Service Manual

Inverter Pair
Wall Mounted Type FTX-N Series

[Applied Models]
- Inverter Pair : Cooling Only
- Inverter Pair : Heat Pump
Inverter Pair
Wall Mounted Type
FTX-N Series

Cooling Only

Indoor Unit
FTX30NVJU
FTX36NVJU

Outdoor Unit
RK30NMVJU
RK36NMVJU

Heat Pump

Indoor Unit
FTX30NVJU
FTX36NVJU

Outdoor Unit
RX30NMVJU
RX36NMVJU
# Table of Contents

1. Safety Cautions........................................................................................................ v  
   1.1 Warnings and Cautions Regarding Safety of Workers........................................ v  
   1.2 Warnings and Cautions Regarding Safety of Users........................................ vii  

2. Icons Used ........................................................................................................... x  

## Part 1 List of Functions .................................................................................. 1 

1. Functions.............................................................................................................. 2  

## Part 2 Specifications .................................................................................... 3  

1. Specifications....................................................................................................... 4  
   1.1 Cooling Only.................................................................................................... 4  
   1.2 Heat Pump ..................................................................................................... 5  

## Part 3 Printed Circuit Board Connector Wiring Diagram .................................. 6  

1. Indoor Unit......................................................................................................... 7  
   1.1 FTX30/36NVJU............................................................................................. 7  
2. Outdoor Unit....................................................................................................... 9  
   2.1 RK(X)30/36NMVJU....................................................................................... 9  

## Part 4 Functions and Control......................................................................... 12  

1. Main Functions.................................................................................................. 13  
   1.1 Temperature Control.................................................................................... 13  
   1.2 Frequency Principle..................................................................................... 13  
   1.3 Airflow Direction Control.............................................................................. 15  
   1.4 Fan Speed Control for Indoor Unit............................................................. 16  
   1.5 Program Dry Operation............................................................................... 17  
   1.6 Automatic Operation................................................................................... 18  
   1.7 Thermostat Control..................................................................................... 19  
   1.8 NIGHT SET Mode..................................................................................... 20  
   1.9 ECONO Operation.................................................................................... 20  
   1.10 INTELLIGENT EYE Operation................................................................. 21  
   1.11 POWERFUL Operation.......................................................................... 21  
   1.12 Clock Setting............................................................................................ 23  
   1.13 WEEKLY TIMER Operation................................................................. 24  
   1.14 Other Functions........................................................................................ 30  
2. Thermistor Functions....................................................................................... 31  
3. Control Specification....................................................................................... 33  
   3.1 Mode Hierarchy.......................................................................................... 33  
   3.2 Frequency Control...................................................................................... 34  
   3.3 Controls at Mode Changing/Start-up.......................................................... 36  
   3.4 Discharge Pipe Temperature Control....................................................... 38  
   3.5 Input Current Control............................................................................... 39  
   3.6 Freeze-up Protection Control.................................................................. 40  
   3.7 Heating Peak-cut Control................................................................. 40  
   3.8 Outdoor Fan Control.............................................................................. 41
Part 5 Remote Controller ........................................................................... 47
1. Remote Controller ................................................................................. 48

Part 6 Service Diagnosis ........................................................................ 50
1. General Problem Symptoms and Check Items .................................... 52
2. Troubleshooting with LED .................................................................. 53
   2.1 Indoor Unit ..................................................................................... 53
   2.2 Outdoor Unit ................................................................................... 53
3. Service Diagnosis ................................................................................ 54
4. Troubleshooting ................................................................................... 57
   4.1 Error Codes and Description ......................................................... 57
   4.2 Indoor Unit PCB Abnormality ...................................................... 58
   4.3 Freeze-up Protection Control/Heating Peak-cut Control ............... 60
   4.4 Indoor Fan Motor (DC Motor) or Related Abnormality ............... 61
   4.5 Thermistor or Related Abnormality (Indoor Unit) ....................... 63
   4.6 Low-voltage Detection or Over-voltage Detection ....................... 64
   4.7 Signal Transmission Error (between Indoor Unit and Outdoor Unit) 66
   4.8 Signal Transmission Error on Outdoor Unit PCB ....................... 68
   4.9 Mismatching of Indoor Unit and Outdoor Unit ............................. 69
   4.10 Outdoor Unit PCB Abnormality .................................................... 70
   4.11 OL Activation (Compressor Overload) ......................................... 71
   4.12 Compressor Lock ....................................................................... 73
   4.13 DC Fan Lock (Outdoor Fan) ....................................................... 74
   4.14 Input Overcurrent Detection ...................................................... 75
   4.15 Four Way Valve Abnormality ..................................................... 76
   4.16 Discharge Pipe Temperature Control ......................................... 78
   4.17 High Pressure Control in Cooling .............................................. 79
   4.18 System Shutdown due to Compressor Internal Temperature
       Abnormality .................................................................................... 80
   4.19 Compressor System Sensor Abnormality ..................................... 81
   4.20 Position Sensor Abnormality ...................................................... 82
   4.21 CT or Related Abnormality ......................................................... 84
   4.22 Thermistor or Related Abnormality (Outdoor Unit) ..................... 86
   4.23 Electrical Box Temperature Rise ............................................... 88
   4.24 Radiation Fin Temperature Rise .................................................. 89
   4.25 Output Overcurrent Detection .................................................... 90
5. Check .................................................................................................. 92
   5.1 Thermistor Resistance Check ....................................................... 92
   5.2 Indoor Fan Motor Connector Output Check ................................. 93
   5.3 Power Supply Waveforms Check .................................................... 93
   5.4 Electronic Expansion Valve Check ............................................... 94
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5</td>
<td>Four Way Valve Performance Check</td>
<td>95</td>
</tr>
<tr>
<td>5.6</td>
<td>Inverter Unit Refrigerant System Check</td>
<td>95</td>
</tr>
<tr>
<td>5.7</td>
<td>Inverter Analyzer Check</td>
<td>96</td>
</tr>
<tr>
<td>5.8</td>
<td>Rotation Pulse Check on the Outdoor Unit PCB</td>
<td>98</td>
</tr>
<tr>
<td>5.9</td>
<td>Installation Condition Check</td>
<td>99</td>
</tr>
<tr>
<td>5.10</td>
<td>Discharge Pressure Check</td>
<td>99</td>
</tr>
<tr>
<td>5.11</td>
<td>Outdoor Fan System Check</td>
<td>100</td>
</tr>
<tr>
<td>5.12</td>
<td>Main Circuit Short Check</td>
<td>100</td>
</tr>
<tr>
<td>5.13</td>
<td>Capacitor Voltage Check</td>
<td>101</td>
</tr>
<tr>
<td>5.14</td>
<td>Power Module Check</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td><strong>Part 7</strong> Trial Operation and Field Settings</td>
<td>103</td>
</tr>
<tr>
<td>1</td>
<td>Pump Down Operation</td>
<td>104</td>
</tr>
<tr>
<td>2</td>
<td>Forced Cooling Operation</td>
<td>105</td>
</tr>
<tr>
<td>3</td>
<td>Trial Operation</td>
<td>106</td>
</tr>
<tr>
<td>4</td>
<td>Field Settings</td>
<td>107</td>
</tr>
<tr>
<td>4.1</td>
<td>Model Type Setting</td>
<td>107</td>
</tr>
<tr>
<td>4.2</td>
<td>Temperature Display Switch</td>
<td>107</td>
</tr>
<tr>
<td>4.3</td>
<td>When 2 Units are Installed in 1 Room</td>
<td>108</td>
</tr>
<tr>
<td>4.4</td>
<td>Facility Setting Switch (cooling at low outdoor temperature)</td>
<td>109</td>
</tr>
<tr>
<td>5</td>
<td>Silicone Grease on Power Transistor/Diode Bridge</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td><strong>Part 8</strong> Appendix</td>
<td>112</td>
</tr>
<tr>
<td>1</td>
<td>Piping Diagrams</td>
<td>113</td>
</tr>
<tr>
<td>1.1</td>
<td>Indoor unit</td>
<td>113</td>
</tr>
<tr>
<td>1.2</td>
<td>Outdoor Unit</td>
<td>114</td>
</tr>
<tr>
<td>2</td>
<td>Wiring Diagrams</td>
<td>115</td>
</tr>
<tr>
<td>2.1</td>
<td>Indoor Unit</td>
<td>115</td>
</tr>
<tr>
<td>2.2</td>
<td>Outdoor Unit</td>
<td>116</td>
</tr>
<tr>
<td>3</td>
<td>Operation Limit</td>
<td>117</td>
</tr>
</tbody>
</table>
1. Safety Cautions

Be sure to read the following safety cautions before conducting repair work. After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer.

Caution Items

The caution items are classified into Warning and Caution. The Warning items are especially important since death or serious injury can result if they are not followed closely. The Caution items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.

Pictograms

⚠ This symbol indicates an item for which caution must be exercised. The pictogram shows the item to which attention must be paid.

🚫 This symbol indicates a prohibited action. The prohibited item or action is shown in the illustration or near the symbol.

❤ This symbol indicates an action that must be taken, or an instruction. The instruction is shown in the illustration or near the symbol.

1.1 Warnings and Cautions Regarding Safety of Workers

<table>
<thead>
<tr>
<th>Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not store equipment in a room with fire sources (e.g., naked flames, gas appliances, electric heaters).</td>
</tr>
</tbody>
</table>

🚫 Be sure to disconnect the power cable from the socket before disassembling equipment for repair. Working on equipment that is connected to the power supply may cause an electrical shock. If it is necessary to supply power to the equipment to conduct the repair or inspect the circuits, do not touch any electrically charged sections of the equipment.

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

⚠ When disconnecting the suction or discharge pipe of the compressor at the welded section, evacuate the refrigerant gas completely at a well-ventilated place first. If there is gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it may cause injury.

⚠ If refrigerant gas leaks during repair work, ventilate the area. Refrigerant gas may generate toxic gases when it contacts flames.

⚠ Be sure to discharge the capacitor completely before conducting repair work. The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. A charged capacitor may cause an electrical shock.
<table>
<thead>
<tr>
<th><strong>Warning</strong></th>
<th></th>
</tr>
</thead>
</table>
| **Do not turn the air conditioner on or off by plugging in or unplugging the power cable.**  
Plugging in or unplugging the power cable to operate the equipment may cause an electrical shock or fire. | ![Warning Icon] |
| **Be sure to wear a safety helmet, gloves, and a safety belt when working in a high place (more than 2 m).**  
Insufficient safety measures may cause a fall. | ![Warning Icon] |
| **In case of R-32 / R-410A refrigerant models, be sure to use pipes, flare nuts and tools intended for the exclusive use with the R-32 / R-410A refrigerant.**  
The use of materials for R-22 refrigerant models may cause a serious accident, such as a damage of refrigerant cycle or equipment failure. | ![Warning Icon] |
| **Do not mix air or gas other than the specified refrigerant (R-32 / R-410A / R-22) in the refrigerant system.**  
If air enters the refrigerant system, an excessively high pressure results, causing equipment damage and injury. | ![Warning Icon] |

<table>
<thead>
<tr>
<th><strong>Caution</strong></th>
<th></th>
</tr>
</thead>
</table>
| **Do not repair electrical components with wet hands.**  
Working on the equipment with wet hands may cause an electrical shock. | ![Caution Icon] |
| **Do not clean the air conditioner with water.**  
Washing the unit with water may cause an electrical shock. | ![Caution Icon] |
| **Be sure to provide an earth / grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks.** | ![Caution Icon] |
| **Be sure to turn off the power switch and unplug the power cable when cleaning the equipment.**  
The internal fan rotates at a high speed, and may cause injury. | ![Caution Icon] |
| **Be sure to conduct repair work with appropriate tools.**  
The use of inappropriate tools may cause injury. | ![Caution Icon] |
1.2 Warnings and Cautions Regarding Safety of Users

<table>
<thead>
<tr>
<th>Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not store the equipment in a room with fire sources (e.g., naked flames, gas appliances, electric heaters).</td>
</tr>
<tr>
<td>Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools may cause an electrical shock, excessive heat generation or fire.</td>
</tr>
<tr>
<td>If the power cable and lead wires are scratched or have deteriorated, be sure to replace them. Damaged cable and wires may cause an electrical shock, excessive heat generation or fire.</td>
</tr>
<tr>
<td>Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it may cause an electrical shock, excessive heat generation or fire.</td>
</tr>
<tr>
<td>Be sure to use an exclusive power circuit for the equipment, and follow the local technical standards related to the electrical equipment, the internal wiring regulations, and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work may cause an electrical shock or fire.</td>
</tr>
<tr>
<td>Be sure to use the specified cable for wiring between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections may cause excessive heat generation or fire.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be sure to check that the refrigerating cycle section has cooled down enough before conducting repair work. Working on the unit when the refrigerating cycle section is hot may cause burns.</td>
</tr>
<tr>
<td>Conduct welding work in a well-ventilated place. Using a welder in an enclosed room may cause oxygen deficiency.</td>
</tr>
</tbody>
</table>

Caution

Warning
<table>
<thead>
<tr>
<th>Warning</th>
</tr>
</thead>
</table>
| **When wiring between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable.**  
If the cover is not mounted properly, the terminal connection section may cause an electrical shock, excessive heat generation or fire. |

<table>
<thead>
<tr>
<th>!</th>
</tr>
</thead>
</table>

| **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 heating or pulling the power cable may damage it. |

<table>
<thead>
<tr>
<th>✗</th>
</tr>
</thead>
</table>

| **Do not mix air or gas other than the specified refrigerant (R-32 / R-410A / R-22) in the refrigerant system.**  
If air enters the refrigerant system, an excessively high pressure results, causing equipment damage and injury. |

<table>
<thead>
<tr>
<th>✗</th>
</tr>
</thead>
</table>

| **If the refrigerant gas leaks, be sure to locate the leaking point and repair it before charging the refrigerant. After charging the refrigerant, make sure that there is no leak.**  
If the leaking point cannot be located and the repair work must be stopped, be sure to pump-down, and close the service valve, to prevent refrigerant gas from leaking into the room. Refrigerant gas itself is harmless, but it may generate toxic gases when it contacts flames, such as those from fan type and other heaters, stoves and ranges. |

<table>
<thead>
<tr>
<th>!</th>
</tr>
</thead>
</table>

| **When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment.**  
If the installation site does not have sufficient strength or the installation work is not conducted securely, the equipment may fall and cause injury. |

<table>
<thead>
<tr>
<th>!</th>
</tr>
</thead>
</table>

| **Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet securely.**  
If the plug is dusty or has a loose connection, it may cause an electrical shock or fire. |

<table>
<thead>
<tr>
<th>!</th>
</tr>
</thead>
</table>

| **When replacing the coin battery in the remote controller, be sure to dispose of the old battery to prevent children from swallowing it.**  
If a child swallows the coin battery, see a doctor immediately. |

| ! |
### Caution

<table>
<thead>
<tr>
<th>Caution</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.</td>
<td>!</td>
</tr>
<tr>
<td>Do not install the equipment in a place where there is a possibility of combustible gas leaks. If combustible gas leaks and remains around the unit, it may cause a fire.</td>
<td>!</td>
</tr>
<tr>
<td>Check to see if parts and wires are mounted and connected properly, and if connections at the soldered or crimped terminals are secure. Improper installation and connections may cause excessive heat generation, fire or an electrical shock.</td>
<td>!</td>
</tr>
<tr>
<td>If the installation platform or frame has corroded, replace it. A corroded installation platform or frame may cause the unit to fall, resulting in injury.</td>
<td>!</td>
</tr>
<tr>
<td>Check the earth / grounding, and repair it if the equipment is not properly earthed / grounded. Improper earth / grounding may cause an electrical shock.</td>
<td>−</td>
</tr>
<tr>
<td>Be sure to measure insulation resistance after the repair, and make sure that the resistance is 1 MΩ or higher. Faulty insulation may cause an electrical shock.</td>
<td>!</td>
</tr>
<tr>
<td>Be sure to check the drainage of the indoor unit after the repair. Faulty drainage may cause water to enter the room and wet the furniture and floor.</td>
<td>!</td>
</tr>
<tr>
<td>Do not tilt the unit when removing it. The water inside the unit may spill and wet the furniture and floor.</td>
<td>−</td>
</tr>
</tbody>
</table>
2. Icons Used

The following icons are used to attract the attention of the reader to specific information.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Type of Information</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>!</td>
<td>Warning</td>
<td>A <strong>Warning</strong> is used when there is danger of personal injury.</td>
</tr>
<tr>
<td>!</td>
<td>Caution</td>
<td>A <strong>Caution</strong> is used when there is danger that the reader, through incorrect manipulation, may damage equipment, lose data, get an unexpected result or have to restart (part of) a procedure.</td>
</tr>
<tr>
<td>i</td>
<td>Note</td>
<td>A <strong>Note</strong> provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.</td>
</tr>
<tr>
<td>📚</td>
<td>Reference</td>
<td>A <strong>Reference</strong> guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.</td>
</tr>
</tbody>
</table>
Part 1
List of Functions

1. Functions.....................................................................................................2
## Functions

<table>
<thead>
<tr>
<th>Category</th>
<th>Functions</th>
<th>FTX30/36NVJU</th>
<th>RK30/36NMVJU</th>
<th>FTX30/36NVJU</th>
<th>RK30/36NMVJU</th>
<th>FTX30/36NVJU</th>
<th>RK30/36NMVJU</th>
<th>FTX30/36NVJU</th>
<th>RK30/36NMVJU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Functions</td>
<td>Inverter (with inverter power control)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Operation limit for cooling</td>
<td>Refer to</td>
<td>P. 117</td>
<td>Refer to</td>
<td>P. 117</td>
<td>Refer to</td>
<td>P. 117</td>
<td>Refer to</td>
<td>P. 117</td>
</tr>
<tr>
<td></td>
<td>Operation limit for heating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PAM control</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Standby electricity saving</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Compressor</td>
<td>Oval scroll compressor</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Swing compressor</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Rotary compressor</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Reluctance DC motor</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Comfortable</td>
<td>Power-airflow flap (horizontal blade)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Airflow</td>
<td>Power-airflow dual flaps (horizontal blade)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Power-airflow diffuser</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Wide-angle louvers (vertical blade)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Auto-swing (up and down)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Auto-swing (right and left)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>COMFORT AIRFLOW operation</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Comfort</td>
<td>Auto fan speed</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Control</td>
<td>Indoor unit quiet operation</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>NIGHT QUIET mode (automatic)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>OUTDOOR UNIT QUIET operation (manual)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>INTELLIGENT EYE operation</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Quick warming function</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Hot-start function</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Automatic defrosting</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Operation</td>
<td>Automatic operation</td>
<td>—</td>
<td>●</td>
<td>—</td>
<td>●</td>
<td>—</td>
<td>●</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Program dry function</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Fan only</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Lifestyle</td>
<td>POWERFUL operation (non-inverter)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Convenience</td>
<td>POWERFUL operation (inverter)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Priority-room setting</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>COOL/HEAT mode lock</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>HOME LEAVE operation</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>ECONO operation</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Indoor unit ON/OFF button</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Signal receiving sign</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>R/C with back light</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Temperature display</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

### Note:
- ●: Available
- —: Not available

**1** Extend operation range to –30°C (–22°F) with an air direction adjustment grille (sold separately).

**2** Extend operation range to –20°C (–4°F) with an air direction adjustment grille (sold separately).
Part 2
Specifications

1. Specifications .......................................................... 4
   1.1 Cooling Only ...................................................... 4
   1.2 Heat Pump .......................................................... 5
1. Specifications

