Engineering Data

VRV III

Installation
Installation of Outdoor Units

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1. Center of Gravity

1.1 460V

REMQ72PBYD

REMQ96PBYD / REMQ120PBYD
REYQ72PBYD / REYQ96PBYD / REYQ120PBYD
1.2 208/230V

REMQ72PBTJ

REMQ96PBTJ / REMQ120PBTJ
RXYQ144PBTJ / REYQ144PBTJ

REYQ72PBTJ / REYQ96PBTJ / REYQ120PBTJ
2. Foundation Drawing

- **460V**
  RXYQ72PBVD / RXYQ96PBVD / RXYQ120PBVD
  REYQ72PBVD / REYQ96PBVD / REYQ120PBVD
  REMQ72PBVD / REMQ96PBVD / REMQ120PBVD

- **208/230V**
  RXYQ72PBTJ / RXYQ96PBTJ / RXYQ120PBTJ / RXYQ144PBTJ
  REYQ72PBTJ / REYQ96PBTJ / REYQ120PBTJ / REYQ144PBTJ
  REMQ72PBTJ / REMQ96PBTJ / REMQ120PBTJ

**Notes:**
1. The proportions of concrete foundation for soil concrete shall be 1:2:4 and the reinforcement bars that their diameter are 3/8in. (Approx. 1-3/4in. interval) shall be placed.
2. The surface shall be finished with wet, the corner edges shall be chamfered.
3. When the foundation is built on a concrete floor, the surface of the section on which the foundation is built shall have head finish.
4. A drain ditch shall be made around the foundation to thoroughly drain water from the equipment installation area.
5. When installing the equipment on a roof, the floor strength shall be checked and water-proofing measures shall be taken.

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>RXYQ72PBVD</td>
<td>3A</td>
<td>3/16</td>
</tr>
<tr>
<td>RXYQ96PBVD</td>
<td>3A</td>
<td>3/16</td>
</tr>
<tr>
<td>REMQ72PBVD</td>
<td>3B</td>
<td>3/16</td>
</tr>
<tr>
<td>REMQ96PBVD</td>
<td>3B</td>
<td>3/16</td>
</tr>
<tr>
<td>RXYQ72PBTJ</td>
<td>40G</td>
<td>3/4</td>
</tr>
<tr>
<td>RXYQ96PBTJ</td>
<td>40G</td>
<td>3/4</td>
</tr>
<tr>
<td>REMQ72PBTJ</td>
<td>40G</td>
<td>3/4</td>
</tr>
</tbody>
</table>

3D058655B
3. REFNET Pipe System

3.1 Layout Example

3.1.1 Heat Pump System

Use of the particular branch fitting appropriate to each individual unit type not only permits the pipes to be laid with ease but also increases the reliability of the system as a whole.

<table>
<thead>
<tr>
<th>Type of fitting</th>
<th>Sample systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line branch fitting (Pipes containing REFNET joints only)</td>
<td></td>
</tr>
<tr>
<td>Header branch fitting (Piping consists of REFNET headers only)</td>
<td></td>
</tr>
<tr>
<td>Mixed branch fittings (Piping including both headers and joints)</td>
<td></td>
</tr>
</tbody>
</table>

Units can be added by connecting them directly to the REFNET header or REFNET joint. Further branches cannot be included in the system below the REFNET header branch.

NOTES:

1. When the capacity ratio of the indoor system to the outdoor unit is more than 100% and when all the indoor units are in operation at the same time, the rated capacity of each unit will be somewhat reduced.

2. Special purpose REFNET pipe components must be used for all the pipe work. For further details concerning choosing components, see **VRVIII REFNET and Piping Selection Rules**.

3. The Daikin REFNET kits are supplied with insulation intended to fit over the main body of the REFNET joint after installation of the REFNET kit is complete.

4. **IMPORTANT**: In applications where the REFNET kits are installed in an environment requiring fire-rated materials to be used, it is necessary for the installer to obtain from a third party supplier and to utilize, for insulation, fire-rated materials that meet all applicable building codes and other requirements. The factory-provided insulation that is supplied with the REFNET kit should be discarded in a manner meeting all applicable laws.
### 3.1.2 Heat Recovery System

Use of the particular branch fitting appropriate to each individual unit type not only permits the pipes to be laid with ease but also increases the reliability of the system as a whole.

<table>
<thead>
<tr>
<th>Type of fitting</th>
<th>Sample systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution by REFNET joints</td>
<td><img src="image1" alt="Diagram" /></td>
</tr>
<tr>
<td>Distribution by REFNET header</td>
<td><img src="image2" alt="Diagram" /></td>
</tr>
<tr>
<td>Combination of REFNET joints and headers</td>
<td><img src="image3" alt="Diagram" /></td>
</tr>
</tbody>
</table>

Units can be added by connecting them directly to the REFNET header or REFNET joint. Further branches cannot be included in the system below the REFNET header branch.

**NOTES:**

1. When the capacity ratio of the indoor system to the outdoor unit is more than 100% and when all the indoor units are in operation at the same time, the rated capacity of each unit will be somewhat reduced.
2. Special purpose REFNET pipe components must be used for all the pipe work. For further details concerning choosing components, see *VRVIII REFNET and Piping Selection Rules*.
3. The Daikin REFNET kits are supplied with insulation intended to fit over the main body of the REFNET joint after installation of the REFNET kit is complete.
4. **IMPORTANT:** In applications where the REFNET kits are installed in an environment requiring fire-rated materials to be used, it is necessary for the installer to obtain from a third party supplier and to utilize, for insulation, fire-rated materials that meet all applicable building codes and other requirements. The factory-provided insulation that is supplied with the REFNET kit should be discarded in a manner meeting all applicable laws.
3.2 Field Refrigerant Piping

3.2.1 Heat Pump Series

1. The following materials should be used for all refrigerant piping.
   - Materials: Deoxidized phosphorous seamless copper pipe or equivalent

2. The tips for insulation
   - Both Gas, Liquid piping must be insulated.
   - Materials: Glass fiber or heat resistant polyethylene foam.
     - Thickness: 1/2 inch or more

   - Insulation of both liquid and gas pipe

3.2.2 Heat Recovery Series

   - Suction, Discharge Gas piping, liquid piping must be insulated.
   - Example of thermal insulation work.

   - 3 piping section (between outdoor unit and Branch Selector unit)
   - 2 piping section (between Branch Selector unit and indoor unit)
3.3 REFNET Joints and Headers

3.3.1 REFNET Joints
For gas and liquid branch pipes

- Make sure that all branch pipes are fitted such that they branch either horizontally or vertically.

- When the size of the selected field piping is different from that of branch pipe then the connecting section should be cut with a pipe cutter as shown in the figure below.

- When you are cutting an inlet or outlet pipe with a pipe cutter make sure that you make the cut in the center of the connection area.

- Branch pipes must be insulated in accordance with the handbook which comes with each kit.

3.3.2 REFNET Header

Gas branch pipes

Liquid branch pipes
When the number of indoor units to be connected to the branch pipes is less than the number of branch pipes available for connection then cap pipes should be fitted to the surplus branches.

When the size of the selected field piping is different from that of branch pipe then the connecting section should be cut with a pipe cutter as shown in the figure below.

When field piping is connected to the B section of the inlet/outlet pipe on the outdoor unit side of the liquid pipe header.
- Cut the B section with a pipe cutter as shown below and connect it to the A section.
- Connect the flared section of the field pipe to the B section.

Fit the branch pipe so that the branch lies in a horizontal plane.

The branch pipe must be insulated in accordance with the instruction manual which comes with each kit.
1. Use the insulator included in the kit to insulate the header.
2. Joints between insulators included in the kit and those already applied to the field piping should be sealed with the tape which is also included in each kit.
3. Any cap pipes should also be insulated using the insulator provided with each kit and then taped as described above.
4. REFNET Pipe System

4.1 REFNET Joint (Branch Kit)

RXYQ72–360PBYD (460V)
RXYQ72–360PBTJ (208/230V)
KHRP26A22T

KHRP26A33T

KHRP26M72TU
REYQ72-336PBYD (460V)
REYQ72-336PBTJ (208/230V)
KHRP25A22T

Suction gas side

Discharge gas side

Liquid side

KHRP25A33T

Suction gas side

Discharge gas side

Liquid side

(unit: in)
4.2 REFNET Header (Branch Kit)

RXYQ72~360PBYD (460V)
RXYQ72~360PBTJ (208/230V)

KHRP26M22H

KHRP26M33H

KHRP26M72H
KHRP26M73HU

Gas Side Header
- I.D. 1-3/8
- I.D. 5/8

Liquid Side Header
- I.D. 3/4
- O.D. 3/4
- I.D. 7/8

Thermal Insulation

Installation of Outdoor Units
4.3 Outdoor Unit Multi Connection Piping Kit

RXYQ144–240PBYD (460V)
RXYQ168–240PBTJ (208/230V)
BHFP22P100U

INSTALLATION MANUAL

INSULATION MATERIAL FOR LIQUID-SIDE PIPE : 1
INSULATION MATERIAL FOR GAS-SIDE PIPE : 1
INSULATION MATERIAL FOR LIQUID-SIDE JOINT : 1
INSULATION MATERIAL FOR GAS-SIDE JOINT : 1
LIQUID-SIDE REDUCER (5) : 1
LIQUID-SIDE REDUCER (3) : 1
LIQUID-SIDE REDUCER (1) : 1
GAS-SIDE REDUCER (9) : 1
GAS-SIDE REDUCER (7) : 1
GAS-SIDE REDUCER (3) : 1
GAS-SIDE REDUCER (2) : 1
GAS-SIDE REDUCER (1) : 1
LIQUID-SIDE JOINT : 1
GAS-SIDE JOINT : 1

NOTE)
1. “- - - -” in the figure show field supply piping.
2. About size of connection pipe refer the “engineering data of VRV III”.
3. In case of install this kit observe follow conditions.
   - Do not fill the joint more than ±15˚.
   - Install the joint horizontally so that the caution label attached to joint comes to the top.
   - Do not install the joint vertically why it may cause the malfunction of outdoor unit.
   - Make sure the piping up to the joint is straight for more than 19-11/16in.
   - Do not bend the field piping within this range. If a straight field piping more than 4-3/4in is connected, more than 19-11/16in of straight section can be ensured.

View 1
View 2 X
View 3

Layout Drawing (Upper-Side)

NOTE)
1. “- - - -” in the figure show field supply piping.
2. About size of connection pipe refer the “engineering data of VRV III”.
3. In case of install this kit observe follow conditions.
   - Make sure the piping up to the joint is straight for more than 19-11/16in.
   - Do not install the joint horizontally so that the caution label attached to joint comes to the top.
   - Install the joint vertically why it may cause the malfunction of outdoor unit.
   - Make sure the piping up to the joint is straight for more than 19-11/16in. Do not bend the field piping within this range. If a straight field piping more than 4-3/4in is connected, more than 19-11/16in of straight section can be ensured.
For RXYQ-PBYD/TJ Models

VRV III Series

Outdoor unit Multi Connection Piping Kit Installation Manual

Component Parts

<table>
<thead>
<tr>
<th>Component</th>
<th>Gas-side joint</th>
<th>Liquid-side joint</th>
<th>Gas-side reducer</th>
<th>Liquid-side reducer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>(1)</td>
<td>(2)</td>
<td>(1)</td>
<td>(2)</td>
</tr>
</tbody>
</table>

To the piping installer

When installing this kit, please apply the following restrictions:

- Do not exceed the distance limit for each connection pipe length specified in this manual.
- Use a pipe cutter for cutting the pipes. Ensure that the internal diameter of the reducer is 3/8", or more.
- Ensure that the internal diameter of the liquid-side joint is 3/8", or more.
- Install only the reducer in order to maintain the connection point specified in this manual.

Connecting pipe sizes and location of the joint

- For the correct measurement of the connection point, use the diagram shown in this manual.

Cutting procedure

- Use a pipe cutter for cutting.
- Set the joint and reducer in order to maintain the connection point specified in this manual.

When reducer is used

- Gas-side reducer(E)
- Liquid-side reducer(F)
- Gas-side reducer(E)
- Liquid-side reducer(F)

Selection Procedure

- Use the correct reducer and joint to ensure the correct connection point.

Field Supply Parts

For RXYQ-PBYD/TJ Models

Installation of Outdoor Units 23
Installation examples

Procedure for Lower Front Connection

1-1 Exterior view

- Set pipe 1 (field supply)
- Field support
- Pipe-side support
- Field support
- To indoor unit

1-2 Finished dimensions

- A standard installation has the following dimensions:
- When the dimensions exceed the standard installation, extend the field pipe between the condenser unit and the.TIME closure in the pipe.

2-1 Cutting the field supply gas pipe 1 to 4

- Cut the pipe according to Table 1.
- Cut the pipe in accordance with Fig. 2 in Table 2.

2-2 Connection of pipes

- Connect the gas and liquid pipes as shown in the figure at the right.

Table 1

<table>
<thead>
<tr>
<th>Model Type</th>
<th>1-1/8</th>
<th>1-3/8</th>
<th>1-5/8</th>
<th>2-1/8</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-20P</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>2-25P</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

The work after the kit is connected

Connection of piping between the condenser unit and the indoor unit

Air tight test

1. Fit the insulation tube to the reducer and temporarily keep it in place with tape.
2. Put the insulating tube along the side, (see the figure at the right)
3. Put it to the field and temporarily keep it in place with tape.
4. Cut the pipe between the insulation tube and the field supply pipe insulation.
5. With the field supply pipe.
6. When the tape around the insulating tube attached to the joint without leaving a gap.

Connection of gas and liquid pipes

1. Cut the pipe in accordance with Fig. 2 in Table 2.
2. Connect the gas and liquid pipes as shown in the figure at the right.

Installation of Outdoor Units
1. Installation examples

**Procedure for Bottom Connection**

**Caution:** This installation is only possible if there is enough space to perform brazing and racking underneath the outdoor unit. If the central drain pipe kit and/or suction return pipe kit are used, the dimensions marked with "x" in the figure below will vary. See the table below and determine the length of the field pipe.

### 1-1 Exterior View

#### 2-1 Cutting the field supply gas pipe 1 and 2, and the Gas-side accessory pipe(3) attached to the outdoor unit

Cut the pipe according to Table 4 or 5.

**Table 4** - A side

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions</th>
<th>Gas pipe 1/2 gas pipe 2</th>
<th>Gas pipe 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>72P</td>
<td>4</td>
<td>2-1/2</td>
<td>1-7/8</td>
</tr>
<tr>
<td>60P</td>
<td>2-13/16</td>
<td>1-5/16</td>
<td>1</td>
</tr>
<tr>
<td>120P</td>
<td>0</td>
<td>2-1/16</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 5** - B side

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions</th>
<th>Gas pipe 1/2 gas pipe 2</th>
<th>Gas pipe 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>72P</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60P</td>
<td>11/16</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>120P</td>
<td>1-1/4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### 2-2 Connection of Pipes

- Before the last two pipes in the network frame, (use the installation manual attached to the outdoor unit)
- Connect the outdoor unit and the pipe at the network frame, which connects the pipes.

**Note:** If the liquid side reduction is not used, the piping shall be according to the piping shown in the figure. (See the view A)

**Table 6** - A side

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions</th>
<th>Mains</th>
<th>Gas pipe 1/2 gas pipe 2</th>
<th>Gas pipe 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>72P</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60P</td>
<td>11/16</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>120P</td>
<td>1-1/4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 7** - B side

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions</th>
<th>Mains</th>
<th>Gas pipe 1/2 gas pipe 2</th>
<th>Gas pipe 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>72P</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60P</td>
<td>11/16</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>120P</td>
<td>1-1/4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### 3-1 The work after the kit is connected

**Connection of pipes between the outdoor unit and the indoor unit**

#### Air tight test

**Insulation of pipes**

1. Lay the insulation tube on the outdoor and connect the tubes. Keep in place with tape.
2. Fix the insulation tube along the pipe. (See the figure in the right)
3. Cut off the excess length and connect the tubes with the field supply piping insulation with the field supply pipe.
4. Wrap the tape around the insulation tube attached to the joint without leaving a gap. (See the figure in the right)

---

1P2187220
RXYQ264-360PBYD (460V)
RXYQ264-360PBTJ (208/230V)
BHFP22P151U

Installation of Outdoor Units

NOTE: "---" in the figure shows field supply piping.
1. Adjust size of connection pipe after verifying the engineering data of REFNET.
2. When installing the joint, observe the following conditions.
   - Ensure the joint is more than 25m from the junction box.
   - Do not bend the field piping within this range. If a straight field piping more than 25m in connected, more than 20m of straight section can be ensured.
REYQ144–240PBYD (460V)
REYQ168–240PBTJ (208/230V)
BHFP26P90U

30 Installation of Outdoor Units

SUCTION GAS-SIDE REDUCER (1)

SUCTION GAS-SIDE JOINT + SUCTION GAS-SIDE REDUCER (1)

SUCTION GAS-SIDE REDUCER (2) (Ø 1-1/4)

LIQUID-SIDE JOINT + LIQUID-SIDE REDUCER (1)

CAUTION:
- SUCTION GAS-SIDE JOINT : 1
- LIQUID-SIDE JOINT : 1
- SUCTION GAS-SIDE REDUCER (1) : 1
- SUCTION GAS-SIDE REDUCER (2) : 1
- LIQUID-SIDE REDUCER (1) : 1
- LIQUID-SIDE REDUCER (2) : 1
- INSULATION MATERIAL FOR SUCTION GAS-SIDE PIPE : 1
- INSULATION MATERIAL FOR LIQUID-SIDE PIPE : 1
- INSTALLATION MANUAL

NOTE:
1. "- - - -" in the figure show field supply piping.
2. About size of connection pipe refer to the "engineering data of VRV III R".
3. In case of install this kit observe follow conditions.
   - Do not tilt the joint more than ±15˚.
   - If a straight field piping more than 4-3/4in is connected, more than 19-11/16in of straight section can be ensured. (See the view 3)

- Make sure the piping up to the joint is straight for more than 19-11/16in.
- Do not install the joint vertically why it may cause the malfunction of outdoor unit. (See the view 2)
- Do not bend the field piping within this range. If a straight field piping more than 4-3/4in is connected, more than 19-11/16in of straight section can be ensured. (See the view 3)
Local Brazing

HP/LP GAS-SIDE RECURER (1) (2)

- Installing outdoor units 31
- HP/LP GAS-SIDE JOINT + HP/LP GAS-SIDE REDUCER (1) (2)
- Caution Label
- Arrow View A
- Arrow View B
- View 1
- View 2
- View 3

NOTE: 1. "- - - -" in the figure show field supply piping.
2. About size of connection pipe refer the "engineering data of VRV III R'.
3. In case of install this kit observe follow conditions.
   - Do not tilt the joint more than ±15˚.
   - Install the joint horizontally so that the caution label attached to joint comes to the top. (See the view 1)
   - Do not install the joint vertically why it may cause the malfunction of outdoor unit. (See the view 2)
   - Make sure the piping up to the joint is straight for more than 19-11/16in. Do not bend the field piping within this range.

4. If a straight field piping more than 4-3/4in is connected, more than 19-11/16in of straight section can be ensured. (See the view 3)

Ab
Installation of Outdoor Units
Installation of Outdoor Units
Installation of Outdoor Units
Procedure for Bottom Connection

Connect the field supply suction main pipe and HP/LP main side pipe and the suction main pipe accessory pipes) connected to the outdoor unit.

1. **Connection of Liquid-side and Evaporator Pipes**
   - Ensure the pipes are properly connected and secured.
   - Use appropriate fittings for secure connection.

2. **Connection of Pipes**
   - Connect the pipes according to the diagram.
   - Use proper connectors and gaskets for airtight connections.

3. **Installation of Outdoor Units**
   - Ensure all units are properly installed and secured.
   - Follow the manufacturer's instructions for proper installation.

4. **The Work After the Unit is Connected**
   - Check for any leaks or malfunctions.
   - Ensure all connections are tight and secure.

Note: Follow all safety guidelines and manufacturer's instructions for proper installation and operation.
5. Installation

5.1 RXYQ72~360PBYD (Heat Pump, 460V)
RXYQ72~360PBTJ (Heat Pump, 208/230V)
1. **Safety Considerations**

1-1 Safety considerations for Installation

Read these SAFETY CONSIDERATIONS for Installation carefully before installing an air conditioner or heat pump. After completing the installation, make sure that the unit operates properly during the startup operation. Instruct the customer on how to operate and maintain the unit. Inform customers that they should store this Installation Manual with the Operation Manual for future reference.

Always use a licensed installer or contractor to install this product. Improper installation can result in water or refrigerant leakage, electrical shock, fire, or explosion.

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

- **DANGER** ............. Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING** ............. Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION** ............. Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
- **NOTE** .............. Indicates situations that may result in equipment or property-damage accidents only.

---

**DANGER**

- Refrigerant gas is heavier than air and replaces oxygen. A massive leak can lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death.
- Do not ground units to water pipes, gas pipes, telephone wires, or lightning rods as incomplete grounding can cause a severe shock hazard resulting in severe injury or death. Additionally, grounding to gas pipes could cause a gas leak and potential explosion causing severe injury or death.
- If refrigerant gas leaks during installation, ventilate the area immediately. Refrigerant gas may produce toxic gas if it comes into contact with fire. Exposure to this gas could cause severe injury or death.
- After completing the installation work, check that the refrigerant gas does not leak throughout the system.
- Do not install unit in an area where flammable materials are present due to risk of explosions that can cause serious injury or death.
- Safely dispose all packing and transportation materials in accordance with federal/state/local laws or ordinances. Packing materials such as nails and other metal or wood parts, including plastic packing materials used for transportation may cause injuries or death by suffocation.

---

**WARNING**

- Only qualified personnel must carry out the installation work. Installation must be done in accordance with this installation manual. Improper installation may result in water leakage, electric shock, or fire.
- When installing the unit in a small room, take measures to keep the refrigerant concentration from exceeding allowable safety limits. Excessive refrigerant leaks, in the event of an accident in a closed ambient space, can lead to oxygen deficiency.
- Use only specified accessories and parts for installation work. Failure to use specified parts may result in water leakage, electric shocks, fire, or the unit falling.
- Install the air conditioner or heat pump on a foundation strong enough that it can withstand the weight of the unit. A foundation of insufficient strength may result in the unit falling and causing injuries.
- Take into account strong winds, typhoons, or earthquakes when installing. Improper installation may result in the unit falling and causing accidents.
- Make sure that a separate power supply circuit is provided for this unit and that all electrical work is carried out by qualified personnel according to local, state, and national regulations. An insufficient power supply capacity or improper electrical construction may lead to electric shocks or fire.
- Make sure that all wiring is secured, that specified wires are used, and that no external forces act on the terminal connections or wires. Improper connections or installation may result in fire.
- When wiring, position the wires so that the terminal box lid can be securely fastened. Improper positioning of the terminal box lid may result in electric shocks, fire, or the terminals overheating.
- Before touching electrical parts, turn off the unit.
- Securely fasten the outside unit terminal cover (panel). If the terminal cover/panel is not installed properly, dust or water may enter the outside unit causing fire or electric shock.
- When installing or relocating the system, keep the refrigerant circuit free from substances other than the specified refrigerant (R-410A) such as air. Any presence of air or other foreign substance in the refrigerant circuit can cause an abnormal pressure rise or rupture, resulting in injury.
- Do not change the setting of the protection devices. If the pressure switch, thermal switch, or other protection device is shorted and operated forcibly, or
parts other than those specified by Daikin are used, fire or explosion may occur.

--- CAUTION ---

- Do not touch the switch with wet fingers.Touching a switch with wet fingers can cause electric shock.
- Do not allow children to play on or around the unit to prevent injury.
- Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frostbite if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touch them, be sure to wear proper gloves.
- Do not use a charging cylinder. Using a charging cylinder may cause the refrigerant to deteriorate.
- Refrigerant R-410A in the system must be kept clean, dry, and tight.

(a) Clean and Dry -- Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting into the system.

(b) Tight -- R-410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth’s protection against harmful ultraviolet radiation. R-410A can contribute to the greenhouse effect if it is released. Therefore take proper measures to check for the tightness of the refrigerant piping installation. Read the chapter Refrigerant Piping and follow the procedures.

- Since R-410A is a blend, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition can change and the system will not work properly.
- The indoor unit is for R-410A. See the catalog for indoor models that can be connected. Normal operation is not possible when connected to other units.
- Remote controller (wireless kit) transmitting distance can be shorter than expected in rooms with electronic fluorescent lamps (inverter or rapid start types). Install the indoor unit far away from fluorescent lamps as much as possible.

- Indoor units are for indoor installation only. Outdoor units can be installed either outdoors or indoors. This unit is for indoor use.
- Do not install the air conditioner or heat pump in the following locations:
  (a) Where a mineral oil mist or oil spray or vapor is produced, for example, in a kitchen. Plastic parts may deteriorate and fall off or result in water leakage.
  (b) Where corrosive gas, such as sulfurous acid gas, is produced. Corroding copper pipes or soldered parts may result in refrigerant leakage.
  (c) Near machinery emitting electromagnetic waves. Electromagnetic waves may disturb the operation of the control system and cause the unit to malfunction.
  (d) Where flammable gas may leak, where there is carbon fiber, or ignitable dust suspension in the air, or where volatile flammables such as thinner or gasoline are handled. Operating the unit in such conditions can cause a fire.

- Take adequate measures to prevent the outside unit from being used as a shelter by small animals. Small animals making contact with electrical parts can cause malfunctions, smoke, or fire. Instruct the customer to keep the area around the unit clean.

--- NOTE ---

- Install the power supply and control wires for the indoor and outdoor units at least 3.5 feet away from televisions or radios to prevent image interference or noise. Depending on the radio waves, a distance of 3.5 feet may not be sufficient to eliminate the noise.
- Dismantling the unit, treatment of the refrigerant, oil and additional parts must be done in accordance with the relevant local, state, and national regulations.
- Do not use the following tools that are used with conventional refrigerants: gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, vacuum gauge, or refrigerant recovery equipment.
- If the conventional refrigerant and refrigerator oil are mixed in R-410A, the refrigerant may deteriorate.
- This air conditioner or heat pump is an appliance that should not be accessible to the general public.
As design pressure is 478 psi, the wall thickness of field-installed pipes should be selected in accordance with the relevant local, state, and national regulations.

1-2 Special notice of product

[CLASSIFICATION]
This air conditioner comes under the term "appliances not accessible to the general public".

[REFRIGERANT]
VRVIII System use R410A refrigerant.

- The refrigerant R410A requires strict cautions for keeping the system clean, dry and tight.
  Read the chapter "REFRIGERANT PIPING" carefully and follow these procedures correctly.
  A. Clean and dry
     Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting mixed into the system.
  B. Tight
     Take care to keep the system tight when installing.
     R410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth’s protection against harmful ultraviolet radiation.
     R410A can contribute slightly to the greenhouse effect if it is released.

- Since R410A is a mixed refrigerant, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition changes and the system will not work properly.

[DESIGN PRESSURE]
Since design pressure is 478 psi, the wall thickness of pipes should be more carefully selected in accordance with the relevant local and national regulations.

1-3 Disposal requirements

Dismantling of the unit, treatment of the refrigerant, oil and eventual other parts, should be done in accordance with the relevant local and national regulations.

2. INTRODUCTION

- RXYQ-P series are designed for outdoor installation and used for cooling and heating applications.
- The indoor units that combined with RXYQ-P system for air conditioning are Daikin VRV series indoor units that compatible with R410A. To learn which indoor units are compatible with R410A, refer to the product catalogs. To combine with other refrigerant indoor unit will cause malfunction.

2-1 Combination

The system name and that independent units are as follows.

(The system name) (Independent units)  
RXYQ72PBYD/PBTJ.....36 ~ 93  
RXYQ96PBYD/PBTJ.....48 ~ 124  
RXYQ120PBYD/PBTJ....60 ~ 156  
RXYQ144PBYD/PBTJ....72 ~ 187  
RXYQ168PBYD/PBTJ....84 ~ 218  
RXYQ192PBYD/PBTJ....96 ~ 249  
RXYQ216PBYD/PBTJ...108 ~ 280  
RXYQ240PBYD/PBTJ...120 ~ 312  
RXYQ264PBYD/PBTJ...132 ~ 343  
RXYQ288PBYD/PBTJ...144 ~ 374  
RXYQ312PBYD/PBTJ...156 ~ 405  
RXYQ336PBYD/PBTJ...168 ~ 436  
RXYQ360PBYD/PBTJ...180 ~ 468

- For installing the 2 or 3 units multi system, Outdoor unit multi connection piping kit is are required. See "2-3 Option accessory"
- If the total capacity of the connected indoor units exceeds the capacity of the outdoor unit, cooling and heating performance may drop when running the indoor units. See the capacity table in the Engineering Data Book for details.

2-2 Standard supplied accessories

Confirm the following accessories are included. The storage location of the accessories is shown in figure 1.

NOTE

Do not throw away any of the accessories until installation is complete. They are needed for installation work.
3. SELECTION OF LOCATION

Select a location for installation that meets the following conditions and get the customer's permission.

1. Select the location of the unit in such a way that neither the discharged air nor the sound generated by the unit disturb anyone.
2. The foundation is strong enough to support the weight of the unit and the floor is flat to prevent vibration and noise generation.
3. The piping length between the outdoor unit and the indoor unit may not exceed the allowable piping length.

4. Locations where the unit's suction vent and outlet vent do not generally face the wind.

5. The space around the unit is adequate for servicing and the minimum space for air inlet and air outlet is available.

(Refer to “6. REFRIGERANT PIPING”)

4. INSPECTING AND HANDLING THE UNIT

- If the number of units installed is more than that shown in the pattern in figure 2, install the units so there are no short circuits.
- As regards space in front of the unit, consider the space needed for the local refrigerant piping when installing the units.
- If the work conditions in figure 2 do not apply, contact your dealer or Daikin directly.

(Refer to figure 2)

1. Front side
2. No limit to wall height
3. Service space of front side
4. Service space of suction side

For Patterns 1 and 2 in figure 2:
- Wall height for front side – no higher than 59 in.
- Wall height on the suction side – no higher than 19-5/8 in.
- Wall height for sides – no limit.
- If the height is exceeded above, calculate h1 and h2 shown in the figure below, and add h2/2 to the service space of front side and h1/2 to the service space of suction side.

- Do not install unit in an area where flammable materials are present due to risk of explosion resulting in serious injury or death.
- Refrigerant gas in heavier air and replaces oxygen. A massive leak could lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death.

Refer to the chapter “CAUTION FOR REFRIGERANT LEAKS”.

NOTE

1. An inverter air conditioner may cause electronic noise generated from AM broadcasting. Examine where to install the main air conditioner and electric wires, keeping proper distances away from stereo equipment, personal computers, etc. Particularly for locations with weak reception, ensure there is a distance of at least 10 ft for indoor remote controllers, place power wiring and transmission wiring in conduits, and ground the conduits.

(Refer to figure 3)
1. Indoor unit
2. Branch switch, overcurrent breaker
3. Remote controller
4. COOL/HEAT selector
5. Personal computer or radio

2. When installing in locations where there is heavy snowfall, implement the following snow measures.
- Ensure the base is high enough that intakes are not clogged by snow.
- Remove the rear intake grille to prevent snow from accumulating on the fins.

Installation of Outdoor Units
4. If hanging the unit, use a cloth sling to prevent damaging the unit. Keeping the following points in mind, hang the unit following the procedure shown in figure 5.
   - Use a sling sufficiently strong to hold the mass of the unit.
   - Use 2 belts of at least 27 ft long.
   - Place extra cloth or boards in the locations where the casing comes in contact with the sling to prevent damage.
   - Hoist the unit making sure it is being lifted at its center of gravity.

5. After installation, remove the transportation brackets (yellow) attached to the large openings. (Refer to figure 4)
   - Packaging material
   - Forklift
   - Removal of shipping brackets
   - Shipping bracket (Remove the brackets by pushing the hook.)

5. PLACING THE UNIT

   • Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise. (Refer to figure 6)
   • The base should support the unit with the extent larger than the hatched area in figure 7. If protective rubber is to be attached, attach it to the whole face of the base.
   • The height of the base should be at least 5-7/8 in. from the floor.
   • Secure the unit to its base using foundation bolts. (Use four commercially available M12-type foundation bolts, nuts, and washers.)
   • The foundation bolts should be inserted 13/16 in.

   (Refer to figure 6)
   1. Independent base (four corner type)
   2. Independent base (with center support type)
   3. Beam base (Horizontal)
   4. Beam base (Vertical)
   5. Center of the product

   (Refer to figure 7)
   1. Foundation bolt point (ø9/16 in. dia., : 4 positions)
   2. (Depth of product)
   3. (Inner dimension of the base)
   4. (Outer dimension of the base)

<table>
<thead>
<tr>
<th>Model</th>
<th>A (in.)</th>
<th>B (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72P type</td>
<td>36-5/8</td>
<td>31-3/16</td>
</tr>
<tr>
<td>96 - 120P type</td>
<td>48-13/16</td>
<td>43-3/8</td>
</tr>
<tr>
<td>RXYQ144PBTJ</td>
<td>51-1/4</td>
<td>45-3/4</td>
</tr>
</tbody>
</table>

**NOTE**
- There are restrictions on the refrigerant pipe connecting order between outdoor unit in the case of the multi system. See “2-1 Combination” for detail.
- When installing on a roof, make sure the roof floor is strong enough and be sure to water-proof all work.
- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation. Drain water is sometimes discharged from the outdoor unit when it is running.
- For anti-corrosion type, use nuts with resin washers. If the paint on nut connections comes off, the anti-corrosion effect may decrease.

6. REFRIGERANT PIPING

   **NOTE**
   * All field piping must be installed by a licensed refrigeration technician and must comply with relevant local and national regulations.
   * After piping work is complete, do not under any circumstances open the shutoff valve until “7. FIELD WIRING” and “10. CHECKING OF DEVICE AND INSTALLATION CONDITIONS” are complete.
   * Do not use flux when brazing the refrigerant piping. Use the phosphor copper brazing filler metal (B-Cu93P-710/795 : ISO 3677) which does not require flux. (Flux has extremely negative effect on refrigerant piping systems. For instance, if the chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will damage the refrigerant oil.)

