

Group: CEILING EXPOSED

Part Number: A08019025473

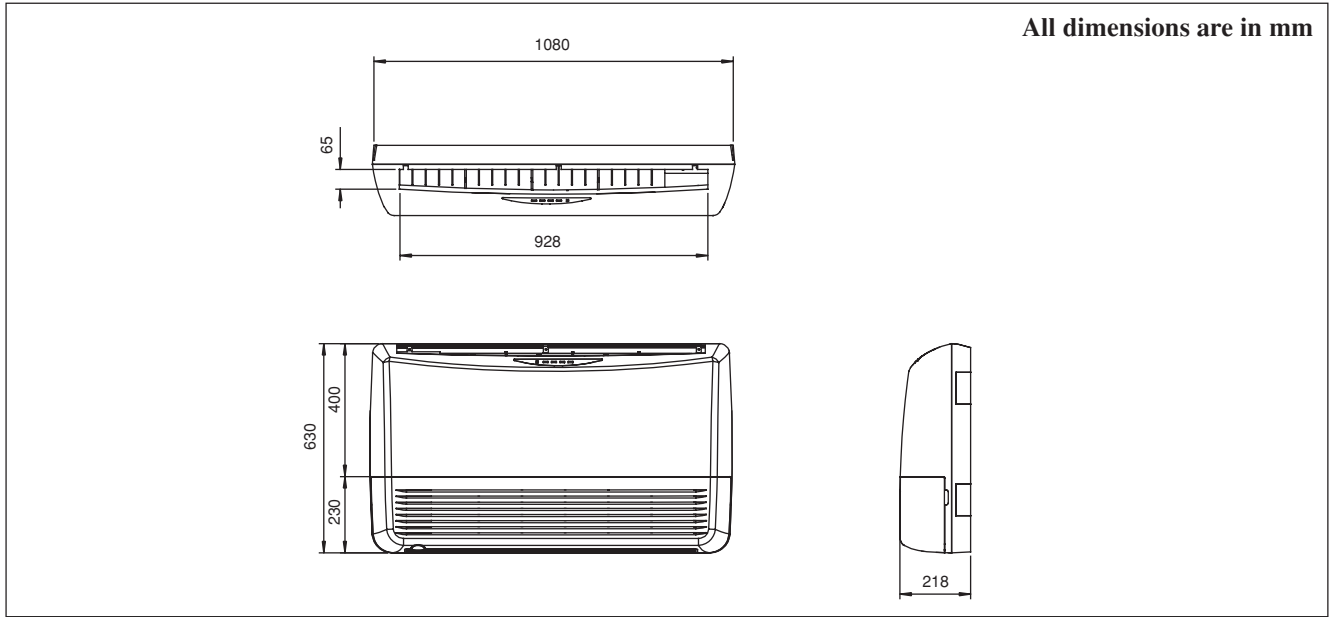
Date: OCTOBER 2004

CEILING/FLOOR EXPOSED CONVERTIBLE SPLIT TYPE AIR CONDITIONERS

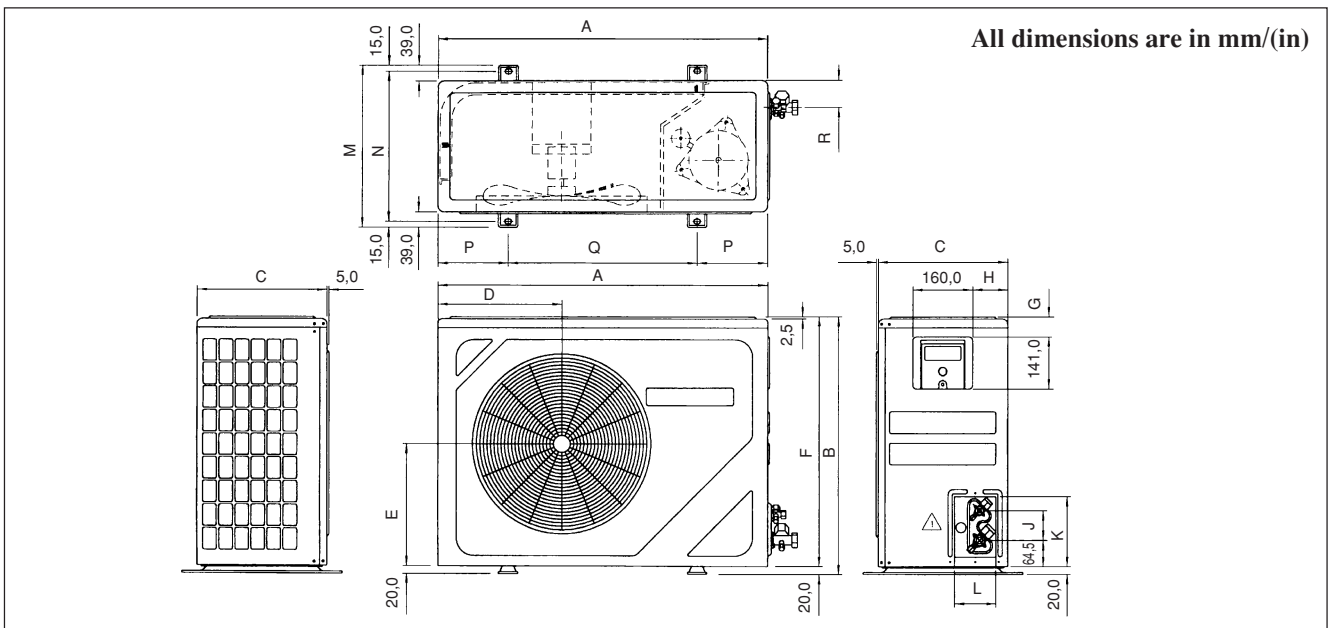


OUTLINE AND DIMENSIONS

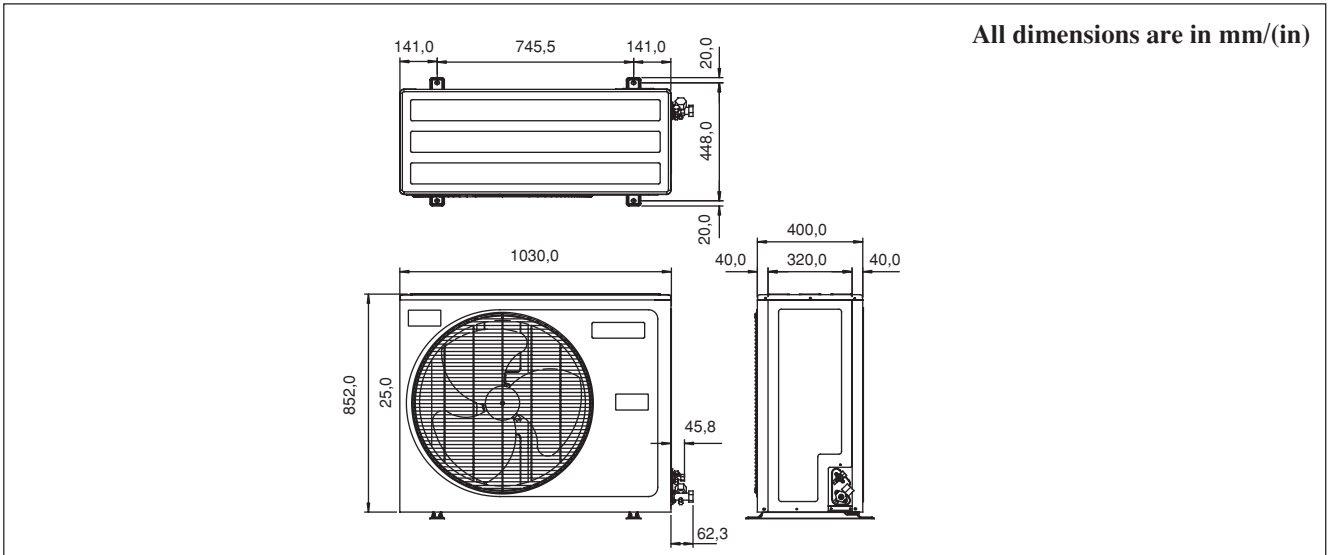
Indoor Unit (CEE series)



