①EN

FOR SERVICE PERSONNEL ONLY

HITACHI
OUTDOOR UNIT INSTALLATION MANUAL

MODEL HFC R410A **RAC-35WPC RAC-50WPC**

- Carefully read through the procedures of proper installation before starting installation work.
- The sales agent should inform customers regarding the correct operation of installation.

Tools Needed For Installation Work

(Mark◉ is exclusive use tool for R410A) ⊕ ⊖ Screwdriver ・ Measuring Tape ・ Knife ・ Saw ・ ø65mm PowerDrill ・ Hexagonal Wrench Key (⇕⇔4mm) ・ Wrench(14,17,19,22mm) ◉ Gas leakage Detector ・ PipeCutter ・ Putty ・ Vinyl Tape ・ Pliers ・ Flare Tool ◉ Vacuum Pump Adapter ◉ Manifold Valve ◉ Charge Hose ◉ Vacuum Pump

SAFETY PRECAUTION

- Read the safety precautions carefully before operating the unit.
- The contents of this section are vital to ensure safety. Please pay special attention to the following sign.
  - ⚠ **WARNING ..... Incorrect methods of installation may cause death or serious injury.**
  - ⚠ **CAUTION ..... Improper installation may result in serious consequence.**
  - ⏚ **Make sure to connect earth line.**
  - ⃠ **This sign in the figures indicates prohibition.**

Be sure that the unit operates in proper condition after installation. Explain to customer the proper operation and maintenance of the unit as described in the user' s guide. Ask a customer to keep this installation manual together with the instruction manual.

⚠ WARNING

- Please request your sales agent or qualified technician to install your unit. Water leakage, short circuit or fire may occur if you do the installation work yourself.
- Please observe the installation stated in the installation manual during the process of installation. Improper installation may cause water leakage, electric shock and fire.
- Make sure that the units are mounted at locations which are able to provide full support to the weight of the units. If not, the units may collapse and impose danger.
- Observe the rules and regulations of the electrical installation and the methods described in the installation manual when dealing with the electrical work. Use cables which are approved official in your country. Be sure to use the specified circuit. A short circuit and fire may occur due to the use of low quality wire or improper work.
- Be sure to use the specified cables for connecting the indoor and outdoor units. Please ensure that the connections are tight after the conductors of the wire are inserted into the terminals to prevent the external force is being applied to the connection section of the terminal base. Improper insertion and loose contact may cause over-heating and fire.
- Please use the specified components for installation work. Otherwise, the unit may collapse or water leakage, electric shock, fire or stronger vibration may occur.
- Be sure to use the specified piping set for R410A. Otherwise, this may result in broken copper pipes or faults.
- When installing or transferring an air conditioner to another location, make sure that air other than the specified refrigerant (R410A) does not enter the refrigeration cycle. If other air should enter, the pressure level of the refrigeration cycle may increase abnormally which could result in a rupture and injury.
- Be sure to ventilate fully if a refrigerant gas leak while at work. If the refrigerant gas comes into contact with fire, a poisonous gas may occur.
- After completion of installation work, check to make sure that there is no refrigeration gas leakage. If the refrigerant gas leaks into the room, coming into contact with fire in the fan-driven heater, space heater, etc., a poisonous gas may occur.
- Unauthorized modifications to the air conditioner may be dangerous. If a breakdown occurs please call a qualified air conditioner technician or electrician. Improper repairs may result in water leakage, electric shock and fire, etc.
- Be sure to connect the earth line from the power supply wire to the outdoor unit and between the outdoor and indoor unit. Do not connect the earth line to the gas tube, water pipe, lighting rod or the earth line of the telephone unit. Improper earthing may cause electric shocks. ⏚
- When finishing the refrigerant collection (pumping down), stop the compressor and then remove the coolant pipe. If you remove the refrigerant pipe while the compressor is operating and the service valve is released, air is sucked and a pressure in the freezing cycle system will build up steeply, causing an explosion or injury.
- When installing the unit, be sure to install the refrigerant pipe before starting the compressor. If the refrigerant pipe is not installed and the compressor is operated with the service valve released, air is sucked and the pressure level of the refrigeration cycle may increase abnormally which could result in a rupture and injury.
- The electric cables should neither be reworked nor added. Make sure to use an exclusive circuit breaker. Otherwise fire or electric shock might occur by connection failure, isolation failure or over current.
- Make sure to connect cables to terminal properly and terminal cover should close firmly. Otherwise, over heating at terminal contact, fire or electric shock might occur.
- Make sure that there is no dust on any connected points of electric cables and fix firmly. Otherwise, fire or electric shock might occur.

