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1 About the documentation

1.1 About this document

Target audience

Authorised installers + end users

For the installer

2 About the box

2.1 To remove the accessories from the outdoor unit

Make sure that all accessories are available in the unit.

2.2 Accessory pipes: Diameters

<table>
<thead>
<tr>
<th>Accessory pipes (mm)</th>
<th>HP</th>
<th>Øa</th>
<th>Øb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas pipe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front connection</td>
<td>10</td>
<td>25.4</td>
<td>22.2</td>
</tr>
<tr>
<td>Bottom connection</td>
<td>14</td>
<td>25.4</td>
<td>28.6</td>
</tr>
<tr>
<td>Liquid pipe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front connection</td>
<td>10</td>
<td>9.5</td>
<td></td>
</tr>
<tr>
<td>Bottom connection</td>
<td>14</td>
<td>12.7</td>
<td></td>
</tr>
</tbody>
</table>

2.3 To remove the transportation stay

Only for 14+16 HP

INFORMATION

This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.

Documentation set

This document is part of a documentation set. The complete set consists of:

- General safety precautions:
  - Safety instructions that you must read before installing
  - Format: Paper (in the box of the outdoor unit)
- Outdoor unit installation and operation manual:
  - Installation and operation instructions
  - Format: Paper (in the box of the outdoor unit)
- Installer and user reference guide:
  - Preparation of the installation, technical specifications, reference data...
  - Detailed step-by-step instructions and background information for basic and advanced usage

Latest revisions of the supplied documentation may be available on the regional Daikin website or via your dealer.

The original documentation is written in English. All other languages are translations.
3 About the units and options

### NOTICE
If the unit is operated with the transportation stay attached, abnormal vibration or noise may be generated.

The transportation stay installed over the compressor leg for protecting the unit during transport must be removed. Proceed as shown in the figure and procedure below.

1. Slightly loosen the fixing nut (a).
2. Remove the transportation stay (b) as shown in the figure below.
3. Tighten the fixing nut (a) again.

### About the outdoor unit

This installation manual concerns the VRV IV, full inverter driven, heat pump system.

#### Model line up

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RXYTQ8~16</td>
<td>Single non-continuous heating model.</td>
</tr>
<tr>
<td>RXYTQ18~48</td>
<td>Multi non-continuous heating model (consisting of 2 or 3 RXYTQ modules).</td>
</tr>
</tbody>
</table>

These units are intended for outdoor installation and aimed for heat pump air to air applications. These units have (in single use) heating capacities ranging from 25 to 50 kW and cooling capacities rating from 22.4 to 45 kW. In multi combination the heating capacity can go up till 150 kW and in cooling till 135 kW. The outdoor unit is designed to work in heating mode at ambient temperatures from –20°C WB to 15.5°C WB and in cooling mode at ambient temperatures from –5°C DB to 52°C DB.

### System layout

#### NOTICE
Design of the system must not be done at temperatures below –15°C.

### Preparation

#### Preparing installation site

### Installation site requirements of the outdoor unit

Mind the spacing guidelines. See the "Technical data" chapter.

#### NOTICE
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### Additional installation site requirements of the outdoor unit in cold climates

#### NOTICE
When operating the unit in a low outdoor ambient temperature with high humidity conditions, make sure to take precautions to keep the drain holes of the unit free by using proper equipment.

### Preparing refrigerant piping

#### Refrigerant piping requirements

#### NOTICE
Refrigerant R410A requires strict cautions for keeping the system clean and dry. Foreign materials (including mineral oils or moisture) should be prevented from getting mixed into the system.
4 Preparation

NOTICE
The piping and other pressure-containing parts shall be suitable for refrigerant. Use phosphoric acid deoxidised seamless copper for refrigerant.

- Foreign materials inside pipes (including oils for fabrication) must be ≤30 mg/10 m.
- Temper grade: use piping with temper grade in function of the pipe diameter as listed in table below.

### Pipe Ø (mm) Temper grade of piping material

<table>
<thead>
<tr>
<th>Pipe Ø (mm)</th>
<th>Temper grade of piping material</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤15.9</td>
<td>O (annealed)</td>
</tr>
<tr>
<td>≥19.1</td>
<td>1/2H (half hard)</td>
</tr>
</tbody>
</table>

- All piping lengths and distances have been taken into consideration (see About the piping length in the installer reference guide).

4.2.2 To select the piping size

Determine the proper size referring to following tables and reference figure (only for indication).

A, B, C: Piping between outdoor unit and (first) refrigerant branch kit

Choose from the following table in accordance with the outdoor unit total capacity type, connected downstream.

<table>
<thead>
<tr>
<th>Outdoor unit capacity type (HP)</th>
<th>Piping outer diameter size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gas pipe</td>
</tr>
<tr>
<td>8</td>
<td>19.1</td>
</tr>
<tr>
<td>10</td>
<td>22.2</td>
</tr>
<tr>
<td>12–16</td>
<td>28.6</td>
</tr>
<tr>
<td>18–22</td>
<td>34.9</td>
</tr>
<tr>
<td>24</td>
<td>34.9</td>
</tr>
<tr>
<td>26–34</td>
<td>41.3</td>
</tr>
<tr>
<td>36–48</td>
<td></td>
</tr>
</tbody>
</table>

D: Piping between refrigerant branch kits

Choose from the following table in accordance with the indoor unit total capacity type, connected downstream. Do not let the connection piping exceed the refrigerant piping size chosen by the general system model name.

<table>
<thead>
<tr>
<th>Indoor unit capacity index</th>
<th>Piping outer diameter size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gas pipe</td>
</tr>
<tr>
<td>&lt;150</td>
<td>15.9</td>
</tr>
<tr>
<td>150&lt;≤200</td>
<td>19.1</td>
</tr>
<tr>
<td>200&lt;≤290</td>
<td>22.2</td>
</tr>
</tbody>
</table>

### Indoor unit capacity index Piping outer diameter size (mm)

<table>
<thead>
<tr>
<th>HP class</th>
<th>Piping outer diameter size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gas pipe</td>
</tr>
<tr>
<td>8</td>
<td>19.1 → 22.2</td>
</tr>
<tr>
<td>10</td>
<td>22.2 → 25.4 (a)</td>
</tr>
<tr>
<td>12+14</td>
<td>28.6 (b)</td>
</tr>
<tr>
<td>16</td>
<td>34.9 (b)</td>
</tr>
<tr>
<td>18–22</td>
<td>34.9 → 38.1 (b)</td>
</tr>
<tr>
<td>24</td>
<td>41.3 (b)</td>
</tr>
</tbody>
</table>

Example:
- Downstream capacity for E=capacity index of unit 1
- Downstream capacity for D=capacity index of unit 1+capacity index of unit 2

E: Piping between refrigerant branch kit and indoor unit

Pipe size for direct connection to indoor unit must be the same as the connection size of the indoor unit (in case indoor unit is VRV DX indoor).

<table>
<thead>
<tr>
<th>Indoor unit capacity index</th>
<th>Piping outer diameter size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gas pipe</td>
</tr>
<tr>
<td>15&lt;≤50</td>
<td>12.7</td>
</tr>
<tr>
<td>63&lt;≤140</td>
<td>15.9</td>
</tr>
<tr>
<td>200</td>
<td>19.1</td>
</tr>
<tr>
<td>250</td>
<td>22.2</td>
</tr>
</tbody>
</table>

- When the equivalent pipe length between outdoor and indoor units is 90 m or more, the size of the main pipes (both gas side and liquid side) must be increased. Depending on the length of the piping, the capacity may drop, but even in such a case the size of the main pipes has to be increased. More specifications can be found in the technical engineering data book.

### Pipe Ø (mm) Minimal thickness t (mm)

<table>
<thead>
<tr>
<th>Pipe Ø (mm)</th>
<th>Minimal thickness t (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4/9.5/12.7</td>
<td>0.89</td>
</tr>
</tbody>
</table>
4 Preparation

### Pipe Ø (mm) Minimal thickness t (mm)

<table>
<thead>
<tr>
<th>Ø</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.9</td>
<td>0.99</td>
</tr>
<tr>
<td>19.1/22.2</td>
<td>0.80</td>
</tr>
<tr>
<td>28.6</td>
<td>0.99</td>
</tr>
<tr>
<td>34.9</td>
<td>1.21</td>
</tr>
<tr>
<td>41.3</td>
<td>1.43</td>
</tr>
</tbody>
</table>

- In case the required pipe sizes (inch sizes) are not available, it is also allowed to use other diameters (mm sizes), taken the following into account:
  - Select the pipe size nearest to the required size.
  - Use the suitable adapters for the change-over from inch to mm pipes (field supply).
  - The additional refrigerant calculation has to be adjusted as mentioned in "5.6.3 To determine the additional refrigerant amount" on page 13.

#### 4.2.3 To select refrigerant branch kits

**Refrigerant refnets**

For piping example, refer to "4.2.2 To select the piping size" on page 5.

- When using refnet joints at the first branch counted from the outdoor unit side, choose from the following table in accordance with the capacity of the outdoor unit (example: refnet joint a).

<table>
<thead>
<tr>
<th>Outdoor unit capacity type (HP)</th>
<th>2 pipes</th>
</tr>
</thead>
<tbody>
<tr>
<td>8~10</td>
<td>KHRQ22M29T9</td>
</tr>
<tr>
<td>12~22</td>
<td>KHRQ22M44T</td>
</tr>
<tr>
<td>24~48</td>
<td>KHRQ22M57T</td>
</tr>
</tbody>
</table>

- For refnet joints other than the first branch (example refnet joint b), select the proper branch kit model based on the total capacity index of all indoor units connected after the refrigerant branch.

<table>
<thead>
<tr>
<th>Indoor unit capacity index</th>
<th>2 pipes</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;200</td>
<td>KHRQ22M29T</td>
</tr>
<tr>
<td>200s&lt;x&lt;290</td>
<td>KHRQ22M29T</td>
</tr>
<tr>
<td>290s&lt;x&lt;640</td>
<td>KHRQ22M44T</td>
</tr>
<tr>
<td>≥640</td>
<td>KHRQ22M57T</td>
</tr>
</tbody>
</table>

- Concerning refnet headers, choose from the following table in accordance with the total capacity of all the indoor units connected below the refrigerant header.

<table>
<thead>
<tr>
<th>Indoor unit capacity index</th>
<th>2 pipes</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;200</td>
<td>KHRQ22M29H</td>
</tr>
<tr>
<td>200s&lt;x&lt;290</td>
<td>KHRQ22M29H</td>
</tr>
<tr>
<td>290s&lt;x&lt;640</td>
<td>KHRQ22M44H</td>
</tr>
<tr>
<td>≥640</td>
<td>KHRQ22M57H</td>
</tr>
</tbody>
</table>

(a) If the pipe size above the refnet header is Ø34.9 or more, KHRQ22M57H is required.

**INFORMATION**

Maximum 8 branches can be connected to a header.

#### 4.2.4 Multiple outdoor units: Possible layouts

- The piping between the outdoor units must be routed level or slightly upward to avoid the risk of oil retention into the piping.

**Pattern 1**

- To avoid the risk of oil retention to the outmost outdoor unit, always connect the stop valve and the piping between outdoor units as shown in the 4 correct possibilities of the figure below.