6-1 Selection of piping material and Refrigerant branching kit

   • Use only pipes which are clean inside and outside and which do not accumulate harmful sulfur, oxidants, dirt, cutting oils, moisture, or other contamination. (Foreign materials inside pipes including oils for fabrication must be 0.14 gr/10 ft or less.)
   • Use the following items for the refrigerant piping.
     - **Material**: Jointless phosphor-deoxidized copper pipe
     - **Size** : See “6-5 Example of connection” to determine the correct size.
     - **Thickness** : Select a thickness for the refrigerant piping which complies with national and local laws.
   • Whether piping work, follow the maximum tolerated length, difference in height, and length after a branch indicated in the “6-5 Example of connection”.
   • Outdoor unit multi connection piping kit and refrigerant branching kit (sold separately) are needed for connection of piping between outdoor units (in case of multi system) and piping branches. Use only separately sold items selected specifically according to the outdoor unit multi connection piping kit, the refrigerant branching kit selection in the “6-5 Example of connection”.

6-2 Protection against contamination when installing pipes

Protect the piping to prevent moisture, dirt, dust, etc. from entering the piping.

<table>
<thead>
<tr>
<th>Place</th>
<th>Installation period</th>
<th>Protection method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor</td>
<td>More than a month</td>
<td>Pinch the pipe</td>
</tr>
<tr>
<td>Indoor</td>
<td>Less than a month</td>
<td>Pinch or tape the pipe</td>
</tr>
<tr>
<td>Indoor</td>
<td>Regardless of the period</td>
<td>Pinch or tape the pipe</td>
</tr>
</tbody>
</table>

**NOTE**
Exercise special caution to prevent dirt or dust when passing piping through holes in walls and when passing pipe edges to the exterior.

6-3 Pipe connection

   • Be sure to perform nitrogen permutation or nitrogen blow when brazing. (Refer to figure 8)
   - Brazing without performing nitrogen permutation or nitrogen blow into the piping will create large quantities of oxidized film on the inside of the pipes, adversely affecting valves and compressors in the refrigerating system and preventing normal operation.

   (Refer to figure 8)
   1. Refrigerant pipe
   2. Location to be brazed
   3. Nitrogen
   4. Taping
   5. Handy valve
   6. Regulator
• The pressure regulator for the nitrogen released when doing the brazing should be set to about 2.9 psi (Enough to feel a slight breeze on your cheek).

⚠️ NOTE
Do not use anti-oxidants when brazing the pipe joints. Residue can clog pipes and break equipment.

6-4 Connecting the refrigerant piping
1. Direction to bring out the pipes
   The local inter unit piping can be connected either forward or to the sides (taken out through the bottom) as shown in the figure 9. When passing out through the bottom, use the knock hole in the bottom frame.
   (Refer to figure 9)
   1. Left-side connection
   2. Front connection
   3. Right-side connection

Precautions when knocking out knock holes
• Open knock hole in the base frame by drilling the 4 concave around it with a 3/4"-bit. (Refer to figure 10)
   (Refer to figure 10)
   1. Knock hole (for liquid pipe and gas pipe)
   2. Drill
   3. Concave section (4 points)

• Be sure to avoid damaging the casing.
• After knocking out the holes, we recommend you to remove any burrs and paint them using the repair paint to prevent rusting.
• When passing electrical wiring through the knock holes, protect the wires with a conduit or bushings, making sure not to damage the wiring.

2. Removing Pinch Piping
• When connecting refrigerant piping to an outdoor unit, remove the pinch piping using the procedure in the figure 11.
   (Refer to figure 11)
• About handling of shutoff valves, refer to "Shutoff valve operation procedure" in "11-1 Before working".

⚠️ CAUTION
After removing the gas, remove the pinch piping. Any gas remaining inside may blow off the pinch piping when you dissolve the brazing, causing damage.

(Refer to figure 11)
1. Pinch piping (2 pieces)
2. Do not remove.
3. Pinch piping
4. Procedure 1 : Confirm the shutoff valve is closed.
5. Procedure 2 : Connect a charge hose to the service port of shutoff valve and remove the gas in the pinch piping.
6. Procedure 3 : After removing the gas in the pinch piping, dissolve the brazing using a burner and remove the pinch piping.

3. Connecting refrigerant piping to outdoor units
• Figure 12-1, 2 and 3 shows the example of connecting refrigerant piping to outdoor units.
• The local inter unit piping next accessory pipes are field supplied.
• About the detail of connecting pipes between outdoor units on outdoor unit multi system, refer to the "4. Precautions when connecting piping between outdoor units" and the installation manual attached to the outdoor unit multi connection piping kit.

<In case of single system: 72-120P type>
(Refer to figure 12-1)
1. If connected to the front
2. When connected at lateral side (bottom)
3. Remove the shutoff valve cover to connect.
4. Remove the knock hole on the bottom frame and route the piping under the bottom frame.
5. Gas side shutoff valve
6. Liquid side shutoff valve
7. Refrigerant charge port
8. Brazing
9. Liquid side accessory pipe (1)
10. Gas side accessory pipe (1)
11. Gas side accessory pipe (2)
12. Liquid side accessory pipe (2)
13. Knockout hole
14. Punch the knock hole.
15. Gas side piping (field supply)
16. Liquid side piping (field supply)

<In case of multi system: 144-360P type>
(Refer to figure 12-2)
1. If connected to the front
2. When connected at lateral side (bottom)
3. Remove the shutoff valve cover to connect.
4. Remove the knock hole on the bottom frame and route the piping under the bottom frame.
5. Gas side shutoff valve
6. Liquid side shutoff valve
7. Refrigerant charge port
8. Brazing
9. Liquid side accessory pipe (1)
10. Gas side accessory pipe (1)
11. Gas side accessory pipe (2)
12. Liquid side accessory pipe (2)
13. Knockout hole
14. Punch the knock hole.

<In case of RXYQ144PBTJ>
(Refer to figure 12-3)
1. When connected to the front
2. When connected at lateral side (bottom)
3. Remove the shutoff valve cover to connect.
4. Remove the knock hole on the bottom frame and route the piping under the bottom frame.
5. Liquid pipe shutoff valve
6. Gas pipe shutoff valve
7. Brazing
8. Liquid side accessory pipe (1)
9. Gas side accessory pipe (1)
10. L type accessory joint
11. Liquid side accessory pipe (2)
12. Gas side accessory pipe (2)
13. Installation for single unit system

⚠️ NOTE
• Make sure the onsite piping does not come into contact with other piping or the bottom frame or side panels of the unit.

4. Precautions when connecting piping between outdoor units
The Outdoor unit multi connection piping kit (sold separately) is needed to connect piping between outdoor units in multi system. Only proceed with piping work after considering the limitations on installation listed here and in "5. Branching the refrigerant piping", always referring to the kit's installation manual.

1. About outdoor unit multi connection piping kit
   • Install the joint horizontally so that the attached warning label faces strait up, and the tilt is within ±15°. (Refer to figure 13-1)
   Do not install vertically. (Refer to figure 13-2)
   • Maintain a straight portion of 19-5/8 in. or more until the split of the joint without wrapping any onsite piping around this area.
   Over 19-5/8 in. of straight area can be maintained by connecting at least 4-3/4 in. of onsite pipe (straight) to the joint.
   (Refer to figure 13-3)
   (Refer to figure 13)
1. Warning label
2. Horizontal surface
3. ±15° or less
4. Ground
5. Onsite pipe (4-3/4 in. length or more)
6. Straight part of 19-5/8 in. or more
7. C-arrow view
8. D-arrow view
(2) The piping between outdoor units must be installed level (Pattern 1) or with a rise (Pattern 2). Otherwise oil may pool in the pipes.

Pattern 1

![Pattern 1 Diagram]

Pattern 2

![Pattern 2 Diagram]

(3) To avoid the risk of oil detention in the stopping unit, always connect the shutoff valve and the piping between outdoor units as shown A or B in the figure below.

![Prohibited Pattern Diagram]

(4) If the piping length between the outdoor units exceeds 80 in., create a rise of 8 in. or more in the gas piping under a length of 80 in. from the outdoor unit multi connection piping kit.

![Rising Height Diagram]

5. Branching the refrigerant piping
Heed the restrictions below when installing the refrigerant branching kit and read the installation instruction manual with the kit. (Improper installation could lead to malfunctioning or breakdown of the outdoor unit.)

<REFNET joint>
Install the REFNET joint so it splits horizontally or vertically.

(Refer to figure 14)
1. Horizontal
2. A-arrow view
3. Horizontal surface
4. ±30° or less
5. Vertical

<REFNET header>
Install the REFNET header so it splits horizontally.

(Refer to figure 15)
1. Horizontal surface
2. B-arrow view
### Example of connection

**Connection of 8 indoor units**

*(1) "→" Indicates the Outdoor unit multi-connection piping kit.

*(2) In case of multi-outdoor system, re-read “outdoor unit” to “the first Outdoor unit multi-connection piping kit” as seen from the indoor unit.

#### Maximum allowable length

<table>
<thead>
<tr>
<th>Between outdoor unit (*2) and indoor unit</th>
<th>Actual pipe length</th>
<th>Equivalent pipe length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Example [A]: (a + b + c + d + e + o) ≤ 540 ft</td>
<td>Example [B]: (a + b + c + d + e + o) ≤ 540 ft</td>
</tr>
</tbody>
</table>

#### Allowable height difference

<table>
<thead>
<tr>
<th>Between outdoor and indoor units</th>
<th>Difference in height</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Example [C]: (b + c + d + e + o) ≤ 130 ft</td>
</tr>
</tbody>
</table>

#### Allowable length after the branch

<table>
<thead>
<tr>
<th>Actual pipe length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example [D]: (b + h) ≤ 130 ft, (b + h) ≤ 130 ft</td>
</tr>
</tbody>
</table>

---

(*1) "→" Indicates the Outdoor unit multi-connection piping kit.

(*2) In case of multi-outdoor system, re-read “outdoor unit” to “the first Outdoor unit multi-connection piping kit” as seen from the indoor unit.

(*3) This can be extended to 295 ft with a replacement outdoor unit PCB.

(*4) If the difference between the outdoor unit and indoor unit is greater than 164 ft, the liquid line must be increased by one size.
Installation EDUS91004-N

Outdoor unit multi connection piping kit and Refrigerant branch kit selection

- Refrigerant branch kits can only be used with R410A.
- When multi outdoor systems are installed, be sure to use the special separately sold Outdoor unit multi connection piping kit (BHFP-22P100U) (BHFP-22P151U) (For how to select the proper kit, follow the table at right.)
- Never use BHFP-26M90U, BHFP-22M90U for M type of this series or T joint (field supplied).

Pipe size selection

- The thickness and material shall be selected in accordance with local code.

For an outdoor unit installation, make the settings in accordance with the following figure:

Outdoor unit multi connection piping kit

- Choose from the following table in accordance with the capacity type of the outdoor unit connected.

<table>
<thead>
<tr>
<th>Outdoor unit capacity type</th>
<th>Piping size (O.D.)</th>
<th>Liquid pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>RXYQ27P type</td>
<td>ø3/4</td>
<td>ø3/8</td>
</tr>
<tr>
<td>RXYQ36P type</td>
<td>ø7/8</td>
<td>ø7/8</td>
</tr>
<tr>
<td>RXYQ120P type</td>
<td>ø1-1/8</td>
<td>ø1-1/8</td>
</tr>
<tr>
<td>RXYQ180P type</td>
<td>ø1-3/8</td>
<td>ø1-3/8</td>
</tr>
<tr>
<td>RXYQ240P type</td>
<td>ø1-5/8</td>
<td>ø1-5/8</td>
</tr>
</tbody>
</table>

Piping between outdoor unit multi connection piping kit and outdoor unit (part A)

- Choose from the following table in accordance with the total capacity type of all the indoor units connected downstream.

<table>
<thead>
<tr>
<th>Indoor unit capacity type</th>
<th>Piping size (O.D.)</th>
<th>Liquid pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>07-09</td>
<td>ø3/4</td>
<td>ø3/8</td>
</tr>
<tr>
<td>24-30 -36 - 48 - 54</td>
<td>ø5/8</td>
<td>ø5/8</td>
</tr>
</tbody>
</table>

Piping between refrigerant branch kits

- Choose from the following table in accordance with the capacity type of the outdoor unit connected.

<table>
<thead>
<tr>
<th>Outdoor unit capacity type</th>
<th>Piping size (O.D.)</th>
<th>Liquid pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>RXYQ27P type</td>
<td>ø3/4</td>
<td>ø3/8</td>
</tr>
<tr>
<td>RXYQ36P type</td>
<td>ø7/8</td>
<td>ø7/8</td>
</tr>
<tr>
<td>RXYQ120P type</td>
<td>ø1-1/8</td>
<td>ø1-1/8</td>
</tr>
</tbody>
</table>

Piping between refrigerant branch kit and outdoor unit (part B)

- Match to the size of the connection piping on the indoor unit.

<table>
<thead>
<tr>
<th>Indoor unit capacity type</th>
<th>Piping size (O.D.)</th>
<th>Liquid pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>07-09</td>
<td>ø3/4</td>
<td>ø3/8</td>
</tr>
<tr>
<td>24-30 -36 - 48 - 54</td>
<td>ø5/8</td>
<td>ø5/8</td>
</tr>
</tbody>
</table>

Example for indoor units connected downstream

Example REFNET joint C: Indoor units 8 + 9 + 10 + 11 Example REFNET joint B: Indoor units 7 + 8 Example REFNET header: Indoor units 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8

For an outdoor unit installation, make the settings in accordance with the following figure:

Outdoor unit multi connection piping kit

- Choose from the following table in accordance with the outdoor unit capacity type.

<table>
<thead>
<tr>
<th>Outdoor unit capacity type</th>
<th>Refrigerant branch kit name</th>
</tr>
</thead>
<tbody>
<tr>
<td>RXYQ72 · 96P type</td>
<td>KHRP26M33T, KHRP26M72TU9</td>
</tr>
<tr>
<td>RXYQ120 · 216P type</td>
<td>KHRP26M72TU9, KHRP26M73TU9</td>
</tr>
<tr>
<td>RXYQ240P · 360P type</td>
<td>KHRP26M72TU9, KHRP26M73TU9</td>
</tr>
</tbody>
</table>

Piping between outdoor unit multi connection piping kit and outdoor unit (part B)

- Choose from the following table in accordance with the capacity type of the outdoor unit connected.

<table>
<thead>
<tr>
<th>Outdoor unit capacity type</th>
<th>Refrigerant branch kit name</th>
</tr>
</thead>
<tbody>
<tr>
<td>RXYQ72 · 96P type</td>
<td>KHRP26M33T, KHRP26M72TU9</td>
</tr>
<tr>
<td>RXYQ120 · 216P type</td>
<td>KHRP26M72TU9, KHRP26M73TU9</td>
</tr>
<tr>
<td>RXYQ240P · 360P type</td>
<td>KHRP26M72TU9, KHRP26M73TU9</td>
</tr>
</tbody>
</table>

Piping between refrigerant branch kits

- Choose from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET header.

<table>
<thead>
<tr>
<th>Indoor unit total capacity index</th>
<th>Refrigerant branch kit name</th>
</tr>
</thead>
<tbody>
<tr>
<td>x &lt; 72</td>
<td>KHRP26M33H9 or KHRP26M33H9</td>
</tr>
<tr>
<td>72 ≤ x &lt; 111</td>
<td>KHRP26M33H9</td>
</tr>
<tr>
<td>111 ≤ x &lt; 230</td>
<td>KHRP26M72H9</td>
</tr>
<tr>
<td>230 ≤ x</td>
<td>KHRP26M73H9</td>
</tr>
</tbody>
</table>

Installation EDUS91004-N
How to calculate the additional refrigerant to be charged

Additional refrigerant to be charged: R(lb)

<table>
<thead>
<tr>
<th>R</th>
<th>((\text{Total length (ft) of liquid piping (size at 3/8)} \times 0.0249) + (\text{Total length (ft) of liquid piping (size at 1/2)} \times 0.0121) + (\text{Total length (ft) of liquid piping (size at 5/8)} \times 0.040))</th>
</tr>
</thead>
</table>

HEAT PUMP SYSTEM

<table>
<thead>
<tr>
<th>MODEL NAME</th>
<th>THE AMOUNT OF REFRIGERANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>RXYQ26, 120, 216, 240, 336, 390P</td>
<td>0.0 lb</td>
</tr>
<tr>
<td>RXYQ72, 144, 192, 264, 288, 312P</td>
<td>1.1 lb</td>
</tr>
<tr>
<td>RXYQ144PB</td>
<td>2.2 lb</td>
</tr>
<tr>
<td>RXYQ240PB</td>
<td>7.2 lb</td>
</tr>
<tr>
<td>RXYQ240PB</td>
<td>7.2 lb</td>
</tr>
</tbody>
</table>

Example for refrigerant branch using REFINET joint and REFINET header for systems and each pipe length as shown below.

Outdoor system: RXYQ240PB

<table>
<thead>
<tr>
<th>System</th>
<th>Gas pipe</th>
<th>Liquid pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>RXYQ72P type</td>
<td>q3/4 - q9/8</td>
<td>q3/4 - q1/2</td>
</tr>
<tr>
<td>RXYQ96P type</td>
<td>Not increased</td>
<td>q3/4 - q1/2</td>
</tr>
<tr>
<td>RXYQ120P type</td>
<td>Not increased</td>
<td>q3/4 - q1/2</td>
</tr>
<tr>
<td>RXYQ144P type</td>
<td>Not increased</td>
<td>q3/4 - q1/2</td>
</tr>
<tr>
<td>RXYQ168P type</td>
<td>Not increased</td>
<td>q3/4 - q3/4</td>
</tr>
<tr>
<td>RXYQ192P type</td>
<td>Not increased</td>
<td>q3/4 - q3/4</td>
</tr>
<tr>
<td>RXYQ216P type</td>
<td>Not increased</td>
<td>q3/4 - q3/4</td>
</tr>
<tr>
<td>RXYQ240P type</td>
<td>Not increased</td>
<td>q3/4 - q3/4</td>
</tr>
<tr>
<td>RXYQ284P</td>
<td>Not increased</td>
<td>q3/4 - q7/8</td>
</tr>
<tr>
<td>RXYQ328P</td>
<td>Not increased</td>
<td>q3/4 - q7/8</td>
</tr>
<tr>
<td>RXYQ372P</td>
<td>Not increased</td>
<td>q3/4 - q7/8</td>
</tr>
<tr>
<td>RXYQ416P</td>
<td>Not increased</td>
<td>q3/4 - q7/8</td>
</tr>
<tr>
<td>RXYQ460P</td>
<td>Not increased</td>
<td>q3/4 - q7/8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System</th>
<th>Gas pipe</th>
<th>Liquid pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>RXYQ240PB</td>
<td>Not increased</td>
<td>q3/4 - q7/8</td>
</tr>
<tr>
<td>RXYQ284PB</td>
<td>Not increased</td>
<td>q3/4 - q7/8</td>
</tr>
<tr>
<td>RXYQ328PB</td>
<td>Not increased</td>
<td>q3/4 - q7/8</td>
</tr>
<tr>
<td>RXYQ372PB</td>
<td>Not increased</td>
<td>q3/4 - q7/8</td>
</tr>
<tr>
<td>RXYQ416PB</td>
<td>Not increased</td>
<td>q3/4 - q7/8</td>
</tr>
<tr>
<td>RXYQ460PB</td>
<td>Not increased</td>
<td>q3/4 - q7/8</td>
</tr>
</tbody>
</table>

Note 1.
When the equivalent pipe length between outdoor and indoor units is 295 ft or more, the size of main pipes (both gas side and liquid side (refer to figure 16) must be increased according to the right table.

1. Outdoor unit
2. Main pipes
3. Increase
4. First refrigerant branch kit
5. Indoor unit

Example for piping:

| a | 0.040 |
| b | 0.015 |
| c | 0.015 |
| d | 0.040 |
| e | 0.040 |
| f | 0.015 |
| g | 0.015 |
| h | 0.040 |
| i | 0.015 |
| j | 0.015 |
| k | 0.040 |
| l | 0.015 |
| m | 0.040 |
| n | 0.015 |
| o | 0.015 |
| p | 0.040 |

\[ R = (25 \times 0.175 + 0.121 + 0.081 + 0.040 + 0.0121 + 0.0081 + 0.040 + 0.0121 + 0.0081) + 1.1 \]

\[ R = 12.127 \]

\[ R \approx 12.1 \text{ lb} \]

Round off in units of 0.1 lb.

Example Drawings

1. If available on the site, use this size. Otherwise it can not be increased.

2. If the specified pipe diameter is not available onsite, do NOT substitute a pipe of greater diameter.
7. FIELD WIRING

**NOTE**

- All field wiring and components must be installed by a licensed electrician and must comply with relevant local and national regulations.
- Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.
- Never install a phase advancing capacitor. As this unit is equipped with an inverter, installing a phase advancing capacitor will not only deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high-frequency waves.
- Only proceed with wiring work after blocking off all power.
- Always ground wires in accordance with relevant local and national regulations.
- This machine includes an inverter device. Connect ground and leave charge to eliminate the impact on other devices by reducing noise generated from the inverter device and to prevent leaked current from being charged in the outer hull of the product.
- Do not connect the ground wire to gas pipes, sewage pipes, lighting rods, or telephone ground wires.
- **Gas pipes**: can explode or catch fire if there is a gas leak.
- **Sewage pipes**: no grounding effect is possible if hard plastic piping is used.
- **Telephone ground wires and lightning rods**: dangerous when struck by lightning due to abnormal rise in electrical potential in the grounding.
- Be sure to install an ground leakage circuit breaker.
- This unit uses an inverter, so install the ground leakage circuit breaker that be capable of handling high harmonics in order to prevent malfunctioning of the ground leakage circuit breaker itself.
- Ground leakage circuit breaker which are especially for protecting ground-faults should be used in conjunction with main switch or fuse for use with wiring.
- Electrical wiring must be done in accordance with the wiring diagrams and the description herein.
- Do not operate until refrigerant piping work is completed. (If operated before complete the piping work, the compressor may be broken down.)
- Never remove thermistor, sensor or etc. when connecting power wiring and transmission wiring. 
  (If operated with thermistor, sensor or etc. removed, the compressor may be broken down.)
- This product have reversed phase protection detector that only works when the power is turned on. If there exists blackout or the power goes on and off which the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase may break the compressor and other parts.
- Never connect the power supply in reversed phase.
- **Gas pipes**: can explode or catch fire if there is a gas leak.
- **Sewage pipes**: no grounding effect is possible if hard plastic piping is used.
- **Telephone ground wires and lightning rods**: dangerous when struck by lightning due to abnormal rise in electrical potential in the grounding.
- Be sure to install an ground leakage circuit breaker.
- This unit uses an inverter, so install the ground leakage circuit breaker that be capable of handling high harmonics in order to prevent malfunctioning of the ground leakage circuit breaker itself.
- Ground leakage circuit breaker which are especially for protecting ground-faults should be used in conjunction with main switch or fuse for use with wiring.
- Electrical wiring must be done in accordance with the wiring diagrams and the description herein.
- Do not operate until refrigerant piping work is completed. (If operated before complete the piping work, the compressor may be broken down.)
- Never remove thermistor, sensor or etc. when connecting power wiring and transmission wiring. (If operated with thermistor, sensor or etc. removed, the compressor may be broken down.)
- This product have reversed phase protection detector that only works when the power is turned on. If there exists blackout or the power goes on and off which the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase may break the compressor and other parts.

7-1 Power circuit, safety device and cable requirements

- A power circuit (see the following table) must be provided for connection of the unit. This circuit must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and an ground leakage circuit breaker.
- When using residual current operated circuit breakers, be sure to use a high-speed type (0.1 second or less) 200mA rated residual operating current.
- Use copper conductors only.
- Use insulated wire for the power cord.
- Select the power supply cable type and size in accordance with relevant local and national regulations.
- Specifications for local wiring power cord and branch wiring are in compliance with local cord.

7-2 Wiring Connection Example for Whole System

(Refer to figure 17)

1. Power supply
2. Main switch
3. Ground leakage circuit breaker
4. Fuse
5. Outdoor unit
6. Remote controller
7. Indoor unit

**NOTE**

- Make sure the low voltage wiring (i.e. for the remote controller, between units, etc.) and the power wiring do not pass near each other, keeping them at least 2 in. apart.
- Proximity may cause electrical interference, malfunctions, and breakage.
- Be sure to connect the power wiring to the power wiring terminal block and secure it as described in "7-5 Power Wiring Connection Procedure".
- Transmission wiring should be secured as described in "7-4 Transmission Wiring Connection Procedure".
- Secure wiring with clamp such as insulation lock ties to avoid contact with piping.
- Shape the wires to prevent the structure such as the electrical components box lid deforming. And close the cover firmly.
- All field wiring is to be procured on site.
7-3 Leading wire Procedure
- The power wiring and ground wiring are passed out from the power wiring hole on the front (knock hole).
- The transmission wiring is passed out from the wiring hole (knock hole) on the front of the unit.

(Refer to figure 18-1)
1. Electric wiring diagram
   Printed on the back of the electrical components box lid.
2. Knockout hole
3. Power line
4. Transmission line

(Refer to figure 18-2)
1. Electrical components box lid
2. Service lid
3. [Service precautions] Label location

⚠️ NOTE
- Open the knock holes with a hammer or the like.
- After knocking out the holes, we recommend you remove any burrs and paint them using the repair paint to prevent rusting.

(Refer to figure 18-1, 2)
- When passing wiring through the knock holes, remove burrs around the knock holes and protect the wiring with protective tape.

(Refer to figure 18-1, 2)
- If small animals might enter the unit, block off any gaps (hatching parts in figure 18-1, 2) with material (field supply).

7-4 Transmission Wiring Connection Procedure
- Referring to figure 19, connect the transmission wiring between outdoor unit and indoor unit, outdoor unit and outdoor unit of other system, outdoor unit and outdoor unit of same system.

(Refer to figure 19)
1. Master unit (*)
2. Sub unit (*)
3. Outdoor unit A
4. Outdoor unit B
5. Electrical components box (1)
6. (Only RXYQ–PBYD)
   Electrical components box (2)
7. (Only RXYQ144PBTJ)
   Do not open the electrical components box (2) lid.
   (There is no work when installation)
8. Never connect the power wire.
9. To outdoor unit of other system
10. Use duplex wires (No polarity)
11. Indoor unit
   (*): The Outdoor unit that connects the transmission wiring to an indoor unit is Master unit of the multi system.
   And the other units are Sub unit. (In this figure, Outdoor unit A is the Master unit.)
Check operation in installation work, Onsite settings and so on are done by operating the PC-board (A1P) of Master unit.

⚠️ NOTE
- Do not connect the power wiring to terminals for the transmission wiring. Doing so would destroy the entire system.
- When connecting wires to the terminal block on the PC-board, too much heat or tightening could damage the PC-board. Attach with care.
See the table below for the tightening torque of the transmission wiring terminals.

<table>
<thead>
<tr>
<th>Screw size</th>
<th>Tightening torque (ft-lbf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3.5 (A1P)</td>
<td>0.59 – 0.71</td>
</tr>
</tbody>
</table>

- Transmission wiring (About the symbol – - , see figure 19) should be done within the following limitations.
If they are exceeded, transmission problems may occur.

⚠️ Between outdoor unit and indoor unit
- Between outdoor unit and outdoor unit of other systems
  Max. wiring length : 3280 ft
  Max. total wiring length : 6360 ft
  Max. no. of branches : 16
  [Note]
  No branch is allowed after branch (See figure 20)
  Max. no. of outdoor units of other system that can be connected : 10
  (Refer to figure 20)
  1. Branch
  2. Branch after branch

⚠️ Between outdoor unit and outdoor unit of same system
Max. wiring length : 100 ft

- The transmission wiring inside the electrical components box should be secured using the clamp (1) as shown in figure 21.

(Refer to figure 21)
1. In the electrical components box
2. Retain to the electrical components box with the accessory clamp (1).
3. Vinyl tube (accessory)

- Outside the units, the transmission wiring must be finished simultaneously with the local refrigerant piping, and wound with tape (field supply) as shown in figure 22.

(Refer to figure 22)
1. Liquid pipe
2. Gas pipe
3. Transmission wiring
4. Insulation material
5. Finishing tape

- For multi system:
1. Transmission wiring between outdoor units in the same piping system must be connected to terminals Q1 and Q2 (TO MULTI UNIT).
   Connecting the wires to the F1, F2 (TO OUT/D UNIT) terminals results in system malfunction.
2. Wiring to other systems should be connected to terminals F1 and F2 (TO OUT/D UNIT) on the PC-board of the master unit.
The outdoor unit that connects transmission wiring to indoor unit is the master unit. The others are sub unit.

7-5 Power Wiring Connection Procedure
- Be sure to connect the power supply wiring to the power supply terminal block and hold it in place using the included clamp as shown in the figure 23.
- The L1, L2 and L3 phases of the power wiring should be secured separately to the hook using the included clamp (1).
- The ground wiring should be bound to the power wiring using the included clamp (1) to prevent outside force from being applied to the terminal area.

(Refer to figure 23)
1. Power supply
   (MODEL PBYD : 3 ~ 460V 60Hz)
   (MODEL PBTJ : 3 ~ 208/230V 60Hz)
2. Ground leakage circuit breaker
3. Branch switch, Overcurrent breaker
4. Ground wire
5. Electrical components box (1)
6. (Only RXYQ–PBYD and RXYQ144PBTJ)
   Electrical components box (2)
7. (Only RXYQ–PBYD and RXYQ144PBTJ)
   Do not open the electrical components box (2) lid.
   (There are no work when installation.)
8. Attach insulation sleeves
9. Power supply terminal block
10. Ground terminal
11. Clamp (1) (accessory)
12. Vinyl tube (accessory)
CAUTION

- Be sure to use crimp-style terminal with insulating sleeves for connections. (See the figure below.)
- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will strip the head and make proper tightening impossible.
- Over-tightening the terminal screws may break them.

See the following table for the tightening torque of the terminal screws.

<table>
<thead>
<tr>
<th>Screw size</th>
<th>Tightening torque (ft · lbf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M8 Power terminal, ground terminal</td>
<td>4.06 – 5.38</td>
</tr>
</tbody>
</table>

- When pulling the ground wire out, wire it so that it comes through the cut out section of the cup washer. (See the figure below.) An improper ground connection may prevent a good ground from being achieved.

NOTE

- After wiring work is completed, check to make sure there are no loose connections among the electrical components in the electrical components box.

8. AIR TIGHT TEST AND VACUUM DRYING

- After finished piping work, carry out air tight test and vacuum drying.

NOTE

- Always use nitrogen gas for the air tight test.
- Absolutely do not open the shutoff valve until the main power circuit insulation measurement has been completed. (measuring after the shutoff valve is opened will cause the insulation value to drop.)

<Needed tools>

- To prevent entry of any impurities and insure sufficient pressure resistance, always use the special tools dedicated for R410A.
- Use charge hose that have pushing stick for connecting to service port of shutoff valves or refrigerant charge port.

<table>
<thead>
<tr>
<th>Vacuum pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The vacuum pump for vacuum drying should be able to lower the pressure to –14.6 psi.</td>
</tr>
<tr>
<td>- Take care the pump oil never flow backward into the refrigerant pipe during the pump stops.</td>
</tr>
</tbody>
</table>

<The system for air tight test and vacuum drying>

- Referring to figure 25, connect a nitrogen tank, refrigerant tank, and a vacuum pump to the outdoor unit. The refrigerant tank and the charge hose connection to refrigerant charge port or the valve A in figure 25 are needed in “11. ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION”.

(Rerfer to figure 25)

1. Gauge manifold
2. Nitrogen
3. Measuring device
4. R410A tank (with siphon)
5. Vacuum pump
6. Charge hose
7. Gas pipe shutoff valve
8. Liquid pipe shutoff valve
9. Refrigerant charge port
10. Valve A
11. Valve B
12. Valve C
13. Outdoor unit
14. Indoor unit
15. Shutoff valve
16. Service port
17. Field piping
18. Gas flow

7-6 Procedure for Wiring Inside Units

- Referring to figure 24, secure and wire the power and transmission wiring using the included clamp (1), (2), and (3).
- Wire so that the ground wiring does not come into contact with the compressor lead wiring.
- If they touch, this may have an adverse effect on other devices.
- The transmission wiring must be at least 2 in. away from the power wiring.
- Make sure all wiring do not contact to the pipes (hatching parts in the figure 24).

(Refer to figure 24)

1. Power/ground wires.
2. Clear over 2 in.
3. Transmission wiring.
4. Retain to the back of the column support with the accessory clamp (2).
5. Power wiring
6. Transmission wiring
7. Ground wire

Precautions when knocking out knockout holes

- To punch out a knockout hole, hit it with a hammer.
- Open an appropriate hole as needed.
- After knocking out the holes, trim off the burr, then we recommend you to paint the edges and areas around the edges using the repair paint to prevent rusting.
- Power line : Open a knockout hole as shown at left and connect it using a conduit.
**NOTE**

- The air tight test and vacuum drying should be done using the service ports of equalizer pipe, gas pipe and liquid pipe shutoff valve. See the [R410A] Label attached to the front plate of the outdoor unit for details on the location of the service port (see figure at right)
- [Shutoff valve operation procedure] in “11-1 Before working” for details on handling the shutoff valve.
- The refrigerant charge port is connected to unit pipe. When shipped, the unit contains the refrigerant, so use caution when attaching the charge hose.

**Air tight test**

Pressurize the liquid pipe, gas pipe, and equalizer pipe from the service ports of each shutoff valve to 550 psi (do not pressurize more than 550 psi). If the pressure does not drop within 24 hours, the system passes the test. If there is a pressure drop, check for leaks, make repairs and perform the air tight test again.

