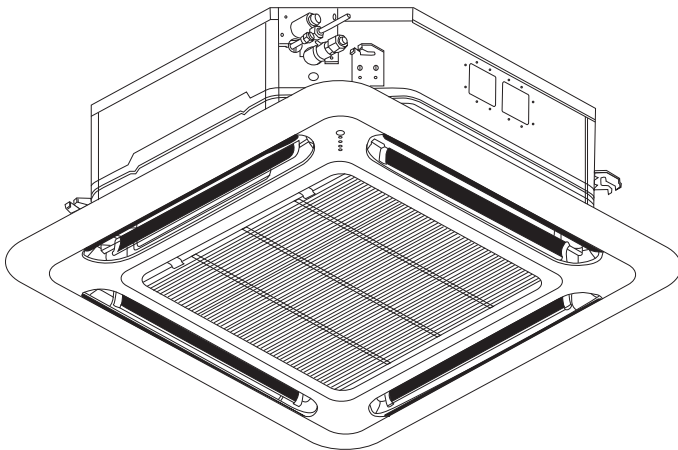


DAIKIN

INSTALLATION MANUAL

CEILING CASSETTE R22 SPLIT TYPE AIR CONDITIONER



Installation Manual
R22 Split Type Air Conditioner

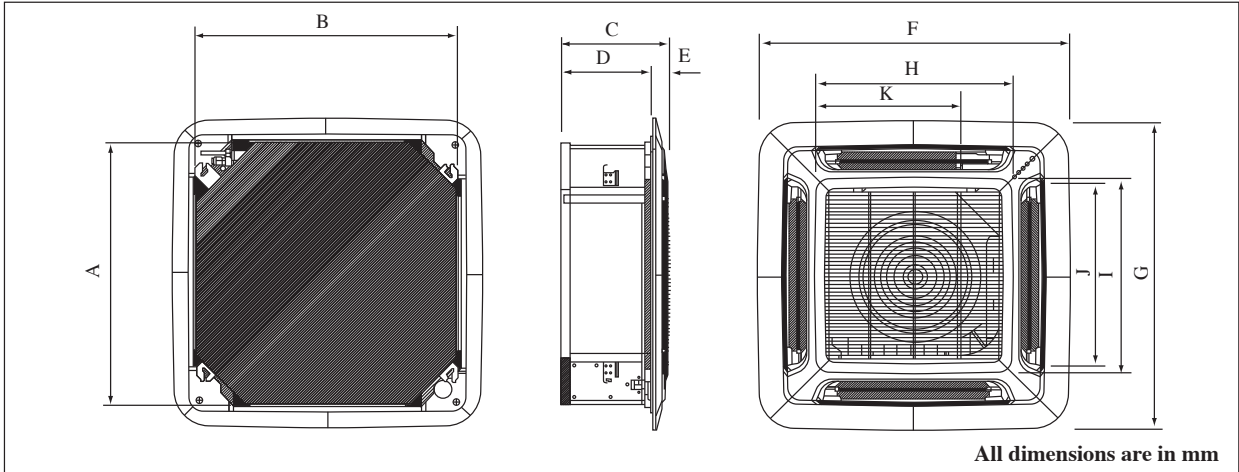
English

MODELS

FHC20JEV1K	RD20JEV1K
FHC25JEV1K	RD25JEV1K
FHC30JEV1K	RD30JEV1K
FHC40JEV1K	RD40JEV1K
	RD40JEY1K
FHC50JEV1K	RD50JEY1K

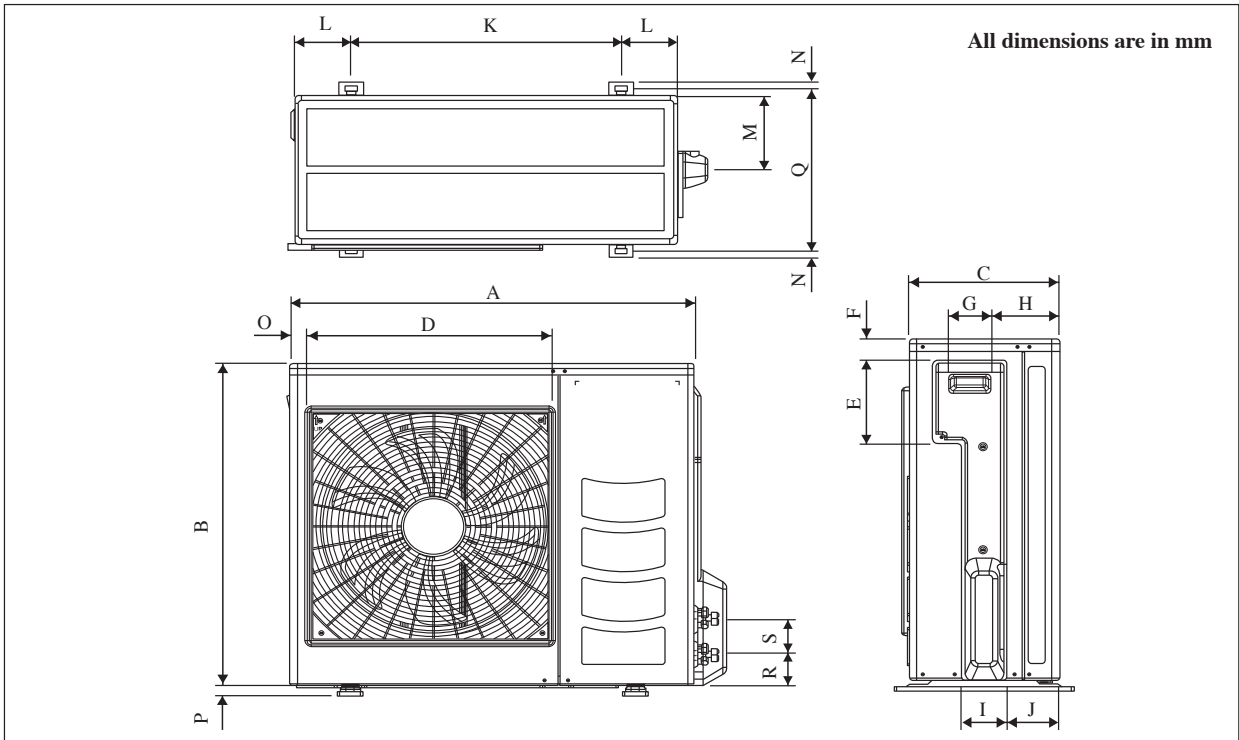
OUTLINE AND DIMENSIONS

Indoor Unit



Model \ Dimension	A	B	C	D	E	F	G	H	I	J	K
FHC20JEV1K FHC25JEV1K FHC30JEV1K	820	820	340	300	40	990	990	627	627	607	430
FHC40JEV1K FHC50JEV1K	820	820	375	335	40	990	990	627	627	607	430

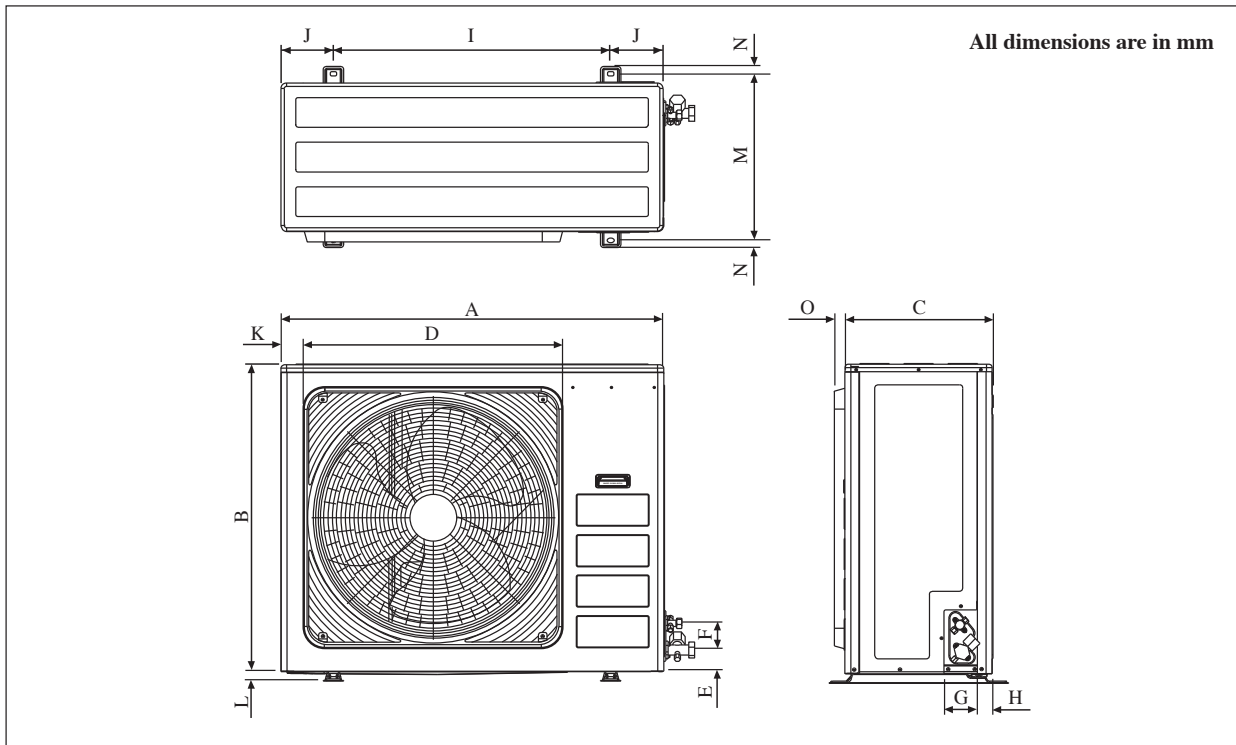
Outdoor Unit



Model \ Dimension	A	B	C	D	E	F	G	H	I	J	K	L
RD20JEV1K	855	628	328	520	179	46	93	149	101	113	603	126
RD25JEV1K RD30JEV1K	855	730	328	520	179	46	93	149	101	113	603	126

Model \ Dimension	M	N	O	P	Q	R	S
RD20JEV1K	164	15	34	23	362	73	75
RD25JEV1K RD30JEV1K	164	15	34	23	362	73	75

Outdoor Unit



Dimension / Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
RD40JEV1K															
RD40JEY1K	1030	826	400	410	57	72	90	40	746	142	60	26	448	22	28
RD50JEY1K															

INSTALLATION MANUAL

This manual provides the procedures of installation to ensure a safe and good standard of operation for the air conditioner unit.

Special adjustment may be necessary to suit local requirements.

Before using your air conditioner, please read this instruction manual carefully and keep it for future reference.

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

This appliance is not intended for use by persons, including children, with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.