**Pattern 2**

- If the piping length between the outdoor units exceeds 2 m, create a rise of 200 mm or more in the gas line within a length of 2 m from the kit.

**NOTICE**

Refrigerant branch kits can only be used with R410A.
5 Installation

### 5.1 Opening the units

#### 5.1.1 To open the outdoor unit

**DANGER: RISK OF ELECTROCUTION**

**DANGER: RISK OF BURNING**

To gain access to the unit, front plates need to be opened as follows:

1. Open the front plates.
2. Once open, the electrical component box can be accessed. See "5.1.2 To open the electrical component box of the outdoor unit" on page 7.
3. For service purposes, the push buttons on the main PCB need to be accessed. To access these push buttons, the electrical component box cover does not need to be opened. See "6.1.3 To access the field setting components" on page 19.

#### 5.1.2 To open the electrical component box of the outdoor unit

**NOTICE**

Do not apply excessive force when opening the electronic component box cover. Excessive force can deform the cover, resulting in entering of water to cause equipment failure.

---

### 4.3 Preparing electrical wiring

#### 4.3.1 Safety device requirements

The power supply must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and an earth leakage protector in accordance with the applicable legislation.

Selection and sizing of the wiring should be done in accordance with the applicable legislation based on the information mentioned in the table below.

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum circuit ampacity</th>
<th>Recommended fuses</th>
</tr>
</thead>
<tbody>
<tr>
<td>RXYTQ8</td>
<td>16.1 A</td>
<td>20 A</td>
</tr>
<tr>
<td>RXYTQ10</td>
<td>22.0 A</td>
<td>25 A</td>
</tr>
<tr>
<td>RXYTQ12</td>
<td>24.0 A</td>
<td>32 A</td>
</tr>
<tr>
<td>RXYTQ14</td>
<td>27.0 A</td>
<td>32 A</td>
</tr>
<tr>
<td>RXYTQ16</td>
<td>31.0 A</td>
<td>40 A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What? Case 1</th>
<th>Case 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase and frequency</td>
<td>3N~ 50 Hz</td>
</tr>
<tr>
<td>Voltage</td>
<td>380–415 V</td>
</tr>
<tr>
<td>Transmission line section (1)</td>
<td>0.75–1.25 mm²</td>
</tr>
</tbody>
</table>

For multi combinations

Calculate the recommended fuse capacity.

---

### NOTICE

There are restrictions on the refrigerant pipe connection order between outdoor units during installation in case of a multiple outdoor unit system. Install according to following restrictions. The capacities of outdoor units A, B and C must fulfill the following restriction conditions: A ≥ B ≥ C.

### 4.4 Electrical connection

#### 4.4.1 Preparation

- Check the electrical connection requirements.
- Ensure all electrical connections are properly made.
- Use a high-speed type 300 mA rated residual current operated circuit breaker.

---

#### 4.4.2 Wiring

- Use suitable wiring materials and fittings.
- Ensure all connectors are properly secured.
- Use a suitable method for cable management.

---

#### 4.4.3 Power supply

- Ensure the power supply is rated correctly.
- Use a suitable power source for the unit.
- Ensure the power supply is connected correctly.

---

### 4.4.4 Grounding

- Ensure the unit is properly grounded.
- Use a suitable method for grounding.
- Ensure the grounding is effective.

---

### 4.4.5 Power supply connection

- Ensure the power supply is connected correctly.
- Use a suitable method for power supply connection.
- Ensure the power supply is connected securely.

---

### 4.4.6 Power supply testing

- Ensure the power supply is tested correctly.
- Use a suitable method for power supply testing.
- Ensure the power supply is tested effectively.

---

### 4.4.7 Power supply protection

- Ensure the power supply is protected correctly.
- Use a suitable method for power supply protection.
- Ensure the power supply is protected effectively.

---

5 Installation

5.1 Opening the units

5.1.1 To open the outdoor unit

**DANGER: RISK OF ELECTROCUTION**

**DANGER: RISK OF BURNING**

To gain access to the unit, front plates need to be opened as follows:

1. Open the front plates.
2. Once open, the electrical component box can be accessed. See "5.1.2 To open the electrical component box of the outdoor unit" on page 7.
3. For service purposes, the push buttons on the main PCB need to be accessed. To access these push buttons, the electrical component box cover does not need to be opened. See "6.1.3 To access the field setting components" on page 19.

5.1.2 To open the electrical component box of the outdoor unit

**NOTICE**

Do not apply excessive force when opening the electronic component box cover. Excessive force can deform the cover, resulting in entering of water to cause equipment failure.
5 Installation

5.2 Mounting the outdoor unit

5.2.1 To provide the installation structure

Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise.

- The height of the foundation must at least be 150 mm from the floor. In heavy snowfall areas, this height should be increased, depending on the installation place and condition.
- The preferred installation is on a solid longitudinal foundation (steel beam frame or concrete). The foundation must be larger than the grey marked area.

5.3 Connecting the refrigerant piping

5.3.1 To route the refrigerant piping

Installation of refrigerant piping is possible as front connection or side connection (when taken out from the bottom) as shown in the figure below.

- Fasten the unit in place using four foundation bolts M12. It is best to screw in the foundation bolts until their length remains 20 mm above the foundation surface.
- Prepare a water drainage channel around the foundation to drain waste water from around the unit. During heating operation and when the outdoor temperatures are negative, the drained water from the outdoor unit will freeze up. If the water drainage is not taken care of, the area around the unit might be very slippery.
- When installed in a corrosive environment, use a nut with plastic washer (a) to protect the nut tightening part from rust.

- Not allowed
- Allowed

<table>
<thead>
<tr>
<th>HP</th>
<th>AA</th>
<th>AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>706</td>
<td>902</td>
</tr>
<tr>
<td>10–16</td>
<td>1076</td>
<td>1302</td>
</tr>
</tbody>
</table>

NOTICE

When closing the electrical component box cover, make sure that the sealing material on the lower back side of the cover is not caught and bend towards the inside.

- a Electrical component box cover
- b Front side
- c Power supply terminal block
- d Sealing material
- e Moisture and dirt could enter
- X Not allowed
- O Allowed
5 Installation

5.3.2 To connect the refrigerant piping to the outdoor unit

NOTICE
- Be sure to use the supplied accessory pipes when carrying out piping work in the field.
- Be sure that the field installed piping does not touch other pipes, the bottom panel or side panel. Especially for the bottom and side connection, be sure to protect the piping with suitable insulation, to prevent it from coming into contact with the casing.

Connection from the stop valves to the field piping can be done by using accessory pipes supplied as accessory.

The connections to the branch kits are the responsibility of the installer (field piping).

5.3.3 To connect the multi connection piping kit

NOTICE
Improper installation may lead to malfunction of the outdoor unit.

- Install the joints horizontally, so that the caution label (a) attached to the joint comes to the top.
- Do not tilt the joint more than 7.5° (see view A).
- Do not install the joint vertically (see view B).
- Make sure that the total length of the piping connected to the joint is absolute straight for more than 500 mm. Only if a straight field piping of more than 120 mm is connected, more than 500 mm of straight section can be ensured.

5.3.4 Multiple outdoor units: Knockout holes

<table>
<thead>
<tr>
<th>Connection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front connection</td>
<td>Remove the front plate knockout holes to connect.</td>
</tr>
<tr>
<td>Bottom connection</td>
<td>Remove the knockout holes on the bottom frame and route the piping under the bottom.</td>
</tr>
</tbody>
</table>

5.3.5 To protect against contamination

Block all gaps in the holes for passing out piping and wiring using sealing material (field supply) (otherwise the capacity of the unit will drop and small animals may enter the machine).

5.3.6 Using the stop valve and service port

To handle the stop valve
- Make sure to keep all stop valves open during operation.
- The stop valve is factory closed.

To open the stop valve
1. Remove the stop valve cover.
2. Insert a hexagon wrench into the stop valve and turn the stop valve counterclockwise.
3. When the stop valve cannot be turned any further, stop turning.

Result: The valve is now open.

To fully open the Ø19.1 mm~Ø25.4 mm stop valve, turn the hexagonal wrench until a torque between 27 and 33 Nm is achieved.
Inadequate torque may cause leakage of refrigerant and breakage of the stop valve cap.
5 Installation

NOTICE
Pay attention that mentioned torque range is applicable for opening Ø19.1~Ø25.4 mm stop valves only.

To close the stop valve
1. Remove the stop valve cover.
2. Insert a hexagon wrench into the stop valve and turn the stop valve clockwise.
3. When the stop valve cannot be turned any further, stop turning.
   Result: The valve is now closed.

Closing direction:

To handle the stop valve cover
- The stop valve cover is sealed where indicated by the arrow. Take care not to damage it.
- After handling the stop valve, make sure to tighten the stop valve cover securely. For the tightening torque, refer to the table below.
- Check for refrigerant leaks after tightening the stop valve cover.

To handle the service port
- Always use a charge hose equipped with a valve depressor pin, since the service port is a Schrader type valve.
- After handling the service port, make sure to tighten the service port cover securely. For the tightening torque, refer to the table below.
- Check for refrigerant leaks after tightening the service port cover.

### Tightening torques

<table>
<thead>
<tr>
<th>Stop valve size (mm)</th>
<th>Shaft</th>
<th>Tightening torque N•m (turn clockwise to close)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø9.5</td>
<td>Valve body</td>
<td>5.4~6.6 4 mm</td>
</tr>
<tr>
<td>Ø12.7</td>
<td>Hexagonal wrench</td>
<td>8.1~9.9 6 mm</td>
</tr>
<tr>
<td>Ø15.9</td>
<td>Cap (valve lid)</td>
<td>13.5~16.5 6 mm</td>
</tr>
<tr>
<td>Ø19.1</td>
<td>Service port</td>
<td>27.0~33.0 8 mm</td>
</tr>
<tr>
<td>Ø25.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.3.7 To remove the pinched pipes

WARNING
Any gas or oil remaining inside the stop valve may blow off the pinched piping.
Failure to observe the instructions in procedure below properly may result in property damage or personal injury, which may be serious depending on the circumstances.

Use the following procedure to remove the pinched piping:
1. Remove the valve cover and make sure that the stop valves are fully closed.
2. Connect the vacuuming/recovery unit through a manifold to the service port of all stop valves.
3. Recover gas and oil from the pinched piping by using a recovery unit.
4. When all gas and oil is recovered from the pinched piping, disconnect the charge hose and close the service ports.
5. Cut off the lower part of the gas, liquid and equalising stop valve pipes along the black line. Use an appropriate tool (e.g. a pipe cutter, a pair of nippers).
5 Installation

WARNING
Never remove the pinched piping by brazing. Any gas or oil remaining inside the stop valve may blow off the pinched piping.

Wait until all oil is dripped out before continuing with the connection of the field piping in case the recovery was not complete.