**Vacuum drying**

Evacuate the system from the liquid pipe and gas pipe shutoff valve service ports by using a vacuum pump for more than 2 hours and bring the system to –14.6 psi or less. After keeping the system under that condition for more than 1 hour, check if the vacuum gauge rises or not. If it rises, the system may either contain moisture inside or have leaks.

---

**NOTE**

If moisture might enter the piping, follow belows. (i.e., if doing work during the rainy season, if the actual work takes long enough that condensation may form on the inside of the pipes, if rain might enter the pipes during work, etc.) After evacuating the system for 2 hours, pressurize the system to 7.25 psi (vacuum break) with nitrogen gas and evacuate the system again using the vacuum pump for 1 hour to –14.6 psi or less (vacuum drying). If the system cannot be evacuated to –14.6 psi within 2 hours, use the vacuum pump for 1 hour to –14.6 psi or less (vacuum break) with nitrogen gas and evacuate the system again. If there is a pressure drop, check for leaks, make repairs and perform the air tight test again.

---

**9. PIPE INSULATION**

- Insulation of pipes should be done after performing “8. AIR TIGHT TEST AND VACUUM DRYING”.
- Always insulate the liquid piping, the gas piping, the equalizer pipe (between the outdoor units for the outdoor multi system) and these pipe connections.
- Failing to insulate the pipes may cause leaking or burns. And be sure to use the insulation which can withstand such temperatures of 248°F or more for the equalizer pipe and the gas piping.
- Reinforce the insulation on the refrigerant piping according to the installation environment. Condensation might form on the surface of the insulation. Refer to the below.
  - Ambient temperature : 86°F, humidity : 75% to 80% RH : min. thickness : 9/16 in.
  - If the ambient temperature exceeds 86°F and the humidity 80% RH, then the min. thickness is 3/4 in.
- See the Engineering data book for detail.
- If there is a possibility that condensation on the shutoff valve might drip into the indoor unit through gaps in the insulation and piping because the outdoor unit is located higher than the indoor unit, etc., this must be prevented by caulking the connections, etc. (Refer to figure 26)
- The piping lead-out hole lid should be attached after opening a knock hole. (Refer to figure 27)

---

**10. CHECKING OF DEVICE AND INSTALLATION CONDITIONS**

Be sure to check the followings.

For those doing electrical work

1. Make sure there is no faulty transmission wiring or loosing of a nut. See “7-4 Transmission Wiring Connection Procedure”.
2. Make sure there is no faulty power wiring or loosing of a nut. See “7-5 Power Wiring Connection Procedure”.
3. Has the insulation of the main power circuit deteriorated? Measure the insulation and check the insulation is above regular value in accordance with relevant local and national regulations.

For those doing pipe work

1. Make sure piping size is correct. See “6-1 Selection of piping material and Refrigerant branching kit”.
2. Make sure insulation work is done. See “7. PIPE INSULATION”.
3. Make sure there is no faulty refrigerant piping. See “6. REFRIGERANT PIPING”.

---

**11. ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION**

The outdoor unit is charged with refrigerant when shipped from the factory, but depending on the size and length of the piping when installed, it may require additional charging. For charging the additional refrigerant, follow the procedure in this chapter. And then carry out the check operation.

---

**11-1 Before working**

[About the refrigerant tank]

Check whether the tank has a siphon pipe before charging and place the tank so that the refrigerant is charged in liquid form. (See the figure below.)

**With siphon pipe**

Stand the tank upright and charge.

(The siphon pipe goes all the way inside, so the tank does not need be put upside-down charge in liquid form.)

**Other tanks**

Stand the tank upside-down and charge.

---

**NOTE**

- If small animals and the like might enter the unit through the piping lead-out hole, close the hole with blocking material (procured on site) after completion of “11. ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION”. (Refer to figure 30)
- If there is a possibility that condensation on the shutoff valve might drip into the indoor unit through gaps in the insulation and piping because the outdoor unit is located higher than the indoor unit, etc., this must be prevented by caulking the connections, etc. (Refer to figure 26)
- The piping lead-out hole lid should be attached after opening a knock hole. (Refer to figure 27)

---

**NOTE**

- After knocking out the holes, we recommend you remove burrs in the knock holes (See figure 27) and paint the edges and areas around the edges using the repair paint.
[Shutoff valve operation procedure]
When operating the shutoff valve, follow the procedure instructed below.

- **NOTE**

  - Do not open the shutoff valve until "10. CHECKING OF DEVICE AND INSTALLATION CONDITIONS" is completed. If the shutoff valve is left open without turning on the power, it may cause refrigerant to build up in the compressor, leading insulation degradation.
  - Be sure to use the correct tools.
  - The shutoff valve is not a back-seat type. If forced it to open, it might break the valve body.
  - When using a service port, use the charge hose.
  - After tightening the cap, make sure no refrigerant gas is leaking.

**Tightening torque**
The sizes of the shutoff valves on each model and the tightening torque for each size are listed in the table below.

<table>
<thead>
<tr>
<th>Shutoff valve size</th>
<th>Tightening torque ft · lbf (Turn clockwise to close)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaft (valve body)</td>
<td>Cap (valve lid)</td>
</tr>
<tr>
<td>3/8</td>
<td>3.98 - 4.87</td>
</tr>
<tr>
<td>1/2</td>
<td>5.97 - 7.30</td>
</tr>
<tr>
<td>3/4</td>
<td>19.9 - 24.3</td>
</tr>
<tr>
<td>1</td>
<td>8.48 - 10.3</td>
</tr>
</tbody>
</table>

(Refer to figure 28)
1. Service port
2. Cap
3. Hex holes
4. Shaft (valve body)
5. Seal section

[How to Check How Many Units are Connected]
It is possible to find out how many indoor or outdoor unit in the system are turned on by operating the push button on the PC-board (A1P) of outdoor unit (In case of multi system master unit).

Follow the procedure below to check how many indoor or outdoor units are turned on.

1. Press the MODE button (BS1) once at Setting Mode 1 (H1P : off), and set the MONITOR MODE (H1P : Blinking).
2. Press the SET button (BS2) the number of times until the LED display matches that at right.
   - For checking the number of outdoor units: eight times
   - For checking the number of indoor units: five times
3. Press the RETURN button (BS3) and read the number of units from the display of H2P through H7P.
   - [Reading Method]
   - The display of H2P through H7P should be read as a binary number, with \( \bigcirc \) standing for "1" and \( \bullet \) standing for "0".
   - **Ex:** For the LED display at right, this would be "0 1 0 1 1 0", which would mean 22 units are connected.
   - \( 32 \times \bigcirc + 16 \times \bigcirc + 8 \times \bigcirc + 4 \times \bigcirc + 2 \times \bigcirc + 1 \times \bigcirc = 22 \) units
   - Note: "000000" indicates 64 units.
4. Press the MODE button (BS1) once. This returns to Setting Mode 1 (H1P : OFF, default).
11-2 Procedure of Adding Refrigerant charging and check operation

**WARNING Electric Shock Warning**
- Make sure to close the electrical components box lid before turning on the power.
- Perform the setting on the PC-board (A1P) of the outdoor unit and check the LED display after the power is on via the inspection door which is in the electrical components box lid.

(Refer to figure 29)
1. Electrical components box (1)
2. Inspection door
3. Electrical components box (1) lid
4. LED (H1~8P)
5. Push button (BS1~5)
6. Lift the protruding part to open the inspection door.
7. (Only RXYQ~PBYD and RXYQ144PBTJ)
   - Electrical components box (2)
8. (Only RXYQ~PBYD and RXYQ144PBTJ)
   - Do not open the electrical components box (2) lid or that inspection door.
- Use an insulated rod to operate the push buttons via the electrical components box's inspection door.
- There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

**CAUTION**
- Make sure to use the protect tool (protective grooves and goggles) when charging the refrigerant.
- Due to a danger of liquid hammer, the refrigerant must not be charged over the allowable maximum amount when charging the refrigerant.
- Do not perform the refrigerant charging operation under working for the indoor unit.
- When opening the front panel, make sure to take caution to the fan rotation during the working.
- After the outdoor unit stops operating, the fan may keep rotation for a while.

**NOTE**
- If operation is performed within 12 minutes after the indoor and outdoor units are turned on, H2P will be lit on and the compressor will not operate.
- Check the LED display indicate as shown below.

![LED Display](image)
- In order to ensure uniform refrigerant distribution, it may take up to around 10 minutes for the compressor to start up after the unit starting operation. This is not a malfunction.
- The refrigerant charge port is connected to the piping inside the unit.
- When the unit is shipped from the factory, the unit's internal piping is already charged with refrigerant, so be careful when connecting the charge hose.
- After adding the refrigerant, make sure to close the lid of the refrigerant charging port.
- The tightening torque for the lid is 8.48 to 10.3 ft · lbf.
- See [Shutoff valve operation procedure] in chapter 11-1 for details on how to handle shutoff valves.
- When done or when pausing the refrigerant charging operation, close the valve of the refrigerant tank immediately.
- The refrigerant charge port of this product have electric expansion valve.
- The valve will be closed at end of refrigerant charging. However the valve will be opened on operation after refrigerant charging (check operation, normal operation, etc.).
- If the tank is left with the valve open, the amount of refrigerant which is properly charged may be off the point.
- Make sure to perform the check operation after installation. Otherwise, the malfunction code “U3” will be displayed and normal operation cannot be performed. And the failure of “Check of miswiring” may also cause abnormal operation. Performance may drop due to the failure of “Judgment of piping length”.
- Check operation must be performed for each refrigerant piping system. Checking is impossible if plural systems are being done at once.
- The individual problems of indoor units can not be checked. About these problems check by test run after the check operation is completed. (See chapter 13)
- The check operation cannot be performed in recovery or other service modes.

11-2-1 Procedure of Adding Refrigerant charging
1. Make sure the following works are complete in accordance with the installation manual.
   - Piping work
   - Wiring work
   - Air tight test
   - Vacuum drying
   - Installation work for indoor unit
2. Calculate the “additional charging amount” using “How to calculate the additional refrigerant to be charged” in “6-5 Example of connection”.
3. Open the valve C (See the figure 30). The valve A, B and the liquid pipe, gas pipe shutoff valves must be left closed, and charge the refrigerant of the “additional charging amount” from the liquid side shutout valve service port.

(Refer to figure 30)
1. Measuring device
2. R410A tank (with siphon)
3. Charge hose
4. Gas pipe shutoff valve
5. Liquid pipe shutoff valve
6. Refrigerant charge port
7. Valve A
8. Valve B
9. Valve C
10. Outdoor unit A
11. Outdoor unit B
12. Indoor unit
13. Field pipings
14. Refrigerant flow
15. Shutoff valve
16. Service port
4. If the “additional charging amount” was charged fully, close the valve B and go to step 6.
   - If the “additional charging amount” was not charged fully, close the valve C and go to step 5.
5. Perform the refrigerant charging following [Automatic refrigerant charging operation procedure] as shown below. And charge the remaining refrigerant of the “additional charging amount”.

**NOTE**
- For performing the automatic refrigerant charging operation, the push button on the PC-board (A1) of outdoor unit are used. (See figure 29.) And the refrigerant are charged from the refrigerant charge port via the valve A. (See figure 31.) For operating the push button and opening or closing the valves, follow the procedure.
- During Automatic refrigerant charging operation, the system will select charging mode (cooling mode or heating mode) by the temperature condition as follows.

<table>
<thead>
<tr>
<th>Outdoor Temp.</th>
<th>Indoor Temp.</th>
<th>Charging Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>32°F DB ~ 109°F DB</td>
<td>50°F DB ~ 90°F DB</td>
<td>Cooling mode</td>
</tr>
<tr>
<td>Less than above range</td>
<td></td>
<td>Heating mode</td>
</tr>
</tbody>
</table>

When charging in the cooling mode, the system will stop operation when the required amount of refrigerant is charged. During charging in heating mode, a person must manually close valve A and stop operation.
Beforehand, check the remaining refrigerant that is needed to charge based on the “additional charging amount” in step 2 and the charged amount in step 3.
- The refrigerant will be charged about 66 lb in one hour at outdoor temp. 86°F DB (about 26 lb at outdoor temp. 32°F DB).
- During Automatic refrigerant charging operation, you can stop the operation forcibly by pushing MODE button (BS1).

(Refer to figure 31)
1. Measuring device
2. R410A tank (with siphon)
3. Charge hose
4. Gas pipe shutoff valve
5. Liquid pipe shutoff valve
6. Refrigerant charge port
7. Valve A
8. Valve B
9. Valve C
10. Outdoor unit A
11. Outdoor unit B
12. Outdoor unit C
13. Indoor unit
14. Field pipings
15. Refrigerant flow when charging
16. Shutoff valve
17. Service port
18. The refrigerant will be charged about 66 lb in one hour at outdoor temp. 86°F DB (26 lb at 32°F DB). (According to outdoor temp. or the refrigerant amount in the tank, the charging rate may speed up). If you need to speed up in case of multi system, connect the refrigerant tanks to each outdoor unit.

[Automatic refrigerant charging operation procedure]

NOTE
- The marks of LED mean as follows.
  ● : OFF  ○ : ON  ❄️ : Blinking  * : OFF, ON or Blinking
- The refrigerant charge port of this unit have electric expansion valve. However, the valve will opened when other operation (Check operation, normal operation, etc.). If you leave the tank connected, the refrigerant will charged and it cause over charge.

(1) Open the liquid pipe and gas pipe shutoff valves. (The valve A~C must be closed. See figure 31.)
(2) Close the electrical components box (1) lid and all front panel except on the electrical components box (1) side. (*1) And turn the power to the outdoor unit and all connected indoor units. (*2)
(3) After H2P stop blinking (about 12 minutes after turning on the power), check H2P is OFF. If H2P is ON, check the malfunction code in the remote controller of indoor unit and correct the malfunction in accordance with [Remote controller display malfunction code] in chapter 11-2-2.
(4) Check the LED. And push the MODE button (BS1) once if the LED displays is not below.

H1P H2P H3P H4P H5P H6P H7P
● ● ● ● ● ● ●

(5) Hold the TEST button (BS4) down for 5 seconds or more.
(The LED displays will change as below and fan of outdoor unit will start rotation.)

H1P H2P H3P H4P H5P H6P H7P
○ ○ ○ ○ ○ ○ ○

(6) When the compressor start working and the LED displays change any state in below (*3), go to “In case of cooling mode” or “In case of heating mode” in accordance with the LED displays.

H1P H2P H3P H4P H5P H6P H7P
❄️ ● ● ● ● ● ●
Go to “In case of cooling mode”
Go to “In case of heating mode”

—In case of cooling mode—
(7) Push the TEST button (BS4) once within 5 minutes after procedure (5) (*4) and close the all front panels (*5).
After that, open the valve A immediately (See figure 31) (*6) and watch the remote controller display of indoor unit.
(8) If the remote controller display shows “PE” code (*7), ready to close the valve A.
And go to procedure (9).
If the remote controller display shows other code, close the valve A immediately and refer to [Remote controller cooling mode malfunction code]

Beware the fan running when open the front panel.
The fan may continue rotation after the system stop the operation.
(9) When the compressor stop working (the fan may continue rotation.), close the valve A immediately (*8).
And check the LED displays are as below and the remote controller display shows “P9” code.

H1P H2P H3P H4P H5P H6P H7P
○ ○ ○ ○ ○ ○ ○

After checking, push the MODE button (BS1) once and the charging is complete.

—In case of heating mode—
(7) Push the TEST button (BS4) once within 5 minutes after procedure (5) (*4) and close the all front panels.
After that, open the valve A immediately (See figure 31) (*6) and check the charged amount by measuring device.
During operation, if the remote controller display shows “P2” or “P8” code, close the valve A immediately and refer to [Remote controller heating mode malfunction code].

Beware the fan running when open the front panel.
The fan may continue rotation after the system stop the operation.
(8) When the required amount of refrigerant is charged, close the valve A (See figure 30) (*) and push the RETURN button (BS3) once. And then go to procedure (9).
(9) Push the MODE button (BS1) once, and the charging is complete.

Notes (*1)~(*8)
(1) Lead the refrigerant charge hose etc from the pipe intake. All front panels must be closed at the procedure (7).
(2) If you perform the refrigerant charging operation within the refrigerant system that have the power off unit, the operation cannot finish properly.
Check the number of outdoor and indoor units that is powered. For checking, see [How to check how many units are connected] in chapter 11-1.
(3) To energize the crankcase heater, make sure to turn on for 6 hours before starting operation.
(4) It takes about 2~10 minutes for getting stability of refrigerant state.
If the additional refrigerant is little and operation is started before getting stability, the system can not judge the charging amount precisely and it cause over charge.
(5) If the TEST button (BS4) is not pushed within 5 minutes, “P2” code will displayed in the remote controller. In this case, refer [Remote controller cooling (or heating) mode malfunction code].
(6) If the front panel is opened during the operation, the system cannot operate properly.
(7) Depending on the situation of operation such as the charging amount is little, the “PE” code may not be displayed and the “P9” code may be displayed.
(8) Always close the valve A and take the tank off.
The refrigerant charge port of this unit have electric expansion valve and the valve are closed when charging is finished. However, the valve will opened when other operation (Check operation, normal operation, etc.). If you leave the tank connected, the refrigerant will charged and it cause over charge.
Installation of Outdoor Units

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[Remote controller cooling mode malfunction code]

<table>
<thead>
<tr>
<th>Code</th>
<th>The work contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>Charging is almost finished. Ready to close the valve A.</td>
</tr>
<tr>
<td>PA</td>
<td>The refrigerant tank is empty. Close the valve A and replace empty tank to the new tank. After changing the tank, open the valve A again. <strong>Beware the fan running. The outdoor unit does not stop operation.</strong></td>
</tr>
<tr>
<td>PH</td>
<td>Close the valve A immediately, and restart the operation from procedure (3).</td>
</tr>
<tr>
<td>P2</td>
<td>Operation is interrupted. Close the valve A immediately and check the below items.</td>
</tr>
<tr>
<td></td>
<td>• Check if gas pipe or liquid pipe shutoff valve is opened.</td>
</tr>
<tr>
<td></td>
<td>• Check the refrigerant tank is connected and the valve A was opened.</td>
</tr>
<tr>
<td></td>
<td>• Check if the air inlet and outlet of the indoor unit are not closed by an obstruction.</td>
</tr>
<tr>
<td>P8</td>
<td>Operation is stopped abnormally. Close the valve A immediately. Confirm the malfunction code and correct the abnormality following the [Remote controller displays malfunction code] in chapter 11-2-2.</td>
</tr>
<tr>
<td>P9</td>
<td>Charging is finished. Close the valve A and take the refrigerant tank off.</td>
</tr>
</tbody>
</table>

6. After completing the additional refrigerant charging, record the charging amount on the accessory “REQUEST FOR THE INSTALLATION records” and adhere it to the back side of the front panel.

11-2-2 Procedure of check operation

- Check operation perform the following work. Do the check operation following below.
- Otherwise, malfunction code “U3” will be displayed in the remote controller and normal operation can not be carried out.
  - Check of shutoff valve opening
  - Check of miswiring
  - Judgment of piping length
  - Check of refrigerant overcharge

**NOTE**

- Check operation can not carried out at outdoor temp. less than 23°F. Perform the check operation at day or time that outdoor temp. is 23°F or more.

[Check Operation Procedure]

1. Close the electrical components box lid and all front panels except as the side of the electrical components box and turn on the power to the outdoor unit and all connected indoor units. (Be sure to turn the power on at least 6 hours before operation in order to have power running to the crank case heater.)

2. Make the onsite settings as needed using the push button (BS1-BS5) on the outdoor unit PC-board (A1P) with the power on. (See “12. ONSITE SETTINGS”)

3. Perform the check operation following the Check Operation Method of the [Service Precautions] label (upper) on the electrical components box lid. (See figure 32) The system operation for about 40–60 minutes and automatically stops the check operation.

If the malfunction code is not displayed in the remote controller after the system stop, check operation is completed. Normal operation will be possible after 5 minutes. If the malfunction code is displayed in the remote controller, correct the malfunction following [Remote controller displays malfunction code] and perform the check operation again.

(Refer to figure 32)

1. Electrical components box (1) lid
2. (Only RXYQ–PB) and RXYQ144PB
3. [Service Precaution] label (upper)
4. [Service Precaution] label (lower)

**NOTE**

For interrupting the check operation, push RETURN button (BS3).

[Remote controller displays malfunction code]

<table>
<thead>
<tr>
<th>Malfunction code</th>
<th>Installation error</th>
<th>Remedial action</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3, E4, F3, F6, UF</td>
<td>The shutoff valve of the outdoor unit is left closed.</td>
<td>Open the shutoff valve.</td>
</tr>
<tr>
<td>U1</td>
<td>The phases of the power to the outdoor unit is reversed.</td>
<td>Exchange two of the three phases (L1, L2, L3) to make a proper connection.</td>
</tr>
<tr>
<td>U1, U4, LC</td>
<td>No power is supplied to an outdoor or indoor unit (including phase interruption).</td>
<td>Make sure the power source wire is properly connected to the outdoor or indoor unit and revise if necessary.</td>
</tr>
<tr>
<td>UF</td>
<td>There is conflict on the connection of transmission wiring in the system.</td>
<td>Check if the refrigerant piping line and the transmission wiring are consistent with each other.</td>
</tr>
<tr>
<td>E3, F6, UF</td>
<td>Refrigerant overcharge.</td>
<td>Recalculate the additional amount refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.</td>
</tr>
<tr>
<td>E4, F3</td>
<td>Insufficient refrigerant.</td>
<td>• Check if the additional refrigerant charge has been finished correctly.</td>
</tr>
<tr>
<td>U7, U4, UF, UH</td>
<td>Field wiring is connected to &quot;TO MULTI UNIT (Q1, Q2)&quot; terminal on the outdoor unit PC-board (A1P) when the system is one outdoor system.</td>
<td>Remove the line from the &quot;TO MULTI UNIT (Q1, Q2)&quot; terminal.</td>
</tr>
</tbody>
</table>

**NOTE**

If any malfunction codes other than the above are displayed, check the service manual for how to respond.
12. ONSITE SETTINGS

--- NOTE ---
In the case of a multi system, all onsite settings should be made on the master unit. Settings made on sub units are invalid. The outdoor unit to which the indoor unit transmission wire is connected is the master unit, and all other units are sub units.

Use the push button switches (BS1 through BS5) on the outdoor unit PC-board (A1P) to make the necessary onsite settings. See the “Service Precautions” label (upper) on the electrical components box lid for details on the positions and operating method of the push button switches and on the onsite setting. Make sure to record the setting on the accessory “REQUEST FOR THE INDICATION” label.

--- WARNING ---
Use an insulated rod to operate the push buttons via the inspection door of electrical components box lid. There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

13. TEST RUN

13-1 Before test run
- Make sure the following works are completed in accordance with the installation manual.
  - Piping work
  - Wiring work
  - Air tight test
  - Vacuum drying
  - Additional refrigerant charge
  - Check operation
- Check that all work for the indoor unit are finished and there are no danger to operate.

13-2 Test Run
After all works are completed, operate the unit normally and check the following.
1. Make sure the indoor and outdoor units are operating normally.
2. Operate each indoor unit one by one and make sure the corresponding outdoor unit is also operating.
3. Check to see if cold (or hot) air is coming out from the indoor unit.
4. Push the fan direction and strength buttons on the remote controller to see if they operate properly.

--- NOTE ---
- Heating is not possible if the outdoor temperature is 75°F or higher. Refer to the Operation manual.
- If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the crank case heater for a sufficient length of time before restarting the operation.
- Once stopping, the compressor will not restart in about 5 minutes even if the On/Off button of the remote controller is pushed.
- When the system operation is stopped by the remote controller, the outdoor units may continue operating for further 5 minutes at maximum.
- The outdoor unit fan may rotate at low speeds if the Night-time low noise setting or the External low noise level setting is made, but this is not a malfunction.
- If the check operation was not performed at first installation, the malfunction code “U3” will be displayed in the remote controller. Perform the check operation following “11-2-2 Procedure of Check Operation”.

13-3 Checks After Test Run
Perform the following checks after the test run is complete.
- Record the contents of field setting.
  → Record them on the accessory “REQUEST FOR THE INDICATION” label.
  → Record the installation date.
- And attach the label on the back side of the front panel.

--- NOTE ---
After the test run, when handing the unit over to the customer, make sure the electrical components box lid, the inspection door, and the unit casing are all attached.
14. CAUTION FOR REFRIGERANT LEAKS

(Points to note in connection with refrigerant leaks)

Introduction:

The installer and system specialist shall secure safety against leakage according to local regulations or standards. The following standards may be applicable if local regulations are not available.

The VRV System, like other air conditioning systems, uses R-410A as refrigerant. R-410A is an entirely safe non-toxic, non-combustible refrigerant. Nevertheless care must be taken to ensure that air conditioning facilities are installed in a room that is sufficiently large. This assures that the maximum concentration level of refrigerant gas is not exceeded, in the unlikely event of major leak in the system and this in accordance to the local applicable regulations and standards.

**Maximum concentration level:**

The maximum charge of refrigerant and the calculation of the maximum concentration of refrigerant is directly related to the humanly occupied space in to which it could leak.

The unit of measurement of the concentration is lb/ft³ (the weight in lb of the refrigerant gas in 1 ft³ volume of the occupied space).

Compliance to the local applicable regulations and standards for the maximum allowable concentration level is required.

1. direction of the refrigerant flow
2. room where refrigerant leak has occurred (outflow of all the refrigerant from the system)

Pay special attention to the place, such as a basement, etc., where refrigerant can stay, since refrigerant is heavier than air.

**Procedure for checking maximum concentration**

Check the maximum concentration level in accordance with steps 1–2 below and take whatever action is necessary to comply.

1. Calculate the amount of refrigerant (lb) charged to each system separately.

   \[
   \text{amount of refrigerant in a single unit system (amount of refrigerant with which the system is charged before leaving the factory)} \quad + \quad \text{additional charging amount (amount of refrigerant added locally in accordance with the length or diameter of the refrigerant piping)} \quad = \quad \text{total amount of refrigerant (lb) in the system}
   \]


---

**NOTE**

- Where a single refrigerant facility is divided into 2 entirely independent refrigerant systems then use the amount of refrigerant with which each separate system is charged.
5.2 REYQ72~120PBYD (Heat Recovery, 460V) REYQ72~144PBTJ (Heat Recovery, 208/230V)

< If installed as a single unit >
(Pattern 1)

< When installed in serial >
(Pattern 1)

< If installed as a single unit >
(Pattern 2)

< When installed in serial >
(Pattern 2)

< If installed as a single unit >
(Pattern 3)

< When installed in serial >
(Pattern 3)
1. Safety Considerations

1-1 Safety considerations for Installation

Safety considerations

Read these SAFETY CONSIDERATIONS for Installation carefully before installing an air conditioner or heat pump. After completing the installation, make sure that the unit operates properly during the startup operation.

Instruct the customer on how to operate and maintain the unit. Inform customers that they should store this Installation Manual with the Operation Manual for future reference.

Always use a licensed installer or contractor to install this product. Improper installation can result in water or refrigerant leakage, electric shock, fire, or explosion.

Meanings of DANGER, WARNING, CAUTION, and NOTE

Symbols:

DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
NOTE Indicates situations that may result in accidents only.

--- DANGER ---

- Refrigerant gas is heavier than air and replaces oxygen. A massive leak can lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death.
- Do not ground units to water pipes, gas pipes, telephone wires, or lightning rods as incomplete grounding can cause a severe shock hazard resulting in severe injury or death. Additionally, grounding to gas pipes could cause a gas leak and potential explosion causing severe injury or death.
- If refrigerant gas leaks during installation, ventilate the area immediately. Refrigerant gas may produce toxic gas if it comes into contact with fire. Exposure to this gas could cause severe injury or death.
- After completing the installation work, check that the refrigerant gas does not leak throughout the system.
- Do not install unit in an area where flammable materials are present due to risk of explosions that can cause serious injury or death.
- Safely dispose all packing and transportation materials in accordance with federal/state/local laws or ordinances. Packing materials such as nails and other metal or wood parts, including plastic packing materials used for transportation may cause injuries or death by suffocation.

--- WARNING ---

- Only qualified personnel must carry out the installation work. Installation must be done in accordance with this installation manual. Improper installation may result in water leakage, electric shock, or fire.
- When installing the unit in a small room, take measures to keep the refrigerant concentration from exceeding allowable safety limits. Excessive refrigerant leaks, in the event of an accident in a closed ambient space, can lead to oxygen deficiency.
- Use only specified accessories and parts for installation work. Failure to use specified parts may result in water leakage, electric shocks, fire, or the unit falling.
- Install the air conditioner or heat pump on a foundation strong enough that it can withstand the weight of the unit. A foundation of insufficient strength may result in the unit falling and causing injuries.
- Take into account strong winds, typhoons, or earthquakes when installing. Improper installation may result in the unit falling and causing accidents.
- Make sure that a separate power supply circuit is provided for this unit and that all electrical work is carried out by qualified personnel according to local, state, and national regulations. An insufficient power supply capacity or improper electrical construction may lead to electric shocks or fire.
- Make sure that all wiring is secured, that specified wires are used, and that no external forces act on the terminal connections or wires. Improper connections or installation may result in fire.
- When wiring, position the wires so that the terminal box lid can be securely fastened. Improper positioning of the terminal box lid may result in electric shocks, fire, or the terminals overheating.
- Before touching electrical parts, turn off the unit.
- Securely fasten the outside unit terminal cover (panel). If the terminal cover/panel is not installed properly, dust or water may enter the outside unit causing fire or electric shock.
- When installing or relocating the system, keep the refrigerant circuit free from substances other than the specified refrigerant (R-410A) such as air. Any presence of air or other foreign substance in the refrigerant circuit can cause an abnormal pressure rise or rupture, resulting in injury.
- Do not change the setting of the protection devices. If the pressure switch, thermal switch, or other protection device is shorted and operated forcibly, or parts other than those specified by Daikin are used, fire or explosion may occur.

--- CAUTION ---

- Do not touch the switch with wet fingers. Touching a switch with wet fingers can cause electric shock.
- Do not allow children to play on or around the unit to prevent injury.
- The heat exchanger fins are sharp enough to cut. To avoid injury wear gloves or cover the fins while working around them.
- Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frostbite if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touch them, be sure to wear proper gloves.
- Install drain piping to proper drainage. Improper drain piping may result in water leakage and property damage.
- Insulate piping to prevent condensation.
- Be careful when transporting the product.
• Do not turn off the power immediately after stopping operation. Always wait for at least 5 minutes before turning off the power. Otherwise, water leakage may occur.

• Do not use a charging cylinder. Using a charging cylinder may cause the refrigerant to deteriorate.

• Refrigerant R-410A in the system must be kept clean, dry, and tight.

  (a) Clean and Dry -- Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting into the system.

  (b) Tight -- R-410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth’s protection against harmful ultraviolet radiation. R-410A can contribute to the greenhouse effect if it is released. Therefore take proper measures to check for the tightness of the refrigerant piping installation. Read the chapter Refrigerant Piping and follow the procedures.

• Since R-410A is a blend, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition can change and the system will not work properly.

• The indoor unit is for R-410A. See the catalog for indoor models that can be connected. Normal operation is not possible when connected to other units.

• Remote controller (wireless kit) transmitting distance can be shorter than expected in rooms with electronic fluorescent lamps (inverter or rapid start types). Install the indoor unit far away from fluorescent lamps as much as possible.

• Indoor units are for indoor installation only. Outdoor units can be installed either outdoors or indoors. This unit is for indoor use.

• Do not install the air conditioner or heat pump in the following locations:
  (a) Where a mineral oil mist or oil spray or vapor is produced, for example, in a kitchen. Plastic parts may deteriorate and fall off or result in water leakage.

  (b) Where corrosive gas, such as sulfuric acid gas, is produced. Corroding copper pipes or soldered parts may result in refrigerant leakage.

  (c) Near machinery emitting electromagnetic waves. Electromagnetic waves may disturb the operation of the control system and cause the unit to malfunction.

  (d) Where flammable gas may leak, where there is carbon fiber, or ignitable dust suspension in the air, or where volatile flammables such as thinner or gasoline are handled. Operating the unit in such conditions can cause a fire.

• Take adequate measures to prevent the outside unit from being used as a shelter by small animals. Small animals making contact with electrical parts can cause malfunctions, smoke, or fire. Instruct the customer to keep the area around the unit clean.

---

**NOTE**

• Install the power supply and control wires for the indoor and outdoor units at least 3.5 feet away from televisions or radios to prevent image interference or noise. Depending on the radio waves, a distance of 3.5 feet may not be sufficient to eliminate the noise.

• Dismantling the unit, treatment of the refrigerant, oil and additional parts must be done in accordance with the relevant local, state, and national regulations.

• Do not use the following tools that are used with conventional refrigerants: gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, vacuum gauge, or refrigerant recovery equipment.

• If the conventional refrigerant and refrigerator oil are mixed in R-410A, the refrigerant may deteriorate.

• This air conditioner or heat pump is an appliance that should not be accessible to the general public.

• As design pressure is 478 psi, the wall thickness of field-installed pipes should be selected in accordance with the relevant local, state, and national regulations.

1-2 Special notice of product

**[CLASSIFICATION]**
This air conditioner comes under the term “appliances not accessible to the general public”.

**[REFRIGERANT]**
VRVIII System use R410A refrigerant.

• The refrigerant R410A requires strict cautions for keeping the system clean, dry and tight. Read the chapter “REFRIGERANT PIPING” carefully and follow these procedures correctly.

  A. Clean and dry
  Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting mixed into the system.

  B. Tight
  Take care to keep the system tight when installing.
  R410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth’s protection against harmful ultraviolet radiation. R410A can contribute slightly to the greenhouse effect if it is released.

• Since R410A is a mixed refrigerant, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition changes and the system will not work properly.

**[DESIGN PRESSURE]**
Since design pressure is 478 psi, the wall thickness of pipes should be more carefully selected in accordance with the relevant local and national regulations.

1-3 Disposal requirements
Dismantling the unit, treatment of the refrigerant, oil and eventual other parts, should be done in accordance with the relevant local and national regulations.

