FOR SERVICE PERSONNEL ONLY

HITACHI

HITACHI SPLIT-UNIT AIR CONDITIONER **INSTALLATION MANUAL**

Indoor Unit RAS-60YHA4



Outdoor Unit RAC-60YHA4

· 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 tool exclusive use for R410A)
- Pliers or Wrench
 Torque Wrench
 Gas Leakage Detector
 Manifold Valve
 Charge Hose

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.
 - MARNING Incorrect methods of installation may cause death or serious injury.
 - Be sure that the unit operates in proper condition after installation. Explain to customer the proper way of operating the unit as described in the user's guide

- 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,
- Observe the rules and regulations of the electrical installation and the methods described in the installation manual when dealing with the electrical work. Use power cables approved by the authorities of your country.
- after the conductors of the wire are inserted into the terminals. Improper insertion and loose contact may cause over-heating
- and fire may occur
- Be sure to use the specified piping set for R410A. Otherwise, this may result in broken copper pipes or faults
- to remain in the refrigeration cycle. Otherwise, pressure in the refrigeration cycle may become abnormally high that may cause rupture to the refrigeration cycle
- . Be sure to ventilate fully if a refrigerant gas leak while at work. If the refrigerant gas comes into contact with fire, a poisonous
- 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.
- contact separation of at least 3mm must be present.
- 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.
- Do not install the indoor unit in a machine shop or kitchen where vapor from oil or its mist flows to the indoor unit. The oil will deposit on the heat exchanger, thereby reducing the indoor unit performance and may deform and in the worst case break the plastic parts of the indoor unit.
- Please ensure smooth flow of water when installing the drain hose

THE CHOICE OF MOUNTING SITE (Please note the following matters and obtain permission from customer before installation).

o

⚠ WARNING

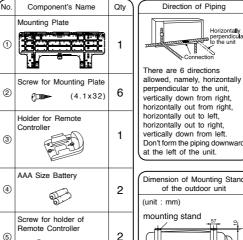
• The unit should be mounted at stable, non-vibratory location

⚠ CAUTION

- No nearby heat source and no obstruction near the air outlet is
- The clearance distances from top, right and left are specified in figure below.

 The location must be convenient for water drainage and pipe
- connection with the outdoor unit. To avoid interference from noise please place the unit and its
- To avoid any error in signal transmission from the remote controller
- please put the controller far away from high-frequency machines and high-power wireless systems The installation height of indoor unit must be 2.3m or more.

Names of Indoor Components



Names of Outdoor Components

6

7

2 Installation of the Indoor Unit

VERTICALLY DOWNWARD PIPING

Pull out the pipe, connecting cord and drain hose.

• The upper part of the indoor unit is hanged on the mounting plate.

Lift the body

then force it

downwards.

Push up the (PUSH) sections at the bottom of the indoor unit and

 pull the bottom plate towards you. Then the claws are released from

(The (PUSH) sections are indicated by 2 arrows in the right figure)

Change of Drain Hose and Installation Procedures.

of the unit

• The projection at the lower part of the indoor unit is hooked onto the mounting plate.

HOW TO REMOVE INDOOR UNIT

• Exchange the location of drain hose and drain cap during horizontal piping as shown in

figure below. Be sure to plug in the drain hose until the insulating material folds upon itself.

Preparation

Installation

Protection >

Preparation

Connect connecting cord.

Pipe

Drain Hose

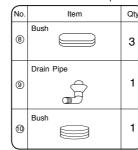
HORIZONTAL PIPING

Please use pliers to pul

(This is an easier way to

remove the drain cap)

out the drain cap.



Connecting cords, pipe

and drain ho

must be laid

Vinyl tape.

⚠ CAUTION

Please pull the lower part of

the indoor unit outwards to

check if the unit is hooked

onto the mounting plate. Improper installation may cause vibration and noise.