1.1 Cooling Only

### Specifications 4

#### 1. Specifications

**1.1 Cooling Only**

- **60 Hz, 208 - 230 V**

<table>
<thead>
<tr>
<th>Model</th>
<th>Indoor Unit</th>
<th>FTX30NVJU</th>
<th>FTX36NVJU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>Rated</td>
<td>31,400 - 31,400</td>
<td>33,200 - 34,400</td>
</tr>
<tr>
<td></td>
<td>Min. / Max.</td>
<td>10,200 - 10,200</td>
<td>10,200 - 33,200 - 34,400</td>
</tr>
<tr>
<td>Running Current (Rated)</td>
<td>A</td>
<td>15.7 - 14.2</td>
<td>17 - 17</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>Rated</td>
<td>3,188 - 3,188</td>
<td>3,458 - 3,780</td>
</tr>
<tr>
<td></td>
<td>Min. / Max.</td>
<td>610 - 610</td>
<td>620 - 3,458 - 3,780</td>
</tr>
<tr>
<td>Power Factor (Rated)</td>
<td>%</td>
<td>97.6 - 97.8</td>
<td>97.8 - 98.7</td>
</tr>
<tr>
<td>COP (Rated)</td>
<td>WW</td>
<td>9.85</td>
<td>9.6 - 9.1</td>
</tr>
<tr>
<td>SEER / HSPF</td>
<td></td>
<td>17.50</td>
<td>15.90</td>
</tr>
<tr>
<td>Piping Connections</td>
<td>Liquid</td>
<td>φ 1/4 (φ 6.4)</td>
<td>φ 1/4 (φ 6.4)</td>
</tr>
<tr>
<td></td>
<td>Gas</td>
<td>φ 5/8 (φ 15.9)</td>
<td>φ 5/8 (φ 15.9)</td>
</tr>
<tr>
<td></td>
<td>Drain</td>
<td>φ 5/8 (φ 16.0)</td>
<td>φ 5/8 (φ 16.0)</td>
</tr>
<tr>
<td>Heat Insulation</td>
<td>Both Liquid and Gas Pipes</td>
<td>Both Liquid and Gas Pipes</td>
<td></td>
</tr>
<tr>
<td>Max. Interunit Piping Length</td>
<td>ft (m)</td>
<td>98-3/8 (30)</td>
<td>98-3/8 (30)</td>
</tr>
<tr>
<td>Max. Interunit Height Difference</td>
<td>ft (m)</td>
<td>65-5/8 (20)</td>
<td>65-5/8 (20)</td>
</tr>
<tr>
<td>Chargeless</td>
<td>ft (m)</td>
<td>32-13/16 (10)</td>
<td>32-13/16 (10)</td>
</tr>
<tr>
<td>Amount of Additional Charge of Refrigerant</td>
<td>oz/ft (g/m)</td>
<td>0.32 (30)</td>
<td>0.32 (30)</td>
</tr>
<tr>
<td>Indoor Unit</td>
<td>FTX30NVJU</td>
<td>FTX36NVJU</td>
<td></td>
</tr>
<tr>
<td>Front Panel Color</td>
<td>White</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Airflow Rate</td>
<td>H</td>
<td>890 (25.2)</td>
<td>915 (25.9)</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>727 (20.6)</td>
<td>742 (21.0)</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>572 (16.2)</td>
<td>572 (16.2)</td>
</tr>
<tr>
<td></td>
<td>SL</td>
<td>512 (14.5)</td>
<td>512 (14.5)</td>
</tr>
<tr>
<td>Fan Type</td>
<td>Cross Flow Fan</td>
<td>Cross Flow Fan</td>
<td></td>
</tr>
<tr>
<td>Air Filter</td>
<td>Removable, Washable, Mildew Proof</td>
<td>Removable, Washable, Mildew Proof</td>
<td></td>
</tr>
<tr>
<td>Running Current (Rated)</td>
<td>A</td>
<td>0.8 - 0.7</td>
<td>0.8 - 0.8</td>
</tr>
<tr>
<td>Power Consumption (Rated)</td>
<td>W</td>
<td>90.0 - 90.0</td>
<td>95.0 - 95.0</td>
</tr>
<tr>
<td>Power Factor (Rated)</td>
<td>%</td>
<td>58.2 - 55.5</td>
<td>57.5 - 55.1</td>
</tr>
<tr>
<td>Temperature Control</td>
<td>Microcomputer Control</td>
<td>Microcomputer Control</td>
<td></td>
</tr>
<tr>
<td>Dimensions (H × W × D)</td>
<td>in. (mm)</td>
<td>13-3/8 × 47-1/4 × 10-3/16 (340 × 1,200 × 259)</td>
<td>13-3/8 × 47-1/4 × 10-3/16 (340 × 1,200 × 259)</td>
</tr>
<tr>
<td>Packaged Dimensions (H × W × D)</td>
<td>in. (mm)</td>
<td>13-7/16 × 51-9/16 × 16-7/8 (342 × 1,310 × 429)</td>
<td>13-7/16 × 51-9/16 × 16-7/8 (342 × 1,310 × 429)</td>
</tr>
<tr>
<td>Weight (Mass)</td>
<td>Lbs (kg)</td>
<td>38 (17)</td>
<td>38 (17)</td>
</tr>
<tr>
<td>Gross Weight (Gross Mass)</td>
<td>Lbs (kg)</td>
<td>49 (22)</td>
<td>49 (22)</td>
</tr>
<tr>
<td>Sound Pressure Level</td>
<td>H / M / L / SL</td>
<td>53 / 47 / 40 / 37 dB(A)</td>
<td>54 / 47 / 40 / 37 dB(A)</td>
</tr>
<tr>
<td>Outdoor Unit</td>
<td>RK30NMVJU</td>
<td>RK36NMVJU</td>
<td></td>
</tr>
<tr>
<td>Casing Color</td>
<td>Ivory</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Compressor Type</td>
<td>Hermetically Sealed Swing Type</td>
<td>Hermetically Sealed Swing Type</td>
<td></td>
</tr>
<tr>
<td>Compressor Model</td>
<td>2TCC3AAAXD</td>
<td>2TCC3AAAXD</td>
<td></td>
</tr>
<tr>
<td>Motor Output</td>
<td>W</td>
<td>1,920</td>
<td>1,920</td>
</tr>
<tr>
<td>Refrigerant Oil Type</td>
<td>FC50K</td>
<td>FC50K</td>
<td></td>
</tr>
<tr>
<td>Charge</td>
<td>oz (L)</td>
<td>30.44 (0.890)</td>
<td>30.44 (0.890)</td>
</tr>
<tr>
<td>Refrigerant Type</td>
<td>R-410A</td>
<td>R-410A</td>
<td></td>
</tr>
<tr>
<td>Charge</td>
<td>Lbs (kg)</td>
<td>3.64 (1.65)</td>
<td>3.64 (1.65)</td>
</tr>
<tr>
<td>Airflow Rate</td>
<td>H</td>
<td>2,528 (71.6)</td>
<td>2,811 (79.6)</td>
</tr>
<tr>
<td></td>
<td>SL</td>
<td>2,528 (71.6)</td>
<td>2,811 (79.6)</td>
</tr>
<tr>
<td>Fan Type</td>
<td>Propeller</td>
<td>Propeller</td>
<td></td>
</tr>
<tr>
<td>Running Current (Rated)</td>
<td>A</td>
<td>14.93 - 13.50</td>
<td>16.18 - 16.25</td>
</tr>
<tr>
<td>Power Consumption (Rated)</td>
<td>W</td>
<td>3,098 - 3,098</td>
<td>3,363 - 3,685</td>
</tr>
<tr>
<td>Power Factor (Rated)</td>
<td>%</td>
<td>99.9 - 99.8</td>
<td>99.9 - 98.6</td>
</tr>
<tr>
<td>Starting Current</td>
<td>A</td>
<td>15.70</td>
<td>17.00</td>
</tr>
<tr>
<td>Dimensions (H × W × D)</td>
<td>in. (mm)</td>
<td>28-15/16 × 34-1/4 × 12-5/8 (735 × 870 × 320)</td>
<td>28-15/16 × 34-1/4 × 12-5/8 (735 × 870 × 320)</td>
</tr>
<tr>
<td>Packaged Dimensions (H × W × D)</td>
<td>in. (mm)</td>
<td>31-7/8 × 41-9/16 × 18-1/4 (810 × 1,056 × 464)</td>
<td>31-7/8 × 41-9/16 × 18-1/4 (810 × 1,056 × 464)</td>
</tr>
<tr>
<td>Weight (Mass)</td>
<td>Lbs (kg)</td>
<td>133 (60)</td>
<td>133 (60)</td>
</tr>
<tr>
<td>Weight (Gross Mass)</td>
<td>Lbs (kg)</td>
<td>142 (64)</td>
<td>142 (64)</td>
</tr>
<tr>
<td>Sound Pressure Level</td>
<td>H</td>
<td>56 dB(A)</td>
<td>59</td>
</tr>
<tr>
<td>Drawing No.</td>
<td>3D107929</td>
<td>3D107930</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. SL: The Quiet fan level of the airflow rate setting.
2. The data are based on the conditions shown in the table below.

#### Conversion Formulae

- kcal/h = kW × 860
- Btu/h = kW × 3412
- cfm = m³/min × 35.3
- Cooling Indoor: 80.0°FDB (26.7°CDB) / 67.0°FWB (19.4°CWB)
- Heating Indoor: 70.0°FDB (21.1°CDB) / 60.0°FWB (15.6°CWB)
- Heating Outdoor: 47°FDB (8.3°C) / 43.0°FWB (6.1°CWB)
- Piping Length 25 ft (7.5 m)
### 1.2 Heat Pump

#### Specifications

**Model** | **Indoor Unit** | **Outdoor Unit**
--- | --- | ---
**Indoor Unit** | **FTX30NVJU** | **FTX36NVJU**
**Outdoor Unit** | **RX30NMVJU** | **RX36NMVJU**

#### Cooling

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Rated Btu/h</th>
<th>Min. - Max. Btu/h</th>
<th>Power Consumption</th>
<th>COP (Rated)</th>
<th>EER (Rated)</th>
<th>SEER / HSPF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cooling</strong></td>
<td>31,400 - 31,400</td>
<td>10,200 - 10,200</td>
<td>W</td>
<td>97.1 - 97.6</td>
<td>3412</td>
<td>—</td>
</tr>
<tr>
<td><strong>Heating</strong></td>
<td>34,800 - 34,800</td>
<td>10,200 - 34,800</td>
<td>W</td>
<td>97.6 - 97.3</td>
<td>3412</td>
<td>—</td>
</tr>
</tbody>
</table>

#### Fan

<table>
<thead>
<tr>
<th>Airflow Rate</th>
<th>H cfm</th>
<th>M cfm</th>
<th>L cfm</th>
<th>SL cfm</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>890 (25.2)</td>
<td>960 (27.2)</td>
<td>915 (25.9)</td>
<td>960 (27.2)</td>
</tr>
<tr>
<td>M</td>
<td>791 (22.4)</td>
<td>828 (23.8)</td>
<td>742 (21.0)</td>
<td>791 (22.4)</td>
</tr>
<tr>
<td>L</td>
<td>572 (16.2)</td>
<td>629 (17.8)</td>
<td>572 (16.2)</td>
<td>629 (17.8)</td>
</tr>
<tr>
<td>SL</td>
<td>512 (14.5)</td>
<td>544 (15.4)</td>
<td>512 (14.5)</td>
<td>544 (15.4)</td>
</tr>
</tbody>
</table>

#### Power and Energy

<table>
<thead>
<tr>
<th>Running Current (Rated)</th>
<th>A</th>
<th>Power Consumption (Rated)</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>0.77 - 0.70</td>
<td>90.0 - 90.0</td>
<td>56.2 - 55.9</td>
</tr>
<tr>
<td>M</td>
<td>0.82 - 0.75</td>
<td>95.0 - 95.0</td>
<td>55.7 - 55.1</td>
</tr>
<tr>
<td>L</td>
<td>0.82 - 0.75</td>
<td>95.0 - 95.0</td>
<td>55.7 - 55.1</td>
</tr>
<tr>
<td>SL</td>
<td>0.82 - 0.75</td>
<td>95.0 - 95.0</td>
<td>55.7 - 55.1</td>
</tr>
</tbody>
</table>

#### Temperature Control

| Dimensions (H × W × D) in. (mm) | 13-3/8 × 47-1/4 × 10-3/16 (340 × 1,200 × 259) |
| Dimensions (H × W × D) in. (mm) | 13-7/16 × 51-9/16 × 16-7/8 (342 × 1,310 × 429) |

#### Noise Level

<table>
<thead>
<tr>
<th>Sound Pressure Level dB(A)</th>
<th>H</th>
<th>M</th>
<th>L</th>
<th>SL</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>53 / 47 / 40 / 37</td>
<td>53 / 47 / 40 / 37</td>
<td>53 / 47 / 40 / 37</td>
<td>53 / 47 / 40 / 37</td>
</tr>
<tr>
<td>M</td>
<td>53 / 46 / 38 / 35</td>
<td>53 / 46 / 38 / 35</td>
<td>53 / 46 / 38 / 35</td>
<td>53 / 46 / 38 / 35</td>
</tr>
</tbody>
</table>

### Notes

1. SL: The Quiet fan level of the airflow rate setting.
2. The data are based on the conditions shown in the table below.

#### Conversion Formulae

- kcal/h = kW × 860
- Btu/h = kW × 3412
- cfm = m³/min × 35.3
Part 3
Printed Circuit Board Connector Wiring Diagram

1. Indoor Unit ................................................................................................................................. 7
   1.1 FTX30/36NVJU ..................................................................................................................... 7

2. Outdoor Unit ................................................................................................................................ 9
   2.1 RK(X)30/36NMVJU .................................................................................................................. 9
1. Indoor Unit

1.1 FTX30/36NVJU

Control PCB (PCB1)

1) S1 Connector for DC fan motor
2) S21 Connector for centralized control (HA)
3) S25 Connector for INTELLIGENT EYE sensor PCB (PCB4)
4) S32 Indoor heat exchanger thermistor
5) S41 Connector for swing motors
6) S46 Connector for display PCB (PCB3)
7) S47 Connector for signal receiver PCB (PCB2)
8) H1, H2, H3, FG Connector for terminal strip
9) JA Address setting jumper
   * Refer to page 108 for details.
10) JB Fan speed setting when compressor stops for thermostat OFF (effective only for cooling operation)
    * Refer to page 108 for details.
11) JC Power failure recovery function (auto-restart)
    * Refer to page 108 for details.
12) LED A LED for service monitor (green)
13) FU1 (F1U), FU2 (F2U) Fuse (3.15 A, 250 V)
14) V1 Varistor

Caution

Replace the PCB if you accidentally cut a wrong jumper.
Jumpers are necessary for electronic circuit. Improper operation may occur if you cut any of them.

Note:
The symbols in the parenthesis are the names on the appropriate wiring diagram.
**Signal Receiver PCB (PCB2)**

1) **S48**
   Connector for control PCB (PCB1)

**Display PCB (PCB3)**

1) **S49**
   Connector for control PCB (PCB1)
2) **SW1**
   Indoor unit **ON/OFF** button
3) **LED1 (H1P)**
   LED for operation (green)
4) **LED2 (H2P)**
   LED for timer (yellow)
5) **LED3 (H3P)**
   LED for INTELLIGENT EYE (green)
6) **RTH1 (R1T)**
   Room temperature thermistor

**INTELLIGENT EYE Sensor PCB (PCB4)**

1) **S36**
   Connector for control PCB (PCB1)

---

**Note:** The symbols in the parenthesis are the names on the appropriate wiring diagram.
# Outdoor Unit

## 2. Outdoor Unit

### 2.1 RK(X)30/36NMVJU

#### Main PCB (PCB1)

| 1) | S       | Connector for terminal block (indoor - outdoor transmission) |
| 2) | S20 (white) | Connector for electronic expansion valve coil |
| 3) | S40     | Connector for overload protector |
| 4) | S70     | Connector for DC fan motor |
| 5) | S80     | Connector for four way valve coil (heat pump models only) |
| 6) | S90     | Connector for thermistors (outdoor temperature, outdoor heat exchanger, discharge pipe) |
| 7) | S201, S202 | Connector for service monitor PCB (PCB2) |
| 8) | CK1     | Connector for voltage endurance test |
| 9) | HL1, HN1 | Connector for terminal block (power supply) |
| 10) | E1, E2 | Connector for ground wire |
| 11) | U, V, W | Connector for compressor |
| 12) | FU1, FU2 | Fuse (3.15 A, 250 V) |
| 13) | FU3     | Fuse (30 A, 250 V) |
| 14) | V2, V3, V401 | Varistor |
Service Monitor PCB (PCB2)

1) S501, S502  Connector for main PCB (PCB1)
2) LED A    LED for service monitor (green)
3) SW5-3  Switch for facility setting
   ∗ Refer to page 109 for details.
4) SW6-2  Switch for facility setting
   ∗ Refer to page 109 for details.

★ SW1 – SW4 and LED1 – LED5 do not work.
# Part 4

## Functions and Control

1. Main Functions

   1.1 Temperature Control
   1.2 Frequency Principle
   1.3 Airflow Direction Control
   1.4 Fan Speed Control for Indoor Unit
   1.5 Program Dry Operation
   1.6 Automatic Operation
   1.7 Thermostat Control
   1.8 NIGHT SET Mode
   1.9 ECONO Operation
   1.10 INTELLIGENT EYE Operation
   1.11 POWERFUL Operation
   1.12 Clock Setting
   1.13 WEEKLY TIMER Operation
   1.14 Other Functions

2. Thermistor Functions

3. Control Specification

   3.1 Mode Hierarchy
   3.2 Frequency Control
   3.3 Controls at Mode Changing/Start-up
   3.4 Discharge Pipe Temperature Control
   3.5 Input Current Control
   3.6 Freeze-up Protection Control
   3.7 Heating Peak-cut Control
   3.8 Outdoor Fan Control
   3.9 Liquid Compression Protection Function
   3.10 Defrost Control
   3.11 Electronic Expansion Valve Control
   3.12 Malfunctions
1. Main Functions

1.1 Temperature Control

Definitions of Temperatures

The definitions of temperatures are classified as following.

- Room temperature: temperature of lower part of the room
- Set temperature: temperature set by remote controller
- Room thermistor temperature: temperature detected by room temperature thermistor
- Target temperature: temperature determined by microcomputer

Temperature Control

The temperature of the room is detected by the room temperature thermistor. However, there is a difference between the temperature detected by room temperature thermistor and the temperature of lower part of the room, depending on the type of the indoor unit or installation condition. Practically, the temperature control is done by the target temperature appropriately adjusted for the indoor unit and the temperature detected by room temperature thermistor.

1.2 Frequency Principle

Control Parameters

The frequency of the compressor is controlled by the following 2 parameters:

- The load condition of the operating indoor unit
- The difference between the room thermistor temperature and the target temperature

The target frequency is adapted by additional parameters in the following cases:

- Frequency restrictions
- Initial settings
- Forced cooling operation

Inverter Principle

To regulate the capacity, a frequency control is needed. The inverter makes it possible to control the rotation speed of the compressor. The following table explains the inverter principle:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The supplied AC power source is converted into the DC power source for the present.</td>
</tr>
</tbody>
</table>
| 2     | The DC power source is reconverted into the three phase AC power source with variable frequency.  
     | When the frequency increases, the rotation speed of the compressor increases resulting in an increase of refrigerant circulation. This leads to a larger amount of heat exchange per unit.  
     | When the frequency decreases, the rotation speed of the compressor decreases resulting in a decrease of refrigerant circulation. This leads to a smaller amount of heat exchange per unit. |
The following drawing shows a schematic view of the inverter principle:

### Inverter Features

The inverter provides the following features:

- The regulating capacity can be changed according to the changes in the outdoor temperature and cooling/heating load.
- Quick heating and quick cooling
  - The rotation speed of the compressor is increased when starting the heating (or cooling). This enables to reach the set temperature quickly.
- Even during extreme cold weather, high capacity is achieved. It is maintained even when the outdoor temperature is 2°C (35.6 °F).
- Comfortable air conditioning
  - A fine adjustment is integrated to keep the room temperature constant.
- Energy saving heating and cooling
  - Once the set temperature is reached, the energy saving operation enables to maintain the room temperature at low power.

### Frequency Limits

The following functions regulate the minimum and maximum frequency:

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low</strong></td>
<td>- Four way valve operation compensation. Refer to page 36.</td>
</tr>
</tbody>
</table>
| **High**  | - Compressor protection function. Refer to page 37.  
                     - Discharge pipe temperature control. Refer to page 38.  
                     - Input current control. Refer to page 39.  
                     - Freeze-up protection control. Refer to page 40.  
                     - Heating peak-cut control. Refer to page 40.  
                     - Defrost control. Refer to page 42. |

### Forced Cooling Operation

Refer to page 105 for details.
1.3 Airflow Direction Control

**Power-Airflow Dual Flaps**

The large flap sends a large volume of air downward to the floor and provides an optimum control in cooling, dry, and heating operation.

**Cooling/Dry**

During cooling or dry operation, the flap retracts into the indoor unit. Then, cool air can be blown far and distributed all over the room.

**Heating**

During heating operation, the large flap directs airflow downward to spread the warm air to the entire room.

**Wide-Angle Louvers**

The louvers, made of elastic synthetic resin, provide a wide range of airflow that guarantees comfortable air distribution.

