TECHNICAL & SERVICE MANUAL

CITY MULTI Series Wall Mounted R410A / R22

Indoor unit [Model names] [Service Ref.]
PKFY-P24NKMU-E2 PKFY-P24NKMU-E2.TH
PKFY-P30NKMU-E2 PKFY-P30NKMU-E2.TH

Note:
• This manual describes only service data of the indoor units.
• RoHS compliant products have <G> mark on the spec name plate.

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PARTS CATALOG (OCB518)
Use the specified refrigerant only.

Never use any refrigerant other than that specified. Doing so may cause a burst, an explosion, or fire when the unit is being used, serviced, or disposed of. Correct refrigerant is specified in the manuals and on the spec labels provided with our products. We will not be held responsible for mechanical failure, system malfunction, unit breakdown or accidents caused by failure to follow the instructions.

1 PART NAMES AND FUNCTIONS

- Indoor unit

Wireless remote controller

OCH518
Wired remote controller

Note: The phrase "Wired remote controller" in this manual refers only to the PAR-21MAA. If you need any information for the other remote controller, please refer to either the installation manual or initial setting manual which are included in remote controller's box.

Display Section

For purposes of this explanation, all parts of the display are shown. During actual operation, only the relevant items will be lit.

Identifies the current operation
Shows the operating mode, etc. *Multilanguage display is available.

"Centrally Controlled" indicator
Indicates that operation from the remote controller has been prohibited by a master controller.

"Timer is Off" indicator
Indicates that the timer is off.

Temperature Setting
Shows the target temperature.

Up/Down Air Direction indicator
The indicator shows the direction of the outcoming airflow.

"One Hour Only" indicator
Displays if the airflow is set to Low or downward during COOL or DRY mode. (Operation varies according to model.) The indicator goes off in one hour, at which time the airflow direction also changes.

Room Temperature display
Shows the room temperature. The room temperature display range is 46–102°F. The display blinks if the temperature is less than 46°F or 102°F or more.

"Sensor" indication
Displays when the remote controller sensor is used.

"Locked" indicator
Indicates that remote controller buttons have been locked.

"Clean The Filter" indicator
To be displayed on when it is time to clean the filter.

Timer indicators
The indicator comes on if the corresponding timer is set.

Fan Speed indicator
Shows the selected fan speed.

Ventilation indicator
Appears when the unit is running in Ventilation mode.

Operation Section

Temperature setting buttons
Down
Up

Mode button (Return button)

Timer Menu button (Monitor/Set button)

Set Time buttons
Back
Ahead

Timer On/Off button (Set Day button)

Closing the cover

ON/OFF button

Fan Speed button

Filter button (Enter button)

Test Run button

Check button (Clear button)

Airflow Up/Down button

Louver button (Operation button)

To return operation number

Ventilation button (Operation button)

To go to next operation number

Built-in temperature sensor

Note: The phrase "Wired remote controller" in this manual refers only to the PAR-21MAA. If you need any information for the other remote controller, please refer to either the installation manual or initial setting manual which are included in remote controller's box.
# 2 SPECIFICATION

## 2-1. Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>PKFY-P24NKMU-E2</th>
<th>PKFY-P30NKMU-E2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cooling capacity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Nominal)</td>
<td>kW</td>
<td>kW</td>
</tr>
<tr>
<td><strong>Heating capacity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Nominal)</td>
<td>kW</td>
<td>kW</td>
</tr>
<tr>
<td><strong>Power source</strong></td>
<td>1-phase 208-230V 60Hz</td>
<td></td>
</tr>
<tr>
<td><strong>Power input</strong></td>
<td>kW</td>
<td>kW</td>
</tr>
<tr>
<td><strong>Current input</strong></td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td><strong>Power input</strong></td>
<td>kW</td>
<td>kW</td>
</tr>
<tr>
<td><strong>Current input</strong></td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td><strong>Internal finish</strong></td>
<td>Plastic, MUNSELL (1.0Y 9.2/0.2)</td>
<td></td>
</tr>
<tr>
<td><strong>External dimension H × W × D</strong></td>
<td>mm</td>
<td>365 × 1170 × 295</td>
</tr>
<tr>
<td><strong>Net weight</strong></td>
<td>kg (lb)</td>
<td>21 (46)</td>
</tr>
<tr>
<td><strong>Heat exchanger</strong></td>
<td>Cross fin (Aluminum fin and copper tube)</td>
<td></td>
</tr>
<tr>
<td><strong>Fan</strong></td>
<td>Line flow fan × 1</td>
<td></td>
</tr>
<tr>
<td><strong>Motor type</strong></td>
<td>DC motor</td>
<td></td>
</tr>
<tr>
<td><strong>Motor output</strong></td>
<td>kW</td>
<td>kW</td>
</tr>
<tr>
<td><strong>Noise level (Low-High)</strong></td>
<td>dB &lt;A&gt;</td>
<td>39 - 49</td>
</tr>
<tr>
<td><strong>Insulation material</strong></td>
<td>Polyethylene sheet</td>
<td></td>
</tr>
<tr>
<td><strong>Air filter</strong></td>
<td>PP honeycomb</td>
<td></td>
</tr>
<tr>
<td><strong>Protection device</strong></td>
<td>Fuse</td>
<td></td>
</tr>
<tr>
<td><strong>Refrigerant control device</strong></td>
<td>LEV</td>
<td></td>
</tr>
<tr>
<td><strong>Connectable outdoor unit</strong></td>
<td>R410A, R22 CITY MULTI</td>
<td>R410A, R22 CITY MULTI</td>
</tr>
<tr>
<td><strong>Pipe length</strong></td>
<td>ft (m)</td>
<td>25 ft (7.6 m)</td>
</tr>
<tr>
<td><strong>Flowing pipe size</strong></td>
<td>mm (in.)</td>
<td>I.D. 16mm (5/8&quot;)</td>
</tr>
<tr>
<td><strong>Standard attachment</strong></td>
<td>Document Accessory</td>
<td>Installation Manual, Instruction Book</td>
</tr>
<tr>
<td><strong>Optional parts</strong></td>
<td>External heater adapter</td>
<td>PAC-YU2SHF</td>
</tr>
<tr>
<td><strong>Remarks</strong></td>
<td>Installation</td>
<td>Details on foundation work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual.</td>
</tr>
</tbody>
</table>

