO

Operation returns to normal when the power is turned off momentarily.

NO

Replace indoor unit P.C.B.

NO

There is possibility of malfunction caused by noise. Check the surrounding area and turn on again.

YES

Switch to double-core independent cable replacement

YES

Defect of remote controller P.C.B. or indoor unit P.C.B. Replace whichever is defective.

NO

Multi-core cable is used for the indoor unit remote controller transmission wiring.

YES

NO

All indoor P.C.B. microcomputer monitors blink.

NO

YES

There is possibility of malfunction caused by noise. Check the surrounding area and turn on again.

NO

Replace indoor unit P.C.B.

YES

Switch to double-core independent cable replacement

NO

Defect of remote controller P.C.B. or indoor unit P.C.B. Replace whichever is defective.
### 3.40 “U8” Malfunction of Transmission between Main and Sub Remote Controllers

**Remote Controller Display**

![Remote Controller Display]

**Applicable Models**

All indoor unit models

**Method of Malfunction Detection**

In case of controlling with 2-remote controller, check the system using the microcomputer if signal transmission between indoor unit and remote controller (main and sub) is normal.

**Malfunction Decision Conditions**

Normal transmission does not continue for specified period.

**Supposed Causes**

- Malfunction of transmission between main and sub remote controller
- Connection between sub-remote controllers
- Defect of remote controller P.C.B.

**Troubleshooting**

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

1. Using 2-remote controllers control,
   - **YES**
   - **NO**

2. SS1 of both remote controllers is set to “SUB.”
   - **YES**
   - **NO**

3. SS1 of remote controller P.C.B.s is set to “MAIN.”
   - **YES**
   - **NO**

- Set SS1 to “MAIN”; the power supply off once and then back on.
- Turn the power off and then back on. If a malfunction occurs, replace the remote controller P.C.B.
- Set one remote controller to “MAIN”; the power supply off once and then back on.
3.41 “UE” Malfunction of Transmission between Centralized Remote Controller and Indoor Unit

<table>
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<tr>
<th>Remote Controller Display</th>
<th>UE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>All indoor unit models</td>
</tr>
<tr>
<td></td>
<td>Centralized controller</td>
</tr>
<tr>
<td>Method of Malfunction Detection</td>
<td>Microcomputer checks if transmission between indoor unit and centralized remote controller is normal.</td>
</tr>
<tr>
<td>Malfunction Decision Conditions</td>
<td>When transmission is not carried out normally for a certain amount of time</td>
</tr>
<tr>
<td>Supposed Causes</td>
<td>- Malfunction of transmission between optional controllers for centralized control and indoor unit</td>
</tr>
<tr>
<td></td>
<td>- Connector for setting master controller is disconnected.</td>
</tr>
<tr>
<td></td>
<td>- Failure of P.C.B. for centralized remote controller</td>
</tr>
<tr>
<td></td>
<td>- Defect of indoor unit P.C.B.</td>
</tr>
</tbody>
</table>
Troubleshooting

**Caution**  Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

```
Has an indoor unit once connected been removed or its address changed?  
  YES  Reset power supply simultaneously for all optional controllers for centralized control.
  NO

Is the power supply turned on for indoor units displaying malfunction?  
  YES  Turn indoor unit's power supply.
  NO

Is transmission wiring disconnected or wired incorrectly?  
  YES  Fix the wiring correctly.
  NO

Is transmission with all indoor units malfunctioning?  
  YES  Set the group No. correctly.
  NO

Is the transmission wiring with the master controller disconnected or wired incorrectly?  
  YES  Replace indoor unit P.C.B.
  NO  Fix the wiring correctly.

Is the master controller's connector for setting master controller disconnected?  
  YES  Connect the connector correctly.
  NO  Replace the central P.C.B.
```
3.42 “UF” System is not Set yet

Remote Controller Display

Applicable Models
All models of indoor units
RZQ18~30PVJU

Method of Malfunction Detection
On check operation, the number of indoor units in terms of transmission is not corresponding to that of indoor units that have made changes in temperature.

Malfunction Decision Conditions
The malfunction is determined as soon as the abnormality aforementioned is detected through checking the system for any erroneous connection of units on the check operation.

Supposed Causes
- Improper connection of transmission wiring between indoor-outdoor units and outdoor-outdoor units
- Failure to execute check operation
- Defect of indoor unit P.C.B.
- Stop valve is left in closed

Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Are the stop valves opened?
- YES
- NO

Is the check operation carried out?
- YES
- NO

Is indoor - outdoor and outdoor - outdoor unit transmission wiring normal?
- YES
- NO

Is indoor - outdoor and outdoor - outdoor unit transmission wiring normal?
- YES
- NO

Replace indoor unit P.C.B.
- YES
- NO

Open the stop valve.
- YES
- NO

After fixing incorrect wiring, push and hold the RESET button on the master outdoor unit P.C.B. for 5 seconds.
* The unit will not run for up to 12 minutes.

Wiring check operation may not have been carried out successfully.

Note: Wiring check operation may not be successful if carried out after the outdoor unit has been off for more than 12 hours, or if it is not carried out after running all connected indoor units in the fan mode for at least an hour.
### 3.43 “UH” Malfunction of System, Refrigerant System Address Undefined

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>UH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>All indoor unit models RZQ18-30PVJU</td>
</tr>
</tbody>
</table>

#### Method of Malfunction Detection

#### Malfunction Decision Conditions

#### Supposed Causes
- Improper connection of transmission wiring between outdoor unit and outdoor unit outside control adaptor
- Defect of indoor unit P.C.B.
- Defect of outdoor unit P.C.B. (A1P)
Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Is electricity being introduced for the first time after installation after an indoor or outdoor unit P.C.B. has been replaced?

