

TOSHIBA

AIR CONDITIONER (MULTI-SPLIT TYPE)

Installation Manual

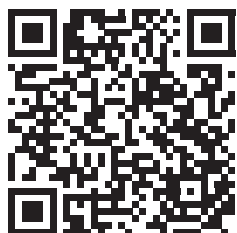
R32

INVERTER

Outdoor Unit

Model name:

RAS-2M60S4AVG-ND



Scan QR CODE to access installation and owner's manual on website.

<https://www.toshiba-carrier.co.th/manuals/default.aspx>

Manual are available in EN/SV/FI/NO/DA/LV/LT/ET.

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Please read this Installation Manual carefully before installing the Air Conditioner.

- This Manual describes the installation method of the outdoor unit.
- For installation of the indoor unit, refer to the Installation Manual attached to the indoor unit.

IMPORTANT NOTICE

For details on how to install the indoor units, refer to the Installation Manual accompanying the indoor units.



WARNING

- In accordance with IEC60335-2-40 2018 a minimum floor area **MUST** be observed when installing the Multi System air conditioner. Follow the table below to calculate the minimum floor area for installed product.

Refrigerant amount (kg)	Minimum floor area, When combined with indoor product. (m ²)				
	BI-FLOW CONSOLE	BI-FLOW CONSOLE with refrigerant detection sensor RB-T301-E	HIGH-WALL	1-WAY, 4-WAY CASSETTE	DUCT
≤1.84	—	—	—	—	—
1.92	32	7	4	2	2
2.12	39	7	4	3	3
2.32	46	8	5	3	3
2.39	49	8	5	4	4
2.52	54	9	6	4	4

PLEASE CHECK LOCAL REGULATIONS WHICH MAY IMPOSE DIFFERENT, MORE RESTRICTIVE LIMITS ON REFRIGERANT CHARGE LIMITS, ROOM AREAS AND PERMITTED INSTALLATION LOCATION.

1 Installation / service tools

Changes in the product and components

In air conditioners using R32, in order to prevent any other refrigerant from being accidentally charged, the service port diameter size of the outdoor unit service valve has been changed. (1/2 UNF 20 threads per inch)

- In order to increase the pressure resisting strength of the refrigerant piping, flare processing diameter and opposing flare nuts sizes have been changed.
(for copper pipes with nominal dimensions 1/2 and 5/8)

Gauge manifold for R32
Charge hose for R32
Vacuum pump for R32
Gas leakage detector for R32

Phillips screwdriver
Level
Scale
Utility knife

Pipe cutter
Torque wrench
Wrench (or spanner)
Reamer

Flare tool for R32
4 mm hexagonal wrench

2 Specifications

RAS-2M60S4AVG-ND		
Operating conditions ^{*1}	Cooling operation	10 to 46°C
	Dry operation	10 to 46°C
	Heating operation	—
Dimension	Height	710 mm
	Width	900 mm
	Depth	320 mm
Net weight		59 kg
Refrigerant R32		1.84 kg
Power supply		1 ph, 50 Hz, 220-240 V
Maximum running current		16.0 A
Installation fuse rating		20 A breaker (all types can be used)
Power cord (H07RN-F or 60245 IEC66)		3-core 2.5 mm ²
Connecting cable (H07RN-F or 60245 IEC66)		4-core 0.75 mm ² or more
Pipe length	Minimum for 1 unit	2 m
	Maximum for 1 unit	25 m
	Maximum for total unit	50 m
	Height difference	15 m
	No additional refrigerant charge	30 m
Refrigerant adjustment		Over 30 m need extra charge 20 g/m

The specifications for performance of this air conditioner differs depending on the combination of the indoor units which are operated.

The information in this specifications table applies for the combinations with the catalogue.

For operation, read the owner's manual packed with the indoor unit.

Equipment complying with IEC61000-3-12.

*1 If the air conditioner is used in conditions other than the above, the safety protection functions may be activated.

* Example of indoor unit class: RAS-B25S4KVPD-ND is abbreviated as "10".

	Indoor unit class	Standard connecting pipe diameter
B	10 or 13 or 18 ^{*2}	6.35, 9.52 mm
A	10 or 13 or 18 ^{*2}	6.35, 9.52 mm
Total	65 (RAS-2M60S4AVG-ND)	—

All combinations that do not exceed the "Total" number can be installed.

When 2 indoor units are connected to an outdoor unit, note that some combinations of indoor units are not compatible. For the further details, refer to the catalogue.

*2 Need the reducer (12.7 to 9.52 mm)

• Locally procured.

3 Optional parts, accessories

Optional parts

Parts name	Specifications			Q'ty
Refrigerant piping ^{*3}	Indoor unit (abbreviation)	Liquid side (O.D.)	Gas side (O.D.)	1 ea.
	10, 13	6.35 mm	9.52 mm	
	18	6.35 mm	9.52 mm	
Putty, PVC tapes	—			1 ea.

*3 Refrigerant piping covered with insulating material (Polyethylene form, 6 mm thick) When duct-type or cassette-type unit is to be installed, it shall be covered with thicker insulating material (Polyethylene form, 10 mm thick)

Accessories

Installation Manual	1		Rubber cap (Water-proof)	5		F-GAS label	1		Drain nipple	1	
Safety Manual	1										

4 Installation of outdoor unit

■ Installation Location

- A place which can bear the weight of the outdoor unit and does not cause an increase in noise level and vibration.
- A place where the operation noise and air discharge do not disturb neighbours.
- A place which is not exposed to strong wind.
- A place free of combustible gas.
- A place which does not block a passageway.
- A place where the drain water does not cause any problems.
- A place where there are no obstructions near its air intake or air discharge.

Installation in the following places may result in trouble:

- A place with a lot of machine oil.
- A place with saline-rich atmosphere such as a coastal area.
- A place with high level of sulfide gas.
- A place where high-frequency waves are likely to be generated, such as from audio equipment, welders, or medical equipment.

Do not install the unit in such places.

