For technical personnel

HITACHI

Split Floor Type Air-Conditioner

Model: RAS/C-L40GHZ

Installation Manual

Please read this manual thoroughly before installing the unit
Installation .......................................................... 1
Installation for Refrigerant Piping ........................................ 2
Installation for Drainage Piping ........................................... 5
Wiring ........................................................................ 5
Refrigerant Infusing ............................................................ 7
Unhook the shims for the handling use ..................................... 7
Accessory ...................................................................... 8
Schematic Diagram ........................................................ 9
Warning ................................................................. Back cover
1 Before installation
Do not open the packing until the unit has been delivered to the installation site.

**Warning:** Be sure that there is no other object inside the indoor or outdoor unit before installation.

2 Initial inspection
(1) The installation site should be accessible for wiring and piping.
(2) Do not install the device in places affected by oil and high temperature steam.
(3) When the air conditioner is installed in the hospital or areas equipped with electric radiating medical machines, attentions should be paid to the following:
   • When installing the air conditioner, do not face the electrical box, controlling wire and switch with electromagnetic source.
   • The air conditioner should be far away from the electromagnetic not less than 3 meters.

3 Indoor unit installation
(1) There should be enough space left around the indoor unit to facilitate the air circulation and future maintenance, see figure 1.
(2) Be sure that the air conditioner is installed in a flat, horizontal and solid place and in accordance with the max.base grade specified in figure 2.
(3) Anti-falling measures
   Since the indoor unit is high and thin, please use the anti-falling plate in the accessory box during installation to avoid overturning, see figure 3.

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade mm</td>
<td>0.4</td>
<td>5</td>
</tr>
<tr>
<td>Grade mm</td>
<td>0.4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Figure 2. The max. base grade**

(4) Do not open the resin panel during installation.
(5) To get an even room temperature, attention must be paid to the installation place so that the air can be evenly distributed.
(6) Do not install the device in an environment rich in acid and kali to prevent the corrosion of exchanger.
(7) Do not install the device in an inflammable environment to prevent explosion accident.

**Warning:** The indoor unit cannot be installed outside, otherwise there maybe electric shocking or leaking due to lack of waterproof design.
4 Outdoor unit installation

(1) The installation area must meet the following requirement:
- Ensure plenty space around the device for convenience of operation and maintenance (see Figure 4).
- An airy and dry environment.
- The operating noise shouldn’t influence the neighbors.
- The air vented from outdoor unit shouldn’t influence the neighbors and ventilation around.
- Ensure the flatness, horizontality and fastness of the foundation for the installation location.
- Avoid high concentration of oil gas, acid and kali gas.
- Shelter is required during installation so as to protect it from direct solarizing and raining. The lower-water point of the shelter should be one meter above the device.

(2) Installation
Fix the unit with ground screw as shown in figure 5. See figure 6 for location of ground screw.

⚠️ Note: After installing the outdoor unit, do not put the packing material or any other flammable objects on it since it is dangerous.

Installation for Refrigerant Piping

1 Specifications for copper pipe: see table 1

<table>
<thead>
<tr>
<th>Outer diameter of copper pipe (mm) X thickness of copper pipe (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gas pipe</strong></td>
</tr>
<tr>
<td>φ 19.05 X 1.0</td>
</tr>
<tr>
<td><strong>Liquid pipe</strong></td>
</tr>
<tr>
<td>φ 9.52 X 0.7</td>
</tr>
</tbody>
</table>

Table 1
2 Connection for copper pipe of indoor and outdoor unit is shown as figure 7:
The altitude difference between indoor and outdoor should not exceed 15 meters.
When the outdoor unit is higher than the one indoor, the copper pipe must be bent
to “oil recover bend” as shown in figure 8.

3 Use the clean copper pipe which is free of accumulated dust and water. Please blow
away the dust inside pipe with nitrogen or other drying air before connection.
4 After installing the pipe, wrap all the connecting area of flare pipe with insulated
gapping cover, as shown in figure 9.
5 Procedures for refrigerant piping connection

- Spread out the pipe part by part, and do not pull with strength to avoid damage.

- Bind the two cooper pipes or together with various connecting wires with insulated plastic tape.

- Bending of the flexible pipe
  The bending shouldn’t exceed 90°
  Try to bend from the middle of pipe and with a bending radius as large as possible.

- Apply slight freezing lubricant on the single opening screw thread, ball valve screw thread as well as the flare part of copper pipe to avoid the damage and enhance the sealing property.

- Fasten it with two pieces of spanners as shown in figure 10.