YES

Does a malfunction occur even after 12 minutes elapses from the time when electricity is introduced to indoor and outdoor units?

NO

Normal

YES

Is indoor - outdoor and outdoor - outdoor unit transmission wiring normal?

NO

After fixing incorrect wiring, push and hold the RESET button on the outdoor unit P.C.B. for 5 seconds.

YES

After fixing incorrect wiring, push and hold the RESET button on the outdoor unit P.C.B. for 5 seconds.

YES

Does a malfunction occur?

NO

Normal

YES

Does a "UH" malfunction occur for all indoor units in the system?

NO

Replace the indoor unit P.C.B.

YES

Replace the outdoor unit P.C.B. (A1P).
4. Troubleshooting by Indication on the Centralized Remote Controller

4.1 “UE” Malfunction of Transmission between Centralized Remote Controller and Indoor Unit

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>UE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>All indoor unit models</td>
</tr>
<tr>
<td>Centralized Remote Controller</td>
<td></td>
</tr>
<tr>
<td>Method of Malfunction Detection</td>
<td>Microcomputer checks if transmission between indoor unit and centralized remote controller is normal.</td>
</tr>
<tr>
<td>Malfunction Decision Conditions</td>
<td>When transmission is not carried out normally for a certain amount of time</td>
</tr>
<tr>
<td>Supposed Causes</td>
<td>■ Malfunction of transmission between optional controllers for centralized control and indoor unit</td>
</tr>
<tr>
<td>■ Connector for setting master controller is disconnected.</td>
<td></td>
</tr>
<tr>
<td>■ Failure of P.C.B. for centralized remote controller</td>
<td></td>
</tr>
<tr>
<td>■ Defect of indoor unit P.C.B.</td>
<td></td>
</tr>
</tbody>
</table>
Troubleshooting

Caution

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Has an indoor unit once connected been removed or its address changed?

YES

Reset power supply simultaneously for all optional controllers for centralized control.

NO

Is the power supply turned on for indoor units displaying malfunction?

NO

Turn indoor unit's power supply.

YES

Is transmission wiring disconnected or wired incorrectly?

NO

Fix the wiring correctly.

YES

Is transmission with all indoor units malfunctioning?

NO

Is the group No. of malfunctioning indoor units set?

NO

Set the group No. correctly.

YES

Replace indoor unit P.C.B.

NO

Is the transmission wiring with the master controller disconnected or wired incorrectly?

YES

Fix the wiring correctly.

NO

Is the master controller's connector for setting master controller disconnected?

YES

Connect correctly.

NO

Replace the central P.C.B.
## 4.2 “M1” P.C.B. Defect

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>M1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applicable Models</strong></td>
<td>Centralized remote controller</td>
</tr>
<tr>
<td><strong>Method of Malfunction Detection</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Malfunction Decision Conditions</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Supposed Causes</strong></td>
<td>Defect of centralized remote controller P.C.B.</td>
</tr>
<tr>
<td><strong>Troubleshooting</strong></td>
<td>Replace the centralized remote controller P.C.B.</td>
</tr>
</tbody>
</table>
4.3 “M8” Malfunction of Transmission between Optional Controllers for Centralized Control

Remote Controller Display

- M8

Applicable Models

- Centralized remote controller

Method of Malfunction Detection

Malfunction Decision Conditions

Supposed Causes

- Malfunction of transmission between optional controllers for centralized control
- Defect of P.C.B. of optional controllers for centralized control

Troubleshooting

Caution

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Has a once connected optional controller for centralized control been disconnected or its address changed?

- YES: Reset power supply simultaneously for all optional controllers for centralized control.
- NO: Turn on power supply for all optional controllers for centralized control.

Is the power supply turned on for all optional controllers for centralized control?

- YES: Set reset switch to “normal.”
- NO: Fix the wiring correctly.

Is the reset switch of all optional controllers for centralized control set to "normal"?

- YES: Fix the wiring correctly.
- NO: The P.C.B. of one of the optional controllers for centralized control is defective. Try turning on/off using each optional controllers for centralized control, and replace the P.C.B. of the one that is unable to control the indoor unit.
### 4.4 "MA" Improper Combination of Optional Controllers for Centralized Control

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>MA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>Centralized remote controller</td>
</tr>
<tr>
<td>Method of Malfunction Detection</td>
<td></td>
</tr>
<tr>
<td>Malfunction Decision Conditions</td>
<td></td>
</tr>
</tbody>
</table>
| Supposed Causes             | ■ Improper combination of optional controllers for centralized control  
                               ■ More than one master controller is connected  
                               ■ Defect of P.C.B. of optional controller for centralized control |
Troubleshooting