⚠ CAUTION

When the outdoor unit is installed in a place where the drain water might cause any problems, Seal the water leakage point tightly using a silicone adhesive or caulking compound.

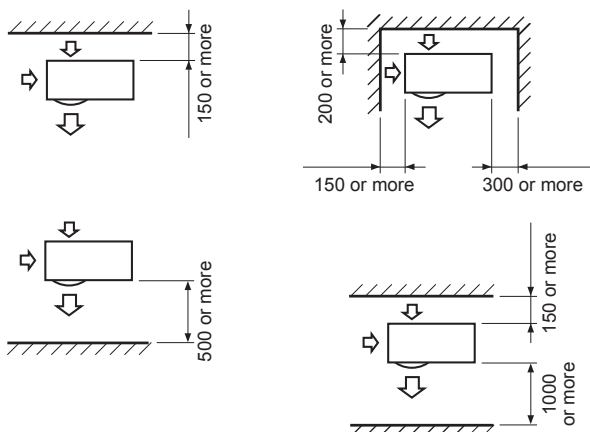
■ Precautions for Installation

- When the outdoor unit is to be installed in an elevated position, be sure to secure its feet.
- If the outdoor unit is to be mounted on a wall, make sure the base plate supporting it is sturdy enough.
- The base plate should be designed and manufactured to maintain its strength over a long period of time, and sufficient consideration should be given to ensure that the outdoor unit will not fall.
- When the outdoor unit is installed in a place that is always exposed to strong wind such as a coastal area or on a high story of a building, secure the normal fan operation using a duct or a wind shield.
- Especially in windy areas, install the unit in such a way as to prevent the admission of wind.
- When the outdoor unit is to be mounted high on a wall, take particular care to ensure that parts do not fall, and that the installer is protected.
- When doing installation work at ground level, it is usual to make wiring and pipe connections to the indoor units first, and then to make connections to the outdoor units.
However, if outdoor work is difficult, you can change the procedure. For example, by making adjustments to the wiring and piping lengths on the inside (rather than the outside).

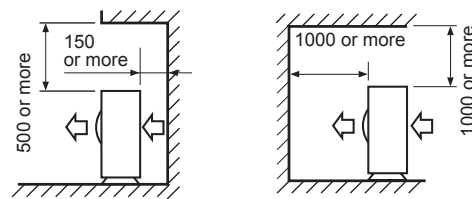
Necessary Space for Installation

If you need to install the outdoor unit in a location where there are some obstructions or a wall, secure sufficient space as shown in the figure below. The cooling effect may be reduced by 10%.

Upper side view (Unit: mm)

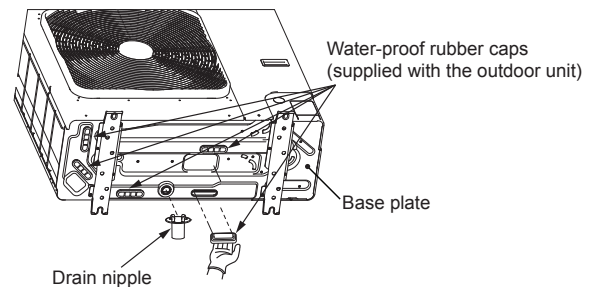


Side view (Unit: mm)

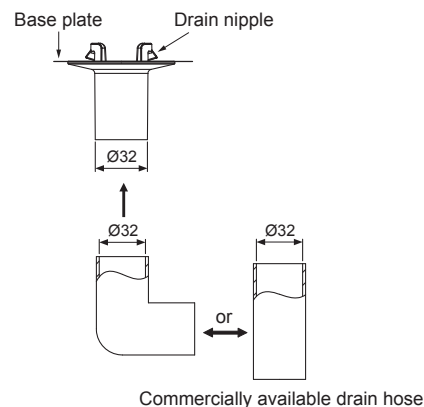


Draining the Water

- Holes are provided on the base plate of the outdoor unit to ensure that the defrost water produced during heating operations is drained off efficiently. If a centralized drain is required when installing the unit on a balcony or wall, follow the steps below to drain off the water.
1. Proceed with water-proofing by installing the water-proof rubber caps in the 5 elongated holes on the base plate of the outdoor unit. [How to install the water-proof rubber caps]
 - 1) Place four fingers into each cap, and insert the caps into the water drain holes by pushing them into place from the underside of the base plate.
 - 2) Press down on the outer circumferences of the caps to ensure that they have been inserted tightly.
(Water leaks may result if the caps have not been inserted properly, if their outer circumferences lift up or the caps catch on or wedge against something.)



2. Install the drain nipple and a commercially available drain hose (32 mm inside diameter), and drain off the water.
(For the position where the drain nipple is installed, refer to the installation diagram of the indoor and outdoor units.)
 - Check that the outdoor unit is horizontal, and route the drain hose at a downward sloped angle while ensuring that it is connected tautly.

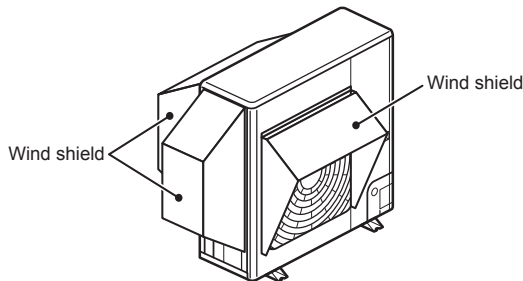


Do not use ordinary garden hose, but one can flatten and prevent water from draining.

Installation in Regions with Snowfall and Cold Temperatures

Do not use waterproof rubber caps or a drain nipple.

- If you need to install the outdoor unit in a location where there is a possibility of the drain freezing, pay close attention so that the drain does not become frozen.
- To protect the outdoor unit from snow, install the outdoor unit on a holding frame, and attach a snow protection hood and plate.
- Keep the outdoor unit at least 500 mm above the snow accumulation line.