**Auto-Swing**

The following table explains the auto-swing process for cooling, dry, heating, and fan:

<table>
<thead>
<tr>
<th>Flap (up and down)</th>
<th>Louver (right and left)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling/Dry</td>
<td>Heating</td>
</tr>
<tr>
<td>15° 50° 60°</td>
<td>30° 40° 75°</td>
</tr>
<tr>
<td>(R9303)</td>
<td>(R9304)</td>
</tr>
<tr>
<td>Heating</td>
<td>Fan</td>
</tr>
<tr>
<td>15° 25° 75°</td>
<td>15° 70°</td>
</tr>
<tr>
<td>(R9305)</td>
<td>(R9306)</td>
</tr>
</tbody>
</table>

**3-D Airflow**

Alternative repetition of vertical and horizontal swing motions enables uniform air-conditioning of the entire room.

When the horizontal swing and vertical swing are both set to automatic operation, the airflow becomes 3-D airflow. The horizontal and vertical swing motions are alternated and the airflow direction changes in the order shown in the following diagram.

(1) The louvers move from the right to the left.
(2) The flaps move downward.
(3) The louvers move from the left to the right.
(4) The flaps move upward.

**COMFORT AIRFLOW Operation**

The airflow direction is upward while in cooling and dry operation, and downward while in heating operation. This function prevents cold or warm air from blowing directly on the occupants in the room.

When COMFORT AIRFLOW operation is set, or the combination use of COMFORT AIRFLOW operation and INTELLIGENT EYE operation is set, the airflow rate will be set to AUTO.

If the up and down airflow direction is selected, COMFORT AIRFLOW operation will be canceled. Priority is given to the function of whichever button is pressed last.
1.4 Fan Speed Control for Indoor Unit

Outline
Phase control and fan speed control contains 9 steps: LLL, LL, SL, L, ML, M, MH, H, and HH. The airflow rate can be automatically controlled depending on the difference between the room thermistor temperature and the target temperature.

Automatic Fan Speed Control
In automatic fan speed operation, the step SL is not available.

<table>
<thead>
<tr>
<th>Step</th>
<th>Cooling</th>
<th>Heating</th>
</tr>
</thead>
<tbody>
<tr>
<td>LLL</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>LL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>ML</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>MH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HH (POWERFUL)</td>
<td>(R11681)</td>
<td>(R6834)</td>
</tr>
</tbody>
</table>

The airflow rate is automatically controlled within this range when FAN button is set to automatic.

Cooling
The following drawing explains the principle of fan speed control for cooling.

![Cooling Diagram](R21654)

*The upper limit is M tap in 30 minutes from the operation start.

Heating
In heating operation, the fan speed is regulated according to the indoor heat exchanger temperature and the difference between the room thermistor temperature and the target temperature.

Note: The fan stops during defrost control.

COMFORT AIRFLOW Operation
- The fan speed is controlled automatically within the following steps.
  - Cooling
    - L tap ~ MH tap (same as automatic)
  - Heating
    - LL tap ~ M tap
1.5 Program Dry Operation

Outline
Program dry operation removes humidity while preventing the room temperature from lowering. Since the microcomputer controls both the temperature and airflow rate, the temperature adjustment and FAN setting buttons are inoperable.

Details
The microcomputer automatically sets the temperature and airflow rate. The difference between the room thermistor temperature at start-up and the target temperature is divided into two zones. Then, the unit operates in an appropriate capacity for each zone to maintain the temperature and humidity at a comfortable level.

<table>
<thead>
<tr>
<th>Room thermistor temperature at start-up</th>
<th>Target temperature X</th>
<th>Thermostat OFF point Y</th>
<th>Thermostat ON point Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>24°C or more (75.2°F or more)</td>
<td>Room thermistor temperature at start-up</td>
<td>X – 2.5°C (X – 4.5°F)</td>
<td>X – 0.5°C (X – 0.9°F)</td>
</tr>
<tr>
<td>18 ~ 23.5°C (64.4 ~ 74.3°F)</td>
<td>18°C (64.4°F)</td>
<td>X – 2.0°C (X – 3.6°F)</td>
<td>X – 0.5°C = 17.5°C (X – 0.9°F = 63.5°F)</td>
</tr>
<tr>
<td>17.5°C or less (63.5°F or less)</td>
<td>18°C (64.4°F)</td>
<td>X – 2.0°C (X – 3.6°F)</td>
<td>X – 0.5°C = 17.5°C (X – 0.9°F = 63.5°F)</td>
</tr>
</tbody>
</table>

* Thermostat turns on also when the room temperature is in the zone B for 10 minutes.
1.6 Automatic Operation

Outline

Automatic Cooling/Heating Function
When the automatic operation is selected with the remote controller, the microcomputer automatically determines the operation mode as cooling or heating according to the room temperature and the set temperature at start-up.
The unit automatically switches the operation mode to maintain the room temperature at the set temperature.

Details

Ts: set temperature (set by remote controller)
Tt: target temperature (determined by microcomputer)
Tr: room thermistor temperature (detected by room temperature thermistor)
C: correction value

1. The set temperature (Ts) determines the target temperature (Tt).
   (Ts = 18 ~ 30°C, 64 ~ 86°F).
2. The target temperature (Tt) is calculated as:
   \[ Tt = Ts + C \]
   where C is the correction value.
   C = 0°C (0°F)
3. Thermostat ON/OFF point and operation mode switching point are as follows.
   Tr means the room thermistor temperature.
   (1) Heating → Cooling switching point:
   \[ Tr \geq Tt + 3.0°C (+5.4°F) \]
   (2) Cooling → Heating switching point:
   \[ Tr < Tt - 2.5°C (-4.5°F) \]
   (3) Thermostat ON/OFF point is the same as the ON/OFF point of cooling or heating operation.
4. During initial operation
   \[ Tr \geq Ts : \text{Cooling operation} \]
   \[ Tr < Ts : \text{Heating operation} \]

Ex: When the target temperature is 25°C (77°F)
   Cooling → 23°C (73.4°F): Thermostat OFF → 22°C (71.6°F): Switch to heating
   Heating → 27°C (80.6°F): Thermostat OFF → 28°C (82.4°F): Switch to cooling
1.7 Thermostat Control

Outline
Thermostat control is based on the difference between the room thermistor temperature and the target temperature.

Details
Thermostat OFF Condition
• The temperature difference is in the zone A.

Thermostat ON Conditions
• The temperature difference returns to the zone C after being in the zone A.
• The system resumes from defrost control in any zones except A.
• The operation turns on in any zones except A.
• The temperature difference remains in zone B for the determined monitoring time.
  (Cooling: 10 minutes, Heating: 10 seconds)

Cooling

Heating

Refer to Temperature Control on page 13 for details.
### 1.8 NIGHT SET Mode

**Outline**
When the OFF TIMER is set, NIGHT SET Mode is automatically activated. NIGHT SET Mode keeps the airflow rate setting.

**Details**
NIGHT SET Mode continues operation at the target temperature for the first one hour, then automatically raises the target temperature slightly in the case of cooling, or lowers it slightly in the case of heating. This prevents excessive cooling in summer and excessive heating in winter to ensure comfortable sleeping conditions, and also conserves electricity.

#### Cooling

- **Target temperature**
- **0.5°C (0.9°F)** temperature shift
- **1 hour**
- **Operation stops at the set hour**
- **TIMER operation**
- **NIGHT SET Mode ON**

#### Heating

- **Target temperature**
- **2°C (3.6°F)** temperature shift
- **1 hour**
- **TIMER operation**
- **NIGHT SET Mode ON**

### 1.9 ECONO Operation

**Outline**
ECONO operation reduces the maximum power consumption. This operation is particularly convenient for energy-saving. It is also a major bonus when breaker capacity does not allow the use of multiple electrical devices and air conditioners.

It can be easily activated by pressing **ECONO** button on the wireless remote controller.

**Details**
- When this function is activated, the maximum capacity also decreases.
- The remote controller can send the ECONO command when the unit is in cooling, heating, dry, or automatic operation. This function can only be set when the unit is running. Press **ON/OFF** button on the remote controller to cancel the function.
- This function and POWERFUL operation cannot be used at the same time. The latest command has the priority.
### 1.10 INTELLIGENT EYE Operation

**Outline**
This function detects the presence of humans in the room with a motion sensor and reduces the capacity when there is nobody in the room in order to save electricity.

**Details**

1. **INTELLIGENT EYE detection method**

   - The motion sensor detects human motion by receiving infrared rays and sends the pulse wave output.
   - The microcomputer in the indoor unit carries out a sampling every 20 msec. If the motion sensor detects 10 times or more of the wave output in one second in total, and the High signal continues for 3 sec., the microcomputer judges humans are in the room as the human detection signal is ON.

2. **Motions (in cooling)**

   - If the detection signal (High) continues for 3 sec. or more, the microcomputer judges humans are in the room.

   - The motion sensor detects the outputs 10 times/sec. or more, the microcomputer judges the detection signal from the motion sensor is High.

   ![](diagram)

   - In FAN operation, the fan speed is reduced by 60 rpm when no one is in the area.
   - When there is no signal from the motion sensor in 20 minutes, the microcomputer judges that nobody is in the room and operates the unit at a temperature shifted from the target temperature. (Cooling/Dry: 1 ~ 2°C (1.8 ~ 3.6°F) higher, Heating: 2°C (3.6°F) lower, Auto: according to the operation mode at that time.)

   ![Diagram](diagram)

**Note:** For dry operation, the target temperature is shifted internally. The temperature cannot be set with the remote controller.
1.11 POWERFUL Operation

Outline
In order to exploit the cooling and heating capacity to full extent, the air conditioner can be operated by increasing the indoor fan rotating speed and the compressor frequency.

Details
When POWERFUL button is pressed, the fan speed and target temperature are converted to the following states for 20 minutes.

<table>
<thead>
<tr>
<th>Operation mode</th>
<th>Fan speed</th>
<th>Target temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOL</td>
<td>H tap + A rpm</td>
<td>18°C (64.4°F)</td>
</tr>
<tr>
<td>DRY</td>
<td>Dry rotating speed + A rpm</td>
<td>Lowered by 2.5°C (4.5°F)</td>
</tr>
<tr>
<td>HEAT</td>
<td>H tap + A rpm</td>
<td>31.5°C (88.7°F)</td>
</tr>
<tr>
<td>FAN</td>
<td>H tap + A rpm</td>
<td>—</td>
</tr>
<tr>
<td>AUTO</td>
<td>Same as cooling/heating in POWERFUL operation</td>
<td>The target temperature is kept unchanged.</td>
</tr>
</tbody>
</table>

A = 0 – 50 rpm (depending on the operating mode)

Ex: POWERFUL operation in cooling

Note: POWERFUL operation cannot be used together with ECONO, COMFORT AIRFLOW or OUTDOOR UNIT QUIET operation.
1.12 Clock Setting

ARC466 Series

The clock can be set by taking the following steps:

1. Press **Clock** button.
   → **0:00** is displayed and **MON** and **2** blink.

2. Press **Select ▲** or **Select ▼** button to set the clock to the current day of the week.

3. Press **Clock** button.
   → **2** blinks.

4. Press **Select ▲** or **Select ▼** button to set the clock to the present time.
   Holding down **Select ▲** or **Select ▼** button rapidly increases or decreases the displayed time.

5. Press **Clock** button. (Point the remote controller at the indoor unit when pressing the button.)
   → **2** blinks and clock setting is completed.
1.13 WEEKLY TIMER Operation

Outline

Up to 4 timer settings can be saved for each day of the week (up to 28 settings in total). The 3 items: ON/OFF, temperature, and time can be set.

Details

Setting example of the WEEKLY TIMER

The same timer settings are used from Monday through Friday, while different timer settings are used for the weekend.

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>![Image of timer settings]</td>
</tr>
<tr>
<td></td>
<td>6:00 8:30 17:30 22:00</td>
</tr>
<tr>
<td></td>
<td>77˚F (25˚C) 81˚F (27˚C)</td>
</tr>
<tr>
<td></td>
<td>ON OFF ON OFF</td>
</tr>
</tbody>
</table>

| [Tuesday] to | Use the copy mode to make settings for Tuesday to Friday, because these settings are the same as those for Monday. |
| [Friday]     |                                      |
|             | ![Image of timer settings]            |
|             | 6:00 8:30 17:30 22:00                |
|             | 77˚F (25˚C) 81˚F (27˚C)              |
|             | ON OFF ON OFF                        |

| [Saturday]  | No timer settings                     |
|             | ![Image of timer settings]            |
|             | 6:00 8:30 17:30 22:00                |
|             | 77˚F (25˚C) 81˚F (27˚C)              |
|             | ON OFF OFF ON                        |

|             | ![Image of timer settings]            |
|             | 8:00 10:00 19:00 21:00                |
|             | 77˚F (25˚C) 81˚F (27˚C) 77˚F (25˚C)   |
|             | ON OFF OFF ON                        |

- Up to 4 reservations per day and 28 reservations per week can be set using the WEEKLY TIMER. The effective use of the copy mode simplifies timer programming.
- The use of ON-ON-ON-ON settings, for example, makes it possible to schedule operating mode and set temperature changes. Furthermore, by using OFF-OFF-OFF-OFF settings, only the turn off time of each day can be set. This will turn off the air conditioner automatically if you forget to turn it off.
To use WEEKLY TIMER operation

Setting mode

- Make sure the day of the week and time are set.
  If not, set the day of the week and time.

<table>
<thead>
<tr>
<th></th>
<th>program 1</th>
<th>program 2</th>
<th>program 3</th>
<th>program 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
</tbody>
</table>

[Monday]

6:00  8:30  17:30  22:00
77˚F (25˚C)  81˚F (27˚C)

Setting Displays

Day and number  ON/OFF  Time  Temperature

1. Press .
   - The day of the week and the reservation number of the current day will be displayed.
   - 1 to 4 settings can be made per day.

2. Press  to select the desired day of the week and reservation number.
   - Pressing  changes the reservation number and the day of the week.

3. Press .
   - The day of the week and reservation number will be set.
   - " " and " ON " blink.

4. Press  to select the desired mode.
   - Pressing  changes the "ON" or "OFF" setting in sequence.

In case the reservation has already been set, selecting " blank " deletes the reservation.
Proceed to STEP 9 if " blank " is selected.
To return to the day of the week and reservation number setting, press .

5. Press .
   - The ON/OFF TIMER mode will be set.
   - " " and the time blink.
6. Press \( \text{Δ} \) to select the desired time.
   - The time can be set between 0:00 and 23:50 in 10-minute intervals.
   - To return to the ON/OFF TIMER mode setting, press \( \text{Next} \).
   - Proceed to \text{STEP 9} when setting the OFF TIMER.

7. Press \( \text{Next} \).
   - The time will be set.
   - "ON/OFF" and the temperature blink.

8. Press \( \text{Δ} \) to select the desired temperature.
   - The temperature can be set between 50˚F (10˚C) and 90˚F (32˚C).
   - COOL or AUTO: The unit operates at 64˚F (18˚C) even if it is set at 50˚F (10˚C) to 63˚F (17˚C).
   - HEAT or AUTO: The unit operates at 86˚F (30˚C) even if it is set at 87˚F (31˚C) to 90˚F (32˚C).
   - To return to the time setting, press \( \text{Next} \).
   - The set temperature is only displayed when the mode setting is on.

9. Press \( \text{Next} \).
   - Check for a receiving tone and that the OPERATION lamp blinks twice.
   - The TIMER lamp lights orange.
   - Temperature and time are set in the case of ON TIMER operation, and the time is set in the case of OFF TIMER operation.
   - The next reservation screen will appear.
   - To continue further settings, repeat the procedure from \text{STEP 4}.

10. Press \( \text{ω} \) to complete the setting.
    - "ON/OFF" is displayed on the LCD and WEEKLY TIMER operation is activated.
    - A reservation made once can be easily copied and the same settings used for another day of the week. Refer to \text{Copy mode}.

**NOTE**

- Do not forget to set the clock on the remote controller first.
- The day of the week, ON/OFF TIMER mode, time and set temperature (only for ON TIMER mode) can be set with the WEEKLY TIMER. When set to ON TIMER mode, operation will begin in the settings used previously for operation mode, temperature, airflow rate, and airflow direction.
- WEEKLY TIMER and ON/OFF TIMER operation cannot be used at the same time. The ON/OFF TIMER operation has priority if it is set while WEEKLY TIMER is still active. The WEEKLY TIMER will enter the standby state, and "ON/OFF" will disappear from the LCD. When the ON/OFF TIMER is up, the WEEKLY TIMER will automatically become active.
- Turning off the circuit breaker, power failure, and other similar events will render operation of the indoor unit's internal clock inaccurate. Reset the clock.
- \( \text{Next} \) can be used only for the time and temperature settings. It cannot be used to go back to the reservation number.
1. Press ．

2. Press  to confirm the day of the week to be copied.

3. Press ．
   • The whole reservation of the selected day of the week will be copied.

4. Press  to select the destination day of the week.

5. Press ．
   • Check for a receiving tone and that the OPERATION lamp blinks twice.
   • The reservation will be copied to the selected day of the week. The whole reservation of
     the selected day of the week will be copied.
   • To continue copying the settings to other days of the week, repeat STEP 4 and STEP 5.

6. Press  to complete the setting.

   • “COPY” is displayed on the LCD and WEEKLY TIMER operation is activated.

**NOTE**

**Note on COPY MODE**

• The entire reservation of the source day of the week is copied in the copy mode.

In the case of making a reservation change for any day of the week individually after copying the content of weekly reservations, press  and change the settings in the steps of [Setting mode].
Confirming a reservation

- The reservation can be confirmed.

<table>
<thead>
<tr>
<th>Setting Displays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>Confirmation</td>
</tr>
</tbody>
</table>

1. Press 
- The day of the week and the reservation number of the current day will be displayed.

2. Press to select the day of the week and the reservation number to be confirmed.
- Pressing displays the reservation details.
- To change the confirmed reserved settings, select the reservation number and press .
- The mode is switched to setting mode. Proceed to Setting mode STEP 4.

3. Press to exit the confirmation mode.
- " is displayed on the LCD and WEEKLY TIMER operation is activated.

To deactivate WEEKLY TIMER operation

- Press Weekly while “ Weekly” is displayed on the LCD.
- “ Weekly” disappears from the LCD.
- The TIMER lamp goes off.
- To reactivate the WEEKLY TIMER operation, press Weekly again.
- If a reservation deactivated with Weekly is activated once again, the last reservation mode will be used.

NOTE

- If not all the reservation settings are reflected, deactivate the WEEKLY TIMER operation once. Then press Weekly again to reactivate the WEEKLY TIMER operation.
To delete reservations

An individual reservation

1. Press \[\text{Select}\].
   - The day of the week and the reservation number will be displayed.

2. Press \[\text{Select}\] to select the day of the week and the reservation number to be deleted.

3. Press \[\text{Next}\].
   - \(\text{ON}, \text{OFF}, \text{blank}, \text{No Setting}\) and \"ON\" or \"OFF\" blink.

4. Press \[\text{Select}\] until no icon is displayed.
   - Pressing \[\text{Select}\] changes the ON/OFF TIMER mode in sequence.
   - Selecting \"blank\" will cancel any reservation you may have.

5. Press \[\text{Next}\].
   - The selected reservation will be deleted.
   - Check for a receiving tone and that the OPERATION lamp blinks twice.

6. Press \[\text{Select}\].
   - If there are still other reservations, WEEKLY TIMER operation will be activated.

Reservations for each day of the week

- This function can be used for deleting reservations for each day of the week.
- It can be used while confirming or setting reservations.

1. Press \[\text{Select}\].
   - The day of the week and the reservation number will be displayed.

2. Press \[\text{Select}\] to select the day of the week to be deleted.

3. Hold \[\text{Weekly}\] for about 5 seconds.
   - Check for a receiving tone and that the OPERATION lamp blinks twice.
   - The reservation of the selected day of the week will be deleted.

4. Press \[\text{Weekly}\].
   - If there are still other reservations, WEEKLY TIMER operation will be activated.

All reservations

Hold \[\text{Weekly}\] for about 5 seconds with the normal display.
- Check for a receiving tone and that the OPERATION lamp blinks twice.
- \"Weekly\" disappears from the LCD.
- The TIMER lamp goes off.
- All reservations will be deleted.
- This operation is not functional while the WEEKLY TIMER setting screen is displayed.
1.14 Other Functions

1.14.1 Hot-Start Function

In order to prevent the cold air blast that normally occurs when heating operation starts, the temperature of the indoor heat exchanger is detected, and the airflow is either stopped or significantly weakened resulting in comfortable heating.

Note: The cold air blast is prevented using similar control when defrost control starts or when the thermostat is turned ON.

1.14.2 Signal Receiving Sign

When the indoor unit receives a signal from the remote controller, the unit emits a signal receiving sound and the operation lamp blinks.