SAFETY PRECAUTIONS

WARNING

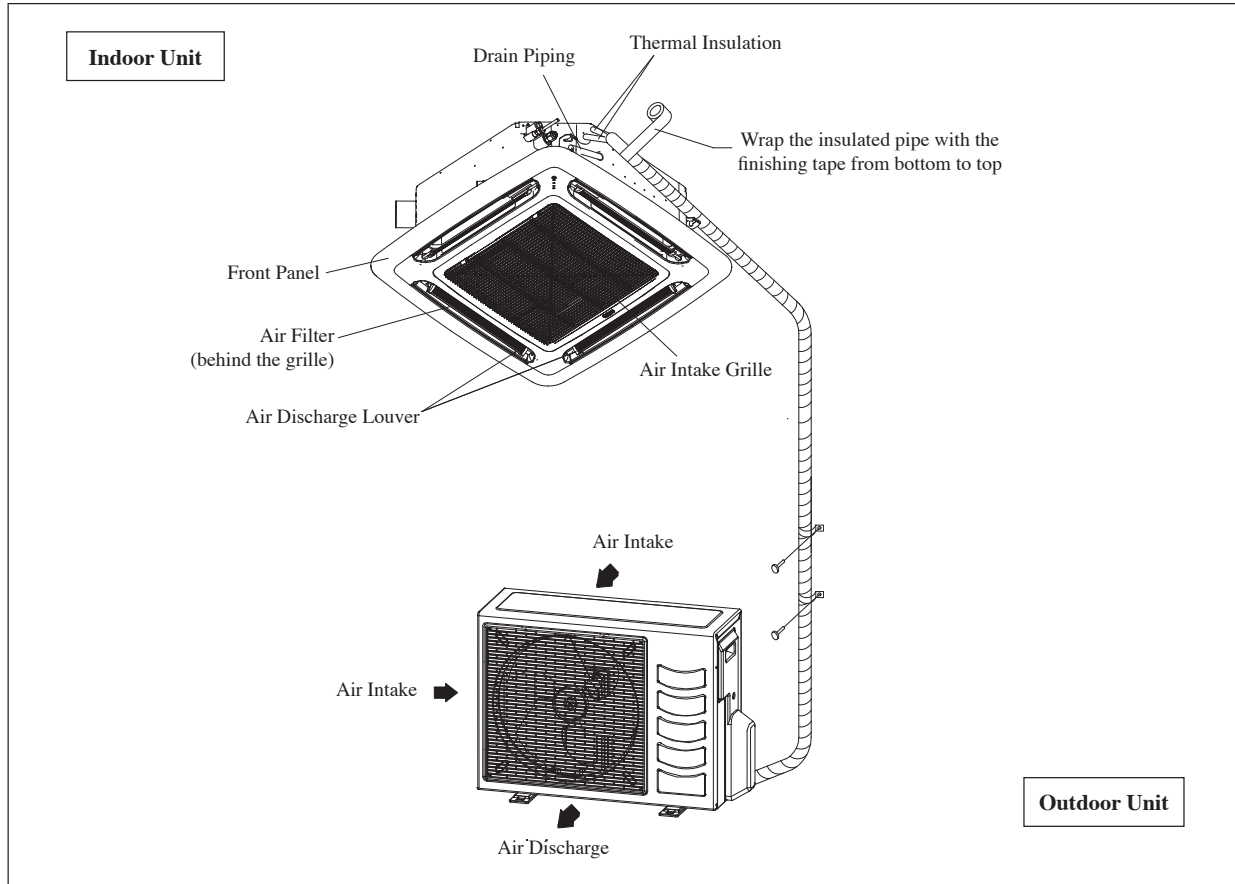
- Installation and maintenance should be performed by qualified persons who are familiar with local code and regulation, and experienced with this type of appliance.
- All field wiring must be installed in accordance with the national wiring regulation.
- Ensure that the rated voltage of the unit corresponds to that of the name plate before commencing wiring work according to the wiring diagram.
- The unit must be GROUNDED to prevent possible hazard due to insulation failure.
- All electrical wiring must not touch the refrigerant piping, or any moving parts of the fan motors.
- Confirm that the unit has been switched OFF before installing or servicing the unit.
- Disconnect from the main power supply before servicing the air conditioner unit.
- DO NOT pull out the power cord when the power is ON. This may cause serious electrical shocks which may result in fire hazards.
- Keep the indoor and outdoor units, power cable and transmission wiring, at least 1m from TVs and radios, to prevent distorted pictures and static. {Depending on the type and source of the electrical waves, static may be heard even when more than 1m away}.

CAUTION

Please take note of the following important points when installing.

- **Do not install the unit where leakage of flammable gas may occur.**
 -  If gas leaks and accumulates around the unit, it may cause fire ignition.
- **Ensure that the drainage piping is connected properly.**
 -  If the drainage piping is not connected properly, it may cause water leakage which will dampen the furniture.
- **Do not overcharge the unit.**
 -  This unit is factory pre-charged. Overcharge will cause over-current or damage to the compressor.
- **Ensure that the unit's panel is closed after service or installation.**
 -  Unsecured panels will cause the unit to operate noisily.
- **Sharp edges and coil surfaces are potential locations which may cause injury hazards. Avoid from being in contact with these places.**
- **Before turning off the power supply, set the remote controller's ON/OFF switch to the "OFF" position to prevent the nuisance tripping of the unit.** If this is not done, the unit's fans will start turning automatically when power resumes, posing a hazard to service personnel or the user.
- Do not install the units at or near doorway.
- Do not operate any heating apparatus too close to the air conditioner unit or use in room where mineral oil, oil vapour or oil steam exist, this may cause plastic part to melt or deform as a result of excessive heat or chemical reaction.
- When the unit is used in kitchen, keep flour away from going into suction of the unit.
- This unit is not suitable for factory used where cutting oil mist or iron powder exist or voltage fluctuates greatly.
- Do not install the units at area like hot spring or oil refinery plant where sulphide gas exists.
- Ensure the color of wires of the outdoor unit and the terminal markings are same to the indoors respectively.
- **IMPORTANT : DO NOT INSTALL OR USE THE AIR CONDITIONER UNIT IN A LAUNDRY ROOM.**
- Don't use joined and twisted wires for incoming power supply.
- The equipment is not intended for use in a potentially explosive atmosphere.

INSTALLATION DIAGRAM

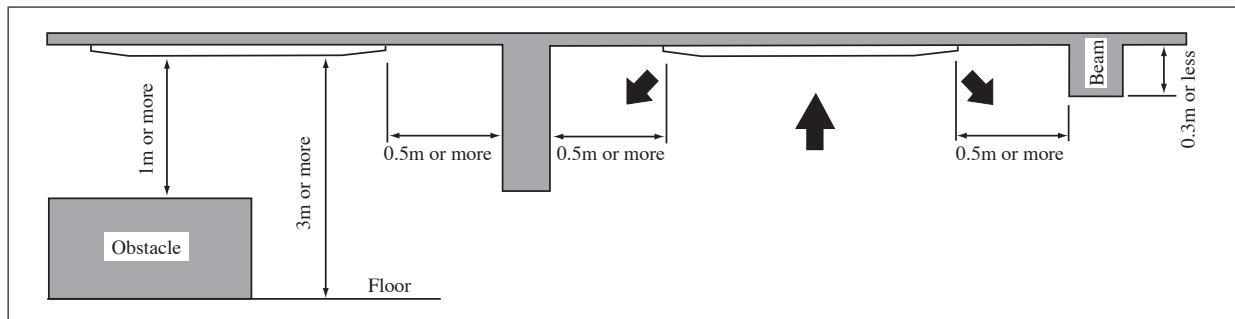


INSTALLATION OF THE INDOOR UNIT

Preliminary Site Survey

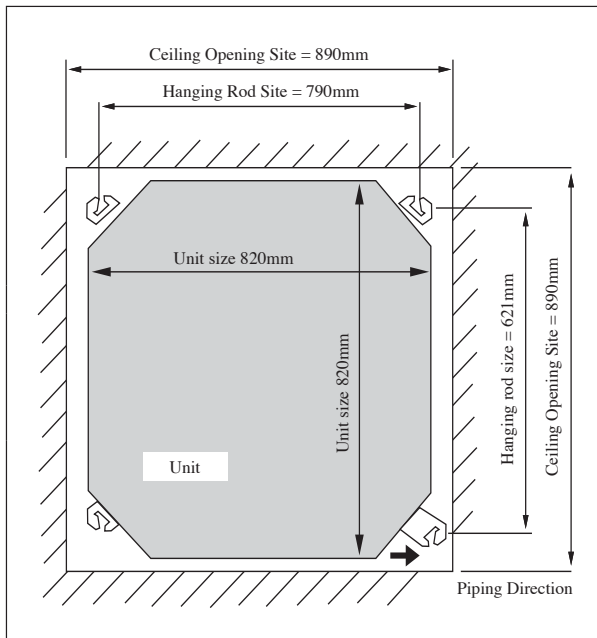
Be sure to read this manual before installing the air-conditioner indoor unit.

- Voltage supply fluctuation must not exceed $\pm 10\%$ of rated voltage. Electricity supply lines must be independent of welding transformers which can cause high supply fluctuation.
- Ensure that the location is convenient for wiring, piping and drainage.
- Do not exert pressure on the resin parts when opening the unit or when moving it after opening.
- Do not move the unit from packaging while moving, until it reaches the installation site. Use safe material or protection plates when unpacking it or lifting it to avoid damage or scratches to the unit.



- Ensure a location where:
 - a) Drainage can be done easily.
 - b) Convenient for wiring and piping.
 - c) Which have enough space for installation and service work.
 - d) Where no risk of flammable gas leakage.
 - e) When free from any obstacles in path of cool air discharge and warm air return and must allow spreading of air throughout the room (near the center of the room).
 - f) Must be provided clearance for indoor unit from the wall and obstacles as shown in figure below.
 - g) The installation place must be strong enough to support a load 4 times the indoor unit weight to avoid amplifying noise and vibration.
 - h) The installation place (hanging ceiling surface) must be assuring levelness and the height in the ceiling is 350mm or more.
 - i) The indoor unit must be away from heat and steam sources (avoid installing it near an entrance).

Unit Installation

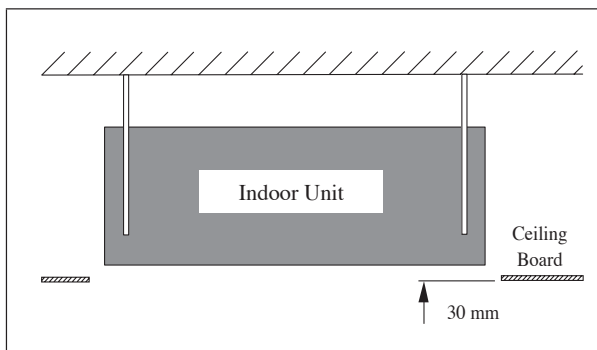


- Measure and mark the position for the hanging rod. Drill the hole for the angle nut on the ceiling and fix the hanging rod.
- The installation template is extended according to temperature and humidity. Check on dimensions in use.
- The dimensions of the installation template are the same as those of the ceiling opening dimensions.
- Before ceiling laminating work is completed, be sure to fit the installation template to the indoor unit.