2. INTRODUCTION
• REYQ-P series are designed for outdoor installation and used for cooling and heating applications.

• The Branch Selector units that combined with REYQ-P system for changing the refrigerant flow to indoor units are BSVQ36-60-96P type only. To combine with other type Branch Selector unit will cause malfunction.
2-1 Combination

- The indoor units that combined with REYQ-P system for air conditioning are Daikin VRV series indoor units that compatible with R410A. To learn which indoor units are compatible with R410A, refer to the product catalogs. To combine with other refrigerant indoor unit will cause malfunction.

2-2 Standard supplied accessories

Confirm the following accessories are included. The storage location of the accessories is shown in figure 1.

NOTE
Do not throw away any of the accessories until installation is complete. They are needed for installation work.

2-3 Option accessory

To install the outdoor units, the following optional parts are also required. To select an optimum kit, refer to “6. REFRIGERANT PIPING”.
- Refrigerant branching kit

2-4 Technical and Electrical specifications

Refer to the Engineering Data Book for the complete list of specifications.

2-5 Main components

For main components and function of the main components, refer to the Engineering Data Book.
3. SELECTION OF LOCATION

Select a location for installation that meets the following conditions and get the customer’s permission.

1. Select the location of the unit in such a way that neither the discharged air nor the sound generated by the unit disturb anyone.
2. The foundation is strong enough to support the weight of the unit and the floor is flat to prevent vibration and noise generation.
3. The piping length between the outdoor unit and the indoor unit may not exceed the allowable piping length. (Refer to “6. REFRIGERANT PIPING”)
4. Locations where the unit’s suction vent and outlet vent do not generally face the wind.
5. The space around the unit is adequate for servicing and the space in front of the unit is adequate for servicing and the minimum space for air inlet and air outlet is available.

Installation Space Examples

- The installation space requirement shown in figure 2 is a reference for cooling operation when the outdoor temperature is 95°F. If the design outdoor temperature exceeds 95°F or the heat load exceeds maximum capacity in all the outdoor unit, take an even larger space on the intake shown in figure 2.
- During installation, install the units using the most appropriate of the patterns shown in figure 2 for the location in question, taking into consideration human traffic and wind.
- If the number of units installed is more than that shown in the pattern in figure 2, install the units so there are no short circuits.
- As regards space in front of the unit, consider the space needed for the local refrigerant piping when installing the units.
- If the work conditions in figure 2 do not apply, contact your dealer or Daikin directly.

(Refer to figure 2)

1. Front side
2. No limit to wall height
3. Service space of front side
4. Service space of suction side

For Patterns 1 and 2 in figure 2:
- Wall height for front side – no higher than 59 in.
- Wall height for suction side – no higher than 19-5/8 in.
- Wall height for sides – no limit.
- If the height is exceeded the above, calculate h1 and h2 shown in the figure below, and add h2/2 to the service space of front side and h1/2 to the service space of suction side.

DANGER

- Do not install unit in an area where flammable materials are present due to risk of explosion resulting in serious injury or death.
- Refrigerant gas in heavier air and replaces oxygen. A massive leak could lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death. Refer to the chapter “CAUTION FOR REFRIGERANT LEAKS”.

4. INSPECTING AND HANDLING THE UNIT

- At delivery, the package should be checked and any damage should be reported immediately to the carrier claims agent.
- When handling the unit, take into account the following:
  1. Fragile, handle the unit with care.
  2. Decide on the transportation route.
  3. If a forklift is to be used, pass the forklift arms through the large openings on the bottom of the unit. (Refer to figure 4)
  4. If hanging the unit, use a cloth sling to prevent damaging the unit. Keeping the following points in mind, hang the unit following the procedure shown in figure 5.
    • Use a sling sufficiently strong to hold the mass of the unit.
    • Use 2 belts of at least 27 ft long.
    • Place extra cloth or boards in the locations where the casing comes in contact with the sling to prevent damage.
    • Hoist the unit making sure it is being lifted at its center of gravity.
- After installation, remove the transportation clasp (yellow) attached to the large openings. (Refer to figure 4)

(Refer to figure 4)

1. Packaging material
2. Forklift

(Refer to figure 5)

1. Belt sling
2. Wear plate

5. PLACING THE UNIT

- Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise. (Refer to figure 6)
- The base should support the unit with the extent larger than hatched area in figure 7.
- If protective rubber is to be attached, attach it to the whole face of the base.
- The height of the base should be at least 5-7/8 in. from the floor.
- Secure the unit to its base using foundation bolts. (Use four commercially available M12-type foundation bolts, nuts, and washers.)
- The foundation bolts should be inserted 13/16 in.

(Refer to figure 6)

1. Independent base (four corner type)
2. Independent base (with center support type)
3. Beam base (Horizontal)
4. Beam base (Vertical)
5. Center of the product
### 6. REFRIGERANT PIPING

**NOTE**
- There are restrictions on the refrigerant pipe connecting order between outdoor unit in the case of the multi system. See “2-1 Combination” for detail.
- When installing on a roof, make sure the roof floor is strong enough and be sure to water-proof all work.
- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation. Drain water is sometimes discharged from the outdoor unit when it is running.
- For anti-corrosion type, use nuts with resin washers. If the paint on nut connections comes off, the anti-corrosion effect may decrease.

#### 6-1 Selection of piping material and Refrigerant branching kit
- Use only pipes which are clean inside and outside and which do not accumulate harmful sulfur, oxidants, dirt, cutting oils, moisture, or other contamination. (Foreign materials inside pipes including oils for fabrication must be 0.14 gr/10 ft or less.)
- Do not use flux when brazing the refrigerant piping. Use the phosphor copper brazing filler metal (B-Cu93P-710/795 : ISO 3677) which does not require flux. (Flux has extremely negative effect on refrigerant piping systems. For instance, if the chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will damage the refrigerant oil.)

#### 6-2 Protection against contamination when installing pipes
Protect the piping to prevent moisture, dirt, dust, etc. from entering the piping.

<table>
<thead>
<tr>
<th>Place</th>
<th>Installation period</th>
<th>Protection method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor</td>
<td>More than a month</td>
<td>Pinch the pipe</td>
</tr>
<tr>
<td>Indoor</td>
<td>Less than a month</td>
<td>Pinch or tape the pipe</td>
</tr>
<tr>
<td>Indoor</td>
<td>Regardless of the period</td>
<td>Pinch or tape the pipe</td>
</tr>
</tbody>
</table>

**NOTE**
- Exercise special caution to prevent dirt or dust when passing piping through holes in walls and when passing pipe edges to the exterior.

#### 6-3 Pipe connection
- Be sure to perform nitrogen permutation or nitrogen blow when brazing. (Refer to figure 8)

Brazing without performing nitrogen permutation or nitrogen blow into the piping will create large quantities of oxidized film on the inside of the pipes, adversely affecting valves and compressors in the refrigerating system and preventing normal operation.

(Refer to figure 8)
1. Refrigerant pipe
2. Location to be brazed
3. Nitrogen
4. Taping
5. Handy valve
6. Regulator

- The pressure regulator for the nitrogen released when doing the brazing should be set to about 2.9 psi (Enough to feel a slight breeze on your cheek).

**NOTE**
- Do not use anti-oxidants when brazing the pipe joints. Residue can clog pipes and break equipment.

#### 6-4 Connecting the refrigerant piping
1. Direction to bring out the pipes
The local inter unit piping can be connected either forward or to the sides (taken out through the bottom) as shown in the figure 9. When passing out through the bottom, use the knock hole in the bottom frame.

(Refer to figure 9)
1. Left-side connection
2. Front connection
3. Right-side connection

**Precautions when knocking out knock holes**
- Open knock hole (large, small) in the base frame by drilling the 4 concave around it with a ø -1/4"-bit. (Refer to figure 10)

(Refer to figure 10)
1. Knock hole (large : for liquid pipe, suction gas pipe and HP/LP gas pipe)
2. Knock hole (small : for equalizer pipe)
3. Drill
4. Concave section (4 points)
- Be sure to avoid damaging the casing.
- After knocking out the holes, we recommend you remove any burrs and paint them using the repair paint to prevent rusting.
- When passing electrical wiring through the knock holes, protect the wiring with a conduit or bushings, making sure not to damage the wiring.

2. Removing Pinch Piping
- When connecting refrigerant piping to an outdoor unit, remove the pinch piping using the procedure in the figure 11. (Refer to figure 11)
- About handling of shutoff valves, refer to [Shutoff valve operation procedure] in “11-1 Before working”.  

![Resin washers](Resin_washers.png)
**CAUTION**

After removing the gas, remove the pinch piping. Any gas remaining inside may blow off the pinch piping when you dissolve the brazing, causing damage.

*(Refer to figure 11)*

1. Pinch piping (3 pieces)
2. Do not remove the relay piping.
3. Pinch piping
4. Procedure 1: Confirm the shutoff valve is closed.
5. Procedure 2: Connect a charge hose to the service port of shutoff valve and remove the gas in the pinch piping.
6. Procedure 3: After removing the gas in the pinch piping, dissolve the brazing using a burner and remove the pinch piping.

3. Connecting refrigerant piping to outdoor units
   - Figure 12 shows the example of connecting refrigerant piping to outdoor units.
   - The local inter unit piping next accessory pipes are field supplied.

*(Refer to figure 12)*

1. When connected to the front
2. When connected at lateral side (bottom)
3. Remove the shutoff valve cover to connect.
4. Remove the knock hole on the bottom frame and route the piping under the bottom frame.
5. Liquid pipe shutoff valve
6. Suction gas pipe shutoff valve
7. HP/LP gas pipe shutoff valve
8. Brazing
9. Liquid side accessory pipe (1)
10. Suction gas side accessory pipe (1)
11. HP/LP gas side accessory pipe (1)
12. L type accessory joint (1)
13. L type accessory joint (2)
14. Liquid side accessory pipe (2)
15. Suction gas side accessory pipe (2)
16. HP/LP gas side accessory pipe (2)
17. In case of 72P type use the Accessory joint for connecting the Suction gas side accessory pipe (2) to Suction gas side shutoff valve.
18. Accessory joint

**NOTE**

- Make sure the onsite piping does not come into contact with other piping or the bottom frame or side panels of the unit.

4. Branching the refrigerant piping
   
   Heed the restrictions below when installing the refrigerant branching kit and read the installation instruction manual with the kit.
   
   *(Improper installation could lead to malfunctioning or breakdown of the outdoor unit.)*

<REFNET joint>

Install the REFNET joint so it splits horizontally or vertically.

*(Refer to figure 13)*

1. Horizontal
2. A-arrow view
3. Horizontal surface
4. ±30° or less
5. Vertical

<REFNET header>

Install the REFNET header so it splits horizontally.

*(Refer to figure 14)*

1. Horizontal surface
2. B-arrow view
**Example of connection**

*Connection of 8 indoor units*

- **Outdoor unit side** 
  - 3 pipes
  - Suction gas pipe
  - LP gas pipe
  - Liquid pipe

- **Indoor unit side** 
  - 2 pipes
  - Branch Selector Unit
  - Gas pipe

**Piping from outdoor unit to Branch Selector Unit**

- **(Bold):** 3 pipes
  - (Suction) gas pipe
  - Liquid pipe

- **(Thin):** 2 pipes
  - HP/LP gas pipe
  - Liquid pipe

**Piping from Branch Selector Unit to indoor unit**

- Using refrigerant branch kit to indoor unit used as cooling only

---

**Table: Example of connection**

<table>
<thead>
<tr>
<th></th>
<th>Branch with REFNET joint</th>
<th>Branch with REFNET joint and header</th>
<th>Branch with REFNET header</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outdoor unit</strong></td>
<td><img src="Example" alt="Diagram" /></td>
<td><img src="Example" alt="Diagram" /></td>
<td><img src="Example" alt="Diagram" /></td>
</tr>
<tr>
<td><strong>REFNET joint</strong></td>
<td><img src="Example" alt="Diagram" /></td>
<td><img src="Example" alt="Diagram" /></td>
<td><img src="Example" alt="Diagram" /></td>
</tr>
<tr>
<td><strong>REFNET header</strong></td>
<td><img src="Example" alt="Diagram" /></td>
<td><img src="Example" alt="Diagram" /></td>
<td><img src="Example" alt="Diagram" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Maximum allowable length</strong></th>
<th><strong>Between outdoor unit and indoor unit</strong></th>
<th><strong>Equivalent length</strong></th>
<th><strong>Between outdoor unit and indoor units</strong> (Note 1)</th>
<th><strong>Difference in height</strong></th>
<th><strong>Between indoor and indoor units</strong> (Note 2)</th>
<th><strong>Difference in height</strong></th>
<th><strong>Allowable length after the branch</strong></th>
<th><strong>Actual pipe length</strong></th>
<th><strong>Actual pipe length</strong></th>
<th><strong>Actual pipe length</strong></th>
</tr>
</thead>
</table>

**Notes:**

1. Indicates the Outside unit multi-connection piping kit.
2. In case of multi-outdoor system, read "outside unit" to the "first Outside unit multi-connection piping kit" as seen from the indoor unit.
3. This can be extended to 295 ft with a replacement outdoor unit PCB.
4. If the difference between the outdoor and indoor unit is greater than 164 ft, the liquid line must be increased by one size.
### Refrigerant branch kit selection

- Refrigerant branch kits can only be used with R410A.

#### How to select the REFNET joint
- Choose the REFNET joints other than the first branch from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET joint.

#### How to select the REFNET header
- Choose from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET header.

<table>
<thead>
<tr>
<th>Outdoor unit capacity type</th>
<th>Refrigerant branch kit name</th>
</tr>
</thead>
<tbody>
<tr>
<td>REYQ2 · 960 type</td>
<td>KHRP25M33T</td>
</tr>
<tr>
<td>REYQ120 · 1440 type</td>
<td>KHRP25M72TU9</td>
</tr>
</tbody>
</table>

#### Piping between outdoor unit and refrigerant branch kit (part A)

- Choose from the following table in accordance with the outdoor units system capacity type.

<table>
<thead>
<tr>
<th>Outdoor unit capacity type</th>
<th>Suction gas pipe</th>
<th>H/LP gas pipe</th>
<th>Liquid pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>REYQ230 type</td>
<td>φ3/4</td>
<td>φ5/8</td>
<td>φ3/8</td>
</tr>
<tr>
<td>REYQ360 type</td>
<td>φ7/8</td>
<td>φ3/4</td>
<td>φ1/2</td>
</tr>
<tr>
<td>REYQ1440 type</td>
<td>φ1-1/8</td>
<td>φ7/8</td>
<td>φ1/2</td>
</tr>
</tbody>
</table>

#### Piping between outdoor unit (*2 and refrigerant branch kit (part A))

- Choose from the following table in accordance with the total capacity index of all the indoor units connected downstream.

<table>
<thead>
<tr>
<th>Indoor unit total capacity index</th>
<th>3 pipes</th>
<th>2 pipes</th>
</tr>
</thead>
<tbody>
<tr>
<td>x &lt; 72</td>
<td>KHRP25M33T</td>
<td>KHRP25M72TU9</td>
</tr>
<tr>
<td>72 ≤ x &lt; 111</td>
<td>KHRP25M22T</td>
<td>KHRP25M22H9</td>
</tr>
<tr>
<td>111 ≤ x</td>
<td>KHRP25M72H9</td>
<td>KHRP26M72H9</td>
</tr>
</tbody>
</table>

#### Piping between refrigerant branch kits

- Choose from the following table in accordance with the total capacity index of all the indoor units connected downstream.

<table>
<thead>
<tr>
<th>Indoor capacity index</th>
<th>Suction gas pipe</th>
<th>H/LP gas pipe</th>
<th>Liquid pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>x &lt; 54</td>
<td>φ5/8</td>
<td>φ1/2</td>
<td>φ3/8</td>
</tr>
<tr>
<td>54 ≤ x &lt; 72</td>
<td>φ3/4</td>
<td>φ3/8</td>
<td>φ3/8</td>
</tr>
<tr>
<td>72 ≤ x &lt; 111</td>
<td>φ7/8</td>
<td>φ3/4</td>
<td>φ3/8</td>
</tr>
<tr>
<td>111 ≤ x ≤ 162</td>
<td>φ1-1/8</td>
<td>φ1-1/8</td>
<td>φ5/8</td>
</tr>
<tr>
<td>162 ≤ x</td>
<td>φ1-1/8</td>
<td>φ1-1/8</td>
<td>φ5/8</td>
</tr>
</tbody>
</table>

#### Piping between refrigerant branch kit, BS unit and indoor unit

- Match to the size of the connection piping on the indoor unit.

<table>
<thead>
<tr>
<th>Indoor unit capacity type</th>
<th>gas pipe</th>
<th>Liquid pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 · 09.12 · 18</td>
<td>φ1/2</td>
<td>φ1/2</td>
</tr>
<tr>
<td>24 · 30 · 36 · 48 · 54</td>
<td>φ5/8</td>
<td>φ3/8</td>
</tr>
<tr>
<td>72</td>
<td>φ3/4</td>
<td>φ3/4</td>
</tr>
<tr>
<td>96</td>
<td>φ7/8</td>
<td>φ7/8</td>
</tr>
</tbody>
</table>
Installation of Outdoor Units

**Required Conditions**

1. It is necessary to increase the pipe size if the pipe length between the first branch kit and the final branch kit is over 130 ft. (Reducers must be procured on site)
   - If the increased pipe size is larger than main pipe size, then increase the main pipe size to the same size.
   - If the specified pipe diameter is not available onsite, do NOT substitute a pipe of greater diameter.

2. For calculation of Total extension length, the actual length of above pipes must be doubled.
   - (except main pipe and the pipes that are not increased)

3. Indoor unit to the nearest branch kit ≤ 130 ft.

4. The difference between [Outdoor unit to the farthest indoor unit] and [Outdoor unit to the nearest indoor unit] ≤ 130 ft.

5. Indoor unit to the nearest branch kit

6. Increase the pipe size as follows
   - $\phi 3/8 \rightarrow \phi 1/2$
   - $\phi 1/2 \rightarrow \phi 5/8$
   - $\phi 3/4 \rightarrow \phi 7/8$
   - $\phi 1-1/4 \rightarrow \phi 1-1/4*$

- If available on the site, use this size. Otherwise it can not be increased.

**Example for refrigerant branch using REFNET joint and REFNET header for systems and each pipe length as shown below.**

Outdoor system : REYQ120PBYD

Total capacity of indoor unit : 116%

$$R = \left( \frac{0.015 \times 100}{0.040} \right) \times 1.02 + 7.9 + 1.1$$

= 13.574 lb

Round off in units of 0.1 lb.

**How to calculate the additional refrigerant to be charged**

**[HEAT RECOVER SYSTEM]**

Additional refrigerant to be charged : R(lb)

- R should be rounded off in units of 0.1 lb.

**Example Drawings**

- Outdoor unit
- REFNET joint (A-G)
- Indoor units (1 - 8)

**Table: REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT**

<table>
<thead>
<tr>
<th>System</th>
<th>Refrigerant Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>REYQ72 ~ 120PBYD</td>
<td>11 lb</td>
</tr>
<tr>
<td>REYQ72 ~ 144PBTJ</td>
<td>11 lb</td>
</tr>
</tbody>
</table>

**Table: REFRIERTG AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT**

<table>
<thead>
<tr>
<th>System</th>
<th>Refrigerant Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>REYQ72 ~ 96P type</td>
<td>116%</td>
</tr>
<tr>
<td>REYQ120 ~ 144P type</td>
<td>116%</td>
</tr>
</tbody>
</table>

**Table: Required Conditions**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Required Drawings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It is necessary to increase the pipe size if the pipe length between the first branch kit and the final branch kit is over 130 ft. (Reducers must be procured on site) If the increased pipe size is larger than main pipe size, then increase the main pipe size to the same size. If the specified pipe diameter is not available onsite, do NOT substitute a pipe of greater diameter.</td>
<td><img src="image-url" alt="Diagram" /></td>
</tr>
<tr>
<td>2. For calculation of Total extension length, the actual length of above pipes must be doubled. (except main pipe and the pipes that are not increased)</td>
<td><img src="image-url" alt="Diagram" /></td>
</tr>
<tr>
<td>3. Indoor unit to the nearest branch kit ≤ 130 ft.</td>
<td><img src="image-url" alt="Diagram" /></td>
</tr>
<tr>
<td>4. The difference between [Outdoor unit to the farthest indoor unit] and [Outdoor unit to the nearest indoor unit] ≤ 130 ft.</td>
<td><img src="image-url" alt="Diagram" /></td>
</tr>
</tbody>
</table>

*If available on the site, use this size. Otherwise it can not be increased.

*If the increased pipe size is larger than the main pipe size, increase the main pipe size to the same as the increased size. If the specified pipe diameter is not available onsite, do NOT substitute a pipe of greater diameter.
7. FIELD WIRING

**NOTE**

- All field wiring and components must be installed by a licensed electrician and must comply with relevant local and national regulations.
- Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.
- Never install a phase advancing capacitor. As this unit is equipped with an inverter, installing a phase advancing capacitor will not only deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high-frequency waves.
- Only proceed with wiring work after blocking off all power.
- Always ground wires in accordance with relevant local and national regulations.
- This machine includes an inverter device. Connect earth and leave grounding.
- If there exists the possibility of reversed phase, lose phase, momentary blackout or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase may break the compressor and other parts.

### 7-1 Power circuit, safety device and cable requirements

- A power circuit (see the following table) must be provided for connection of the unit. This circuit must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and an earth leakage circuit breaker.
- When using residual current operated circuit breakers, be sure to use a high-speed type (0.1 second or less) 200mA rated residual operating current.
- Use copper conductors only.
- Use insulated wire for the power cord.
- Select the power supply cable type and size in accordance with relevant local and national regulations.
- Specifications for local wiring power cord and branch wiring are in compliance with local cord.

<table>
<thead>
<tr>
<th>Phase and frequency</th>
<th>Voltage</th>
<th>Minimum circuit amp.</th>
<th>Maximum overcurrent protective device</th>
<th>Transmission line selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>REYQ72PBYD</td>
<td>3, 60Hz</td>
<td>460V</td>
<td>16.0A</td>
<td>20A</td>
</tr>
<tr>
<td>REYQ96PBYD</td>
<td>3, 60Hz</td>
<td>460V</td>
<td>20.4A</td>
<td>25A</td>
</tr>
<tr>
<td>REYQ120PBYD</td>
<td>3, 60Hz</td>
<td>460V</td>
<td>20.5A</td>
<td>30A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase and frequency</th>
<th>Voltage</th>
<th>Minimum circuit amp.</th>
<th>Maximum overcurrent protective device</th>
<th>Transmission line selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>REYQ72PBTJ</td>
<td>3, 60Hz</td>
<td>208/230V</td>
<td>36.1A</td>
<td>40A</td>
</tr>
<tr>
<td>REYQ96PBTJ</td>
<td>3, 60Hz</td>
<td>208/230V</td>
<td>43.8A</td>
<td>45A</td>
</tr>
<tr>
<td>REYQ120PBTJ</td>
<td>3, 60Hz</td>
<td>208/230V</td>
<td>44.2A</td>
<td>50A</td>
</tr>
<tr>
<td>REYQ144PBTJ</td>
<td>3, 60Hz</td>
<td>208/230V</td>
<td>72.2A</td>
<td>80A</td>
</tr>
</tbody>
</table>

### 7-2 Wiring Connection Example for Whole System

(Refer to figure 16)

1. Power supply
2. Main switch
3. Earth leakage circuit breaker
4. Fuse
5. Outdoor unit
6. COOL/HEAT selector
7. Remote controller
8. Indoor unit
9. Branch Selector unit

**NOTE**

- Make sure the weak electric wiring (i.e. for the remote controller, between units, etc.) and the power wiring do not pass near each other, keeping them at least 2 in. apart. Proximity may cause electrical interference, malfunctions, and breakage.
- Be sure to connect the power wiring to the power wiring terminal block and secure it as described in "7-5 Power Wiring Connection Procedure".
- Transmission wiring should be secured as described in "7-4 Transmission Wiring Connection Procedure".
- Secure wiring with clamp such as insulation lock ties to avoid contact with piping.
- Shape the wires to prevent the structure such as the electrical components box lid deforming. And close the cover firmly.
- All field wiring is to be procured on site.
7-3 Leading wire Procedure

- The power wiring and ground wiring are passed out from the power wiring hole on the sides, the front (knock hole) or the bottom frame (knock hole).
- The transmission wiring is passed out from the wiring hole (knock hole) on the front of the unit or from a piping hole.

(Refer to figure 17-1)
1. Electric wiring diagram
   Printed on the back of the electrical components box lid.
2. Knockout hole
3. Power line
4. Transmission line

(Refer to figure 17-2)
1. Electrical components box lid
2. Service lid
3. [Service precautions] Label location

NOTE

- Open the knock holes with a hammer or the like.
- After knocking out the holes, we recommend you remove any burrs and paint them using the repair paint to prevent rusting.

(Refer to figure 17-1, 2)
- When passing wiring through the knock holes, remove burrs around the knock holes and protect the wiring with protective tape.
- If small animals might enter the unit, block off any gaps (hatching parts in figure 17-1, 2) with material (field supply).

7-4 Transmission Wiring Connection Procedure

- Referring to figure 18 connect the transmission wiring between outdoor unit and indoor unit, outdoor unit and outdoor unit of other system, outdoor unit and outdoor unit of same system.

(Refer to figure 18)
1. Electrical components box (1)
2. Electrical components box (2)
3. Do not open the electrical components box (2) lid.
   (There are no work when installation)
4. Never connect the power wire.
5. To outdoor unit of other system
6. Use duplex wires (No polarity)
7. Branch Selector unit
8. Indoor unit
9. Indoor unit (Cooling only)

NOTE

- Do not connect the power wiring to terminals for the transmission wiring. Doing so would destroy the entire system.
- When connecting wires to the terminal block on the PC-board, too much heat or tightening could damage the PC-board. Attach with care.
- See the table below for the tightening torque of the transmission wiring terminals.

<table>
<thead>
<tr>
<th>Screw size</th>
<th>Tightening torque (ft · lbf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3.5 (A1P)</td>
<td>0.59 – 0.71</td>
</tr>
</tbody>
</table>

Transmission wiring (About the symbol \[ \mathcal{T} \] – \[ \mathcal{H} \], see figure 18) should be done within the following limitations. If they are exceeded, transmission problems may occur.

- Between outdoor unit and Branch Selector (or indoor) unit
- Between Branch Selector unit and indoor unit
- Between outdoor unit and outdoor unit of other systems
- Between outdoor unit and outdoor unit of same system

Max. wiring length : 3280 ft
Max. total wiring length : 6560 ft
Max. no. of branches : 16

[Note]
No branch is allowed after branch (See figure 19)
Max. no. of outdoor units of other system that can be connected : 10

7-5 Power Wiring Connection Procedure

- Be sure to connect the power supply wiring to the power supply terminal block and hold it in place using the included clamp as shown in the figure 22.
- The L1, L2, L3 and N phases of the power wiring should be secured separately to the hook using the included clamp (1).
- The ground wiring should be bound to the power wiring using the included clamp (1) to prevent outside force from being applied to the terminal area.

(Refer to figure 22)
1. Power supply
   (MODEL PBYD:3~460V 60Hz)
   (MODEL PBTJ:3~208/230V 60Hz)
2. Earth leakage circuit breaker
3. Branch switch, Overcurrent breaker
4. Ground wire
5. Electrical components box (1)
6. Electrical components box (2)
7. Do not open the electrical components box (2) lid.
   (There are no work when installation)
8. Attach insulation sleeves
9. Power supply terminal block
10. Ground terminal
11. Clamp (1) (accessory)
12. Vinyl tube (accessory)

CAUTION

- Be sure to use crimp-style terminal with insulating sleeves for connections. (See the figure below.)

Crimp-style terminal

- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will strip the head and make proper tightening impossible.
Over-tightening the terminal screws may break them. See the following table for the tightening torque of the terminal screws.

<table>
<thead>
<tr>
<th>Screw size</th>
<th>Tightening torque (ft-lbf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M8 Power terminal, ground terminal</td>
<td>4.06 – 5.38</td>
</tr>
</tbody>
</table>

When pulling the ground wire out, wire it so that it comes through the cut out section of the cup washer. (See the figure below.) An improper ground connection may prevent a good ground from being achieved.

When two wires are connected to a single terminal, connect them so that the rear sides of the crimp contacts face each other. Also, make sure the thinner wire is on top, securing the two wires simultaneously to the resin hook using the included clamp (1).

When punching out a knockout hole, hit it with a hammer. Make sure the thinner wire is on top, securing the two wires simultaneously to the resin hook using the included clamp (1).

When wiring, exercise sufficient caution not to detach the acoustic insulators from the compressor. Secure to the back side of the support beam using the accessory clamp (1). Retain to the back of the column support with the accessory clamp (2).

Precautions when knocking out knockout holes
- To punch out a knockout hole, hit it with a hammer.
- Open an appropriate hole as needed.
- After knocking out the holes trim off the burr, then we recommend you to paint the edges and areas around the edges using the repair paint to prevent rusting.
- Power line : Open a knockout hole as shown at left and connect it using a conduit.

Transmission line : Connect it using a conduit in the knockout hole on the right.

NOTE
- After wiring work is completed, check to make sure there are no loose connections among the electrical parts in the electrical components box.

8. AIR TIGHT TEST AND VACUUM DRYING
- After finished piping work, carry out air tight test and vacuum drying.

WARNING
- Always use nitrogen gas for the air tight test.
- Absolutely do not open the shutoff valve until the main power circuit insulation measurement has been completed. (measuring after the shutoff valve is opened will cause the insulation value to drop.)

TABLE 1. R410A TANK (WITH SYphon)

- To prevent entry of any impurities and insure sufficient pressure resistance, always use the special tools dedicated for R410A.
- Use charge hose that have pushing stick for connecting to service port of shutoff valves or refrigerant charge port.
- The vacuum pump for vacuum drying should be able to lower the pressure to –14.6 psi.
- Take care the pump oil never flow backward into the refrigerant pipe during the pump stops.

The system for air tight test and vacuum drying
- Referring to figure 24, connect a nitrogen tank, refrigerant tank, and a vacuum pump to the outdoor unit.

ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION

Gauge manifold Charge hose valve
- To prevent entry of any impurities and insure sufficient pressure resistance, always use the special tools dedicated for R410A.
- Use charge hose that have pushing stick for connecting to service port of shutoff valves or refrigerant charge port.

Vacuum pump
- The vacuum pump for vacuum drying should be able to lower the pressure to –14.6 psi.
- Take care the pump oil never flow backward into the refrigerant pipe during the pump stops.

The system for air tight test and vacuum drying
- Referring to figure 24, connect a nitrogen tank, refrigerant tank, and a vacuum pump to the outdoor unit.

- The refrigerant tank and the charge hose connection to refrigerant charge port or the valve A in figure 24 are needed in “11.

ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION”.

(Refer to figure 24)
1. Gauge manifold
2. Nitrogen
3. Measuring device
4. R410A tank (with siphon)
5. Vacuum pump
6. Charge hose
7. Refrigerant charge port
8. HP/LP gas pipe shutoff valve
9. Suction gas pipe shutoff valve
10. Liquid pipe shutoff valve
11. Valve A
12. Valve B
13. Valve C
14. Outdoor unit
15. To Branch Selector (or indoor) unit
16. Shutoff valve
17. Service port
18. Field piping
19. Gas flow
NOTE

- The air-tightness test and vacuum drying should be done using the service ports of equalizer pipe, HP/LP gas pipe, suction gas pipe and liquid pipe shutoff valve.
- See the [R410A] Label attached to the front plate of the outdoor unit for details on the location of the service port (see figure at right).
- See [Shutoff valve operation procedure] in “11-1 Before working” for details on handling the shutoff valve.
- The refrigerant charge port is connected to unit pipe.

When shipped, the unit contains the refrigerant, so use caution.

NOTE

If moisture might enter the piping, follow belows.
(i.e., if doing work during the rainy season, if the actual work takes long enough that condensation may form on the inside of the pipes, if rain might enter the pipes during work, etc.)

After evacuating the system for 2 hours, pressurize the system to 7.25 psi (do not pressurize more than 550 psi). If the pressure does not drop within 2 hours, the system passes the test.

If there is a pressure drop, check for leaks, make repairs and perform the airtight test again.

Vacuum drying

Evacuate the system from the liquid pipe, suction gas pipe, HP/LP gas pipe and equalizer pipe service ports by using a vacuum pump for more than 2 hours and bring the system to –14.6 psi or less. After keeping the system under that condition for more than 1 hour, check if the vacuum gauge rises or not. If it rises, the system may either contain moisture inside or have leaks.

NOTE

If there is a possibility that condensation on the shutoff valve might drip down into the indoor unit through gaps in the insulation and piping because the outdoor unit is located higher than the indoor unit, etc., this must be prevented by caulking the connections, etc.

(Refer to figure 25)

- The piping lead-out hole lid should be attached after opening a knock hole. (Refer to figure 26)

- If small animals and the like might enter the unit through the piping lead-out hole, close the hole with blocking material (procured on site) after completion of “11. ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION”. (Refer to figure 29)

(Refer to figure 25)

1. Insulation material
2. Caulking, etc.

(Refer to figure 26)

1. Piping lead-out hole lid
2. Open a knock hole at “．”
3. Block “．”

9. PIPE INSULATION

- Insulation of pipes should be done after performing “8. AIR TIGHT TEST AND VACUUM DRYING”.
- Always insulate the liquid piping, the HP/LP gas piping, the gas piping, and these pipe connections.

Failing to insulate the pipes may cause leaking or burns.
Especially, be sure to insulate the HP/LP gas piping as withstanding as the suction pipe because the suction gas follows in the HP/LP gas piping when the system is whole cooling mode.
And be sure to use the insulation which can withstand such temperatures of 248°F or more for the HP/LP gas piping, the equalizer pipe and the gas piping because the HP/LP gas follows in these piping.

- Reinforce the insulation on the refrigerant piping according to the installation environment. Condensation might form on the surface of the insulation. Refer to the below:
  - Ambient temperature : 86°F, humidity : 75% to 80% RH : min. thickness : 9/16 in.
  - If the ambient temperature exceeds 86°F and the humidity 80% RH, then the min. thickness is 3/4 in.