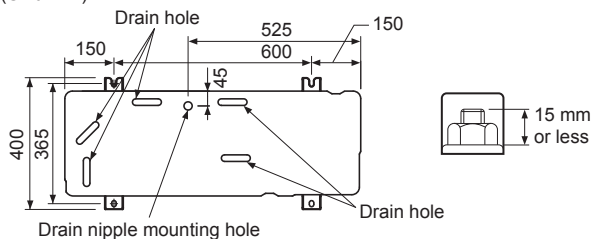


Fixing the Outdoor Unit

Fix the outdoor unit using attachment bolts.

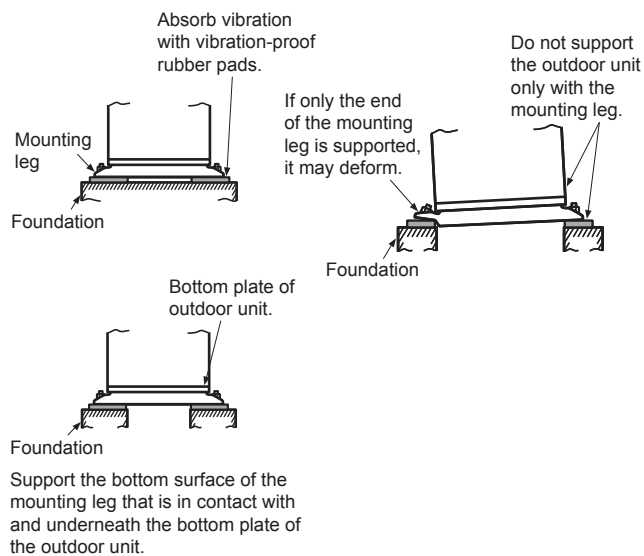
- Use 8 mm or 10 mm anchor bolts and nuts.
- Do not allow the attachment bolts to protrude by more than 15 mm.
- Install the outdoor unit at ground level.
- Attach the vibration-proof rubber pads under the fixing legs.

(Unit: mm)



GOOD

BAD



5 Refrigerant piping

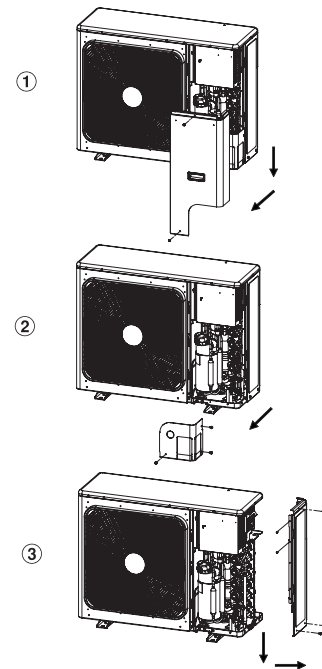
CAUTION

Install in rooms that are 13 m³ or larger.
If a leak of refrigerant gas occurs inside the room, an oxygen deficiency may occur.

Detaching the Front and Side panel to service

Remove the 10 screws follow 3 step.

- Pull out the front and side panel according to the direction of the arrows on the illustration below.



Refrigerant Piping Connection

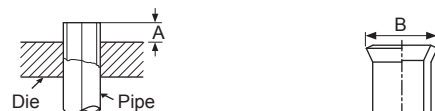
Flaring

1. Cut the pipe with a pipe cutter.



2. Remove the burr inside of the pipe.
When removing the burr, be careful so that chips do not fall into the pipe.
3. Remove the flare nuts attached to the outdoor/indoor unit, then insert them into each of the pipes.
4. Flare the pipes.

See the following table for the projection margin (A) and flaring size (B).



Pipe		A		B	Flare Nut		
Outside diameter	Thickness	Rigid (clutch type) R32 tool	Imperial (wing nut type) R32 tool		Width across flat	Tighten torque	
mm	mm	mm	mm	mm	mm	N•m	kgf•m
6.35	0.8	0 to 0.5	1.5 to 2.0	9.1	17	14 to 18	1.4 to 1.8
9.52	0.8	0 to 0.5	1.5 to 2.0	13.2	22	33 to 42	3.3 to 4.2
12.7	0.8	0 to 0.5	2.0 to 2.5	16.6	26	50 to 62	5.0 to 6.2

⚠ CAUTION

- Do not scratch the inner surface of the flared part when removing burrs.
- Flare processing under the condition of scratches on the inner surface of flare processing part will cause refrigerant gas leak.

Pipe connection

- Make wire and pipe connections for each indoor unit separately.
- Align the centres of the connecting pipes and tighten the flare nut as much as possible with your fingers, then tighten the nut using a torque wrench. Be sure to tighten the nut at the specified torque value.
 - If you use one outdoor unit for several indoor units of a different class, connect the largest one first A, then connect the rest in the order B to D.
 - Do not remove the flare nuts for any ports you are not going to use for connection.
 - Do not leave the flare nut unattached for a long period of time.
 - Use a different-diameter joint if the diameters of the connection port and connection piping are different.
 - Mount the different-diameter joint on the connection port of the outdoor unit.

⚠ CAUTION

• KEEP IMPORTANT 7 POINTS FOR PIPING WORK.

- Take away dust and moisture (inside of the connecting pipes).
- Tighten the connections (between pipes and unit).
- Evacuate the air in the connecting pipes using a VACUUM PUMP.
- Check gas leak (connected points).
- Be sure to fully open the packed valves before operation.
- Reusable mechanical connectors and flared joints are not allowed indoors. When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be refabricated.
- Don't operate air conditioner in case no refrigerant in the system.

■ Air Purge

From the sake of environmental protection, use a vacuum pump to extract the air during installation.

* Prepare a 4 mm hexagon wrench.

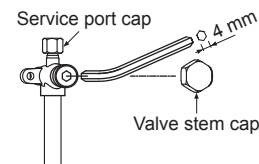
- Connect a charge hose.
 - Make sure that the Handle Hi of the gauge manifold valve is closed fully.
 - Connect the port of the gauge manifold valve and the service port (Valve core (Setting Pin)) using the charge hose.