Outdoor Unit (SL series)




Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
SL 20B / BR	840	646	330	297	309	626	41	85	75	177	106	408	378	124	592	78,5
SL 25B / BR																
SL 30B / BR																
SL 20C / CR	855	648	328	303	309	630	49	116	75	187	98	392	362	126	603	164
SL 25C / CR		750				730										
SL 28C / CR																





- ⚠ Caution** Sharp edges and coil surfaces are potential locations which may cause injury hazards. Avoid from being in contact with these places.
- ⚠ Avertissement** Les bords coupants et les surfaces du refroidisseur tuulaire présentent un risque de blessure. Mieux vaut éviter le contact avec ces endroits.
- ⚠ Vorsicht** Scharfe Kanten und Wärmetauscherflächen stellen eine Gefahrenquelle dar. Jeglicher Kontakt mit diesen Stellen ist zu vermeiden.
- ⚠ Cautela** Per preservarsi da eventuali ferite, evitare di toccare gli spigoli afilati e la superficie dei serpentine.
- ⚠ Cuidado** Los Bordes afilados y la superficie del serpentín pueden producir lesiones. Evite tocarlos.
- ⚠ Осторожно** Острые края и поверхности змеевиков являются потенциальными местами нанесения травм. Остерегайтесь контакта с этими местами.


NOTICE


- This product is subjected to Waste of Electrical and Electronic Equipment Regulations (WEEE Regulations). The waste product shall be separately collected by specific collection and treatment centre. Please refer to local authority for these centres. This is only applicable to European Union countries.



- Ce produit est soumis à la réglementation concernant les déchets des équipements électriques et électroniques (réglementation DEEE). Le déchet doit être collecté séparément par un centre de collecte et de traitement spécifique. Veuillez vous référer aux autorités locales pour connaître ces centres. Ceci est uniquement applicable aux pays de l'Union Européenne.


- Dieses Produkt unterliegt den Bestimmungen zur Entsorgung von elektrischen und elektronischen Geräten (WEEE Bestimmungen). Die Entsorgung sollte am Ende des Lebenszyklus des Gerätes getrennt vom Hausmüll bei Ihrer örtlichen Mülldeponie bzw. Ihrem örtlichen Wiederaufbereitungszentrum erfolgen. Bitte wenden Sie sich an Ihr zuständiges Abfall-Amt. Dieser Hinweis gilt nur für Länder der Europäischen Union.


- Questo prodotto è soggetto alle disposizioni RAEE (Rifiuti di apparecchiature elettriche ed elettroniche). Il prodotto da smaltire verrà ritirato da un centro incaricato del ritiro e smaltimento. Per conoscere il nome del centro pertinente, contattare le autorità locali. Questa disposizione è valida solamente i paesi dell'U.E.


- Este producto esta sujeto a las Regulaciones del Equipamiento Eléctrico y Electrónico en materia de desechos (Regulaciones WEEE). El producto dañado será retirado por separado por el centro específico de colección y tratamiento. Por favor remitirse a las autoridades locales de estos centros. Esto es solamente aplicable a los países de la Unión Europea.


- Процесс утилизации данного продукта регулируется правилами по утилизации отходов электротехнического и электронного оборудования (WEEE Regulations). Такини отходами должен заниматься специальный центр по сборке и обработке отходов. За информацией о таких центрах, обращайтесь к местным властям. Эти правила применяются только в странах Европейского Союза.



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.

CEILING/FLOOR EXPOSED CONVERTIBLE SPLIT TYPE AIR CONDITIONER

MODEL

COOLING UNIT

Reference Model

CE20E
SL20B
SL20C

CE25E
SL25B
SL25C

CE28E
SL30B
SL28C
SL30C

Model

MCM020E
MLC020B
MLC020C

MCM025E
MLC025B
MLC025C

MCM028E
MLC030B
MLC028C
MLC030C

HEAT PUMP UNIT

Reference Model

CE20ER
SL20BR
SL20CR

CE25ER
SL25BR
SL25CR

CE28ER
SL30BR
SL28CR
SL30CR

Model

MCM020ER
MLC020BR
MLC020CR

MCM025ER
MLC025BR
MLC025CR

MCM028ER
MLC030BR
MLC028CR
MLC030CR

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SAFETY PRECAUTIONS

Before installing the air conditioner unit, please read the following safety precautions carefully.

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, compressor and any moving parts of the fan motors.
- Confirm that the unit has been switched OFF before installing or servicing the unit.

IMPORTANT

DO NOT INSTALL OR USE THE AIR CONDITIONER UNIT IN A LAUNDRY ROOM.

Caution

Please take note on 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.**



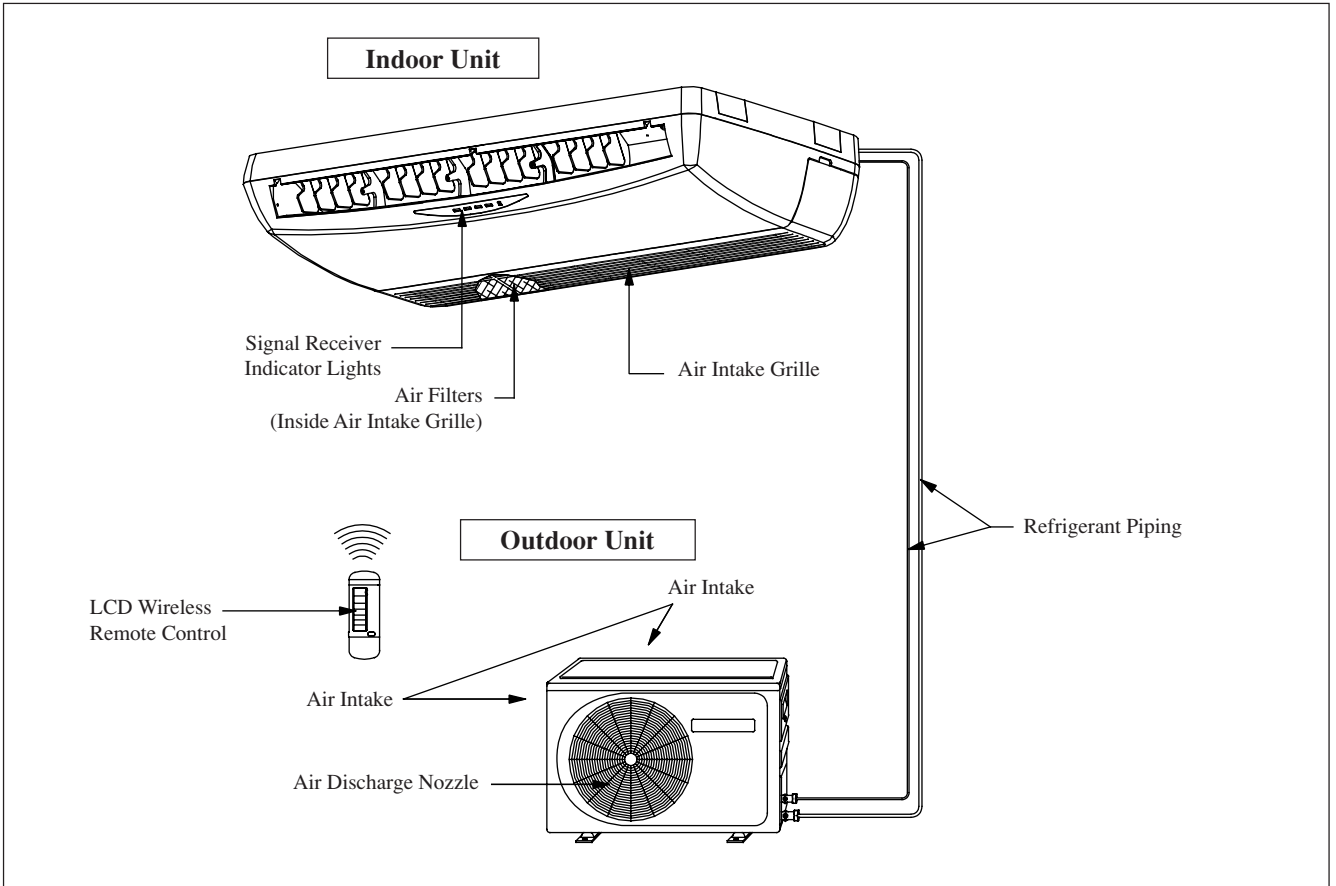
This unit is factory pre-charged. Overcharge will cause over-current or damage to the compressor.