See the Engineering data book for detail.
11. ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION

The outdoor unit is charged with refrigerant when shipped from the factory, but depending on the size and length of the piping when installed, it may require additional charging. For charging the additional refrigerant, follow the procedure in this chapter. And then carry out the check operation.

11-1 Before working

[About the refrigerant tank]
Check whether the tank has a siphon pipe before charging and place the tank so that the refrigerant is charged in liquid form. (See the figure below.)

<table>
<thead>
<tr>
<th>With siphon pipe</th>
<th>Stand the tank upright and charge. (The siphon pipe goes all the way inside, so the tank does not need be put upside-down charge in liquid form.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other tanks</td>
<td>Stand the tank upside-down and charge.</td>
</tr>
</tbody>
</table>

**NOTE**
- Always use the proper refrigerant (R410A). If charged with the refrigerant containing an improper material, it may cause an explosion or accident.
- R410A is a mixed refrigerant, so charging it as a gas will cause the refrigerant composition to change, which may prevent normal operation.

**Shutoff valve operation procedure**

When operating the shutoff valve, follow the procedure instructed below.

**NOTE**
- Do not open the shutoff valve until “10. CHECKING OF DEVICE AND INSTALLATION CONDITIONS” are completed. If the shutoff valve is left open without turning on the power, it may cause refrigerant to buildup in the compressor, leading insulation degradation.
- Be sure to use the correct tools. The shutoff valve is not a back-seat type. If forced it to open, it might break the valve body.
- When using a service port, use the charge hose.
- After tightening the cap, make sure no refrigerant gas is leaking.
**Tightening torque**
The sizes of the shutoff valves on each model and the tightening torque for each size are listed in the table below.

<table>
<thead>
<tr>
<th>Size of Shutoff Valve</th>
<th>72P type</th>
<th>96P type</th>
<th>120P/144P type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid pipe shutoff valve</td>
<td>φ1 3/8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suction gas shutoff valve</td>
<td></td>
<td>φ3/4</td>
<td></td>
</tr>
<tr>
<td>HP/LP gas shutoff valve</td>
<td>φ3/4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Refer to figure 27)
1. Service port
2. Cap
3. Hex holes
4. Shaft (valve body)
5. Seal section

**To open**
1. Remove the cap and turn the shaft counterclockwise with the hexagon wrench.
2. Turn it until the shaft stops.
3. Make sure to tighten the cap securely.

(For the tightening torque, refer to the item <Tightening Torque>.)

**To close**
1. Remove the cap and turn the shaft clockwise with the hexagon wrench.
2. Securely tighten the valve until the shaft contacts the main body seal.
3. Make sure to tighten the cap securely.

(For the tightening torque, refer to the item <Tightening Torque>.)

**<Tightening torque>**

**How to Check How Many Units are Connected**
It is possible to find out how many indoor or outdoor unit in the system are turned on by operating the push button on the PC-board (A1P) of outdoor unit.

Follow the procedure below to check how many indoor or outdoor units are turned on.

1. Press the MODE button (BS1) once at Setting Mode 1 (H1P : off), and set the MONITOR MODE (H1P : Blinking).
2. Press the SET button (BS2) the number of times until the LED display matches that at right.
   - For checking the number of outdoor units: eight times
   - For checking the number of indoor units: five times
3. Press the RETURN button (BS3) and read the number of units from the display of H2P through H7P.
   **[Reading Method]**
   - The display of H2P through H7P should be read as a binary number, with * standing for “1” and • standing for “0”.
   - Ex: For the LED display at right, this would be “0 1 0 1 1 0”, which would mean 22 units are connected.
   - Note: “000000” indicates 64 units.

4. Press the MODE button (BS1) once. This returns to Setting Mode 1 (H1P : OFF, default).

---

**NOTE**
Press the “MODE button” (BS1) if you get confused while operating. This returns to Setting Mode 1 (H1P : OFF, default).

---

**11-2 Procedure of Adding Refrigerant charging and check operation**

---

**WARNING** Electric Shock Warning
- Make sure to close the electrical components box lid before turning on the power.
- Perform the setting on the PC-board (A1P) of the outdoor unit and check the LED display after the power is on via the inspection door which is in the electrical components box lid.

(Refer to figure 28)
There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

⚠️ CAUTION ⚠️

- Make sure to use the protect tool (protective groves and goggles) when charging the refrigerant.
- Due to a danger of liquid hammer, the refrigerant must not be charged over the allowable maximum amount when charging the refrigerant.
- Do not perform the refrigerant charging operation under working for the Branch Selector and indoor unit.
- When opening the front panel, make sure to take caution to the fan rotation during the working.
- After the outdoor unit stops operating, the fan may keep rotation for a while.

⚠️ NOTE ⚠️

- If operation is performed within 12 minutes after the BS, indoor and outdoor units are turned on, H2P will be lit on and the compressor will not operate.
- Check the LED display indicate as shown below.

![](image)

- In order to ensure uniform refrigerant distribution, it may take up to around 10 minutes for the compressor to start up after the unit starting operating. This is not a malfunction.
- The refrigerant charge port is connected to the piping inside the unit.
- When the unit is shipped from the factory, the unit's internal piping is already charged with refrigerant, so be careful when connecting the charge hose.
- After adding the refrigerant, make sure to close the lid of the refrigerant charging port.
- The tightening torque for the lid is 8.48 to 10.3 ft · lbf.
- See [Shutoff valve operation procedure] in chapter 11-1 for details on how to handle shutoff valves.
- When done or when pausing the refrigerant charging operation, close the valve A. (See figure 30.) For operating the push button and opening or closing the valves, follow the procedure.
- The refrigerant charge port of this product have electric expansion valve.
- The valve will be closed at end of refrigerant charging. However the valve will be opened on operation after refrigerant charging (check operation, normal operation, etc.). If the tank is left with the valve open, the amount of refrigerant which is properly charged may be off the point.
- Make sure to perform the check operation after installation. Otherwise, the malfunction code “U3” will be displayed and normal temperature condition as follows.
- During Automatic refrigerant charging operation, the system will select charging mode (cooling mode or heating mode) by the temperature condition as follows.

Outdoor temp. : 32°F DB ~ 109°F DB
Indoor temp. : 50°F DB ~ 90°F DB

Less than above range       Cooling mode
Heating mode

When charging in cooling mode, the system will stop operation when the required amount of refrigerant is charged.
- During charging in heating mode, a person must manually close valve A and stop operation. Beforehand, check the remaining refrigerant that is needed to charge based on the “additional charging amount” in step 2 and the charged amount in step 3.
- The refrigerator will be charged about 66 lb in one hour at outdoor temp. 86°F DB (about 26 lb at outdoor temp. 32°F DB).
- During Automatic refrigerant charging operation, you can stop the operation forcibly by pushing MODE button (BS1).

### 11-2-1 Procedure of Adding Refrigerant charging

1. Make sure the following works are complete in accordance with the installation manual.
   - Piping work
   - Wiring work
   - Air tight test
   - Vacuum drying
   - Installation work for BS, indoor unit
2. Calculate the “additional charging amount” using “How to calculate the additional refrigerant to be charged” in “6-5 Example of connection”.
3. Open the valve B (See the figure 29). The valve A, C and the liquid pipe, suction gas pipe, HP/LP gas pipe, equalizer pipe shutoff valves must be left closed), and charge the refrigerant of the “additional charging amount” from the liquid side shutout valve service port.

(Refer to figure 29)

1. Measuring device
2. R410A tank (with siphon)
3. Charge hose
4. Refrigerant charge port
5. HP/LP gas pipe shutoff valve
6. Suction gas shutoff valve
7. Liquid pipe shutoff valve
8. Valve A
9. Valve B
10. Valve C
11. Outdoor unit
12. To BS, indoor unit
13. Field pipings
14. Refrigerant flow when charging
15. Shutoff valve
16. Service port

4. If the “additional charging amount” was charged fully, close the valve B and go to step 6.
   If the “additional charging amount” was not charged fully, close the valve B and go to step 5.
5. Perform the refrigerant charging following [Automatic refrigerant charging operation procedure] as shown below. And charge the remaining refrigerant of the “additional charging amount”.

   ### NOTE

- The valve A, C and the liquid pipe shutout valve (check operation, normal operation, etc.) must be left closed), and charge the refrigerant of the “additional charging amount”.

(Refer to figure 30)

1. Measuring device
2. R410A tank (with siphon)
3. Charge hose
4. Refrigerant charge port
5. HP/LP gas pipe shutoff valve
6. Suction pipe shutoff valve
7. Liquid pipe shutoff valve
8. Valve A
9. Valve B
10. Valve C
11. Outdoor unit
12. To BS, indoor unit
13. Field pipings
14. Refrigerant flow when charging
15. Shutoff valve
16. Service port

3P215731-12R
Installation

[Automatic refrigerant charging operation procedure]

NOTE

- The marks of LED mean as follows.
  - : OFF
  - : ON
  - : Blinking
  - : OFF, ON or Blinking

(1) Open the liquid pipe, suction gas pipe and HP/LP gas pipe shutoff valves. (The valve A-C must be closed. See figure 30.)

(2) Close the electrical components box (1) lid and all front panel except on the electrical components box (1) side. (*) (1) And turn the power to the outdoor unit and all connected BS, indoor units. (2)
   - After H2P stop blinking (about 12 minutes after turning on the power), check H2P is OFF.
   - If H2P is ON, check the malfunction code in the remote controller of indoor unit and correct the malfunction in accordance with [Remote controller display malfunction code] in chapter 11-2-2.

(3) Check the LED. And push the MODE button (BS1) once if the LED displays is not as below.

<table>
<thead>
<tr>
<th>H1P</th>
<th>H2P</th>
<th>H3P</th>
<th>H4P</th>
<th>H5P</th>
<th>H6P</th>
<th>H7P</th>
</tr>
</thead>
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</tbody>
</table>

(4) Push the TEST button (BS4) once. (The LED displays will change as below.)

<table>
<thead>
<tr>
<th>H1P</th>
<th>H2P</th>
<th>H3P</th>
<th>H4P</th>
<th>H5P</th>
<th>H6P</th>
<th>H7P</th>
</tr>
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<tbody>
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</tbody>
</table>

(5) Hold the TEST button (BS4) down for 5 seconds or more. (The LED displays will change as below and fan of outdoor unit will start rotation.)

<table>
<thead>
<tr>
<th>H1P</th>
<th>H2P</th>
<th>H3P</th>
<th>H4P</th>
<th>H5P</th>
<th>H6P</th>
<th>H7P</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

(6) When the compressor start working and the LED displays change any state in below (*3), go to “In case of cooling mode” or “In case of heating mode” in accordance with the LED displays.

<table>
<thead>
<tr>
<th>H1P</th>
<th>H2P</th>
<th>H3P</th>
<th>H4P</th>
<th>H5P</th>
<th>H6P</th>
<th>H7P</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

   Go to “In case of cooling mode”

   Go to “In case of heating mode”

—in case of cooling mode

(7) Push the TEST button (BS4) once within 5 minutes after procedure (5) (*4) and close the all front panels (*5).

After that, open the valve A immediately (See figure 30) (*6) and watch the remote controller display of indoor unit.

(8) If the remote controller display shows “PE” code (*7), ready to close the valve A.

And go to procedure (9).

If the remote controller display shows other code, close the valve A immediately and refer to [Remote controller cooling mode malfunction code].

 Beware the fan running when open the front panel.

The fan may continue rotation after the system stop the operation.

(9) When the compressor stop working (the fan may continue rotation.), close the valve A immediately (*8).

And check the LED displays are as below and the remote controller display shows “P9” code.

<table>
<thead>
<tr>
<th>H1P</th>
<th>H2P</th>
<th>H3P</th>
<th>H4P</th>
<th>H5P</th>
<th>H6P</th>
<th>H7P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

After checking, push the MODE button (BS1) once and the charging is complete.

—in case of heating mode

(7) Push the TEST button (BS4) once within 5 minutes after procedure (5) (*4) and close the all front panels.

After that, open the valve A immediately (See figure 30) (*6) and check the charged amount by measuring device.

During operation, if the remote controller display shows “P2” or “P8” code, close the valve A immediately and refer to [Remote controller heating mode malfunction code].

 Beware the fan running when open the front panel.

The fan may continue rotation after the system stop the operation.

(8) When the required amount of refrigerant is charged, close the valve A (See figure 30) (*8) and push the RETURN button (BS3) once. And then go to procedure (9).

(9) Push the MODE button (BS1) once, and the charging is complete.

Notes (*1)–(*8)

(*) Lead the refrigerant charge hose etc from the pipe intake. All front panels must be closed at the procedure (7).

(2) If you perform the refrigerant charging operation within the refrigerator system that have the power off unit, the operation cannot finish properly.

Check the number of outdoor and indoor units that is powered. For checking, see [How to check how many units are connected] in chapter 11-1.

- To energize the crankcase heater, make sure to turn on for 6 hours before starting operation.

(*) It takes about 2–10 minutes for getting stability of refrigerant state. If the additional refrigerant is little and operation is started before getting stability, the system can not judge the charging amount precisely and it cause over charge.

(*4) If the TEST button (BS4) is not pushed within 5 minutes, “P2” code will displayed in the remote controller. In this case, refer [Remote controller cooling (or heating) mode malfunction code].

(*5) If the front panel is opened during the operation, the system cannot operate properly.

(*6) If you leave the system without connecting the refrigerant tank or opening the valve A for 30 minutes or more, the system stop operation and “P2” code are displayed in remote controller.

In this case, refer [Remote controller cooling (or heating) mode malfunction code].

(*7) Depending on the situation of operation such as the charging amount is little, the “PE” code may not be displayed and the “P9” code may be displayed.

(*8) Always close the valve A and take the tank off.

The refrigerant charge port of this unit have electric expansion valve and the valve are closed when charging is finished. However, the valve will opened when other operation (Check operation, normal operation, etc.). If you leave the tank connected, the refrigerant will charged and it cause over charge.

[Remote controller cooling mode malfunction code]

<table>
<thead>
<tr>
<th>Code</th>
<th>The work contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>Charging is almost finished. Ready to close the valve A.</td>
</tr>
<tr>
<td>PA</td>
<td>The refrigerant tank is empty. Close the valve A and replace empty tank to the new tank. After changing the tank, open the valve A again. Beware the fan running. The outdoor unit does not stop operation.</td>
</tr>
<tr>
<td>PH</td>
<td>Close the valve A immediately, and restart the operation from procedure (3).</td>
</tr>
</tbody>
</table>
| P2   | Operation is interrupted. Close the valve A immediately and check the below items.  
- Check if HP/LP gas pipe, suction gas pipe or liquid pipe shutoff valve is opened.  
- Check the refrigerant tank is connected and the valve A was opened.  
- Check if the air inlet and outlet of the indoor unit are not closed by an obstruction.  
After correcting the abnormality, restart the operation from procedure (3). |
| P8   | Operation is stopped abnormally. Close the valve A immediately. Confirm the malfunction code and correct the abnormality following the [Remote controller displays malfunction code] in chapter 11-2-2. |
| P9   | Charging is finished. Close the valve A and take the refrigerant tank off. |
6. After completing the additional refrigerant charging, record the charging amount on the accessory "REQUEST FOR THE INDICATION" label (installation records) and adhere it to the back side of the front panel.

11-2-2 Procedure of check operation
- Check operation perform the following work. Do the check operation following below. Otherwise, malfunction code "U3" will be displayed in the remote controller and normal operation can not be carried out.
  - Check of shutoff valve opening
  - Check of miswiring
  - Judgment of piping length
  - Check of refrigerant overcharge

**NOTE**
- Check operation can not carried out at outdoor temp. less than 23°F. Perform the check operation at day or time that outdoor temp. is 23°F or more.

[Check Operation Procedure]
(1) Close the electrical components box lid and all front panels except as the side of the electrical components box and turn on the power to the outdoor unit and all connected Branch Selector, indoor units. (Be sure to turn the power on at least 6 hours before operation in order to have power running to the crank case heater.)
(2) Make the onsite settings as needed using the push button (BS1-BS5) on the outdoor unit PC-board (A1P) with the power on. (See "12. ONSITE SETTINGS")
(3) Perform the check operation following the Check Operation Method of the [Service Precautions] label (lower) on the electrical components box lid. (See figure 31) The system operation for about 40~60 minutes and automatically stops the check operation. If the malfunction code is not displayed in the remote controller after the system stop, check operation is completed. Normal operation will be possible after 5 minutes. If the malfunction code is displayed in the remote controller, correct the malfunction following [Remote controller displays malfunction code] and perform the check operation again.

(Refer to figure 31)
1. Electrical components box (1) lid
2. Electrical components box (2) lid
3. [Service Precaution] label (upper)
4. [Service Precaution] label (lower)

**NOTE**
For interrupting the check operation, push RETURN button (BS3).

---

### Remote controller heating mode malfunction code

<table>
<thead>
<tr>
<th>Code</th>
<th>The work contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>P8</td>
<td>Close the valve A immediately and push the TEST button (BS4) once. And restart from procedure (7) of &quot;In case of heating mode&quot;.</td>
</tr>
</tbody>
</table>
| P2   | Operation is interrupted. Close the valve A immediately and check the below items.  

  - Check if HP/LP gas pipe, suction gas pipe or liquid pipe shutoff valve is opened.  
  - Check the refrigerant tank is connected and the valve A was opened.  
  - Check if the air inlet and outlet of the indoor unit are not closed by an obstruction. |

### Remote controller displays malfunction code

<table>
<thead>
<tr>
<th>Malfunction code</th>
<th>Installation error</th>
<th>Remedial action</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3, E4 F3, F6 UF</td>
<td>The shutoff valve of the outdoor unit is left closed.</td>
<td>Open the shutoff valve.</td>
</tr>
<tr>
<td>U1</td>
<td>The phases of the power to the outdoor unit is reversed.</td>
<td>Exchange two of the three phases (L1, L2, L3) to make a proper connection.</td>
</tr>
<tr>
<td>U1 U4 LC</td>
<td>No power is supplied to an outdoor, Branch Selector or indoor unit (including phase interruption).</td>
<td>Make sure the power source wire is properly connected to the outdoor, Branch Selector or indoor unit and revise if necessary.</td>
</tr>
<tr>
<td>UF</td>
<td>There is conflict on the connection of transmission wiring in the system.</td>
<td>Check if the refrigerant piping line and the transmission wiring are consistent with each other.</td>
</tr>
<tr>
<td>E3 F6 UF</td>
<td>Refrigerant overcharge.</td>
<td>Recalculate the additional amount refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.</td>
</tr>
<tr>
<td>E4 F3</td>
<td>Insufficient refrigerant.</td>
<td></td>
</tr>
</tbody>
</table>

  - Check if the additional refrigerant charge has been finished correctly.  
  - Recalculate the additional amount refrigerant from the piping length and add the adequate amount. |
| U7, U4 UF, UH    | Field wiring is connected to "TO MULTI UNIT (Q1, Q2)" terminal on the outdoor unit PC-board (A1P) when the system is one outdoor system. | Remove the line from the "TO MULTI UNIT (Q1, Q2)" terminal. |

---

**NOTE**
If any malfunction codes other than the above are displayed, check the service manual for how to respond.

---

### 12. ONSITE SETTINGS

**NOTE**
In the case of a multi system, all onsite settings should be made on the master unit. Settings made on sub units are invalid. The outdoor unit to which the indoor unit transmission wire are connected is the master unit, and all other units are sub units.

Use the push button switches (BS1 through BS5) on the outdoor unit PC-board (A1P) to make the necessary onsite settings. See the “Service Precautions” label (upper) on the electrical components box lid for details on the positions and operating method of the push button switches and on the onsite setting. Make sure to record the setting on the accessory "REQUEST FOR THE INDICATION" label.

**WARNING**
Electric Shock Warning

Use an insulated rod to operate the push buttons via the inspection door of electrical components box lid. There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.
13. TEST RUN

13-1 Before test run
- Make sure the following works are completed in accordance with the installation manual.
  - Piping work
  - Wiring work
  - Air tight test
  - Vacuum drying
  - Additional refrigerant charge
  - Check operation
- Check that all work for the BS, indoor unit are finished and there are no danger to operate.

13-2 Test Run
After all works are completed, operate the unit normally and check the following.
(1) Make sure the indoor and outdoor units are operating normally.
(2) Operate each indoor unit one by one and make sure the corresponding outdoor unit is also operating.
(3) Check to see if cold (or hot) air is coming out from the indoor unit.
(4) Push the fan direction and strength buttons on the remote controller to see if they operate properly.

**NOTE**
- Heating is not possible if the outdoor temperature is 75°F or higher. Refer to the Operation manual.
- If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the crank case heater for a sufficient length of time before restarting the operation.
- Once stopping, the compressor will not restart in about 5 minutes even if the On/Off button of the remote controller is pushed.
- When the system operation is stopped by the remote controller, the outdoor units may continue operating for further 5 minutes at maximum.
- The outdoor unit fan may rotate at low speeds if the Night-time low noise setting or the External low noise level setting is made, but this is not a malfunction.
- If the check operation was not performed at first installation, the malfunction code “U3” will be displayed in the remote controller.
- Perform the check operation following “11-2-2 Procedure of Check Operation”.

13-3 Checks After Test Run
Perform the following checks after the test run is complete.
- Record the contents of field setting.
  - Record them on the accessory “REQUEST FOR THE INDICATION” label.
  - And attach the label on the back side of the front panel.
- Record the installation date.
  - Record the installation date on the accessory “REQUEST FOR THE INDICATION” label in accordance with the IEC60335-2-40. And attach the label on the back side of the front panel.

**NOTE**
After the test run, when handing the unit over to the customer, make sure the electrical components box lid, the inspection door, and the unit casing are all attached.

14. CAUTION FOR REFRIGERANT LEAKS

(Points to note in connection with refrigerant leaks)

Introduction:
The installer and system specialist shall secure safety against leakage according to local regulations or standards. The following standards may be applicable if local regulations are not available.
The VRV System, like other air conditioning systems, uses R-410A as refrigerant. R-410A is an entirely safe non-toxic, non-combustible refrigerant. Nevertheless care must be taken to ensure that air conditioning facilities are installed in a room that is sufficiently large. This assures that the maximum concentration level of refrigerant gas is not exceeded, in the unlikely event of major leak in the system and this in accordance to the local applicable regulations and standards.

**Maximum concentration level:**
The maximum charge of refrigerant and the calculation of the maximum concentration of refrigerant is directly related to the humanly occupied space in to which it could leak.
The unit of measurement of the concentration is lb/ft³ (the weight in lb of the refrigerant gas in 1 ft³ volume of the occupied space).

Compliance to the local applicable regulations and standards for the maximum allowable concentration level is required.

**Procedure for checking maximum concentration**
Check the maximum concentration level in accordance with steps 1–2 below and take whatever action is necessary to comply.

1. Calculate the amount of refrigerant (lb) charged to each system separately.
   - amount of refrigerant in a single unit system (amount of refrigerant with which the system is charged before leaving the factory)
   - additional charging amount (amount of refrigerant added locally in accordance with the length or diameter of the refrigerant piping)

   \[ \text{total amount of refrigerant (lb) in the system} = \text{amount of refrigerant} + \text{additional charging amount} \]

2. direction of the refrigerant flow
3. room where refrigerant leak has occurred (outflow of all the refrigerant from the system)

Pay special attention to the place, such as a basement, etc., where refrigerant can stay, since refrigerant is heavier than air.

**Procedure for checking maximum concentration**
Follow local code requirements (ASHRAE-15 2007 & ASHRAE-34 2007).

- Where a single refrigerant facility is divided into 2 entirely independent refrigerant systems then use the amount of refrigerant with which each separate system is charged.
5.3 REYQ144~336PBYD (Heat Recovery, 460V)  
REYQ168~336PBTJ (Heat Recovery, 208/230V)

<If installed as a single unit>
(Pattern 1)

When installed in serial>
(Pattern 1)

(Pattern 2)

(Pattern 3)

<When installed in serial>
(Pattern 1)

(Pattern 2)

(Pattern 3)

<If installed as a single unit>
(Pattern 1)

<If installed as a single unit>
(Pattern 3)

<When installed in serial>
(Pattern 1)

<When installed in serial>
(Pattern 3)
1. Safety Considerations

1-1 Safety considerations

Read these SAFETY CONSIDERATIONS for Installation carefully before installing an air conditioner or heat pump. After completing the installation, make sure that the unit operates properly during the startup operation.

Instruct the customer on how to operate and maintain the unit. Inform customers that they should store this Installation Manual with the Operation Manual for future reference.

Always use a licensed installer or contractor to install this product. Improper installation can result in water or refrigerant leakage, electrical shock, fire, or explosion.

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

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

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

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

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

⚠️ DANGER

• Refrigerant gas is heavier than air and replaces oxygen. A massive leak can lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death.

• Do not ground units to water pipes, gas pipes, telephone wires, or lightning rods as incomplete grounding can cause a severe shock hazard resulting in severe injury or death. Additionally, grounding to gas pipes could cause a gas leak and potential explosion causing severe injury or death.

• If refrigerant gas leaks during installation, ventilate the area immediately. Refrigerant gas may produce toxic gas if it comes into contact with fire. Exposure to this gas could cause severe injury or death.

• After completing the installation work, check that the refrigerant gas does not leak throughout the system.

• Do not install unit in an area where flammable materials are present due to risk of explosions that can cause serious injury or death.

• Safely dispose all packing and transportation materials in accordance with federal/state/local laws or ordinances. Packing materials such as nails and other metal or wood parts, including plastic packing materials used for transportation may cause injuries or death by suffocation.

⚠️ WARNING

• Only qualified personnel must carry out the installation work. Installation must be done in accordance with this installation manual. Improper installation may result in water leakage, electric shock, or fire.

• When installing the unit in a small room, take measures to keep the refrigerant concentration from exceeding allowable safety limits. Excessive refrigerant leaks, in the event of an accident in a closed ambient space, can lead to oxygen deficiency.

• Use only specified accessories and parts for installation work. Failure to use specified parts may result in water leakage, electric shocks, fire, or the unit falling.

• Install the air conditioner or heat pump on a foundation strong enough that it can withstand the weight of the unit. A foundation of insufficient strength may result in the unit falling and causing injuries.

• Take into account strong winds, typhoons, or earthquakes when installing. Improper installation may result in the unit falling and causing accidents.

• Make sure that a separate power supply circuit is provided for this unit and that all electrical work is carried out by qualified personnel according to local, state, and national regulations. An insufficient power supply capacity or improper electrical construction may lead to electric shocks or fire.

• Make sure that all wiring is secured, that specified wires are used, and that no external forces act on the terminal connections or wires. Improper connections or installation may result in fire.

• When wiring, position the wires so that the terminal box lid can be securely fastened. Improper positioning of the terminal box lid may result in electric shocks, fire, or the terminals overheating.

• Before touching electrical parts, turn off the unit.

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

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

• Do not change the setting of the protection devices. If the pressure switch, thermal switch, or other protection device is shorted and operated forcibly, or parts other than those specified by Daikin are used, fire or explosion may occur.

⚠️ CAUTION

• Do not touch the switch with wet fingers. Touching a switch with wet fingers can cause electric shock.

• Do not allow children to play on or around the unit to prevent injury.

• The heat exchanger fins are sharp enough to cut. To avoid injury wear gloves or cover the fins while working around them.

• Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frostbite if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touch them, be sure to wear proper gloves.

3P215731-11R
Installation of Outdoor Units

- Install drain piping to proper drainage. Improper drain piping may result in water leakage and property damage.
- Insulate piping to prevent condensation.
- Be careful when transporting the product.
- Do not turn off the power immediately after stopping operation. Always wait for at least 5 minutes before turning off the power. Otherwise, water leakage may occur.
- Do not use a charging cylinder. Using a charging cylinder may cause the refrigerant to deteriorate.
- Refrigerant R-410A in the system must be kept clean, dry, and tight.
  
  (a) Clean and Dry -- Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting into the system.
  
  (b) Tight -- R-410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth's protection again harmful ultraviolet radiation. R-410A can contribute to the greenhouse effect if it is released. Therefore take proper measures to check for the tightness of the refrigerant piping installation. Read the chapter Refrigerant Piping and follow the procedures.

- Since R-410A is a blend, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition can change and the system will not work properly.

- The indoor unit is for R-410A. See the catalog for indoor models that can be connected. Normal operation is not possible when connected to other units.

- Remote controller (wireless kit) transmitting distance can be shorter than expected in rooms with electronic fluorescent lamps (inverter or rapid start types). Install the indoor unit far away from fluorescent lamps as much as possible.

- Indoor units are for indoor installation only. Outdoor units can be installed either outdoors or indoors. This unit is for indoor use.

- Do not install the air conditioner or heat pump in the following locations:
  
  (a) Where a mineral oil mist or oil spray or vapor is produced, for example, in a kitchen. Plastic parts may deteriorate and fall off or result in water leakage.
  
  (b) Where corrosive gas, such as sulfuric acid gas, is produced. Corroding copper pipes or soldered parts may result in refrigerant leakage.
  
  (c) Near machinery emitting electromagnetic waves. Electromagnetic waves may disturb the operation of the control system and cause the unit to malfunction.
  
  (d) Where flammable gas may leak, where there is carbon fiber, or ignitable dust suspension in the air, or where volatile flammable such as thinner or gasoline are handled. Operating the unit in such conditions can cause a fire.

- Take adequate measures to prevent the outside unit from being used as a shelter by small animals. Small animals making contact with electrical parts can cause malfunctions, smoke, or fire. Instruct the customer to keep the area around the unit clean.

---

**NOTE**

- Install the power supply and control wires for the indoor and outdoor units at least 3.5 feet away from televisions or radios to prevent image interference or noise. Depending on the radio waves, a distance of 3.5 feet may not be sufficient to eliminate the noise.

- Dismantling the unit, treatment of the refrigerant, oil and additional parts must be done in accordance with the relevant local, state, and national regulations.

- Do not use the following tools that are used with conventional refrigerants: gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, vacuum gauge, or refrigerant recovery equipment.

- If the conventional refrigerant and refrigerator oil are mixed in R-410A, the refrigerant may deteriorate.

- This air conditioner or heat pump is an appliance that should not be accessible to the general public.

- As design pressure is 478 psi, the wall thickness of field-installed pipes should be selected in accordance with the relevant local, state, and national regulations.

---

1-2 Special notice of product

**[CLASSIFICATION]**

This air conditioner comes under the term “appliances not accessible to the general public”.

**[REFRIGERANT]**

VRVIII System use R410A refrigerant.

- The refrigerant R410A requires strict cautions for keeping the system clean, dry and tight. Read the chapter “REFRIGERANT PIPING” carefully and follow these procedures correctly.
  
  A. Clean and dry
     Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting mixed into the system.
  
  B. Tight
     Take care to keep the system tight when installing.
     R410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth’s protection against harmful ultraviolet radiation.
     R410A can contribute slightly to the greenhouse effect if it is released.

- Since R410A is a mixed refrigerant, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition changes and the system will not work properly.

**[DESIGN PRESSURE]**

Since design pressure is 478 psi, the wall thickness of pipes should be more carefully selected in accordance with the relevant local and national regulations.

1-3 Disposal requirements

Dismantling the unit, treatment of the refrigerant, oil and eventual other parts, should be done in accordance with the relevant local and national regulations.

2. INTRODUCTION

- REYQ-P series are designed for outdoor installation and used for cooling and heating applications.
• The Branch Selector units that combined with REYQ-P system for changing the refrigerant flow to indoor units are BSVQ36 - 60 - 96P type only. To combine with other type Branch Selector units will cause malfunction.

• The indoor units that combined with REYQ-P system for air conditioning are Daikin VRV series indoor units that compatible with R410A. To learn which indoor units are compatible with R410A, refer to the product catalogs. To combine with other refrigerant indoor unit will cause malfunction.

### 2-1 Combination

The system name and that independent units are as follows.

<table>
<thead>
<tr>
<th>(The system name)</th>
<th>(Independent units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REYQ144PBYD</td>
<td>REMQ72PBYD REMQ108PBYD</td>
</tr>
<tr>
<td>REYQ168PBYD/PBTJ</td>
<td>REMQ72PBYD/PBTJ REMQ96PBYD/PBTJ</td>
</tr>
<tr>
<td>REYQ192PBYD/PBTJ</td>
<td>REMQ72PBYD/PBTJ REMQ108PBYD/PBTJ</td>
</tr>
<tr>
<td>REYQ216PBYD/PBTJ</td>
<td>REMQ96PBYD/PBTJ REMQ120PBYD/PBTJ</td>
</tr>
<tr>
<td>REYQ240PBYD/PBTJ</td>
<td>REMQ108PBYD/PBTJ REMQ120PBYD/PBTJ</td>
</tr>
<tr>
<td>REYQ264PBYD/PBTJ</td>
<td>REMQ120PBYD/PBTJ REMQ120PBYD/PBTJ</td>
</tr>
</tbody>
</table>

The indoor units can be installed in the following range.

<table>
<thead>
<tr>
<th>(Outdoor unit)</th>
<th>(Total capacity index of indoor units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REYQ144PBYD</td>
<td>72 - 187</td>
</tr>
<tr>
<td>REYQ168PBYD/PBTJ</td>
<td>84 - 218</td>
</tr>
<tr>
<td>REYQ192PBYD/PBTJ</td>
<td>96 - 249</td>
</tr>
<tr>
<td>REYQ216PBYD/PBTJ</td>
<td>108 - 280</td>
</tr>
<tr>
<td>REYQ240PBYD/PBTJ</td>
<td>120 - 312</td>
</tr>
<tr>
<td>REYQ264PBYD/PBTJ</td>
<td>132 - 343</td>
</tr>
<tr>
<td>REYQ288PBYD/PBTJ</td>
<td>144 - 374</td>
</tr>
<tr>
<td>REYQ312PBYD/PBTJ</td>
<td>156 - 405</td>
</tr>
<tr>
<td>REYQ336PBYD/PBTJ</td>
<td>168 - 436</td>
</tr>
</tbody>
</table>

• For installing the 2 or 3 units multi system, Outdoor unit multi connection piping kit is required. See “2-3 Option accessory”.