- Fastening torque see table 2:

<table>
<thead>
<tr>
<th>Outer diameter of copper pipe (mm)</th>
<th>Fastening torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>φ 9.52</td>
<td>40</td>
</tr>
<tr>
<td>φ 19.05</td>
<td>100</td>
</tr>
</tbody>
</table>

- Make sure that the two block valves on the outdoor unit have been totally closed.
- Connect the vacuum pump to the inspecting opening of liquid pipe block valve, and start the vacuum pump to exhaust the air in the connecting pipe and indoor unit until the vacuum degree of pressure is reduced to 756mmHg (more than 20 minutes).

- Open the block valve of gas pipe.
- Open the block valve of liquid pipe.
- Turn on the air conditioner for operation.

- Perform a leak checking with soap water or relative instrument in connection areas of single opening and copper or block valve and copper to make sure there is no leaking.
Installation for Draining Pipe

Installation for indoor draining pipe

(1) Connect the draining pipe (the attached indoor draining pipe can be used) with the water outlet.

(2) The draining pipe should be inclining from inside to outside to facilitate the draining of condensed water.

(3) Please apply the attached adhesive to the connecting area of draining pipe to avoid leaking, see figure 11.

(4) Depending on the actual situation, the piping can pass through the hole of either the back, left or right panel when installing.

(5) Check the draining pipe installed as per requirement to make sure that it works efficiently.

1 Inspection before wiring

(1) Check whether the electrical part (master power switch, fuse, wire, terminal etc.) is in line with the requirement on the nameplate of unit.

(2) Check and make sure that the difference between supply voltage and rated voltage is within 10% of rated voltage.

2 Apply the separate power supply with separate circuit breaker, see figure 12.

3 The earthing should be safe, reliable and correct.

4 Refer to table 3 for details of electrical parameters.
Table 3. Electrical Parameters

<table>
<thead>
<tr>
<th>Specification</th>
<th>Model</th>
<th>RAS/C-L40GHZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase</td>
<td>Indoor Unit</td>
<td>Single phase</td>
</tr>
<tr>
<td></td>
<td>Outdoor Unit</td>
<td>Triple phase</td>
</tr>
<tr>
<td>Rated voltage (V~)</td>
<td>Indoor Unit</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td>Outdoor Unit</td>
<td>380</td>
</tr>
<tr>
<td>Frequency (Hz)</td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>Capacity for breaker (A)</td>
<td>Indoor unit</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Outdoor unit</td>
<td>30</td>
</tr>
<tr>
<td>Wiring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power cord for indoor unit</td>
<td>Cord specifications</td>
<td>flexible cord</td>
</tr>
<tr>
<td></td>
<td>Section mm$^2$</td>
<td>1.5/piece Totally 3 pieces</td>
</tr>
<tr>
<td>Power cord for outdoor unit</td>
<td>Cord specifications</td>
<td>flexible cord</td>
</tr>
<tr>
<td></td>
<td>Section mm$^2$</td>
<td>2.0/piece Totally 4 pieces</td>
</tr>
<tr>
<td>earth cord</td>
<td>Section mm$^2$</td>
<td>1.5</td>
</tr>
<tr>
<td>Connecting wire for indoor/outdoor signal</td>
<td>Cord specifications</td>
<td>flexible cord</td>
</tr>
<tr>
<td></td>
<td>Section mm$^2$</td>
<td>1.0/piece Totally 4 pieces</td>
</tr>
</tbody>
</table>

⚠️ **Note:** The outdoor power cord should meet the min. requirement of chloroprene rubber sheathed flexible cord (cord 57 in IEC245). Hitachi will assume no responsibility for any accidents incurred from the unconformity of power cord.

5 **Indoor wiring**

(1) Remove the lower maintenance panel of indoor unit: Remove the two screws in the lower side of maintenance panel and then pull out the panel downward.

(2) Wiring according to the electrical diagram, as shown in figure 13.

![Figure 13 (for wiring reference only)](image)

Note: " the necessary earthing wire; Make sure that the power cord has been fixed with the cover strip as shown in the figure; Cover back the plastic strip to the terminal board after wiring.
6 Outdoor wiring

![Diagram of wiring connections](image)

Figure 14 (for wiring reference only)

1. Join the connecting cable correctly according to the wiring diagram. (Tightening torque 0.8~1.5N·m).
2. The connecting cables are pressed by wire clamp, and then fixed with screws, as shown in Fig. 14.
3. The earthing wire must be connected to the terminal block marked with "⊕" through yellow/green lead among the connecting cables.