⚠ CAUTION

- A circuit breaker must be installed in the house distribution box for the direct connected power supply cables to the outdoor unit. In case of other installations a main switch with a contact gap or more than 3mm has to be installed. Without a circuit breaker, the danger of electric shock exists.
- Do not install the unit near a location where there is flammable gas. The outdoor unit may catch fire if flammable gas leaks around it.
- Please ensure smooth flow of water when installing the drain hose. Improper installing may wet your furniture.
- An IEC approved power cord should be used. Power cord type: NYM.

THE CHOICE OF MOUNTING SITE

(Please note the following matters and obtain permission from customer before installation.)

⚠ WARNING

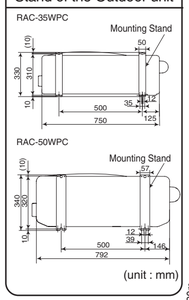
- The Outdoor unit must be mounted at a location which can support heavy weight. Otherwise, noise and vibration will increase.

⚠ CAUTION

- Selecting the installation location: Suitable location that will reduce the impact from rain and direct sun that may affect the unit performance. Besides, ventilation must be good and clear of obstruction .
- The air blown out of the unit should not point directly to animals or plants.
- The clearances of the unit from top,left,right and front are specified in figure below . At least three of the above sides must be open air .
- Be sure that the hot air blown out of the unit and noise do not disturb the neighbourhood.
- Do not install at a location where there is flammable gas, steam, oil and smoke.
- The location must be convenient for water drainage.
- Place the Outdoor unit and its connecting cord at least 1m away from the antenna or signal line of television, radio or telephone. This is to avoid noise interference.

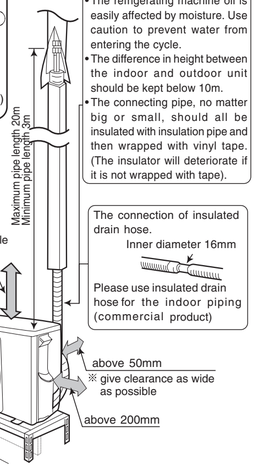
Figure showing the Installation of Outdoor Unit.

Dimension of Mounting Stand of the Outdoor unit



Names of Outdoor Components

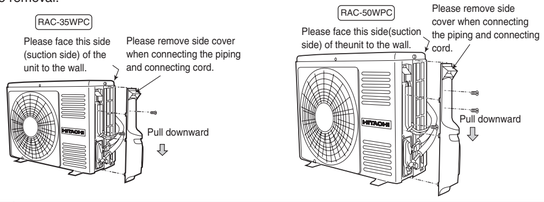
No.	Item	Qty
①	Drain Pipe	1
②	Bush (35WPC)	1
	Bush (50WPC)	2



- The refrigerating machine oil is easily affected by moisture. Use caution to prevent water from entering the cycle.
- The difference in height between the indoor and outdoor unit should be kept below 10m.
- The connecting pipe, no matter big or small, should all be insulated with insulation pipe and then wrapped with vinyl tape. (The insulator will deteriorate if it is not wrapped with tape).

The connection of insulated drain hose.
Inner diameter 16mm
Please use insulated drain hose for the indoor piping (commercial product)

- Please mount the Outdoor unit of stable ground to prevent vibration and increase of noise level.
- Decide the location for piping after sorting out the different types of pipe available.
- When removing side cover, please pull the handle after undoing the hook by pulling it downward. Reinstall the side cover in the reverse order of the removal.

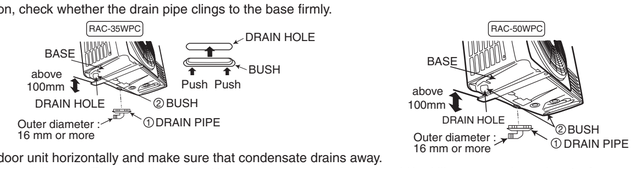


⚠ CAUTION

- Do not touch the suction port, bottom surface,or aluminum fin of the outdoor unit.Failure to do so may cause an injury.

CONDENSED WATER DISPOSAL OF OUTDOOR UNIT

- There is holes on the base of Outdoor unit for condensed water to exhaust.
- In order to flow condensed water to the drain, the unit is installed on a stand or a block so that the unit is 100mm above the ground as shown figure. Join the drain pipe to one hole.
- After installation, check whether the drain pipe clings to the base firmly.