NOTE

If a control valve or charge valve is attached to the charge hose, leak of R32 refrigerant can be avoided.

- Open the Handle Low of the gauge manifold valve fully, then operate the vacuum pump.
 - Loosen the flare nut of the at the gas end a little to make sure that air is taken in, then tighten the nut.
 - If you find air is not taken in, make sure that the charge hose is connected to the port(s) securely.
 - Perform extraction for about 40 minutes or more and make sure that the compound pressure gauge reading is -101 kPa (-76 cmHg).
 - If the compound pressure gauge reading is not -101 kPa (-76 cmHg), there is a possibility air is being taken in from the port(s).
 - Make sure that the charge hose is connected to the port(s) securely.
- Close the Handle Low of the gauge manifold valve fully, then stop operating the vacuum pump.
 - Leave the gauge and pump as they are for 1 or 2 minutes, then make sure that the compound pressure gauge reading stays at -101 kPa (-76 cmHg).
- Disconnect the charge hose from the service port, then open the valve stem fully using a 4 mm hexagon wrench.

Hexagon wrench is required.



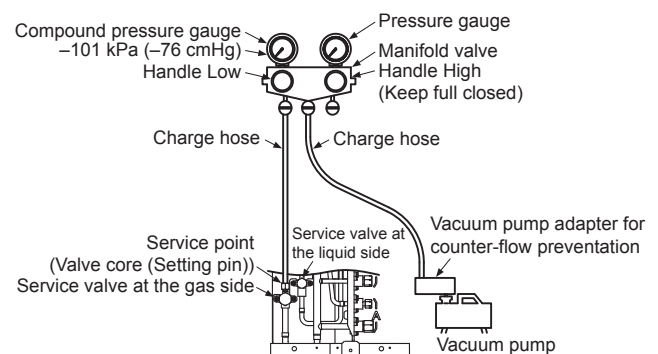
- Tighten the service valve stem cap and service port cap securely.

⚠ CAUTION

Use a torque wrench and tighten the nut at the specified torque value.

- Tighten all the caps on the valves securely, then perform a gas leak inspection.
 - The cap with the 9.52 mm outer diameter is available in two sizes in accordance with the type of packed valve for which the cap is used. The tightening torque depends on the width across flats of the cap so check it in the table below.

Service valve		Tighten torque			
		Valve stem cap		Service port cap	
mm		N•m	kgf•m	N•m	kgf•m
Liquid side (9.52)	H19 mm	14 to 18	1.4 to 1.8	—	—
	H22 mm	33 to 42	3.3 to 4.2		
Gas side (12.7)		33 to 42	3.3 to 4.2	14 to 18	1.4 to 1.8

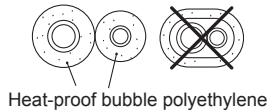


Precautions for Adding Refrigerant

- Use a scale with a precision of at least 10 g per index line when adding the refrigerant. Do not use bathroom scales or similar instruments.

■ Insulation of the Refrigerant Pipes

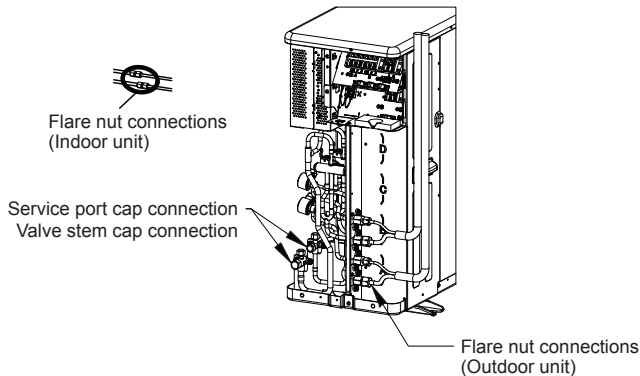
- Insulate the refrigerant pipes for liquid and gas separately.



Underground piping: 10t
(Laying the pipes on the wall,
ceiling, or under the floor)

■ Gas Leak Inspection

- Perform a gas leak inspection for the flare nut connections, valve stem connection, and service port cap without fail.
- Use a leak detector exclusively manufactured for R32.



* Check point example (RAS-2M60S4AVG-ND)

■ Performing Additional Installation of an Indoor Unit

- Collect refrigerant from the outdoor unit.
- Turn off the circuit breaker.
- Perform additional installation referring to the procedure from "Refrigerant Piping Connection" on the previous page.

6 Electrical work

⚠ WARNING

- Be sure to comply with local regulations/codes when running the wire from the outdoor unit to the indoor unit.
(Size of wire and wiring method etc.)
- A lack of electrical capacitance or incorrect wiring may cause an electric shock or a fire.
- To make sure that the wiring connection are secure, use designated cables.
- Fix the cables securely so that no external force applied to the cables may effect the terminals.
- If wiring connections are incomplete or cables are not fixed securely, it may cause a fire.
- Be sure to ground the outdoor unit.
- Incomplete grounding may lead to an electric shock.

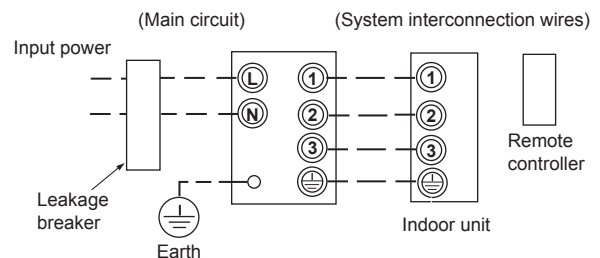
⚠ CAUTION

- Use a circuit breaker of a type that is not tripped by shock waves.
- Incorrect/incomplete wiring will cause electrical fires or smoke.
- Prepare the power source for exclusive use with the air conditioner.
- This product can be connected to the main power.
Fixed wire connections:
A switch that disconnects all poles and has a contact separation of at least 3 mm must be incorporated into the fixed wiring.