D

∴ CAUTION

For horizontally out to right piping

GOOD

For right piping, follow the instruction as belo

✗ BAD

ng from left to right directly

INSTALLATION OF REFRIGERATING PIPES AFTER CONNECTION

The refrigerating pipes should be adjusted to fit into the hole on the wall and then ready for further connection.

The terminals of 2 connected pipes must be covered with insulator used for terminal connection. Then the pipes are wrapped with insulation pipe. Connect the connecting cord after removing electrical

cover. (Refer to "CONNECTION OF POWER CORD")
After adjustment, fit the connecting cord and pipes into the space available under the indoor unit.

• When connection is at left side, refrigerating pipe and cabinet shall be tied together.
Failing to do so may cause the unit bottom side become

Excess binder shall be cut to prevent abnormal sound

THE CONNECTION OF REFRIGERATING PIPE DURING THE

Preparation To Install Refrigerating Pipes

- The refrigerating pipes and connecting cord
- arrangement are attached. • The end of the refrigerating pipes are at locations
- marked with " ∇ " symbol.



• Wrap the refrigerating pipes with insulation pipe after connecting refrigerating pipe.

Connect the connecting cord after removing electrical cover. (Refer to "Connection of Power Cord")

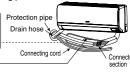
• After adjustment, the connecting cord and refrigerating pipes

are placed into the space available under the Indoor unit. • The projection of Indoor unit must hook to the mounting plate

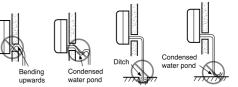








Installation of Drain Hose



You are free to choose the side (left or right) for the installation of drain hose. Please ensure the smooth flow of condensed water of the Indoor

- - ↑ CAUTION Improper installation may result in serious consequence.

⚠ WARNING

- Please request your sales agent or qualified technician to install your unit. Water leakage, short circuit or fire may occur if
- Please observe the instructions stated in the installation manual during the process of installation. Improper installation may
- the units may collapse and impose danger.
- Be sure to use the specified wire for connecting the indoor and outdoor units. Please ensure that the connections are tight
- Please use the specified components for installation work. Otherwise, the units may collapse or water leakage, electric shock
- When installing or removing an air conditioner, only specified refrigerant (R410A) shall be allowed, do not allow air or moisture.
- After completion of installation work, check to make sure that there is no refrigeration gas leakage. If the refrigerant gas

⚠ CAUTION

- A circuit breaker must be installed. Without a circuit breaker or fuse the danger of electric shock exists. The external switch shall be incorporated to completely disconnect from power supply. It should disconnect all poles, and a

- Piping shall be suitable supported with a maximum spacing of 1m between the supports.

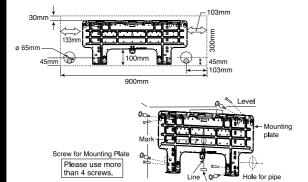
1 Installation of Hanger, Wall Penetration and Installation of Protection Pipe

⚠ CAUTION

• The draining of the water container inside the indoor unit can be done from the left. Therefore the mounting plate must be fixed horizontally or slightly tilted towards the side of drain hose. Otherwise, condensed water may overflow the water container.

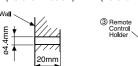
Direct Mounting On The Wall

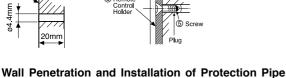
Please use hidden beams in the wall to hold the mounting plate



Procedures of Installation and Precautions

- Procedures to fix the mounting plate.
- 1. Drill holes on wall. 2. Push plug into the holes. 3. Fix the mounting plate on wall (As shown below) (As shown below)
 - with 4.1 x 32 screw (As shown in figure below
- Procedures to fix the holder of remote control 1. Drill holes on wall. 2. Push plug into the holes. (As shown below)



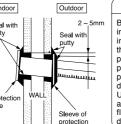


wall which is slightly tilted towards the outdoor side Drill the wall at a small Cut the protection pipe

thickness Empty gap in the sleeve of protection pipe should putty to avoid dripping of

<IA1367:(A)>

according to the wall



⚠ WARNING Be sure that the wire is no

in contact with any meta in the wall. Please use the protection pipe as wire passing through the hollow part of the wall so as to prevent the possibility of damaged by mouse. Unless it seals completely any air with high humidity flows from outdoor and dew may drop.