1.14.3 Indoor Unit ON/OFF Button

ON/OFF button is provided on the display of the unit.

- Press ON/OFF button once to start operation. Press once again to stop it.
- ON/OFF button is useful when the remote controller is missing or the battery has run out.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Temperature setting</th>
<th>Airflow rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling Only</td>
<td>COOL</td>
<td>22°C (72°F)</td>
</tr>
<tr>
<td>Heat Pump</td>
<td>AUTO</td>
<td>25°C (77°F)</td>
</tr>
</tbody>
</table>

Forced cooling operation

Forced cooling operation can be started by pressing ON/OFF button for 5 to 9 seconds while the unit is not operating. Forced cooling operation is not started if ON/OFF button is pressed for 10 seconds or more.

Refer to page 105 for details.

1.14.4 Auto-restart Function

If a power failure (even a momentary one) occurs during the operation, the system restarts automatically in the same conditions as before when the power supply is restored to the conditions prior to the power failure.

Note: It takes 3 minutes to restart the operation because the 3-minute standby function is activated.
2. Thermistor Functions

(1) Discharge Pipe Thermistor
- The discharge pipe thermistor is used for controlling discharge pipe temperature. If the discharge pipe temperature (used in place of the inner temperature of the compressor) rises abnormally, the operating frequency becomes lower or the operation halts.
- The discharge pipe thermistor is used for detecting disconnection of the discharge pipe thermistor.

(2) Outdoor Heat Exchanger Thermistor
- The outdoor heat exchanger thermistor is used for controlling the target discharge pipe temperature. The system sets the target discharge pipe temperature according to the outdoor and indoor heat exchanger temperature, and controls the electronic expansion valve opening so that the target discharge pipe temperature can be obtained.
- In cooling operation, the outdoor heat exchanger thermistor is used for detecting the disconnection of the discharge pipe thermistor. When the discharge pipe temperature drops below the outdoor heat exchanger temperature by more than a certain value, the discharge pipe thermistor is judged as disconnected.
- In cooling operation, the outdoor heat exchanger thermistor is used for high pressure protection.

(3) Outdoor Temperature Thermistor
- The outdoor temperature thermistor detects the outdoor air temperature and is used for refrigerant shortage detection, input current control, outdoor fan control, liquid compression protection function, and so on.

(4) Indoor Heat Exchanger Thermistor
- The indoor heat exchanger thermistor is used for controlling the target discharge pipe temperature. The system sets the target discharge pipe temperature according to the outdoor and indoor heat exchanger temperature, and controls the electronic expansion valve opening so that the target discharge pipe temperature can be obtained.
- In cooling operation, the indoor heat exchanger thermistor is used for freeze-up protection control. If the indoor heat exchanger temperature drops abnormally, the operating frequency becomes lower or the operation halts.
- In cooling operation, the indoor heat exchanger thermistor is used for anti-icing function. If any of the following conditions are met in the room where operation halts, it is assumed as icing.
The conditions are
\[ T_c \leq -1^\circ C \]
\[ T_a - T_c \geq 10^\circ C \]
where \( T_a \) is the room temperature and \( T_c \) is the indoor heat exchanger temperature.

- In heating operation, the indoor heat exchanger thermistor is used for heating peak-cut control. If the indoor heat exchanger temperature rises abnormally, the operating frequency becomes lower or the operation halts.

- In heating operation, the indoor heat exchanger thermistor is used for detecting the disconnection of the discharge pipe thermistor. When the discharge pipe temperature drops below the highest indoor heat exchanger temperature by more than a certain value, the discharge pipe thermistor is judged as disconnected.

- When only one indoor unit is operating, the indoor heat exchanger thermistor is used for subcooling control. The actual subcool is calculated with the liquid pipe temperature and the indoor heat exchanger temperature. The system controls the electronic expansion valve openings to obtain the target subcool.

(5) Room Temperature Thermistor

- The room temperature thermistor detects the room air temperature and is used for controlling the room air temperature.
### 3. Control Specification

#### 3.1 Mode Hierarchy

**Outline**

The air conditioner control has normal operation mode, forced operation mode, and power transistor test mode for installation and servicing.

**Details**

**Cooling Only Model**

<table>
<thead>
<tr>
<th>Air conditioner control mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forced operation mode</td>
</tr>
<tr>
<td>Forced cooling operation (for pump down operation)</td>
</tr>
<tr>
<td>Power transistor test mode</td>
</tr>
<tr>
<td>Normal operation mode</td>
</tr>
<tr>
<td>Fan</td>
</tr>
<tr>
<td>Cooling (includes drying)</td>
</tr>
<tr>
<td>Stop (indoor unit: OFF)</td>
</tr>
<tr>
<td>Preheating operation</td>
</tr>
<tr>
<td>Discharging from capacitor</td>
</tr>
<tr>
<td>Stop</td>
</tr>
</tbody>
</table>

(R19505)

**Heat Pump Model**

<table>
<thead>
<tr>
<th>Air conditioner control mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forced operation mode</td>
</tr>
<tr>
<td>Forced cooling operation (for pump down operation)</td>
</tr>
<tr>
<td>Power transistor test mode</td>
</tr>
<tr>
<td>Normal operation mode</td>
</tr>
<tr>
<td>Fan</td>
</tr>
<tr>
<td>Cooling (includes drying)</td>
</tr>
<tr>
<td>Heating</td>
</tr>
<tr>
<td>Heating</td>
</tr>
<tr>
<td>Defrosting</td>
</tr>
<tr>
<td>Stop (indoor unit: OFF)</td>
</tr>
<tr>
<td>Preheating operation</td>
</tr>
<tr>
<td>Discharging from capacitor</td>
</tr>
<tr>
<td>Stop</td>
</tr>
</tbody>
</table>

(R19522)

**Note:** Unless specified otherwise, dry operation command is regarded as cooling operation.
### 3.2 Frequency Control

**Outline**
The compressor frequency is determined according to the difference between the room thermistor temperature and the target temperature.

When the shift of the frequency is less than zero ($\Delta F<0$) by PI control, the target frequency is used as the command frequency.

**Details**

**For Cooling Only Model**

1. **Determine command frequency**
   Command frequency is determined in the following order of priority.
   1. Forced cooling
   2. Indoor frequency command

2. **Determine upper limit frequency**
   The minimum value is set as an upper limit frequency among the frequency upper limits of the following functions:
   - Compressor protection
   - Input current control
   - Discharge pipe temperature
   - Freeze-up protection

3. **Determine lower limit frequency**
   The maximum value is set as a lower limit frequency among the frequency lower limits of the following function:
   - Pressure difference upkeep

4. **Determine prohibited frequency**
   There is a certain prohibited frequency such as a power supply frequency.

**For Heat Pump Model**

1. **Determine command frequency**
   Command frequency is determined in the following order of priority.
   1. Limiting defrost control time
   2. Forced cooling
   3. Indoor frequency command

\(\Delta F\): only for heat pump models

---

**Legend**

- **Upper limit frequency** $F_{\text{MAX}}$
- **Lower limit frequency** $F_{\text{MIN}}$
- **Dropping function**
- **Input current control, etc.**
- **Compressor protection function**
- **Four way valve operation compensation ( ), etc.**
- **Initial frequency**
- **PI control**
- **Defrost control ( )**
- **Limit frequency**
- **Skip control**
- **Target frequency**

(R17857)
2. **Determine upper limit frequency**
   The minimum value is set as an upper limit frequency among the frequency upper limits of the following functions:
   Compressor protection, input current, discharge pipe temperature, heating peak-cut, freeze-up protection, defrost control.

3. **Determine lower limit frequency**
   The maximum value is set as an lower limit frequency among the frequency lower limits of the following functions:
   Four way valve operation compensation, draft prevention, pressure difference upkeep.

4. **Determine prohibited frequency**
   There is a certain prohibited frequency such as a power supply frequency.

### Initial Frequency
When starting the compressor, the frequency is initialized according to the $\Delta D$ value of the indoor unit.

\[ \Delta D \text{ signal: Indoor frequency command} \]

The difference between the room thermistor temperature and the target temperature is taken as the $\Delta D$ value and is used for $\Delta D$ signal of frequency command.

<table>
<thead>
<tr>
<th>Temperature difference</th>
<th>$\Delta D$ signal</th>
<th>Temperature difference</th>
<th>$\Delta D$ signal</th>
<th>Temperature difference</th>
<th>$\Delta D$ signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>–2.0°C (–3.6°F)</td>
<td>OFF</td>
<td>0°C (0°F)</td>
<td>4</td>
<td>2.0°C (3.6°F)</td>
<td>8</td>
</tr>
<tr>
<td>–1.5°C (–2.7°F)</td>
<td>1</td>
<td>0.5°C (0.9°F)</td>
<td>5</td>
<td>2.5°C (4.5°F)</td>
<td>9</td>
</tr>
<tr>
<td>–1.0°C (–1.8°F)</td>
<td>2</td>
<td>1.0°C (1.8°F)</td>
<td>6</td>
<td>3.0°C (5.4°F)</td>
<td>10★</td>
</tr>
<tr>
<td>–0.5°C (–0.9°F)</td>
<td>3</td>
<td>1.5°C (2.7°F)</td>
<td>7</td>
<td>3.5°C (6.3°F)</td>
<td>11★</td>
</tr>
</tbody>
</table>

*OFF = Thermostat OFF
★ For heating operation only.

### PI Control

1. **P control**
   The $\Delta D$ value is calculated in each sampling time (20 seconds), and the frequency is adjusted according to its difference from the frequency previously calculated.

2. **I control**
   If the operating frequency does not change for more than a certain fixed time, the frequency is adjusted according to the $\Delta D$ value.
   When $\Delta D$ value is low, the frequency is lowered.
   When $\Delta D$ value is high, the frequency is increased.

3. **Frequency control when other controls are functioning**
   - When frequency is dropping:
     Frequency control is carried out only when the frequency drops.
   - For limiting lower limit:
     Frequency control is carried out only when the frequency rises.

4. **Upper and lower limit of frequency by PI control**
   The frequency upper and lower limits are set according to the command of the indoor unit.
   When the indoor or outdoor unit quiet operation command comes from the indoor unit, the upper limit frequency is lower than the usual setting.
3.3 Controls at Mode Changing/Start-up

3.3.1 Preheating Operation

Outline
The inverter operation in open phase starts with the conditions of the outdoor temperature and the preheating command from the indoor unit.

Details
ON Condition
- When the outdoor temperature is below 6°C (42.8°F), the inverter operation in open phase starts.

OFF Condition
- When the outdoor temperature is higher than 8°C (46.4°F), the inverter operation in open phase stops.

3.3.2 Four Way Valve Switching

Outline
The four way valve coil is energized/not energized depending on the operation mode.
(Heating: ON, Cooling/Dry/Defrost: OFF)
In order to eliminate the switching sound as the four way valve coil switches from ON to OFF when the heating is stopped, the OFF delay switch of the four way valve is carried out.

Details
OFF delay switch of four way valve
The four way valve coil is energized for 160 seconds after the operation is stopped.

3.3.3 Four Way Valve Operation Compensation

Outline
At the beginning of operation as the four way valve is switched, the pressure difference to activate the four way valve is acquired when the output frequency is higher than a certain fixed frequency, for a certain fixed time.

Details
Starting Conditions
1. Compressor starts and the four way valve switches from OFF to ON
2. Four way valve switches from ON to OFF during operation
3. Compressor starts after resetting
4. Compressor starts after the fault of four way valve switching

The lower limit of frequency keeps A Hz for B seconds with any conditions 1 through 4 above. When the outdoor temperature is above C in heating, the frequency decreases depending on the outdoor temperature.

<table>
<thead>
<tr>
<th></th>
<th>RK30/36NMVJU</th>
<th>RX30/36NMVJU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cooling</td>
<td>Heating</td>
</tr>
<tr>
<td><strong>A (Hz)</strong></td>
<td>46</td>
<td>—</td>
</tr>
<tr>
<td><strong>B (seconds)</strong></td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td><strong>C (°C)</strong></td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td><strong>C (°F)</strong></td>
<td>59</td>
<td>59</td>
</tr>
</tbody>
</table>
3.3.4 3-Minute Standby
Turning on the compressor is prohibited for 3 minutes after turning it off.
(The function is not activated when defrosting.)

3.3.5 Compressor Protection Function
When turning the compressor from OFF to ON, the upper limit of frequency is set as follows.
(The function is not activated when defrosting.)

<table>
<thead>
<tr>
<th></th>
<th>RK30/36NMVJU</th>
<th>RX30/36NMVJU</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Hz)</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>B (Hz)</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>C (Hz)</td>
<td>56</td>
<td>56</td>
</tr>
<tr>
<td>D (seconds)</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td>E (seconds)</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td>F (seconds)</td>
<td>180</td>
<td>180</td>
</tr>
</tbody>
</table>
3.4 Discharge Pipe Temperature Control

Outline
The discharge pipe temperature is used as the internal temperature of the compressor. If the discharge pipe temperature rises above a certain level, the upper limit of frequency is set to keep the discharge pipe temperature from rising further.

Details

<table>
<thead>
<tr>
<th>Zone</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop zone</td>
<td>When the temperature reaches the stop zone, the compressor stops.</td>
</tr>
<tr>
<td>Dropping zone</td>
<td>The upper limit of frequency decreases.</td>
</tr>
<tr>
<td>Keep zone</td>
<td>The upper limit of frequency is kept.</td>
</tr>
<tr>
<td>Up zone</td>
<td>The upper limit of frequency increases.</td>
</tr>
<tr>
<td>Reset zone</td>
<td>The upper limit of frequency is canceled.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RK(X)30/36NMVJU</th>
<th>°C</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>120</td>
<td>248.0</td>
</tr>
<tr>
<td>B</td>
<td>111</td>
<td>231.8</td>
</tr>
<tr>
<td>C</td>
<td>109</td>
<td>228.2</td>
</tr>
<tr>
<td>D</td>
<td>107</td>
<td>224.6</td>
</tr>
<tr>
<td>E</td>
<td>107</td>
<td>224.6</td>
</tr>
</tbody>
</table>
### 3.5 Input Current Control

**Outline**

The microcomputer calculates the input current while the compressor is running, and sets the frequency upper limit based on the input current.

In case of heat pump models, this control is the upper limit control of frequency and takes priority over the lower limit control of four way valve operation compensation.

**Details**

#### Frequency control in each zone

**Stop zone**
- After the input current remains in the stop zone for 2.5 seconds, the compressor is stopped.

**Dropping zone**
- The upper limit of the compressor frequency is defined as operation frequency – 2 Hz.
- After this, the output frequency is lowered by 2 Hz every second until it reaches the keep zone.

**Keep zone**
- The present maximum frequency goes on.

**Reset zone**
- Limit of the frequency is canceled.

<table>
<thead>
<tr>
<th></th>
<th>RK30/36NMVJU</th>
<th>RX30/36NMVJU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A (A)</strong></td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td><strong>B (A)</strong></td>
<td>16.25</td>
<td>—</td>
</tr>
<tr>
<td><strong>C (A)</strong></td>
<td>15.25</td>
<td>18.25</td>
</tr>
</tbody>
</table>

**Limitation of current dropping and stop value according to the outdoor temperature**
- The current drops when outdoor temperature becomes higher than a certain level (depending on the model).
3.6 Freeze-up Protection Control
During cooling operation, the signal sent from the indoor unit determines the frequency upper limit and prevents freezing of the indoor heat exchanger. (The signal from the indoor unit is divided into zones.)
The operating frequency limitation is judged with the indoor heat exchanger temperature.

![Diagram of Freeze-up Protection Control]

3.7 Heating Peak-cut Control
During heating operation, the indoor heat exchanger temperature determines the frequency upper limit to prevent abnormal high pressure.
The operating frequency limitation is judged with the indoor heat exchanger temperature.

![Diagram of Heating Peak-cut Control]

### RX30/36NMVJU

<table>
<thead>
<tr>
<th></th>
<th>°C</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>60</td>
<td>140.0</td>
</tr>
<tr>
<td>B</td>
<td>57</td>
<td>134.6</td>
</tr>
<tr>
<td>C</td>
<td>54</td>
<td>129.2</td>
</tr>
<tr>
<td>D</td>
<td>52</td>
<td>125.6</td>
</tr>
<tr>
<td>E</td>
<td>47</td>
<td>116.6</td>
</tr>
</tbody>
</table>

### Zone Control

<table>
<thead>
<tr>
<th>Zone</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop zone</td>
<td>When the temperature reaches the stop zone, the compressor stops.</td>
</tr>
<tr>
<td>Dropping zone</td>
<td>The upper limit of frequency decreases.</td>
</tr>
<tr>
<td>Keep zone</td>
<td>The upper limit of frequency is kept.</td>
</tr>
<tr>
<td>Up zone</td>
<td>The upper limit of frequency increases.</td>
</tr>
<tr>
<td>Reset zone</td>
<td>The upper limit of frequency is canceled.</td>
</tr>
</tbody>
</table>
3.8 Outdoor Fan Control

1. Fan ON control to cool down the electrical box
   The outdoor fan is turned ON when the electrical box temperature is high while the compressor is OFF.

2. Fan OFF control during defrosting
   The outdoor fan is turned OFF during defrosting.

3. Fan OFF delay when stopped
   The outdoor fan is turned OFF 60 seconds after the compressor stops.

4. Fan speed control for pressure difference upkeep
   The rotation speed of the outdoor fan is controlled for keeping the pressure difference during cooling operation with low outdoor temperature.
   • When the pressure difference is low, the rotation speed of the outdoor fan is reduced.
   • When the pressure difference is high, the rotation speed of the outdoor fan is controlled as well as normal operation.

5. Fan speed control during forced cooling operation
   The outdoor fan is controlled as well as normal operation during forced cooling operation.

6. Fan speed control during POWERFUL operation
   The rotation speed of the outdoor fan is increased during POWERFUL operation.

7. Fan speed control during indoor/outdoor unit quiet operation
   The rotation speed of the outdoor fan is reduced by the command of the indoor/outdoor unit quiet operation.

8. Fan ON/OFF control when operation (cooling, heating, dry) starts/stops
   The outdoor fan is turned ON when the operation starts. The outdoor fan is turned OFF when the operation stops.

3.9 Liquid Compression Protection Function

Outline
In order to increase the dependability of the compressor, the compressor is stopped according to the outdoor temperature.

Details
Operation stops depending on the outdoor temperature
Compressor turns off under the conditions that the system is in cooling operation and outdoor temperature is below 0°C (32°F).
3.10 Defrost Control

Outline
Defrosting is carried out by the cooling cycle (reverse cycle). The defrosting time or outdoor heat exchanger temperature must be more than a certain value to finish defrosting.

Details

Conditions for Starting Defrost
- The starting conditions are determined with the outdoor temperature and the outdoor heat exchanger temperature.
- The system is in heating operation.
- The compressor operates for 6 minutes.
- More than A minutes (depending on the duration of the previous defrost control) of accumulated time have passed since the start of the operation, or ending the previous defrosting.

Conditions for Canceling Defrost
The judgment is made with the outdoor heat exchanger temperature (B).

![Diagram of control sequence](R21661)

<table>
<thead>
<tr>
<th>RX30/36NMVJU</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A (minute)</td>
<td>15 ~ 25</td>
</tr>
<tr>
<td>B (°C)</td>
<td>6 ~ 30</td>
</tr>
<tr>
<td>B (°F)</td>
<td>42.8 ~ 86.0</td>
</tr>
<tr>
<td>C (Hz)</td>
<td>58</td>
</tr>
<tr>
<td>D (Hz)</td>
<td>58</td>
</tr>
<tr>
<td>E (seconds)</td>
<td>60</td>
</tr>
<tr>
<td>F (seconds)</td>
<td>60</td>
</tr>
<tr>
<td>G (seconds)</td>
<td>340</td>
</tr>
<tr>
<td>H (seconds)</td>
<td>60</td>
</tr>
<tr>
<td>J (seconds)</td>
<td>8</td>
</tr>
<tr>
<td>K (pulse)</td>
<td>200</td>
</tr>
<tr>
<td>L (pulse)</td>
<td>150</td>
</tr>
<tr>
<td>M (pulse)</td>
<td>200</td>
</tr>
</tbody>
</table>
3.11 Electronic Expansion Valve Control

Outline
The following items are included in the electronic expansion valve control.

**Electronic expansion valve is fully closed**
1. Electronic expansion valve is fully closed when turning on the power.
2. Pressure equalizing control

**Open Control**
1. Electronic expansion valve control when starting operation
2. Electronic expansion valve control when the frequency changes
3. Electronic expansion valve control for defrosting
4. Electronic expansion valve control when the discharge pipe temperature is abnormally high
5. Electronic expansion valve control when the discharge pipe thermistor is disconnected

**Feedback Control**
Target discharge pipe temperature control

Details
The following are examples of electronic expansion valve control for each operation mode.