- **Ensure that the unit panel is closed after service or installation.**



Unsecured panel will cause unit to operate noisily.

AIR CONDITIONER PARTS DESCRIPTION



INSTALLATION OF THE INDOOR UNIT

Preliminary Site Survey

- Electrical supply and installation shall conform to the local authority (e.g. National Electrical Board).
- Voltage supply fluctuation must not exceed $\pm 10\%$ of the rated voltage. Electricity supply lines must be independent of welding transformers which can cause high supply fluctuation.
- Ensure that the installation location is convenient for wiring and piping.

Standard Mounting

Ensure that the overhead supports are strong enough to hold the weight of the unit. Position the hanger rods (wall mounting bracket for floor standing), and check for its alignment with the unit as shown in Figure A. Also, check that the hangers are secured and the base of the fan coil unit is leveled in both horizontal directions, taking into account the gradient for drainage flow as recommended in Figure B.

Figure A

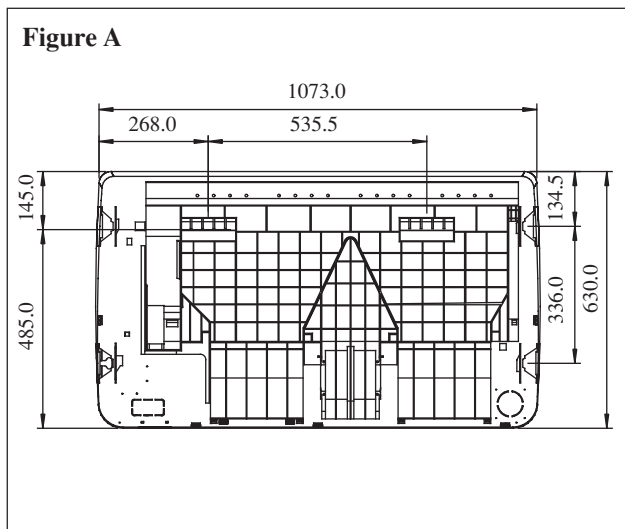
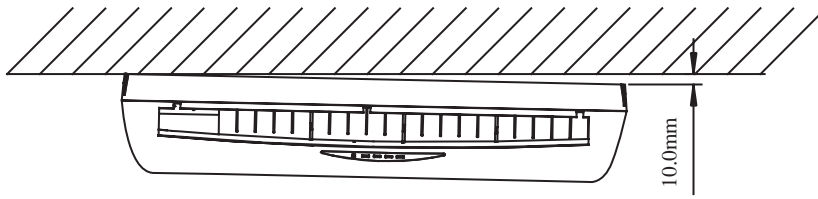


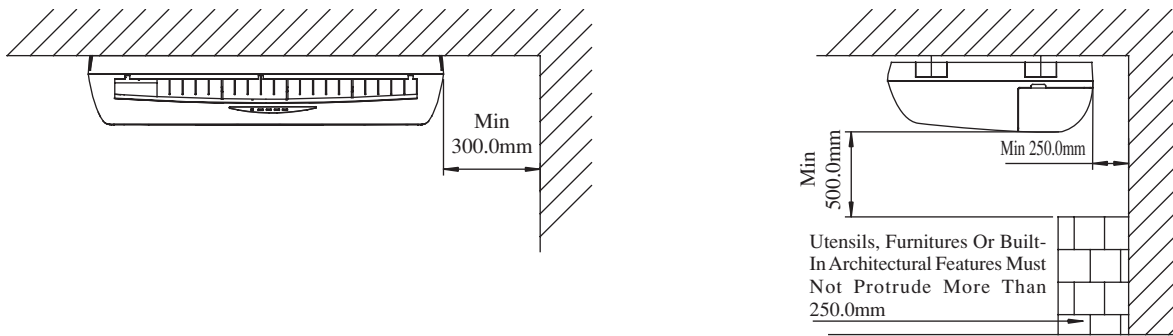
Figure B



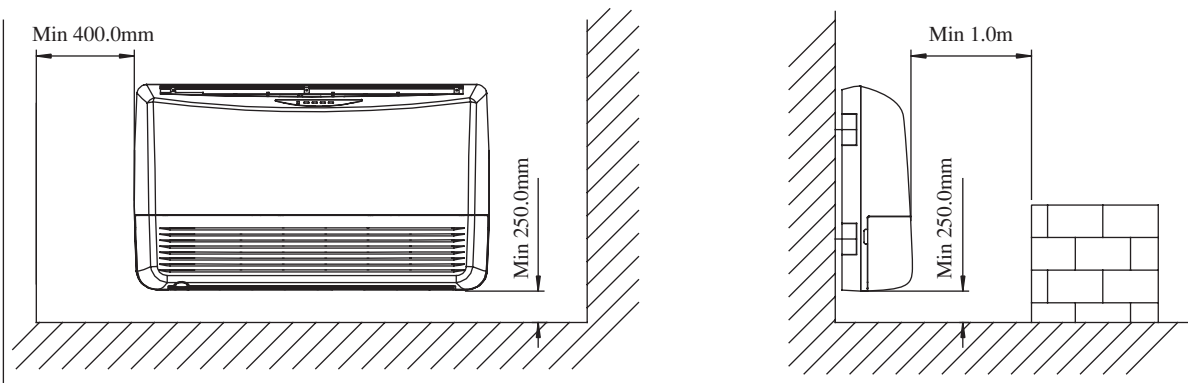
Please ensure that the following steps are taken:

- Check the gradient for drainage flow as recommended in Figure B.
- Provide clearance for easy servicing and optimal air flow as shown in Figure C.
- The indoor unit must be installed such that there is no short circuit of the cool discharge air with the warm return air.
- Do not install the indoor unit where there is direct sunlight shining on the unit. The location should be suitable for piping and drainage installation. The unit must be a large distance away from the door.