Remove the cap for

be fully tightened by pushing with Hexagonal wrench key when changing

Drain cap shall



Condensed water may leak out if not

Drain hose

INS RAS-RAC-60YHA4 (EN) 1

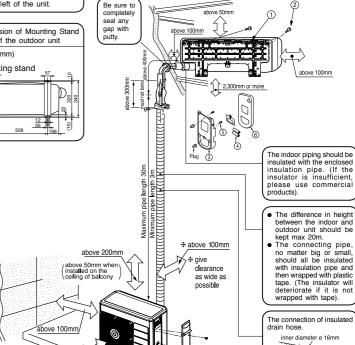


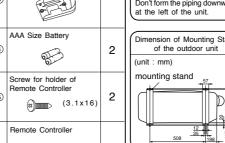
- The outdoor unit must be mounted at a location which can support heavy weight. Otherwise, noise and vibration will increas
 - **⚠** CAUTION
- · Selecting the installation location: Suitable location that will reduce the
- Selecting the installation occurrence of the selection of the selecti in figure below. At least 3 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
- The location must be convenient for water draina
- Place the outdoor unit and its connection wire at least 1m away from the antenna or signal line of television, radio or telephone. This is to avoid the control of the Do not install outdoor unit facing strong wind direction. It may damage
- the fan motor. Do not install the outdoor unit in a place where small animals may build.
- their nests. If small animal goes inside the unit and touches the electrical parts, failure of the unit, smoke or fire may be caused. Request your customer to keep the surrounding of the unit is clean.

Figure showing the Installation of Indoor and Outdoor Unit.

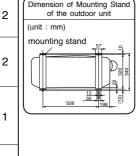
A CAUTION

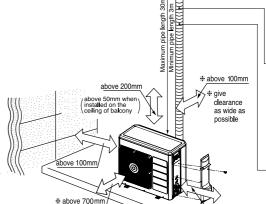
In case the pipe length is more than 20m, add refrigerant R410A at 10 gram per every meter exceeds. However, pipe length shall not exceed 30m

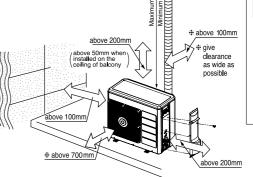


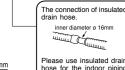


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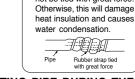




not be tied with great force.

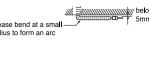






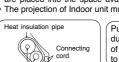
INSTALLATION OF INDOOR UNIT ⚠ CAUTION

· Please fix in the plastic core after flaring to avoid copper chips entering the pipes.

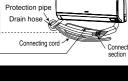


Installation

Hang the Indoor unit onto the mounting plate. Use the temporary 15cm forwards Place the drain hose through the hole on the wall.





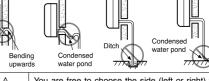


⚠ CAUTION

Be sure that the

loosely connected





CAUTION unit during installation. (Carelessness may result in water leakage.)

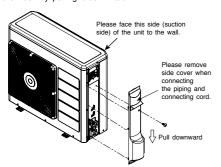
Drain hose



(

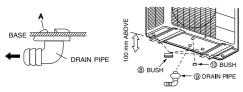
Decide the location for piping after sorting out the different types of pipe available.

 When removing side cover, please pull the handle after undoing the hook by pulling it downward.



CONDENSED WATER DISPOSAL OF OUTDOOR UNIT

- There are holes on the base of Outdoor unit for condensed OUTDOO 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.
 - At first insert one portion of the hook to the base (Portion A) then pull the drain pipe in the direction shown by the arrow while inserting the hook into the base. After installation, check whether the drain pipe cling to the base firmly.