<table>
<thead>
<tr>
<th>Status</th>
<th>Power on</th>
<th>Compressor stop</th>
<th>Operation start</th>
<th>Frequency change under starting control</th>
<th>During target discharge pipe temperature control</th>
<th>Frequency change under target discharge pipe thermistor temperature control</th>
<th>Discharge pipe thermistor disconnection control</th>
<th>Frequency change under discharge pipe thermistor disconnection control</th>
<th>During defrost control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting operation control</td>
<td>—</td>
<td>●</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Control when the frequency changes</td>
<td>—</td>
<td>—</td>
<td>●</td>
<td>—</td>
<td>●</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Target discharge pipe temperature control</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>●</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Discharge pipe thermistor disconnection control</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>●</td>
<td>●</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>High discharge pipe temperature control</td>
<td>—</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Defrost control (heating only)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>●</td>
<td>—</td>
</tr>
<tr>
<td>Pressure equalizing control</td>
<td>●</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Opening limit control</td>
<td>—</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

● : Available
— : Not available
3.11.1 Initialization as Power Supply On
The electronic expansion valve is initialized (fully closed) when the power is turned on. Then, the valve opening is set and the pressure is equalized.

3.11.2 Pressure Equalizing Control
When the compressor is stopped, the pressure equalizing control is activated. The electronic expansion valve opens and the pressure is equalized.

3.11.3 Opening Limit Control
The maximum and minimum opening of the electronic expansion valve are limited.

<table>
<thead>
<tr>
<th></th>
<th>RK(X)30/36NMVJU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum opening (pulse)</td>
<td>480</td>
</tr>
<tr>
<td>Minimum opening (pulse)</td>
<td>56</td>
</tr>
</tbody>
</table>

The electronic expansion valve is fully closed when cooling operation stops, and is opened at a fixed degree during defrosting.

3.11.4 Starting Operation Control
The electronic expansion valve opening is controlled when the operation starts, thus preventing superheating or liquid compression.

3.11.5 Control when the frequency changes
When the target discharge pipe temperature control is active, if the target frequency changes to a specified value in a certain period of time, the target discharge pipe temperature control is canceled and the target opening of the electronic expansion valve is changed according to the frequency shift.

3.11.6 High Discharge Pipe Temperature Control
When the compressor is operating, if the discharge pipe temperature exceeds a certain value, the electronic expansion valve opens and the refrigerant runs to the low pressure side. This procedure lowers the discharge pipe temperature.

3.11.7 Discharge Pipe Thermistor Disconnection Control
Outline
The disconnection of the discharge pipe thermistor is detected by comparing the discharge pipe temperature with the condensation temperature. If the discharge pipe thermistor is disconnected, the electronic expansion valve opens according to the outdoor temperature and the operation frequency, operates for a specified time, and then stops. After 3 minutes, the operation restarts and checks if the discharge pipe thermistor is disconnected. If the discharge pipe thermistor is disconnected, the system stops after operating for a specified time. If the disconnection is detected repeatedly, the system is shut down. When the compressor runs for 60 minutes without any error, the error counter is reset.
Details

Determining thermistor disconnection
When the starting control (Cooling: A seconds, Heating: B seconds) finishes, the detection timer for
disconnection of the discharge pipe thermistor (C seconds) starts. When the timer is over, the
following adjustment is made.
1. When the operation mode is cooling
   When the following condition is fulfilled, the discharge pipe thermistor disconnection is
   ascertained.
   Discharge pipe temperature +6°C (+10.8°F) < outdoor heat exchanger temperature
2. When the operation mode is heating
   When the following condition is fulfilled, the discharge pipe thermistor disconnection is
   ascertained.
   Discharge pipe temperature +6°C (+10.8°F) < indoor heat exchanger temperature

<table>
<thead>
<tr>
<th></th>
<th>RK(X)30/36NMVJU</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (seconds)</td>
<td>180</td>
</tr>
<tr>
<td>B (seconds)</td>
<td>60</td>
</tr>
<tr>
<td>C (seconds)</td>
<td>1020</td>
</tr>
</tbody>
</table>

When the thermistor is disconnected
When the disconnection is ascertained, the compressor continues operation for 9 minutes and then
stops.
If the compressor stops repeatedly, the system is shut down.

3.11.8 Target Discharge Pipe Temperature Control
The target discharge pipe temperature is obtained from the indoor and outdoor heat exchanger
temperature, and the electronic expansion valve opening is adjusted so that the actual discharge
pipe temperature becomes close to the target discharge pipe temperature. (Indirect SH
(superheating) control using the discharge pipe temperature)

The electronic expansion valve opening and the target discharge pipe temperature are adjusted
every A seconds. The opening degree of the electronic expansion valve is adjusted by the
following.
• Target discharge pipe temperature
• Actual discharge pipe temperature
• Previous discharge pipe temperature

<table>
<thead>
<tr>
<th></th>
<th>RK(X)30/36NMVJU</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (seconds)</td>
<td>20</td>
</tr>
</tbody>
</table>
3.12 Malfunctions

3.12.1 Sensor Malfunction Detection

Sensor malfunction can be detected in the following thermistors:
1. Outdoor heat exchanger thermistor
2. Discharge pipe thermistor
3. Radiation fin thermistor
4. Outdoor temperature thermistor

3.12.2 Detection of Overcurrent and Overload

Outline
An excessive output current is detected and the OL temperature is observed to protect the compressor.

Details
- If the OL (compressor head) temperature exceeds 130°C (266°F), the system shuts down the compressor.
- If the inverter current exceeds 20 A, the system shuts down the compressor.
  The upper limit of the current decreases when the outdoor temperature exceeds a certain level.
Part 5
Remote Controller

1. Remote Controller .................................................................48
1. Remote Controller

Signal transmitter

- To use the remote controller, aim the transmitter at the indoor unit. If there is anything blocking the signals between the unit and the remote controller, such as a curtain, the unit may not operate.
- The maximum transmission distance is about 23 ft (7 m).

Fan setting button

- Selects the airflow rate setting every time you press this button.
- In indoor unit quiet operation, operation sound becomes weak. (The airflow rate also decreases.)
- In DRY operation, the airflow rate setting is not available.

Display (LCD)

- Displays the current settings. (In this illustration, each section is shown with all its displays on for the purpose of explanation.)

Temperature adjustment buttons

- Changes the temperature setting.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Temperature Range</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO</td>
<td>18 ~ 30 °C (64 ~ 86 °F)</td>
<td></td>
</tr>
<tr>
<td>DRY</td>
<td>Not available</td>
<td></td>
</tr>
<tr>
<td>COOL</td>
<td>18 ~ 32 °C (64 ~ 90 °F)</td>
<td></td>
</tr>
<tr>
<td>HEAT</td>
<td>10 ~ 30 °C (50 ~ 86 °F)</td>
<td></td>
</tr>
<tr>
<td>FAN</td>
<td>Not available</td>
<td></td>
</tr>
</tbody>
</table>

On/Off button

- Press this button once to start operation. Press once again to stop it.

Powerful** button

- Starts POWERFUL operation.

Reference

Refer to the following pages for details.

★1 POWERFUL operation P.22

Note: Refer to the operation manual of applicable model for details. You can download operation manuals from Daikin Business Portal:
(URL: https://global1d.daikin.com/business_portal/login/)
Open the Front Cover

Mode button
- Selects the operation mode.

Econo*4 / Quiet button
- Every time you press Econo/ Quiet button, the setting changes in the following order.

Swing*5 buttons
- Adjusts the airflow direction.
- When you press Swing button, the flap moves up and down, or (and) the louver moves right and left. The flap (louver) stops when you press Swing button again.

Weekly button (WEEKLY TIMER Operation*)
Weekly : Weekly button
Program : Program button
Copy : Copy button
Back : Back button
Next : Next button

Select button
- Changes the ON/OFF TIMER and WEEKLY TIMER settings.

On Timer button
- Press this button and adjust the day of the week and time with Select button. Press this button again to complete TIMER setting.

Off Timer button (NIGHT SET mode)
- Press this button and adjust the day of the week and time with Select button. Press this button again to complete TIMER setting.

Timer Cancel button
- Cancels the timer setting.
- It cannot be used for the WEEKLY TIMER operation.

Comfort/Sensor button (COMFORT AIRFLOW Operation **/ INTELLIGENT EYE Operation **)
- Every time you press Comfort/Sensor button, the setting changes in the following order.

Note: Refer to the following pages for details.

Reference
Refer to the operation manual of applicable model for details. You can download operation manuals from Daikin Business Portal:

(R24630)
# Part 6

## Service Diagnosis

1. General Problem Symptoms and Check Items ................................................. 52
2. Troubleshooting with LED ................................................................. 53
   2.1 Indoor Unit .......................................................................................... 53
   2.2 Outdoor Unit .......................................................................................... 53
3. Service Diagnosis .................................................................................. 54
4. Troubleshooting .................................................................................. 57
   4.1 Error Codes and Description .......................................................... 57
   4.2 Indoor Unit PCB Abnormality ....................................................... 58
   4.3 Freeze-up Protection Control/Heating Peak-cut Control .......... 60
   4.4 Indoor Fan Motor (DC Motor) or Related Abnormality .............. 61
   4.5 Thermistor or Related Abnormality (Indoor Unit) ....................... 63
   4.6 Low-voltage Detection or Over-voltage Detection ................. 64
   4.7 Signal Transmission Error (between Indoor Unit and Outdoor Unit) .... 66
   4.8 Signal Transmission Error on Outdoor Unit PCB ..................... 68
   4.9 Mismatching of Indoor Unit and Outdoor Unit ......................... 69
   4.10 Outdoor Unit PCB Abnormality .................................................. 70
   4.11 OL Activation (Compressor Overload) ......................................... 71
   4.12 Compressor Lock ........................................................................... 73
   4.13 DC Fan Lock (Outdoor Fan) .......................................................... 74
   4.14 Input Overcurrent Detection .......................................................... 75
   4.15 Four Way Valve Abnormality ....................................................... 76
   4.16 Discharge Pipe Temperature Control ......................................... 78
   4.17 High Pressure Control in Cooling ............................................... 79
   4.18 System Shutdown due to Compressor Internal Temperature
       Abnormality ...................................................................................... 80
   4.19 Compressor System Sensor Abnormality .................................... 81
   4.20 Position Sensor Abnormality .......................................................... 82
   4.21 CT or Related Abnormality ............................................................. 84
   4.22 Thermistor or Related Abnormality (Outdoor Unit) ................. 86
   4.23 Electrical Box Temperature Rise .................................................. 88
   4.24 Radiation Fin Temperature Rise .................................................... 89
   4.25 Output Overcurrent Detection ...................................................... 90
5. Check .......................................................... 92
   5.1 Thermistor Resistance Check .......................................................... 92
   5.2 Indoor Fan Motor Connector Output Check .................................... 93
   5.3 Power Supply Waveforms Check ..................................................... 93
   5.4 Electronic Expansion Valve Check .................................................. 94
   5.5 Four Way Valve Performance Check .............................................. 95
   5.6 Inverter Unit Refrigerant System Check ........................................ 95
   5.7 Inverter Analyzer Check ................................................................. 96
   5.8 Rotation Pulse Check on the Outdoor Unit PCB ......................... 98
5.9 Installation Condition Check ................................................................. 99
5.10 Discharge Pressure Check ................................................................. 99
5.11 Outdoor Fan System Check ............................................................... 100
5.12 Main Circuit Short Check ................................................................. 100
5.13 Capacitor Voltage Check ................................................................. 101
5.14 Power Module Check ....................................................................... 101
1. General Problem Symptoms and Check Items

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Check Item</th>
<th>Details</th>
<th>Reference Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The unit does not operate.</td>
<td>Check the power supply.</td>
<td>Check if the rated voltage is supplied.</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Check the type of the indoor unit.</td>
<td>Check if the indoor unit type is compatible with the outdoor unit.</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Check the outdoor temperature.</td>
<td>Heating/cooling operations are not available when the outdoor temperature is out of the operation limit. Check the reference page for the operation limit.</td>
<td>117</td>
</tr>
<tr>
<td></td>
<td>Diagnose with remote controller indication.</td>
<td>—</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Check the remote controller addresses.</td>
<td>Check if address settings for the remote controller and indoor unit are correct.</td>
<td>108</td>
</tr>
<tr>
<td>Operation sometimes stops.</td>
<td>Check the power supply.</td>
<td>A power failure of 2 to 10 cycles stops air conditioner operation. (Operation lamp OFF)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Check the outdoor temperature.</td>
<td>Heating/cooling operations are not available when the outdoor temperature is out of the operation limit. Check the reference page for the operation limit.</td>
<td>117</td>
</tr>
<tr>
<td></td>
<td>Diagnose with remote controller indication.</td>
<td>—</td>
<td>57</td>
</tr>
<tr>
<td>The unit operates but does not cool, or does not heat.</td>
<td>Check for wiring and piping errors in the connection between the indoor unit and outdoor unit.</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Check for thermistor detection errors.</td>
<td>Check if the thermistor is mounted securely.</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Check for faulty operation of the electronic expansion valve.</td>
<td>Set the unit to cooling operation, and check the temperature of the liquid pipe to see if the electronic expansion valve works.</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Diagnose with remote controller indication.</td>
<td>—</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Diagnose by service port pressure and operating current.</td>
<td>Check for refrigerant shortage.</td>
<td>—</td>
</tr>
<tr>
<td>Large operating noise and vibrations</td>
<td>Check the output voltage of the power module.</td>
<td>—</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>Check the power module.</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Check the installation condition.</td>
<td>Check if the required spaces for installation (specified in the installation manual) are provided.</td>
<td>—</td>
</tr>
</tbody>
</table>
2. Troubleshooting with LED

2.1 Indoor Unit

<table>
<thead>
<tr>
<th>Operation Lamp</th>
<th>The operation lamp blinks when any of the following errors is detected.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. A protection device of the indoor or outdoor unit is activated, or</td>
</tr>
<tr>
<td></td>
<td>the thermistor malfunctions.</td>
</tr>
<tr>
<td></td>
<td>2. A signal transmission error occurs between the indoor and outdoor</td>
</tr>
<tr>
<td></td>
<td>units.</td>
</tr>
</tbody>
</table>

In either case, conduct the diagnostic procedure described in the following pages.

2.2 Outdoor Unit

The outdoor unit has one green LED (LED A) on the PCB. When the microcomputer works in order, the LED A blinks. However, the LED A turns OFF while the standby electricity saving function is activated and the power supply is OFF. (Refer to page 9 for the location of LED A.)
3. Service Diagnosis

Method 1

1. When **Timer Cancel** button is held down for 5 seconds, **00** is displayed on the temperature display screen.

![Image of Timer Cancel button](R24532)

2. Press **Timer Cancel** button repeatedly until a long beep sounds.
   - The code indication changes in the sequence shown below.

**ARC466A37**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>00</td>
<td>14</td>
<td>04</td>
<td>27</td>
<td>8R</td>
</tr>
<tr>
<td>2</td>
<td>85</td>
<td>15</td>
<td>87</td>
<td>28</td>
<td>UR</td>
</tr>
<tr>
<td>3</td>
<td>8F</td>
<td>16</td>
<td>83</td>
<td>29</td>
<td>8M</td>
</tr>
<tr>
<td>4</td>
<td>F3</td>
<td>17</td>
<td>H8</td>
<td>30</td>
<td>8P</td>
</tr>
<tr>
<td>5</td>
<td>86</td>
<td>18</td>
<td>H9</td>
<td>31</td>
<td>U0</td>
</tr>
<tr>
<td>6</td>
<td>L3</td>
<td>19</td>
<td>C9</td>
<td>32</td>
<td>UH</td>
</tr>
<tr>
<td>7</td>
<td>L4</td>
<td>20</td>
<td>C4</td>
<td>33</td>
<td>8K</td>
</tr>
<tr>
<td>8</td>
<td>L5</td>
<td>21</td>
<td>C5</td>
<td>34</td>
<td>8R</td>
</tr>
<tr>
<td>9</td>
<td>L4</td>
<td>22</td>
<td>E3</td>
<td>35</td>
<td>H1</td>
</tr>
<tr>
<td>10</td>
<td>E6</td>
<td>23</td>
<td>E5</td>
<td>36</td>
<td>H3</td>
</tr>
<tr>
<td>11</td>
<td>H8</td>
<td>24</td>
<td>E8</td>
<td>37</td>
<td>E3</td>
</tr>
<tr>
<td>12</td>
<td>H0</td>
<td>25</td>
<td>R1</td>
<td>38</td>
<td>H3</td>
</tr>
<tr>
<td>13</td>
<td>R6</td>
<td>26</td>
<td>E1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. A short beep or two consecutive beeps indicate non-corresponding codes.
2. To return to the normal mode, hold down **Timer Cancel** button for 5 seconds. When the remote controller is left untouched for 60 seconds, it also returns to the normal mode.
3. Not all the error codes are displayed. When you cannot find the error code, try method 2.
   - (Refer to page 55.)
Method 2

1. Press the center of Temp button and Mode button at the same time.

\[
\begin{array}{c}
\text{On/Off} \\
\text{Temp} \\
\text{Mode} \\
\end{array}
\]

SC is displayed on the LCD.

\[
\begin{array}{c}
\text{SC} \\
001
\end{array}
\]

2. Select SC (service check) with Temp ▲ or Temp ▼ button.

3. Press Mode button to enter the service check mode.

\[
\begin{array}{c}
\text{On/Off} \\
\text{Temp} \\
\text{Mode} \\
\end{array}
\]

The left-side number blinks.

\[
\begin{array}{c}
00
\end{array}
\]

4. Press Temp ▲ or Temp ▼ button and change the number until you hear the two consecutive beeps or the long beep.

\[
\begin{array}{c}
\text{On/Off} \\
\text{Temp} \\
\text{Mode} \\
\end{array}
\]
5. Diagnose by the sound.
   ★ beep: The left-side number does not correspond with the error code.
   ★ two consecutive beeps: The left-side number corresponds with the error code but the right-side number does not.
   ★ long beep: Both the left-side and right-side numbers correspond with the error code.
   The numbers indicated when you hear the long beep are the error code.
   Refer to page 57.

6. Press **Mode** button.

7. Press **Temp ▲** or **Temp ▼** button and change the number until you hear the long beep.

8. Diagnose by the sound.
   ★ beep: The left-side number does not correspond with the error code.
   ★ two consecutive beeps: The left-side number corresponds with the error code but the right-side number does not.
   ★ long beep: Both the left-side and right-side numbers correspond with the error code.

9. Determine the error code.
   The numbers indicated when you hear the long beep are the error code.
   Refer to page 57.