Figure C



Ceiling Type



Floor Standing Type

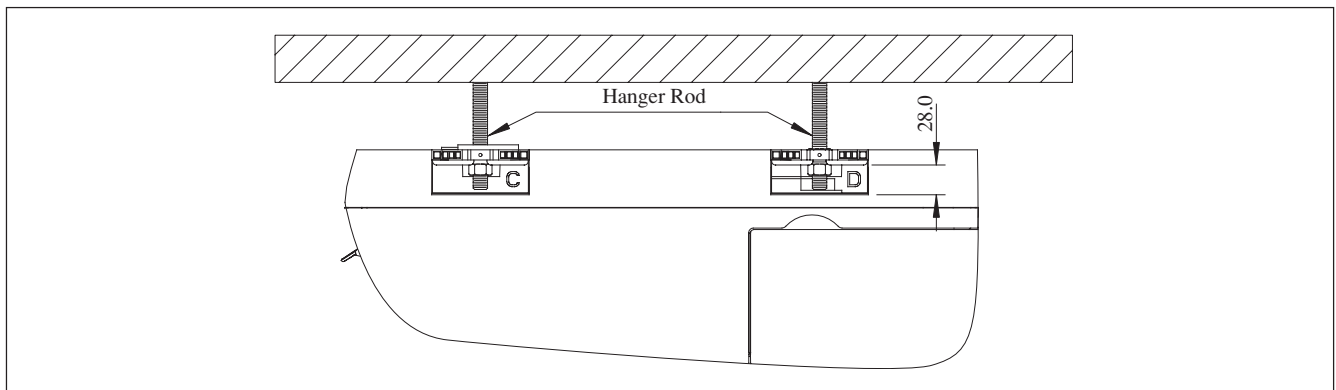
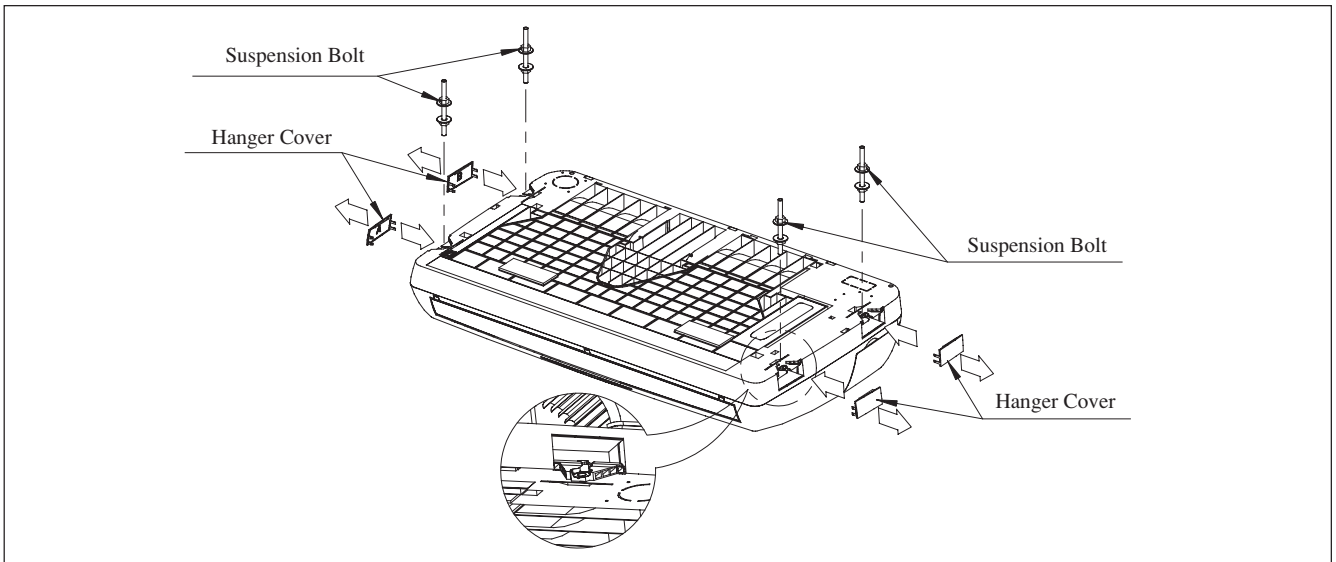
UNDER CEILING INSTALLATION

Install the Suspension Bolts

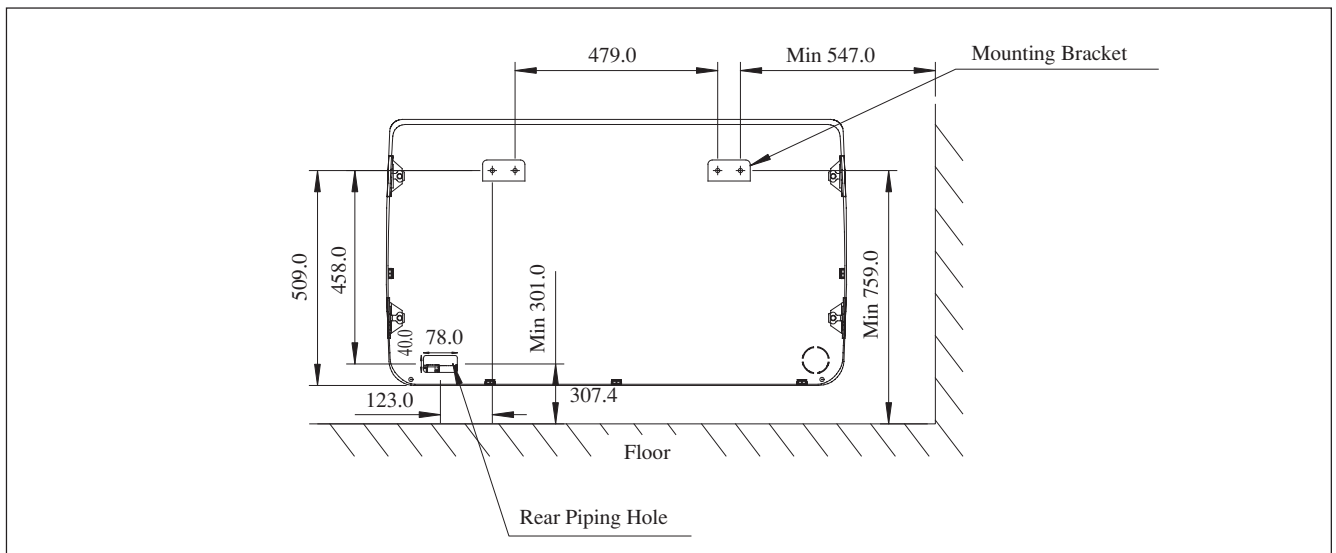
1. Install the suspension bolts so that it can support the indoor unit.
2. Adjust distance to ceiling before installation.
3. Refer to the dimension given to install the unit.

Install the Indoor Units

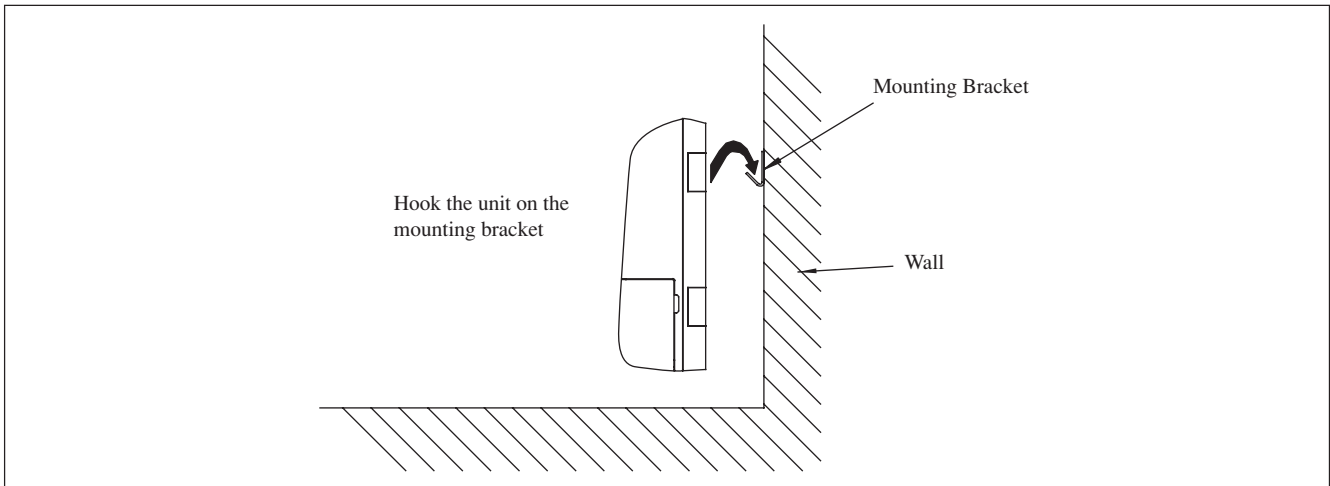
1. Insert the suspension bolts into the fittings of the hanger bracket.
2. Set the nuts and washer on the both side of the metal fittings.
3. Secure it with nuts.
4. Attach the hanger cover (4 pcs) to the units.