When Using and Installing In Cold Areas

When the air conditioner is used in low temperature and in snowy conditions, water from the heat exchanger may freeze on the base surface to cause poor drainage. When using the air conditioner in such areas, do not install the bushings. Keep a minimum of 250mm between the drain hole and the ground. When using the drain pipe, consult your sales agent.

* For more details, refer to the installation Manual for Cold Areas

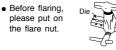
1 Preparation of Pipe

• Use a pipe cutter to cut the copper pipe.

⚠ CAUTION

• Jagged edge will cause leakage.

 Point the side to be trimmed downwards during trimming to prevent copper chips from entering the pipe.



REMOVAL

AIR

AND

PIPES

GERATING

0F

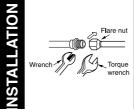


	Thickness (mm)	A (mm)		
Outer Diameter (mm)		Flare tool for R410A	Conventional flare tool	
		Clutch type	Clutch type	Wing nut type
6.35 (1/4)	0.8	0.0 ~ 0.5	1.0 ~ 1.5	1.5 ~ 2.0
9.52 (3/8)	0.8	0.0 ~ 0.5	1.0 ~ 1.5	1.5 ~ 2.0
12.70 (1/2)	0.8	0.0 ~ 0.5	1.0 ~ 1.5	1.5 ~ 2.5
15.88 (5/8)	1.0	0.0 ~ 0.5	1.0 ~ 1.5	1.5 ~ 2.5

2 Pipe Connection

In case of removing flare nut of an Indoor unit, first remove a nut of

CAUTION small diameter side, or a seal cap of big diameter side will fly out. Prevent water from entering into the piping when working.



			Outer diameter of pipe	Torque N.m (kgf • cm)
	Small dia. side		6.35 (1/4")	13.7 ~ 18.6 (140 ~ 190)
	Large dia. side		9.52 (3/8") 12.7 (1/2") 15.88 (5/8")	34.3 ~ 44.1 (350 ~ 450) 44.1 ~ 53.9 (450 ~ 550) 49 ~ 58.8 (500 ~ 600)
n	Valve head cap	Small dia. side	6.35 (1/4")	19.6 ~ 24.5 (200 ~ 250)
		Large dia. side	9.52 (3/8") 12.7 (1/2") 15.88 (5/8")	19.6 ~ 24.5 (200 ~ 250) 29.4 ~ 34.3 (300 ~ 350) 29.0 ~ 31.0 (296 ~ 316)
		Valve core cap	12.3 ~ 15.7 (125 ~ 160)	

3 Removal Of Air From The Pipe And Gas Leakage Inspection

lures of using Vacuum Pump for Air Removal

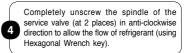
As shown in right figure, remove the cap of valve core. Then, connect the charge hose. Remove the cap of valve head. Connect the vacuum pump adapter to the vacuum pump and connect the charge hose to the adapter.

Fully tighten the "Hi" knob of the manifold valve and completely unscrew the "Lo" knob. Run the vacuum pump for about 10~15minutes, then completely tighten the "Lo" knob and switch off the vacuum pump.

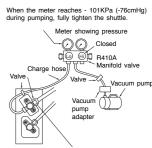
REMOVA

AIR

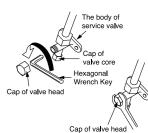
Remove the charge hose and tighten the cap of valve core. Check the cap's periphery if there is any gas leakage.



Re-cap the service valve and tighten using



flare nut to check of air sucked in. Then

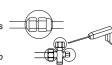


wrench. Check the cap's periphery if there is any gas leakage. The task is then completed.

Gas Leakage Inspection

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

If gas leakage occurs, further tighten the connection to stop leakage. (Use the detector provided for R410A)



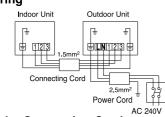


POWER

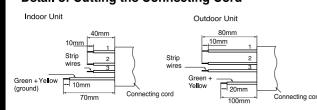
OF

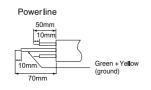
• THIS APPLIANCE MUST BE EARTHED

Procedures of Wiring



Detail of Cutting the Connecting Cord 10 50Hz



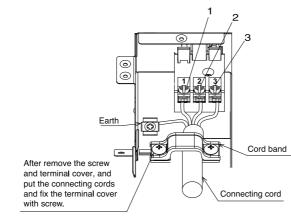


A WARNING

- 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
- 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.