5.4 Checking the refrigerant piping

5.4.1 About checking the refrigerant piping

<table>
<thead>
<tr>
<th>Refrigerant piping works are finished?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use procedure:</td>
<td>Method 1: Before power ON.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method 2: After power ON.</td>
<td></td>
</tr>
<tr>
<td>The indoor units and/or outdoor unit were already powered ON?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Use procedure: &quot;Method 1: Before power ON (regular method)&quot;.</td>
<td></td>
</tr>
</tbody>
</table>

It is very important that all refrigerant piping work is done before the units (outdoor or indoor) are powered on. When the units are powered on, the expansion valves will initialise. This means that they will close. Leak test and vacuum drying of field piping and indoor units is impossible when this happens. Therefore, there will be explained 2 methods for initial installation, leak test and vacuum drying.

Method 1: Before power ON
If the system has not yet been powered on, no special action is required to perform the leak test and the vacuum drying.

Method 2: After power ON
If the system has already been powered on, activate setting [2-21] (refer to "6.1.4 To access mode 1 or 2" on page 19). This setting will open field expansion valves to guarantee a R410A piping pathway and make it possible to perform the leak test and the vacuum drying.

NOTICE
Make sure that all indoor units connected to the outdoor unit are powered on.

NOTICE
Wait until the outdoor unit has finished the initialisation to apply setting [2-21].

Leak test and vacuum drying
Checking the refrigerant piping involves:
- Checking for any leakages in the refrigerant piping.
- Performing vacuum drying to remove all moisture, air or nitrogen in the refrigerant piping.

If there is a possibility of moisture being present in the refrigerant piping (for example, water may have entered the piping), first carry out the vacuum drying procedure below until all moisture has been removed.

All piping inside the unit has been factory tested for leaks. Only field installed refrigerant piping needs to be checked. Therefore, make sure that all the outdoor unit stop valves are firmly closed before performing leak test or vacuum drying.

NOTICE
Make sure that all (field supplied) field piping valves are OPEN (not outdoor unit stop valves) before you start leak test and vacuuming.

For more information on the state of the valves, refer to "6.4.3 Checking refrigerant piping: Setup" on page 11.

5.4.2 Checking refrigerant piping: General guidelines
Connect the vacuum pump through a manifold to the service port of all stop valves to increase efficiency (refer to "6.4.3 Checking refrigerant piping: Setup" on page 11).

NOTICE
Use a 2-stage vacuum pump with a non-return valve or a solenoid valve that can evacuate to a gauge pressure of –100.7 kPa (5 Torr absolute).

NOTICE
Make sure the pump oil does not flow oppositely into the system while the pump is not working.

NOTICE
Do not purge the air with refrigerants. Use a vacuum pump to evacuate the installation.

5.4.3 Checking refrigerant piping: Setup

| a | Pressure reducing valve |
| b | Nitrogen |
| c | Weighing scales |
| d | Refrigerant R410A tank (siphon system) |
| e | Vacuum pump |
| f | Liquid line stop valve |
| g | Gas line stop valve |
| A | Valve A |
| B | Valve B |
| C | Valve C |
5 Installation

<table>
<thead>
<tr>
<th>Valve</th>
<th>State of valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve A</td>
<td>Open</td>
</tr>
<tr>
<td>Valve B</td>
<td>Open</td>
</tr>
<tr>
<td>Valve C</td>
<td>Open</td>
</tr>
<tr>
<td>Liquid line stop valve</td>
<td>Close</td>
</tr>
<tr>
<td>Gas line stop valve</td>
<td>Close</td>
</tr>
</tbody>
</table>

**NOTICE**
The connections to the indoor units and all indoor units should also be leak and vacuum tested. Keep any possible (field supplied) field piping valves open as well.

Refer to the indoor unit installation manual for more details. Leak test and vacuum drying should be done before the power supply is set to the unit. If not, see also the flow chart earlier described in this chapter (see "5.4.1 About checking the refrigerant piping" on page 11).

5.4.4 To perform a leak test

The leak test must satisfy the specifications of EN378-2.

**To check for leaks: Vacuum leak test**

1. Evacuate the system from the liquid and gas piping to –100.7 kPa (–1.007 bar/5 Torr) for more than 2 hours.
2. Once reached, turn off the vacuum pump and check that the pressure does not rise for at least 1 minute.
3. Should the pressure rise, the system may either contain moisture (see vacuum drying below) or have leaks.

**To check for leaks: Pressure leak test**

1. Break the vacuum by pressurising with nitrogen gas to a minimum gauge pressure of 0.2 MPa (2 bar). Never set the gauge pressure higher than the maximum operation pressure of the unit, i.e. 4.0 MPa (40 bar).
2. Test for leaks by applying a bubble test solution to all piping connections.
3. Discharge all nitrogen gas.

**NOTICE**
Make sure to use a recommended bubble test solution from your wholesaler. Do not use soap water, which may cause cracking of flare nuts (soap water may contain salt, which absorbs moisture that will freeze when the piping gets cold), and/or lead to corrosion of flared joints (soap water may contain ammonia which causes a corrosive effect between the brass flare nut and the copper flare).

5.4.5 To perform vacuum drying

To remove all moisture from the system, proceed as follows:

1. Evacuate the system for at least 2 hours to a target vacuum of –100.7 kPa (~1.007 bar/S Torr) for more than 2 hours.
2. Check that, with the vacuum pump turned off, the target vacuum is maintained for at least 1 hour.
3. Should you fail to reach the target vacuum within 2 hours or maintain the vacuum for 1 hour, the system may contain too much moisture. In that case, break the vacuum by pressurising with nitrogen gas to a gauge pressure of 0.05 MPa (0.5 bar) and repeat steps 1 to 3 until all moisture has been removed.
4. Depending on whether you want to immediately charge refrigerant through the refrigerant charge port or first pre-charge a portion of refrigerant through the liquid line, either open the outdoor unit stop valves, or keep them closed. See "5.6.2 About charging refrigerant" on page 13 for more information.

5.5 To insulate the refrigerant piping

After finishing the leak test and vacuum drying, the piping must be insulated. Take into account the following points:

- Make sure to insulate the connection piping and refrigerant branch kits entirely.
- Be sure to insulate the liquid and gas piping (for all units).
- Use heat resistant polyethylene foam which can withstand a temperature of 70°C for liquid piping and polyethylene foam which can withstand a temperature of 120°C for gas piping.
- Reinforce the insulation on the refrigerant piping according to the installation environment.

<table>
<thead>
<tr>
<th>Ambient temperature (°C)</th>
<th>Humidity</th>
<th>Minimum thickness (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤30</td>
<td>≥75%</td>
<td>15</td>
</tr>
<tr>
<td>&gt;30</td>
<td>≥80%</td>
<td>20</td>
</tr>
</tbody>
</table>

Condensation might form on the surface of the insulation.

**NOTICE**
If there is a possibility that condensation on the stop 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, this must be prevented by sealing up the connections. See below figure.

5.6 Charging refrigerant

5.6.1 Precautions when charging refrigerant

**WARNING**
- Only use R410A as refrigerant. Other substances may cause explosions and accidents.
- R410A contains fluorinated greenhouse gases. Its global warming potential (GWP) value is 2087.5. Do NOT vent these gases into the atmosphere.
- When charging refrigerant, always use protective gloves and safety glasses.

**NOTICE**
If the power of some units is turned off, the charging procedure cannot be finished properly.

**NOTICE**
In case of a multiple outdoor system, turn on the power of all outdoor units.

**NOTICE**
Be sure to turn on the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.
5 Installation

5.6.2 About charging refrigerant

Once vacuum drying is finished, additional refrigerant charging can start. To speed up the refrigerant charging process, it is in case of larger systems recommended to first pre-charge a portion of refrigerant through the liquid line before proceeding with the manual charging. This step is included in below procedure (see \"5.6.5 To charge refrigerant\" on page 15). It can be skipped, but charging will take longer then.

A flow chart is available which gives an overview of the possibilities and actions to be taken (see \"5.6.4 To charge refrigerant: Flow chart\" on page 15).

5.6.3 To determine the additional refrigerant amount

\[ R = \left( \sum_{i=1}^{6} \left( X_i \times \text{Size} \right) \right) + A \]

where:
- \( X_i \) = Total length (m) of liquid piping size at \( \text{Size} \)
- \( A \) = Parameter (kg)

\( \text{Size} \) and \( A \) parameters are given in the table below:

<table>
<thead>
<tr>
<th>Size (( \text{mm} ))</th>
<th>Weight factor</th>
<th>( R ) (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>0.022</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>0.059</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td>0.12</td>
<td>12</td>
</tr>
<tr>
<td>15</td>
<td>0.18</td>
<td>15</td>
</tr>
<tr>
<td>18</td>
<td>0.26</td>
<td>18</td>
</tr>
<tr>
<td>22</td>
<td>0.37</td>
<td>22</td>
</tr>
</tbody>
</table>

For final charge adjustment in the test laboratory, please contact your local dealer.
## 5 Installation

### Pre-charging refrigerant

**Step 1**
Calculate additional refrigerant charge amount: \( R \) (kg)

**Step 2**
- Open valves C and B to the liquid line
- Execute pre-charging amount: \( Q \) (kg)

**Step 3a**
- Close valves C and B
- Charging is finished
- Fill in the amount on the additional refrigerant charge label
- Go to test run

**Step 3b**
- Close valves C and B
- \( R = Q \)

### Charging refrigerant

**Step 4**
- Connect valve A to the refrigerant charge port (d)
- Open all outdoor unit stop valves

**Step 5**
Proceed with manual charge

**Step 6**
Activate field setting \([2-20]=1\)
Unit will start manual refrigerant charging operation.

**Step 7**
- Open valve A
- Charge remaining amount of refrigerant \( P \) (kg)
- \( R + Q = P \)

**Step 8**
- Close valve A
- Push BS3 to stop manual charging
- Charging is finished
- Fill in the amount on the additional refrigerant charge label
- Go to test run
5.6.5 To charge refrigerant

Follow the steps as described below.

Pre-charging refrigerant

1. Calculate the additional amount of refrigerant to be added using the formula mentioned in "5.6.3 To determine the additional refrigerant amount" on page 13.

2. The first 10 kg of additional refrigerant can be pre-charged without outdoor unit operation.

<table>
<thead>
<tr>
<th>If</th>
<th>Then</th>
</tr>
</thead>
<tbody>
<tr>
<td>The additional refrigerant amount</td>
<td>Perform steps 2+3.</td>
</tr>
<tr>
<td>is smaller than 10 kg</td>
<td></td>
</tr>
<tr>
<td>The additional refrigerant charge</td>
<td>Perform steps 2~8.</td>
</tr>
<tr>
<td>is larger than 10 kg</td>
<td></td>
</tr>
</tbody>
</table>

3. Pre-charging can be done without compressor operation, by connecting the refrigerant bottle to the service ports of the liquid and equalising stop valves (open valve B). Make sure that valve A and all outdoor unit stop valves are closed.

NOTICE

During pre-charging, the refrigerant is charged through the liquid line. Close valve A and disconnect the manifold from the gas line.