NOTE

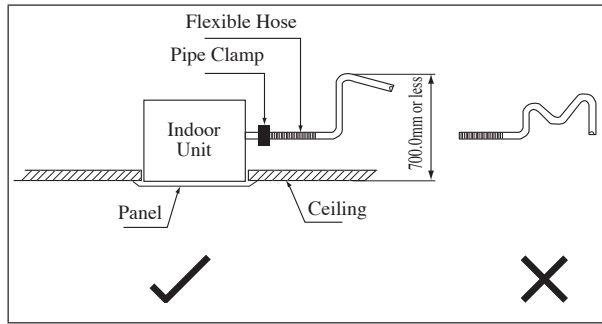
Be sure to discuss the ceiling drilling work with the installers concerned.

Unit Hanging



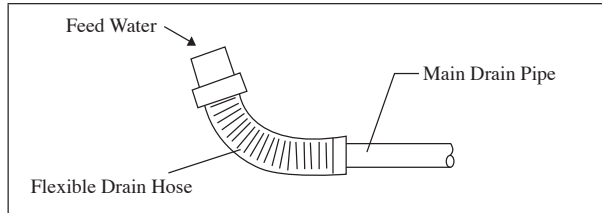
- Confirm the pitch of the hanging rod is 770mm x 622mm sharp.
- Hold the unit and hang it on the hanging rod with the nut and washer.
- Adjust the unit height to 30mm between the indoor unit bottom surface and the ceiling surface.
- Confirm with a level gauge that the unit is installed horizontally and tighten the nut and bolt to prevent unit falling and vibration.
- Open the ceiling board along the outer edge of the paper installation template.

Drain Piping Work



- Avoid installing the drain pipe in upward gradient after the drain connection.
- Ensure the height of drain pipe from ceiling is 700mm or less if it is necessary to increase the height of drain pipe to prevent water leak.
- Avoid installing the drain pipe in up and down slope to prevent reversed water flow.
- During the drain pipe connection, be careful not to exert extra force on the drain connector at indoor unit.
- The outside diameter of the drain connection at the flexible drain hose is 20mm.
- Be sure to execute heat insulation (polyethylene foam with thickness more than 8mm) on the drain piping to avoid the condensed water dripping inside the room.

Drain Test



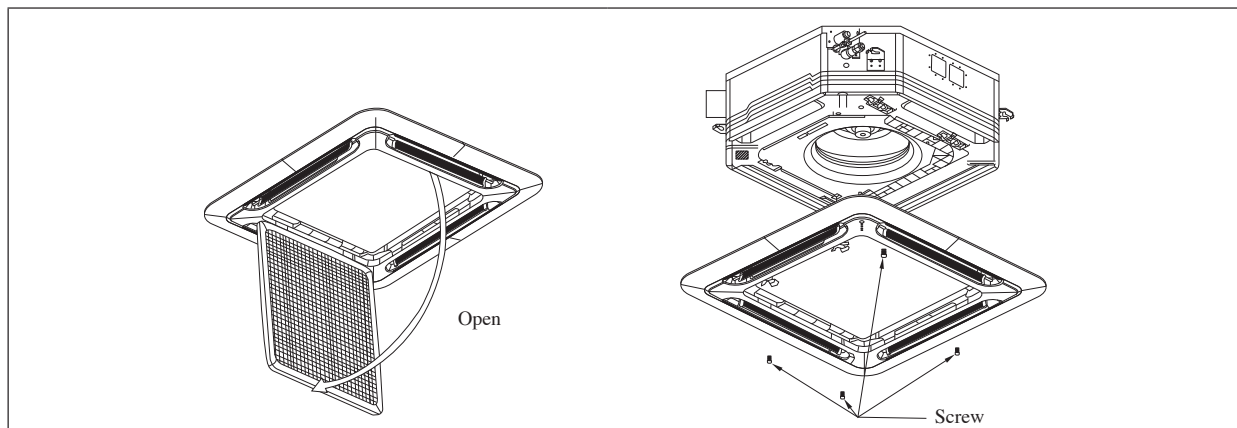
- Connect the main drain pipe to the flexible drain hose.
- Feed water from flexible drain hose to check the piping for leakage.
- When the test is completed, connect the flexible drain hose to the drain connector on the indoor unit.

NOTE

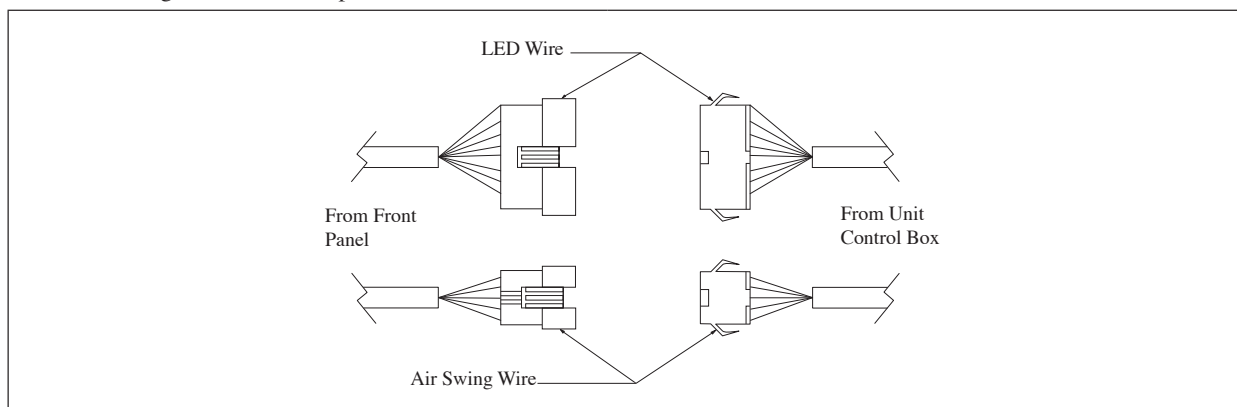
This Indoor Unit uses a drain pump for condensed water drainage. Install the unit horizontally to prevent water leakage or condensation around the air outlet.

Panel Installation

- The front panel can only be fitted in one direction, follow the piping direction. (Follow piping arrow sticker on front panel)
- Be sure to remove the installation template before installing the front panel.

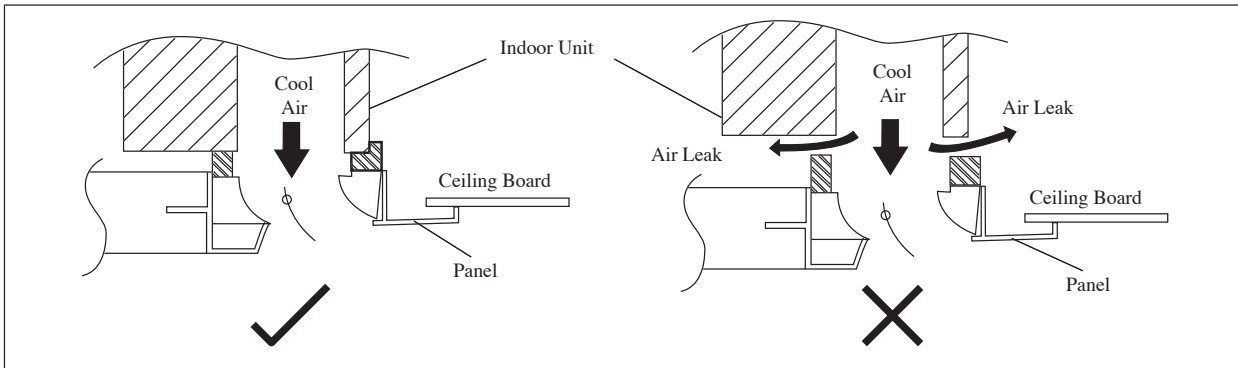


- Open the air intake grille by pulling back the catchers and removing it together with filter from panel.
- Install the front frame panel onto the indoor unit by 4 screws and tighten it completely to prevent cool air leakage.
- Connect the LED wire and air swing wire to the indoor unit.
- The air swing connector must put inside the control box after connected.

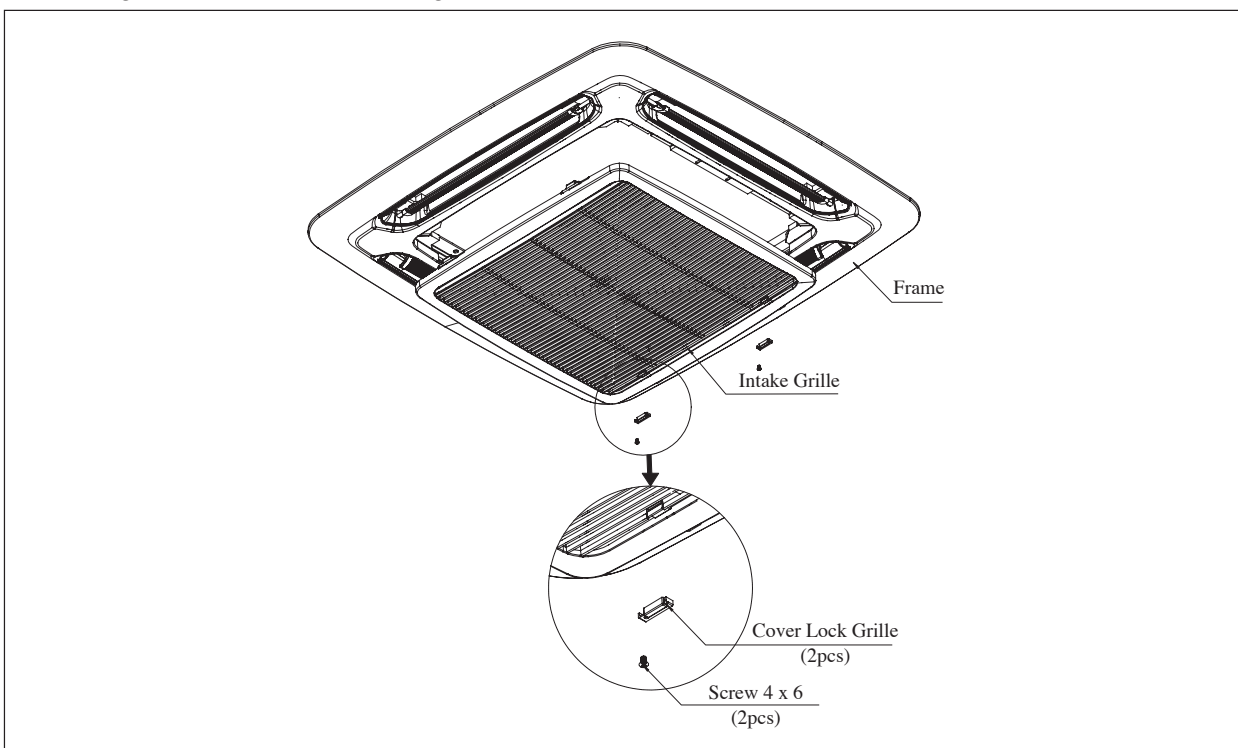


NOTE

Install the front frame panel firmly to prevent cool air leakage which will cause condensation and water dripping.