Wiring of The Indoor Unit

- For wire connection of the Indoor unit, you need to remove the front cover, the low cover under the body of the unit and terminal cover
- · Remove the cover from the terminal base and screw the cable



Method to remove electrical cover

- · Remove the screw and electrical cover. • Insert the connecting cord (1, 2, 3) from the back of unit.

▲ 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.

How to connect the optional parts

(RAC Adapter, Dry contact, Wired Remote Controller, Run status)

For cable connection to control P.W.B., you need to remove front cover and electrical box cover.

Each connecting location is as below ① Dry contact : CN6

② H-LINK: CN7

③ Wired Remote Controller : CN20

④ Run status : CN25 Please check and confirm manuals attached to each optional parts for more connection details.

You can refer to this installation manual how to remove and re-attach the front cover. Please be careful not to damage lead wires by edge of plate when connecting the optional parts

Wiring of the Outdoor Unit

Please remove the side cover for wire connection.



- 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

CN7

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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 locked
- 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.

⚠ CAUTION

Please use a new socket. Accident may occur due to the use of old socket because

ullet Please plug in and then remove the plug for 2 - 3 times. This is to ensure that the

• Keep additional length for the power cord and do not render the plug under external

• 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.

For (Power cord - L. N. Earth) Wire cross-section 2.5 mm²

For (Connecting cord - 1, 2, 3, Earth) Wire length Wire cross-section up to 30 m 1.5 mm²

3 Power Source And Operation Test

plug is completely plugged into the socket.

force as this may cause poor contact. Do not fix the power cord with U-shape nail.

⚠ WARNING

Power Source

of poor contact.

Operation Test

BURST HAZARD
Do not allow air, etc. to get into refrigerant cycle (piping)

removing refrigerant pipes.

All service valve must be fully closed after pumping down operation.

RISK OF EXPLOSION

IMPORTANT Circuit Breaker

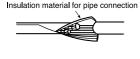
CAUTION 20A

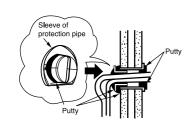
Outdoor supply cords shall not be lighter than polychloroprene sheathed flexible cord with code designation 60245 IEC 57

Earth

1 Insulation And Maintenance Of Pipe Connection

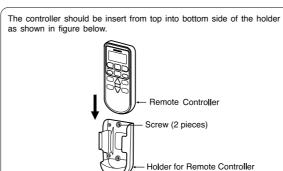
- and then tied up with rubber strap.
- Please tie the pipe and power line together with vinyl tape as shown in the figure showing the installation of indoor and outdoor units. Then fix their position with holders.
- To enhance the heat insulation and to prevent water condensation, please cover the outdoor part of the drain hose and pipe with insulation pipe.
- Completely seal any gap with putty.





2 Installation Of Remote Controller

controller can be placed in its holder which is fixed on wall or be • To operate the remote controller at its holder, please ensure that the unit can receive signal transmitted from the controller at the place where the holder is to be fixed. The unit will beep when signal is received from the remote controller. The signal transmission is weaken by the florescent light. Therefore, during the installation of the remote control holder, please switch on the light, even during day time, to determine the mounting location of the holder.



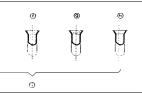
- How to check pipe bending.
- Compare bended pipe with the picture below.
- (a) all areas are smooth, no notching area (b) no scratch or mark inside
- © all have the same length
- slanting
- If bended pipe is not good enough, cut bended area and bend it again
- - (f) there are scratches around bending area (g) crack

(i) sample of bending pipe cannot be used

(h) different length







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FINAL STAGE OF INSTALLATION