Caution

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

**Diagram Description:**

1. **Is the wiring adaptor for electrical appendices connected?**
   - **YES:** Cannot be used in combination with a wiring adaptor for electrical appendices. Remove the wiring adaptor for electrical appendices and reset the power supply for all optional controllers for centralized control simultaneously.
   - **NO:**
     2. **Is a schedule timer connected?**
        - **YES:** Schedule timer and data station cannot be used in combination. Disconnect either the schedule timer or data station and reset the power supply for all optional controllers for centralized control simultaneously.
        - **NO:**
          3. **Is a parallel interface connected?**
             - **YES:** Schedule timer and parallel interface cannot be used in combination. Disconnect either the schedule timer or parallel interface and reset the power supply for all optional controllers for centralized control simultaneously.
             - **NO:**
               4. **Is the schedule timer's individual/combined connector connected?**
                  - **YES:** Disconnect the schedule timer's individual / combined connector and reset the power supply for all optional controllers for centralized control simultaneously.
                  - **NO:**

2. **Are there two or more optional controllers for centralized control connected with the connector for setting master control?**
   - **YES:** Arrange so that the connector for setting master control is connected to one controller for centralized control and reset the power supply for all optional controllers for centralized control simultaneously.
   - **NO:**

3. If the malfunction is still not cleared:
   - **Disconnect the connector for setting master control from the master controller, connect to another optional controller for centralized control and simultaneously reset all optional controllers for centralized control again. The controller connected by the connector for setting master control when the malfunction is cleared is defective and must be replaced.**

4. **Reset the power supply for all optional controllers for centralized control simultaneously.**
4.5 “MC” Address Duplication, Improper Setting

Remote Controller Display

| Applicable Models | Centralized remote controller |

Method of Malfunction Detection

Malfunction Decision Conditions

Supposed Causes
- Address duplication of centralized remote controller

Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Are two or more centralized remote controllers connected?

YES
- Disconnect all centralized remote controllers except one, and reset the power supply of the centralized remote controller.

NO
- Reset power supply of the centralized remote controller.
5. Troubleshooting by Indication on the Unified ON/OFF Controller

5.1 Operation Lamp Blinks

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>Operation lamp blinks</th>
</tr>
</thead>
</table>

| Applicable Models          | All models of indoor units  
<table>
<thead>
<tr>
<th></th>
<th>Unified ON/OFF controller</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Method of Malfunction Detection</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Malfunction Decision Conditions</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Supposed Causes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction of transmission between optional controller and indoor unit</td>
<td></td>
</tr>
<tr>
<td>Connector for setting master controller is disconnected</td>
<td></td>
</tr>
<tr>
<td>Defect of unified ON/OFF controller</td>
<td></td>
</tr>
<tr>
<td>Defect of indoor unit P.C.B.</td>
<td></td>
</tr>
<tr>
<td>Malfunction of air conditioner</td>
<td></td>
</tr>
</tbody>
</table>
Troubleshooting

**Caution**
Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

1. Is a malfunction code displayed on the remote controller?
   - **YES**
     - Diagnose the cause with the air conditioner's failure diagnosis manual.
   - **NO**

2. Has a once connected indoor unit been removed or its address changed?
   - **YES**
     - Reset power supply for all optional controllers for centralized control simultaneously.
   - **NO**

3. Is the power supply for the indoor unit displaying a malfunction turned on?
   - **YES**
     - Turn the power supply of the indoor unit on.
   - **NO**

4. Is transmission wiring disconnected or wired incorrectly?
   - **YES**
     - Fix the wiring correctly.
   - **NO**

5. Is transmission with all indoor units malfunctioning?
   - **NO**
     - Is the group No. of malfunctioning indoor units set?
       - **NO**
         - Set the group No. correctly.
       - **YES**
         - Replace the indoor unit P.C.B.
   - **YES**
     - Fix the wiring correctly.

6. Is the transmission wiring with the master controller disconnected or wired incorrectly?
   - **YES**
     - Connect the connector correctly.
   - **NO**

7. Is the master controller's connector for setting master controller disconnected?
   - **YES**
     - Replace the central P.C.B.
   - **NO**
## 5.2 Display “Under Host Computer Integrate Control” Blinks (Repeats Single Blink)

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>“under host computer integrated control” (Repeats single blink)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>Unified ON/OFF controller, Centralized controller, Schedule timer</td>
</tr>
<tr>
<td>Method of Malfunction Detection</td>
<td></td>
</tr>
<tr>
<td>Malfunction Decision Conditions</td>
<td></td>
</tr>
<tr>
<td>Supposed Causes</td>
<td>Address duplication of centralized remote controller</td>
</tr>
<tr>
<td></td>
<td>Improper combination of optional controllers for centralized control</td>
</tr>
<tr>
<td></td>
<td>Connection of more than one master controller</td>
</tr>
<tr>
<td></td>
<td>Malfunction of transmission between optional controllers for centralized control</td>
</tr>
<tr>
<td></td>
<td>Defect of P.C.B. of optional controllers for centralized control</td>
</tr>
</tbody>
</table>
Troubleshooting

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

Has a once connected optional controller for centralized control been disconnected or its address changed?

Yes → Reset power supply simultaneously for all optional controllers for centralized control.

No → Is the power supply turned on for all optional controllers for centralized control?

Yes → Turn on power supply for all optional controllers for centralized control.

No → Is the reset switch of all optional controllers for centralized control set to "normal."

Yes → Set reset switch to "normal."

No → Is transmission wiring disconnected or wired incorrectly?

Yes → Fix the wiring correctly.

No → Is a centralized remote controller or schedule timer connected?

Yes → Is the centralized remote controller or schedule timer displaying a malfunction?

Yes → Refer to failure diagnosis for centralized remote controller or schedule timer.

No → Are two or more unified ON/OFF controllers connected?

Yes → Is the setting of the unified ON/OFF controller's switch for setting each address duplicated?