4. Do one of the following:

<table>
<thead>
<tr>
<th>If</th>
<th>Then</th>
</tr>
</thead>
<tbody>
<tr>
<td>The calculated additional</td>
<td>Close valves C and B and disconnect the</td>
</tr>
<tr>
<td>refrigerant amount may be reached</td>
<td>manifold connection to the liquid line.</td>
</tr>
<tr>
<td>by pre-charging procedure</td>
<td></td>
</tr>
<tr>
<td>The total amount of refrigerant</td>
<td>Close valves C and B, disconnect the</td>
</tr>
<tr>
<td>could not be charged by pre-charging</td>
<td>manifold connection to the liquid line,</td>
</tr>
<tr>
<td></td>
<td>and perform steps 4~6.</td>
</tr>
</tbody>
</table>

INFORMATION

If the total additional refrigerant amount reached in step 3 (by pre-charging only), record the amount of refrigerant that was added on the additional refrigerant charge label provided with the unit and attach it on the backside of the front panel. Perform the test procedure as described in "7 Commissioning" on page 21.

Charging refrigerant

5. After pre-charging, connect valve A to the refrigerant charge port and charge the remaining additional refrigerant through this port. Open all outdoor unit stop valves. At this point, valve A must remain closed!
5 Installation

5.6.7 Error codes when charging refrigerant

If a malfunction occurs, close valve A immediately. Confirm the malfunction code and take corresponding action, “8.1 Solving problems based on error codes” on page 22.

5.6.8 Checks after charging refrigerant

- Are all stop valves open?
- Is the amount of refrigerant, that has been added, recorded on the refrigerant charge label?

NOTICE
Make sure to open all stop valves after (pre-) charging the refrigerant.
Operating with the stop valves closed will damage the compressor.

5.7 Connecting the electrical wiring

5.7.1 Field wiring: Overview
Field wiring consists of power supply (always including earth) and indoor-outdoor communication (= transmission) wiring.

Example:

Field power supply (with earth leakage protector)
Main switch
Earth connection
Outdoor unit
Indoor unit
User interface
Indoor power supply wiring (sheathed cable) (230 V)
Transmission wiring (sheathed cable) (16 V)
Outdoor power supply wiring (sheathed cable)
Power supply 3N~ 50/60 Hz
Power supply 1~ 50/60 Hz
Earth wiring

5.7.2 Guidelines when knocking out knockout holes

- To punch a knockout hole, hit on it with a hammer.
- After knocking out the holes, we recommend removing any burrs and paint the edges and areas around the holes using repair paint to prevent rusting.
- When passing electrical wiring through the knockout holes, prevent damage to the wires by wrapping the wiring with protective tape, putting the wires through field supplied protective wire conduits at that location, or install suitable field supplied wire nipples or rubber bushings into the knockout holes.

5.7.3 To route and fix the transmission wiring
Transmission wiring can be routed through the front side only. Fix it to the upper mounting hole.

5 HP
10–16 HP

Fix to the indicated plastic brackets using field supplied clamping material.

a Wiring between the units (indoor-outdoor) (F1/F2 left)
b Internal transmission wiring (Q1/Q2)

a Knockout hole
b Burr

- Remove burrs
- If there are any possibilities that small animals enter the system through the knockout holes, plug the holes with packing materials (to be prepared on-site)
5 Installation

5.7.4 To connect the transmission wiring
The wiring from the indoor units must be connected to the F1/F2 (In-Out) terminals on the PCB in the outdoor unit.

<table>
<thead>
<tr>
<th>Screw size</th>
<th>Tightening torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3.5 (A1P)</td>
<td>0.80~0.96</td>
</tr>
</tbody>
</table>

**In case of single outdoor unit installation**

- Outdoor unit PCB (A1P)
- Use the conductor of sheathed wire (2 wire) (no polarity)
- Terminal board (field supply)
- Indoor unit
- Outdoor unit

**In case of multi outdoor unit installation**

- Unit A (master outdoor unit)
- Unit B (slave outdoor unit)
- Unit C (slave outdoor unit)
- Master/slave transmission (Q1/Q2)
- Outdoor/indoor transmission (F1/F2)
- Outdoor unit/other system transmission (F1/F2)

- The interconnecting wiring between the outdoor units in the same piping system must be connected to the Q1/Q2 (Out Multi) terminals. Connecting the wires to the F1/F2 terminals results in system malfunction.
- The wiring for the other systems must be connected to the F1/F2 (Out-Out) terminals of the PCB in the outdoor unit to which the interconnecting wiring for the indoor units is connected.
- The base unit is the outdoor unit to which the interconnecting wiring for the indoor units is connected.

5.7.5 To finish the transmission wiring
After installing the transmission wires inside the unit, wrap them along with the on-site refrigerant pipes using finishing tape, as shown in figure below.

- Liquid pipe
- Gas pipe
- Insulator
- Transmission wiring (F1/F2)
- Finishing tape

5.7.6 To route and fix the power supply

**NOTICE**
When routing earth wires, secure clearance of 25 mm or more away from compressor lead wires. Failure to observe this instruction properly may adversely affect correct operation of other units connected to the same earth.

The power supply wiring can be routed from the front and left side. Fix it to the lower mounting hole.

- Power supply (possibility 1) (a)
- Power supply (possibility 2) (a)
- Power supply (possibility 3) (a)
- Use conduit.
- Tie wrap
- Knockout hole has to be removed. Close the hole to avoid small animals or dirt from entering.

5.7.7 To connect the power supply
The power supply must be clamped to the plastic bracket using field supplied clamp material.

The green and yellow striped wire must be used for earthing only (refer to the figure below).
**6 Configuration**

**Power supply (380~415 V - 3N~ 50Hz OR 400 V - 3N~60 Hz)**
- **Fuse**
- **Earth leakage protector**
- **Earth wire**
- **Power supply terminal block**
- **Connect each power wire: RED to L1, WHT to L2, BLK to L3 and BLU to N**
- **Earth wire (GRN/YLW)**

Clamp the power supply to the plastic bracket using a field supplied clamp to prevent external force being applied to the terminal.

**Clamp (field supplied)**

**Cup washer**

When connecting the earth wire, it is recommended to perform curling.

**Multiple outdoor units**

To connect the power supply for multiple outdoor units to each other, ring tongues have to be used. No bare cable can be used.

The ring washer which is standard provided should be removed in that case.

Attaching both cables to the power supply terminal should be done as indicated.

---

**6.1 Making field settings**

**6.1.1 About making field settings**

To continue the configuration of the VRV IV heat pump system, it is required to give some input to the PCB of the unit. This chapter will describe how manual input is possible by operating the push buttons/DIP switches on the PCB and reading the feedback from the 7-segment displays.

Making settings is done via the master outdoor unit.

---

**Push buttons and DIP switches**

Next to making field settings it is also possible to confirm the current operation parameters of the unit.

**Item** | **Description**
--- | ---
**Push buttons** | By operating the push buttons it is possible to:
- Perform special actions (testrun, etc).
- Perform field settings (demand operation, low noise, etc).

**DIP switches** | By operating the DIP switches it is possible to:
- DS1 (1): COOL/HEAT selector (refer to the manual of the cool/heat selector switch).
- OFF=not installed=factory setting
- DS1 (2~4): NOT USED. DO NOT CHANGE THE FACTORY SETTING.
- DS2 (1~4): NOT USED. DO NOT CHANGE THE FACTORY SETTING.

See also:
- "6.1.2 Field setting components" on page 18
- "6.1.3 To access the field setting components" on page 19

**PC configurator**

For VRV IV heat pump system it is alternatively possible to make several commissioning field settings through a personal computer interface (for this, option EKPCCAB is required). The installer can prepare the configuration (off-site) on PC and afterwards upload the configuration to the system.

See also: "6.1.9 To connect the PC configurator to the outdoor unit" on page 21.

**Mode 1 and 2**

**Mode** | **Description**
--- | ---
**Mode 1 (monitoring settings)** | Mode 1 can be used to monitor the current situation of the outdoor unit. Some field setting contents can be monitored as well.

**Mode 2 (field settings)** | Mode 2 is used to change the field settings of the system. Consulting the current field setting value and changing the current field setting value is possible.

In general, normal operation can be resumed without special intervention after changing field settings.

Some field settings are used for special operation (e.g., 1 time operation, recovery/ evacuation setting, manual adding refrigerant setting, etc.). In such a case, it is required to abort the special operation before normal operation can restart. It will be indicated in below explanations.

See also:
- "6.1.4 To access mode 1 or 2" on page 19
- "6.1.5 To use mode 1" on page 19
- "6.1.6 To use mode 2" on page 19
- "6.1.7 Mode 1: Monitoring settings" on page 20
- "6.1.8 Mode 2: Field settings" on page 20

**6.1.2 Field setting components**

Location of the 7-segment displays, buttons and DIP switches:
6.1.3 To access the field setting components

It is not required to open the complete electronic component box to access the push buttons on the PCB and read out the 7-segment display(s).

To access you can remove the front inspection cover of the front plate (see figure). Now you can open the inspection cover of the electrical component box front plate (see figure). You can see the three push buttons and the 3 7-segment displays and DIP switches.

Operate the switches and push buttons with an insulated stick (such as a closed ball-point pen) to avoid touching of live parts.

Make sure to re-attach the inspection cover into the electronic component box cover and to close the front plate of the unit should be attached. Settings are still possible to be made through the inspection opening.

6.1.4 To access mode 1 or 2

Initialisation: default situation

**NOTICE**

Be sure to turn on the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.

Turn on the power supply of the outdoor unit and all indoor units. When the communication between indoor units and outdoor unit(s) is established and normal, the 7-segment display indication state will be as below (default situation when shipped from factory).

6.1.5 To use mode 1

Mode 1 is used to set basic settings and to monitor the status of the unit.

<table>
<thead>
<tr>
<th>What</th>
<th>How</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing and accessing the setting in mode 1</td>
<td>Once mode 1 is selected (push BS1 1 time), you can select the wanted setting. It is done by pushing BS2. Accessing the selected setting’s value is done by pushing BS3 1 time.</td>
</tr>
</tbody>
</table>

To quit and return to the initial status

Press BS1.

6.1.6 To use mode 2

The master unit should be used to input field settings in mode 2.

Mode 2 is used to set field settings of the outdoor unit and system.

<table>
<thead>
<tr>
<th>What</th>
<th>How</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing and accessing the setting in mode 2</td>
<td>Once mode 2 is selected (push BS1 for more than 5 seconds), you can select the wanted setting. It is done by pushing BS2. Accessing the selected setting’s value is done by pushing BS3 1 time.</td>
</tr>
</tbody>
</table>

To quit and return to the initial status

Press BS1.
6 Configuration

### What

Changing the value of the selected setting in mode 2

### How

- Once mode 2 is selected (push BS1 for more than 5 seconds) you can select the wanted setting. It is done by pushing BS2.
- Accessing the selected setting’s value is done by pushing BS3 1 time.
- Now BS2 is used to select the required value of the selected setting.
- When the required value is selected, you can define the change of value by pushing BS3 1 time.
- Press BS3 again to start operation according to the chosen value.

### 6.1.7 Mode 1: Monitoring settings

#### [1-0]

**Description**

- No indication: Undefined situation.
- 0: Outdoor unit is master unit.
- 1: Outdoor unit is slave 1 unit.
- 2: Outdoor unit is slave 2 unit.

#### [1-1]

**Description**

- 0: Unit is currently not operating under low noise restrictions.
- 1: Unit is currently operating under low noise restrictions.