**Note:**

1. Nominal cooling conditions
2. Nominal heating conditions

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**Unit converter:**

- "kW = kW × 3.412"
- "A = A × 0.4536"
- "Btu/h = Btu/h × 10.0"
- "CFM = CFM × 0.3531"
- "kg = kg × 2.20462"

*Due to continuing improvement, above specification may be subject to change without notice.

*Above specification data is subject to rounding variation.
2-2. Electrical parts specifications

<table>
<thead>
<tr>
<th>Service Ref.</th>
<th>Symbol</th>
<th>PKFY-P24NKMU-E2.TH</th>
<th>PKFY-P30NKMU-E2.TH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room temperature thermistor</td>
<td>TH21</td>
<td>Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ</td>
<td></td>
</tr>
<tr>
<td>Liquid pipe thermistor</td>
<td>TH22</td>
<td>Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ</td>
<td></td>
</tr>
<tr>
<td>Gas pipe thermistor</td>
<td>TH23</td>
<td>Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ</td>
<td></td>
</tr>
<tr>
<td>Fuse (Indoor controller board)</td>
<td>FUSE</td>
<td>250V 3.15A</td>
<td></td>
</tr>
<tr>
<td>Fan motor</td>
<td>MF</td>
<td>8-Pole Output 56W / RCOJ56-AC</td>
<td></td>
</tr>
<tr>
<td>Vane motor (with limit switch)</td>
<td>MV</td>
<td>MSBPC20 DC12V</td>
<td></td>
</tr>
<tr>
<td>Linear expansion valve</td>
<td>LEV</td>
<td>EFM-40YGME DC 12 V</td>
<td></td>
</tr>
<tr>
<td>Power supply terminal block</td>
<td>TB2</td>
<td>(L1, L2, GR) 250V 20A</td>
<td></td>
</tr>
<tr>
<td>Transmission terminal block</td>
<td>TB5</td>
<td>(M1, M2, S) 250V 20A</td>
<td></td>
</tr>
<tr>
<td>MA remote controller terminal block</td>
<td>TB15</td>
<td>(1, 2) 250V 10A</td>
<td></td>
</tr>
</tbody>
</table>

2-3. Sound levels

* Measured in anechoic room.

<table>
<thead>
<tr>
<th>Service Ref.</th>
<th>Sound level at anechoic room: Low-High</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKFY-P24NKMU-E2.TH</td>
<td>39 - 49</td>
</tr>
<tr>
<td>PKFY-P30NKMU-E2.TH</td>
<td>43 - 49</td>
</tr>
</tbody>
</table>

2-4. NC curves
4 WIRING DIAGRAM

PKFY-P24NKMU-E2.TH
PKFY-P30NKMU-E2.TH

NOTES:
1. At servicing for outdoor unit, always follow the wiring diagram of outdoor unit.
2. In case of using MA-Remote controller, please connect to TB15. (remote controller wire is non-polar.)
3. In case of using M-NET, please connect to TB5. (Transmission line is non-polar.)
4. Symbol [·] of TB5 is the shield wire connection.
5. Symbols used in wiring diagram above see a terminal block.
6. The setting of the 0W2 dip switches differs in the capacity, for the detail, refer to the fig: 81.
   Use copper supply wires.