Yes → Correct the setting of the unified ON/OFF controller's switch for setting each address and reset the power supply of the unified ON/OFF controller.

No → NO
Is the wiring adaptor for electrical appendices connected?

NO

Is a schedule timer connected?

YES Is a data station connected?

NO

YES

Is a parallel interface connected?

NO

YES

Is the schedule timer's individual/combined connector connected?

NO

YES

Are there two or more optional controllers for centralized control connected with the connector for setting master control?

YES

NO

Reset the power supply for all optional controllers for centralized control simultaneously.

If the malfunction is still not cleared:

Cannot be used in combination with a wiring adaptor for electrical appendices. Remove the wiring adaptor for electrical appendices and reset the power supply for all optional controllers for centralized control simultaneously.

Schedule timer and data station cannot be used in combination. Disconnect either the schedule timer or data station and reset the power supply for all optional controllers for centralized control simultaneously.

Schedule timer and parallel interface cannot be used in combination. Disconnect either the schedule timer or parallel interface and reset the power supply for all optional controllers for centralized control simultaneously.

Arrange so that the connector for setting master control is connected to one controller for centralized control and reset the power supply for all optional controllers for centralized control simultaneously.

Disconnect the connector for setting master control from the master controller, connect to another optional controller for centralized control and simultaneously reset all optional controllers for centralized control again. The controller connected by the connector for setting master control when the malfunction is cleared is defective and must be replaced.
### 5.3 Display “Under Host Computer Integrate Control” Blinks (Repeats Double Blink)

<table>
<thead>
<tr>
<th>Remote Controller Display</th>
<th>“Under host computer integrated control” (Repeats double blink)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Models</td>
<td>Unified ON/OFF controller</td>
</tr>
</tbody>
</table>

#### Method of Malfunction Detection

<table>
<thead>
<tr>
<th>Malfunction Decision Conditions</th>
<th>Supposed Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Central control address (group No.) is not set for indoor unit.</td>
</tr>
<tr>
<td></td>
<td>Improper address setting</td>
</tr>
<tr>
<td></td>
<td>Improper wiring of transmission wiring</td>
</tr>
</tbody>
</table>

#### Troubleshooting

**Caution**

Be sure to turn off the power switch before connecting or disconnecting the connector, or parts could be damaged.

```
Is the central control address (group No.) set for the indoor unit?  NO  YES
   Set by remote controller the central control address for all indoor units connected to the central control line.

Is the switch for setting each address set correctly?  NO  YES
   Set the switch for setting each address correctly and simultaneously reset the power supply for all optional controllers for centralized control.

Is the transmission wiring disconnected or wired incorrectly?  NO  YES
   Fix the wiring correctly.

Replace the P.C.B. of the unified ON/OFF controller.
```
**CHECK 1** Check for causes of rise in high pressure

Referring to the Fault Tree Analysis (FTA) shown below, probe the faulty points.

- **Stop valve closed**
  - Check to be sure the stop valve is open.
- **Bent or crashed pipe**
  - Conduct visual checks for pipe conditions.
- **Clogging of foreign**
  - Is there any temperature difference before and after the filter or branch pipe?
- **Faulty valve coil**
  - Are the coil resistance and insulation normal?
- **Faulty valve body**
  - Are the electrical characteristics normal?
- **Faulty high pressure sensor**
  - Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
  - Are the coil resistance and insulation normal?
- **Faulty control**
  - Are the electrical characteristics normal?
  - Is the connector properly connected?
  - Are the thermistor resistance characteristics normal?
- **Faulty indoor unit electronic expansion valve**
  - Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- **Faulty outdoor unit electronic expansion valve**
  - Is the suction air temperature not more than 115°F?
  - Is the outdoor temperature not more than 115°F?
  - Is the suction air temperature not more than 81°F?
  - Is the indoor temperature not more than 81°F?
  - Is the connector properly connected?
  - Are the thermistor resistance characteristics normal?
  - Is the outdoor temperature not more than 61°FWB?
  - Is the connector properly connected?
  - Are the thermistor resistance characteristics normal?
- **Dirty condenser**
  - Is the heat exchanger clogged? (In cooling)
  - Is air or else mixed in the refrigerant system?
- **Faulty fan motor**
  - Can the fan motor be rotated with hands?
  - Are the motor coil resistance and insulation normal?
- **Faulty control P.C.B.**
  - If a spare P.C.B. is mounted, is the capacity setting properly made?
- **Decreased fan airflow rate**
  - Is the air filter clogged?
- **Dirty filter**
  - Is there any obstacle in the air passage?
- **Obstacle**
  - Refer to P.112.
  - Is the indoor unit too small compared to the large-sized outdoor unit?

*1: In cooling, it is normal if the outdoor unit electronic expansion valve (EV1) is fully open.
*2: In heating, the indoor unit electronic expansion valve is used for “subcooled degree control”.

---

Troubleshooting by Indication on the Unified ON/OFF Controller

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CHECK 2 Check for causes of drop in low pressure

Referring to the Fault Tree Analysis (FTA) shown below, probe the faulty points.

- Abnormally low low-pressure (low evaporating temperature)
- Low suction air temperature of the evaporator
- Less circulation quantity of refrigerant
- Degradation in condensing capacity

Faulty low pressure control

- In both cooling and heating (See *2.)
- In cooling (See *1.)