**Cover Lock Grille (The moving part protection for user direct touching)**

Cover lock grille must be installed as the figure below.



If the unit need to be service, steps below shall be followed:

1. Confirm that the unit had been switched off before servicing the unit.
2. Use screwdriver to unlock the screw on the cover lock grille.
3. Remove the cover lock grille and open the intake grille for the service purpose.
4. Install the intake grille and screw the cover lock grille after service and make sure the unit is proper install.

Wires Installation

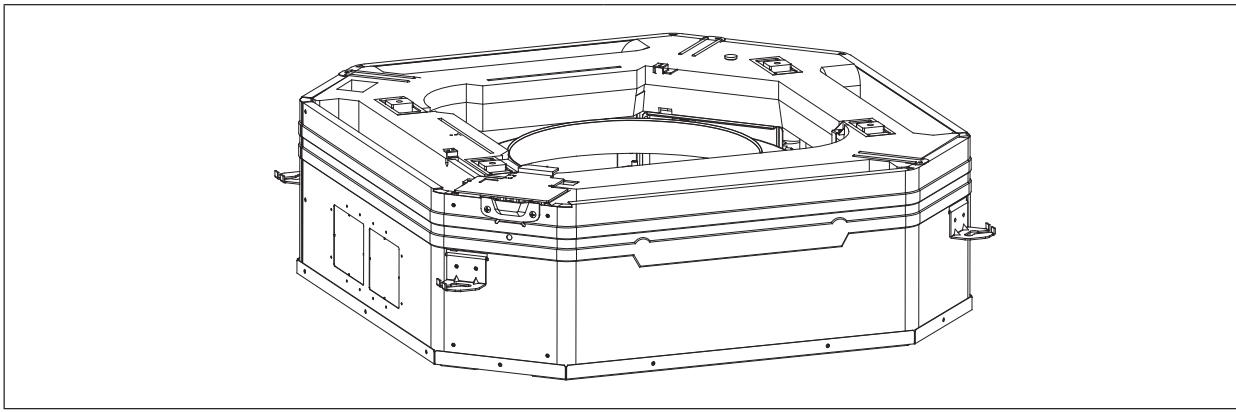


Figure A

Figure A and Figure B shows the location of cover wire in indoor unit.

Steps to install power supply wires and wires from outdoor unit.

1. Remove wire cover by removing 2 screws as shown in Figure C.
2. Wires will go through the hole as shown in Figure D and E respectively without crossing the height of the hole.
3. After that, wire cover will be assembled back to close the wire.

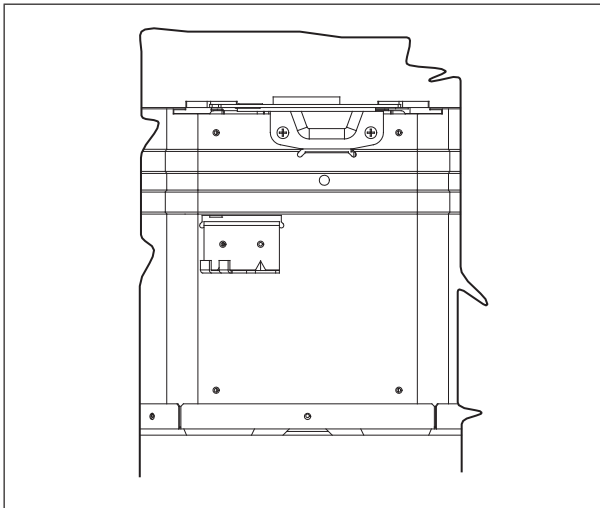


Figure B

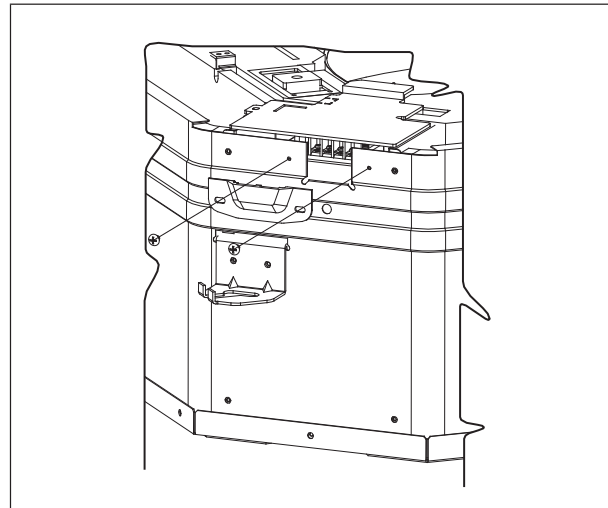


Figure C

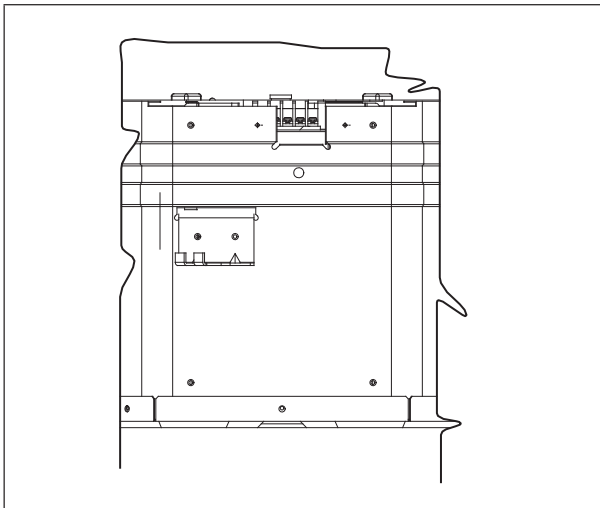


Figure D

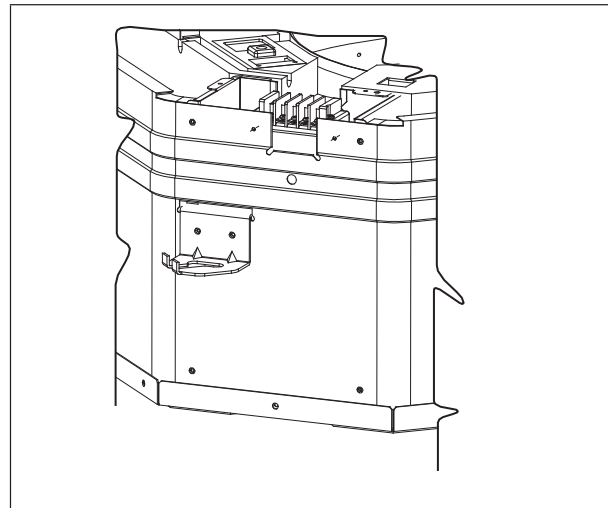
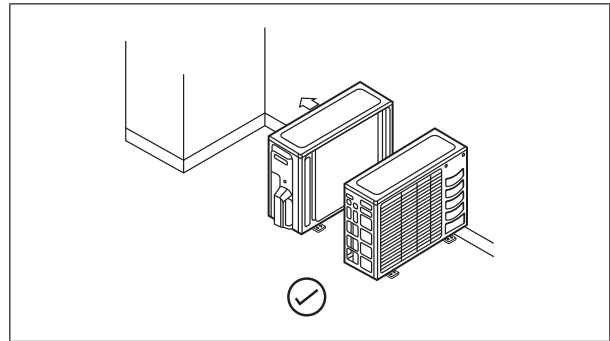
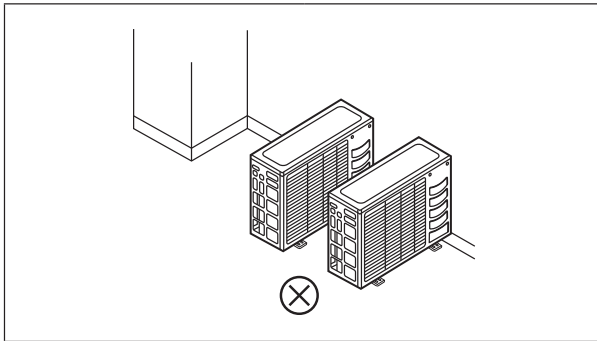


Figure E

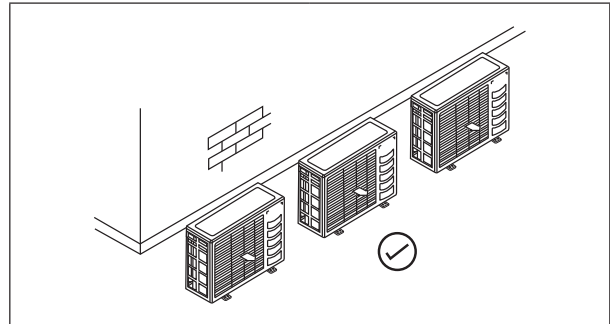
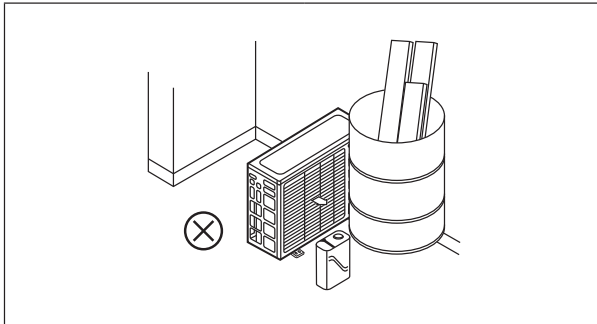
INSTALLATION OF THE OUTDOOR UNIT

As condensing temperature rises, evaporating temperature rises and cooling capacity drops. In order to achieve maximum cooling capacity, the location selected for outdoor unit should fulfill the following requirements:

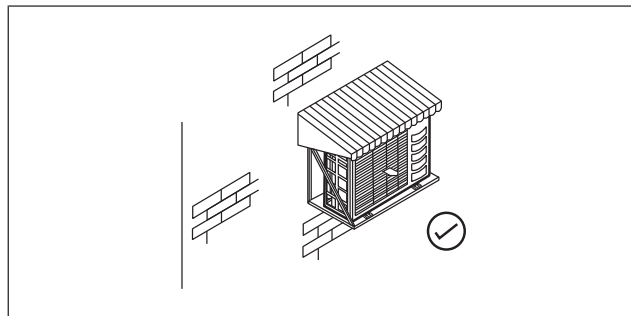
- Install the condensing (outdoor) unit in a way such that the hot air distributed by the outdoor condensing unit cannot be drawn in again (as in the case of short circuit of hot discharge air). Allow sufficient space for maintenance around the unit.