#### [1-2]

**Description**

- 0: Unit is currently not operating under power consumption limitations.
- 1: Unit is currently operating under power consumption limitation.

#### [1-5] [1-6]

**Description**

- 0: The current T_e target parameter position.
- 1: The current T_c target parameter position.

### 6.1.8 Mode 2: Field settings

#### [2-0]

**Cool/Heat selection setting.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (default)</td>
<td>Each individual outdoor unit can select Cool/Heat operation (by Cool/Heat selector if installed), or by defining master indoor user interface (see setting [2-83] and the operation manual).</td>
</tr>
<tr>
<td>1</td>
<td>Master unit decides Cool/Heat operation when outdoor units are connected in multiple system combination(a).</td>
</tr>
<tr>
<td>2</td>
<td>Slave unit for Cool/Heat operation when outdoor units are connected in multiple system combination(a).</td>
</tr>
</tbody>
</table>

(a) It is necessary to use the optional external control adaptor for outdoor unit (DTA104A61/62). See the instruction delivered with the adaptor for further details.

#### [2-8]

**T_e target temperature during cooling operation.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (default)</td>
<td>Auto</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>11</td>
</tr>
</tbody>
</table>

#### [2-9]

**T_c target temperature during heating operation.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (default)</td>
<td>Auto</td>
</tr>
<tr>
<td>1</td>
<td>41</td>
</tr>
<tr>
<td>3</td>
<td>43</td>
</tr>
<tr>
<td>6</td>
<td>46</td>
</tr>
</tbody>
</table>

#### [2-20]

**Manual additional refrigerant charge.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (default)</td>
<td>Deactivated.</td>
</tr>
<tr>
<td>1</td>
<td>Activated.</td>
</tr>
</tbody>
</table>

To stop the manual additional refrigerant charge operation (when the required additional refrigerant amount is charged), push BS3. If this function was not aborted by pushing BS3, the unit will stop its operation after 30 minutes. If 30 minutes was not sufficient to add the needed refrigerant amount, the function can be reactivated by changing the field setting again.

### [2-35]

**Height difference setting.**
7 Commissioning

### 7.1 Precautions when commissioning

**CAUTION**
Do not perform the test operation while working on the indoor units.

When performing the test operation, not only the outdoor unit, but the connected indoor unit will operate as well. Working on an indoor unit while performing a test operation is dangerous.

**NOTICE**
Be sure to turn on the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.

During test operation, the outdoor unit and the indoor units will start up. Make sure that the preparations of all indoor units are finished (field piping, electrical wiring, air purge, ...). See installation manual of the indoor units for details.

### 7.2 Checklist before commissioning

After the installation of the unit, first check the following items. Once all below checks are fulfilled, the unit must be closed, only then can the unit be powered up.

- **Installation**
  - Check that the unit is installed properly, to avoid abnormal noises and vibrations when starting up the unit.
- **Field wiring**
  - Be sure that the field wiring has been carried out according to the instructions described in the chapter "5.7 Connecting the electrical wiring" on page 16, according to the wiring diagrams and according to the applicable legislation.
- **Power supply voltage**
  - Check the power supply voltage on the local supply panel. The voltage must correspond to the voltage on the identification label of the unit.
- **Earth wiring**
  - Be sure that the earth wires have been connected properly and that the earth terminals are tightened.
- **Insulation test of the main power circuit**
  - Using a megatester for 500 V, check that the insulation resistance of 2 MΩ or more is attained by applying a voltage of 500 V DC between power terminals and earth. Never use the megatester for the transmission wiring.
- **Fuses, circuit breakers, or protection devices**
  - Check that the fuses, circuit breakers, or the locally installed protection devices are of the size and type specified in the chapter "4.3.1 Safety device requirements" on page 7. Be sure that neither a fuse nor a protection device has been bypassed.
- **Internal wiring**
  - Visually check the electrical component box and the inside of the unit on loose connections or damaged electrical components.
- **Pipe size and pipe insulation**
  - Be sure that correct pipe sizes are installed and that the insulation work is properly executed.
- **Stop valves**
  - Be sure that the stop valves are open on both liquid and gas side.
- **Damaged equipment**
  - Check the inside of the unit on damaged components or squeezed pipes.
- **Refrigerant leak**
  - Check the inside of the unit on refrigerant leakage. If there is a refrigerant leak, try to repair the leak. If the repair is unsuccessful, call your local dealer. Do not touch any refrigerant which has leaked out from refrigerant piping connections. This may result in frostbite.
- **Oil leak**
  - Check the compressor for oil leakage. If there is an oil leak, try to repair the leak. If the repairing is unsuccessful, call your local dealer.
- **Air inlet/outlet**
  - Check that the air inlet and outlet of the unit is not obstructed by paper sheets, cardboard, or any other material.

---

**Description**

0 (default)

- In case the outdoor unit is installed in the highest position (indoor units are installed on a lower position than outdoor units) and the height difference between the highest indoor unit and the outdoor unit exceeds 50 m, the setting [2-49] has to be changed to 1.

---

**Description**

1 (default)

- In case the outdoor unit is installed in the lowest position (indoor units are installed on a higher position than outdoor units) and the height difference between the highest indoor unit and the outdoor unit exceeds 40 m, the setting [2-35] should be changed to 0.

---

**6.1.9 To connect the PC configurator to the outdoor unit**

![Connecting diagram](image)
8 Troubleshooting

7.3 About test run
The procedure below describes the test operation of the complete system. This operation checks and judges following items:
- Check of wrong wiring (communication check with indoor units).
- Check of the stop valves opening.
- Judgement of piping length.
- Make sure to carry out the system test operation after the first installation. Otherwise, the malfunction code L3 will be displayed on the user interface and normal operation or individual indoor unit test run cannot be carried out.
- Abnormalities on indoor units cannot be checked for each unit separately. After the test operation is finished, check the indoor units one by one by performing a normal operation using the user interface. Refer to the indoor unit installation manual for more details concerning the individual test run.

INFORMATION
- It may take 10 minutes to achieve a uniform refrigerant state before the compressor starts.
- During the test operation, the refrigerant running sound or the magnetic sound of a solenoid valve may become loud and the display indication may change. These are not malfunctions.

7.4 To perform a test run
1. Close all front panels in order to not let it be the cause of misjudgement (except the electrical component box inspection opening service cover).
2. Make sure all field settings you want are set; see "6.1 Making field settings" on page 18.
3. Turn ON the power to the outdoor unit and the connected indoor units.

NOTICE
Be sure to turn on the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.

4. Make sure the default (idle) situation is existing; see "6.1.4 To access mode 1 or 2" on page 19. Push BS2 for 5 seconds or more. The unit will start test operation.

Result: The test operation is automatically carried out, the outdoor unit display will indicate "Cooling stable condition" and the indication "Under centralised control" will display on the user interface of indoor units.

Steps during the automatic system test run procedure:

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L01</td>
<td>Control before start up (pressure equalisation)</td>
</tr>
<tr>
<td>L02</td>
<td>Cooling start up control</td>
</tr>
</tbody>
</table>

Note: During the test operation, it is not possible to stop the unit operation from a user interface. To abort the operation, press BS3. The unit will stop after ~30 seconds.

5. Check the test operation results on the outdoor unit 7-segment display.

Completion | Description
--- | ---
Normal completion | No indication on the 7-segment display (idle).
Abnormal completion | Indication of malfunction code on the 7-segment display. Refer to "7.5 Correcting after abnormal completion of the test run" on page 22 to take actions for correcting the abnormality. When the test operation is fully completed, normal operation will be possible after 5 minutes.

7.5 Correcting after abnormal completion of the test run
The test operation is only completed if there is no malfunction code displayed on the user interface or outdoor unit 7-segment display. In case of a displayed malfunction code, perform correcting actions as explained in the malfunction code table. Carry out the test operation again and confirm that the abnormality is properly corrected.

INFORMATION
Refer to the installation manual of the indoor unit for other detailed malfunction codes related to indoor units.

8 Troubleshooting

8.1 Solving problems based on error codes
In case of a displayed malfunction code, perform correcting actions as explained in the malfunction code table. After correcting the abnormality, press BS3 to reset the malfunction code and retry operation.

The malfunction code which is displayed on the outdoor unit will indicate a main malfunction code and a sub code. The sub code indicates more detailed information about the malfunction code. The malfunction code will be displayed intermittent.

Example:

<table>
<thead>
<tr>
<th>Code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main code</td>
<td>L3</td>
</tr>
<tr>
<td>Sub code</td>
<td>01</td>
</tr>
</tbody>
</table>

With an interval of 1 second, the display will switch between main code and sub code.
### 8.2 Error codes: Overview

<table>
<thead>
<tr>
<th>Main code</th>
<th>Sub code</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>-b</td>
<td>-b1</td>
<td>Earth leakage detector activated</td>
<td>Restart the unit. If problem reoccurs, contact your dealer.</td>
</tr>
<tr>
<td>-b4</td>
<td>-b5</td>
<td>High pressure switch was activated (S1PH, S2PH) - A1P (X3A, X4A)</td>
<td>Check stop valve situation or abnormalities in (field) piping or airflow over air cooled coil.</td>
</tr>
<tr>
<td>-b2</td>
<td>-b4</td>
<td>-b6</td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-13</td>
<td>-14</td>
<td>-15</td>
<td>Stop valve closed (liquid)</td>
</tr>
<tr>
<td>-16</td>
<td>-17</td>
<td></td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-c1</td>
<td>-c2</td>
<td>-c3</td>
<td>Low pressure malfunction:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant shortage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indoor unit malfunction</td>
</tr>
<tr>
<td>-c4</td>
<td>-c5</td>
<td>-c6</td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-c7</td>
<td>-c8</td>
<td>-c9</td>
<td>Refrigration (R21T/R22T):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant shortage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indoor unit malfunction</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigration (R21T):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant shortage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indoor unit malfunction</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigration (R22T):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant shortage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indoor unit malfunction</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigration (R8T):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant shortage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indoor unit malfunction</td>
</tr>
<tr>
<td>-d1</td>
<td>-d2</td>
<td>-d3</td>
<td>Ambient temperature sensor malfunction (R1T) - A1P (X18A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-d4</td>
<td>-d5</td>
<td>-d6</td>
<td>Discharge temperature sensor malfunction (R21T) - A1P (X29A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-d7</td>
<td>-d8</td>
<td>-d9</td>
<td>Discharge temperature sensor malfunction (R22T) - A1P (X29A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-d10</td>
<td>-d11</td>
<td>-d12</td>
<td>Discharge temperature sensor malfunction (R8T):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-d13</td>
<td>-d14</td>
<td>-d15</td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-e1</td>
<td>-e2</td>
<td>-e3</td>
<td>Ambient temperature sensor malfunction (R1T) - A1P (X18A)</td>
</tr>
<tr>
<td>-e4</td>
<td>-e5</td>
<td>-e6</td>
<td>Discharge temperature sensor malfunction (R21T):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-e7</td>
<td>-e8</td>
<td>-e9</td>
<td>Discharge temperature sensor malfunction (R22T):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-e10</td>
<td>-e11</td>
<td>-e12</td>
<td>Compressor casing temperature sensor malfunction (R8T):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-e13</td>
<td>-e14</td>
<td>-e15</td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-f1</td>
<td>-f2</td>
<td>-f3</td>
<td>Ambient temperature sensor malfunction (R1T):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-f4</td>
<td>-f5</td>
<td>-f6</td>
<td>Discharge temperature sensor malfunction (R21T):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-f7</td>
<td>-f8</td>
<td>-f9</td>
<td>Compressor casing temperature sensor malfunction (R8T):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-f10</td>
<td>-f11</td>
<td>-f12</td>
<td>Ambient temperature sensor malfunction (R1T):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
<tr>
<td>-f13</td>
<td>-f14</td>
<td>-f15</td>
<td>Refrigerant overcharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stop valve closed</td>
</tr>
</tbody>
</table>
### 8 Troubleshooting