- Install the outdoor unit horizontally and make sure that condensate drains away.
- In case of using in chilly area. Especially, in case that there are many snows by very cold in chilly area, condensed water freezes on the base and may result not to drain. In this case, please remove the bush and the drain pipe at the bottom of unit.(Left and center near discharge portion of air, each 1 place).It becomes smooth drain.Ensure that the distance from the drain hole to the ground is 250 mm or more.

Drain hose

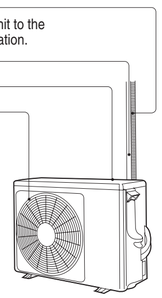
Drains the dehumidified water from the indoor unit to the outdoor during “cooling” or “dehumidifying” operation.

Piping and Wiring

Air inlets (Rear and left sides)

Air outlet

When“heating”operation is performed, cool air blows and when “cooling” or “dehumidifying” operation is performed, warm air blows.



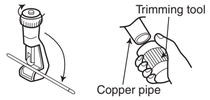
About the outdoor unit:
- When “Stop” is selected during operation of the indoor unit, the fan of the outdoor unit continues turning for 10 to 60 seconds to cool the electric parts down.
- In heating operation, condensate or water due to defrosting will flow. Do not cover the drain port of the outdoor unit because such water may freeze in the chilly area.
- When the outdoor unit is hung on the ceiling, install the bush and drain pipe on the drain port and drain water.

MODEL	WIDTH (mm)	HEIGHT (mm)	DEPTH (mm)
RAC-35WPC	750	548	288
RAC-50WPC	792	600	299

INSTALLATION OF REFRIGERATING PIPES AND AIR REMOVAL

1 Preparation of Pipe

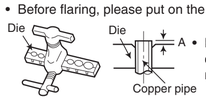
- Use a pipe cutter to cut the copper pipe and remove burr.



⚠ CAUTION

- Remove burr and jagged edge will cause leakage.
- Point the side to be trimmed downwards during trimming to prevent copper chips from entering the pipe.

- Before flaring, please put on the flare nut.



- Please use exclusive tool for refrigerant R410A.

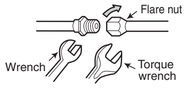
Outer Diameter (Ø)	A (mm) Rigid Flaring Tool For R410A tool	For R22 tool
6.35 (1/4")	0 - 0.5	1.0
9.52 (3/8")	0 - 0.5	1.0
12.7 (1/2")	0 - 0.5	1.0

2 Pipe Connection

⚠ CAUTION

- In case of removing flare nut of a indoor unit, first remove a nut of small diameter side, or a seal cap of big diameter side will fly out. Free from water into the piping when working.
- Be sure to tighten the flare nut to the specified torque with a torque wrench. If the flare nut is overtightened, the nut may be split after a long period has passed, and may cause a refrigerant leak.

- Please be careful when bending the copper pipe.
- Screw in manually while adjusting the center. After that, use a torque wrench to tighten the connection.



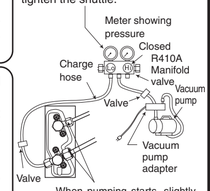
		Outer diameter of pipe (ø)	Torque N·m (kgf·cm)
Small diameter side		6.35 (1/4")	13.7-18.6 (140 - 190)
Large diameter side		9.52 (3/8")	34.3-44.1 (350 - 450)
		12.7 (1/2")	44.1-53.9 (450 - 550)
Valve head cap	Small diameter side	6.35 (1/4")	19.6-24.5 (200 - 250)
	Large diameter side	9.52 (3/8")	19.6-24.5 (200 - 250)
		12.7 (1/2")	29.4-34.3 (300 - 350)
Valve core cap			12.3-15.7 (125 - 160)

3 Remove of Air From The Pipe And Gas Leakage Inspection

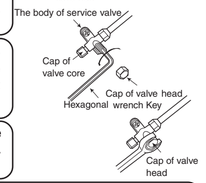
Procedures of using Vacuum Pump for Air Removal

1. As shown in right figure, remove the cap of valve core. Then, connect the charge hose. Remove the cap of valve head. Connect the vacuum pump adapter to the vacuum pump and connect the charge hose to the adapter.
2. Fully tighter the "Hi" shuttle of the manifold valve and completely unscrew the "Lo" shuttle. Run the vacuum pump for about 10-15 minutes, then completely tighten the "Lo" shuttle and switch off the vacuum pump.
   - Loosen the spindle of the service valve with small diameter by 1/4 turn and tighten the spindle immediately after 5 to 6 seconds.
   - Remove the charging hose from the service valve.
3. Completely unscrew the spindle of the service valve (at 2 places) in anticlockwise direction to allow the flow of refrigerant (using Hexagonal Wrench key).
4. Tighten the cap of valve head. Check the cap's periphery if there is any gas leakage. The task is then completed.