- Ensure that there is no obstruction of air flow into or out of the unit. Remove obstacles which block air intake or discharge.
- The location must be well ventilated, so that the unit can draw in and distribute plenty of air thus lowering the condensing temperature.



- A place capable of bearing the weight of the outdoor unit and isolating noise and vibration.
- A place protected from the direct sunlight. Otherwise use an awning for protection, if necessary.



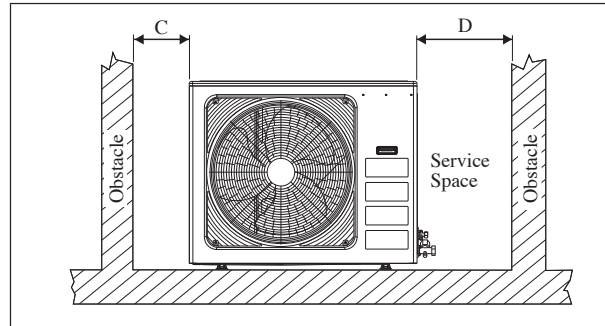
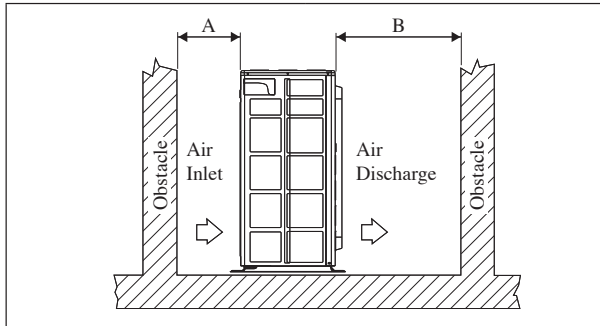
- The location must not be susceptible to dust or oil mist.

CAUTION

- Do not install the unit at altitude over 2000m for both indoor and outdoor.

INSTALLATION CLEARANCE

- Outdoor units must be installed such that there is no short circuit of the hot discharge air or obstruction to smooth air flow. Select the coolest possible place where intake air should not be hotter than the outside temperature (refer to operating range).



All Model	A	B	C	D
Minimum Distance (mm)	300	1000	300	500

REFRIGERANT PIPING

Allowable Pipe Length and Elevation

If the pipe is too long, both the capacity and reliability of the unit will drop. As the number of bends increases, resistance to the flow of refrigerant system increases, thus lowering cooling capacity. As a result, the compressor may become defective. Always choose the shortest path and follow the recommendations as tabulated below:

R22 Units

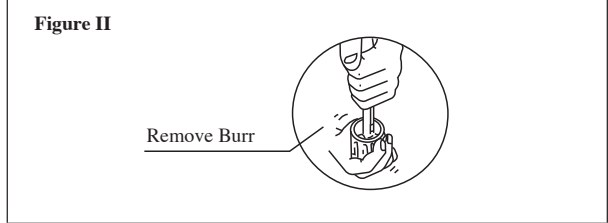
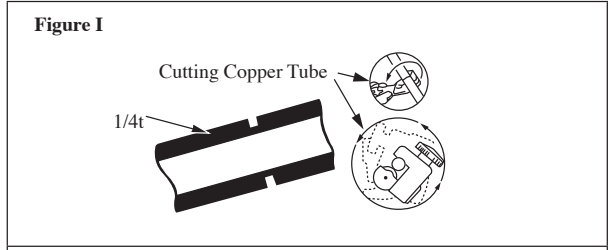
Model	Indoor	FHC20JEV1K	FHC25JEV1K	FHC30JEV1K	FHC40JEV1K	FHC40JEV1K	FHC50JEV1K
	Outdoor	RD20JEV1K	RD25JEV1K	RD30JEV1K	RD40JEV1K	RD40JEV1K	RD50JEV1K
Max. allowable length, m		40	40	50	50	50	45
Max. allowable elevation, m		20	20	30	30	30	25
Liquid pipe size, mm/(in)		6.35 (1/4")	9.52 (3/8")	9.52 (3/8")	9.52 (3/8")	9.52 (3/8")	9.52 (3/8")
Gas pipe size, mm/(in)		15.88 (5/8")	15.88 (5/8")	15.88 (5/8")	19.05 (3/4")	19.05 (3/4")	19.05 (3/4")

NOTE

Be sure to add the proper amount of additional refrigerant, failure to do so may result in reduced performance.
Remark: The refrigerant pre-charged in the outdoor unit is for the piping length up to 7.5m.

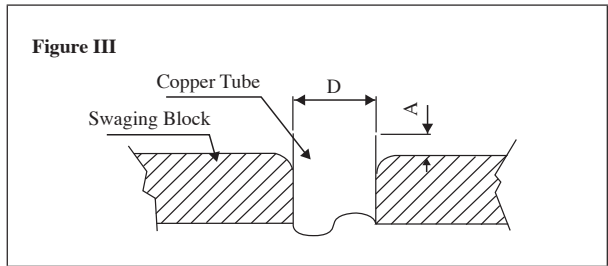
Piping Works And Flaring Technique

- Do not use contaminated or damaged copper tubing. If any pipings, evaporator or condenser had been exposed or had been opened for 15 seconds or more, the system must be vacuumed. Generally, do not remove plastic, rubber plugs and brass nuts from the valves, fittings, tubings and coils until it is ready to connect suction or liquid line into valves or fittings.
- If any brazing work is required, ensure that the nitrogen gas is passed through coil and joints while the brazing work is being done. This will eliminate soot formation on the inside walls of the copper tubings.
- Cut the pipe stage by stage, advancing the blade of the pipe cutter slowly. Extra force and deep cut will cause more distortion on the pipe and thus extra burr. See Figure I.
- Remove burrs from cut edges of the pipes with remover as shown in Figure II. This will avoid unevenness on the flare faces which will cause gas leak. Hold the pipe on top position and burr remover at lower position to prevent metal chips from entering the pipe.
- Insert the flare nuts, mounted on the connection parts of both the indoor unit and outdoor unit, into the copper pipes.
- The exact length of pipe protruding from the top surface of the swaging block is determined by the flaring tool. Refer Figure III.
- Fix the pipe firmly on the flare die. Match the centers of both the flare die and the flaring punch, and then tighten the flaring punch fully.



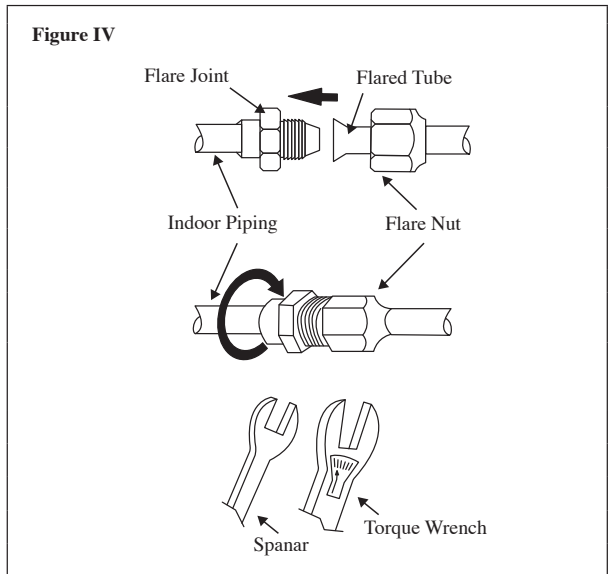
Piping Connection To The Units

- Align the center of the piping and tighten the flare nut sufficiently with fingers. Refer Figure IV.
- Finally, tighten the flare nut with the torque wrench until the wrench clicks.
- When tightening the flare nut with the torque wrench, ensure that the tightening direction follows the arrow indicated on the wrench.
- The refrigerant pipe connection are insulated by closed cell polyurethane.



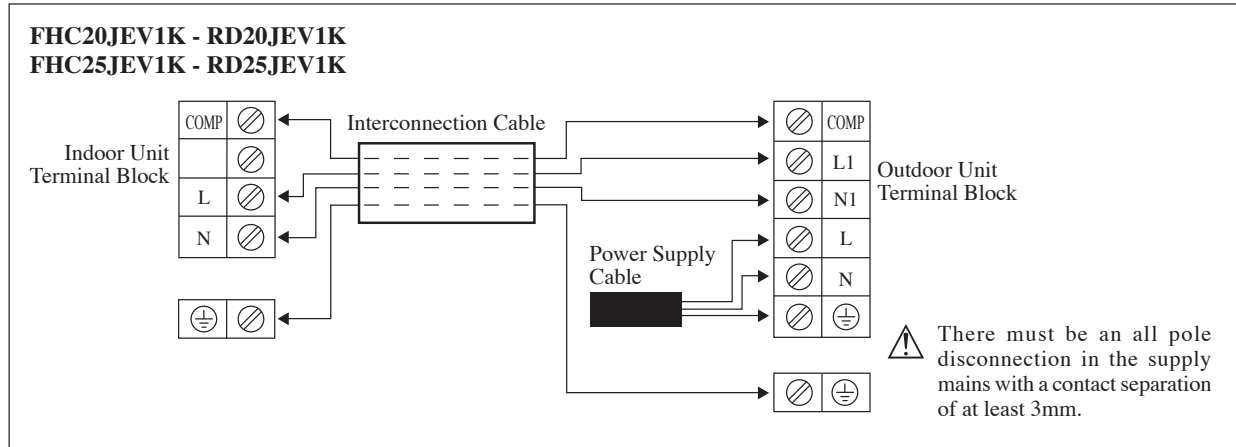
Pipe Size (mm/in)	Torque, Nm/(ft-lb)
6.35 (1/4")	18 (13.3)
9.52 (3/8")	42 (31.0)
12.70 (1/2")	55 (40.6)
15.88 (5/8")	65 (48.0)
19.05 (3/4")	78 (57.6)

Ø Tube, D		A (mm)	
Inch	mm	Imperial (Wing-nut Type)	Rigid (Clutch Type)
1/4"	6.35	1.3	0.7
3/8"	9.52	1.6	1.0
1/2"	12.70	1.9	1.3
5/8"	15.88	2.2	1.7
3/4"	19.05	2.5	2.0