⚠️ Note: Do not connect the power cord to the terminal 1, 2, 4 on the terminal board of indoor/outdoor unit. "⊕" the necessary earthing wire; Make sure that the power cord has been fixed with the cover strip as shown in the figure; Cover back the plastic strip to the terminal board after wiring.

⚠️ Attention: Please verify that it is the null line that connects with the N port of the terminal board.

---

**Refrigerant Infusing**

1. The outdoor unit has been infused with refrigerant before delivery, and more refrigerant need to be infused only when the connecting pipe is longer than 20m.
2. Quantity for refrigerant infusing: 55g refrigerant for every 1m added. The longest piping for this unit is 40m.
3. Procedures for refrigerant infusing:
   1. Perform according to "Procedures for refrigerant piping connection" until the vacuum is higher than 756mmHg.
   2. Open the block valve of gas pipe.
   3. Slightly open the liquid pipe block valve and set the controlling switch at "Cooling" to operate the compressor.
   4. Connect the opening of steel refrigerant bottle to the checking point of liquid block valve and then infuse proper refrigerant.
   5. The liquid pipe block valve must be opened after infusing the refrigerant.

---

**Note:**
1. Place scale the infused refrigerant carefully since accidents will be incurred with either too more or too less refrigerant infused.
2. There should be no air permeated into the pipe when infusing the refrigerant.
<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Quantity</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connecting pipe φ 9.52(including nozzle, insert, heating cover and transitional joint)</td>
<td>1</td>
<td>The length of connecting copper pipe is five meters, user purchases as the case may be.</td>
</tr>
<tr>
<td>2</td>
<td>Connecting pipe φ 19.05 (including nozzle, insert, heating cover and transitional joint)</td>
<td>1</td>
<td>Do not tilt during the installation of the indoor unit.</td>
</tr>
<tr>
<td>3</td>
<td>Anti-inclining plate</td>
<td>1</td>
<td>Installed on the top of indoor unit</td>
</tr>
<tr>
<td>4</td>
<td>Anti-falling plate</td>
<td>2</td>
<td>Do not tilt during the installation of the indoor unit.</td>
</tr>
<tr>
<td>5</td>
<td>Tapping screw ST4 x 25</td>
<td>8</td>
<td>Install on the hole of wall</td>
</tr>
<tr>
<td>6</td>
<td>Tapping screw ST4 x 10</td>
<td>4</td>
<td>Connect with the indoor draining outlet</td>
</tr>
<tr>
<td>7</td>
<td>Washer φ 18 x φ 5 x 1</td>
<td>8</td>
<td>Weep hole in the chassis of the outdoor unit</td>
</tr>
<tr>
<td>8</td>
<td>Pipe cover for the hole of wall</td>
<td>1</td>
<td>For piping installation</td>
</tr>
<tr>
<td>9</td>
<td>Draining pipe for indoor unit φ 25 x 2000</td>
<td>1</td>
<td>For the place where the draining pipe and indoor unit are connected</td>
</tr>
<tr>
<td>10</td>
<td>Plug for outdoor drain hole</td>
<td>1</td>
<td>Power wiring</td>
</tr>
<tr>
<td>11</td>
<td>Adhesive</td>
<td>1</td>
<td>Installed on the piping hole</td>
</tr>
<tr>
<td>12</td>
<td>Insulated gapping bush</td>
<td>2</td>
<td>For wrapping all the connecting area of flare pipe</td>
</tr>
<tr>
<td>13</td>
<td>Nylon fastening strip</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Rubber ring for wiring hole</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Insulated tape</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Hole protection ring nearby the piping</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Insulated plastic strip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Insulated gapping bush</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>nylon fastening strip</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>
Working Schematic Diagram of Refrigerant
warning

Do not operate the air conditioner with any function when perform the following checks.
(1) Check whether the terminal resistor of ground and power cord is above 2 MΩ. If not, do not operate the air conditioner with any function until the problem is found and solved.
(2) Check whether the ball valve of indoor/outdoor unit has been fully opened. Operate the air conditioner only after the valve has been fully opened.

Pay attention to the following during operation of the air conditioner:
(1) Do not touch any part of the ventilating panel. Since the temperature of compressor compartment and piping on the ventilating panel will exceed 90°C.
(2) Do not press the electromagnetic contact switch. Otherwise severe accidents will be incurred.
When the figure of the low pressure meter of the refrigeration system is below 0 Pa, the compressor should not run more than 50 seconds or damage will be committed.