■ Wire Connection

- The dash lines show on-site wiring.

For indoor unit RAS-M series.

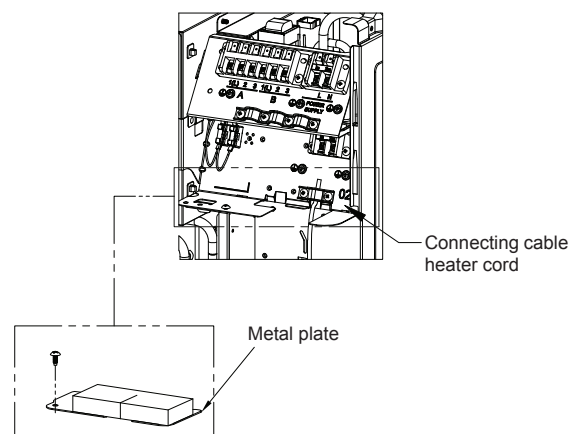


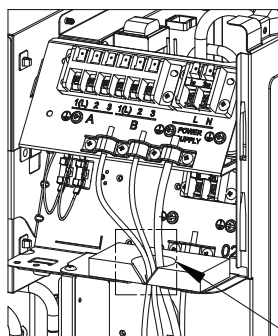
- Connect the indoor/outdoor connecting cables to the identical terminal numbers on the terminal block of each unit.
- Incorrect connection may cause a failure.

Model	RAS-2M60S4AVG-ND
Power supply	1 ph, 50 Hz, 220-240 V
Maximum running current	16.0 A
Installation fuse rating	20 A (All types can be used)
Power cord	H07RN-F or 60245 IEC66 3-core 2.5 mm ²
Connecting cable	H07RN-F or 60245 IEC66 4-core 7.5 mm ²

- Detach the front and side panel from the outdoor unit.
- Remove the cord clamp and the metal plate.
- Connect the wires for the heater cord.
- Fix the wiring connecting for the heater cord securely using a cord clamp and metal plate.
- Connect the wires for the power source and indoor units A, B.
- Fix the wiring connecting for the power source and indoor A, B securely using a cord clamp.
- Attach the front and side panel to the unit.

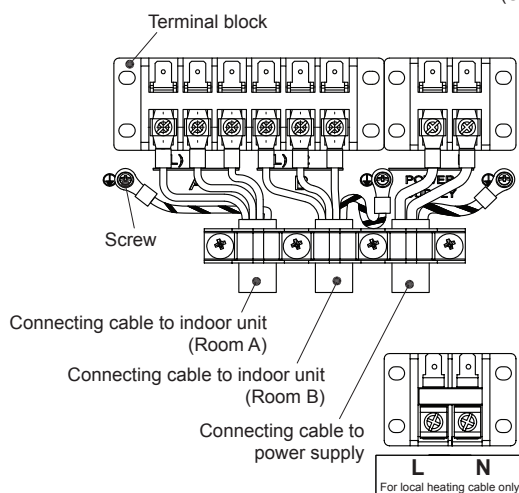
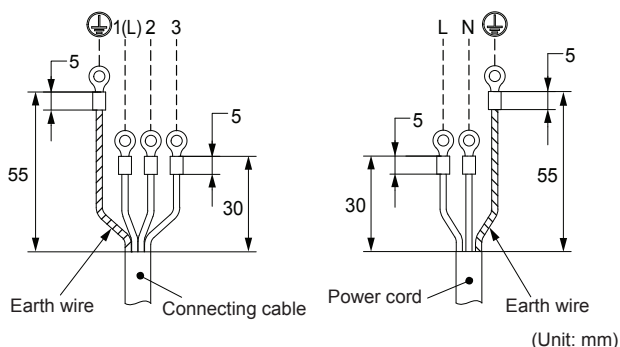
* Connect the connecting cable to the terminal as identified by the matching numbers on the terminal block of the indoor unit and the outdoor unit.





Hole for connecting cable A, B and power source

Stripping Length of connecting cable for outdoor unit



* Connection example (RAS-2M60S4AVG-ND)

7 Grounding

This air conditioner must be grounded without fail.

- Grounding is necessary not only to safeguard against the possibility of receiving an electric shock but also to absorb both static, which is generated by high frequencies and held in the surface of the outdoor unit, and noise since the air conditioner incorporates a frequency conversion device (called an inverter) in the outdoor unit.
- If the air conditioner is not grounded, users may receive an electric shock if they touch the surface of the outdoor unit and that unit is charged with static.

Pump down process

- Turn off the Air Conditioner system.
- Connect the charge hose from the manifold valve to the service port of the packed valve at gas side.
- Turn on the Air Conditioner system in cooling operation more than 10 minutes.
- Check the operating pressure of the system should be normal value. (Ref. with product specification)
- Release the valve rod cap of both service valves.
- Use the Hexagon wrench to turning the valve rod of Liquid side fully close. (*Make sure no entering air into the system)
- Continue operate Air Conditioner system until the gauge of manifold dropped into the range of 0.5 - 0 kgf/cm².
- Use the Hexagon wrench to turning the valve rod of Gas side fully close. And turn off the Air Conditioner system immediately thereafter.
- Remove the gauge manifold from the service port of the packed valve.
- Securely tighten the valve rod cap to the both service valves.



CAUTION

Should be check the compressor operating condition while pumping down process. It must not any abnormal sound, more vibration. It is abnormal condition appears and must turn off the Air Conditioner immediately.