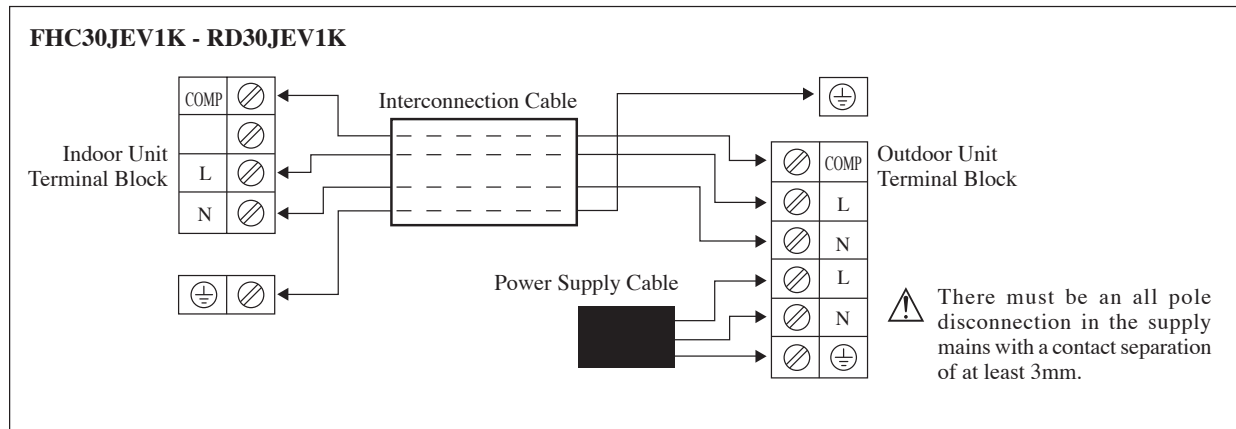


ELECTRICAL WIRING CONNECTION

IMPORTANT : * These values are for information only. They should be checked and selected to comply with local and/or national codes and regulations. They are also subject to the type of installation and size of conductors.
 ** The appropriate voltage range should be checked with data label on the unit.

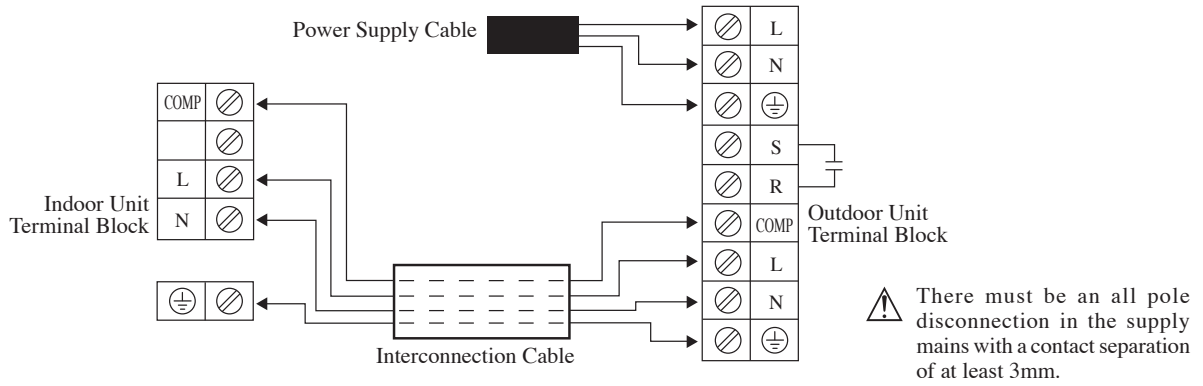


Model	Indoor	FHC20JEV1K	FHC25JEV1K
	Outdoor	RD20JEV1K	RD25JEV1K
Voltage range**	Indoor	220-240V/1Ph/50Hz + ⊕	
	Outdoor	220-240V/1Ph/50Hz + ⊕	
Power supply cable size*	mm ²	2.5	4
Number of conductors		3	3
Interconnection cable size*	mm ²	1.0	1.0
Number of conductors		4	4
Recommended time delay fuse*	A	20	25



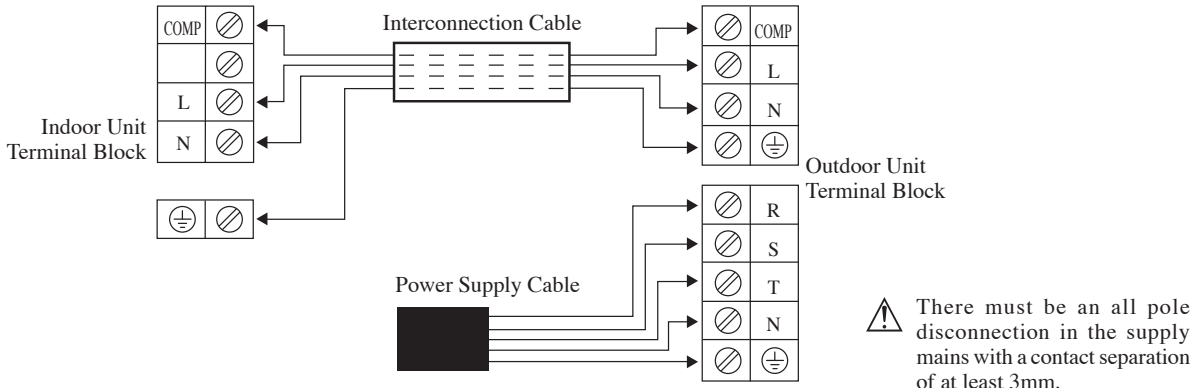
Model	Indoor	FHC30JEV1K
	Outdoor	RD30JEV1K
Voltage range**	Indoor	220-240V/1Ph/50Hz + ⊕
	Outdoor	220-240V/1Ph/50Hz + ⊕
Power supply cable size*	mm ²	4
Number of conductors		3
Interconnection cable size*	mm ²	2.5
Number of conductors		4
Recommended time delay fuse*	A	30

FHC40JEV1K - RD40JEV1K



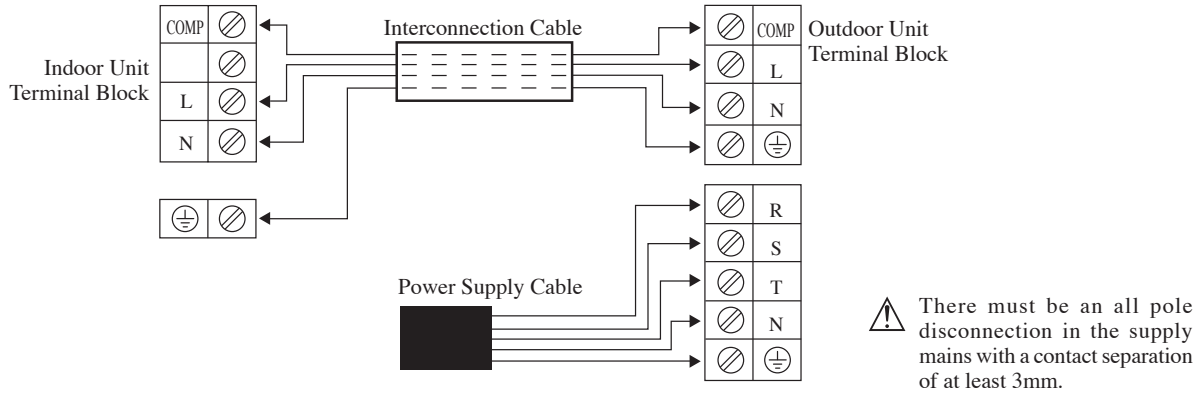
Model	Indoor	FHC40JEV1K
	Outdoor	RD40JEV1K
Voltage range**	Indoor	220-240V/1Ph/50Hz + ⊕
	Outdoor	220-240V/1Ph/50Hz + ⊕
Power supply cable size*	mm²	4.0
Number of conductors		3
Interconnection cable size*	mm²	2.5
Number of conductors		4
Recommended time delay fuse*	A	35

FHC40JEV1K - RD40JEY1K



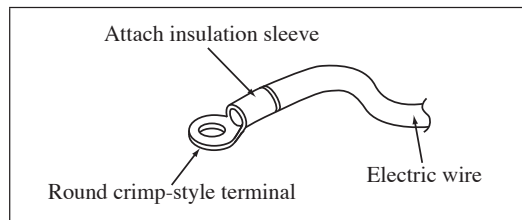
Model	Indoor	FHC40JEV1K
	Outdoor	RD40JEY1K
Voltage range**	Indoor	220-240V/1Ph/50Hz + ⊕
	Outdoor	308-415V/3N~/50Hz + ⊕
Power supply cable size*	mm²	2.5
Number of conductors		5
Interconnection cable size*	mm²	2.5
Number of conductors		4
Recommended time delay fuse*	A	15

FHC50JEV1K - RD50JEY1K

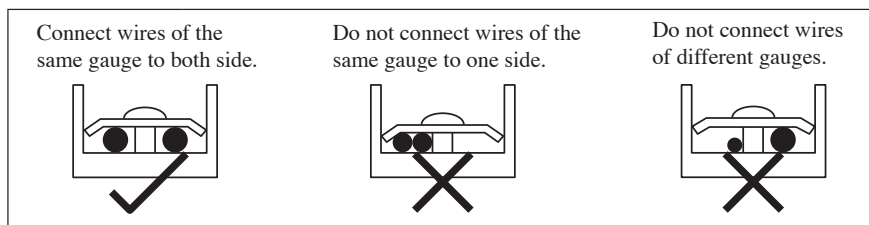


Model	Indoor	FHC50JEV1K
	Outdoor	RD50JEY1K
Voltage range**	Indoor	220-240V/1Ph/50Hz + ⊕
	Outdoor	308-415V/3N~/50Hz + ⊕
Power supply cable size*	mm²	2.5
Number of conductors		5
Interconnection cable size*	mm²	2.5
Number of conductors		4
Recommended time delay fuse*	A	16

- All wires must be firmly connected.
- Make sure all the wire do not touch the refrigerant pipings, compressor or any moving parts.
- The connecting wire between the indoor unit and the outdoor unit must be clamped on the wire clamps.
- The power supply cord must be equivalent to H07RN-F which is the minimum requirement.
- Make sure no external pressure is applied to the terminal connectors and wires.
- Make sure all the covers are properly fixed to avoid any gap.
- Use round crimp-style terminal for connecting wires to the power supply terminal block. Connect the wires by matching to the indication on terminal block. (Refer to the wiring diagram attached on the unit).



- Use the correct screwdriver for terminal screws tightening. Unsuitable screwdrivers can damage the screw head.
- Over tightening can damage the terminal screw.
- Do not connect wire of different gauge to same terminal.
- Keep wiring in an orderly manner. Prevent the wiring from obstructing other parts and the terminal box cover.



VACUUMING AND CHARGING

Vacuuming is necessary to eliminate all moisture and air from the system. The series II Outdoor Unit is provided with flare valve fittings.

Vacuuming The Piping And The Indoor Unit

Except for the outdoor unit which is pre-charged with refrigerant, the indoor unit and the refrigerant connection pipes must be air-purged because the air containing moisture that remains in the refrigerant cycle may cause malfunction of the compressor.