High pipe resistance

- Abnormal piping length
- Bent or crashed pipe
- Clogging of foreign particles
- Stop valve closed

Low suction air temperature of the evaporator

- In heating
- In cooling

Faulty indoor unit electronic expansion valve

- Faulty gas pipe thermistor of indoor unit
- Faulty liquid pipe thermistor of indoor unit
- Faulty control P.C.B.

Faulty outdoor unit electronic expansion valve

- Faulty valve coil
- Faulty valve body
- Faulty low pressure sensor
- Faulty suction pipe thermistor
- Faulty control P.C.B.

Low suction air temperature of the indoor unit

- Short circuit
- Low ambient temperature

- Is the suction air temperature not less than 57˚F
- Is the indoor temperature not less than 57˚F
- Is the connector properly connected?
  Are the thermistor resistance characteristics normal?
- Is the outdoor temperature not less than 5˚F
- Is the connector properly connected?
  Are the thermistor resistance characteristics normal?
- Does the piping length fall in the permissible range?
- Conduct visual checks for pipe conditions.
- Is there any temperature difference caused before and after the filter or branch pipe?
- Check to be sure the stop valve is open.

Moisture choke

- Inadequate refrigerant quantity

Dirty evaporator

- Decreased fan airflow rate
- Decreased fan output
- High air passage resistance

Faulty electronic expansion valve control

- Faulty fan motor
- Faulty control P.C.B.
  (Including capacity setting)
- Faulty control P.C.B.

Faulty gas pipe thermistor of outdoor unit

- Faulty liquid pipe thermistor of outdoor unit
- Faulty outdoor temperature thermistor of outdoor unit
- Faulty control P.C.B.

Low suction air temperature of the outdoor unit

- Faulty outdoor temperature thermistor of outdoor unit
- Faulty control P.C.B.

High pipe resistance

- Abnormal piping length
- Bent or crashed pipe
- Clogging of foreign particles
- Stop valve closed

Faulty indoor unit electronic expansion valve

- Faulty low pressure sensor
- Faulty hot gas solenoid valve
- Faulty control P.C.B.

Faulty outdoor unit electronic expansion valve

- Faulty valve coil
- Faulty valve body
- Faulty low pressure sensor
- Faulty suction pipe thermistor
- Faulty control P.C.B.

Low suction air temperature of the indoor unit

- Short circuit
- Low ambient temperature

- Is the suction air temperature not less than 57˚F
- Is the indoor temperature not less than 57˚F
- Is the connector properly connected?
  Are the thermistor resistance characteristics normal?
- Is the outdoor temperature not less than 5˚F
- Is the connector properly connected?
  Are the thermistor resistance characteristics normal?
- Does the piping length fall in the permissible range?
- Conduct visual checks for pipe conditions.
- Is there any temperature difference caused before and after the filter or branch pipe?
- Check to be sure the stop valve is open.

Faulty control

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?

Faulty control P.C.B.

- Are the electrical characteristics normal?
- Is the pressure value checked with the Service Checker corresponding to the measurement of the pressure sensor?
- Are the coil resistance and insulation normal?
CHECK 3 Check for Fan Motor Connector

1. Turn the power supply off.
2. With the fan motor connector disconnected, measure the resistance between each pin, then make sure that the resistance is more than the value mentioned in the following table.

<table>
<thead>
<tr>
<th>Measurement point</th>
<th>Judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 4</td>
<td>1MΩ or more</td>
</tr>
<tr>
<td>2 - 4</td>
<td>100kΩ or more</td>
</tr>
<tr>
<td>3 - 4</td>
<td>100Ω or more</td>
</tr>
<tr>
<td>4 - 7</td>
<td>100kΩ or more</td>
</tr>
</tbody>
</table>

CHECK 4 Check for Power Transistor

Judgment is made through cable check with an analog tester.

1. Do not touch the energized part (high voltage part) for at least 10 minutes after the power is turned OFF.
2. Be sure to touch the ground terminal with a hand to release static electricity from the body (to prevent the PC board from being damaged).
3. Also with a tester, take measurements at the following spots and confirm that residual electric charge of the power transistor is DC 50V or less.

4. After checking the residual electric charge, remove the connector of the outdoor unit fan motor. When the outdoor unit fan is rotated by strong headwind, remove the connector of the outdoor unit fan motor after confirming that the outdoor unit fan has stopped because electrical energy is stored in the capacitor and there may be a risk of electric shock.
5. Remove the wire connecting the power transistor and the compressor. Remove it from the compressor terminal side. During this work, be careful not to deform the Faston terminal at the end of the connecting wire.
6. Using an analog tester, measure resistance and fill in the blanks in the following table.

In case of unbalanced resistance for one of the three phases in each table (when the resistance value is equal to five times or more than the other resistance values), the power transistor is broken.