When the meter reaches - 101KPa (-76cmHg) during pumping fully tighten the shuttle.

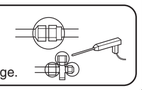


When pumping starts, slightly loosen the flare nut to check of air sucked in. Then tighten the flare nut.



Gas leakage inspection

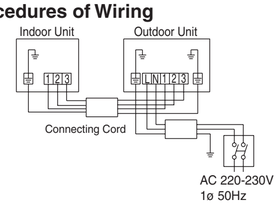
Please use gas leakage detector to check if leakage occurs at connection of Flare nut as shown on the right. If gas leakage occurs, further tighten the connection to stop leakage.



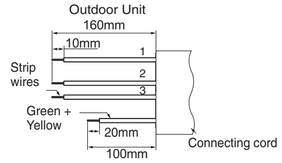
CONNECTION OF POWER CORD

⚠ WARNING • THIS APPLIANCE MUST BE EARTHED.

Procedures of Wiring



Detail of Cutting the Connecting Cord

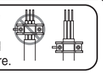


⚠ WARNING

- The naked part of the wire core should be 10mm fix it to the terminal tightly. Then try to pull the individual wire to check if the contact is tight. Improper insertion may burn the terminal.
- Be sure to use only wire specified for the use of air-conditioner.
- Please refer to the manual for wire connection and the wiring technique should meet the standard of the electrical installation.
- There is an AC voltage drop between the LN terminal if the power is on. Therefore, be sure to remove the plug from its socket.
- When the fuse (F5 or F6) has been blown out by the improper connection of power cable, it can be restored by the attached reserve fuse. Please exchange the blown-out fuse after making sure the right connection.

⚠ WARNING

- Leave some space in the connecting cord for maintenance purpose and be sure to secure it with the cord band.
- Secure the connecting cord along the coated part of the wire using the cord band.Do not exert pressure on the wire as this may cause overheating or fire.



Wiring of the Outdoor Unit

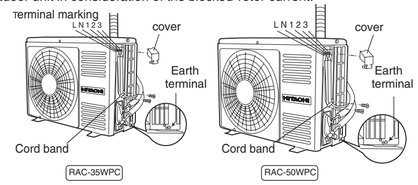
- Please remove the side cover for wire connection.

⚠ WARNING

- If you cannot attach the side plate due to the connection cord, please press the connecting cord in the direction to the front panel to fix it.
- Be sure that the hooks of the side cover fixed in certainly. Otherwise water leakage may occur and this causes short circuit or faults.
- The connecting cord should not touch to service valve and pipes. (it becomes high temperature in heating operation.)

Checking for the electric source and the voltage range

- Before installation, the power source must be checked and necessary wiring work must be completed. To make the wiring capacity proper, use the wire gauge list below for the wiring from house distribution fuse box to the outdoor unit in consideration of the blocked rotor current.



- Investigate the power supply capacity and other electrical conditions at the installing location. Depending on the model of room air conditioner to be installed, request the customer to make arrangements for the necessary electrical work etc. The electrical work includes the wiring work up the outdoor unit. In localities where electrical conditions are poor, use of a voltage regulation is recommended.
- Install outdoor for the room air conditioner within the reaching range of the line cord.

IMPORTANT

Fuse Capacity	
RAC-35WPC	15A time delay fuse
RAC-50WPC	25A time delay fuse

Wire length	Wire cross-section
up to 6m	1.5mm²
up to 15m	2.5mm²
up to 20m	4.0mm²

FINAL STAGE OF INSTALLATION

Power Source And Operation Test

Power Source

⚠ WARNING

- Never remodel the power plug nor extend the long-distance cord.
- Keep additional length for the power cord and do not render the plug under external force as this may cause poor contact.
- Do not fix the power cord with U-shape nail.
- The power cable easily generates heat. Do not bring the cable together with a wire or vinyl tie.

Operation test

- Please ensure that the air conditioner is in normal operating condition during the operation test.
- Explain to your customer the proper operation procedures as described in the user' s manual.
- If the indoor unit won't operate, check the cable for correct connection.
- Turn on the lamp in the room where the indoor unit is installed and check the remote controller for normal operation.