- Remove the caps from the valve and the service port.
- Connect the center of the charging gauge to the vacuum pump.
- Connect the charging gauge to the service port of the 3-way valve.
- Start the vacuum pump. Evacuate for approximately 30 minutes. The evacuation time varies with different vacuum pump capacity. Confirm that the charging gauge needle has moved towards -760mmHg.

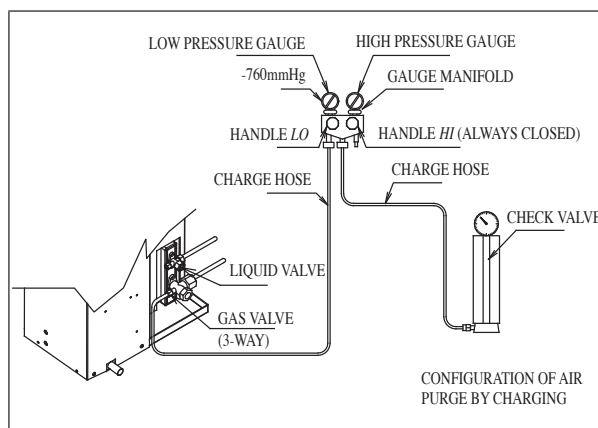
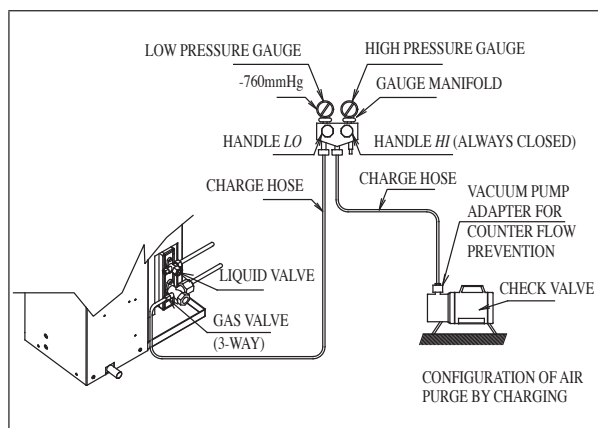
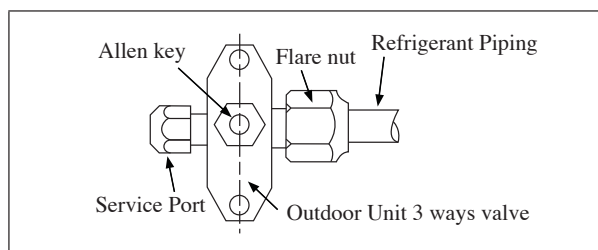
Caution

- If the gauge needle does not move to -760mmHg, be sure to check for gas leaks (using the refrigerant detector) at flare type connection of the indoor and outdoor unit and repair the leak before proceeding to the next step.
- Close the valve of the changing gauge and stop the vacuum pump.
- On the outdoor unit, open the suction valve (3 way) and liquid valve (2 way) (in anti-clockwise direction) with 4mm key for hexagon sacked screw.

Charge Operation

This operation must be done by using a gas cylinder and a precise weighing machine. The additional charge is topped-up into the outdoor unit using the suction valve via the service port.

- Remove the service port cap.
- Connect the low pressure side of the charging gauge to the suction service port center of the cylinder tank and close the high pressure side of the gauge. Purge the air from the service hose.
- Start the air conditioner unit.
- Open the gas cylinder and low pressure charging valve.
- When the required refrigerant quantity is pumped into the unit, close the low pressure side and the gas cylinder valve.
- Disconnect the service hose from service port. Put back the service port cap.



ADDITIONAL CHARGE

The refrigerant is pre-charge in the outdoor unit. If the piping length is less than 7.5m, then additional charge after vacuuming is not necessary. If the piping length is more than 7.5m then use the additional charge value as indicated in the table.

Additional refrigerant charge [g] per additional 1m length as tabulated

Cooling only

Model	Indoor	FHC20JEV1K	FHC25JEV1K	FHC30JEV1K	FHC40JEV1K	FHC40JEV1K	FHC50JEV1K
	Outdoor	RD20JEV1K	RD25JEV1K	RD30JEV1K	RD40JEV1K	RD40JEY1K	RD50JEV1K
Additional charge [g/m]		19	38	55	65	65	54

Example:

FHC25JEV1K & RD25JEV1K with 13m piping length, additional piping length is 5.5m. Thus,

$$\begin{aligned} \text{Additional charge} &= 5.5[\text{m}] \times 38[\text{g/m}] \\ &= 209[\text{g}] \end{aligned}$$

SPECIAL PRECAUTIONS WHEN CHARGING UNIT WITH SCROLL COMPRESSORS

These precautions are intended for use with Scroll compressors only with R22 refrigerants but are not applied to others competitive Scroll compressors.

Scroll compressors have a very high volumetric efficiency and quickly pump a deep vacuum if there is insufficient refrigerant in the system or if refrigerant is added too slowly. Operation with low suction pressure will quickly lead to very high discharge temperatures. While this process is happening, the scrolls are not being well lubricated – scrolls depend on the oil mist in the refrigerant for lubrication. A lack of lubrication leads to high friction between the scroll flanks and tips and generates additional heat. The combination of heat of compression and heat from increased friction is concentrated in a small localized discharge area where temperatures can quickly rise to more than 300°C. These extreme temperatures damage the Scroll spirals and the orbiting Scroll bearing. This damage can occur in less than one minute especially on larger compressors. Failure may occur in the first few hours or the damage done during field charging may show up some time later.

Other typical field charging problems include undercharging, overcharging, moisture or air in the system etc. In time each one of these problems can cause compressor failure.

Minimal equipment is required for field charging. The minimum equipment required to do a satisfactory job is:-

- | | |
|--------------------------|-----------------|
| 1. Set of service gauges | 4. Vacuum gauge |
| 2. Hoses | 5. Scales |
| 3. Vacuum pump | 6. Thermometer |

The proper refrigerant charge should follow the volume as recommended by manufacturer and recommendation should be followed by the installer.

1. Charging procedures – Single phase compressors

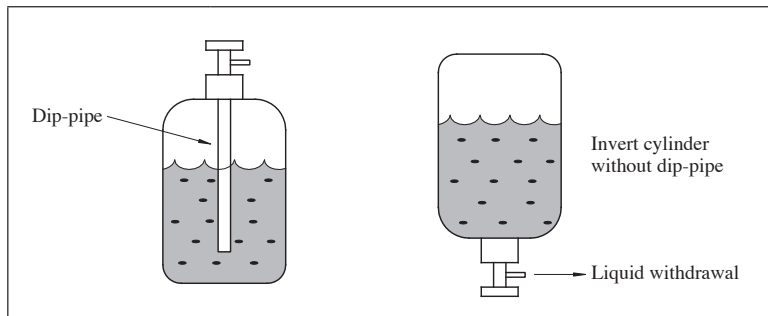
Evacuate the system to -760mmHg. To reduce evacuation time, use short, large diameter hoses and connect to unrestricted service ports on the system. Quality of vacuum cannot be determined by time – a reliable vacuum gauge must be used. (etc. electronic vacuum gauge)

Turn the refrigerant cylinder upside down, purge the charging hose and charge liquid through the liquid line charging port until refrigerant no longer flows or until the correct charge has been weighed in. If additional charge is required start the system and slowly bleed liquid into the suction side until the system is full.

It recommends charging liquid in a CONTROLLED manner into the suction side until the system is full.

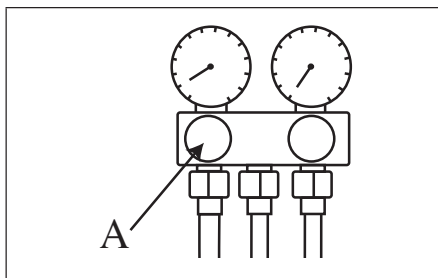
This recommendation does not hold true for reciprocating compressors where liquid charging into the suction side could cause severe damage.

Carefully monitor the suction and discharge pressures – ensure that the suction pressure does not fall below 25 psig (1.7 bar) at any time during the charging process.



⚠ CAUTION

- Manifold Gauge will show cylinder pressure rather than suction pressure if the cylinder valve and Manifold valve “A” are both open.



There are many ways of charging liquid in a “controlled manner” into the suction side:-

1. Use valve A on the manifold gauge set
2. Use the valve on the refrigerant cylinder
3. Charge through a Shredder valve
4. Use a hose with a Shredder valve depressor
5. Charge into the suction side at some distance from the compressor
6. All of the above

2. Charging procedures – Three phase compressors

The fundamental procedure is the same as for single phase models but the compressor can run in the wrong direction on starting.

If this happens reverse any two phases and start again. Short term reverse rotation will not damage the compressor.

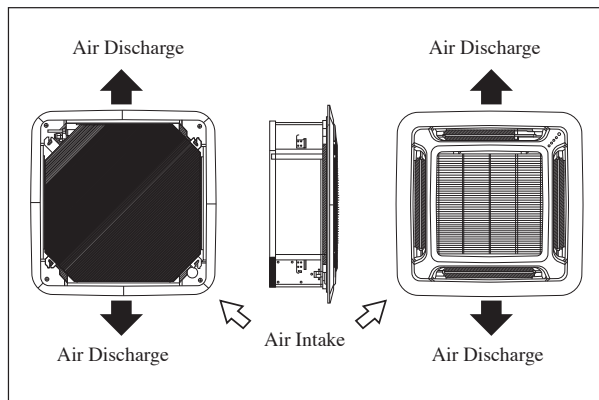
All Specter compressors have internal discharge temperature protectors which are very effective in preventing dangerously high discharge temperatures during charging. The protection module will trip and lock the compressor out for 30 minutes. It is not normally necessary to wait 30 minutes for the module to reset. When the compressor has cooled down the module can be reset by breaking the power supply to the control circuit. Very often the serviceman does not understand why the module tripped and uses a jumper wire to bypass it. He continues to charge the system and removes the jumper when charging is complete. The compressor may or may not run with the protector back in the circuit but it is certain that the compressor has been damaged and premature failure is inevitable.