LED on indoor board for service

<table>
<thead>
<tr>
<th>Mark</th>
<th>Meaning</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>LE31</td>
<td>Main power supply</td>
<td>Main power supply (Indoor unit 200-230V)</td>
</tr>
<tr>
<td>LE32</td>
<td>Power supply for MA-remote controller</td>
<td>Power supply for MA-remote controller on — lamp is 8</td>
</tr>
</tbody>
</table>

OCH518
### REFRIGERANT SYSTEM DIAGRAM

**PKFY-P24NKMU-E2.TH**  
**PKFY-P30NKMU-E2.TH**

<table>
<thead>
<tr>
<th>Item</th>
<th>PKFY-P24NKMU-E2</th>
<th>PKFY-P30NKMU-E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas pipe</td>
<td>15.88 (5/8)</td>
<td>15.88 (5/8)</td>
</tr>
<tr>
<td>Liquid pipe</td>
<td>9.52 (3/8)</td>
<td>9.52 (3/8)</td>
</tr>
</tbody>
</table>

*Unit: mm (inch)*
6 MICROPROCESSOR CONTROL

INDOOR UNIT CONTROL
6-1. COOL OPERATION

<How to operate>
① Press POWER ON/OFF button.
② Press the operation MODE button to display COOL.
③ Press the TEMP. button to set the desired temperature.

NOTE: The set temperature changes 2°F when the $\circ$ or $\bullet$ button is pressed one time. Cooling 67°F to 87°F

<table>
<thead>
<tr>
<th>Control modes</th>
<th>Control details</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| 1. Thermostat function | 1-1. Thermostat function (Function to prevent restarting for 3 minutes)
- Room temperature $\geq$ desired temperature + 2°F → Thermo ON
- Room temperature $\leq$ desired temperature → Thermo OFF | |
| | 1-2. Anti-freezing control
Detected condition: When the liquid pipe temp. (TH22) is 32°F or less in 16 minutes from compressors start up, anti-freezing control starts and the thermo OFF.
Released condition: The timer which prevents reactivating is set for 3 minutes, and anti-freezing control is cancelled when any one of the following conditions is satisfied.
① Liquid pipe temp. (TH22) turns 50°F or above.
② The condition of the thermo OFF has become complete by thermostat, etc.
③ The operation modes became mode other than COOL.
④ The operation stopped. | |
| 2. Fan | By the remote controller setting (switch of 2 speeds)

<table>
<thead>
<tr>
<th>Type</th>
<th>Fan speed notch</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 speeds</td>
<td>[Low], [High]</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 3. Vane (up/down vane change) | (1) Initial setting: Start at COOL mode and horizontal vane.
(2) Vane position:
Horizontal → Downward A → Downward B → Downward C → Downward D → Swing → Auto
(3) Restriction of the downward vane setting
When setting the downward vane A, B, C or D in [Low] of the fan speed notch, the vane changes to horizontal position after 1 hour have passed. | “ONLY 1 Hr” appears on the wired remote controller. |

OCH518
6-2. DRY OPERATION

**Control modes**

1. Thermostat function
   - Function to prevent restarting for 3 minutes
   - Setting the Dry thermo by the thermostat signal and the room temperature (TH21).
   - **Dry thermo ON**: Room temperature ≥ desired temperature + 2°F
   - **Dry thermo OFF**: Room temperature ≤ desired temperature

   **Remarks**

<table>
<thead>
<tr>
<th>Room temperature</th>
<th>Thermostat signal</th>
<th>Door temperature (T1)</th>
<th>Dry thermo ON time (min)</th>
<th>Dry thermo OFF time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 64°F</td>
<td>ON</td>
<td>T1≥83°F</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>83°F &gt; T1 ≥ 79°F</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>79°F &gt; T1 ≥ 75°F</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>75°F &gt; T1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Less than 64°F</td>
<td>OFF</td>
<td>Unconditional</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

1-2. Freeze prevention control
- No control function

2. Fan
- Indoor fan operation controlled depending on the compressor conditions.

   **Dry thermo**
   - Fan speed notch
   - **ON**: Stop
   - **OFF**: Stop

   **Note**: Remote controller setting is not acceptable.

3. Vane (up/down vane change)
- Same control as COOL operation

---

**<How to operate>**
1. Press POWER ON/OFF button.
2. Press the operation MODE button to display DRY.
3. Press the TEMP. button to set the desired temperature.