• If the total capacity of the connected indoor units exceeds the capacity of the outdoor unit, cooling and heating performance may drop when running the indoor units. See the capacity table in the Engineering Data Book for details.

### 2-2 Standard supplied accessories

Confirm the following accessories are included. The storage location of the accessories is shown in figure 1.

---

**NOTE**

Do not throw away any of the accessories until installation is complete. They are needed for installation work.
2-3 Option accessory
To install the outdoor units, the following optional parts are also required. To select an optimum kit, refer to “6. REFRIGERANT PIPING”:
• Outdoor unit multi connection piping kit

<table>
<thead>
<tr>
<th>Number of outdoor units connected</th>
<th>2 units</th>
<th>3 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kit name</td>
<td>BHFP26P90U</td>
<td>BHFP26P136U</td>
</tr>
</tbody>
</table>

• Refrigerant branching kit

<table>
<thead>
<tr>
<th>For 3 piping</th>
</tr>
</thead>
<tbody>
<tr>
<td>REFNET header</td>
</tr>
<tr>
<td>REFNET joint</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>For 2 piping</th>
</tr>
</thead>
<tbody>
<tr>
<td>REFNET header</td>
</tr>
<tr>
<td>REFNET joint</td>
</tr>
</tbody>
</table>

Make sure that any separately purchased accessories are designed for use with R410A.

2-4 Technical and Electrical specifications
Refer to the Engineering Data Book for the complete list of specifications.

2-5 Main components
For main components and function of the main components, refer to the Engineering Data Book.

3. SELECTION OF LOCATION
Select a location for installation that meets the following conditions and get the customer’s permission.
1. Select the location of the unit in such a way that neither the discharged air nor the sound generated by the unit disturb anyone.
2. The foundation is strong enough to support the weight of the unit and the floor is flat to prevent vibration and noise generation.
3. The piping length between the outdoor unit and the indoor unit may not exceed the allowable piping length. (Refer to “6. REFRIGERANT PIPING”)
4. Locations where the unit’s suction vent and outlet vent do not generally face the wind.
   Wind blowing directly into the suction or outlet vents will interfere with the unit’s operation. If necessary, install some kind of obstruction to block the wind.
5. The space around the unit is adequate for servicing and the minimum space for air inlet and air outlet is available. (See the “Installation Space Examples” for the minimum space requirements.)

Installation Space Examples
• The installation space requirement shown in figure 2 is a reference for cooling operation when the outdoor temperature is 95°F. If the design outdoor temperature exceeds 95°F or the heat load exceeds maximum capacity in all the outdoor unit, take an even large space on the intake shown in figure 2.
• During installation, install the units using the most appropriate of the patterns shown in figure 2 for the location in question, taking into consideration human traffic and wind.
• If the number of units installed is more than that shown in the pattern in figure 2, install the units so there are no short circuits.
• As regards space in front of the unit, consider the space needed for the local refrigerant piping when installing the units.
• If the work conditions in figure 2 do not apply, contact your dealer or Daikin directly.

(Refer to figure 2)
1. Front side
2. No limit to wall height
3. Service space of front side
4. Service space of suction side

For Patterns 1 and 2 in figure 2:
• Wall height for front side – no higher than 59 in.
• Wall height on the suction side – no higher than 19-5/8 in.
• Wall height for sides – no limit.

4. INSPECTING AND HANDLING THE UNIT
• At delivery, the package should be checked and any damage should be reported immediately to the carrier claims agent.
• When handling the unit, take into account the following:
  1. Fragile, handle the unit with care.
  2. Keep the unit upright in order to avoid compressor damage.
  3. Decide on the transportation route.
  4. If a forklift is to be used, pass the forklift arms through the large space in the figure below, and add h2/2 to the service space of front side and h1/2 to the service space of suction side.

(Refer to figure 4)
1. Packaging material
2. Forklift
3. Removal of shipping brackets
4. Shipping bracket (Remove the brackets by pushing the hook.)

(Refer to figure 5)
1. Belt sling
2. Wear plate

5. PLACING THE UNIT

- Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise. (Refer to figure 6)
- The base should support the unit with the extent larger than hatched area in figure 7. If protective rubber is to be attached, attach it to the whole face of the base.
- The height of the base should be at least 5-7/8 in. from the floor.
- Secure the unit to its base using foundation bolts. (Use four commercially available M12-type foundation bolts, nuts, and washers.)

- The foundation bolts should be inserted 13/16 in.

(Refer to figure 6)
1. Independent base (four corner type)
2. Independent base (with center support type)
3. Beam base (Horizontal)
4. Beam base (Vertical)
5. Center of the product

(Refer to figure 7)
1. Foundation bolt point (39/16 in. dia. : 4 positions)
2. (Depth of product)
3. (Inner dimension of the base)
4. (Outer dimension of the base)

### NOTE
- There are restrictions on the refrigerant pipe connecting order between outdoor unit in the case of the multi system. See "2-1 Combination" for detail.
- When installing on a roof, make sure the roof floor is strong enough and be sure to water-proof all work.
- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation. Drain water is sometimes discharged from the outdoor unit when it is running.
- For anti-corrosion type, use nuts with resin washers. If the paint on nut connections comes off, the anti-corrosion effect may decrease.

### REFRIGERANT PIPING

### NOTE
- All field piping must be installed by a licensed refrigeration technician and must comply with relevant local and national regulations.
- After piping work is complete, do not under any circumstances open the shutoff valve until "7. FIELD WIRING" and "10. CHECKING OF DEVICE AND INSTALLATION CONDITIONS" are complete.
- Do not use flux when brazing the refrigerant piping. Use the phosphor copper brazing filler metal (B-Cu93P-710/795 : ISO 3677) which does not require flux. (Flux has extremely negative effect on refrigerant piping systems. For instance, if the chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will damage the refrigerant oil.)

6-1 Selection of piping material and Refrigerant branching kit

- Use only pipes which are clean inside and outside and which do not accumulate harmful sulfur, oxidants, dirt, cutting oils, moisture, or other contamination. (Foreign materials inside pipes including oils for fabrication must be 0.14 gr/10 ft or less.)
- Use the following items for the refrigerant piping.
  - Material: Jointless phosphor-deoxidized copper pipe
  - Size: See "6-5 Example of connection" to determine the correct size.
  - Thickness: Select a thickness for the refrigerant piping which complies with national and local laws.
- For piping work, follow the maximum tolerated length, difference in height, and length after a branch indicated in the "6-5 Example of connection".
- Outdoor unit multi connection piping kit and refrigerant branching kit (sold separately) are needed for connection of piping between outdoor units (in case of multi system) and piping branches. Use only separately sold items selected specifically according to the outdoor unit multi connection piping kit, the refrigerant branching kit selection in the "6-5 Example of connection".

6-2 Protection against contamination when installing pipes

Protect the piping to prevent moisture, dirt, dust, etc. from entering the piping.

<table>
<thead>
<tr>
<th>Place</th>
<th>Installation period</th>
<th>Protection method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor</td>
<td>More than a month</td>
<td>Pinch the pipe</td>
</tr>
<tr>
<td></td>
<td>Less than a month</td>
<td>Pinch or tape the pipe</td>
</tr>
<tr>
<td>Indoor</td>
<td>Regardless of the period</td>
<td>Pinch or tape the pipe</td>
</tr>
</tbody>
</table>

### NOTE
Exercise special caution to prevent dirt or dust when passing piping through holes in walls and when passing pipe edges to the exterior.

6-3 Pipe connection

- Be sure to perform nitrogen permutation or nitrogen blow when brazing. (Refer to figure 8)

Brazing without performing nitrogen permutation or nitrogen blow into the piping will create large quantities of oxidized film on the inside of the pipes, adversely affecting valves and compressors in the refrigerating system and preventing normal operation.

(Refer to figure 8)
1. Refrigerant pipe
2. Location to be brazed
3. Nitrogen
4. Taping
5. Handy valve
6. Regulator

- The pressure regulator for the nitrogen released when doing the brazing should be set to about 2.9 psi (Enough to feel a slight breeze on your cheek).

### NOTE
Do not use anti-oxidants when brazing the pipe joints. Residue can clog pipes and break equipment.

6-4 Connecting the refrigerant piping

1. Direction to bring out the pipes
The local inter unit piping can be connected either forward or to the sides (taken out through the bottom) as shown in the figure 9. When passing out through the bottom, use the knock hole in the bottom frame.

(Refer to figure 9)
1. Left-side connection
2. Front connection
3. Right-side connection
Precautions when knocking out knock holes
- Open knock hole (large, small) in the base frame by drilling the 4 concave around it with a ø-1/4”-bit. (Refer to figure 10)
(Refer to figure 10)
1. Knock hole (large : for liquid pipe, suction gas pipe and HP/LP gas pipe)
2. Knock hole (small : for equalizer pipe)
3. Drill
4. Concave section (4 points)
- Be sure to avoid damaging the casing.
- After knocking out the holes, we recommend you remove any burrs and paint them using the repair paint to prevent rusting.
- When passing electrical wiring through the knock holes, protect the wiring with a conduit or bushings, making sure not to damage the wiring.

2. Removing Pinch Piping
- When connecting refrigerant piping to an outdoor unit, remove the pinch piping using the procedure in the figure 11.
(Refer to figure 11)
1. Pinch piping (4 pieces)
2. Do not remove the relay piping.
3. Pinch piping
4. Procedure 1 : Confirm the shutoff valve is closed.
5. Procedure 2 : Connect a charge hose to the service port of shutoff valve and remove the gas in the pinch piping.
6. Procedure 3 : After removing the gas in the pinch piping, dissolve the brazing using a burner and remove the pinch piping.

3. Connecting refrigerant piping to outdoor units
- Figure 12 shows the example of connecting refrigerant piping to outdoor units.
- The local inter unit piping next accessory pipes are field supplied.
- About the detail of connecting pipes between outdoor units on outdoor unit multi system, refer to the “4. Precautions when connecting piping between outdoor units” and the installation manual attached to the outdoor unit multi connection piping kit.
(Refer to figure 12)
1. When connected to the front
2. When connected at lateral side (bottom)
3. Remove the shutoff valve cover to connect.
4. Remove the knock hole on the bottom frame and route the piping under the bottom frame.
5. Liquid pipe shutoff valve
6. Suction gas pipe shutoff valve
7. HP/LP gas pipe shutoff valve
8. Equalizer pipe shutoff valve
9. Brazing
10. Liquid side accessory pipe (1)
11. Suction gas side accessory pipe (1)
12. HP/LP gas side accessory pipe (1)
13. Equalizer side accessory pipe (1)
14. L type accessory joint (1)
15. L type accessory joint (2)
16. Liquid side accessory pipe (2)
17. Suction gas side accessory pipe (2)
18. HP/LP gas side accessory pipe (1)
19. Equalizer side accessory pipe (2)

4. Precautions when connecting piping between outdoor units
The Outdoor unit multi connection piping kit (sold separately) is needed to connect piping between outdoor units in multi system. Only proceed with piping work after considering the limitations on installation listed here and in “5. Branching the refrigerant piping”, always referring to the kit’s installation manual.
(1) About outdoor unit multi connection piping kit
- Install the joint horizontally so that the attached warning label faces strait up, and the tilt is within ±15°. (Refer to figure 13-1)
Do not install vertically. (Refer to figure 13-2)
- Maintain a straight portion of 19-5/8 in. or more until the split of the joint without wrapping any onsite piping around this area.
Over 19-5/8 in. of straight area can be maintained by connecting at least 4-3/4 in. of onsite pipe (straight) to the joint.
(Refer to figure 13-3)
(Refer to figure 13)
1. Warning label
2. Horizontal surface
3. ±15° or less
4. Ground
5. Onsite pipe (4-3/4 in. length or more)
6. Straight part of 19-5/8 in. or more
7. C-arrow view
8. D-arrow view
(2) The piping between outdoor units must be installed level (Pattern 1) or with a rise (Pattern 2). Otherwise oil may pool in the pipes.

NOTE
- Equalizer pipe is only for connection between outdoor units on multi outdoor unit system.
That is not connect to indoor units.
- Make sure the onsite piping does not come into contact with other piping or the bottom frame or side panels of the unit.
(4) If the piping length between the outdoor units exceeds 80 in., create a rise of 8 in. or more in the suction gas and HP/LP gas piping under a length of 80 in. from the outdoor unit multi connection piping kit.

5. Branching the refrigerant piping
   Heed the restrictions below when installing the refrigerant branching kit and read the installation instruction manual with the kit.
   (Improper installation could lead to malfunctioning or breakdown of the outdoor unit.)

<REFNET joint>
   Install the REFNET joint so it splits horizontally or vertically.
   (Refer to figure 14)
   1. Horizontal
   2. A-arrow view
   3. Horizontal surface
   4. ±30° or less
   5. Vertical

<REFNET header>
   Install the REFNET header so it splits horizontally.
   (Refer to figure 15)
   1. Horizontal surface
   2. B-arrow view
### Example of connection

**Installation of Outdoor Units**

<table>
<thead>
<tr>
<th>Example of connection</th>
<th>Branch with REFNET joint</th>
<th>Branch with REFNET joint and header</th>
<th>Branch with REFNET header</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Example of connection</strong></td>
<td><img src="example1.png" alt="Diagram" /></td>
<td><img src="example2.png" alt="Diagram" /></td>
<td><img src="example3.png" alt="Diagram" /></td>
</tr>
<tr>
<td>Connection of 8 indoor units</td>
<td>Outdoor unit</td>
<td>Indoor unit side</td>
<td>Gas pipe</td>
</tr>
<tr>
<td>Piping from outdoor unit to Branch Selector Unit</td>
<td>(Bold): 3 pipes</td>
<td>Suction gas pipe</td>
<td>HP/LP gas pipe</td>
</tr>
<tr>
<td>Piping from Branch Selector Unit to indoor unit or Piping from Refrigerant branch kit to indoor unit used as cooling only</td>
<td>(Thick): 2 pipes</td>
<td>(Suction) gas pipe</td>
<td>Liquid pipe</td>
</tr>
<tr>
<td><em>Indicates the Outdoor unit multi-connection piping kit.</em></td>
<td><em>Indicates the Outside unit multi-connection piping kit.</em></td>
<td><em>Indicates the Outside unit multi-connection piping kit.</em></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum allowable length</strong></td>
<td>Between outdoor unit (*2) and indoor unit</td>
<td>Actual pipe length</td>
<td>Pipe length between outdoor unit (*2) and indoor unit ≤ 540 ft</td>
</tr>
<tr>
<td></td>
<td>Between first outdoor unit multi-connection piping kit and outdoor unit</td>
<td>Actual and Equivalent pipe length</td>
<td>Equivalent pipe length between outdoor unit (*2) and indoor unit ≤ 630 ft (Note 1)</td>
</tr>
<tr>
<td></td>
<td>Total extension length</td>
<td></td>
<td>(Assume equivalent pipe length of REFNET joint to be 1.6 ft, that of REFNET header to be 3.3 ft, that of BS/36 - 60.96 to be 13 ft, for calculation purposes)</td>
</tr>
<tr>
<td><strong>Allowable height difference</strong></td>
<td>Between outdoor and indoor units</td>
<td>Difference in height</td>
<td>Difference in height between outdoor unit and indoor unit (H1) ≤ 164 ft (30(Max 295 ft if the outside unit is below)</td>
</tr>
<tr>
<td></td>
<td>Between indoor and outdoor units</td>
<td>Difference in height</td>
<td>Difference in height between adjacent indoor units (H2) ≤ 49 ft</td>
</tr>
<tr>
<td></td>
<td>Total difference in height</td>
<td></td>
<td>Difference in height between adjacent outdoor units (H3) ≤ 16 ft</td>
</tr>
<tr>
<td><strong>Allowable length after the branch</strong></td>
<td>Actual pipe length</td>
<td>Actual pipe length from first refrigerant branch kit (either REFNET joint or REFNET header) to indoor unit ≤ 130 ft (Note 2)</td>
<td></td>
</tr>
</tbody>
</table>

(*1) Indicates the Outside unit multi-connection piping kit.

(*2) In case of multi outdoor system, re-read “outside unit” to “the first Outside unit multi-connection piping kit” as seen from the indoor unit.

(*3) This can be extended to 295 ft with a replacement outdoor unit PCB.

(*4) If the difference between the outdoor and indoor unit is greater than 164 ft, the liquid line must be increased by one size.

---

**Installation of Outdoor Units**

Example of connection (Connection of 8 indoor units)

- **Outdoor unit**
  - Indoor unit side (3 pipes)
  - Suction gas pipe
  - HP/LP gas pipe
  - Branch Selector
  - Liquid pipe

- **Piping from outdoor unit to Branch Selector Unit**
  - (Bold): 3 pipes
  - Suction gas pipe
  - HP/LP gas pipe

- **Piping from Branch Selector Unit to indoor unit or Piping from Refrigerant branch kit to indoor unit used as cooling only**
  - (Thick): 2 pipes
  - (Suction) gas pipe
  - Liquid pipe

---

**Diagram**

- **First outdoor unit multi-connection piping kit**
  - Outdoor unit
  - REFNET joint (A-G)
  - Indoor unit (Cool/Heat selection possible)
  - Indoor unit (Cooling only)

- **Second outdoor unit multi-connection piping kit**
  - Outdoor unit
  - REFNET header
  - Indoor unit (Cool/Heat selection possible)
  - Indoor unit (Cooling only)

---

**Example of connection (Connection of 8 indoor units)**

- **Outdoor unit**
  - Indoor unit side (3 pipes)
  - Suction gas pipe
  - HP/LP gas pipe
  - Branch Selector
  - Liquid pipe

- **Piping from outdoor unit to Branch Selector Unit**
  - (Bold): 3 pipes
  - Suction gas pipe
  - HP/LP gas pipe

- **Piping from Branch Selector Unit to indoor unit or Piping from Refrigerant branch kit to indoor unit used as cooling only**
  - (Thick): 2 pipes
  - (Suction) gas pipe
  - Liquid pipe

---

**Example of connection (Connection of 8 indoor units)**

- **Outdoor unit**
  - Indoor unit side (3 pipes)
  - Suction gas pipe
  - HP/LP gas pipe
  - Branch Selector
  - Liquid pipe

- **Piping from outdoor unit to Branch Selector Unit**
  - (Bold): 3 pipes
  - Suction gas pipe
  - HP/LP gas pipe

- **Piping from Branch Selector Unit to indoor unit or Piping from Refrigerant branch kit to indoor unit used as cooling only**
  - (Thick): 2 pipes
  - (Suction) gas pipe
  - Liquid pipe

---

**Diagram**

- **First outdoor unit multi-connection piping kit**
  - Outdoor unit
  - REFNET joint (A-G)
  - Indoor unit (Cool/Heat selection possible)
  - Indoor unit (Cooling only)

- **Second outdoor unit multi-connection piping kit**
  - Outdoor unit
  - REFNET header
  - Indoor unit (Cool/Heat selection possible)
  - Indoor unit (Cooling only)
Outdoor unit multi connection piping kit and Refrigerant branch kit selection

- Refrigerant branch kits can only be used with R410A.
- When multi outdoor system are installed, be sure to use the special separately sold Outdoor unit multi connection piping kit (BHFP26P90U).
- Never use BHFP26M90U or BHFP22M90U for M type of this series or T part (field supplied).

### How to select the REFNET joint
- When using REFNET joint at the first branch counted from the outdoor unit side, choose from the following table in accordance with the outdoor unit capacity type. (Example: REFNET joint A)
- Choose from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET joint.

<table>
<thead>
<tr>
<th>Outdoor unit total capacity index</th>
<th>Refrigerant branch kit name</th>
</tr>
</thead>
<tbody>
<tr>
<td>X &lt; 72</td>
<td>KHRP25M22T</td>
</tr>
<tr>
<td>72 ≤ X &lt; 111</td>
<td>KHRP25M23T</td>
</tr>
<tr>
<td>111 ≤ X &lt; 246</td>
<td>KHRP25M22TU9</td>
</tr>
<tr>
<td>246 ≤ X</td>
<td>KHRP25M23TU9</td>
</tr>
</tbody>
</table>

### How to select the REFNET header
- Choose from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET header.

<table>
<thead>
<tr>
<th>Indoor unit total capacity index</th>
<th>Refrigerant branch kit name</th>
</tr>
</thead>
<tbody>
<tr>
<td>X &lt; 72</td>
<td>KHRP25M23H9</td>
</tr>
<tr>
<td>72 ≤ X &lt; 111</td>
<td>KHRP25M23H9</td>
</tr>
<tr>
<td>111 ≤ X &lt; 230</td>
<td>KHRP25M32H9</td>
</tr>
<tr>
<td>230 ≤ X</td>
<td>KHRP25M32H9</td>
</tr>
</tbody>
</table>

### How to select the outdoor unit multi connection piping kit
- When multi outdoor system are installed, be sure to use the special separately sold Outdoor unit multi connection piping kit. (BHFP26P90U). (For how to select the proper kit, follow the table at right.)
- Choose from the following table in accordance with the number of outdoor units.

<table>
<thead>
<tr>
<th>Number of outdoor unit</th>
<th>Connecting piping kit name</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 units</td>
<td>BHFP26P90U</td>
</tr>
<tr>
<td>3 units</td>
<td>BHFP26P136U</td>
</tr>
</tbody>
</table>

### Pipe size selection
- The thickness and material shall be selected in accordance with local code.

Piping between outdoor unit (*2 and refrigerant branch kit (part A)
- Choose from the following table in accordance with the capacity type of the outdoor unit connected.

<table>
<thead>
<tr>
<th>Outdoor unit capacity type</th>
<th>Suction gas pipe (φ)</th>
<th>HP/LP gas pipe (φ)</th>
<th>Liquid pipe (φ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REYQ144P type</td>
<td>φ1-1/8</td>
<td>φ7/8</td>
<td>φ1/2</td>
</tr>
<tr>
<td>REYQ169P type</td>
<td>φ1-1/8</td>
<td>φ7/8</td>
<td>φ1/2</td>
</tr>
<tr>
<td>REYQ240P type</td>
<td>φ1-1/8</td>
<td>φ7/8</td>
<td>φ1/2</td>
</tr>
<tr>
<td>REYQ264-339P type</td>
<td>φ1-1/8</td>
<td>φ7/8</td>
<td>φ1/2</td>
</tr>
</tbody>
</table>

Piping between outdoor unit multi connection piping kit and outdoor unit (part B)
- Choose from the following table in accordance with the capacity type of the outdoor unit connected.

<table>
<thead>
<tr>
<th>Outdoor unit capacity type</th>
<th>Suction gas pipe (φ)</th>
<th>HP/LP gas pipe (φ)</th>
<th>Liquid pipe (φ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KHRP25M33H9</td>
<td>φ1-1/8</td>
<td>φ7/8</td>
<td>φ1/2</td>
</tr>
<tr>
<td>KHRP25M33TU9</td>
<td>φ1-1/8</td>
<td>φ7/8</td>
<td>φ1/2</td>
</tr>
<tr>
<td>KHRP25M72TU9</td>
<td>φ1-1/8</td>
<td>φ7/8</td>
<td>φ1/2</td>
</tr>
</tbody>
</table>

Piping between refrigerant branch kits
- Choose from the following table in accordance with the total capacity type of all the indoor units connected downstream.

<table>
<thead>
<tr>
<th>Indoor capacity index</th>
<th>Suction gas pipe (φ)</th>
<th>HP/LP gas pipe (φ)</th>
<th>Liquid pipe (φ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X &lt; 54</td>
<td>φ5/8</td>
<td>φ5/8</td>
<td>φ3/4</td>
</tr>
<tr>
<td>54 ≤ X &lt; 72</td>
<td>φ5/8</td>
<td>φ5/8</td>
<td>φ3/4</td>
</tr>
<tr>
<td>72 ≤ X &lt; 111</td>
<td>φ7/8</td>
<td>φ3/4</td>
<td>φ3/4</td>
</tr>
<tr>
<td>111 ≤ X &lt; 162</td>
<td>φ1-1/8</td>
<td>φ3/4</td>
<td>φ3/4</td>
</tr>
<tr>
<td>162 ≤ X &lt; 230</td>
<td>φ1-1/8</td>
<td>φ3/4</td>
<td>φ3/4</td>
</tr>
<tr>
<td>230 ≤ X &lt; 300</td>
<td>φ1-1/8</td>
<td>φ3/4</td>
<td>φ3/4</td>
</tr>
<tr>
<td>300 ≤ X</td>
<td>φ1-5/8</td>
<td>φ3/4</td>
<td>φ3/4</td>
</tr>
</tbody>
</table>

Piping between refrigerant branch kits and BS unit
- Choose from the following table in accordance with the total capacity type of all the indoor units connected downstream.

<table>
<thead>
<tr>
<th>Indoor capacity index</th>
<th>Suction gas pipe (φ)</th>
<th>HP/LP gas pipe (φ)</th>
<th>Liquid pipe (φ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X &lt; 54</td>
<td>φ5/8</td>
<td>φ5/8</td>
<td>φ3/4</td>
</tr>
<tr>
<td>54 ≤ X &lt; 72</td>
<td>φ5/8</td>
<td>φ5/8</td>
<td>φ3/4</td>
</tr>
<tr>
<td>72 ≤ X &lt; 111</td>
<td>φ7/8</td>
<td>φ3/4</td>
<td>φ3/4</td>
</tr>
<tr>
<td>111 ≤ X &lt; 162</td>
<td>φ1-1/8</td>
<td>φ3/4</td>
<td>φ3/4</td>
</tr>
<tr>
<td>162 ≤ X &lt; 230</td>
<td>φ1-1/8</td>
<td>φ3/4</td>
<td>φ3/4</td>
</tr>
<tr>
<td>230 ≤ X &lt; 300</td>
<td>φ1-1/8</td>
<td>φ3/4</td>
<td>φ3/4</td>
</tr>
<tr>
<td>300 ≤ X</td>
<td>φ1-5/8</td>
<td>φ3/4</td>
<td>φ3/4</td>
</tr>
</tbody>
</table>

**Notes:**
* Connection piping must not exceed the refrigerant Piping size between outdoor unit and refrigerant branch kit (part A).
* When selecting 2 pipes line (gas pipe and liquid pipe), use Suction gas pipe column for gas pipe and Liquid pipe column for liquid pipe.

For an outdoor unit installation, make the settings in accordance with the following figure.

![Diagram of outdoor unit installation](image-url)
Installation of Outdoor Units

How to calculate the additional refrigerant to be charged

[HEAT RECOVERY SYSTEM]
Additional refrigerant to be charged: \( R \) (lb)

\[ R = \left( \frac{\text{Total length (ft) of liquid piping size at } \phi \frac{3}{4}}{15} \right) + \left( \frac{\text{Total length (ft) of liquid piping size at } \phi \frac{3}{8}}{6} \right) + \left( \frac{\text{Total length (ft) of liquid piping size at } \phi \frac{1}{4}}{15} \right) \times 1.02 + \left( \frac{\text{Total length (ft) of liquid piping size at } \phi \frac{1}{2}}{12} \right) + \left( \frac{\text{Total length (ft) of liquid piping size at } \phi \frac{5}{8}}{12} \right) + \left( \frac{\text{Total length (ft) of liquid piping size at } \phi \frac{7}{8}}{12} \right) \]

\[ = \frac{25 \times 0.172 + 3 \times 0.122 + 1 \times 0.081 + 75 \times 0.040 + 10 \times 0.015}{1.02 + 3.3 + 1.1} \]

Note 1.
When the equivalent pipe length between outdoor and indoor units is 295 ft or more, the size of main pipes on the liquid side (refer to figure 16) must be increased according to the right table.

Note 2.
Allowable length after the first refrigerant branch kit to indoor units is 130 ft or less, however it can be extended up to 295 ft if all the following conditions are satisfied. (In case of "Branch with REFNET joint")

Example for refrigerant branch using REFNET joint and REFNET header for systems and each pipe length as shown below.

Outdoor system: REYQ240PBYD
Total capacity of indoor unit: 116%

\[ R = \left( \frac{25 \times 0.172}{15} \right) + \left( \frac{3 \times 0.122}{6} \right) + \left( \frac{1 \times 0.081}{12} \right) \]

<table>
<thead>
<tr>
<th>System</th>
<th>Liquid pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>REYQ72 · 96P type</td>
<td>( \phi \frac{3}{8} \rightarrow \phi \frac{1}{2} )</td>
</tr>
<tr>
<td>REYQ120 · 144P type</td>
<td>( \phi \frac{1}{2} \rightarrow \phi \frac{5}{8} )</td>
</tr>
<tr>
<td>REYQ168 · 240P type</td>
<td>( \phi \frac{5}{8} \rightarrow \phi \frac{3}{4} )</td>
</tr>
<tr>
<td>REYQ264 · 336P type</td>
<td>( \phi \frac{3}{4} \rightarrow \phi \frac{7}{8} )</td>
</tr>
</tbody>
</table>

Example for calculation of Total extension length, the actual length of above pipes must be doubled.

\[ a + b \times 2 + c \times 2 + d \times 2 + e \times 2 + f \times 2 + g \times 2 + h + i + j + k + l \leq 3280 \text{ ft} \]

Example for calculation of total refrigerant amount for exceeding connection capacity of indoor unit

**If the increased pipe size is larger than the main pipe size, increase the main pipe size to the same as the increased size.**

**If the specified pipe diameter is not available onsite, do NOT substitute a pipe of greater diameter.**
7. FIELD WIRING

**NOTE**

- All field wiring and components must be installed by a licensed electrician and must comply with relevant local and national regulations.
- Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.
- Never install a phase advancing capacitor. As this unit is equipped with an inverter, installing a phase advancing capacitor will not only deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high-frequency waves.
- Only proceed with wiring work after blocking off all power.
- Always ground wires in accordance with relevant local and national regulations.
- This machine includes an inverter device. Connect earth and leave charge to eliminate the impact on other devices by reducing noise generated from the inverter device and to prevent leaked current from being charged in the outer hull of the product.
- Do not connect the ground wire to gas pipes, sewage pipes, lightning rods, or telephone ground wires.
- **Gas pipes**: can explode or catch fire if there is a gas leak.
- **Sewage pipes**: no grounding effect is possible if hard plastic piping is used.
- **Telephone ground wires and lightning rods**: dangerous when struck by lightning due to abnormal rise in electrical potential in the grounding.
- Be sure to install an earth leakage circuit breaker. This machine includes an inverter device. Connect earth and leave charge to eliminate the impact on other devices by reducing noise generated from the inverter device and to prevent leaked current from being charged in the outer hull of the product.
- Earth leakage circuit breaker which are especially for protecting devices connected to the inverter, installing a phase advancing capacitor will not prevent malfunctioning of the earth leakage circuit breaker itself.
- Earth leakage circuit breaker which are especially for protecting ground-faults should be used in conjunction with main switch or fuse for use with wiring.
- Electrical wiring must be done in accordance with the wiring diagrams and the description herein.
- Do not operate until refrigerant piping work is completed. (If operated before complete the piping work, the compressor may be broken down.)
- Never remove thermistor, sensor or etc. when connecting power wiring and transmission wiring. (If operated with thermistor, sensor or etc. removed, the compressor may be broken down.)
- This product have reversed phase protection detector that only works when the power is turned on. If there exists blackout or the power goes on and off which the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase may break the compressor and other parts.
- Attach the power wire securely. Introducing power with a missing N-phase or with a mistaken N-phase will break the unit.
- Make sure the weak electric wiring (i.e. for the remote controller, between units, etc.) and the power wiring do not pass near each other, keeping them at least 2 in. apart. Proximity may cause electrical interference, malfunctions, and breakage.
- Be sure to connect the power wiring to the power wiring terminal block and secure it as described in "7-5 Power Wiring Connection Procedure".
- Transmission wiring should be secured as described in "7-4 Transmission Wiring Connection Procedure".
- Secure wiring with clamp such as insulation lock ties to avoid contact with piping.
- Shape the wires to prevent the structure such as the electrical components box lid deforming. And close the cover firmly.
- All field wiring is to be procured on site.

### 7-1 Power circuit, safety device and cable requirements

- A power circuit (see the following table) must be provided for connection of the unit. This circuit must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and an earth leakage circuit breaker.
- When using residual current operated circuit breakers, be sure to use a high-speed type (0.1 second or less) 200mA rated residual operating current.
- Use copper conductors only.
- Use insulated wire for the power cord.
- Select the power supply cable type and size in accordance with relevant local and national regulations.
- Specifications for local wiring power cord and branch wiring are in compliance with local cord.

<table>
<thead>
<tr>
<th>Phase and frequency</th>
<th>Voltage</th>
<th>Minimum circuit amp.</th>
<th>Maximum overcurrent protective device</th>
<th>Transmission line selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>4, 60Hz 460V</td>
<td>16.7+16.7</td>
<td>25A+25A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>16.7+20.3</td>
<td>25A+25A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>20.3+20.3</td>
<td>25A+25A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>20.3+20.5</td>
<td>25A+30A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>20.5+20.5</td>
<td>30A+30A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>16.7+20.3+20.3</td>
<td>25A+25A+25A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>16.7+20.3+20.5</td>
<td>25A+25A+25A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>20.3+20.3+20.5</td>
<td>25A+25A+25A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>20.3+20.5+20.5</td>
<td>25A+30A+30A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>28.8+36.1+36.1</td>
<td>40A+50A+50A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>36.1+36.1+36.1</td>
<td>50A+50A+50A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>36.1+41.3+41.3</td>
<td>50A+60A+60A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>41.3+41.3+41.3</td>
<td>60A+60A+60A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>28.8+36.1+36.1</td>
<td>40A+50A+50A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>28.8+36.1+41.3</td>
<td>40A+50A+60A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>36.1+36.1+41.3</td>
<td>50A+50A+60A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>36.1+41.3+41.3</td>
<td>50A+60A+60A</td>
<td>AWG16-16</td>
<td></td>
</tr>
<tr>
<td>4, 60Hz 460V</td>
<td>36.1+41.3+41.3</td>
<td>50A+60A+60A</td>
<td>AWG16-16</td>
<td></td>
</tr>
</tbody>
</table>

### 7-2 Wiring Connection Example for Whole System

(Refer to figure 17)

1. Power supply
2. Main switch
3. Earth leakage circuit breaker
4. Fuse
5. Outdoor unit
6. COOL/HEAT selector
7. Remote controller
8. Indoor unit
9. Branch Selector unit

**NOTE**

- Make sure the weak electric wiring (i.e. for the remote controller, between units, etc.) and the power wiring do not pass near each other, keeping them at least 2 in. apart. Proximity may cause electrical interference, malfunctions, and breakage.
- Be sure to connect the power wiring to the power wiring terminal block and secure it as described in "7-5 Power Wiring Connection Procedure".
- Transmission wiring should be secured as described in "7-4 Transmission Wiring Connection Procedure".
- Secure wiring with clamp such as insulation lock ties to avoid contact with piping.
- Shape the wires to prevent the structure such as the electrical components box lid deforming. And close the cover firmly.
- All field wiring is to be procured on site.
7-3 Leading wire Procedure

- The power wiring and ground wiring are passed out from the power wiring hole on the sides, the front (knock hole) or the bottom frame (knock hole).
- The transmission wiring is passed out from the wiring hole (knock hole) on the front of the unit or from a piping hole.