10. Press **Mode** button for 5 seconds to exit from the service check mode.
    (When the remote controller is left untouched for 60 seconds, it returns to the normal mode also.)
# 4. Troubleshooting

## 4.1 Error Codes and Description

<table>
<thead>
<tr>
<th>Error Codes</th>
<th>Description</th>
<th>Reference Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U2</td>
<td>Low-voltage detection or over-voltage detection</td>
<td>64</td>
</tr>
<tr>
<td>U4</td>
<td>Signal transmission error (between indoor unit and outdoor unit)</td>
<td>66</td>
</tr>
<tr>
<td>U9</td>
<td>Mismatching of indoor unit and outdoor unit</td>
<td>69</td>
</tr>
<tr>
<td>Indoor Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1</td>
<td>Indoor unit PCB abnormality</td>
<td>58</td>
</tr>
<tr>
<td>R5</td>
<td>Freeze-up protection control/heating peak-cut control</td>
<td>60</td>
</tr>
<tr>
<td>R6</td>
<td>Indoor fan motor (DC motor) or related abnormality</td>
<td>61</td>
</tr>
<tr>
<td>E4</td>
<td>Indoor heat exchanger thermistor or related abnormality</td>
<td>63</td>
</tr>
<tr>
<td>E9</td>
<td>Room temperature thermistor or related abnormality</td>
<td>63</td>
</tr>
<tr>
<td>Outdoor Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E1</td>
<td>Outdoor unit PCB abnormality</td>
<td>70</td>
</tr>
<tr>
<td>E5☆</td>
<td>OL activation (compressor overload)</td>
<td>71</td>
</tr>
<tr>
<td>E6☆</td>
<td>Compressor lock</td>
<td>73</td>
</tr>
<tr>
<td>E7☆</td>
<td>DC fan lock (outdoor fan)</td>
<td>74</td>
</tr>
<tr>
<td>E8</td>
<td>Input overcurrent detection</td>
<td>75</td>
</tr>
<tr>
<td>E9</td>
<td>Four way valve abnormality</td>
<td>76</td>
</tr>
<tr>
<td>F3</td>
<td>Discharge pipe temperature control</td>
<td>78</td>
</tr>
<tr>
<td>F6</td>
<td>High pressure control in cooling</td>
<td>79</td>
</tr>
<tr>
<td>F8</td>
<td>System shutdown due to compressor internal temperature abnormality</td>
<td>80</td>
</tr>
<tr>
<td>H0</td>
<td>Compressor system sensor abnormality</td>
<td>81</td>
</tr>
<tr>
<td>H6</td>
<td>Position sensor abnormality</td>
<td>82</td>
</tr>
<tr>
<td>H8</td>
<td>CT or related abnormality</td>
<td>84</td>
</tr>
<tr>
<td>H9</td>
<td>Outdoor temperature thermistor or related abnormality</td>
<td>86</td>
</tr>
<tr>
<td>J3☆</td>
<td>Discharge pipe thermistor or related abnormality</td>
<td>86</td>
</tr>
<tr>
<td>J5</td>
<td>Outdoor heat exchanger thermistor or related abnormality</td>
<td>86</td>
</tr>
<tr>
<td>L3</td>
<td>Electrical box temperature rise</td>
<td>88</td>
</tr>
<tr>
<td>L4</td>
<td>Radiation fin temperature rise</td>
<td>89</td>
</tr>
<tr>
<td>L5☆</td>
<td>Output overcurrent detection</td>
<td>90</td>
</tr>
<tr>
<td>P4</td>
<td>Radiation fin thermistor or related abnormality</td>
<td>86</td>
</tr>
<tr>
<td>U7</td>
<td>Signal transmission error on outdoor unit PCB</td>
<td>68</td>
</tr>
</tbody>
</table>

☆: Displayed only when system-down occurs.
## 4.2 Indoor Unit PCB Abnormality

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Detection Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>The system checks if the circuit works properly within the microcomputer of the indoor unit.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Error Decision Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The system cannot set the internal settings.</td>
</tr>
</tbody>
</table>

### Supposed Causes
- Wrong models interconnected
- Defective indoor unit PCB
- Disconnection of connector
- Reduction of power supply voltage
Caution: Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

Troubleshooting

Check the combination of the indoor and outdoor unit.

OK?

YES

Match the compatible models.

NO

Check the connection of connectors. (Refer to Note)

OK?

YES

* To secure the connection, disconnect the connectors once and then reconnect.

Check the power supply voltage.

Voltage as rated?

YES

Correct the power supply.

NO

Start operation.

Error repeats?

YES

Replace the indoor unit PCB (control PCB).

NO

Completed.

Correct the connection.

NO

Check the power supply voltage.

Voltage as rated?

YES

Start operation.

NO

Correct the power supply.

Error repeats?

YES

Replace the indoor unit PCB (control PCB).

NO

Completed.

Note: Check the following connector.

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall mounted type</td>
<td>Terminal strip ~ Control PCB (H1, H2, H3)</td>
</tr>
</tbody>
</table>
4.3 Freeze-up Protection Control/Heating Peak-cut Control

Error Code: A5

Method of Error Detection
- Freeze-up protection control
  During cooling operation, the freeze-up protection control (operation halt) is activated according to the temperature detected by the indoor heat exchanger thermistor.
- Heating peak-cut control
  During heating operation, the temperature detected by the indoor heat exchanger thermistor is used for the heating peak-cut control (operation halt, outdoor fan stop, etc.)

Error Decision Conditions
- Freeze-up protection control
  During cooling operation, the indoor heat exchanger temperature is below 0°C (32°F).
- Heating peak-cut control
  During heating operation, the indoor heat exchanger temperature is above about 60°C (140°F) (depending on the model).

Supposed Causes
- Short-circuited air
- Clogged air filter of the indoor unit
- Dust accumulation on the indoor heat exchanger
- Defective indoor heat exchanger thermistor
- Defective indoor unit PCB

Troubleshooting

Check No. 01
Refer to P.92

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

Check the air passage.

Is there any short circuit?

NO

Check the air filter.

Dirty?

NO

Check the dust accumulation on the indoor heat exchanger.

Dirty?

NO

Check the indoor heat exchanger thermistor.

As described in the thermistor characteristic chart?

NO

Replace the indoor heat exchanger thermistor.

YES

Replace the indoor unit PCB (control PCB).

(R21064)
### 4.4 Indoor Fan Motor (DC Motor) or Related Abnormality

<table>
<thead>
<tr>
<th>Error Code</th>
<th>A6</th>
</tr>
</thead>
</table>

**Method of Error Detection**
The rotation speed detected by the Hall IC during fan motor operation is used to determine abnormal fan motor operation.

**Error Decision Conditions**
The detected rotation speed does not reach the demanded rotation speed of the target tap, and is less than 50% of the maximum fan motor rotation speed.

**Supposed Causes**
- Remarkable decrease in power supply voltage
- Layer short inside the fan motor winding
- Breaking of wire inside the fan motor
- Breaking of the fan motor lead wires
- Defective capacitor of the fan motor
- Defective indoor unit PCB
Troubleshooting

**Check No.02**
Refer to P.93

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

**Caution**

Check the power supply voltage.

Is the voltage fluctuation within ±10% from the rated value?

- NO: Correct the power supply.
- YES: Turn off the power and rotate the fan by hand.

Does the fan rotate smoothly?

- NO: Replace the indoor fan motor.
- YES: Turn on the power and start operation.

Does the fan rotate?

- NO: Turn off the power and disconnect the fan motor connector, then turn the power on.
- YES: Check No.02 Check the output of the fan motor connector.

Motor power supply voltage 310 ~ 340 VDC?

- NO: Replace the indoor unit PCB (control PCB).
- YES: Motor control voltage 15 VDC generated?

- NO: Replace the indoor unit PCB (control PCB).
- YES: Rotation command voltage 1 ~ 6.5 VDC?

- NO: Replace the indoor unit PCB (control PCB).
- YES: Indoor fan motor rotation pulse generated?

- NO: Replace the indoor unit PCB (control PCB).
- YES: Replace the indoor unit PCB (control PCB).

**Note:** The rotation pulse is the feedback signal from the indoor fan motor.
4.5 Thermistor or Related Abnormality (Indoor Unit)

Error Code

| C4, C9 |

Method of Error Detection

The temperatures detected by the thermistors determine thermistor errors.

Error Decision Conditions

The voltage between the both ends of the thermistor is either 4.96 V or more, or 0.04 V or less during compressor operation.

Supposed Causes

- Disconnection of connector
- Defective thermistor(s)
- Defective indoor unit PCB

Troubleshooting

Check No. 01
Refer to P.92

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

Check the connection of connectors.

Normal?

NO → Correct the connection.

YES → Check No. 01
Check the thermistor resistance value.

Normal?

NO → Replace the defective thermistor.

YES → Replace the indoor unit PCB (control PCB).

Caution:

Check No. 01
Check the thermistor resistance value.

C4 : Indoor heat exchanger thermistor
C9 : Room temperature thermistor

Note:

When replacing the defective thermistor(s), replace the thermistors as ASSY.
4.6 Low-voltage Detection or Over-voltage Detection

<table>
<thead>
<tr>
<th>Error Code</th>
<th>U2</th>
</tr>
</thead>
</table>

**Method of Error Detection**

**Indoor Unit**

The zero-cross detection of the power supply is evaluated by the indoor unit PCB.

**Outdoor Unit**

**Low-voltage detection:**
An abnormal voltage drop is detected by the DC voltage detection circuit.

**Over-voltage detection:**
An abnormal voltage rise is detected by the over-voltage detection circuit.

**Error Decision Conditions**

**Indoor Unit**

There is no zero-cross detection in approximately 10 seconds.

**Outdoor Unit**

**Low-voltage detection:**
- The voltage detected by the DC voltage detection circuit is below 150 ~ 200 V (depending on the model).
- The compressor stops if the error occurs, and restarts automatically after 3-minute standby.

**Over-voltage detection:**
- An over-voltage signal is fed from the over-voltage detection circuit to the microcomputer.
- The compressor stops if the error occurs, and restarts automatically after 3-minute standby.

**Supposed Causes**

- Power supply voltage out of specification
- Defective DC voltage detection circuit
- Defective over-voltage detection circuit
- Defective PAM control part
- Disconnection of compressor harness
- Short circuit inside the fan motor winding
- Noise
- Momentary drop of voltage
- Momentary power failure
- Defective outdoor unit PCB
- Defective indoor unit PCB
Troubleshooting

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

Check the power supply voltage.

- Is the voltage fluctuation within ±10% from the rated value?
  - NO: Correct the power supply.
  - YES: Proceed to the next step.

- Check the connection of the compressor harness.
  - Loose or disconnected?
    - YES: Reconnect the harness.
    - NO: Proceed to the next step.

- Does the outdoor fan rotate smoothly?
  - NO: Replace the outdoor fan motor and the outdoor unit PCB (main PCB).
  - YES: Proceed to the next step.

(Precaution before turning on the power again)
Make sure the power has been off for at least 30 seconds.

Turn on the power. System restarted? (Repeat a few times.)

- YES: Disturbance factors
  - Noise
  - Power supply distortion
  - Check for such factors for a long term.
  - NO: Proceed to the next step.

- Error again within 3 minutes after turning on the power?
  - NO: Replace the outdoor unit PCB (main PCB).
  - YES: Replace the indoor unit PCB (control PCB).
4.7 Signal Transmission Error (between Indoor Unit and Outdoor Unit)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>U4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method of Error Detection</td>
<td>The signal transmission data from the outdoor unit is checked whether it is normal.</td>
</tr>
<tr>
<td>Error Decision Conditions</td>
<td>The data sent from the outdoor unit cannot be received normally, or the content of the data is abnormal.</td>
</tr>
</tbody>
</table>
| Supposed Causes | - Power supply voltage out of specification  
- Reduction of power supply voltage  
- Wiring error  
- Breaking of the connecting wires between the indoor and outdoor units (wire No. 3)  
- Defective outdoor unit PCB  
- Short circuit inside the fan motor winding  
- Defective indoor unit PCB  
- Disturbed power supply waveform |
Troubleshooting

Check No.11
Refer to P.93

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

Check the power supply voltage.

Is the voltage fluctuation within ±10% from the rated value?

NO → Correct the power supply.

YES

Check the connection wires between the indoor unit and the outdoor unit.

Is there any wiring error?

YES → Correct the connection wires between the indoor unit and the outdoor unit.

NO

Check the voltage of the connection wires on the indoor terminal board between No. 1 and No. 3, and between No. 2 and No. 3.

Properly insulated?

NO → Replace the connection wires between the indoor unit and outdoor unit.

YES

Check the LED A on the outdoor unit PCB.

Is LED A blinking?

Continuously ON or OFF → Replace the outdoor unit PCB (main PCB).

Blink

Rotate the outdoor fan manually. Does the outdoor fan rotate smoothly?

NO → Replace the outdoor fan motor and the outdoor unit PCB (main PCB).

YES

Check the power supply waveform.

Is there any disturbance?

NO → Replace the indoor unit PCB (control PCB).

YES → Locate and eliminate the cause of the disturbance of the power supply waveform.

* Before you check the LED A, cancel the standby electricity saving function by starting fan operation with the remote controller.

* Wait at least for 15 sec. after turning on the power.
4.8 Signal Transmission Error on Outdoor Unit PCB

Error Code: U7

Method of Error Detection: Communication error between microcomputer mounted on the main microcomputer and PM1.

Error Decision Conditions:
- The abnormality is determined when the data sent from the PM1 cannot be received for 9 seconds.
- The error counter is reset when the data from the PM1 can be successfully received.

Supposed Causes:
- Defective outdoor unit PCB

Troubleshooting:

![Diagram]

Caution: Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

- Turn off the power. Then, turn on the power to restart the system.
- Error again? NO
  - The cause can be an external factor other than the malfunction. Observe the operating condition in long term.
  - YES
    - Replace the outdoor unit PCB (main PCB).
4.9 Mismatching of Indoor Unit and Outdoor Unit

Error Code

Method of Error Detection
Detection from the signal transmission signal between indoor/outdoor units.

Error Decision Conditions
Improper combination of indoor and outdoor units.

Supposed Causes
- Wrong models interconnected
- Wrong wiring of connecting wires
- Wrong indoor unit PCB or outdoor unit PCB mounted
- Defective indoor unit PCB
- Defective outdoor unit PCB

Troubleshooting

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

Check the combination of the indoor and outdoor unit.

OK? NO

YES

Are the connecting wires connected properly?

NO

YES

Correct the combination of indoor/outdoor units.

Connect the wirings correctly.

Replace the indoor unit PCB (control PCB) or outdoor unit PCB (main PCB).

(R24632)
4.10 Outdoor Unit PCB Abnormality

<table>
<thead>
<tr>
<th>Error Code</th>
<th>3</th>
</tr>
</thead>
</table>

**Method of Error Detection**
- The system checks if the microprocessor is working in order.
- The system checks if the zero-cross signal comes in properly.

**Error Decision Conditions**
- The microprocessor program runs out of control.
- The zero-cross signal is not detected.

**Supposed Causes**
- Defective outdoor unit PCB
- Noise
- Momentary drop of voltage
- Momentary power failure

**Troubleshooting**

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

- **Caution**

  - Turn on the power again.
  - Is LED A blinking?  
    - Blink
  - Check if the outdoor unit is grounded.
    - Grounded?
      - NO
        - Ground the system.
      - YES
        - Zero-cross signal abnormality. Replace the outdoor unit PCB (main PCB).
    -连续 ON or OFF
      - Replace the outdoor unit PCB (main PCB).
  - *Before you check the LED A, cancel the standby electricity saving function by starting fan operation with the remote controller.
  - *Wait at least for 15 sec. after turning on the power.
### 4.11 OL Activation (Compressor Overload)

<table>
<thead>
<tr>
<th>Error Code</th>
<th>E5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method of Error Detection</td>
<td>A compressor overload is detected through compressor OL.</td>
</tr>
</tbody>
</table>
| Error Decision Conditions | - If the error repeats, the system is shut down.  
- Reset condition: Continuous run for about 60 minutes without any other error |
| Supposed Causes | - Disconnection of discharge pipe thermistor  
- Defective discharge pipe thermistor  
- Disconnection of connector S40  
- Disconnection of 2 terminals of OL (Q1L)  
- Defective OL (Q1L)  
- Broken OL harness  
- Defective electronic expansion valve or coil  
- Defective four way valve or coil  
- Defective outdoor unit PCB  
- Refrigerant shortage  
- Water mixed in refrigerant  
- Defective stop valve |
Troubleshooting

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

Check No. 01
Refer to P.92
Discharge pipe thermistor disconnected?
YES
Insert the thermistor in position.

Check No. 12
Refer to P.94
Check No. 01
Check the discharge pipe thermistor.
NG
Replace the discharge pipe thermistor.

Check No. 13
Refer to P.95
Is the connector S40 properly connected?
NO
Connect the connector S40 properly.

Check No. 14
Refer to P.95
YES
Disconnect the connector S40 from the PCB.

Check the resistance between the 2 terminals on connector S40.
Resistance
Disconnect the 2 terminals of the OL (Q1L).
Nearly 0 Ω
Check the resistance between the 2 terminals of the OL (Q1L).
Resistance
Replace the OL (Q1L).
Nearly 0 Ω
Replace the OL harness.

Check No. 12
Check the electronic expansion valve.
NG
Replace the electronic expansion valve or the coil.

Check No. 13
Check the four way valve.
NG
Replace the four way valve or the coil.
Replace the outdoor unit PCB (main PCB).
OK

Check No. 14
Check the refrigerant line.
NG
- Refrigerant shortage
- Water mixed
- Stop valve
OK
Refer to the refrigerant line check procedure.

Replace the outdoor unit PCB (main PCB).

Note: OL (Q1L) activating temperature: 130°C (266°F)
OL (Q1L) recovery temperature: 95°C (203°F)
4.12 Compressor Lock

**Error Code**

| Error Code | E6 |

**Method of Error Detection**

A compressor lock is detected by the current waveform generated when applying high-frequency voltage to the motor.

**Error Decision Conditions**

- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 11 minutes without any other error

**Supposed Causes**

- Closed stop valve
- Compressor locked
- Disconnection of compressor harness

---

**Troubleshooting**

- **Check No.12** Refer to P.94
- **Check No.15** Refer to P.96

**Caution**

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

(Precaution before turning on the power again)
Make sure the power has been off for at least 30 seconds.

```
Stop valve closed?

YES
Open the stop valve.

NO
Turn off the power. Disconnect the harnesses U, V, and W.

Check No.15
Check with the inverter analyzer. *Inverter analyzer: RSUK0917C*

Any LED off?

YES
Turn off the power and reconnect the harnesses. Turn on the power again and restart the system.

NO
Correct the power supply or replace the outdoor unit PCB (main PCB).

Emergency stop without compressor running?

YES
Replace the compressor.

NO

System shut down after errors repeated several times?

YES

Replace the compressor.

NO
Check the electronic expansion valve coil. Go to Check No. 12.
```

(R21067)
4.13 DC Fan Lock (Outdoor Fan)

**Error Code**

| Method of Error Detection | An error is determined with the high-voltage fan motor rotation speed detected by the Hall IC. |

**Error Decision Conditions**

- The fan does not start in 15 ~ 30 seconds even when the fan motor is running.
- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 11 minutes without any other error.

**Supposed Causes**

- Disconnection of the fan motor
- Foreign matter stuck in the fan
- Defective fan motor
- Defective outdoor unit PCB

---

**Troubleshooting**

**Check No.16**

Refer to P.98

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

- **Fan motor connector disconnected?**
  - YES: Turn off the power and reconnect the connector.
  - NO: Foreign matter in or around the fan?
    - YES: Remove the foreign matter.
    - NO: Turn on the power.

- **Rotate the fan.**
  - Fan rotates smoothly?
    - NO: Replace the outdoor fan motor.
    - YES: Check No. 16
      - Check the rotation pulse input on the outdoor unit PCB (main PCB).
        - Pulse signal generated?
          - NO: Replace the outdoor fan motor.
          - YES: Replace the outdoor unit PCB (main PCB).  (R22877)
4.14 Input Overcurrent Detection

Error Code: E8

Method of Error Detection: An input overcurrent is detected by checking the input current value with the compressor running.

Error Decision Conditions: The current exceeds about 20 A for 2.5 seconds with the compressor running. (The upper limit of the current decreases when the outdoor temperature exceeds a certain level.)

Supposed Causes:
- Outdoor temperature is out of operation range.
- Defective compressor
- Defective power module
- Defective outdoor unit PCB
- Short circuit

Troubleshooting:

Check No. 15
Refer to P.96
Check with the inverter analyzer.

Check No. 17
Refer to P.99
Check the installation condition.

Check No. 18
Refer to P.99
Start operation and measure the input current.

Input current flowing above its stop level?

Turn off the power and disconnect the harnesses U, V, and W.

Check No.15
Check with the inverter analyzer.

Turn off the power, and reconnect the harnesses. Turn on the power again and start operation.

Any LED off?

Replace the outdoor unit PCB (main PCB).

Correct the power supply or replace the outdoor unit PCB (main PCB).

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

* An input overcurrent may result from wrong internal wiring. If the system is interrupted by an input overcurrent after the wires have been disconnected and reconnected for part replacement, check the wiring again.

* Inverter analyzer: RSUK0917C
4.15 Four Way Valve Abnormality

### Error Code

EA

### Method of Error Detection

The room temperature thermistor and the indoor heat exchanger thermistor are checked if they function within their normal ranges in each operation mode.

### Error Decision Conditions

The following condition continues over 10 minutes after operating for 5 minutes.

- **Cooling/Dry**
  - \( A - B < -5^\circ C \) (\( A - B < -9^\circ F \))
- **Heating**
  - \( B - A < -5^\circ C \) (\( B - A < -9^\circ F \))

  A: Room thermistor temperature  
  B: Indoor heat exchanger temperature

- If the error repeats, the system is shut down.  
- Reset condition: Continuous run for about 60 minutes without any other error

### Supposed Causes

- Disconnection of four way valve coil
- Defective four way valve, coil, or harness
- Defective outdoor unit PCB
- Defective thermistor(s)
- Refrigerant shortage
- Water mixed in refrigerant
- Defective stop valve
Troubleshooting

Caution: Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

Check No. 01
Refer to P.92

Four way valve coil disconnected (loose)?

YES → Correct the four way valve coil.

NO → Harness disconnected?