**NOTE**: The set temperature changes 2°F when the or button is pressed one time. Dry 67°F to 87°F
# 6-3. FAN OPERATION

## <How to operate>
1. Press POWER ON/OFF button.
2. Press the operation MODE button to display FAN.

## Control modes

<table>
<thead>
<tr>
<th>Control modes</th>
<th>Control details</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fan</td>
<td>Set by remote controller.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Type</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fan speed notch</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>2 speeds</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[Low], [High]</td>
<td></td>
</tr>
<tr>
<td>2. Vane (up/down vane change)</td>
<td>Same as the control performed during the COOL operation, but with no restriction on the vane's downward blow setting</td>
<td>Same control as COOL operation</td>
</tr>
</tbody>
</table>
6-4. HEAT OPERATION

**<How to operate>**

1. Press POWER ON/OFF button.
2. Press the operation MODE button to display HEAT.
3. Press the TEMP. button to set the desired temperature.

**NOTE:** The set temperature changes 2°F when the or button is pressed one time. Heating 63 to 83°F.

**<Display in HEAT operation>**

- **[DEFROST]**
  - The [DEFROST] symbol is only displayed during the defrost operation.
- **[STANDBY]**
  - The [STANDBY] symbol is only displayed during the hot adjust mode.

### Control modes and Control details

<table>
<thead>
<tr>
<th>Control modes</th>
<th>Control details</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Thermostat</td>
<td><strong>Function to prevent restarting for 3 minutes</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Room temperature ≤ desired temperature -2°F → Thermo ON</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Room temperature ≥ desired temperature → Thermo OFF</td>
<td></td>
</tr>
<tr>
<td>2. Fan</td>
<td>By the remote controller setting (switch of 2 speeds)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Type</strong></td>
<td><strong>Fan speed notch</strong></td>
</tr>
<tr>
<td></td>
<td>2 speeds</td>
<td>[Low], [High]</td>
</tr>
<tr>
<td>2-1. Hot adjust mode</td>
<td>The fan controller becomes the hot adjuster mode for the following conditions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>① When starting the HEAT operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>② When the thermoregulating function changes from OFF to ON.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>③ When release the HEAT defrosting operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="" alt="Diagram" /></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A: Hot adjust mode starts.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B: 5 minutes have passed since the condition A or the indoor liquid pipe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>temperature turned 95°F or more.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C: 2 minutes have passed since the condition B. (Terminating the hot adjust mode)</td>
<td></td>
</tr>
<tr>
<td>2-2. Residual heat exclusion mode</td>
<td>When the condition changes the auxiliary heater ON to OFF (thermostat or operation stop, etc), the indoor fan operates in [Low] mode for 1 minute.</td>
<td></td>
</tr>
</tbody>
</table>

* *1 "STAND BY" will be displayed during the hot adjust mode.*

To be continued on the next page.
### Control modes

<table>
<thead>
<tr>
<th>Control modes</th>
<th>Control details</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| 2. Fan        | 2-3. Thermo OFF mode  
When the thermostat function changes to OFF, the indoor fan operates in [Extra low]. |         |
|               | 2-4. Heat defrosting mode  
The indoor fan stops. |         |
| 3. Vane control (Up/down vane change) | (1) Initial setting: OFF → HEAT→[last setting]  
When the last setting is [Swing] → [Downward D]  
When changing the mode from exception of HEAT to HEAT operation  → [Downward D]  
(2) Vane position:  
Horizontal → Downward A → Downward B → Downward C → Downward D → Swing → Auto  
(3) Restriction of vane position  
① The vane is horizontally fixed for the following modes.  
The control by the remote controller is temporarily invalidated and control by the unit.  
② Thermo OFF  
③ Hot adjust [Extra low] mode  
④ Heat defrost mode |         |

### 6-5. AUTO OPERATION [AUTOMATIC COOL/HEAT CHANGE OVER OPERATION]

**<How to operate>**
① Press POWER ON/OFF button.  
② Press the operation MODE button to display AUTO.  
③ Press the TEMP. button to set the desired temperature.  
**NOTE:** The set temperature changes 2°F when the or button is pressed one time. Automatic 67 to 83°F

<table>
<thead>
<tr>
<th>Control modes</th>
<th>Control details</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| 1. Initial value of operation mode | HEAT mode for room temperature < Desired temperature  
COOL mode for room temperature ≥ Desired temperature |         |
| 2. Mode change | (1) HEAT mode → COOL mode  
Room temperature ≥ Desired temperature + 3°F or 3 min. has passed  
(2) COOL mode → HEAT mode  
Room temperature ≥ Desired temperature - 3°F or 3 min. has passed |         |
| 3. COOL mode | Same control as cool operation |         |
| 4. HEAT mode | Same control as heat operation |         |
7 TROUBLESHOOTING

7-1. HOW TO CHECK THE PARTS
PKFY-P24NKMU-E2.TH  PKFY-P30NKMU-E2.TH

### Parts name | Check points
--- | ---
Room temperature thermistor (TH21) | Disconnect the connector then measure the resistance with a tester.
Liquid pipe temperature thermistor (TH22) | (At the ambient temperature 50°F~86°F)
Gas pipe temperature thermistor (TH23, TH24) | Refer to 7-1-1.