<table>
<thead>
<tr>
<th>Main code</th>
<th>Sub code</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1</td>
<td>-GB</td>
<td>Liquid temperature sensor (after subcool HE) malfunction (RST) - A1P (X30A)</td>
<td>Check connection on PCB or actuator.</td>
</tr>
<tr>
<td>J6</td>
<td>-Q1</td>
<td>Liquid temperature sensor (coil) malfunction (R47) - A1P (X30A)</td>
<td>Check connection on PCB or actuator.</td>
</tr>
<tr>
<td>J4</td>
<td>-Q1</td>
<td>Gas temperature sensor (after subcool HE) malfunction (R6T) - A1P (X30A)</td>
<td>Check connection on PCB or actuator.</td>
</tr>
<tr>
<td>JH</td>
<td>-Qb</td>
<td>High pressure sensor malfunction (S1NPH) open circuit - A1P (X32A)</td>
<td>Check connection on PCB or actuator.</td>
</tr>
<tr>
<td>J1</td>
<td>-Q9</td>
<td>High pressure sensor malfunction (S1NPH) short circuit - A1P (X32A)</td>
<td>Check connection on PCB or actuator.</td>
</tr>
<tr>
<td>JG</td>
<td>-Q9</td>
<td>Low pressure sensor malfunction (S1NPL) open circuit - A1P (X31A)</td>
<td>Check connection on PCB or actuator.</td>
</tr>
<tr>
<td>JG</td>
<td>-Q9</td>
<td>Low pressure sensor malfunction (S1NPL) short circuit - A1P (X31A)</td>
<td>Check connection on PCB or actuator.</td>
</tr>
<tr>
<td>J1</td>
<td>-Q3</td>
<td>INV1 unbalanced power supply voltage</td>
<td>Check if power supply is within range.</td>
</tr>
<tr>
<td>J1</td>
<td>-Q3</td>
<td>INV2 unbalanced power supply voltage</td>
<td>Check if power supply is within range.</td>
</tr>
<tr>
<td>U1</td>
<td>-Q7</td>
<td>Reversed power supply phase malfunction</td>
<td>Correct phase order.</td>
</tr>
<tr>
<td>U2</td>
<td>-Q7</td>
<td>Reversed power supply phase malfunction</td>
<td>Correct phase order.</td>
</tr>
<tr>
<td>U2</td>
<td>-Q2</td>
<td>INV1 voltage power shortage</td>
<td>Check if power supply is within range.</td>
</tr>
<tr>
<td>U2</td>
<td>-Q2</td>
<td>INV2 voltage power shortage</td>
<td>Check if power supply is within range.</td>
</tr>
<tr>
<td>U2</td>
<td>-Q3</td>
<td>INV2 power phase loss</td>
<td>Check if power supply is within range.</td>
</tr>
<tr>
<td>U2</td>
<td>-Q3</td>
<td>INV2 power phase loss</td>
<td>Check if power supply is within range.</td>
</tr>
<tr>
<td>U2</td>
<td>-Q3</td>
<td>Malfunction code: System test run not yet executed (system operation not possible)</td>
<td>Execute system test run.</td>
</tr>
<tr>
<td>U4</td>
<td>-Q1</td>
<td>Faulty wiring to Q1/Q2 or indoor - outdoor</td>
<td>Check (Q1/Q2) wiring.</td>
</tr>
<tr>
<td>U4</td>
<td>-Q2</td>
<td>Faulty wiring to Q1/Q2 or indoor - outdoor</td>
<td>Check (Q1/Q2) wiring.</td>
</tr>
<tr>
<td>U1</td>
<td>-Q1</td>
<td>System test run abnormal ending</td>
<td>Execute test run again.</td>
</tr>
<tr>
<td>U1</td>
<td>-Q2</td>
<td>Malfunction code: faulty wiring to Q1/Q2</td>
<td>Check Q1/Q2 wiring.</td>
</tr>
<tr>
<td>U4</td>
<td>-Q1</td>
<td>Too many indoor units are connected to F1/F2 line</td>
<td>Check indoor unit amount and total capacity connected.</td>
</tr>
<tr>
<td>U4</td>
<td>-Q1</td>
<td>Bad wiring between outdoor and indoor units</td>
<td>Check indoor unit amount and total capacity connected.</td>
</tr>
<tr>
<td>U4</td>
<td>-Q1</td>
<td>System mismatch: Wrong type of indoor units combined (R410A, R407C, RA, Hydrobox, etc)</td>
<td>Check if other indoor units have malfunction and confirm indoor unit mix is allowed.</td>
</tr>
</tbody>
</table>
9 Technical data

Latest information can be found in the technical engineering data.

9.1 Service space: Outdoor unit

Make sure the space around the unit is adequate for servicing and the minimum space for air inlet and air outlet is available (refer to the figure below and choose one of the possibilities).
9 Technical data

- In case of an installation site where sides A+B+C+D have obstacles, the wall heights of sides A+C have no impact on service space dimensions. Refer to the figure above for impact of wall heights of sides B+D on service space dimensions.
- In case of an installation site where only the sides A+B have obstacles, the wall heights have no influence on any indicated service space dimensions.
- The installation space required on these drawings are for full load heating operation without considering possible ice accumulation. If the location of the installation is in a cold climate, then all dimensions above should be >500 mm to avoid accumulation of ice in between the outdoor units.

INFORMATION
The service space dimensions in above figure are based on cooling operation at 46°C ambient temperature (standard conditions).

INFORMATION
Further specifications can be found in the technical engineering data.

9.2 Piping diagram: Outdoor unit

Piping diagram: RXYTQ8

Piping diagram: RXYTQ10+12

- Compressor (M1C)
- Heat exchanger
- Fan
- Fan motor (M1F)
- Accumulator
- Expansion valve, main (Y1E)
- Expansion valve, subcool heat exchanger (Y2E)
- Subcool heat exchanger
- Oil separator
- Solenoid valve, oil (Y3S)
- Solenoid valve, oil accumulator (Y2S)
- 4-way valve, main (Y1S)
- 4-way valve, subcool heat exchanger (Y2E)
- Expansion valve, main (Y1E)
- Solenoid valve, oil accumulator (Y2S)
- Solenoid valve, oil (Y3S)
- 4-way valve, subcool heat exchanger (Y2E)
- Service port, refrigerant charge
- Stop valve (liquid)
- Stop valve (gas)
- Service port
- Stop valve (gas)
- Stop valve (liquid)
- Service port
- Oil separator
- Fan motor (M1F, M2F)
- Fan
- Accumulator
- Expansion valve, subcool heat exchanger (Y2E)
- Subcool heat exchanger
Piping diagram: RXYTQ14+16

a. Compressor (M1C)
b. Compressor (M2C)
c. Heat exchanger
d. Fan
e. Fan motor (M1F, M2F)
f. Accumulator
g. Expansion valve, main (Y1E)
h. Expansion valve, subcool heat exchanger (Y2E)
i. Subcool heat exchanger
j. Oil separator
k. Solenoid valve, oil1 (Y3S)
l. Solenoid valve, oil accumulator (Y2S)
m. 4-way valve, main (Y15)
n. Service port, refrigerant charge
o. Stop valve (liquid)
p. Stop valve (gas)
q. Service port
10 About the system

For the user

10 About the system

The indoor unit part of VRV IV heat pump system can be used for heating/cooling applications. The type of indoor unit which can be used depends on the outdoor units series.

NOTICE
Do not use the air conditioner for other purposes. In order to avoid any quality deterioration, do not use the unit for cooling precision instruments, food, plants, animals or works of art.

NOTICE
For future modifications or expansions of your system:
A full overview of allowable combinations (for future system extensions) is available in technical engineering data and should be consulted. Contact your installer to receive more information and professional advice.

11 User interface

CAUTION
Never touch the internal parts of the controller.
Do not remove the front panel. Some parts inside are dangerous to touch and appliance problems may happen. For checking and adjusting the internal parts, contact your dealer.

This operation manual will give a non-exhaustive overview of the main functions of the system.
Detailed information on required actions to achieve certain functions can be found in the dedicated installation and operation manual of the indoor unit.
Refer to the operation manual of the installed user interface.

12 Operation

12.1 Operation range

Use the system in the following temperature and humidity ranges for safe and effective operation.

<table>
<thead>
<tr>
<th>Outdoor temperature</th>
<th>Heating</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5~52°C DB</td>
<td>-20~21°C DB</td>
</tr>
<tr>
<td>-20~15.5°C WB</td>
<td></td>
</tr>
<tr>
<td>Indoor temperature</td>
<td></td>
</tr>
<tr>
<td>21~32°C DB</td>
<td>15~27°C DB</td>
</tr>
<tr>
<td>14~25°C WB</td>
<td></td>
</tr>
<tr>
<td>Indoor humidity</td>
<td></td>
</tr>
<tr>
<td>≤80% (a)</td>
<td></td>
</tr>
</tbody>
</table>

(a) To avoid condensation and water dripping out of the unit. If the temperature or the humidity is beyond these conditions, safety devices may be put in action and the air conditioner may not operate.

Above operation range is only valid in case direct expansion indoor units are connected to the VRV IV system. Special operation ranges are valid in case of using AHU. They can be found in the installation/operation manual of the dedicated unit. Latest information can be found in the technical engineering data.

12.2 Operating the system

12.2.1 About operating the system

- Operation procedure varies according to the combination of outdoor unit and user interface.
- To protect the unit, turn on the main power switch 6 hours before operation.
- If the main power supply is turned off during operation, operation will restart automatically after the power turns back on again.

12.2.2 About cooling, heating, fan only, and automatic operation

- Changeover cannot be made with a user interface whose display shows "change-over under centralised control" (refer to installation and operation manual of the user interface).
- When the display "change-over under centralised control" flashes, refer to "12.5.1 About setting the master user interface" on page 30.
- The fan may keep on running for about 1 minute after the heating operation stops.
- The air flow rate may adjust itself depending on the room temperature or the fan may stop immediately. This is not a malfunction.

12.2.3 About the heating operation

It may take longer to reach the set temperature for general heating operation than for cooling operation.

Defrost operation
In heating operation, freezing of the outdoor unit's air cooled coil increases over time, restricting the energy transfer to the outdoor unit's coil. Heating capability decreases and the system needs to go into defrost operation to be able to deliver enough heat to the indoor units.