YES → Reconnect the harness.

NO → Check the continuity of the four way valve coil and harness.

Disconnect the harness from the connector.

Resistance between harnesses about 1000 ~ 2000 Ω?

NO → Replace the four way valve coil.

YES → Check No. 13
Check the four way valve switching output.

NG → Replace the outdoor unit PCB (main PCB).

OK → Any thermistor disconnected?

YES → Reconnect the thermistor(s).

NO → Check No. 01
Check the thermistors.

NG → Replace the defective thermistor(s).

OK → Check No. 14
Check the refrigerant line.

NG → Refer to the refrigerant line check procedure.

OK → Replace the four way valve (defective or dust-clogged).

(R20405)
4.16 Discharge Pipe Temperature Control

Error Code

F3

Method of Error Detection

An error is determined with the temperature detected by the discharge pipe thermistor.

Error Decision Conditions

- If the temperature detected by the discharge pipe thermistor rises above A, the compressor stops.
- The error is cleared when the discharge pipe temperature has dropped below B.

RK(X)30/36NMVJU

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>°F</td>
</tr>
<tr>
<td>120</td>
<td>248</td>
</tr>
<tr>
<td>107</td>
<td>224.6</td>
</tr>
</tbody>
</table>

- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

Supposed Causes

- Defective discharge pipe thermistor
  (Defective outdoor heat exchanger thermistor or outdoor temperature thermistor)
- Defective electronic expansion valve or coil
- Refrigerant shortage
- Defective four-way valve
- Water mixed in refrigerant
- Defective stop valve
- Defective outdoor unit PCB

Troubleshooting

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

- **Check No. 01**
  Refer to P.92
  Check the thermistors.
  - NG
    - Discharge pipe thermistor
    - Outdoor heat exchanger thermistor
    - Outdoor temperature thermistor
    Replace the defective thermistor(s).
  - OK
    Replace the electronic expansion valve or the coil.

- **Check No. 12**
  Refer to P.94
  Check the electronic expansion valve.
  - NG
    - Refrigerant shortage
    - Four-way valve
    - Water mixed
    - Stop valve
    Refer to the refrigerant line check procedure.
    Replace the outdoor unit PCB (main PCB). (R20417)
  - OK
    Replace the outdoor unit PCB (main PCB). (R20417)

- **Check No. 14**
  Refer to P.95
  Check the refrigerant line.
  - NG
    Replace the outdoor unit PCB (main PCB). (R20417)
  - OK
4.17 High Pressure Control in Cooling

**Error Code**

F6

**Method of Error Detection**

High-pressure control (operation halt, frequency drop, etc.) is activated in cooling operation if the temperature sensed by the outdoor heat exchanger thermistor exceeds the limit.

**Error Decision Conditions**

- The temperature sensed by the outdoor heat exchanger thermistor rise above 60°C (140°F).
- The error is cleared when the temperature drops below 47°C (116.6°F).

**Supposed Causes**

- Installation space not large enough
- Dirty outdoor heat exchanger
- Defective outdoor fan motor
- Defective stop valve
- Defective electronic expansion valve or coil
- Defective outdoor heat exchanger thermistor
- Defective outdoor unit PCB

---

**Troubleshooting**

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

1. **Check No. 01**
   - Refer to P.92
   - Check the outdoor heat exchanger thermistor.
   - OK: NG
   - NG: OK

2. **Check No. 12**
   - Refer to P.94
   - Check the discharge pressure.
   - OK: NG
   - NG: OK

3. **Check No. 17**
   - Refer to P.99
   - Check the installation condition.
   - OK: NG
   - NG: OK

4. **Check No. 18**
   - Refer to P.99
   - Check the electronic expansion valve or the coil.
   - OK: NG
   - NG: OK

5. **Check No. 19**
   - Refer to P.100
   - Check the outdoor fan.
   - OK: NG
   - NG: OK

- NG: Change the installation location or direction. Clean the outdoor heat exchanger.
- NG: Replace the outdoor fan motor. Reconnect the connector or fan motor lead wires.
- NG: Replace the stop valve.
- NG: Replace the electronic expansion valve or the coil. Replace the outdoor unit PCB (main PCB).
- NG: Replace the outdoor heat exchanger thermistor.
- NG: Replace the outdoor unit PCB (main PCB).
4.18 System Shutdown due to Compressor Internal Temperature Abnormality

Error Code
F8

Method of Error Detection
Operation is halted when the temperature detected by the discharge pipe thermistor exceeds the determined limit.

Error Decision Conditions
Temperature exceeds the detection threshold of 127.5°C during forced cooling operation.

Supposed Causes
- Abnormal operation due to air intrusion
- Defective discharge pipe thermistor

Troubleshooting

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

- Abnormal deformation of piping in the outdoor unit
  - YES: Replace the outdoor unit.
  - NO: Check No. 01

  - Check the discharge pipe thermistor
    - NG: Replace both the discharge pipe thermistor and the outdoor unit PCB (main PCB).
    - OK: Replace the outdoor unit.

★ Replace the unit as directed in the installation manual, making sure that air does not intrude into the refrigerant pipings.
4.19 Compressor System Sensor Abnormality

Error Code: H0

Method of Error Detection:
The system checks the DC current before the compressor starts.

Error Decision Conditions:
- The voltage converted from the DC current before compressor start-up is out of the range 0.5 ~ 4.5 V.
- The DC voltage before compressor start-up is below 50 V.

Supposed Causes:
- Broken or disconnected harness
- Defective outdoor unit PCB

Troubleshooting:

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

Check the relay harness for the compressor.

Is the harness broken?

- YES: Replace the harness.
- NO: Turn off the power. Then, turn on the power to restart the system.

Restart operation and error displayed again?

- NO: Not a malfunction. Keep observing.
- YES: Replace the outdoor unit PCB (main PCB).

(R22016)
### 4.20 Position Sensor Abnormality

<table>
<thead>
<tr>
<th>Error Code</th>
<th>H6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method of Error Detection</td>
<td>A compressor start-up failure is detected by checking the compressor running condition through the position detection circuit.</td>
</tr>
</tbody>
</table>
| Error Decision Conditions | ■ If the error repeats, the system is shut down.  
■ Reset condition: Continuous run for about 11 minutes without any other error |
| Supposed Causes | ■ Power supply voltage out of specification  
■ Disconnection of the compressor harness  
■ Defective compressor  
■ Defective outdoor unit PCB  
■ Start-up failure caused by the closed stop valve  
■ Input voltage out of specified range |
Troubleshooting

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

1. **Check No. 15**
   Refer to P.96
   - Turn off the power.

2. **Check No. 18**
   Refer to P.99
   - Check the power supply voltage.
   - Voltage as rated?
     - NO: Correct the power supply.
     - YES: Check the discharge pressure.
   - OK?
     - NO: Replace the stop valve.
     - YES: Check the connection.
   - Electrical components or compressor harnesses connected as specified?
     - NO: Reconnect the electrical components or compressor harnesses as specified.
     - YES: Turn on the power. Check the electrolytic capacitor voltage.

3. 320 \( \pm 100 \) VDC?
   - NO: Replace the outdoor unit PCB (main PCB).
   - YES: Turn off the power. Disconnect the harnesses U, V, and W.

4. **Check No. 15**
   Check with the inverter analyzer.
   - Inverter analyzer: RSUK0917C
   - Any LED OFF?
     - NO: Replace the compressor.
     - YES: Correct the power supply or replace the outdoor unit PCB (main PCB).

(R21864)
4.21 CT or Related Abnormality

Remote Controller Display

Method of Malfunction Detection

A CT or related error is detected by checking the compressor running frequency and CT-detected input current.

Malfunction Decision Conditions

- The compressor running frequency is more than A Hz, and the CT input current is less than B A.

<table>
<thead>
<tr>
<th>A (Hz)</th>
<th>B (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>0.5</td>
</tr>
</tbody>
</table>

- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

Supposed Causes

- Defective power module
- Broken or disconnected wiring
- Defective reactor
- Defective outdoor unit PCB
Troubleshooting

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

Check No. 15
Refer to P.96

Turn off the power and turn it on again.

Start operation.

Check No. 21
Refer to P.101

* Running current as shown at right with relay cable 1 or 2?

NO

Check No. 21
Check the capacitor voltage.

NO

320 ± 50 VDC?

YES

Turn off the power. Disconnect the harnesses U, V, and W.

NO

Measure the rectifier input voltage.

Check No. 15
Check with the inverter checker (*).

Any LED OFF?

YES

Correct the power supply or replace the outdoor unit PCB.

NO

Turn off the power and reconnect the harnesses. Then turn on the power again and restart operation.

Compressor running?

YES

Replace the outdoor unit PCB.

NO

Replace the compressor.

Voltage within the allowable range (Supply voltage ± 15%)?

YES

Replace the outdoor unit PCB.

NO

Check the supply voltage.

* Inverter checker
Part No.: 1225477

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

Starting current
as shown at right with relay cable 1 or 2?

Running current as shown at right with relay cable 1 or 2?

Capacitor charged when the indoor unit or outdoor unit main relay turns on.

Rising with increasing frequency
Time

2 sec

Current (guideline)

320 ± 50 VDC?

YES

Turn off the power. Disconnect the harnesses U, V, and W.

NO

Measure the rectifier input voltage.

Check No. 15
Check with the inverter checker (*).

Any LED OFF?

YES

Correct the power supply or replace the outdoor unit PCB.

NO

Turn off the power and reconnect the harnesses. Then turn on the power again and restart operation.

Compressor running?

YES

Replace the outdoor unit PCB.

NO

Replace the compressor.

Voltage within the allowable range (Supply voltage ± 15%)?

YES

Replace the outdoor unit PCB.

NO

Check the supply voltage.

* Inverter checker
Part No.: 1225477

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

Starting current
as shown at right with relay cable 1 or 2?

Running current as shown at right with relay cable 1 or 2?

Capacitor charged when the indoor unit or outdoor unit main relay turns on.

Rising with increasing frequency
Time

2 sec

Current (guideline)

320 ± 50 VDC?

YES

Turn off the power. Disconnect the harnesses U, V, and W.

NO

Measure the rectifier input voltage.

Check No. 15
Check with the inverter checker (*).

Any LED OFF?

YES

Correct the power supply or replace the outdoor unit PCB.

NO

Turn off the power and reconnect the harnesses. Then turn on the power again and restart operation.

Compressor running?

YES

Replace the outdoor unit PCB.

NO

Replace the compressor.

Voltage within the allowable range (Supply voltage ± 15%)?

YES

Replace the outdoor unit PCB.

NO

Check the supply voltage.

* Inverter checker
Part No.: 1225477

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

Starting current
as shown at right with relay cable 1 or 2?

Running current as shown at right with relay cable 1 or 2?

Capacitor charged when the indoor unit or outdoor unit main relay turns on.

Rising with increasing frequency
Time

2 sec

Current (guideline)

320 ± 50 VDC?

YES

Turn off the power. Disconnect the harnesses U, V, and W.

NO

Measure the rectifier input voltage.

Check No. 15
Check with the inverter checker (*).

Any LED OFF?

YES

Correct the power supply or replace the outdoor unit PCB.

NO

Turn off the power and reconnect the harnesses. Then turn on the power again and restart operation.

Compressor running?

YES

Replace the outdoor unit PCB.

NO

Replace the compressor.

Voltage within the allowable range (Supply voltage ± 15%)?

YES

Replace the outdoor unit PCB.

NO

Check the supply voltage.

* Inverter checker
Part No.: 1225477

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

Starting current
as shown at right with relay cable 1 or 2?

Running current as shown at right with relay cable 1 or 2?

Capacitor charged when the indoor unit or outdoor unit main relay turns on.

Rising with increasing frequency
Time

2 sec

Current (guideline)

320 ± 50 VDC?

YES

Turn off the power. Disconnect the harnesses U, V, and W.

NO

Measure the rectifier input voltage.

Check No. 15
Check with the inverter checker (*).

Any LED OFF?

YES

Correct the power supply or replace the outdoor unit PCB.

NO

Turn off the power and reconnect the harnesses. Then turn on the power again and restart operation.

Compressor running?

YES

Replace the outdoor unit PCB.

NO

Replace the compressor.

Voltage within the allowable range (Supply voltage ± 15%)?

YES

Replace the outdoor unit PCB.

NO

Check the supply voltage.

* Inverter checker
Part No.: 1225477

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.
4.22 Thermistor or Related Abnormality (Outdoor Unit)

Error Code

H9, J3, J6, P4

Method of Error Detection

This fault is identified based on the thermistor input voltage to the microcomputer. A thermistor fault is identified based on the temperature sensed by each thermistor.

Error Decision Conditions

- The voltage between the both ends of the thermistor is either 4.96 V or more, or 0.04 V or less with the power on.
- J3 error is judged if the discharge pipe temperature is lower than the heat exchanger temperature.

Supposed Causes

- Disconnection of the connector for the thermistor
- Defective thermistor(s)
- Defective heat exchanger thermistor in the case of J3 error (outdoor heat exchanger thermistor in cooling operation, or indoor heat exchanger thermistor in heating operation)
- Defective outdoor unit PCB

Troubleshooting

In case of P4

Caution

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

Replace the outdoor unit PCB (main PCB).

P4: Radiation fin thermistor
Troubleshooting

In case of $H_9$, $J_3$, $J_6$

### Caution
Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

1. Turn on the power again.

2. Error displayed again on remote controller?
   - NO: Reconnect the connectors or thermistors.
   - YES: Check No. 01
     - Check the thermistor resistance value.

3. Normal?
   - NO: Replace the defective thermistor(s) of the following thermistors.
     - Outdoor temperature thermistor
     - Discharge pipe thermistor
     - Outdoor heat exchanger thermistor
   - YES: Cool.

4. Error displayed again on remote controller?
   - NO: Reconnect the connectors or thermistors.
   - YES: Indoor heat exchanger thermistor functioning?
     - NO: Replace the indoor heat exchanger thermistor.
     - YES: Replace the outdoor unit PCB (main PCB).

$H_9$ : Outdoor temperature thermistor
$J_3$ : Discharge pipe thermistor
$J_6$ : Outdoor heat exchanger thermistor

### Note:
When replacing the defective thermistor(s), replace the thermistors as ASSY.
4.23 Electrical Box Temperature Rise

| Error Code | L3 |

Method of Error Detection
An electrical box temperature rise is detected by checking the radiation fin thermistor with the compressor off.

Error Decision Conditions
- With the compressor off, the radiation fin temperature is above A.
- The error is cleared when the radiation fin temperature drops below B.
- To cool the electrical components, the outdoor fan starts when the radiation fin temperature rises above C and stops when it drops below B.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>°F</td>
<td>°C</td>
<td>°F</td>
</tr>
<tr>
<td>RK(X)30/36NMVJU</td>
<td>92</td>
<td>197.6</td>
<td>70</td>
</tr>
</tbody>
</table>

Supposed Causes
- Defective outdoor fan motor
- Short circuit
- Defective radiation fin thermistor
- Disconnection of connector
- Defective outdoor unit PCB

Troubleshooting

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

Check No. 17
Refer to P. 99

Check No. 19
Refer to P. 100
4.24 Radiation Fin Temperature Rise

Error Code  

Method of Error Detection  
A radiation fin temperature rise is detected by checking the radiation fin thermistor with the compressor on.

Error Decision Conditions  
- If the radiation fin temperature with the compressor on is above A.
- The error is cleared when the radiation fin temperature drops below B.
- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>°F</td>
<td>°C</td>
</tr>
<tr>
<td>RK(X)30/36NMVJU</td>
<td>82</td>
<td>179.6</td>
</tr>
</tbody>
</table>

Supposed Causes  
- Defective outdoor fan motor
- Short circuit
- Defective radiation fin thermistor
- Disconnection of connector
- Defective outdoor unit PCB
- Silicone grease not applied properly on the radiation fin after replacing the outdoor unit PCB

Troubleshooting

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

Caution

Turn off the power. Then, turn on the power to restart the system.

Check No. 17
Refer to P.99

Check No. 19
Refer to P.100

Note: Refer to Silicone Grease on Power Transistor/Diode Bridge on page 111 for details.
4.25 Output Overcurrent Detection

<table>
<thead>
<tr>
<th>Error Code</th>
<th>L5</th>
</tr>
</thead>
</table>

Method of Error Detection

An output overcurrent is detected by checking the current that flows in the inverter DC section.

Error Decision Conditions

- A position signal error occurs while the compressor is running.
- A rotation speed error occurs while the compressor is running.
- An output overcurrent signal is fed from the output overcurrent detection circuit to the microcomputer.
- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 11 minutes without any other error

Supposed Causes

- Poor installation condition
- Closed stop valve
- Defective power module
- Wrong internal wiring
- Abnormal power supply voltage
- Defective outdoor unit PCB
- Power supply voltage out of specification
- Defective compressor
Troubleshooting

Check No.15
Refer to P.96

Check No.17
Refer to P.99

Check No.18
Refer to P.99

Check No.22
Refer to P.101

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

* An output overcurrent may result from wrong internal wiring. If the system is interrupted by an output overcurrent after the wires have been disconnected and reconnected for part replacement, check the wiring again.

Check No. 17
Check the installation condition.

Stop valve fully open?

NO

Fully open the stop valve.

YES

Turn off the power. Then, turn on the power to restart the system. See if the same error occurs.

Error again?

NO

Monitor the power supply voltage, discharge and suction pressures, and other factors for a long term.

Possible causes
- Momentary drop of power supply voltage
- Compressor overload
- Short circuit

YES

Turn off the power and disconnect the harnesses U, V, and W.

Check No. 15
Check with the inverter analyzer.

Any LED off?

YES

Correct the power supply or replace the outdoor unit PCB (main PCB).

NO

Check No. 22
Check the power module.

Normal?

NO

Replace the outdoor unit PCB (main PCB).

YES

Turn off the power, and reconnect the harnesses. Turn on the power again and start operation.

Check the power supply voltage.

Is the voltage fluctuation within ±10% from the rated value?

NO

Correct the power supply.

YES

Check the discharge pressure. Go to Check No. 18.

Short circuit or wire breakage between compressor's coil phases?

NO

Replace the compressor.

YES

* Inverter analyzer: RSUK0917C

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

* Inverter analyzer: RSUK0917C

Short circuit or wire breakage between compressor's coil phases?

NO

Replace the compressor.

YES

Check the discharge pressure. Go to Check No. 18.

Correct the power supply.

Check the discharge pressure. Go to Check No. 18.

Replace the compressor.

(R22566)
5. Check

5.1 Thermistor Resistance Check

Check No.01

Disconnect the connectors of the thermistors from the PCB, and measure the resistance of each thermistor using a multimeter.

<table>
<thead>
<tr>
<th>Thermistor temperature</th>
<th>Resistance (kΩ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>°F</td>
</tr>
<tr>
<td>–20</td>
<td>–4</td>
</tr>
<tr>
<td>–15</td>
<td>5</td>
</tr>
<tr>
<td>–10</td>
<td>14</td>
</tr>
<tr>
<td>–5</td>
<td>23</td>
</tr>
<tr>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>5</td>
<td>41</td>
</tr>
<tr>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>15</td>
<td>59</td>
</tr>
<tr>
<td>20</td>
<td>68</td>
</tr>
<tr>
<td>25</td>
<td>77</td>
</tr>
<tr>
<td>30</td>
<td>86</td>
</tr>
<tr>
<td>35</td>
<td>95</td>
</tr>
<tr>
<td>40</td>
<td>104</td>
</tr>
<tr>
<td>45</td>
<td>113</td>
</tr>
<tr>
<td>50</td>
<td>122</td>
</tr>
</tbody>
</table>

(R25°C (77°F) = 20 kΩ, B = 3950 K)

- The room temperature thermistor is soldered on the PCB. Disconnect the connector to the control PCB before measuring the resistance.
- When the connector of indoor heat exchanger thermistor is soldered on the PCB, remove the thermistor and measure the resistance.
5.2 Indoor Fan Motor Connector Output Check

Check No.02

1. Check the connection of connector.
2. Check the motor power supply voltage output (pins 4 - 7).
3. Check the motor control voltage (pins 4 - 3).
4. Check the rotation command voltage (pins 4 - 2).
5. Check the rotation pulse (pins 4 - 1).