#### Normal | Abnormal
--- | ---
4.3kΩ-9.6kΩ | Open or short

#### Vane motor (MV)

Measure the resistance between the terminals with a tester. (Coil temperature 68°F)

| Terminal | Normal | Abnormal |
--- | --- | ---
1-2 | Brown-Red | Open or short |
1-3 | Brown-Orange | |
1-4 | Brown-Yellow | |
1-5 | Brown-Green | |

#### Fan motor (MF)

Refer to 7-1-3.

#### Linear expansion valve (LEV)

Disconnect the connector then measure the resistance value with a tester. (Coil temperature 68°F)

| Terminal | Normal | Abnormal |
--- | --- | ---
(1)-(5) | White-Red | |
(2)-(6) | Yellow-Brown | |
(3)-(5) | Orange-Red | |
(4)-(6) | Blue-Brown | |

---

7-1-1. Thermistor

**Room temperature thermistor (TH21)**

**Liquid pipe temperature thermistor (TH22)**

**Gas pipe temperature thermistor (TH23, TH24)**

**Thermistor characteristic graph**

- **Thermistor for lower temperature**
  - Thermistor R(t)=15kΩ ± 3%
  - Fixed number of B=3480 ± 2%
  - \( R_t = 15 \exp \left\{ \frac{3480}{273+(t-32)/1.8} - \frac{1}{273} \right\} \)

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>Resistance (kΩ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30°F</td>
<td>15.8kΩ</td>
</tr>
<tr>
<td>50°F</td>
<td>9.6kΩ</td>
</tr>
<tr>
<td>70°F</td>
<td>6.0kΩ</td>
</tr>
<tr>
<td>80°F</td>
<td>4.8kΩ</td>
</tr>
<tr>
<td>90°F</td>
<td>3.9kΩ</td>
</tr>
<tr>
<td>100°F</td>
<td>3.2kΩ</td>
</tr>
</tbody>
</table>

---

7-1-2. Liner expansion valve

- Linear expansion valve open/close through stepping motor after receiving the pulse signal from the indoor controller board.
- Valve position can be changed in proportion to the number of pulse signals.

---

OCH518

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<Output pulse signal and the valve operation>

<table>
<thead>
<tr>
<th>Output (Phase)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>φ1</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>φ2</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>φ3</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>φ4</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>

1. **Linear expansion valve operation**

2. **Trouble shooting**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Check points</th>
<th>Countermeasures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation circuit failure of the micro processor</td>
<td>Disconnect the connector on the controller board, then connect LED for checking.</td>
<td>Exchange the indoor controller board at drive circuit failure.</td>
</tr>
<tr>
<td>Linear expansion valve mechanism is locked.</td>
<td>Motor will idle and make a ticking noise when the motor is operated while the linear expansion valve is locked. The ticking sound is the sign of the abnormality.</td>
<td>Exchange the linear expansion valve.</td>
</tr>
<tr>
<td>Short or breakage of the motor coil of the linear expansion valve</td>
<td>Measure the resistance between each coil (white-red, yellow-brown, orange-red, blue-brown) using a tester. It is normal if the resistance is in the range of 2000 ±10%.</td>
<td>Exchange the linear expansion valve.</td>
</tr>
<tr>
<td>Valve does not close completely.</td>
<td>To check the linear expansion valve, operate the indoor unit in fan mode and at the same time operate other indoor units in cooling mode, then check the pipe temperature «liquid pipe temperature» of the indoor unit by the outdoor multi controller board operation monitor. During fan operation, linear expansion valve is closed completely and if there is any leaking, detecting temperature of the thermistor will go lower. If the detected temperature is much lower than the temperature indicated in the remote controller, it means the valve is not closed all the way. It is not necessary to exchange the linear expansion valve, if the leakage is small and not affecting normal operation.</td>
<td>If large amount of refrigerant is leaked, exchange the linear expansion valve.</td>
</tr>
<tr>
<td>Wrong connection of the connector or contact failure</td>
<td>Check the color of lead wire and missing terminal of the connector.</td>
<td>Disconnect the connector at the controller board, then check the continuity.</td>
</tr>
</tbody>
</table>
7-1-3. DC Fan motor (fan motor/indoor controller circuit board)

Check method of DC fan motor (fan motor/indoor controller circuit board)

Notes:
- High voltage is applied to the connector (CNMF) for the fan motor. Pay attention to the service.
- Do not pull out the connector (CNMF) for the motor with the power supply on.
  (It causes trouble of the indoor controller circuit board and fan motor.)

Self check
Symptom: The indoor fan cannot turn around.