Floor Standing Installation

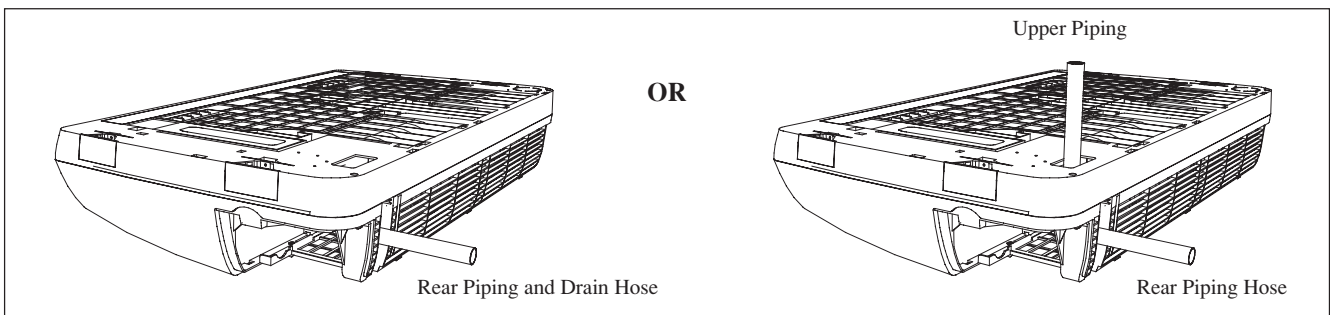


1. Refer to the dimension as illustrated when installing the mounting bracket.
2. When the rear piping, determine the pipe hose position. Drill the pipe hole at the slight downward slant to the outdoor side.

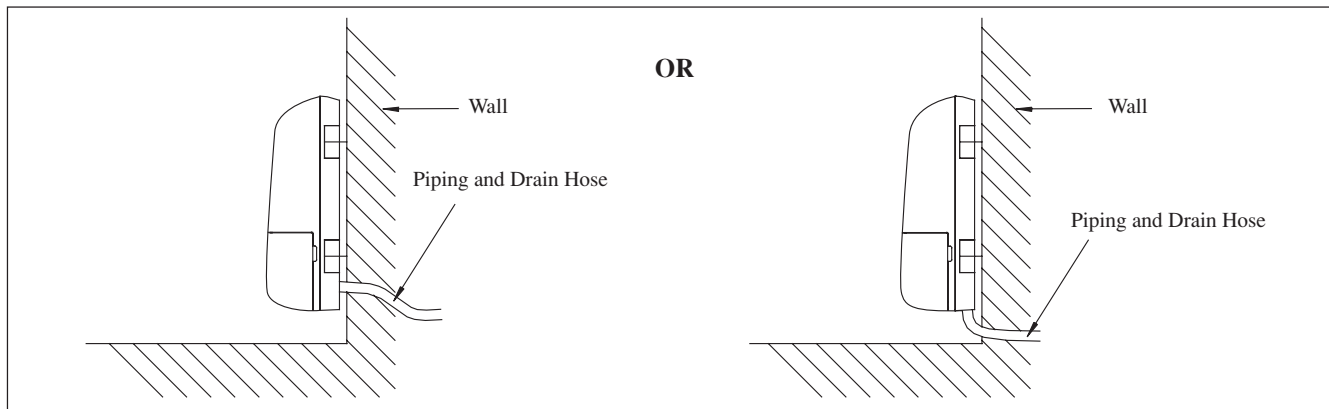


Piping and Drain Hose Installation (Under Ceiling Type)

1. The piping direction can be 2 ways as illustrated.
2. The drain hose is only 1 way.

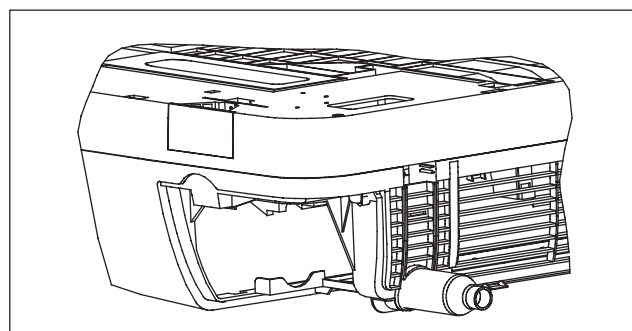
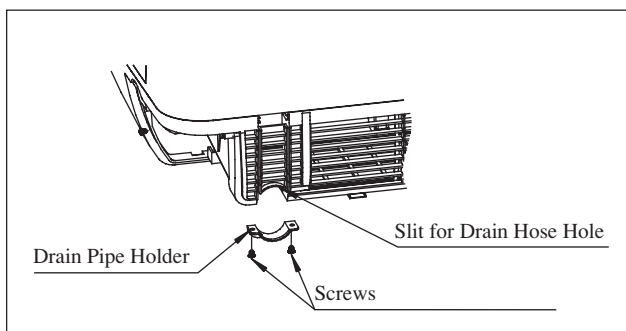


Piping and Drain Hose Installation (Floor Standing Type)



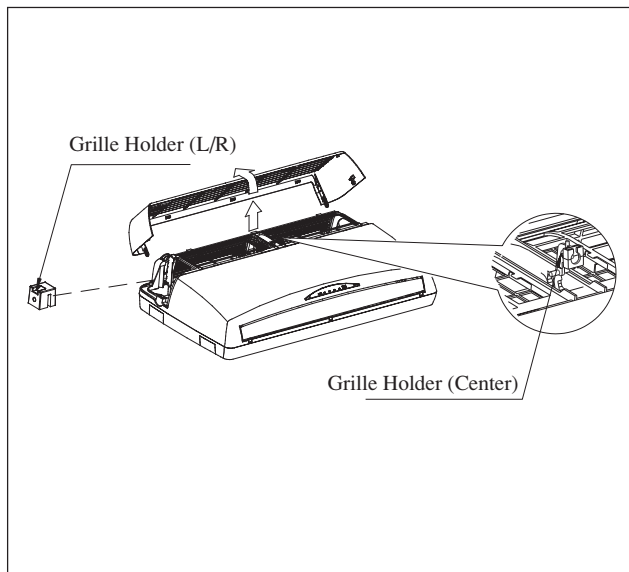
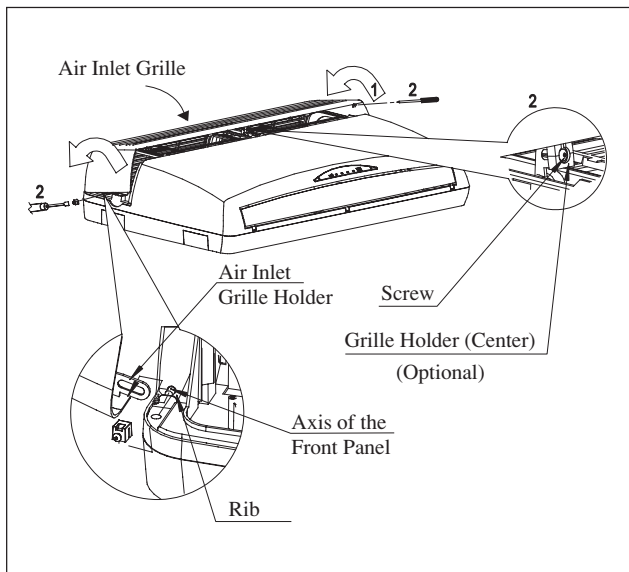
How to Install the Drain Hose

1. Remove the two screws and the drain pipe holder.
2. Cut a slit for the drain hose hole.
3. Place the drain hose on the v-shape area and secure it with drain pipe holder and two screws.