<table>
<thead>
<tr>
<th>S1</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Motor power supply voltage (310 – 340 VDC)</td>
</tr>
<tr>
<td>6</td>
<td>Unused</td>
</tr>
<tr>
<td>5</td>
<td>Unused</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
</tr>
<tr>
<td>3</td>
<td>Motor control voltage (15 VDC)</td>
</tr>
<tr>
<td>2</td>
<td>Rotation command voltage (1~ 6.5 VDC)</td>
</tr>
<tr>
<td>1</td>
<td>Rotation pulse input</td>
</tr>
</tbody>
</table>

5.3 Power Supply Waveforms Check

Check No.11

Measure the power supply waveform between No. 1 and No. 2 on the terminal board, and check the waveform disturbance.
- Check if the power supply waveform is a sine wave (Fig.1).
- Check if there is waveform disturbance near the zero-cross (sections circled in Fig.2).

Fig.1

Fig.2
5.4 Electronic Expansion Valve Check

**Check No. 12**

Conduct the following to check the electronic expansion valve (EV).

1. Check if the EV connector is correctly connected to the PCB.
2. Turn the power off and on again, and check to see if the EV generates a latching sound.
3. If the EV does not generate a latching sound in the above step 2, disconnect the connector and check the continuity using a multimeter.
4. Check the continuity between the pins 5 - 1, 5 - 2, 5 - 3, 5 - 4. If there is no continuity between the pins, the EV coil is faulty.
5. If the continuity is confirmed in step 3, the outdoor unit PCB (main PCB) is faulty.

![Diagram of 5P Connector Check](image-url)
### 5.5 Four Way Valve Performance Check

#### Check No.13

1. Turn the power off and then on again.
2. Start heating operation.
3. Disconnect the four way valve coil from the connector and check the continuity.
4. Four way valve coil resistance at 1000 ~ 2000 Ω?
   - **NO**: Replace the four way valve coil.
   - **YES**: Replace the four way valve.

   *(Fig. 1)*

   - S80 voltage at 208 - 230 VAC with compressor on? *(Fig. 1)*
     - **NO**: Replace the outdoor unit PCB (main PCB).
     - **YES**: S80 voltage at 208 - 230 VAC with compressor on? *(Fig. 1)*

   *(R21674)*

### 5.6 Inverter Unit Refrigerant System Check

#### Check No.14

1. Refrigerant system check
2. Is the discharge pipe thermistor disconnected from the holder?
   - **YES**: Reconnect the thermistor.
   - **NO**: Check for refrigerant leakage. See the service diagnosis on refrigerant shortage *(U2)*.

   *(R15683)*
5.7 Inverter Analyzer Check

Check No.15

- **Characteristics**

Inverter analyzer: RSUK0917C

If an abnormal stop occurs due to compressor startup failure or overcurrent output when using an inverter unit, it is difficult to judge whether the stop is caused by the compressor failure or some other failure (main PCB, power module, etc.). The inverter analyzer makes it possible to judge the cause of trouble easily and securely. (Connect an inverter analyzer as a quasi-compressor instead of compressor and check the output of the inverter.)

- **Operation Method**

**Step 1**
Be sure to turn off the power.

**Step 2**
Install an inverter analyzer instead of a compressor.

Note:
Make sure the charged voltage of the built-in smoothing electrolytic capacitor drops to 10 VDC or below before carrying out the service work.

![Diagram](image)

Reference:
If the terminals of the compressor are not FASTON terminals (difficult to remove the wire on the terminals), it is possible to connect wires available on site to the outdoor unit from output side of PCB. (Do not connect them to the compressor at the same time, otherwise it may result in incorrect detection.)
Step 3
Activate power transistor test operation from the indoor unit.

(1) Turn the power on.
(2) Select FAN operation with the Mode button on the remote controller.
(3) Press the center of the Temp button and the Mode button at the same time.
(4) Select ° with the Temp ▲ or Temp ▼ button.
(5) Press the Mode button to start the power transistor test operation.

■ Diagnose method (Diagnose according to 6 LEDs lighting status of inverter analyzer.)
(1) If all the LEDs are lit uniformly, the compressor is defective.
   → Replace the compressor.
(2) If the LEDs are not lit uniformly, check the power module.
   → Refer to Check No.22.
(3) If NG in Check No.22, replace the power module.
   (Replace the main PCB. The power module is united with the main PCB.)
   If OK in Check No.22, check if there is any solder cracking on the PCB.
(4) If any solder cracking is found, replace the PCB or repair the soldered section.
   If there is no solder cracking, replace the PCB.

Caution
(1) When the output frequency is low, the LEDs blink slowly. As the output frequency increases, the LEDs blink quicker. (The LEDs look like they are lit.)
(2) On completion of the inverter analyzer diagnosis, be sure to re-crimp the FASTON terminals. Otherwise, the terminals may be burned due to loosening.
5.8 Rotation Pulse Check on the Outdoor Unit PCB

Check No.16

Make sure that the voltage of 320 + 100 V ~ 320 - 50 V is applied.

1. Set operation off and power off. Disconnect the connector S70 or S71.
2. Check that the voltage between the pins 4 - 7 is 320 VDC.
3. Check that the control voltage between the pins 4 - 3 is 15 VDC.
4. Check that the rotation command voltage between the pins 4 - 2 is 0 ~ 6.5 VDC.
5. Keep operation off and power off. Connect the connector S70 or S71.
6. Check whether 4 rotation pulses (0 ~ 15 VDC) are input at the pins 4 - 1 when the fan motor is rotated 1 turn by hand.

When the fuse is melted, check the outdoor fan motor for proper function.

- If NG in step 2 → Defective PCB → Replace the outdoor unit PCB (main PCB).
- If NG in step 4 → Defective Hall IC → Replace the outdoor fan motor.
- If OK in both steps 2 and 4 → Replace the outdoor unit PCB (main PCB).

![PCB diagram]

(R19655)
5.9 Installation Condition Check

Check No. 17

Installation condition check

- Check the allowable dimensions of the air suction and discharge area.
  - NG: Change the installation location or direction.
  - OK:

- Is the discharged air short-circuited?
  - YES: Change the installation location or direction.
  - NO:

- Is the outdoor heat exchanger very dirty?
  - YES: Clean the outdoor heat exchanger.
  - NO:

- Is the airflow blocked by obstacles or winds blowing in the opposite direction?
  - YES: Change the installation location or direction.
  - NO: Check the outdoor temperature. (The outdoor temperature should be within the operation range.)

5.10 Discharge Pressure Check

Check No. 18

Discharge pressure check

- High?
  - NO: Replace the compressor.
  - YES:

- Is the stop valve open?
  - NO: Open the stop valve.
  - YES:

- Is the connection pipe deformed?
  - YES: Replace the pipe installed at the site.
  - NO:

- Is the air filter or indoor/outdoor heat exchanger dirty?
  - YES: Clean the dirty air filter or indoor/outdoor heat exchanger.
  - NO: Replace the compressor.

(R19386)
5.11 Outdoor Fan System Check

Check No. 19

**DC motor**

Check the outdoor fan system.

Is the outdoor fan running?

- YES: Outdoor fan system is functioning.
- NO: Fan motor lead wire connector disconnected?
  - YES: Reconnect the connector.
  - NO: Go to Check No. 16.

5.12 Main Circuit Short Check

Check No. 20

Check to make sure that the voltage between (+) and (–) of the diode bridge (DB1) is approximately 0 V before checking.

- Measure the resistance between the pins of the DB1 referring to the table below.
- If the resistance is \( \infty \) or less than 1 k\( \Omega \), short circuit occurs on the main circuit.

<table>
<thead>
<tr>
<th>Positive terminal (+) of digital multimeter</th>
<th>~ (2, 3)</th>
<th>+ (4)</th>
<th>~ (2, 3)</th>
<th>− (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative terminal (−) of digital multimeter</td>
<td>+ (4)</td>
<td>~ (2, 3)</td>
<td>− (1)</td>
<td>~ (2, 3)</td>
</tr>
<tr>
<td>Resistance is OK.</td>
<td>several k( \Omega ) ~ several M( \Omega )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance is NG.</td>
<td>0 ( \Omega ) or ( \infty )</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

RK(X)30/36NMVJU
5.13 Capacitor Voltage Check

Check No.21

Before this check, be sure to check the main circuit for short circuit. With the circuit breaker still on, measure the voltage according to the drawing of the model in question. Be careful never to touch any live parts.

To prevent an electrical shock, use a multimeter to check that the voltage between FU2 and DC– is 50 V or less.

The surface of the test points (DC–) may be covered with the coating. Be sure to make firm contact between the multimeter probes and the test points.

Multimeter (DC. voltage range)

5.14 Power Module Check

Check No.22

Check to make sure that the voltage between (+) and (–) of the power module is approximately 0 V before checking.

- Disconnect the compressor harness connector from the outdoor unit PCB. To disengage the connector, press the protrusion on the connector.
- Follow the procedure below to measure resistance between the terminals of the power module and the terminals of the compressor with a multimeter. Evaluate the measurement results referring to the following table.

<table>
<thead>
<tr>
<th>Positive terminal (+) of digital multimeter</th>
<th>Power module (+)</th>
<th>UVW</th>
<th>Power module (–)</th>
<th>UVW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative terminal (–) of digital multimeter</td>
<td>UVW</td>
<td>Power module (+)</td>
<td>UVW</td>
<td>Power module (–)</td>
</tr>
<tr>
<td>Resistance is OK.</td>
<td>several kΩ ~ several MΩ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance is NG.</td>
<td>0 Ω or ∞</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
RK(X)30/36NMVJU
# Part 7
## Trial Operation and Field Settings

1. Pump Down Operation ................................................................. 104
2. Forced Cooling Operation ............................................................... 105
3. Trial Operation .................................................................................. 106
4. Field Settings .................................................................................. 107
   4.1 Model Type Setting ..................................................................... 107
   4.2 Temperature Display Switch ......................................................... 107
   4.3 When 2 Units are Installed in 1 Room ........................................... 108
   4.4 Facility Setting Switch (cooling at low outdoor temperature) ......... 109
5. Silicone Grease on Power Transistor/Diode Bridge ......................... 111
1. Pump Down Operation

Outline

In order to protect the environment, be sure to conduct pump down operation when relocating or disposing of the unit.

Details

1. Remove the valve caps from the liquid stop valve and the gas stop valve.
2. Carry out forced cooling operation.
3. After 5 to 10 minutes, close the liquid stop valve with a hexagonal wrench.
4. After 2 to 3 minutes, close the gas stop valve and stop the forced cooling operation.
5. Attach the valve cap once procedures are complete.

Refer to forced cooling operation on page 105.
2. Forced Cooling Operation

Outline
The forced cooling operation is allowed when both the following conditions are met.
1) The outdoor unit is not abnormal and not in the 3-minute standby mode.
2) The outdoor unit is not operating.

Protection functions have priority over all other functions during forced cooling operation.

Procedure

- With the indoor unit ON/OFF button
  Press the indoor unit ON/OFF button for at least 5 seconds. (The operation will start.)
  - Forced cooling operation will stop automatically after about 15 minutes.
  - To stop the operation, press the indoor unit ON/OFF button.

- With the indoor unit’s remote controller
  (1) Press Mode button and select the cooling operation.
  (2) Press On/Off button to turn on the system.
  (3) Press Temp ▲, ▼ buttons and Mode button at the same time.
  (4) Press Temp ▲, ▼ buttons, select “ ↑ ”, and press Mode button for confirmation.
     - Forced cooling operation will stop automatically after about 30 minutes.
     - To stop the operation, press On/Off button.
3. Trial Operation

Outline

1. Measure the supply voltage and make sure that it is within the specified range.
2. In cooling operation, select the lowest programmable temperature; in heating operation, select the highest programmable temperature.
3. Carry out the trial operation following the instructions in the operation manual to ensure that all functions and parts, such as the movement of the flaps, are working properly.
   - To protect the air conditioner, restart operation is disabled for 3 minutes after the system has been turned off.
4. After trial operation is complete, set the temperature to a normal level (78°F to 82°F (26°C to 28°C) in cooling operation, 68°F to 75°F (20°C to 24°C) in heating operation).

Procedure

When operating the air conditioner in cooling operation in winter, or heating operation in summer, set it to the trial operation mode using the following method.

With remote controller

(1) Press On/Off button to turn on the system.
(2) Press the center of Temp button and Mode button at the same time.
(3) Select “T” (trial operation) with Temp ▲ or Temp ▼ button.
(4) Press Mode button to start the trial operation.
(5) Press Mode button and select operation mode.
(6) Trial operation will stop automatically after about 30 minutes.
   To stop trial operation, press On/Off button.

Test Items

<table>
<thead>
<tr>
<th>Test items</th>
<th>Symptom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor and outdoor units are installed securely.</td>
<td>Fall, vibration, noise</td>
</tr>
<tr>
<td>No refrigerant gas leaks.</td>
<td>Incomplete cooling/heating function</td>
</tr>
<tr>
<td>Refrigerant gas and liquid pipes and indoor drain hose extension</td>
<td>Water leakage</td>
</tr>
<tr>
<td>are thermally insulated.</td>
<td></td>
</tr>
<tr>
<td>Draining line is properly installed.</td>
<td>Water leakage</td>
</tr>
<tr>
<td>System is properly grounded.</td>
<td>Electrical leakage</td>
</tr>
<tr>
<td>Only specified wires are used for all wiring, and all wires are connected</td>
<td>No operation or burn damage</td>
</tr>
<tr>
<td>correctly.</td>
<td></td>
</tr>
<tr>
<td>Indoor or outdoor unit’s air inlet or air outlet are unobstructed.</td>
<td>Incomplete cooling/heating function</td>
</tr>
<tr>
<td>Stop valves are opened.</td>
<td>Incomplete cooling/heating function</td>
</tr>
<tr>
<td>Indoor unit properly receiving remote controller commands.</td>
<td>No operation</td>
</tr>
<tr>
<td>Remote controller jumper setting is correct for the type of unit (heat pump</td>
<td>Remote controller malfunctioning</td>
</tr>
<tr>
<td>or cooling only).</td>
<td></td>
</tr>
</tbody>
</table>

(R24542)
4. Field Settings

4.1 Model Type Setting

(1) Turn on all the fluorescent lamps in the room, if any, and find a location where the remote controller signals are properly received by the indoor unit (within 23ft (7m)).

(2) Configure according to the type of unit (heat pump or cooling only). The default setting is heat pump.

- **For heat pump (outdoor unit model: RX)**
  No change to jumper setting is required.

- **For cooling only (outdoor unit model: RK)**
  Cut the jumper J8 inside the remote controller.

4.2 Temperature Display Switch

- Press the upper side of **Temp** button and **On** button at the same time for 5 seconds to change the unit of temperature display.
4.3 When 2 Units are Installed in 1 Room

Outline When 2 indoor units are installed in 1 room, 1 of the 2 indoor units and the corresponding wireless remote controller can be set for different addresses.
Both the indoor unit PCB and the wireless remote controller need alteration.

Indoor Unit PCB
- Cut the address setting jumper JA on the control PCB.

Caution Replace the PCB if you accidentally cut a wrong jumper.
Jumpers are necessary for electronic circuit. Improper operation may occur if you cut any of them.

Wireless Remote Controller
- ARC466 series
  - Cut the address setting jumper (J4).

Caution Replace the remote controller if you cut a wrong jumper.
The heating operation will not be available when the jumper on the left side is cut.

4.3.1 Jumper Settings

<table>
<thead>
<tr>
<th>Jumper (on indoor unit PCB)</th>
<th>Function</th>
<th>When connected (factory setting)</th>
<th>When cut</th>
</tr>
</thead>
<tbody>
<tr>
<td>JB</td>
<td>Fan speed setting when compressor stops for thermostat OFF. (effective only at cooling operation)</td>
<td>Fan speed setting; Remote controller setting</td>
<td>The fan stops.</td>
</tr>
<tr>
<td>JC</td>
<td>Power failure recovery function</td>
<td>Auto-restart</td>
<td>The unit does not resume operation after recovering from a power failure. Timer settings are cleared.</td>
</tr>
</tbody>
</table>

For the location of the jumpers, refer to page 7.
4.4 Facility Setting Switch (cooling at low outdoor temperature)

Outline
This function is designed for facilities such as equipment or computer rooms. It is never to be used in a residence or office where people occupy the space.

Details
(1) Turning on SW5-3 on the PCB will extend the operation range to –10°C (14°F). Installing an air direction adjustment grille (sold separately) will further extend the operation range to –20°C (–4°F). In these cases, the unit will stop operating if the outdoor temperature falls below –20°C (–4°F), restarting once the temperature rises above this level.

(2) Only for cooling models
If the unit is to be operated in outdoor temperatures down to –30°C (–22°F), turn on SW6-2 on the PCB, in addition to the settings in step (1) above. If the outdoor temperature falls below –30°C (–22°F) the unit will stop operating and will only restart once the temperature rises above –30°C (–22°F).
Caution

- If the outdoor unit is installed where the outdoor heat exchanger of the unit is exposed to direct wind, provide a windbreak wall.
- Intermittent noises may be produced by the indoor unit due to the outdoor fan turning on and off when using facility settings.
- Do not place humidifiers or other items which might raise the humidity in rooms where facility settings are being used.
  A humidifier might cause dew jumping from the indoor unit outlet vent.
- Activating the facility setting sets the indoor fan tap to the highest position.
  Notify the user about this.
- When the outdoor temperature is below –20°C (–4°F) and if SW6-2 in step 2) below is turned on, for the purpose of protecting the compressor, it may take up to 3 hours for operation to begin while the system warms up.
5. Silicone Grease on Power Transistor/Diode Bridge

Outline

Apply the specified silicone grease to the heat radiation part of a power transistor/diode bridge when you replace an outdoor unit PCB. The silicone grease encourages the heat radiation of a power transistor/diode bridge.

Details

1. Wipe off the old silicone grease completely.
2. Apply the silicone grease evenly. See the illustrations below for examples of application.
3. Tighten the screws of the power transistor/diode bridge.
4. Make sure that the heat radiation parts are firmly contacted to the radiation fin.

Note: Smoke emission may be caused by bad heat radiation when the silicone grease is not appropriately applied.

- **OK**: Evenly applied

![Diagram](R22541)  
Power transistor  
(or diode bridge)  
PCB  
Radiation fin  
Silicone grease

- **NG**: Not evenly applied

![Diagram](R21866)  
Silicone grease

- **NG**: Foreign matter is stuck.

![Diagram](R21867)  
Foreign matter
Part 8
Appendix

1. Piping Diagrams.................................................................................................................. 113
   1.1 Indoor unit ....................................................................................................................... 113
   1.2 Outdoor Unit .................................................................................................................... 114

2. Wiring Diagrams.................................................................................................................. 115
   2.1 Indoor Unit ....................................................................................................................... 115
   2.2 Outdoor Unit .................................................................................................................... 116

3. Operation Limit..................................................................................................................... 117
1. Piping Diagrams
1.1 Indoor unit

FTX30/36NVJU
1.2 Outdoor Unit

1.2.1 Cooling Only

RK30/36NMVJU

1.2.2 Heat Pump

RX30/36NMVJU
2. Wiring Diagrams
2.1 Indoor Unit

FTX30/36NVJU

**Note:**
- PCB1: Control PCB
- PCB2: Signal receiver PCB
- PCB3: Display PCB
- PCB4: INTELLIGENT EYE sensor PCB

Refer to Part 3 for Printed Circuit Board Connector Wiring Diagram.
2.2 Outdoor Unit

RK(X)30/36NMVJU

**WIRING DIAGRAM**

- **PCB1**: Main PCB
- **PCB2**: Service monitor PCB
- Refer to Part 3 for Printed Circuit Board Connector Wiring Diagram.
3. Operation Limit

RK30/36NMVJU

Notes:
1. The graphs are based on the following conditions.
   • Equivalent piping length 25ft
   • Level difference 0ft
   • Airflow rate High
2. Facility Setting (cooling at low outdoor temperature)
   This function is limited only for facilities
   (the target of air conditioning is equipment such as computer).
   Never use it in a residence or office (the space where is a human).
   Refer to the installation manual in detail of setting.

RX30/36NMVJU

Notes:
1. The graphs are based on the following conditions.
   • Equivalent piping length 25ft
   • Level difference 0ft
   • Airflow rate High
2. Facility Setting (cooling at low outdoor temperature)
   This function is limited only for facilities
   (the target of air conditioning is equipment such as computer).
   Never use it in a residence or office (the space where is a human).
   Refer to the installation manual in detail of setting.
# Revision History

<table>
<thead>
<tr>
<th>Month / Year</th>
<th>Version</th>
<th>Revised contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 / 2017</td>
<td>SiUS041638E</td>
<td>First edition</td>
</tr>
</tbody>
</table>
• Daikin products are manufactured for export to numerous countries throughout the world. Prior to purchase, please 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 inquiries, 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.

---

© All rights reserved

• Specifications, designs and other content appearing in this brochure are current as of March 2017 but subject to change without notice.