In normal cases, each phase shows a similar resistance value.
Part 8
Appendix

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4. Pressure Sensor .................................................................................................. 168
1. Piping Diagrams

1.1 Outdoor Unit

RZQ18PVJU
RZQ24PVJU
RZQ30PVJU
1.2 Indoor Unit

FCQ18P / 24P / 30PVJU
FHQ18P / 24P / 30PVJU
FAQ18P / 24PVJU

R1T : Thermistor for suction air temperature
R2T : Thermistor for liquid line temperature
R3T : Thermistor for gas line temperature

<table>
<thead>
<tr>
<th>Capacity</th>
<th>GAS</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>18/24/30P</td>
<td>ø5/8</td>
<td>ø3/8</td>
</tr>
</tbody>
</table>
2. Wiring Diagrams for Reference

2.1 Outdoor Unit

RZQ18PVJU
RZQ24PVJU
RZQ30PVJU
2.2 Indoor Unit

FCQ18PVJU
FCQ24PVJU
FCQ30PVJU
NOTE-4

RECEIVER/DISPLAY UNIT (WIRELESS REMOTE CONTROLLER)

POWER SUPPLY
208-230V~

1. TERMINAL BLOCK : CONNECTOR
2. SHORT CIRCUIT CONNECTOR
3. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, USE COPPER CONDUCTORS ONLY.
4. X23A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER IS ATTACHED TO THE UNIT.
5. USE COPPER CONDUCTORS ONLY.
FAQ18PVJU
FAQ24PVJU

3D046039D

INDOOR UNIT A2P A3P

PRINTED CIRCUIT BOARD
FUSE(T 3.15AH 250V)
LIGHT EMITTING DIODE
(MODEMONITOR GREEN)
MOTOR(INDOOR FAN)
MOTOR(SWING FLAP)
THERMISTOR(AIR)
THERMISTOR(COIL LIQUID PIPE)
THERMISTOR(COIL GAS PIPE)
TERMINAL BLOCK(CONTROL)
TERMINAL BLOCK(POWER)
ELECTRONIC EXPANSION VALVE
SWITCHING POWER SUPPLY
PRINTED CIRCUIT BOARD
PRINTED CIRCUIT BOARD
PUSH BUTTON(ON/OFF)
LIGHT EMITTING DIODE(ON-RED)
LIGHT EMITTING DIODE
(TIMER-GREEN)
LIGHT EMITTING DIODE
(FILTER SIGN-RED)
LIGHT EMITTING DIODE
(DEFROST -ORANGE)
SELECTOR SWITCH(MAIN/SUB)
SELECTOR SWITCH

H1PX2AR1TR3TR2TGRN H2P BS1GRN/YLW 208-230V~ X2M SS2 H3P 60Hz
L2 WHT X24A X27A
T2PNK INPUT FROM OUTSIDE T1WHT
F2 TRANSMISSION WIRING
CENTRAL REMOTE CONTROLLER
YLWX2MA1P X30AX35AHAP F1ORGX2M P2BLUX20A X36A X15A X7A
SS1P1BLK P2 WIRED REMOTE CONTROLLER
X1M
R1TX1M P1WHT HAP
BRN
RED
ORG
BLU
WHT
5. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAl.
6. REMOTE CONTROLLER MODEL Varies ACCORDING TO THE SYSTEM, CONFIRM ENGINEERING DATA, ETC. BEFORE CONNECTING.
7. CONFIRM THE METHOD OF SETTING THE SELECTOR SWITCH(SS1, SS2) OF WIRED REMOTE CONTROLLER AND WIRELESS REMOTE CONTROLLER BY INSTALLATION MANUAL AND ENGINEERING DATA, ETC.
8. X24A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS USED.

NOTE)5
NOTE)7
NOTE)2
NOTE)8
NOTE)8
NOTE)5
NOTE)2
NOTE)8
NOTE)8
3. Thermistor Resistance / Temperature Characteristics

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<tr>
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<th>T°C</th>
<th>kΩ</th>
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<tr>
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<th>T°C</th>
<th>kΩ</th>
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Indoor unit
For air suction R1T
For liquid pipe R2T
For gas pipe R3T

Outdoor unit
For outdoor air R1T
For suction 1 R3T
For Heat exchanger R4T
For Suction 2 R5T
<table>
<thead>
<tr>
<th>T°F</th>
<th>T°C</th>
<th>kΩ</th>
<th>T°F</th>
<th>T°C</th>
<th>kΩ</th>
<th>T°F</th>
<th>T°C</th>
<th>kΩ</th>
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<td>86.0</td>
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<td>52.8</td>
<td>143.6</td>
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<td>48.9</td>
</tr>
</tbody>
</table>

For discharge R2T
4. Pressure Sensor

Detected Pressure

\[ P_H, P_L \] (psi) MPa

\[ \begin{align*}
725 & : 5.0 \\
652 & : 4.5 \\
580 & : 4.0 \\
507 & : 3.5 \\
435 & : 3.0 \\
362 & : 2.5 \\
290 & : 2.0 \\
217 & : 1.5 \\
145 & : 1.0 \\
72 & : 0.5 \\
0 & : 0 \\
-72 & : 0.5 \\
\end{align*} \]

Output Voltage \((V_H, V_L)\)

\[ \begin{align*}
PH & = 1.38V - 0.69 \\
PL & = 0.57V - 0.28 \\
PH : & \text{ High pressure} \\
PL : & \text{ Low pressure} \\
V : & \text{ Voltage (V)} \\
V_H : & \text{ Output Voltage [High Side]} \\
V_L : & \text{ Output Voltage [Low Side]} \\
V oc & \text{ Output Voltage (Voc)} \\
\end{align*} \]
Part 9
Precautions for New Refrigerant (R-410A)

1. Precautions for New Refrigerant (R-410A) .................................................170
   1.1 Outline .................................................................................................170
   1.2 Service Tools ......................................................................................172
1. Precautions for New Refrigerant (R-410A)

1.1 Outline

1.1.1 About Refrigerant R-410A

- Characteristics of new refrigerant, R-410A
  1. Performance
     Almost the same performance as R-22 and R-407C
  2. Pressure
     Working pressure is approximately 1.4 times more than R-22 and R-407C.
  3. Refrigerant composition
     Few problems in composition control, since it is a Quasi-azeotropic mixture refrigerant.