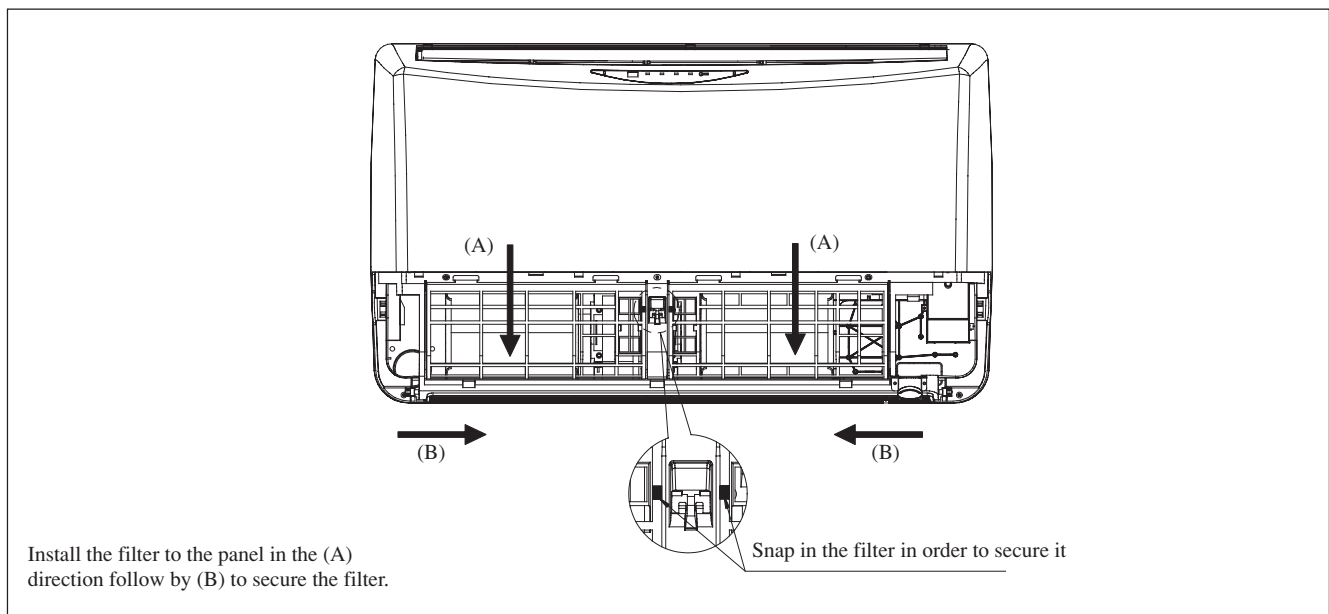


How to Remove Air Inlet Grille

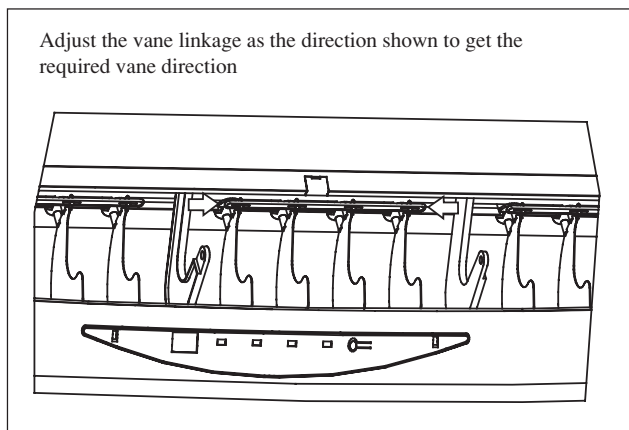
1. Remove the air inlet grille by both hands as the direction shown.
2. Loosen the screw for fixing the panel arm (3 screw, left, right and center). Do not remove the screw at this time.
3. Move the air inlet grille upward, and then turn it backwards. (Do not use too much force).
4. Remove the grille holder (both left and right side). After that, remove to air intake grille.
5. Remove the grille holder (center) from the panel.