Wiring contact check
Contact of fan motor connector (CNMF)

Is there contact failure?
→ Yes → Wiring recovery

No

Power supply check (Remove the connector (CNMF))
Measure the voltage in the indoor controller circuit board.
TEST POINT ①: VCC (between 1 (+) and 3 (-) of the fan connector): VCC DC294~325V
TEST POINT ②: VCC (between 4 (+) and 3 (-) of the fan connector): VCC DC15V

Is the voltage normal?
→ No → Indoor controller board fuse check

Yes

Sensor signal check
Measure the voltage between CNMF ① and ② DC 0V and DC 15V in the indoor controller circuit board.

Does the voltage repeat DC 0V and DC 15V?
→ No → Replace indoor controller board

Yes

Replace the fan motor

 Indoor controller board fuse check

Is the fuse normal?
→ No → Replace the fuse

Yes

Check the operation → END

NG

Replace the fan motor

Replace the indoor controller board.

Check the operation → END

Replace the fan motor
### 7-2. Function of Dip switch

**PKFY-P24NKMU-E2.TH**  **PKFY-P30NKMU-E2.TH**

<table>
<thead>
<tr>
<th>Switch</th>
<th>Pole</th>
<th>Function</th>
<th>Operation by switch</th>
<th>Effective timing</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW1 Mode selection</td>
<td>1</td>
<td>Thermistor/Room temperature position</td>
<td>Built-in remote controller</td>
<td>Indoor unit</td>
<td><strong>Address board</strong></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Filter clogging detection</td>
<td>Provide</td>
<td>Not provide</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Filter cleaning sign</td>
<td>2,500 hr</td>
<td>100 hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Fresh air intake</td>
<td>Not effective</td>
<td>Not effective</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Switching remote controller display</td>
<td>Thermo ON signal indication</td>
<td>Fan output indication</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Humidifier control</td>
<td>Fan operation at Heating mode</td>
<td>Thermo ON operation at heating mode</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Air flow set in case of heat thermo OFF</td>
<td>Low #1</td>
<td>Extra low #1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Setting air flow</td>
<td>Depends on SW1-7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Auto restart function</td>
<td>Effective</td>
<td>Not effective</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Power ON/OFF by breaker</td>
<td>Effective</td>
<td>Not effective</td>
<td></td>
</tr>
</tbody>
</table>

#### Models

<table>
<thead>
<tr>
<th>Models</th>
<th>SW2</th>
</tr>
</thead>
<tbody>
<tr>
<td>P24</td>
<td>ON 1 2 3 4 5 6</td>
</tr>
<tr>
<td>P30</td>
<td>ON 1 2 3 4 5 6</td>
</tr>
</tbody>
</table>

#### SW3 Function selection

<table>
<thead>
<tr>
<th>Pole</th>
<th>Function</th>
<th>Operation by switch</th>
<th>Effective timing</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Heat pump/Cool only</td>
<td>Cooling only</td>
<td>Heat pump</td>
<td><strong>Indoor controller board</strong></td>
</tr>
<tr>
<td>2</td>
<td>Not used</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Not used</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Vane horizontal angle</td>
<td>Second setting #1</td>
<td>First setting</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Changing the opening of linear expansion valve during thermo OFF</td>
<td>Effective</td>
<td>Not effective</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Heating 4 degree up</td>
<td>Not effective</td>
<td>Effective</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Target superheat setting #2</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Target subcool #2</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

#### SW4 Model selection

<table>
<thead>
<tr>
<th>Pole</th>
<th>Function</th>
<th>Operation by switch</th>
<th>Effective timing</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>In case of replacing the indoor controller board, make sure to set the switch to the initial setting, which is shown below.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Before power supply ON**

#### SW1 Mode selection

- **Address board**
  - 1: Thermistor/Room temperature position
  - 2: Filter clogging detection
  - 3: Filter cleaning sign
  - 4: Fresh air intake
  - 5: Switching remote controller display
  - 6: Humidifier control
  - 7: Air flow set in case of heat thermo OFF
  - 8: Setting air flow
  - 9: Auto restart function
  - 10: Power ON/OFF by breaker

#### SW2 Capacity code switch

- **Models**
  - P24
    - ON 1 2 3 4 5 6
  - P30
    - ON 1 2 3 4 5 6

#### SW3 Function selection

- **Indoor controller board**
  - 1: Heat pump/Cool only
  - 2: Not used
  - 3: Not used
  - 4: Vane horizontal angle
  - 5: Changing the opening of linear expansion valve during thermo OFF
  - 6: Heating 4 degree up
  - 7: Target superheat setting
  - 8: Target subcool

#### SW4 Model selection

- **Indoor controller board**
  - 1-4: In case of replacing the indoor controller board, make sure to set the switch to the initial setting, which is shown below.
To operate each indoor unit by each remote controller when installed 2 indoor units or more are near, Pair No. setting is necessary. 
- Pair No. setting is available with the 4 patterns (Setting patterns A to D).
- Make setting for J41, J42 of indoor controller board and the Pair No. of wireless remote controller.
- You may not set it when operating it by one remote controller.