<table>
<thead>
<tr>
<th>Refrigerant name</th>
<th>HFC units (Units using new refrigerants)</th>
<th>HCFC units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composing substances</td>
<td>R-407C</td>
<td>R-410A</td>
</tr>
<tr>
<td></td>
<td>Non-azeotropic mixture of HFC32, HFC125 and HFC134a (*1)</td>
<td>Quasi-azeotropic mixture of HFC32 and JFC125 (*1)</td>
</tr>
<tr>
<td>Design pressure</td>
<td>3.2 MPa (gauge pressure) = 32.6 kgf/cm² = 464 psi</td>
<td>4.0 MPa (gauge pressure) = 40.8 kgf/cm² = 580 psi</td>
</tr>
<tr>
<td>Refrigerant oil</td>
<td>Synthetic oil (Ether)</td>
<td>Mineral oil (Suniso)</td>
</tr>
<tr>
<td>Ozone destruction factor (ODP)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Combustibility</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Toxicity</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

★ 1. Non-azeotropic mixture refrigerant: mixture of two or more refrigerants having different boiling points.
★ 2. Quasi-azeotropic mixture refrigerant: mixture of two or more refrigerants having similar boiling points.
★ 3. The design pressure is different at each product. Please refer to the installation manual for each product.

(Reference) 1 MPa ≅ 10.19716 kgf / cm²
1 MPa ≅ 145 psi

Pressure-Enthalpy curves of HFC-32/125 (50/50 wt%)
### Thermodynamic characteristic of R-410A

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Steam pressure (kPa)</th>
<th>Density (kg/m³)</th>
<th>Specific heat at constant pressure (kJ/kgK)</th>
<th>Specific enthalpy (kJ/kg)</th>
<th>Specific entropy (kJ/KgK)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liquid</td>
<td>Vapor</td>
<td>Liquid</td>
<td>Vapor</td>
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#### DAIREP ver 2.0
1.2 Service Tools

R-410A is used under higher working pressure, compared to previous refrigerants (R-22, R-407C). Furthermore, the refrigerating machine oil has been changed from Suniso oil to Ether oil, and if oil mixing is occurred, sludge results in the refrigerants and causes other problems. Therefore, gauge manifolds and charge hoses that are used with a previous refrigerant (R-22, R-407C) can not be used for products that use new refrigerants. Be sure to use dedicated tools and devices.

- Tool compatibility

<table>
<thead>
<tr>
<th>Tool</th>
<th>Compatibility</th>
<th>Reasons for change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge manifold</td>
<td></td>
<td>• Do not use the same tools for R-22 and R-410A.</td>
</tr>
<tr>
<td>Charge hose</td>
<td>×</td>
<td>• Thread specification differs for R-410A and R-407C.</td>
</tr>
<tr>
<td>Gas detector</td>
<td>O</td>
<td>• The same tool can be used for HFCs.</td>
</tr>
<tr>
<td>Vacuum pump</td>
<td>O</td>
<td>• To use existing pump for HFCs, vacuum pump adapter must be installed.</td>
</tr>
<tr>
<td>(pump with reverse flow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>preventive function)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weighting instrument</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Flaring tool (Clutch type)</td>
<td>O</td>
<td>• For R-410A, flare gauge is necessary.</td>
</tr>
<tr>
<td>Torque wrench</td>
<td>O</td>
<td>• Torque-up for 1/2 and 5/8</td>
</tr>
<tr>
<td>Pipe cutter</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Pipe expander</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Pipe bender</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Pipe assembling oil</td>
<td>×</td>
<td>• Due to refrigerating machine oil change. (No Suniso oil can be used.)</td>
</tr>
<tr>
<td>Refrigerant recovery</td>
<td></td>
<td>device. Check your recovery device.</td>
</tr>
<tr>
<td>device.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerant piping</td>
<td></td>
<td>• Only ø19.1 is changed to 1/2H material while the previous material is &quot;O&quot;.</td>
</tr>
</tbody>
</table>

As for the charge mouthpiece and packing, 1/2UNF20 is necessary for mouthpiece size of charge hose.

- Copper tube material and thickness

<table>
<thead>
<tr>
<th>Pipe size [mm]</th>
<th>R-407C Material</th>
<th>Thickness [mm]</th>
<th>R-410A Material</th>
<th>Thickness [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø6.4</td>
<td>O</td>
<td>0.8</td>
<td>O</td>
<td>0.8</td>
</tr>
<tr>
<td>ø9.5</td>
<td>O</td>
<td>0.8</td>
<td>O</td>
<td>0.8</td>
</tr>
<tr>
<td>ø12.7</td>
<td>O</td>
<td>0.8</td>
<td>O</td>
<td>0.8</td>
</tr>
<tr>
<td>ø15.9</td>
<td>O</td>
<td>1.0</td>
<td>O</td>
<td>1.0</td>
</tr>
<tr>
<td>ø19.1</td>
<td>O</td>
<td>1.0</td>
<td>1/2H</td>
<td>1.0</td>
</tr>
<tr>
<td>ø22.2</td>
<td>1/2H</td>
<td>1.0</td>
<td>1/2H</td>
<td>1.0</td>
</tr>
<tr>
<td>ø25.4</td>
<td>1/2H</td>
<td>1.0</td>
<td>1/2H</td>
<td>1.0</td>
</tr>
<tr>
<td>ø28.6</td>
<td>1/2H</td>
<td>1.0</td>
<td>1/2H</td>
<td>1.0</td>
</tr>
<tr>
<td>ø31.8</td>
<td>1/2H</td>
<td>1.2</td>
<td>1/2H</td>
<td>1.1</td>
</tr>
<tr>
<td>ø38.1</td>
<td>1/2H</td>
<td>1.4</td>
<td>1/2H</td>
<td>1.4</td>
</tr>
<tr>
<td>ø44.5</td>
<td>1/2H</td>
<td>1.6</td>
<td>1/2H</td>
<td>1.6</td>
</tr>
</tbody>
</table>