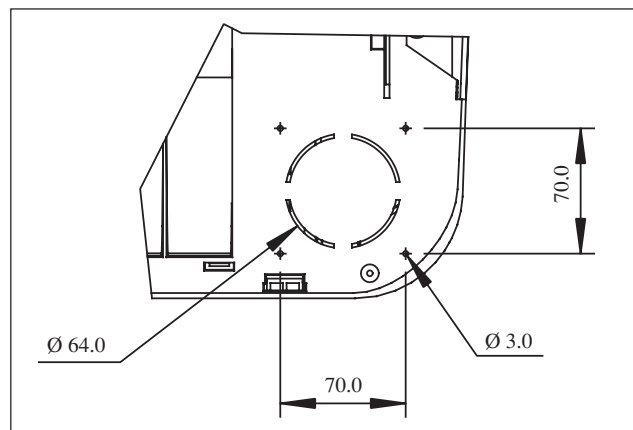
How to Install the Air Filter



To Adjust the Vane Direction

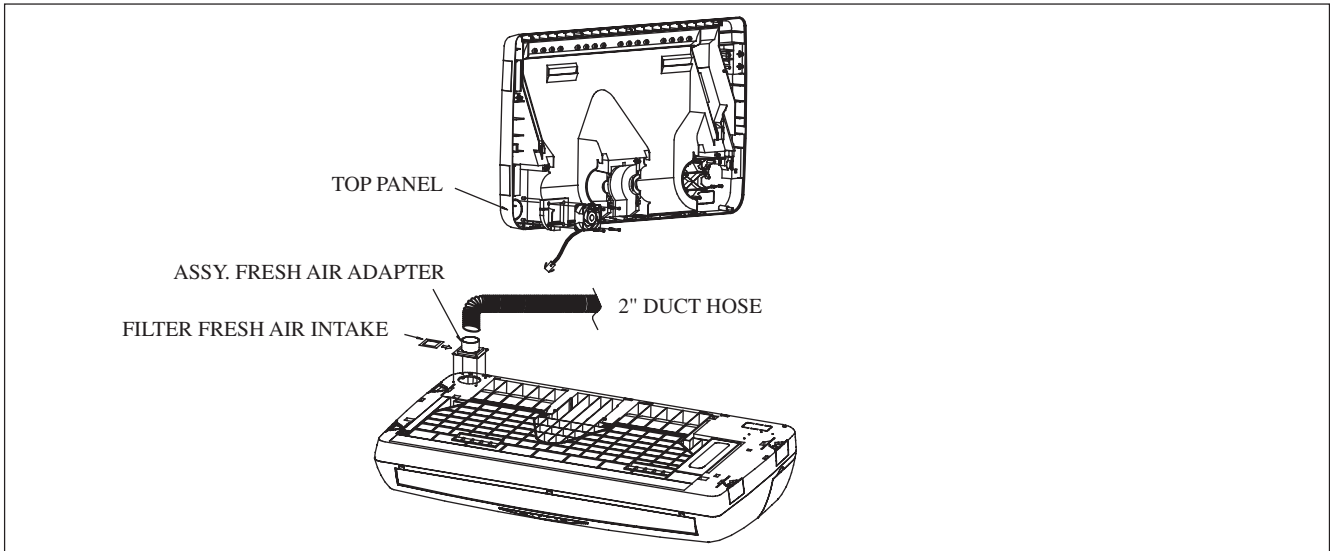


Dimension of the fresh air intake hole

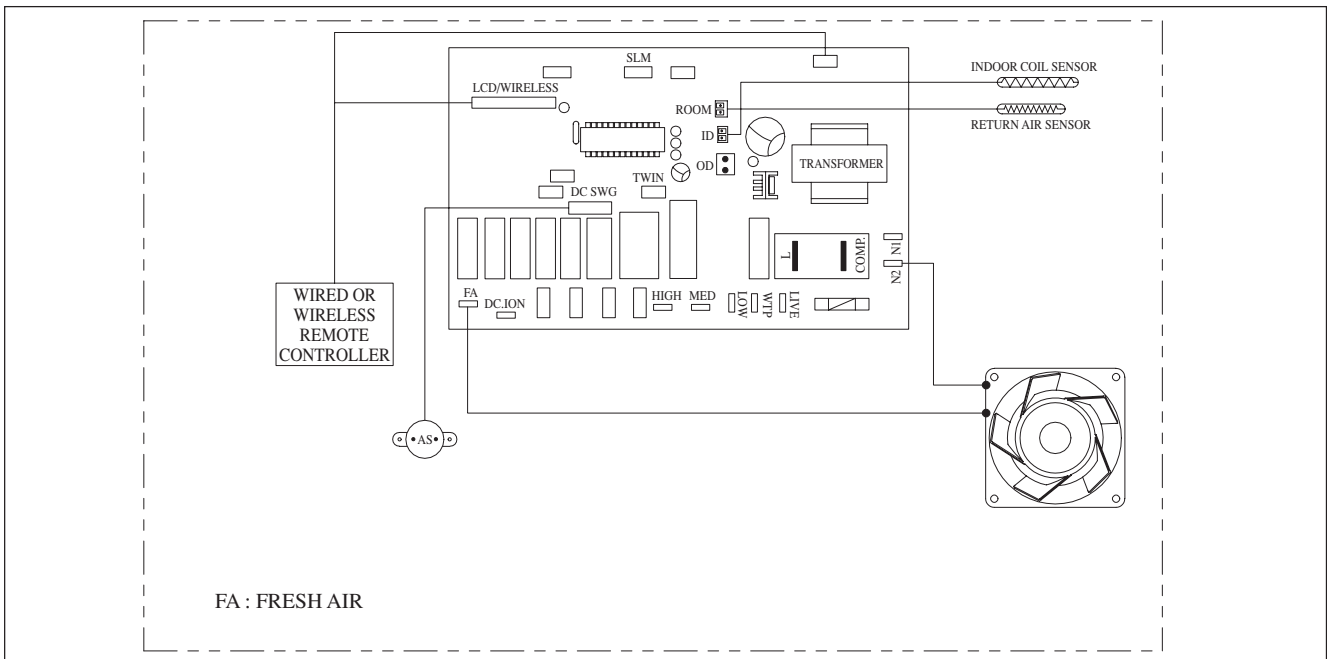


INSTALLATION OF FRESH AIR INTAKE

1. Knock out the fresh air intake hole at the top panel
2. Assemble the axial fan, fresh air adapter, filter and dust hose as shown in figure below.



3. Connect the wire to the control box as indicated in the wiring diagram below:



4. The axial fan model are as follow.
 - a. ebm axial fan. 8556A - pin type.
 - b. ebm axial fan. 8556N - wire type.

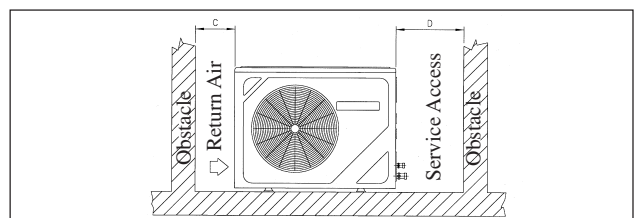
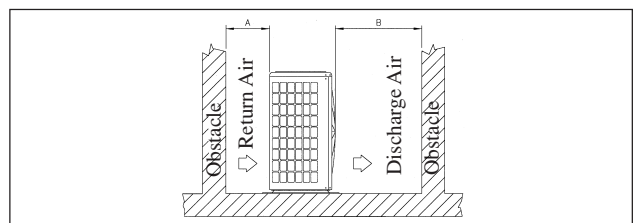
INSTALLATION OF THE OUTDOOR UNIT

The outdoor unit must be installed in such a way, so as to prevent short circuit of the hot discharged air or obstruction to the smooth air flow. Please follow the installation clearance shown in the figure. Select the coolest possible place where intake air temperature is not greater than the outside air temperature (maximum 45°C).

Installation Clearance

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

NOTE : If there is any obstacle higher than 2m, or if there is any obstruction at the upper part of the unit, please allow more space than the figure indicated in the above table.



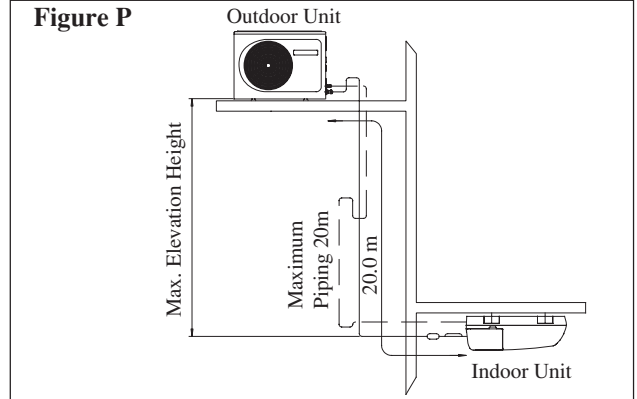
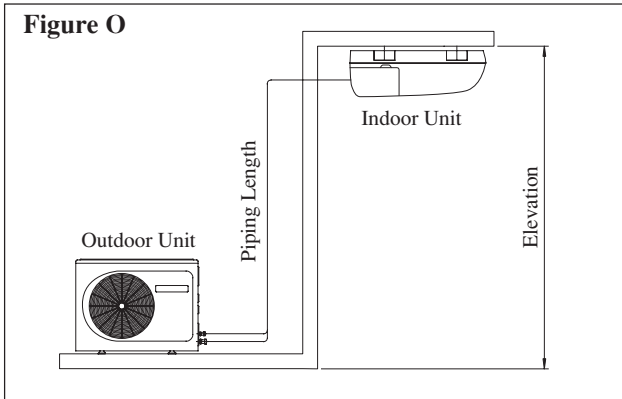
REFRIGERANT PIPING

Maximum Pipe Length And Maximum Number Of Bends

If the pipe length is too long, both the capacity and the reliability of the unit will decrease. As the number of bends increases, resistance of the piping system to the refrigerant flow increases and thus lowering the capacity, as a result the compressor may become defective. See Figure O and Figure P.