Setting for indoor unit:
Cut jumper wire J41, J42 on the indoor controller board according to the table below.

Wireless remote controller pair number:
1. Press the SET button (using a pointed implement). Check that the remote controller’s display has stopped before continuing.
2. Press the MINUTE button twice. The pair number appears flashing.
3. Press the temperature buttons to select the pair number to set.
4. Press the SET button (using a pointed implement). The set pair number is displayed (steadily-lit) for 3 seconds, then disappears.

### Setting operation
- To set the pair number:
  1. Press the SET button (using a pointed implement).
  2. Press the MINUTE button twice. The pair number appears flashing.
  3. Press the temperature buttons to select the pair number to set.
  4. Press the SET button (using a pointed implement). The set pair number is displayed (steadily-lit) for 3 seconds, then disappears.

<table>
<thead>
<tr>
<th>Setting pattern</th>
<th>Indoor controller jumper wire</th>
<th>Pair No. of wireless remote controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>—</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>Cut</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>—</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>Cut</td>
<td>3</td>
</tr>
</tbody>
</table>

* Pair No. 4-9 of wireless remote controller is setting pattern D.
7-3. TEST POINT DIAGRAM
7-3-1. Indoor controller board
PKFY-P24NKMU-E2.TH
PKFY-P30NKMU-E2.TH

CN2M
Connect to the terminal block (TB5)
(M-NE transmission connecting wire)
24-30VDC (non-polar)
Power supply from outdoor unit

CN3A
Connected to the terminal block (TB15)
(MA-Remote controller connecting wire)
1-3: 8.7-13V DC

CN20
Room temperature thermistor (TH21)

CN2A
Connected to the terminal block (TB15)
(MA-Remote controller connecting wire)
1-3: 8.7-13V DC

CN4
Pipe temperature thermistor
1-4: Liquid (TH22)
1-5: Gas1 (TH23)

CN44
Pipe temperature
thermistor Gas2 (TH24)

CN60
Linear expansion valve (LEV) output
12VDC pulse output
12VDC pulse output

CN42
External heater
12VDC

CN2G
Pipe temperature
thermistor Gas2 (TH24)

CN42
External heater
12VDC

CN2F
Connect to the fan motor (MF)
1-3: DC294-325V
1-4: DC15V
1-5: DC0-6V
1-6: DC0 or DC15V (Stop)
12VDC (Operation)

CND
Power supply for indoor controller board
1-3: 208/230VAC
3.15A 250V

FUSE
3.15A 250V

LED1
Main power supply
(Indoor unit: 208/230VAC)

CN151
Vane motor output
12VDC pulse

CNRU
Connect to the wireless remote controller board (W.B)

LDSWE(A)
Connect to the wireless remote controller board (S.B)

LD SWE (B)
Connect to the indoor controller board (L.B)

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7-3-2. Wireless remote controller board
PKFY-P24NKMU-E2.TH
PKFY-P30NKMU-E2.TH

7-3-3. Address board
PKFY-P24NKMU-E2.TH
PKFY-P30NKMU-E2.TH
1. REMOVING THE PANEL

(1) Press and unlock the knobs on both sides of the front grille and lift the front grille until it is level. Pull the hinges forward to remove the front grille. (See Photo 1)
(2) Remove 3 screw caps of the panel. Remove 5 screws. (See Photo 1)
(3) Unfix 3 hooks. (See Figure 1)
(4) Hold the lower part of both ends of the panel and pull it slightly toward you, and then remove the panel by pushing it upward.
(5) Remove the screw of the corner box. (See Photo 1) Remove the corner box.

2. REMOVING THE ADDRESS BOARD, THE INDOOR CONTROLLER BOARD AND THE WIRELESS CONTROLLER BOARD

(1) Remove the panel and the corner box. (Refer to procedure 1)
(2) Remove the screw and hook of address board case. (See Photo 2)
(3) Disconnect the connectors of address board.
(4) Remove the front and side electrical box covers (each 1 screw).
(5) Disconnect the connectors on the indoor controller board. (See Photo 3)
(6) Remove the switch board holder and open the cover.
(7) Pull out the indoor controller board toward you then remove the indoor controller board and switch board. (See Photo 3)
(8) Remove the holder of wireless remote controller board.
(9) Disconnect the connector of wireless remote controller board and remove the wireless remote controller board from the holder.
## OPERATION PROCEDURE

### 3. REMOVING THE ELECTRICAL BOX

1. Remove the panel and the corner box. (Refer to procedure 1)
2. Remove the screw and hook of address board case.
3. Remove the front and side electrical box covers (each 1 screw).
4. Remove the transmission wiring of TB5, the power supply wiring of TB2 and the wiring of MA-remote controller (TB15).
5. Disconnect the connectors on the indoor controller board.
6. Disconnect the connector for ground wire.
7. Remove the screw on lower side of the electrical box. (See Photo 5)
8. Push up the upper fixture catch to remove the box, then remove it from the box fixture.