<table>
<thead>
<tr>
<th>If (a)</th>
<th>Then</th>
</tr>
</thead>
<tbody>
<tr>
<td>RXYTQ outdoor unit is installed</td>
<td>The indoor unit will stop fan operation, the refrigerant cycle will reverse and energy from inside the building will be used to defrost the outdoor unit.</td>
</tr>
</tbody>
</table>

(a) To avoid condensation and water dripping out of the unit. If the temperature or the humidity is beyond these conditions, safety devices may be put in action and the air conditioner may not operate.

Above operation range is only valid in case direct expansion indoor units are connected to the VRV IV system. Special operation ranges are valid in case of using AHU. They can be found in the installation/operation manual of the dedicated unit. Latest information can be found in the technical engineering data.

12.2.4 To operate the system (WITHOUT cool/heat changeover remote control switch)

1 Press the operation mode selector button on the user interface several times and select the operation mode of your choice.
  - Cooling operation
  - Heating operation
12 Operation

2 Press the ON/OFF button on the user interface.

Result: The operation lamp lights up and the system starts operating.

12.2.5 To operate the system (WITH cool/heat changeover remote control switch)

Overview of the changeover remote control switch

To start
1. Select operation mode with the cool/heat changeover switch as follows:
   - Cooling operation
   - Heating operation
   - Fan only operation

2. Press the ON/OFF button on the user interface.

Result: The operation lamp lights up and the system starts operating.

To stop
3. Press the ON/OFF button on the user interface once again.

Result: The operation lamp goes out and the system stops operating.

NOTICE
Do not turn off power immediately after the unit stops, but wait for at least 5 minutes.

12.3 Using the dry program

12.3.1 About the dry program
- The function of this program is to decrease the humidity in your room with minimal temperature decrease (minimal room cooling).
- The micro computer automatically determines temperature and fan speed (cannot be set by the user interface).
- The system does not go into operation if the room temperature is low (<20°C).

12.3.2 To use the dry program (WITHOUT cool/heat changeover remote control switch)

To start
1. Press the operation mode selector button on the user interface several times and select (program dry operation).
2. Press the ON/OFF button of the user interface.

Result: The operation lamp lights up and the system starts operating.

3. Press the air flow direction adjust button (only for double-flow, multi-flow, corner, ceiling-suspended and wall-mounted). Refer to "12.4 Adjusting the air flow direction" on page 29 for details.

To stop
4. Press the ON/OFF button on the user interface once again.

Result: The operation lamp goes out and the system stops operating.

NOTICE
Do not turn off power immediately after the unit stops, but wait for at least 5 minutes.

12.3.3 To use the dry program (WITH cool/heat changeover remote control switch)

To start
1. Select cooling operation mode with the cool/heat changeover remote control switch.
2. Press the ON/OFF button on the user interface.

Result: The operation lamp lights up and the system starts operating.

3. Press the air flow direction adjust button (only for double-flow, multi-flow, corner, ceiling-suspended and wall-mounted). Refer to "12.4 Adjusting the air flow direction" on page 29 for details.

To stop
4. Press the ON/OFF button on the user interface once again.

Result: The operation lamp goes out and the system stops operating.

NOTICE
Do not turn off power immediately after the unit stops, but wait for at least 5 minutes.

12.4 Adjusting the air flow direction

Refer to the operation manual of the user interface.

12.4.1 About the air flow flap

Double flow + multi-flow units
13 Maintenance and service

Corner units
Ceiling suspended units
Wall-mounted units

For the following conditions, a micro computer controls the air flow direction which may be different from the display.

<table>
<thead>
<tr>
<th>Cooling</th>
<th>Heating</th>
</tr>
</thead>
<tbody>
<tr>
<td>・ When the room temperature is lower than the set temperature.</td>
<td>・ When starting operation.</td>
</tr>
<tr>
<td>・ When the room temperature is higher than the set temperature.</td>
<td>・ When the room temperature is higher than the set temperature.</td>
</tr>
<tr>
<td>・ When starting operation.</td>
<td>・ At defrost operation.</td>
</tr>
</tbody>
</table>

The air flow direction can be adjusted in one of the following ways:
・ The air flow flap itself adjusts its position.
・ The air flow direction can be fixed by the user.
・ Automatic and desired position.

**WARNING**
Never touch the air outlet or the horizontal blades while the swing flap is in operation. Fingers may become caught or the unit may break down.

**NOTICE**
・ The movable limit of the flap is changeable. Contact your dealer for details. (only for double-flow, multi-flow, corner, ceiling-suspended and wall-mounted).
・ Avoid operating in the horizontal direction. It may cause dew or dust to settle on the ceiling or flap.

12.5 Setting the master user interface

12.5.1 About setting the master user interface

When the system is installed as shown in the figure above, it is necessary to designate one of the user interfaces as the master user interface.

The displays of slave user interfaces show (change-over under centralised control) and slave user interfaces automatically follow the operation mode directed by the master user interface.

Only the master user interface can select heating or cooling mode.

13.1 About the refrigerant

This product contains fluorinated greenhouse gases. Do NOT vent gases into the atmosphere.

Refrigerant type: R410A

Global warming potential (GWP) value: 2087.5

**NOTICE**
In Europe, the greenhouse gas emissions of the total refrigerant charge in the system (expressed as tonnes CO₂-equivalent) is used to determine the maintenance intervals. Follow the applicable legislation.

Formula to calculate the greenhouse gas emissions:

\[ \text{GWP value of the refrigerant} \times \text{Total refrigerant charge} [\text{in kg}] / 1000 \]

Please contact your installer for more information.

**WARNING**
The refrigerant in the air conditioner is safe and normally does not leak. If the refrigerant leaks in the room, contact with a fire of a burner, a heater or a cooker may result in a harmful gas.

Turn off any combustible heating devices, ventilate the room and contact the dealer where you purchased the unit. Do not use the air conditioner until a service person confirms that the portion where the refrigerant leaks is repaired.

13.2 After-sales service and warranty

13.2.1 Warranty period

・ This product includes a warranty card that was filled in by the dealer at the time of installation. The completed card has to be checked by the customer and stored carefully.

Never inspect or service the unit by yourself. Ask a qualified service person to perform this work.

**WARNING**
Never replace a fuse with a fuse of a wrong ampere ratings or other wires when a fuse blows out. Use of wire or copper wire may cause the unit to break down or cause a fire.

**CAUTION**
Do not insert fingers, rods or other objects into the air inlet or outlet. Do not remove the fan guard. When the fan is rotating at high speed, it will cause injury.

**CAUTION**
After a long use, check the unit stand and fitting for damage. If damaged, the unit may fall and result in injury.

**NOTICE**
Do not wipe the controller operation panel with benzine, thinner, chemical dust cloth, etc. The panel may get discoloured or the coating peeled off. If it is heavily dirty, soak a cloth in water-diluted neutral detergent, squeeze it well and wipe the panel clean. Wipe it with another dry cloth.

**WARNING**
The refrigerant in the air conditioner is safe and normally does not leak. If the refrigerant leaks in the room, contact with a fire of a burner, a heater or a cooker may result in a harmful gas.

Turn off any combustible heating devices, ventilate the room and contact the dealer where you purchased the unit. Do not use the air conditioner until a service person confirms that the portion where the refrigerant leaks is repaired.
If repairs to the air conditioner are necessary within the warranty period, contact your dealer and keep the warranty card at hand.

### 13.2.2 Recommended maintenance and inspection

Since dust collects when using the unit for several years, performance of the unit will deteriorate to some extent. As taking apart and cleaning interiors of units requires technical expertise and in order to ensure the best possible maintenance of your units, we recommend to enter into a maintenance and inspection contract on top of normal maintenance activities. Our network of dealers has access to a permanent stock of essential components in order to keep your air conditioner in operation as long as possible. Contact your dealer for more information.

#### When asking your dealer for an intervention, always state:

- The complete model name of the air conditioner.
- The manufacturing number (stated on the nameplate of the unit).
- The installation date.
- The symptoms or malfunction, and details of the defect.

#### WARNING

- Do not modify, disassemble, remove, reinstall or repair the unit yourself as incorrect dismantling or installation may cause an electric shock or fire. Contact your dealer.
- In case of accidental refrigerant leaks, make sure there are no naked flames. The refrigerant itself is entirely safe, non-toxic and non-combustible, but it will generate toxic gas when it accidentally leaks into a room where combustible air from fan heaters, gas cookers, etc. is present. Always have qualified service personnel confirm that the point of leakage has been repaired or corrected before resuming operation.

#### 14 Troubleshooting

If one of the following malfunctions occur, take the measures shown below and contact your dealer:

#### WARNING

Stop operation and shut off the power if anything unusual occurs (burning smells etc.). Leaving the unit running under such circumstances may cause breakage, electric shock or fire. Contact your dealer.

The system must be repaired by a qualified service person:

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the system does not operate at all.</td>
<td>• Check if there is no power failure. Wait until power is restored. If power failure occurs during operation, the system automatically restarts immediately after the power supply is recovered.</td>
</tr>
<tr>
<td>If the system goes into fan only operation, but as soon as it goes into heating or cooling operation, the system stops.</td>
<td>• Check if no fuse has blown or breaker has worked. Change the fuse or reset the breaker if necessary.</td>
</tr>
<tr>
<td>The system operates but cooling or heating is insufficient.</td>
<td>• Check if air inlet or outlet of outdoor or indoor unit is not blocked by obstacles. Remove any obstacles and make it well-ventilated.</td>
</tr>
<tr>
<td>• Check the user interface display shows (time to clean the air filter). (Refer to &quot;13 Maintenance and service&quot; on page 30 and &quot;Maintenance in the indoor unit manual.&quot;)</td>
<td></td>
</tr>
</tbody>
</table>

If after checking all above items, it is impossible to fix the problem yourself, contact your installer and state the symptoms, the complete model name of the air conditioner (with manufacturing number if possible) and the installation date (possibly listed on the warranty card).

#### 14.1 Error codes: Overview

In case a malfunction code appears on the indoor unit user interface display, contact your installer and inform the malfunction code, the unit type, and serial number (you can find this information on the nameplate of the unit). For your reference, a list with malfunction codes is provided. You can, depending on the level of the malfunction code, reset the code by pushing the ON/OFF button. If not, ask your installer for advice.