8 Test run

■ Wiring/Piping Check

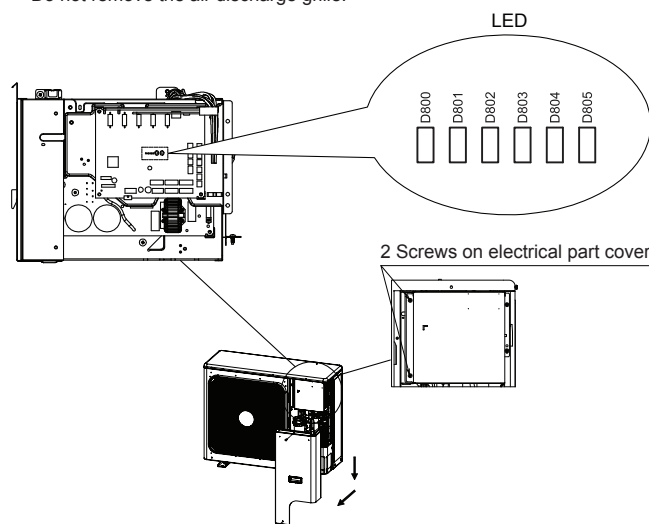


CAUTION



Electric current is applied on the control board. Beware of electric shock.

- Detach the front panel and electrical cover by removing the 4 screws. Do not remove the air discharge grille.



2. Turn on the circuit breaker to supply electricity.
In the initial LED display status, D805 is lighted as below.

○ : ON, ● : OFF, ◎ : Rapid Flashing (5 times/sec.),
◇ : Slow Flashing (1 time/sec.)

D800	D801	D802	D803	D804	D805
●	●	●	●	●	○

Start running all the indoor units connected to the outdoor unit in the cooling mode.
(The indoor unit in the room that doesn't operate the cooling mode cannot be checked.)

3. After 5 minutes, hold down SW81 for at least 5 seconds, and check that D800 is lighted and D804 light is flashing (1 time/sec.).

D800	D801	D802	D803	D804	D805
○	●	●	●	◇	●

4. Press the SW81 4 times until the LED is displayed as below.

D800	D801	D802	D803	D804	D805
●	●	○	●	◎	●

5. Press SW82 for 1 time. Then D805 light is flashing (5 times/sec.).

D800	D801	D802	D803	D804	D805
●	●	○	●	◎	◎

6. Hold down SW82 for at least 5 seconds. Then the wiring/piping check starts automatically. (The LED display is lighted for a moment.)

D800	D801	D802	D803	D804	D805
●	●	○	●	◇	○

- If no problems are detected, the checking operation returns to the normal operation automatically. The LED is displayed as below.

D800	D801	D802	D803	D804	D805
●	●	●	●	●	○

7. The below is displayed when the error is detected.
(*Repetition of 3 sec ON/0.5 sec OFF)

D800*	D801	D802	D803	D804	D805
○*	○*	○*	○*	○*	○

Press the SW81 3 times until the LED is displayed as below, to check the room judged as error.

D800	D801	D802	D803	D804	D805
●	○	●	●	●	◎

Incorrect wiring/piping can be checked by pressing SW82. The LED is displayed as below. Turn off the circuit breaker, then check wiring/piping again.

○ : ON, ● : OFF, ◎ : Rapid Flashing (5 times/sec.),
◇ : Slow Flashing (1 time/sec.)

Check result	LED						Description
	D800	D801	D802	D803	D804	D805	
	●	●	●	●	●	◇	
	○	●	●	●	●	◇	
	●	○	●	●	●	◇	
	○	○	●	●	●	◇	
	○	○	○	○	○	◇	"Trouble in all units Service valve stays closed"

- The D800 LED represents unit A.
- The D801 LED represents unit B.
- The D802 LED represents unit C.
- The D803 LED represents unit D.

8. When you want to start over the operation of the SW81 and SW82, press the SW81 and the SW82 at the same time for 5 sec.
(The procedure will set back to step 3.) However, do not execute the operation during the check. If by any chance the check is stopped by the operation, start over the check after turning off the power once.

9. Notes

- It sometimes takes about 30 minutes maximum for the check.
- During the check, the compressor and the fan of the outdoor/indoor unit repeat ON/OFF.
- You cannot check wiring/piping when the external temperature is 5°C or less. Also, there is a possibility to misjudge if the indoor temperature becomes too low by cooling operation. In that case, execute the cooling operation per room and check if the connection is normal.

■ Gas Leak Inspection

Refer to the "■ Gas Leak Inspection" on page 6.

■ Test run

For the test run, be sure to satisfy the following conditions below:

- Perform the test run for each indoor unit respectively.
- Perform the test run for about 10 minutes in the cooling mode.
- You can perform the test run in the cooling mode by utilizing the thermo sensor of the indoor unit.
Cooling mode: Warm the thermo sensor using an appliance such as a hair dryer.

■ Instructions for the Customers

- Explain to the customers the proper operation procedure and let them operate the air conditioner along with the supplied instruction manual.
- When you start running the indoor unit or change the operation mode, the unit starts running after 3 minutes. This is due to the protection function of the unit, not a malfunction.
- Electronic expansion valves are used for the outdoor unit.
When you turn on the power, the outdoor unit starts clattering every 1 or 2 months. This clattering is not a malfunction, but occurs when the unit is returning to the default setting for optimised control.

■ Pump-down Operation (Recovering refrigerant)



CAUTION

Since the forcible running for collecting refrigerant stops automatically after 10 minutes, finish collecting refrigerant within 10 minutes.



Electric current is applied on the control board. Beware of electric shock.

- The following must be certainly done during pump down.
- Do not incorporate air into the refrigeration cycle.
- Close the 2 service valves. Stop the compressor and remove the refrigerant pipe.
If the refrigerant pipe is removed when the compressor is operating and service valves are opened, the refrigerant cycle will inhale unwanted matter such as air and the pressure in the cycle becomes abnormally elevated. It may cause a burst or injury.

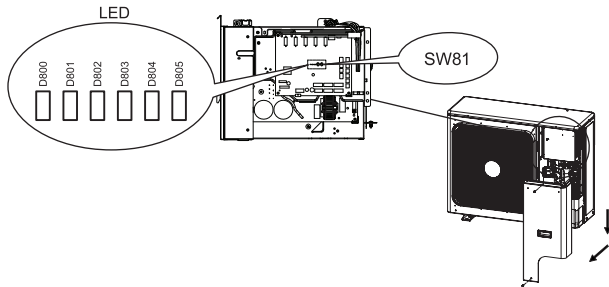
1. Detach the front panel and electrical cover by removing the 4 screws.
Do not remove the air discharge grille.
2. Turn on the circuit breaker to supply electricity.
In the initial LED display status, D805 is lighted as below.