### 4. REMOVING THE NOZZLE ASSEMBLY (with VANE and VANE MOTOR) AND DRAIN HOSE

1. Remove the panel and corner box. (Refer to procedure 1)
2. Remove the electrical box covers. (Refer to procedure 2)
3. Disconnect the vane motor connector (CN151) on the indoor controller board.
4. Pull out the drain hose from the nozzle assembly, and remove nozzle assembly. (See Photo 5)

### 5. REMOVING THE VANE MOTOR

1. Remove the nozzle assembly. (Refer to procedure 4)
2. Remove 2 screws of the vane motor unit cover, and pull out the vane motor unit.
3. Remove 2 screws of the vane motor unit.
4. Remove the vane motor from the vane motor unit.
5. Disconnect the connector from the vane motor.

---

### PHOTOS

#### Photo 4
- Connect for ground
- Fixture
- Electrical box

#### Photo 5
- Nozzle assembly
- Vane motor
- Drain hose
- Screw of electrical box

#### Photo 6
- Screws of the vane motor unit
- Screws of the vane motor unit cover
6. REMOVING THE INDOOR FAN MOTOR AND THE LINE FLOW FAN

(1) Remove the panel and the corner box. (Refer to procedure 1)
(2) Remove the electrical box (Refer to procedure 2) and the nozzle assembly (Refer to procedure 3).
(3) Remove the water cut. (See Photo 2)
(4) Remove the screw fixing the line flow fan. (See Photo 8)
(5) Remove the screw fixing the motor bed. (See Photo 7)
(6) Remove the lead wire of pipe thermistor from the hook of motor bed. (See Photo 7)
(7) Remove the screw fixing motor band. (See Photo 7)
(8) Remove the motor bed together with fan motor and motor band.
(9) Remove 3 screws fixing the left side of the heat exchanger. (See Photo 9)
(10) Lift the heat exchanger, and pull out the line flow fan to the lower-left.

7. REMOVING THE LIQUID PIPE THERMISTOR AND GAS PIPE THERMISTOR

(1) Remove the panel and the corner box. (Refer to procedure 1)
(2) Remove the electrical box covers. (Refer to procedure 2)
(3) Remove the water cut. (See Photo 2)
(4) Remove the liquid pipe thermistor and gas pipe thermistors.
(5) Disconnect the connector (CN44) (CN2G) on the indoor controller board. (TH22 and TH23/CN44, TH24/CN2G)
8. REMOVING THE HEAT EXCHANGER AND LEV

<table>
<thead>
<tr>
<th>OPERATION PROCEDURE</th>
<th>PHOTOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove the panel and the corner box. (Refer to procedure 1)</td>
<td>Photo 11</td>
</tr>
<tr>
<td>(2) Remove the electrical box (Refer to procedure 3) and the nozzle assembly (Refer to procedure 4).</td>
<td>Heat exchanger</td>
</tr>
<tr>
<td>(3) Remove the water cut.</td>
<td>Water cut</td>
</tr>
<tr>
<td>(4) Remove the pipe thermistors (Refer to procedure 7).</td>
<td>LEV</td>
</tr>
<tr>
<td>(5) Disconnect the connector (CN60) on the indoor controller board and the connector for ground wire.</td>
<td>Connect for ground</td>
</tr>
<tr>
<td>(6) Remove 3 screws fixing the left side of the heat exchanger. (See Photo 9)</td>
<td>Heat exchanger</td>
</tr>
<tr>
<td>(7) Remove the heat exchanger with LEV.</td>
<td>LEV</td>
</tr>
</tbody>
</table>

9. REMOVING THE ROOM TEMPERATURE THERMISTOR

<table>
<thead>
<tr>
<th>OPERATION PROCEDURE</th>
<th>PHOTOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Remove the panel and corner box. (Refer to procedure 1)</td>
<td>Photo 13</td>
</tr>
<tr>
<td>(2) Remove the electrical box covers.</td>
<td>Indoor controller board</td>
</tr>
<tr>
<td>(3) Remove the room temperature thermistor.</td>
<td>Room temp. thermistor (TH21)</td>
</tr>
<tr>
<td>(4) Disconnect the connector (CN20) on the indoor controller board.</td>
<td></td>
</tr>
</tbody>
</table>