(Refer to figure 18-1)

1. Electric wiring diagram
   Printed on the back of the electrical components box lid.
2. Knockout hole
3. Power line
4. Transmission line

(Refer to figure 18-2)

1. Electrical components box lid
2. Service lid
3. [Service precautions] Label location

**NOTE**
- Open the knock holes with a hammer or the like.
- After knocking out the holes, we recommend you remove any burrs and paint them using the repair paint to prevent rusting.

(Refer to figure 18-1, 2)

- When passing wiring through the knock holes, remove burrs around the knock holes and protect the wiring with protective tape.
- If small animals might enter the unit, block off any gaps (hatching parts in figure 18-1, 2) with material (field supply).

7-4 Transmission Wiring Connection Procedure

- Referring to figure 19 connect the transmission wiring between outdoor unit and indoor unit, outdoor unit and outdoor unit of other system, outdoor unit and outdoor unit of same system.

(Refer to figure 19)

1. Master unit (*)
2. Sub unit (*)
3. Outdoor unit A
4. Outdoor unit B
5. Electrical components box (1)
6. (Only REYQ~PBYD) Electrical components box (2)
7. (Only REYQ~PBYD) Electrical components box (2)
8. Do not open the electrical components box (2) lid. (There are no work when installation)
9. To outdoor unit of other system
10. Use duplex wires (No polarity)
11. Branch Selector unit
12. Indoor unit
13. Indoor unit (Cooling only)

(*) : The Outdoor unit that connect the transmission wiring to Branch Selector unit is Master unit of the multi system.
And the other units are Sub unit. (In this figure, Outdoor unit A is the Master unit.)

Check operation in installation work, Onsite settings and so on are done by operating the PC-board (A1P) of Master unit.

**NOTE**
- Do not connect the power wiring to terminals for the transmission wiring. Doing so would destroy the entire system.
- When connecting wires to the terminal block on the PC-board, too much heat or tightening could damage the PC-board. Attach with care.

See the table below for the tightening torque of the transmission wiring terminals.

<table>
<thead>
<tr>
<th>Screw size</th>
<th>Tightening torque (ft-lbf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3.5 (A1P)</td>
<td>0.59 – 0.71</td>
</tr>
</tbody>
</table>

- Transmission wiring (About the symbol \( T \rightarrow P \), see figure 19) should be done within the following limitations.
  - If they are exceeded, transmission problems may occur.

7-5 Power Wiring Connection Procedure

- Be sure to connect the power wiring to the power supply terminal block and hold it in place using the included clamp as shown in the figure 23.
- The L1, L2, L3 and N phases of the power wiring should be secured separately to the hook using the included clamp (1).
- The ground wiring should be bound to the power wiring using the included clamp (1) to prevent outside force from being applied to the terminal area.

(Refer to figure 23)

1. Power supply (MODEL PBYD: 3 – 460V 60Hz)
2. Earth leakage circuit breaker
3. Branch switch, Overcurrent breaker
4. Ground wire
5. Electrical components box (1)
6. (Only REYQ–PBYD) Electrical components box (2)
7. (Only REYQ–PBYD) Electrical components box (2)
8. Do not open the electrical components box (2) lid. (There are no work when installation)
9. Attach insulation sleeves
10. Power supply terminal block
11. Clamp (1) (accessory)
12. Vinyl tube (accessory)
### CAUTION

- Be sure to use crimp-style terminal with insulating sleeves for connections. (See the figure below.)

![Crimp-style terminal](image)

- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will strip the head and make proper tightening impossible.
- Over-tightening the terminal screws may break them. See the following table for the tightening torque of the terminal screws.

<table>
<thead>
<tr>
<th>Screw size</th>
<th>Tightening torque (ft · lbf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M8 Power terminal, ground terminal</td>
<td>4.06 ~ 5.38</td>
</tr>
</tbody>
</table>

- When pulling the ground wire out, wire it so that it comes through the cut out section of the cup washer. (See the figure below.) An improper ground connection may prevent a good ground from being achieved.

![Crimp-style terminal](image)

- When two wires are connected to a single terminal, connect them so that the rear sides of the crimp contacts face each other. Also, make sure the thinner wire is on top, securing the two wires simultaneously to the resin hook using the included clamp (1).

![Terminal block](image)

**NOTE**
- After wiring work is completed, check to make sure there are no loose connections among the electrical parts in the electrical components box.

### 7-6 Procedure for Wiring Inside Units

- Referring to figure 24, secure and wire the power and transmission wiring using the included clamp (1), (2), and (3).
- Wire so that the ground wiring does not come into contact with the compressor lead wiring. If they touch, this may have an adverse effect on other devices.
- The transmission wiring must be at least 2 in. away from the power wiring.
- Make sure all wiring do not contact to the pipes (hatching parts in the figure 24).

*(Refer to figure 24)*

1. Retain with accessory clamp (3).
2. Electric conduit
3. When routing out the power/ground wires from the left side.
4. When routing out the transmission wiring from the opening for piping.
5. When routing out the power/ground wires from the front.
6. Clear over 2 in..
7. When routing out the transmission wiring from the knockout hole.
8. Retain to the back of the column support with the accessory clamp (2).
9. When routing out the power/ground wires from the right side.
10. Power wiring
11. Transmission wiring
12. Ground wire

**NOTE**
- Always use nitrogen gas for the air tight test.
- Absolutely do not open the shutoff valve until the main power circuit insulation measurement has been completed. (measuring after the shutoff valve is opened will cause the insulation value to drop.)

### Precautions when knocking out knockout holes

- To punch out a knockout hole, hit it with a hammer.
- Open an appropriate hole as needed.
- After knocking out the holes, trim off the burr, then we recommend you to paint the edges and areas around the edges using the repair paint to prevent rusting.
- Power line: Open a knockout hole as shown at left and connect it using a conduit.
- Transmission line: Connect it using a conduit in the knockout hole on the right.

![Conduit mounting plate](image)

**NOTE**
- After finished piping work, carry out air tight test and vacuum drying.

### 8. AIR TIGHT TEST AND VACUUM DRYING

- After finished piping work, carry out air tight test and vacuum drying.

**NOTE**
- Absolutely do not open the shutoff valve until the main power circuit insulation measurement has been completed. (measuring after the shutoff valve is opened will cause the insulation value to drop.)

### Needed tools

<table>
<thead>
<tr>
<th>Gauge manifold Charge hose valve</th>
<th>To prevent entry of any impurities and insure sufficient pressure resistance, always use the special tools dedicated for R410A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum pump</td>
<td>The vacuum pump for vacuum drying should be able to lower the pressure to –14.6 psi.</td>
</tr>
<tr>
<td>Charge hose</td>
<td>Take care the pump oil never flow backward into the refrigerant pipe during the pump stops.</td>
</tr>
</tbody>
</table>

### The system for air tight test and vacuum drying

- Referring to figure 25, connect a nitrogen tank, refrigerant tank, and a vacuum pump to the outdoor unit.

The refrigerant tank and the charge hose connection to refrigerant charge port or the valve A in figure 25 are needed in “11. ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION”.

*(Refer to figure 25)*

1. Gauge manifold
2. Nitrogen
3. Measuring device
4. R410A tank (with siphon)
5. Vacuum pump
6. Charge hose
7. Equalizer pipe shutoff valve
8. HP/LP gas pipe shutoff valve
9. Suction gas pipe shutoff valve
10. Liquid pipe shutoff valve
11. Refrigerant charge port
12. Valve A
13. Valve B  
14. Valve C  
15. Outdoor unit  
16. To Branch Selector (or indoor) unit  
17. Shutoff valve  
18. Service port  
19. Field piping  
20. Gas flow

⚠️ NOTE
- The air-tightness test and vacuum drying should be done using the service ports of equalizer pipe, HP/LP gas pipe, suction gas pipe and liquid pipe shutoff valve. See the [R410A] Label attached to the front plate of the outdoor unit for details on the location of the service port (see figure at right)
- See [Shutoff valve operation procedure] in “11-1 Before working” for details on handling the shutoff valve.
- The refrigerant charge port is connected to unit pipe. When shipped, the unit contains the refrigerant, so use caution when attaching the charge hose.

<Air tight test>
Pressurize the liquid pipe, suction gas pipe, HP/LP gas pipe and equalizer pipe from the service ports of each shutoff port to 550 psi (do not pressurize more than 550 psi). If the pressure does not drop within 24 hours, the system passes the test. If there is a pressure drop, check for leaks, make repairs and perform the airtight test again.

<Vacuum drying>
Evacuate the system from the liquid pipe, suction gas pipe, HP/LP gas pipe and equalizer pipe shutoff valve service ports by using a vacuum pump for more than 2 hours and bring the system to –14.6 psi or less. After keeping the system under that condition for more than 1 hour, check if the vacuum gauge rises or not. If it rises, the system may either contain moisture inside or have leaks.

⚠️ NOTE
If moisture might enter the piping, follow belows. (I.e., if doing work during the rainy season, if the actual work takes long enough that condensation may form on the inside of the pipes, if rain might enter the pipes during work, etc.) After evacuating the system for 2 hours, pressurize the system to 7.25 psi (vacuum break) with nitrogen gas and evacuate the system again using the vacuum pump for 1 hour to –14.6 psi or less (vacuum drying). If the system cannot be evacuated to –14.6 psi or less (vacuum break) with nitrogen gas and evacuate the system again within 2 hours, repeat the operation of vacuum break and vacuum drying. Then, after leaving the system in vacuum for 1 hour, confirm that the vacuum gauge does not rise.

9. PIPE INSULATION
- Insulation of pipes should be done after performing “8. AIR TIGHT TEST AND VACUUM DRYING”.
- Always insulate the liquid piping, the HP/LP gas piping, the gas piping, the equalizer pipe (between the outdoor units for the outdoor multi system) and these pipe connections. Failing to insulate the pipes may cause leaking or burns. Especially, be sure to insulate the HP/LP gas piping as withstanding as the suction pipe because the suction gas follows in the HP/LP gas piping when the system is whole cooling mode. And be sure to use the insulation which can withstand such temperatures of 248°F or more for the HP/LP gas piping, the equalizer pipe and the gas piping because the HP/LP gas follows in these pipeing.
- Reinforce the insulation on the refrigerant piping according to the installation environment. Condensation might form on the surface of the insulation. Refer to the below.
- Ambient temperature : 86°F, humidity : 75% to 80% RH : min. thickness : 9/16 in.

- If the ambient temperature exceeds 86°F and the humidity 80% RH, then the min. thickness is 3/4 in.
- If there is a possibility that condensation on the shutoff valve might drip down into the indoor unit through gaps in the insulation and piping because the outdoor unit is located higher than the indoor unit, etc., this must be prevented by caulking the connections, etc. (Refer to figure 26)
  - The piping lead-out hole lid should be attached after opening a knock hole. (Refer to figure 27)
  - If small animals and the like might enter the unit through the piping lead-out hole, close the hole with blocking material (procured on site) after completion of “11. ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION”. (Refer to figure 30)
  
  (Refer to figure 26)
  1. Insulation material  
  2. Caulking, etc.  
  
  (Refer to figure 27)
  1. Piping lead-out hole lid  
  2. Open a knock hole at “[ ]”.  
  3. Block “[ ]”.

⚠️ NOTE
- After knocking out the holes, we recommend you remove burrs in the knock holes (See figure 27) and paint the edges and areas around the edges using the repair paint.

10. CHECKING OF DEVICE AND INSTALLATION CONDITIONS
Be sure to check the followings.

For those doing electrical work
1. Make sure there is no faulty transmission wiring or loosening of a nut. See “7-4 Transmission Wiring Connection Procedure”.
2. Make sure there is no faulty power wiring or loosening of a nut. See “7-5 Power Wiring Connection Procedure”.
3. Has the insulation of the main power circuit deteriorated? Measure the insulation and check the insulation is above regular value in accordance with relevant local and national regulations.

For those doing pipe work
1. Make sure piping size is correct. See “6-1 Selection of piping material and Refrigerant branching kit”.
2. Make sure insulation work is done. See “9. PIPE INSULATION”.
3. Make sure there is no faulty refrigerant piping. See “6. REFRIGERANT PIPING”.

Installation of Outdoor Units  105
11. ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION
The outdoor unit is charged with refrigerant when shipped from the factory, but depending on the size and length of the piping when installed, it may require additional charging. For charging the additional refrigerant, follow the procedure in this chapter. And then carry out the check operation.

11-1 Before working

[About the refrigerant tank]
Check whether the tank has a siphon pipe before charging and place the tank so that the refrigerant is charged in liquid form.
(See the figure below.)

<table>
<thead>
<tr>
<th>With siphon pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stand the tank upright and charge. (The siphon pipe goes all the way inside, so the tank does not need to be put upside-down charge in liquid form.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other tanks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stand the tank upside-down and charge.</td>
</tr>
</tbody>
</table>

---

### NOTE

- Always use the proper refrigerant (R410A). If charged with the refrigerant containing an improper material, it may cause an explosion or accident.
- R410A is a mixed refrigerant, so charging it as a gas will cause the refrigerant composition to change, which may prevent normal operation.

[Shutoff valve operation procedure]
When operating the shutoff valve, follow the procedure instructed below.

---

### NOTE

- Do not open the shutoff valve until “10. CHECKING OF DEVICE AND INSTALLATION CONDITIONS” are completed. If the shutoff valve is left open without turning on the power, it may cause refrigerant to buildup in the compressor, leading insulation degradation.
- Be sure to use the correct tools. The shutoff valve is not a back-seat type. If forced to open, it might break the valve body.
- When using a service port, use the charge hose.
- After tightening the cap, make sure no refrigerant gas is leaking.
Tightening torque
The sizes of the shutoff valves on each model and the tightening torque for each size are listed in the table below.

<table>
<thead>
<tr>
<th>Size of Shutoff Valve</th>
<th>Liquid pipe shutoff valve</th>
<th>Suction gas shutoff valve</th>
<th>HP/LP gas shutoff valve</th>
<th>Equalizer pipe shutoff valve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1/2</td>
<td>1/2</td>
<td>3/4</td>
<td>3/4</td>
</tr>
<tr>
<td>72P type</td>
<td>3/8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>96P type</td>
<td></td>
<td>3/8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>120P type</td>
<td></td>
<td></td>
<td>1/2</td>
<td></td>
</tr>
</tbody>
</table>

(Refer to figure 28)

1. Service port
2. Cap
3. Hex holes
4. Shaft (valve body)

[How to Check How Many Units are Connected]
It is possible to find out how many indoor or outdoor unit in the system are turned on by operating the push button on the PC-board (A1P) of outdoor unit (In case of multi system master unit).

Follow the procedure below to check how many indoor or outdoor units are turned on.

1. Press the MODE button (BS1) once at Setting Mode 1 (H1P: off), and set the MONITOR MODE (H1P: Blinking).
2. Press the SET button (BS2) the number of times until the LED display matches that at right.
3. Press the RETURN button (BS3) and read the number of units from the display of H2P through H7P.

(Reading Method)
The display of H2P through H7P should be read as a binary number, with standing for “1” and standing for “0”.

Ex: For the LED display at right, this would be “010110”, which would mean 22 units are connected.

32 x 0 + 16 x 1 + 8 x 0 + 4 x 1 + 2 x 1 + 1 x 0 = 22 units

Note: “000000” indicates 64 units.

4. Press the MODE button (BS1) once. This returns to Setting Mode 1 (H1P: OFF, default).

---

5. Seal section

To open
1. Remove the cap and turn the shaft counterclockwise with the hexagon wrench.
2. Turn it until the shaft stops.
3. Make sure to tighten the cap securely.

(For the tightening torque, refer to the item <Tightening Torque>.)

To close
1. Remove the cap and turn the shaft clockwise with the hexagon wrench.
2. Securely tighten the valve until the shaft contacts the main body seal.
3. Make sure to tighten the cap securely.

(For the tightening torque, refer to the item <Tightening Torque>.)

---

6. Lift the protruding part to open the inspection door.

- Use an insulated rod to operate the push buttons via the electrical components box’s inspection door.
- There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

---

3P215731-11R
• When opening the front panel, make sure to take caution to the fan rotation during the working.
  After the outdoor unit stops operating, the fan may keep rotation for a while.

⚠️ NOTE ⚠️

• If operation is performed within 12 minutes after the BS, indoor and outdoor units are turned on, H2P will be lit on and the compressor will not operate.

Check the LED display indicate as shown below.

![LED display diagram](image)

• In order to ensure uniform refrigerant distribution, it may take up to around 10 minutes for the compressor to start up after the unit starting operating. This is not a malfunction.

• The refrigerant charge port is connected to the piping inside the unit.

When the unit is shipped from the factory, the unit's internal piping is already charged with refrigerant, so be careful when connecting the charge hose.

• After adding the refrigerant, make sure to close the lid of the refrigerant charging port.

The tightening torque for the lid is 8.48 to 10.3 ft · lbf.

• During Automatic refrigerant charging operation, you can stop the operation. Performance may drop due to the failure of “Judgment of piping length”.

• Check operation must be performed for each refrigerant piping system.

The individual problems of indoor units can not be checked.

• Make sure to perform the check operation after installation.

Otherwise, the malfunction code “U3” will be displayed and normal operation cannot be performed.

And the failure of “Check of miswiring” may also cause abnormal operation. Performance may drop due to the failure of “Judgment of piping length”.

• Check operation must be performed for each refrigerant piping system.

Checking is impossible if plural systems are being done at once.

The individual problems of indoor units cannot be checked. About these problems check by test run after the check operation is completed. (See chapter 13)

• The check operation cannot be performed in recovery or other service modes.

### 11-2-1 Procedure of Adding Refrigerant charging

1. Make sure the following works are complete in accordance with the installation manual.
   - Piping work
   - Wiring work
   - Air tight test
   - Vacuum drying
   - Installation work for BS, indoor unit

2. Calculate the “additional charging amount” using “How to calculate the additional refrigerant to be charged” in “6-5 Example of connection”.

3. Open the valve B (See the figure 30). The valve A, C and the liquid pipe, suction gas pipe, HP/LP gas pipe, equalizer pipe shutoff valves must be left closed), and charge the refrigerant of the “additional charging amount” from the liquid side shutoff valve service port.

(Refer to figure 30)

1. Measuring device
2. R410A tank (with siphon)
3. Charge hose
4. Equalizer pipe shutoff valve
5. HP/LP gas pipe shutoff valve
6. Suction gas shutoff valve
7. Liquid pipe shutoff valve
8. Refrigerant charge port
9. Valve A
10. Valve B
11. Valve C
12. Outdoor unit A
13. Outdoor unit B
14. To BS, indoor unit
15. Field pipings
16. Refrigerant flow when charging
17. Shutoff valve
18. Service port

4. If the “additional charging amount” was charged fully, close the valve B and go to step 6.

If the “additional charging amount” was not charged fully, close the valve B and go to step 5.

5. Perform the refrigerant charging following [Automatic refrigerant charging operation procedure] as shown below. And charge the remaining refrigerant of the “additional charging amount”.

⚠️ NOTE ⚠️

• For performing the automatic refrigerant charging operation, the push button on the PC-board (A1) of outdoor unit are used. (See figure 29.)

And the refrigerant are charged from the refrigerant charge port via the valve A. (See figure 31.) For operating the push button and opening or closing the valves, follow the procedure.

• During Automatic refrigerant charging operation, the system will select charging mode (cooling mode or heating mode) by the temperature condition as follows.

<table>
<thead>
<tr>
<th>Outdoor temp.</th>
<th>Indoor temp.</th>
<th>Heating mode</th>
<th>Cooling mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than above range</td>
<td>32°F DB ~ 109°F DB</td>
<td>Heating mode</td>
<td>Cooling mode</td>
</tr>
<tr>
<td>50°F DB ~ 90°F DB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When charging in cooling mode, the system will stop operation when the required amount of refrigerant is charged. During charging in heating mode, a person must manually close valve A and stop operation.

Beforehand, check the remaining refrigerant that is needed to charge based on the “additional charging amount” in step 2 and the charged amount in step 3.

• The refrigerant will be charged about 66 lb in one hour at outdoor temp. 86°F DB (about 26 lb at outdoor temp. 32°F DB).

• During Automatic refrigerant charging operation, you can stop the operation forcibly by pushing MODE button (BS1).

(Refer to figure 31)

1. Measuring device
2. R410A tank (with siphon)
3. Charge hose
4. Equalizer pipe shutoff valve
5. HP/LP gas pipe shutoff valve
6. Suction pipe shutoff valve
7. Liquid pipe shutoff valve
8. Refrigerant charge port
9. Valve A
10. Valve B
11. Valve C
12. Outdoor unit A
13. Outdoor unit B
14. To BS, indoor unit
15. Field pipings
16. Refrigerant flow when charging
17. Shutoff valve
18. Service port

The refrigerant will be charged about 66 lb in one hour at outdoor temp. 86°F DB (26 lb at 32°F DB). (According to outdoor temp. or the refrigerant amount in the tank, the charging rate may speed up. If you need to speed up in case of multi system, connect the refrigerant tanks to each outdoor unit.)
**Automatic refrigerant charging operation procedure**

---

**NOTE**

- The marks of LED mean as follows.
  - ● : OFF  ○ : ON  ▲ : Blinking  ● : OFF, ON or Blinking

1. Open the liquid pipe, suction gas pipe and HP/HP gas pipe shutoff valves. (The valve A–C must be closed. See figure 31.)
2. Close the electrical components box (1) lid and all front panel except on the electrical components box (1) side. (1) And turn the power to the outdoor unit and all connected BS, indoor units. (2)
   - After H2P stop blinking (about 12 minutes after turning on the power), check H2P is OFF. If H2P is ON, check the malfunction code in the remote controller of indoor unit and correct the malfunction in accordance with [Remote controller display malfunction code] in chapter 11-2-2.
3. Check the LED. And push the MODE button (BS1) once if the LED displays is not as below.
   - [Diagram]
4. Push the TEST button (BS4) once. (The LED displays will change as below.)
   - [Diagram]
5. Hold the TEST button (BS4) down for 5 seconds or more. (The LED displays will change as below and fan of outdoor unit will start rotation.)
   - [Diagram]
6. When the compressor start working and the LED displays change any state in below (3), go to “In case of cooling mode” or “In case of heating mode” in accordance with the LED displays.
   - [Diagram]
   - Go to “In case of cooling mode”
   - Go to “In case of heating mode”

---

**In case of cooling mode**

7. Push the TEST button (BS4) once within 5 minutes after procedure (5) (*) and close all the front panels (*5).
   - After that, open the valve A immediately (See figure 31) (*6) and watch the remote controller display of indoor unit.
8. If the remote controller display shows “PE” code (*) , ready to close the valve A.
   - And go to procedure (9).
   - If the remote controller display shows other code, close the valve A immediately and refer to [Remote controller cooling mode malfunction code].

---

**Beware the fan running when open the front panel.**

The fan may continue rotation after the system stop the operation.

9. When the compressor stop working (the fan may continue rotation), close the valve A immediately (*8).
   - And check the LED displays are as below and the remote controller display shows “P9” code.
   - After checking, push the MODE button (BS1) once and the charging is complete.

---

**In case of heating mode**

7. Push the TEST button (BS4) once within 5 minutes after procedure (5) (*) and close all the front panels.
   - After that, open the valve A immediately (See figure 31) (*6) and check the charged amount by measuring device. During operation, if the remote controller display shows “P2” or “P8” code, close the valve A immediately and refer to [Remote controller heating mode malfunction code].

---

**[Remote controller cooling mode malfunction code]**

<table>
<thead>
<tr>
<th>Code</th>
<th>The work contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>Charging is almost finished. Ready to close the valve A.</td>
</tr>
<tr>
<td>PA</td>
<td>The refrigerant tank is empty. Close the valve A and replace empty tank to the new tank. After changing the tank, open the valve A again. Beware the fan running. The outdoor unit does not stop operation.</td>
</tr>
<tr>
<td>PH</td>
<td>Open the valve A immediately and check the below items.</td>
</tr>
<tr>
<td></td>
<td>- Check if HP/HP gas pipe, suction gas pipe or liquid pipe shutoff valve is opened.</td>
</tr>
<tr>
<td></td>
<td>- Check the refrigerant tank is connected and the valve A was opened.</td>
</tr>
<tr>
<td></td>
<td>- Check if the air inlet and outlet of the indoor unit are not closed by an obstruction.</td>
</tr>
<tr>
<td>P8</td>
<td>Close the valve A immediately, and restart the operation from procedure (3).</td>
</tr>
<tr>
<td>P2</td>
<td>Operation is interrupted. Close the valve A immediately and check the below items.</td>
</tr>
<tr>
<td></td>
<td>- Check if HP/HP gas pipe, suction gas pipe or liquid pipe shutoff valve is opened.</td>
</tr>
<tr>
<td></td>
<td>- Check the refrigerant tank is connected and the valve A was opened.</td>
</tr>
<tr>
<td></td>
<td>After correcting the abnormality, restart the operation from procedure (3).</td>
</tr>
<tr>
<td>P9</td>
<td>Charging is finished. Close the valve A and take the refrigerant tank off.</td>
</tr>
</tbody>
</table>

---

**Notes (**1)**–(**8)**

- Lead the refrigerant charge hose etc from the pipe intake. All front panels must be closed at the procedure (7).
- If you perform the refrigeration charging operation within the refrigeration system that have the power off unit, the operation cannot finish properly.
- Check the number of outdoor and indoor units that is powered. For checking, see [How to check how many units are connected] in chapter 11-1.
- To energize the crankcase heater, make sure to turn on for 6 hours before starting operation.
- Depending on the situation of operation such as the charging amount is little, the “PE” code may not be displayed and the “P9” code may be displayed.
- Always close the valve A and take the tank off. The refrigerant charge port of this unit have electric expansion valve and the valve are closed when charging is finished. However, the valve will opened when other operation (Check operation, normal operation, etc.). If you leave the tank connected, the refrigerant will charged and it cause over charge.
[Remote controller heating mode malfunction code]

<table>
<thead>
<tr>
<th>Code</th>
<th>The work contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>P8</td>
<td>Close the valve A immediately and push the TEST button (BS4) once. And restart from procedure (7) of “In case of heating mode”.</td>
</tr>
</tbody>
</table>
| P2   | Operation is interrupted. Close the valve A immediately and check the below items.  
- Check if HP/HP gas pipe, suction gas pipe or liquid pipe shutoff valve is opened.  
- Check the refrigerant tank is connected and the valve A was opened.  
- Check if the air inlet and outlet of the indoor unit are not closed by an obstruction. |

6. After completing the additional refrigerant charging, record the charging amount on the accessory "REQUEST FOR THE INDICATION" label (installation records) and adhere it to the back side of the front panel.

11-2-2 Procedure of check operation

- Check operation perform the following work. Do the check operation following below. Otherwise, malfunction code “U3” will be displayed in the remote controller and normal operation can not be carried out.
  - Check of shutoff valve opening
  - Check of miswiring
  - Judgment of piping length
  - Check of refrigerant overcharge

\[\text{NOTE}\]

- Check operation can not carried out at outdoor temp. less than 23°F. Perform the check operation at day or time that outdoor temp. is 23°F or more.

[Check Operation Procedure]

(1) Close the electrical components box lid and all front panels except as the side of the electrical components box and turn on the power to the outdoor unit and all connected Branch Selector and indoor units. (Be sure to turn the power on at least 6 hours before operation in order to have power running to the crank case heater.)

(2) Make the onsite settings as needed using the push button (BS1-BS5) on the outdoor unit PC-board (A1P) with the power on. (See “12 Onsite Settings”)

(3) Perform the check operation following the Check Operation Method of the [Service Precautions] label (lower) on the electrical components box lid. (See figure 32) The system operation for about 40~60 minutes and automatically stops the check operation. If the malfunction code is not displayed in the remote controller after the system stop, check operation is completed. Normal operation will be possible after 5 minutes. If the malfunction code is displayed in the remote controller, correct the malfunction following [Remote controller displays malfunction code] and perform the check operation again.

(Refer to figure 32)
1. Electrical components box (1) lid
2. (Only REYQ-PYDN) Electrical components box (2) lid
3. [Service Precaution] label (upper)
4. [Service Precaution] label (lower)

\[\text{NOTE}\]

For interrupting the check operation, push RETURN button (BS3).

[Remote controller displays malfunction code]

<table>
<thead>
<tr>
<th>Malfunction code</th>
<th>Installation error</th>
<th>Remedial action</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3, E4 F3, F6 U3</td>
<td>The shutoff valve of the outdoor unit is left closed.</td>
<td>Open the shutoff valve.</td>
</tr>
<tr>
<td>U1, U4 LC</td>
<td>No power is supplied to an outdoor, Branch Selector or indoor unit (including phase interruption).</td>
<td>Make sure the power source wire is properly connected to the outdoor, Branch Selector or indoor unit and revise if necessary.</td>
</tr>
<tr>
<td>UF</td>
<td>There is conflict on the connection of transmission wiring in the system.</td>
<td>Check if the refrigerant piping line and the transmission wiring are consistent with each other.</td>
</tr>
</tbody>
</table>

E3, F6 UF
Refrigerant overcharge.
Recalculate the additional amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.

E4 F3
Insufficient refrigerant.
- Check if the additional refrigerant charge has been finished correctly.
- Recalculate the additional amount of refrigerant from the piping length and add the adequate amount.

U7, U4 UF, UH
Field wiring is connected to "TO MULTI UNIT (Q1, Q2)" terminal on the outdoor unit PC-board (A1P) when the system is one outdoor system.
Remove the line from the "TO MULTI UNIT (Q1, Q2)" terminal.

\[\text{NOTE}\]
If any malfunction codes other than the above are displayed, check the service manual for how to respond.

12. ONSITE SETTINGS

\[\text{NOTE}\]

In the case of a multi system, all onsite settings should be made on the master unit. Settings made on sub units are invalid. The outdoor unit to which the indoor unit transmission wire are connected is the master unit, and all other units are sub units.

Use the push button switches (BS1 through BS5) on the outdoor unit PC-board (A1P) to make the necessary onsite settings. See the “Service Precautions” label (upper) on the electrical components box lid for details on the positions and operating method of the push button switches and the onsite setting. Make sure to record the setting on the accessory “REQUEST FOR THE INDICATION” label.

\[\text{WARNING}\]

Electric Shock Warning

Use an insulated rod to operate the push buttons via the inspection door of electrical components box lid. There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.
13. TEST RUN

13-1 Before test run
- Make sure the following works are completed in accordance with the installation manual.
  - Piping work
  - Wiring work
  - Air tight test
  - Vacuum drying
  - Additional refrigerant charge
  - Check operation
- Check that all work for the BS, indoor unit are finished and there are no danger to operate.

13-2 Test Run
After all works are completed, operate the unit normally and check the following:
1. Make sure the indoor and outdoor units are operating normally.
2. Operate each indoor unit one by one and make sure the corresponding outdoor unit is also operating.
3. Check to see if cold (or hot) air is coming out from the indoor unit.
4. Push the fan direction and strength buttons on the remote controller to see if they operate properly.

NOTE
- Heating is not possible if the outdoor temperature is 75°F or higher. Refer to the Operation manual.
- If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the crank case heater for a sufficient length of time before restarting the operation.
- Once stopping, the compressor will not restart in about 5 minutes even if the On/Off button of the remote controller is pushed.
- When the system operation is stopped by the remote controller, the outdoor units may continue operating for further 5 minutes at maximum.
- The outdoor unit fan may rotate at low speeds if the Night-time low noise level setting is made, but this is not a malfunction.
- If the check operation was not performed at first installation, the malfunction code “U3” will be displayed in the remote controller.
- When the system operation is stopped by the remote controller, the outdoor units may continue operating for further 5 minutes at maximum.
- The installation date.

13-3 Checks After Test Run
Perform the following checks after the test run is complete.
- Record the contents of field setting.
  - Record them on the accessory “REQUEST FOR THE INDICATION” label.
  - And attach the label on the back side of the front panel.
- Record the installation date.
  - Record the installation date on the accessory “REQUEST FOR THE INDICATION” label in accordance with the IEC60335-2-40.
  - And attach the label on the back side of the front panel.

NOTE
After the test run, when handing the unit over to the customer, make sure the electrical components box lid, the inspection door, and the unit casing are all attached.

14. CAUTION FOR REFRIGERANT LEAKS

(Points to note in connection with refrigerant leaks)
Introduction:
The installer and system specialist shall secure safety against leakage according to local regulations or standards. The following standards may be applicable if local regulations are not available.
The VRV System, like other air conditioning systems, uses R-410A as refrigerant. R-410A is an entirely safe non-toxic, non-combustible refrigerant. Nevertheless care must be taken to ensure that air conditioning facilities are installed in a room that is sufficiently large. This assures that the maximum concentration level of refrigerant gas is not exceeded, in the unlikely event of major leak in the system and this in accordance to the local applicable regulations and standards.