<table>
<thead>
<tr>
<th>Main code</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>R2</td>
<td>External protection device was activated</td>
</tr>
<tr>
<td>R1</td>
<td>EEPROM failure (indoor)</td>
</tr>
<tr>
<td>R2</td>
<td>Drain system malfunction (indoor)</td>
</tr>
<tr>
<td>Rb</td>
<td>Fan motor malfunction (indoor)</td>
</tr>
<tr>
<td>R1</td>
<td>Swing flap motor malfunction (indoor)</td>
</tr>
<tr>
<td>RA</td>
<td>Expansion valve malfunction (indoor)</td>
</tr>
<tr>
<td>Rf</td>
<td>Drain malfunction (indoor unit)</td>
</tr>
<tr>
<td>Rwh</td>
<td>Filter dust chamber malfunction (indoor)</td>
</tr>
</tbody>
</table>
# Troubleshooting

## Main Code

<table>
<thead>
<tr>
<th>Code</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>R. 1</td>
<td>Capacity setting malfunction (indoor)</td>
</tr>
<tr>
<td>L. 1</td>
<td>Transmission malfunction between main PCB and sub PCB (indoor)</td>
</tr>
<tr>
<td>L. 4</td>
<td>Heat exchanger thermistor malfunction (indoor; liquid)</td>
</tr>
<tr>
<td>L. 5</td>
<td>Heat exchanger thermistor malfunction (indoor; gas)</td>
</tr>
<tr>
<td>L. 6</td>
<td>Suction air thermistor malfunction (indoor)</td>
</tr>
<tr>
<td>L. 7</td>
<td>Discharge air thermistor malfunction (indoor)</td>
</tr>
<tr>
<td>L. 9</td>
<td>User interface thermistor malfunction (indoor)</td>
</tr>
<tr>
<td>E. 1</td>
<td>PCB malfunction (outdoor)</td>
</tr>
<tr>
<td>E. 2</td>
<td>Current leakage detector was activated (outdoor)</td>
</tr>
<tr>
<td>E. 3</td>
<td>High pressure switch was activated</td>
</tr>
<tr>
<td>F. 4</td>
<td>Low pressure malfunction (outdoor)</td>
</tr>
<tr>
<td>E. 5</td>
<td>Compressor lock detection (outdoor)</td>
</tr>
<tr>
<td>E. 4</td>
<td>Fan motor malfunction (outdoor)</td>
</tr>
<tr>
<td>F. 7</td>
<td>Electronic expansion valve malfunction (outdoor)</td>
</tr>
<tr>
<td>F. 3</td>
<td>Discharge temperature malfunction (outdoor)</td>
</tr>
<tr>
<td>F. 4</td>
<td>Abnormal suction temperature (outdoor)</td>
</tr>
<tr>
<td>F. 5</td>
<td>Refrigerant overcharge detection</td>
</tr>
<tr>
<td>H. 3</td>
<td>High pressure switch malfunction</td>
</tr>
<tr>
<td>H. 4</td>
<td>Low pressure switch malfunction</td>
</tr>
<tr>
<td>H. 7</td>
<td>Fan motor trouble (outdoor)</td>
</tr>
<tr>
<td>H. 9</td>
<td>Ambient temperature sensor malfunction (outdoor)</td>
</tr>
<tr>
<td>J. 1</td>
<td>Pressure sensor malfunction</td>
</tr>
<tr>
<td>J. 2</td>
<td>Current sensor malfunction</td>
</tr>
<tr>
<td>J. 3</td>
<td>Discharge temperature sensor malfunction (outdoor)</td>
</tr>
<tr>
<td>J. 4</td>
<td>Heat exchanger gas temperature sensor malfunction (outdoor)</td>
</tr>
<tr>
<td>J. 5</td>
<td>Suction temperature sensor malfunction (outdoor)</td>
</tr>
<tr>
<td>J. 6</td>
<td>De-icing temperature sensor malfunction (outdoor)</td>
</tr>
<tr>
<td>J. 7</td>
<td>Liquid temperature sensor (after subcool HE) malfunction (outdoor)</td>
</tr>
<tr>
<td>J. 8</td>
<td>Liquid temperature sensor (coil) malfunction (outdoor)</td>
</tr>
<tr>
<td>J. 9</td>
<td>Gas temperature sensor (after subcool HE) malfunction (outdoor)</td>
</tr>
<tr>
<td>J. 5</td>
<td>High pressure sensor malfunction (S1NPH)</td>
</tr>
<tr>
<td>L. 1</td>
<td>Low pressure sensor malfunction (S1NPL)</td>
</tr>
<tr>
<td>L. 2</td>
<td>INV PCB abnormal</td>
</tr>
<tr>
<td>L. 4</td>
<td>Fin temperature abnormal</td>
</tr>
<tr>
<td>L. 5</td>
<td>Inverter PCB faulty</td>
</tr>
<tr>
<td>L. 6</td>
<td>Compressor over current detected</td>
</tr>
<tr>
<td>L. 9</td>
<td>Compressor lock (startup)</td>
</tr>
<tr>
<td>L. C</td>
<td>Transmission outdoor unit - inverter: INV transmission trouble</td>
</tr>
<tr>
<td>P. 1</td>
<td>INV unbalanced power supply voltage</td>
</tr>
<tr>
<td>P. 4</td>
<td>Fan reverser malfunction</td>
</tr>
<tr>
<td>P. 7</td>
<td>Capacity setting malfunction (outdoor)</td>
</tr>
<tr>
<td>U. 1</td>
<td>Abnormal low pressure drop, faulty expansion valve</td>
</tr>
<tr>
<td>U. 3</td>
<td>Reversed power supply phase failure</td>
</tr>
<tr>
<td>U. 2</td>
<td>INV voltage power shortage</td>
</tr>
<tr>
<td>U. 3</td>
<td>System test run not yet executed</td>
</tr>
<tr>
<td>U. 4</td>
<td>Faulty wiring indoor/outdoor</td>
</tr>
<tr>
<td>U. 5</td>
<td>Abnormal user interface - indoor communication</td>
</tr>
<tr>
<td>U. 7</td>
<td>Faulty wiring to outdoor/outdoor</td>
</tr>
<tr>
<td>U. 8</td>
<td>Abnormal main-sub user interface communication</td>
</tr>
</tbody>
</table>

## Contents

<table>
<thead>
<tr>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>System mismatch. Wrong type of indoor units combined. Indoor unit malfunction.</td>
</tr>
<tr>
<td>Connection malfunction over indoor units or type mismatch</td>
</tr>
<tr>
<td>Centralised address duplication</td>
</tr>
<tr>
<td>Malfunction in communication centralised control device - indoor unit</td>
</tr>
<tr>
<td>Auto address malfunction (inconsistency)</td>
</tr>
<tr>
<td>Auto address malfunction (inconsistency)</td>
</tr>
</tbody>
</table>

## 14.2 Symptoms that are not air conditioner troubles

Following symptoms are not air conditioner troubles:

### 14.2.1 Symptom: The system does not operate
- The air conditioner does not start immediately after the ON/OFF button on the user interface is pressed. If the operation lamp lights, the system is in normal condition. To prevent overloading of the compressor motor, the air conditioner starts 5 minutes after it is turned ON again in case it was turned OFF just before. The same starting delay occurs after the operation mode selector button was used.
- If “Under Centralized Control” is displayed on the user interface, pressing the operation button causes the display to blink for a few seconds. The blinking display indicates that the user interface cannot be used.
- The system does not start immediately after the power supply is turned on. Wait one minute until the micro computer is prepared for operation.

### 14.2.2 Symptom: Cool/Heat cannot be changed over
- When the display shows (change-over under centralized control), it shows that this is a slave user interface.
- When the cool/heat changeover remote control switch is installed and the display shows (change-over under centralized control), this is because cool/heat changeover is controlled by the cool/heat changeover remote control switch. Ask your dealer where the remote control switch is installed.

### 14.2.3 Symptom: Fan operation is possible, but cooling and heating do not work
Immediately after the power is turned on. The micro computer is getting ready to operate and is performing a communication check with all indoor units. Please wait 12 minutes (max.) till this process is finished.

### 14.2.4 Symptom: The fan speed does not correspond to the setting
The fan speed does not change even if the fan speed adjustment button is pressed. During heating operation, when the room temperature reaches the set temperature, the outdoor unit goes off and the indoor unit changes to whisper fan speed. This is to prevent cold air blowing directly on occupants of the room. The fan speed will not change even when another indoor unit is in heating operation, if the button is pressed.
14.2.5 Symptom: The fan direction does not correspond to the setting

The fan direction does not correspond with the user interface display. The fan direction does not swing. This is because the unit is being controlled by the micro computer.

14.2.6 Symptom: White mist comes out of a unit (Indoor unit)

- When humidity is high during cooling operation. If the interior of an indoor unit is extremely contaminated, the temperature distribution inside a room becomes uneven. It is necessary to clean the interior of the indoor unit. Ask your dealer for details on cleaning the unit. This operation requires a qualified service person.
- Immediately after the cooling operation stops and if the room temperature and humidity are low. This is because warm refrigerant gas flows back into the indoor unit and generates steam.

14.2.7 Symptom: White mist comes out of a unit (Indoor unit, outdoor unit)

When the system is changed over to heating operation after defrost operation. Moisture generated by defrost becomes steam and is exhausted.

14.2.8 Symptom: The user interface display reads “U4” or “U5” and stops, but then restarts after a few minutes

This is because the user interface is intercepting noise from electric appliances other than the air conditioner. The noise prevents communication between the units, causing them to stop. Operation automatically restarts when the noise ceases.

14.2.9 Symptom: Noise of air conditioners (Indoor unit)

- A “zeen” sound is heard immediately after the power supply is turned on. The electronic expansion valve inside an indoor unit starts working and makes the noise. Its volume will reduce in about one minute.
- A continuous low “shah” sound is heard when the system is in cooling operation or at a stop. When the drain pump (optional accessories) is in operation, this noise is heard.
- A “pishi-pishi” squeaking sound is heard when the system stops after heating operation. Expansion and contraction of plastic parts caused by temperature change make this noise.
- A low “sah”, “choro-choro” sound is heard while the indoor unit is stopped. When another indoor unit is in operation, this noise is heard. In order to prevent oil and refrigerant from remaining in the system, a small amount of refrigerant is kept flowing.

14.2.10 Symptom: Noise of air conditioners (Indoor unit, outdoor unit)

- A continuous low hissing sound is heard when the system is in cooling or defrost operation. This is the sound of refrigerant gas flowing through both indoor and outdoor units.
- A hissing sound which is heard at the start or immediately after stopping operation or defrost operation. This is the noise of refrigerant caused by flow stop or flow change.

14.2.11 Symptom: Noise of air conditioners (Outdoor unit)

When the tone of operating noise changes. This noise is caused by the change of frequency.

14.2.12 Symptom: Dust comes out of the unit

When the unit is used for the first time in a long time. This is because dust has gotten into the unit.

14.2.13 Symptom: The units can give off odours

The unit can absorb the smell of rooms, furniture, cigarettes, etc., and then emit it again.

14.2.14 Symptom: The outdoor unit fan does not spin

During operation. The speed of the fan is controlled in order to optimise product operation.

14.2.15 Symptom: The display shows “88”

This is the case immediately after the main power supply switch is turned on and means that the user interface is in normal condition. This continues for one minute.

14.2.16 Symptom: The compressor in the outdoor unit does not stop after a short heating operation

This is to prevent refrigerant from remaining in the compressor. The unit will stop after 5 to 10 minutes.

14.2.17 Symptom: The inside of an outdoor unit is warm even when the unit has stopped

This is because the crankcase heater is warming the compressor so that the compressor can start smoothly.

14.2.18 Symptom: Hot air can be felt when the indoor unit is stopped

Several different indoor units are being run on the same system. When another unit is running, some refrigerant will still flow through the unit.

15 Relocation

Contact your dealer for removing and reinstalling the total unit. Moving units requires technical expertise.

16 Disposal

This unit uses hydrofluorocarbon. Contact your dealer when discarding this unit. It is required by law to collect, transport and discard the refrigerant in accordance with the “hydrofluorocarbon collection and destruction” regulations.