OPTIONAL FUNCTIONS

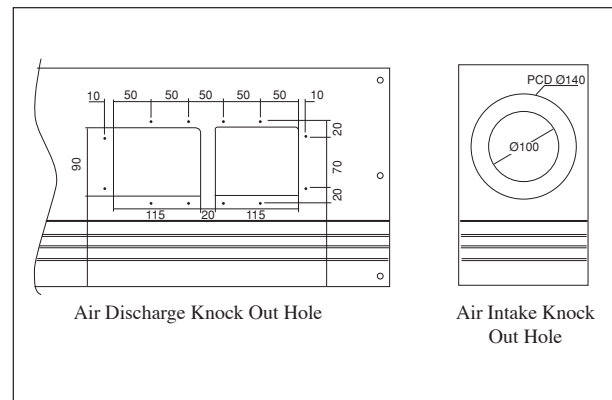
Short Duct Specification

- The indoor unit is provided with air discharge and air intake “knock-out” hole for duct connection. However the connection of the short duct for air discharge is possible on only one side.
- The use of short duct for air discharge will improve airflow distribution if there is an obstruction (such as a lighting fixture) or in a long, narrow room or an L-shaped room. It also use for air conditioning of two rooms simultaneously.

Possible Direction For Air Discharge And Air Intake



Possible Opening Dimension For Duct Connection



NOTE

- Avoid using the short duct on which the air discharge grille can be completely closed, to prevent evaporator freezing.
- In order to prevent condensation forming, be sure that there is sufficient thermal insulation and no leakage of cool air when installing the short duct.
- Keep the introduction of fresh air intake within 20% of total air flow. Also provide a chamber and use a booster fan.

Sealing Material

- It is possible to seal one of the four air discharge outlet. (sealing two or more air discharge outlet could cause a malfunction)
- Remove the front panel and insert the sealing material into the air discharge outlet on the indoor unit to seal the air outlet.
- The sealing material is the same length as the longer air discharge outlet. If it is desired to seal the shorter air discharge outlet, cut the sealing material to shorten it.
- Push the sealing material in about 10mm beyond the bottom surface of the indoor unit so that it does not touch the air louver. Be sure not to push the sealing material in any farther than about 10mm.

INDICATOR LIGHTS

FAULT DIAGNOSIS

Wireless Controller

When there is infrared remote control operating signal, the signal receiver on indoor unit will make a <beep> for signal acceptance confirmation.

Wired Controller

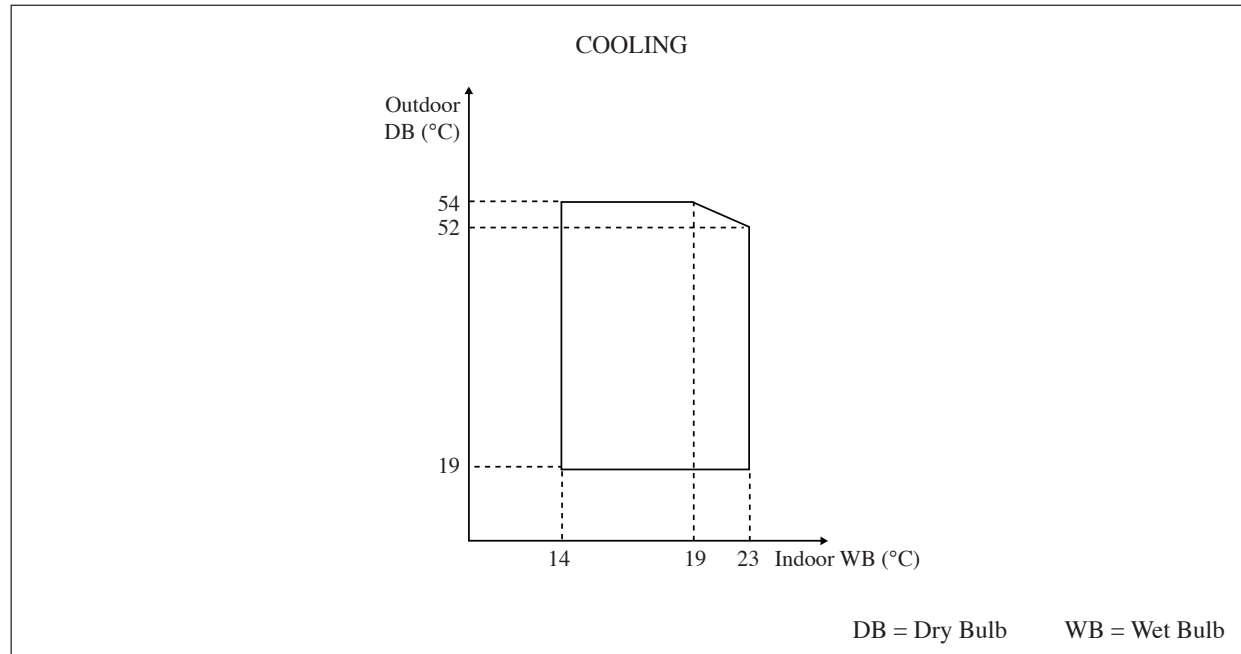
If there is any abnormal condition detected, wired controller will blink the error code.

	Event	Power LED	Timer LED	Other LEDs	Error Code
1.	Room Sensor Open or Short	Blink 1 time	-	Blink Fan	Blink E1
2.	Indoor Coil Sensor Open	Blink 2 times	-	Blink Sleep	Blink E2
3.	Outdoor Coil Sensor Open	Blink 3 times	-	Blink Dry	Blink E3
4.	Compressor Overload / Indoor Coil Sensor Short / Outdoor Coil Sensor Short	-	Blink 1 time	Blink Cool	Blink E4
5.	Low Refrigerant Charge/Gas Leak/Outdoor Abnormal	-	Blink 3 times	Blink Cool & Dry	Blink E5
6.	Water Pump Fault	-	Blink 2 times	Blink Cool & Fan	Blink E6
7.	Outdoor Coil Sensor Exist (MS model)	-	Blink 5 times	Blink Cool & Heat	Blink E7
8.	Hardware Error (tact switch pin short)	-	Blink 6 times	Blink Heat, Cool, follow by Fan, Dry	Blink E8

NOTE

Power LED = Cool/Dry/Fan LED, turns on in these modes
The unit will not detect sensor missing when the compressor is ON
Call your dealer immediately when this error happen

OPERATING RANGE



OVERALL CHECKING

- **Ensure that:**
 - 1) The unit has been mounted solidly and rigid in position.
 - 2) The piping and connections are leak-proof after the charging.
 - 3) Proper wiring has been installed.
- **Drainage check**
 - pour some water into the left side of the drain pan (the drainage is at the right side of the unit).
- **Test run:**
 - 1) Conduct a test run on the unit after having perform the water drainage test and the gas leakage test.
 - 2) Check the following items:
 - a) Is the electrical plug inserted firmly into the socket?
 - b) Is there any abnormal sounds from the unit?
 - c) Is there any abnormal vibrations on the unit or the piping?
 - d) Is the drainage of water smooth?
- **Confirm that:**
 - 1) The condenser fan is running. Check the warm air blowing from the condensing unit.
 - 2) The evaporator blower is running and discharge cool air.
 - 3) The suction (low side) pressure is as recommended.
 - 4) The remote controller incorporates a 3-minute delay protection in the circuit, whereby the outdoor condensing unit requires about 3 minutes delay before it can start operating.

PHASE PROTECTOR (OPTIONAL)

The unit with Scroll Compressor can only rotate in one direction. For this reason, a protective device (phase protector) is fitted to prevent incorrect wiring of the electrical phases. When the three phases are not connected correctly, the phase protector operates, and the unit will not start. This device is located in the control box of the outdoor unit.

The following table shows the LED indicator light for phase protector under normal operation and fault conditions.

Description \ LED	PW (Red)	P_R (Yellow)	P_S (Yellow)	P_T (Yellow)	Actions
Normal operation	○	●	●	●	-
Reverse phase	◐	◐	◐	◐	Switch off the unit. Check the 3 phase wiring.
T phase missing	◐	●	●	◐	Switch off the unit. Check the 3 phase wiring.
S phase missing	◐	●	◐	●	Switch off the unit. Check the 3 phase wiring.
R phase missing	●	●	●	●	Switch off the unit. Check the 3 phase wiring.
S & T phase missing ⁺	◐	●	◐	◐	Switch off the unit. Check the 3 phase wiring.
Overload ⁺	◐	●	●	●	High discharge temperature. Check the refrigerant system.
Sensor missing ⁺	◐	○	○	○	Switch off the unit. Plug in sensor.

○ ON

● OFF

◐ Fast Blink

NOTE

1. “+” indicates additional functions for PP01 phase protector.
2. When R phase missing, no LED or buzzer will indicate the error, but relay 71 and relay 81 will cut off.

SERVICE AND MAINTENANCE

Service Parts	Maintenance Procedures	Period
Indoor Air Filter	<ol style="list-style-type: none"> 1. Remove any dust adhering to the filter by using a vacuum cleaner or wash in lukewarm water (below 40°C) with a neutral cleaning detergent. 2. Rinse the filter well and dry before placing it back onto the unit. 3. Do not use gasoline, volatile substances or chemicals to clean the filter. 	<p>At least every 2 week.</p> <p>More frequently if necessary.</p>
Indoor Unit	<ol style="list-style-type: none"> 1. Clean any dirt or dust on the grille or panel by wiping it with a soft cloth soaked in lukewarm water (below 40°C) and a neutral detergent solution. 2. Do not use gasoline, volatile substances or chemicals to clean the indoor unit. 	<p>At least every 2 week.</p> <p>More frequently if necessary.</p>
Indoor Fan	<ol style="list-style-type: none"> 1. Check for any abnormal noise. 	When necessary

CAUTION

- Avoid direct contact of any coil treatment cleaners on plastic part. This may cause plastic part to deform as a result of chemical reaction.

TROUBLESHOOTING

For any enquiries on spare parts, please contact your authorized dealer. If any malfunction of the air conditioner unit is noted, immediately switch off the power supply to the unit. Check the following fault conditions and causes for some simple troubleshooting tips.

Fault	Causes / Action
1. The compressor does not start operate after 3 minutes from starting the air conditioner unit.	- Protection against frequent starting. Wait for 3 to 4 minutes for the compressor to start operating.
2. The air conditioner unit does not operate.	<ul style="list-style-type: none"> - Power failure, or the fuse need to be replaced. - The power plug is disconnected. - It is possible that your delay timer has been set incorrectly.
3. The air flow is too low.	<ul style="list-style-type: none"> - The air filter is dirty. - The air suction and discharge are clogged. - The regulated temperature is not high enough (applicable for auto fan mode only).
4. Discharge air flow has bad odor.	- Odors may be caused by cigarettes, smoke particles, perfume etc. which might have adhered onto the coil.
5. Condensation on the front air grille of the indoor unit.	<ul style="list-style-type: none"> - This is caused by air humidity after an extended long period of operation. - The set temperature is too low, increase the temperature setting and operate the unit at high fan speed.
6. Water flowing out from the air conditioner unit.	- Switch off unit and call local dealer/serviceman.

If the fault persists, please call your local dealer / serviceman.

- In the event that there is any conflict in the interpretation of this manual and any translation of the same in any language, the English version of this manual shall prevail.
- The manufacturer reserves the right to revise any of the specification and design contain herein at any time without prior notification.

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