* O: Soft (Annealed)
  H: Hard (Drawn)
1. Flaring tool

- Specifications
  - Dimension A

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>Tube O.D.</th>
<th>Class-2 (R-410A)</th>
<th>Class-1 (Conventional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>6.35</td>
<td>9.1</td>
<td>9.0</td>
</tr>
<tr>
<td>3/8</td>
<td>9.52</td>
<td>13.2</td>
<td>13.0</td>
</tr>
<tr>
<td>1/2</td>
<td>12.70</td>
<td>16.6</td>
<td>16.2</td>
</tr>
<tr>
<td>5/8</td>
<td>15.88</td>
<td>19.7</td>
<td>19.4</td>
</tr>
<tr>
<td>3/4</td>
<td>19.05</td>
<td>24.0</td>
<td>23.3</td>
</tr>
</tbody>
</table>

- Differences
  - Change of dimension A

Conventional flaring tools can be used when the work process is changed.
(change of work process)
Previously, a pipe extension margin of 0 to 0.5mm was provided for flaring. For R-410A air conditioners, perform pipe flaring with a pipe extension margin of 1.0 to 1.5mm.
(For clutch type only)
Conventional tool with pipe extension margin adjustment can be used.
2. Torque wrench

![Torque wrench image]

- **Specifications**
  - **Dimension B**
  
<table>
<thead>
<tr>
<th>Nominal size</th>
<th>Class-1</th>
<th>Class-2</th>
<th>Previous</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>24</td>
<td>26</td>
<td>24</td>
</tr>
<tr>
<td>5/8</td>
<td>27</td>
<td>29</td>
<td>27</td>
</tr>
</tbody>
</table>

No change in tightening torque
No change in pipes of other sizes

- **Differences**
  - Change of dimension B
    - Only 1/2", 5/8" are extended

![Dimension B image]

For class-1: R-407C
For class-2: R-410A

3. Vacuum pump with check valve

![Vacuum pump image]

- **Specifications**
  - **Discharge speed**
    - 50 l/min (50Hz)
    - 60 l/min (60Hz)
  - Suction port UNF7/16-20(1/4 Flare)
  - UNF1/2-20(5/16 Flare) with adapter

  - Maximum degree of vacuum
    - Select a vacuum pump which is able to keep the vacuum degree of the system in excess of −14.6 psi (5 torr or 5000 micron or − 755 mmHg).

- **Differences**
  - Equipped with function to prevent reverse oil flow
  - Previous vacuum pump can be used by installing adapter.
4. **Leak tester**

- **Specifications**
  - Hydrogen detecting type, etc.
  - Applicable refrigerants
    - R-410A, R-407C, R-404A, R-507A, R-134a, etc.

- **Differences**
  - Previous testers detected chlorine. Since HFCs do not contain chlorine, new tester detects hydrogen.

5. **Refrigerant oil**

- **Specifications**
  - Contains synthetic oil, therefore it can be used for piping work of every refrigerant cycle.
  - Offers high rust resistance and stability over long period of time.

- **Differences**
  - Can be used for R-410A and R-22 units.
6. **Gauge manifold for R-410A**

- **Specifications**
  - High pressure gauge
    - 15 to 770 psi (-76 cmHg to 53 kg/cm²)
  - Low pressure gauge
    - 15 to 550 psi (-76 cmHg to 38 kg/cm²)
  - 1/4" → 5/16" (2min → 2.5min)
  - No oil is used in pressure test of gauges. → For prevention of contamination
  - Temperature scale indicates the relationship between pressure and temperature in gas saturated state.

- **Differences**
  - Change in pressure
  - Change in service port diameter

7. **Charge hose for R-410A**

- **Specifications**
  - Working pressure 737 psi (51.8 kg/cm²)
  - Rupture pressure 3685 psi (259 kg/cm²)
  - Available with and without hand-operated valve that prevents refrigerant from outflow.

- **Differences**
  - Pressure proof hose
  - Change in service port diameter
  - Use of nylon coated material for HFC resistance
8. Weigher for refrigerant charge

■ Specifications
- High accuracy
  TA101A (for 10-kg cylinder) = ± 2g
  TA101B (for 20-kg cylinder) = ± 5g
- Equipped with pressure-resistant sight glass to check liquid refrigerant charging.
- A manifold with separate ports for HFCs and previous refrigerants is equipped as a standard accessory.

■ Differences
- Measurement is based on weight to prevent change of mixing ratio during charging.

Regarding purchasing of service tools, please contact following address.
Daikin U.S. Corporation (Dallas Office)
1645 Wallace Dr, Ste 110 Carrollton, TX 75006
"Tel: 1-972-245-1510     FAX: 1-972-245-1038"
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