○ : ON, ● : OFF, ◎ : Rapid Flashing (5 times/sec.),
◇ : Slow Flashing (1 time/sec.)

D800	D801	D802	D803	D804	D805
●	●	●	●	●	○

Start running all the indoor units connected to the outdoor unit in the cooling mode.

The checking procedure cannot be completed if the cooling mode is not operated in every indoor units.



3. Hold down SW81 for at least 5 seconds, and check that D800 is lighted and D804 light is flashing (1 time/sec.).

D800	D801	D802	D803	D804	D805
○	●	●	●	◇	●

4. Press SW81 for 1 time. Then D804 light is flashing (5 times/sec.).

D800	D801	D802	D803	D804	D805
○	●	●	●	◎	●

5. Press SW82 for 1 time. Then D805 light is flashing (5 times/sec.).

D800	D801	D802	D803	D804	D805
○	●	●	●	◎	◎

6. Hold down SW82 for at least 5 seconds. Then outdoor unit start cooling mode.

(The display is kept during the refrigerants collection operation.)

D800	D801	D802	D803	D804	D805
○	●	●	●	◇	○

7. Close the valve stem of the service valve at the liquid end.
8. Make sure that the compound pressure gauge reading is -101 kPa (-76 cmHg).
9. Close the valve stem of the service valve at the gas end.
10. The refrigerants collection operation is finished in maximum 10 minutes.
After the collection is finished, promptly stop the operation of all the indoor unit.
(There are cases that the compressor restarts.)
11. When you want to start over the operation of the SW81 and SW82, press the SW81 and SW82 at the same time for 5 sec. (It back to the initial condition of 3.)
However, do not execute the operation during the refrigerants collection.
If by any chance the collection is stopped by the operation, start over the refrigerants collection operation.

9 Troubleshooting

You can perform fault diagnosis of the outdoor unit with the LEDs on the P.C. Board of the outdoor unit in addition to using the check codes displayed on the remote controller of the indoor unit.

Use the LEDs and check codes for various checks. Details of the check codes displayed on the remote controller of the indoor unit are described in the Installation Manual of the indoor unit.

LED displays and check codes

○ : ON (○* : 3 sec ON/0.5 sec OFF) ● : OFF

Display						Indoor check code	Description
D800 (YL)	D801 (YL)	D802 (YL)	D803 (YL)	D804 (YL)	D805 (GN)		
●	●	●	●	●	●	-	Normal operation (no error)
○*	●	●	●	●	●	1C	Compressor case thermostat error
●	○*	●	●	●	●	21	High pressure switch error
○*	○*	●	●	●	●	1C	Compressor system error
●	●	○*	●	●	●	1D	Compressor lock
○*	●	○*	●	●	●	1F	Compressor breakdown
●	○*	○*	●	●	●	14	Driving element short circuit
○*	○*	○*	●	●	●	16	Position detection circuit error
●	●	●	○*	●	●	17	Current detection circuit error
○*	●	●	○*	●	●	1C	Communication error between MCU
●	○*	●	○*	●	●	1A	Fan system error
○*	○*	●	○*	●	●	1E	Discharge temperature error
●	●	○*	○*	●	●	19	Discharge temperature sensor (TD) error
1 ○	●	○*	○*	●	○	1B	Outdoor air temperature sensor (TO) error
●	○*	○*	○*	●	●	18	Suction temperature sensor (TS) error
○*	○*	○*	○*	●	●	18	Heat exchanger temperature sensor (TE) error
2 ●	●	●	●	○	●	1C	Gas pipe (unit A) temperature sensor (TGa) error
2 ○	●	●	●	○*	●	1C	Gas pipe (unit B) temperature sensor (TGb) error
○*	●	○*	●	○*	●	-	PMV error (SH≥20)
●	○*	○*	●	○*	●	-	PMV error (SH≤-8)
●	●	●	○*	○*	●	20	PMV leakage error (unit A)
○*	●	●	○*	○*	●	20	PMV leakage error (unit B)
○*	●	○*	○*	○*	●	-	Miswiring (mispiping) check error
●	○*	○*	○*	○*	●	1C	Communication error between MCU
○*	○*	○*	○*	○*	●	1C	Communication error between MCU

*1 : Back-up operation is performed without error display of the indoor unit.

*2 : Operated normally when the air conditioners in other rooms are driven.

- The D800 LED represents unit A.
- The D801 LED represents unit B.

10 Appendix

Work instructions

The existing R22 and R410A piping can be reused for inverter R32 product installations.

WARNING

Confirming the existence of scratches or dents on the existing pipes and confirming the reliability of the pipe strength are conventionally referred to the local site.

If the specified conditions can be cleared, it is possible to update existing R22 and R410A pipes to those for R32 models.

Basic conditions needed to reuse existing pipes

Check and observe the presence of three conditions in the refrigerant piping works.

1. **Dry** (There is no moisture inside of the pipes.)
2. **Clean** (There is no dust inside of the pipes.)
3. **Tight** (There are no refrigerant leaks.)

Restrictions for use of existing pipes

In the following cases, the existing pipes should not be reused as they are. Clean the existing pipes or exchange them with new pipes.

1. When a scratch or dent is heavy, be sure to use new pipes for the refrigerant piping works.
2. When the existing pipe thickness is thinner than the specified "Pipe diameter and thickness," be sure to use new pipes for the refrigerant piping works.
 - The operating pressure of R32 is high (1.6 times that of R22). If there is a scratch or dent on the pipe or a thinner pipe is used, the pressure strength may be inadequate, which may cause the pipe to break in the worst case.