Maximum concentration level:
The maximum charge of refrigerant and the calculation of the maximum concentration of refrigerant is directly related to the humanly occupied space in to which it could leak.
The unit of measurement of the concentration is lb/ft³ (the weight in lb of the refrigerant gas in 1 ft³ volume of the occupied space).
Compliance to the local applicable regulations and standards for the maximum allowable concentration level is required.

NOTE
- Where a single refrigerant facility is divided into 2 entirely independent refrigerant systems then use the amount of refrigerant with which each separate system is charged.

Follow local code requirements (ASHRAE-15 2007 & ASHRAE-34 2007).
6. Field Setting

6.1 460V

How to set the unit to high ESP.

(1) Standard external static pressure for VRV is 0.12"Wg.

(2) High external static pressure of 0.32"Wg is available by field setting as shown below.

In this case a kind of sound proof device should be considered because of increasing the operation sound.

Set the unit along the operation name plate attached to the face of the switch box.

---

Service Precautions

Touch the uncoated metal part to eliminate static electricity before performing service.

(Ex. standard type-----the Electrical Components Box lid)

---

Field Setting

Carry out the field setting according to the following instructions.

- For single outdoor system, carry out all field setting through the Electrical Components Box (1) (right side).
- For multi connecting system, carry out all field setting through the Electrical Components Box of master unit.

Refer [Caution for Multi connecting system]

1. How to operate

- Open the inspection door as shown to the right, with the power on.
- Operate the push button switch with a resin ballpoint pen or other non-conducting object.
- After the work is finished, make sure to shut the inspection door.

2. Setting by the push button switch (BS1-5)

- Function of the push button switch (on the PC board of the outdoor unit (AIP))

---

<table>
<thead>
<tr>
<th>TEST-3</th>
<th>C/H SELECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1P</td>
<td>H2P</td>
</tr>
<tr>
<td>H3P</td>
<td>H4P</td>
</tr>
<tr>
<td>H5P</td>
<td>H6P</td>
</tr>
<tr>
<td>H7P</td>
<td>H8P</td>
</tr>
</tbody>
</table>


MODE: H1P, MASTER, SLAVE, L,N,O., DEMAND, (MULTI)

LED display:

- Light OFF ● Light ON 3 ● Flashing

The LED display on the left shows the factory setting of the single outdoor system.

If you get confused in the setting process, push the MODE button (BS1). Then it will return to initial state (SETTING MODE).

For resetting the address when the wiring is changed or an additional indoor unit is installed
For check operation
For changing the field setting
For changing the setting mode

- Changing the setting mode

The setting mode can be changed by the MODE button (BS1) according to the following procedure.

When H1P is flashing (●), push BS1 once. It will change to SETTING MODE 1.

- Hold down BS1 for 5 seconds
- Push BS1 once.
**SETTING MODE 2** *(HIP is light ON)* Setting of the following items A to H can be carried out.

(See the service manual for setting other than the below.)

<table>
<thead>
<tr>
<th>Setting procedure</th>
<th>Details of setting • set point</th>
<th>LED display and its points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Push the SET button (BS2) and adjust the LED display to the example shown on the right according to the required mode(4 ~ H),</td>
<td>A. Additional refrigerant charging operation setting</td>
<td>HIP H2P H3P H4P H5P H6P H7P</td>
</tr>
<tr>
<td></td>
<td>B. Refrigerant recovery operation/Evacuation mode setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Night-time low noise setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. External low noise level setting(*)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E. Demand level setting(*)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F. External low noise demand setting(*)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>G. High static pressure setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>H. Evaporating Temperature Setting</td>
<td></td>
</tr>
</tbody>
</table>

2. Push the RETURN button (BS3). (The present setting will be indicated.)

3. Push the SET button (BS2) and adjust the LED display to the example shown on the right according to the required mode.

(*)2 Effect of level setting

<table>
<thead>
<tr>
<th>set point</th>
<th>level 1</th>
<th>level 2</th>
<th>level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>level L</td>
<td>level M</td>
<td>level H</td>
</tr>
</tbody>
</table>

(4) noise level — ➔ low noise

(6) power consumption — ➔ saving power

(H) evap. temp. — ➔ low

For details, see the service manual.

4. Push the RETURN button (BS3). (The setting in (3) is defined.)

5. Push the RETURN button (BS3) again. (The system starts the operation according to the setting.) Flashing ➔ Light ON

<CAUTION>

(*)1 For selecting low noise operation by an outside order, demand operation, and external control adapter for outdoor unit (optional accessory) is required. For details, see the instruction attached to the adapter.

**Confirmation of setting**
The following items can be confirmed by the SETTING MODE II

<table>
<thead>
<tr>
<th>Confirming items</th>
<th>LED display and its points</th>
</tr>
</thead>
<tbody>
<tr>
<td>The present operating state</td>
<td>HIP H2P H3P H4P H5P H6P H7P</td>
</tr>
<tr>
<td>Low noise level setting state</td>
<td>HIP H2P H3P H4P H5P H6P H7P</td>
</tr>
<tr>
<td>Demand setting state</td>
<td>HIP H2P H3P H4P H5P H6P H7P</td>
</tr>
</tbody>
</table>

2P281604A
**Caution for the inspection door**

- Shut the inspection door after servicing or malfunction may occur due to water or foreign materials entering.
- Otherwise, it may cause malfunction due to intrusion of water or foreign materials.

**Caution when performing service inside the Electrical Components Box**

**WARNING**

- Do not open the Electrical Components Box lid for 10 minutes after the power supply is turned off.
- Measure the voltage between terminals on the terminal block for power supply with a tester and confirm that the power supply is shut off.
- In addition, measure the points shown below with a tester and confirm that the voltage of the capacitor in the main circuit is less than 50V.
- To prevent a damage of the PC board, touch the uncoated metal part and make sure to eliminate static electricity before pulling out or plugging in the connector.
- The work must be started after pulling out the junction connector X4A, X5A, X6A, X7A, and X8A are fixed on only the unit installed 2 fan motors. For the fan motor in the outdoor unit and be careful not to touch the live parts.
- If the fan rotates by strong wind, it may cause storage of electricity in the capacitor in the main circuit and electric shock.
- After the service is finished, plug in the junction connector, and normal operation will not be performed.
- For details, see the "Wiring Diagram" labeled on the back of the Electrical Components Box lid.

**Caution for Multi connecting system**

- All the setups must be made by the master unit. Setting by the slave unit is not effective.
- **How to identify master or slave**
  - The master unit in the outdoor unit connected to the transmission wiring to the indoor units.
  - The indoor units and the slave units.
- The system status can be checked on LCD display or the PC board (AIP) of the unit as shown in the table to the right.

<table>
<thead>
<tr>
<th>EB display and its points</th>
<th>Model</th>
<th>Model</th>
<th>Model</th>
<th>Model</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master</td>
<td>M0</td>
<td>M0</td>
<td>M0</td>
<td>M0</td>
<td>M0</td>
</tr>
<tr>
<td>Slave 1</td>
<td>S1</td>
<td>S1</td>
<td>S1</td>
<td>S1</td>
<td>S1</td>
</tr>
<tr>
<td>Slave 2</td>
<td>S2</td>
<td>S2</td>
<td>S2</td>
<td>S2</td>
<td>S2</td>
</tr>
</tbody>
</table>

**Caution for piping work and additional refrigerant charge**

- The unit uses R410A as a refrigerant, so keep the following points:
  - Use the charging hose and gauge manifold designed exclusive use R410A in order to withstand the pressure and prevent overpressurization as (1000 psi) from mixing sites.
  - Carry out a nitrogen blow when draining.
  - Perform the air tightness test and vacuum drying certainly. (The air tightness test pressure:50 PSI)
  - Charge the additional refrigerant in liquid state.
**Service mode operation method**

*Note* - After turning on the power supply, the unit may not start until the LED HLP goes off (for maximum 12 minutes).
- Do not shut off the power and do not reset the **SETTING MODE 2** when evacuating or recovering the refrigerant.
  (The expansion valves will close and the system can not be evacuated or recovered the refrigerant.)

**Evacuation method** *(At the first installation this evacuation is not required, it is only required for service.)*

1. When the unit is in standstill and under the **SETTING MODE 2**, set the **Refrigerant recovery** /Evacuation mode to ON. The expansion valve in the indoor, the BS and outdoor units will be opened completely, HLP will light up, and "Test operation" and "Under centralized control" will be displayed on the remote controller. The operation will be rejected.
2. Evacuate the system with a vacuum pump.
3. After completed, push the MODE button (BSI) and reset the **SETTING MODE 2**.

**Refrigerant recovery operation method** *(Make sure to use a refrigerant reclaimer.)*

1. When the unit is at standstill and under the **SETTING MODE 2**, set the **Refrigerant recovery** /Evacuation mode to ON. The expansion valve in the indoor, the BS and outdoor units will be opened completely. HLP will light up and "Test operation" and "Under centralized control" will be displayed on the remote controller. The operation will be rejected.
2. Recover the refrigerant by a refrigerant reclaimer.
3. After completed, push the MODE button (BSI) and reset the **SETTING MODE 2**.

**Additional refrigerant charging method**

*Note* - When the outdoor unit is stopped and the entire quantity of refrigerant can not be charged from the shutoff valve on the liquid side, make sure to charge the remaining quantity of refrigerant using this procedure.
If the refrigerant quantity is insufficient, the unit may malfunction.

**Operation procedure**

1. Turn ON the power of the indoor unit, the BS and the outdoor unit.
2. Make sure to completely open the equalizer(Multi system only), suction pipe, HP/LP gas pipe, and liquid pipe shutoff valves.
3. Connect the refrigerant charge hose to the refrigerant charging port (for additionally charging the refrigerant).
4. In the stopped status, set to the **additional refrigerant charging operation setting in SETTING MODE 2**(HLP : Turn on).
5. The operation is automatically started.

(The LED indicator HLP flickers, and **Test operation** and **Under centralized control** are displayed in the remote controller.)

6. After charging the specified quantity of refrigerant, press the RETURN button (BSI) to stop the operation.

(The operation is automatically stopped within 30 minutes.
If charging is not completed within 30 minutes, set and perform the **additional refrigerant charging operation again.**
Never charge extra refrigerant.

7. Disconnect the refrigerant charge hose.
Check operation method

(Note) Make sure to completely open the equalizer (Multi system only), suction pipe, dual pressure gas pipe, and liquid pipe shutoff valves.
- In the check operation, the following works will be automatically performed.
- Check of evacuation/check of shutoff valve opening/check of refrigerant overcharge/judgment of piping leak.

- Make sure to carry out the check operation after the first installation.
- Otherwise, the malfunction code “12” will be displayed in the remote controller and normal operation cannot be carried out.
- When the check operation is finished normally, normal operation can be carried out after 5 minutes.
- For Multi system, check the setting and result on the master unit. (See Section for Multi connection option)
- The abnormality of each indoor unit cannot be checked. After the check operation is finished, check the indoor units individually by normal operation using the remote controller.

Operation procedure

① To protect the compressor, make sure to turn on the power supply for 6 hours before starting operation.
(If turning on the power supply, the unit can not start the operation until the MIP LED goes off, (maximum 12 minutes))
② Set to the [TEST MODE] in MIP, [Mode OFF].
③ Push the [TEST BUTTON] for 5 seconds or more, then the unit will start the check operation.
- The check operation is automatically carried out in a cooling mode, MIP will flash up and [Test operation], and the [Other controlled area] will be displayed in the remote controller.
- It may take 10 minutes to bring the state of refrigerant uniform before the compressor starts.
- During the check operation, the refrigerant running sound or the magnetic sound of a solenoid valve may become loud during operation, and the LED display may change, but these are not malfunctions.
- During the check operation, it is impossible to stop the unit from the remote controller. When discontinuing the operation, push the [RETRY button (R3)]. The system will stop after behind operation for 30 seconds.
④ Close the front panel. (Otherwise, it may cause a misjudgment.)
⑤ When the checks are completed, the system will stop automatically. After the system stops, the operation can be stopped manually by the indoor unit LED display. (See the table shown right.)

Measure for abnormal finish

① Confirm the malfunction code by the remote controller, and correct the abnormality. (For how to correct the abnormality, see the installation manual.)
② After correcting the abnormality, push the [RETRY button (R3)] and reset the malfunction code.
③ Carry out the check operation again and confirm that the abnormality is properly corrected.

Automatic refrigerant charge method

For details, refer to the “INSTALLATION MANUAL”.

Electric Shock Hazard!

Disconnect all remote power supplies before installing or servicing this equipment.
Failure to do so could lead to serious injury or death. Only a qualified service technician should install or service this equipment.

Danger d’Electrocution!

Déconnecter toutes les alimentations électriques éloignées avant d’installer ou de réparer cet appareil.
Le non respect de cette recommandation peut entraîner des blessures graves ou la mort.
Seul un technicien de service qualifié peut installer ou réparer cet appareil.
RXYQ72PBYD / RXYQ96PBYD / RXYQ120PBYD

**To Installers**

1. When carrying the unit.
   - If a forklift is used for carrying the unit, put the forklift arms into the large openings on the bottom of the unit.
   - In order not to damage the coating of the bottom frame, put rags on the forklift arms. Otherwise rustproofing effect will be lost.
   - After installation, remove the transport protector with a pulling hook attached to the large openings.

2. When lifting the unit.
   - Put the belt slings into the small openings.
   - Lift the unit with 2 belts of at least 26ft long.
   - Put cushioning plates or rags where the slings contact the casing.

3. Electrical work.
   - To prevent electric shock and fire accidents, be sure to perform grounding and install an earth lead breaker.
   - Electrical work must be carried out by a licensed electrician in accordance with local and national regulations.

**To Service Person**

- **WARNING**
- **Caution to electric shock**
  - Beware the fan running when inspect.
  - Do not touch the charged parts when inspect.

Check the system status on LED(H2P) on the PCB board(AIP) from inspection door on the Electrical Components Box lid.

LED display shows;
- TURN OFF: Normal
- TURN ON: Abnormal
- FLASH: Under preparation

For multi system, check the PCB board of the master unit.

The master unit is the outdoor unit connected to the transmission Warning to the indoor units.

**To All Handlers**

- For removing the front panel, lift the panel a little (1), and pull the panel towards you (2).
- For the location of the Electrical Components Box and the service port, see as shown below on the right.
REYQ72PBYD / REYQ96PBYD / REYQ120PBYD

To Installers

1. When carrying the unit
   - If a forklift is used for carrying the unit, put the forklift arms into the large openings on the bottom of the unit.
   - In order not to damage the coating of the bottom frame, put rags on the forklift arms. (Otherwise rustproofing effect will be lost.)
   - After installation, remove the transport protector with pushing hook attached to the large openings.

2. When lifting the unit
   - Put the belt slings under the palette.
   - Lift the unit with 2 belts of each length at least 26ft.

3. Electrical work
   - To prevent electric shocks or a fire accident, be sure to perform grounding and install a ground leakage breaker.
   - Electrical work must be carried out by a licensed electrician in accordance with local and national regulations.

To Service Person

WARNING Caution to electric shock

- Be careful of the running fan when inspecting.
- Do not touch the charged parts when inspecting.

To All handlers

- For removing the front panel, lift the panel a little, and pull the panel towards you.
- For the location of the Electrical Components Box, the service port and refrigerant charge port, see diagram below on the right.

- Lift the hanging lug (both sides) Side plate (support) Front panel
To Installers

1. When carrying the unit:
   - If a forklift is used for carrying the unit, put the forklift arms into the large openings on the bottom of the unit.
   - In order not to damage the coating of the bottom frame, put rags on the forklift arms. (Otherwise, rustproofing effect will be lost.)
   - After installation, remove the transport protector with pulling hook attached to the large opening.

2. When lifting the unit:
   - Put the belt strings under the palette.
   - Lift the unit with 2 belts of each length at least 26 ft.

3. Electrical work:
   - To prevent electric shocks or a fire accident, be sure to perform grounding and install a ground leakage breaker.
   - Electrical work must be carried out by a licensed electrician in accordance with local and national regulations.

To Service Person

**WARNING Caution to electric shock**

- Be cautious of the running fan when inspecting.
- Do not touch the charged parts when inspecting.

Check the system status on LED (X5P) on the PCB board (X5P) from inspection door on the Electrical Components Box (1) lid.

- LED display shows:
  - TURNING OFF—Normal, TURNING ON—Abnormal, FLASHING—Under preparation
- For multi system, check the PCB board of the master unit. The master unit is the outdoor unit connected to the transmission wiring to the indoor and Branch Selector units.

To All Handlers:

- For removing the front panel, lift the panel a little, and pull the panel towards you.
- For the location of the Electrical Components Box, the service port and refrigerant charge port, see diagram below on the right.

- Lift the hanging ring (both sides).
- In the upper drawing: SP: Service port
- In the lower drawing: HP: Heat recovery
### Service Precautions

Touch the uncoated metal part to eliminate static electricity before performing service. (Ex. standard type......the Electrical Components Box lid)

#### Field Setting

Carry out the field setting according to the following instructions.

- For single outdoor system, carry out all field setting through the Electrical Components Box (l) (right side).
- For multi connecting system, carry out all field setting through the Electrical Components Box of master unit.

1. How to operate
   - Open the inspection door as shown to the right, with the power on.
   - Operate the push button switch with a resin ballpoint pen or other non-conducting object.
   - After the work is finished, make sure to shut the inspection door.

2. Setting by the push button switch (BS1-5)
   - Function of the push button switch (on the PC board of the outdoor unit (A1P))

#### LED Display

- **LED display:** ⚪️Light Off ⚫️Light On ⚫️Flashing

  - The LED display on the left shows the factory setting of the single outdoor system.
  - If you get confused in the setting process, push the MODE button (BS1), then it will return to initial state SETTING MODE 1.

  - For resetting the address when the wiring is changed or an additional indoor unit is installed
  - For check operation
  - For changing the field setting
  - For changing the setting mode

#### Changing the setting mode

The setting mode can be changed by the MODE button (BS1) according to the following procedure.

When HIP is flashing (⚫️), push BS1 once. It will change to SETTING MODE 2.
**SETTING MODE 2** (H11 is light ON) Setting of the following items ① to ⑩ can be carried out.
(See the service manual for setting other than the below.)

<table>
<thead>
<tr>
<th>Setting procedure</th>
<th>Details of setting - set point</th>
<th>LED display and its points</th>
</tr>
</thead>
<tbody>
<tr>
<td>① Push the SET button (B52) and adjust the LED display to the example shown on the right according to the required model (④ ~ ⑩).</td>
<td>④ Additional refrigerant charging operation setting</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
<tr>
<td></td>
<td>⑤ Refrigeration recovery operation/Evaporation mode setting</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
<tr>
<td></td>
<td>⑥ Night-time low noise setting</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
<tr>
<td></td>
<td>⑦ External low noise level setting(*)1</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
<tr>
<td></td>
<td>⑧ Demand level setting(*)1</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
<tr>
<td></td>
<td>⑨ External low noise demand setting(*)1</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
<tr>
<td></td>
<td>⑩ High static pressure setting</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
<tr>
<td></td>
<td>⑪ Evaporating Temperature Setting</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
<tr>
<td>② Push the RETURN button (B53). (The present setting will be indicated.)</td>
<td>Either of ③</td>
<td></td>
</tr>
<tr>
<td>③ Push the SET button (B52) and adjust the LED display to the example shown on the right according to the required mode.</td>
<td>For ①, ②, ⑤, ⑦, UN OFF (Factory set)</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
<tr>
<td></td>
<td>For ④, ⑥, (*2)</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
<tr>
<td></td>
<td>For ⑧, (*)2</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
<tr>
<td></td>
<td>For ⑨, (*)2</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
<tr>
<td></td>
<td>For ⑩, (*)2</td>
<td>H11 H21 H31 H41 H51 H61</td>
</tr>
</tbody>
</table>

(*)2 Effect of level setting

- **①** Power consumption saving power→Low noise
- **②** Evapor. temp.→Low

For details, see the service manual.

④ Push the RETURN button (B53) (The setting in ③ is defined.) Flashing → Light ON

⑤ Push the RETURN button (B53) again. (The system start the operation according to the setting.)

---

**CAUTION**

* For selecting low noise operation by an outside order, demand operation, and external control adapter for outdoor unit (optional accessory) is required. For details, see the instruction attached to the adapter.

**Confirmation of setting**

The following items can be confirmed by the SETTING MODE 2.

<table>
<thead>
<tr>
<th>Confirming item</th>
<th>Details for LED display</th>
</tr>
</thead>
<tbody>
<tr>
<td>The present operating state</td>
<td>Normal - Malfunction - Under preparation or under check operation</td>
</tr>
<tr>
<td>Low noise level setting state</td>
<td>Under normal operation (factory setting) - Under low noise operation</td>
</tr>
<tr>
<td>Demand setting state</td>
<td>Under normal operation (factory setting) - Under low noise operation</td>
</tr>
</tbody>
</table>

LED display and its points
H11 H21 H31 H41 H51 H61
Caution for the inspection door

Shut the inspection door after servicing or malfunction may occur due to water or foreign materials entering. (Designs are not cause malfunction by such as intrusion of water or foreign materials.)

Caution when performing service inside the Electrical Components Box

**WARNING** Caution to ELECTRIC SHOCK

1. Do not open the Electrical Components Box lid for 10 minutes after the power supply is turned off.
2. Measure the voltage between terminals on the terminal block for power supply with a tester and confirm that the power supply is shut off.
3. In addition, measure the points shown below with a tester and confirm that the voltage of the capacitor in the main circuit is less than DC50V.
4. To prevent a damage of the PCB board, touch the uncoated metal part and make sure to eliminate static electricity before pulling out or plugging in the connector.
5. After the work is started after pulling out the junction connector X1A, X2A, X3A, X4A (X3A and X4A are fixed only on the unit installed 2 fan motors, X3A and X4A of REV0145REV0144PRT, REV0144PRT2 are inside the Electrical Components Box(2)). See the wiring diagram 300110275.png.
6. For the fan motor in the outdoor unit and be careful not to touch the live parts.
7. (If the fan rotates by strong wind, it may cause storage of electricity.)
8. (For details, see the "Wiring Diagram" labeled on the back of the Electrical Components Box lid.)

Caution for Multi connecting system

All the operations must be made by the master unit. Setting to the slave unit is not effective.

**How to identify master or slave**

- The master unit is on the outdoor unit connected to the transmission wiring to the indoor units, and the others are the slave units.
- The system status can be checked on the display or the PCB board (MCP) of the unit, as shown in the table to the right.

<table>
<thead>
<tr>
<th>Status</th>
<th>Matter</th>
<th>Slave 1</th>
<th>Slave 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED display and its printer</td>
<td>MTP</td>
<td>HPF</td>
<td>HEP</td>
</tr>
</tbody>
</table>

Caution for piping work and additional refrigerant charge

This unit can be used as a refrigerant, so keep the following points.

- Use the charging hose and gauge supplied as an exclusive use for charging in order to withstand the pressure and prevent interior (such as liquid inside) from mixing into.
- Carry out a refrigerant blow with boiling.
- Perform the air tightness test with vacuum drying.
- Charge the additional refrigerant in liquid state.
Service mode operation method

[Note] After turning on the power supply, the unit can not start until the LED HIF goes off (for maximum 12 minutes).
Do not shut off the power and do not reset the SETTING MODE when evacuating or recovering the refrigerant.

[Evacuation method] (At the first installation this evacuation is not required. It is only required for service.)

1. When the unit is at standstill and under the SETTING MODE 2, set the Refrigerant recovery /Evacuation mode to ON. The expansion valves in the indoor, the Branch Selector and outdoor units will be opened completely, HIF will light up, and "Test operation" and "Under centralized control" will be displayed on the remote controller. The operation will be rejected.
2. Evacuate the system with a vacuum pump.
3. After completed, push the MODE button (BS1) and reset the SETTING MODE 2.

Refrigerant recovery operation method (Make sure to use a refrigerant reclaimer)

1. When the unit is at standstill and under the SETTING MODE 2, set the Refrigerant recovery /Evacuation mode to ON. The expansion valves in the indoor, the Branch Selector and outdoor units will be opened completely, HIF will light up, and "Test operation" and "Under centralized control" will be displayed on the remote controller. The operation will be rejected.
2. Recover the refrigerant by a refrigerant reclaimer.
3. After completed, push the MODE button (BS1) and reset the SETTING MODE 2.

Additional refrigerant charging method

[Note] When the outdoor unit is stopped and the entire quantity of refrigerant can not be charged from the shutoff valve on the liquid side, make sure to charge the remaining quantity of refrigerant using this procedure.

If the refrigerant quantity is insufficient, the unit may malfunction.

[Operation procedure]

1. Turn ON the power of the indoor unit, the Branch Selector and the outdoor unit.
2. Make sure to completely open the equalizer(Multi system only), suction pipe, HP/LP gas pipe, and liquid pipe shutoff valves.
3. Contact the refrigerant charge hose to the refrigerant charging port (for additionally charging the refrigerant).
4. In the stopped status, set to the Additional refrigerant charging operation setting in SETTING MODE 2 (HIF : Turn on).
5. The operation is automatically started.
(The LED indicator HP/LP, and [Test operation] and [Under centralized control] are displayed in the remote controller.)
6. After charging the specified quantity of refrigerant, press the RETURN button (BS3) to stop the operation.
   (The operation is automatically stopped within 30 minutes.
   If charging is not completed within 30 minutes, set and perform the 2 additional refrigerant charging operation again.
   Never charge extra refrigerant.
   If the additional refrigerant charging operation is stopped soon, the refrigerant may be overcharged.)
7. Disconnect the refrigerant charge hose.
### Check operation method

**[Note]** Make sure to completely open the equalizer (Multi system only), suction pipe, dual pressure gas pipe, and liquid pipe shut-off valves.
- In the check operation, the following works will be automatically performed.
  - Check if the outdoor unit efficacy or refrigerant charge is performed.
- Make sure to carry out the check operation after the first installation.
- Otherwise, the malfunction code “CH” will be displayed on the remote controller and normal operation cannot be carried out.
- When the check operation is finished normally, normal operation can be carried out after 5 minutes.
- For Multi system, check the setting and result on the master unit. (See *Metering for Multi connection system*)
- The abnormality of each indoor unit can not be checked. After the check operation is finished, check the indoor units individually by normal operation using the remote controller.

#### Operation procedure

1. **To protect the compressor, make sure to turn on the power supply for 6 hours before starting operation.**
3. **Push the **[TEST] button** for 5 seconds or more, then the unit will start the check operation.
   - The check operation is automatically carried out in a cooling mode. M1 will flash up and [Test operation] and [Under centralized control] will be displayed in the remote controller.
   - It may take 10 minutes to bring the state of refrigerant uniform before the compressor starts.
   - During the check operation, the refrigerant running sound or the magnetic sound of a solenoid valve may become loud during operation, and the LED display may change, but these are not malfunctions.
   - During the check operation, it is impossible to stop the unit from the remote controller. When discontinuing the operation, push the **[RETURN] button** (BS1). The system will stop after 30 seconds.
4. **Close the front panel.** (Otherwise, it may cause a malfunction.)
5. **When the check is completed, the system will stop automatically.** After the system stops the operation, check the operation result by the outdoor unit LED display. (See the table above right.)

#### Measure for abnormal initial

1. **Confirm the malfunction code by the remote controller, and correct the abnormality.** (For how to correct the abnormality, see the Installation manual.)
2. **After correcting the abnormality, push the **[RETURN] button** (BS3) and reset the malfunction code.
3. **Carefully check the check operation again and confirm that the abnormality is properly corrected.

### Automatic refrigerant charge method

- For details, refer to the "INSTALLATION MANUAL"

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**DANGER** ELECTRIC SHOCK HAZARD!

Disconnect all remote power supplies before installing or servicing this equipment.

Failure to do so could lead to serious injury or death. Only a qualified service technician should install or service this equipment.

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**DANGER D' ELECTROCUTION!**

Déconnectez toutes les alimentations électriques éloignées avant d'installer ou de réparer cet appareil.

Le non respect de cette recommandation peut entraîner des blessures graves ou la mort.

Seul un technicien de service qualifié peut installer ou réparer cet appareil.
To Installers

1. When carrying the unit
   • If a forklift is used for carrying the unit, put the forklift arms into the large openings on the bottom of the unit.
   • In order not to damage the coating of the bottom frame, put rags on the forklift arms.
   • Otherwise, rustproofing effect will be lost.
   • After installation, remove the transport protector with pushing hook attached to the large openings.

2. When lifting the unit
   • Put the belt slings into the small openings.
   • Lift the unit with 2 belts of the at least 26ft long.
   • Put cushioning plates or rags where the slings contact the casing.

3. Electrical work
   • To prevent electric shock and fire accident, be sure to perform grounding and install a ground leakage breaker.
   • Electrical work must be carried out by a licensed electrician in accordance with local and national regulations.

To Service Person

WARNING  Caution to electric shock

• Be cautious of the running fan when inspecting.
• Do not touch the charged parts when inspecting.

Check the system status on LED(H2P) on the PC board(ATP) from inspection door on the Electrical Components Box lid.
LED display shows:
  TURNING OFF... Normal  TURNING ON... Abnormal  FLASHING... Under preparation
For multi system, check the PC board of the master unit.
The master unit is the outdoor unit connected to the transmission wiring to the indoor units.

To All Handlers

• For removing the front panel, lift the panel a little(①), and pull the panel towards you(②).
• For the location of the Electrical Components Box and the service port, see as shown below on the right.
To Installers

1. When carrying the unit
   ● If a forklift is used for carrying the unit, put the forklift arms under the palette.

2. When lifting the unit
   ● Put the belt slings under the palette.
   ● Lift the unit with 2 belts of each length at least 26ft.

3. Electrical work
   ● To prevent electric shock and fire accident, be sure to perform grounding and install a ground leakage breaker.
   ● Electrical work must be carried out by a licensed electrician in accordance with local and national regulations.

To Service Person

⚠️ WARNING! Caution to electric shock

● Beware the fan running when inspect.
● Do not touch the charged parts when inspect.

Check the system status on LED(H/F) on the PC board(ACP) from inspection door on the Electrical Components Box (1) lid.
   ● LED display shows:
     - TURNING OFF—Normal, TURNING ON—Abnormal, FLASHING—Under preparation
   ● In the case of an outdoor unit independent system, please check by the circuit board of Electrical Components Box (1) (right-hand side).

To All Handlers

● For removing the front panel, lift the panel a little and pull the panel towards you.
● For the location of the Electrical Components Box, the service port and refrigerant charge port, see diagram below on the right.
**To Installers**

1. When carrying the unit
   - If a forklift is used for carrying the unit, put the forklift arms under the pallet.

2. When lifting the unit
   - Put the belt slings under the pallet.
   - Lift the unit with 2 belts of each length at least 26 ft.

3. Electrical work
   - To prevent electric shock and fire accident, be sure to perform grounding and install a ground leakage breaker.
   - Electrical work must be carried out by a licensed electrician in accordance with local and national regulations.

**To Service Person**

**WARNING**

- Be cautious of the running fan when inspecting.
- Do not touch the charged parts when inspecting.

Check the system status on LED (LED) on the PC board (AIP) from inspection door on the Electrical Components Box (1) lid.

LED display shows:
- TURNING OFF: Normal, TURNING ON: Abnormal, FLASHING: Under preparation
- In the case of a central system, check by the circuit board of Electrical Components Box (1) (right-hand side).

**To All Handlers**

- For removing the front panel, lift the panel a little and pull the panel towards you.
- For the location of the Electrical Components Box, the service port and refrigerant charge port, see diagram below on the right.

**Diagram**

- **Ground terminal**
- **Wiring diagram (on the back side)**
- **Electrical Components Box (1)**
- **Electrical Components Box (2)**
- **Inspection door**
- **Refrigerant charge port**
- **Liquid pipe SP**
  - Cooling: LP or HP
  - Heating or HR: HP
- **Suction gas pipe SP: LP**
- **Liquid pipe SP**
  - Cooling: HP or HP
  - Heating or HR: HP

**Installation of Outdoor Units**

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To Installers

1. When carrying the unit,
   ● If a forklift is used for carrying the unit, put the forklift arms under the large openings on the bottom of the unit.
   ● In order not to damage the coating of the bottom frame, put rags on the forklift arms. (Otherwise rustproofing effect will be lost.)
   ● After installation, remove the transport protector with pushing hook attached to the large openings.

2. When lifting the unit
   ● Put the belt slings under the pallet.
   ● Lift the unit with 2 belts of each length at least 26 ft.

3. Electrical work
   ● To prevent electric shock and fire accidents,
     ● Be sure to perform grounding and install a ground leakage breaker.
     ● Electrical work must be carried out by a licensed electrician in accordance with local and national regulations.

To Service Person

⚠️ WARNING ⚠️ Caution to electric shock

- Beware of the fan running when inspect.
- Do not touch the charged parts when inspect.
- Check the system status on LED (MP) on the PC board (AFP) from inspection door on the Electrical Components Box (1) lid.
- LED display shows:
  • TURNING ON--Normal, TURNING OFF--Abnormal, FLASHING--Under preparation
  • For multi system, check the PC board of the master unit. The master unit is the outdoor unit connected to the transmission wiring to the indoor units & the Branch Selector units.

To All Handlers

- Lift the panel a little.
- For the location of the Electrical Components Box, the service port and refrigerant charge port, See diagram below on the right.

[Diagram of electrical components and connections]

Lift the panel (both sides)
Hanging holes
Front panel
Side panels/standoffs

Liquid pipe SP
Cooling HP
Heating or
INTC/HP

Refrigerant charge port

Suction gas pipe SP
Equalizer pipe SP:HP

In the upper drawing,
● SP: Service port
● HP: Heat recovery
ISO 9001 is a plant certification system defined by the International Organization for Standardization (ISO) relating to quality assurance. ISO 9001 certification covers quality assurance aspects related to the “design, development, manufacture, installation, and supplementary service” of products manufactured at the plant.

ISO 14001 is the standard defined by the International Organization for Standardization (ISO) relating to environmental management systems. Our group has been acknowledged by an internationally accredited program of environmental protection procedures and activities to meet the requirements of ISO 14001.

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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, or retailer.