* Pipe diameter and thickness (mm)

Pipe outer diameter	R32, R410A		R22	
	Ø6.4	Ø9.5	Ø12.7	
Thickness	0.8	0.8	0.8	0.8

3. When the outdoor unit was left with the pipes disconnected, or the gas leaked from the pipes and the pipes were not repaired and refilled.

- There is the possibility of rain water or air, including moisture, entering the pipe.

4. When refrigerant cannot be recovered using a refrigerant recovery unit.

- There is the possibility that a large quantity of dirty oil or moisture remains inside the pipes.

5. When a commercially available dryer is attached to the existing pipes.

- There is the possibility that copper green rust has been generated.

6. When the existing air conditioner is removed after refrigerant has been recovered.
Check if the oil is judged to be clearly different from normal oil.

- The refrigerant oil is copper rust green in color: There is the possibility that moisture has mixed with the oil and rust has been generated inside the pipe.
- There is discolored oil, a large quantity of residue, or a bad smell.
- A large quantity of shiny metal dust or other wear residue can be seen in the refrigerant oil.

7. When the air conditioner has a history of the compressor failing and being replaced.

- When discolored oil, a large quantity of residue, shiny metal dust, or other wear residue or mixture of foreign matter is observed, trouble will occur.

8. When temporary installation and removal of the air conditioner are repeated such as when leased etc.

9. If the type of refrigerator oil of the existing air conditioner is other than the following oil (Mineral oil), Suniso, Freol-S, MS (Synthetic oil), alkyl benzene (HAB, Barrel-freeze), ester series, PVE only of other series.

- The winding-insulation of the compressor may deteriorate.

10. When total pipe length is longer than the maximum length for total unit, specified in clause 3, be sure to use new pipes for the refrigerant piping works.

NOTE

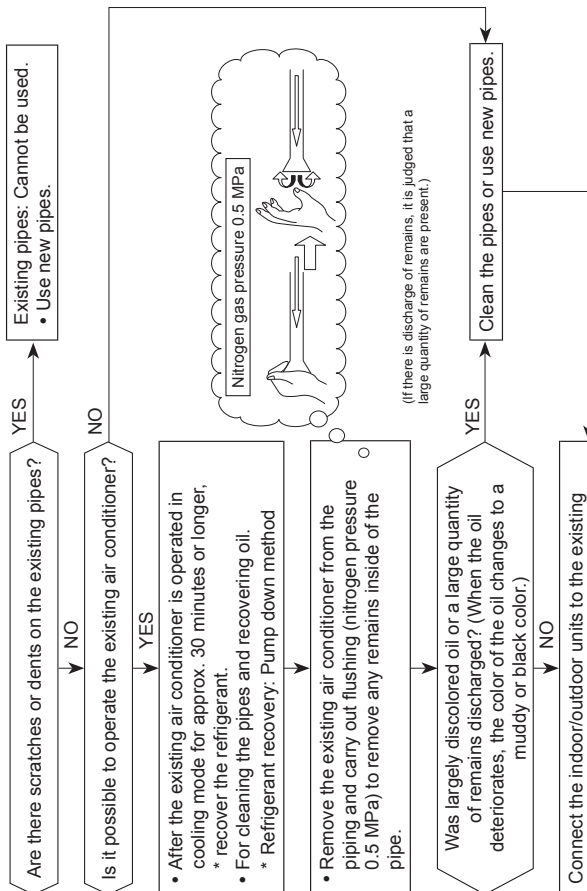
The above descriptions are results have been confirmed by our company and represent our views on our air conditioners, but do not guarantee the use of the existing pipes of air conditioners that have adopted R32 in other companies.

Curing of pipes

When removing and opening the indoor or outdoor unit for a long time, cure the pipes as follows:

- Otherwise rust may be generated when moisture or foreign matter due to condensation enters the pipes.
- The rust cannot be removed by cleaning, and new pipes are necessary.

Placement location	Term	Curing manner
Outdoors	1 month or more	Pinching
	Less than 1 month	Pinching or taping
Indoors	Every time	



Piping necessary to change the flare nut / machining size due to pipe compression

1) Flare nut width: H

A technical drawing of a flare nut. It shows a circular cross-section with a central hole. The outer diameter is labeled as Ø. The width of the nut is labeled as H.

	(mm)			
Copper pipe outer diameter	Ø6.4	Ø9.5	Ø12.7	
For R32, R410A	17	22	26	
For R22	Same as above		24	

2) Flare machining size: A

A technical drawing of a flare nut. It shows a circular cross-section with a central hole. The machining size A is indicated by a dimension line across the top of the nut.

	(mm)			
Copper pipe outer diameter	Ø6.4	Ø9.5	Ø12.7	
For R32, R410A	9.1	13.2	16.6	
For R22	9.0	13.0	16.2	

Becomes a little larger for R32

Do not apply refrigerant oil to the flare surface.

11 Installation Check List

After finishing installation work, please check items below and hand this sheet to user to keep it in a safe place together with Owner and Installation Manuals	Model name _____ Check date _____ Checked by _____
---	--

Note : Please put a mark “✓” in the box you checked.

■ Piping work

Check items	Symptom	Check
Connecting pipes are cleaned and no dent	Insufficient Air conditioner capacity Compressor malfunction Compressor rupture or Burst	
Use vacuum pump for completed vacuuming		
No any gas leakage or clogging is found		
Service valves are fully open before operation		

■ Wiring work

Check items	Symptom	Check
Electrical wires are connected correctly	Burnt out, No operation	
Use breaker to connect to main power supply	Burnt out, No abnormal protection	
Wiring insulators are in good condition	Burnt out, Electrical leakage	
Use the specified size/rating wires	Burnt out	
Ground wire must be Installation per manufacturing Installation Manual	Electrical leakage or shock	

■ Drainage work

Check items	Symptom	Check
Drain hose is properly connected	Water leakage or dropping	
Drain hose is well insulated	Water or dew dropping	

Remark : All check items, please refer procedure from manufacturing Installation Manual

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