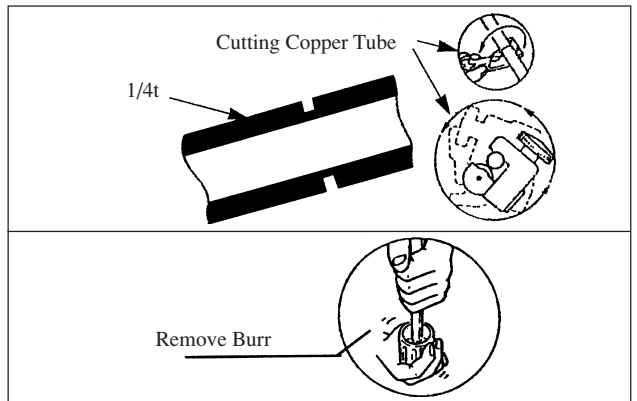
Therefore, always select the shortest path for the piping system and follow the recommendations as tabulated in the table.

Model	20	25	28
Maximum Length m	15	15	35
Maximum Elevation m	8	8	10
Maximum Number of Bends	10	10	10



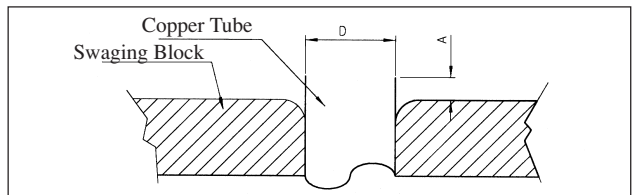
Piping Works

- Do not use contaminated or damaged copper tubing. Do not remove plastic, rubber plugs and brass nuts from the valves, fittings, tubings and coils until you are 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 connection pipe with a pipe cutter.
- Remove burrs from cut edges of the pipes with remover. Hold the end of the pipe downwards 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 onto the copper pipes.
- Flare the pipe with extra length above the flaring tool as shown in the table.
- The flared edge must be even and not cracked or scratched.



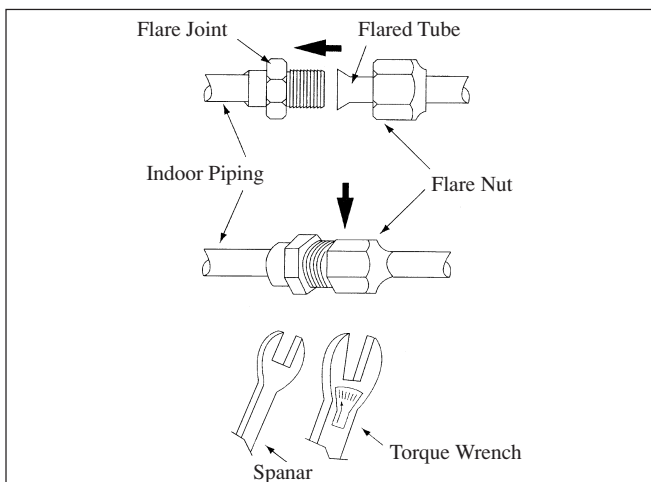
Piping Connection To The Units

- Align the center of the piping and tighten the flare nut sufficiently with fingers.
- Finally, tighten the flare nut with the torque wrench until the wrench clicks.



Pipe Size (mm/in)	Torque (Nm)
6.35 (1/4)	18
9.53 (3/8)	42
12.7 (1/2)	55
15.88 (5/8)	65
19.05 (3/4)	78

Ø Tube, D		A (mm)	
Inch	mm	Imperial	Rigid
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

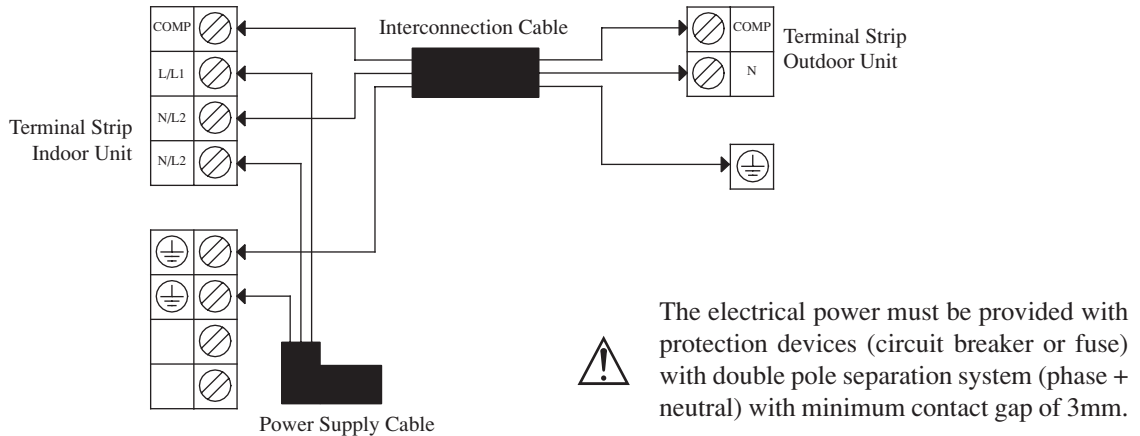


ELECTRICAL WIRING CONNECTION

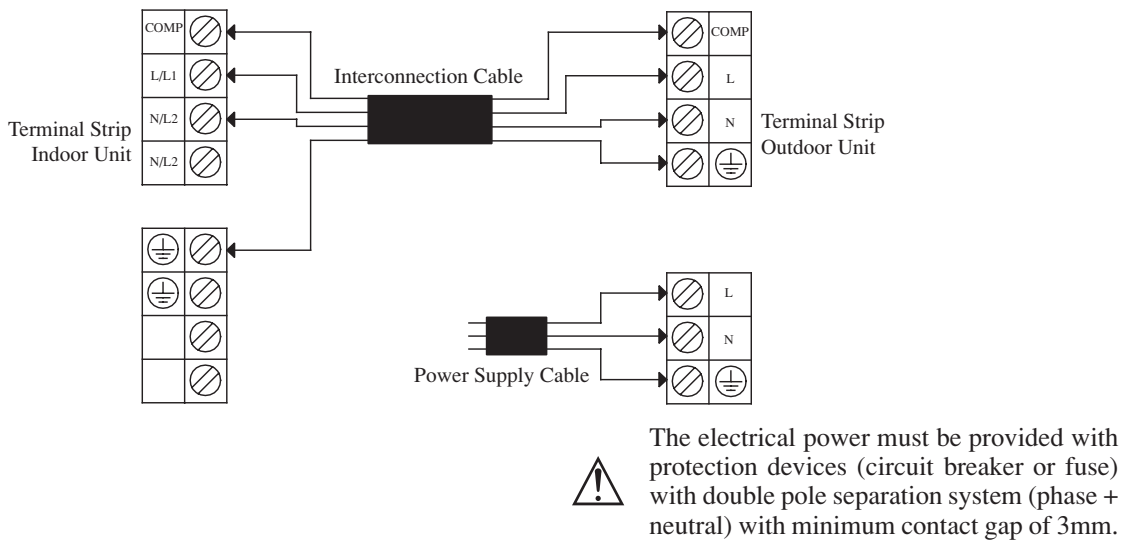
Electrical Wiring Connection For CE20E / CE25E / CE28E

Model	20E	25E	28E
Voltage Range**	220V – 240V /1Ph /50Hz + ⊕ or 208V – 230V /1Ph /60Hz + ⊕		
Power Supply Cable Size	2.5	2.5	4.0
Number Of Conductors*	3	3	3
Interconnection Cable Size	2.5	2.5	2.5
Number Of Conductors*	3	3	3
Recommended Fuse*	16	20	25

CE20E / 25E / 28E

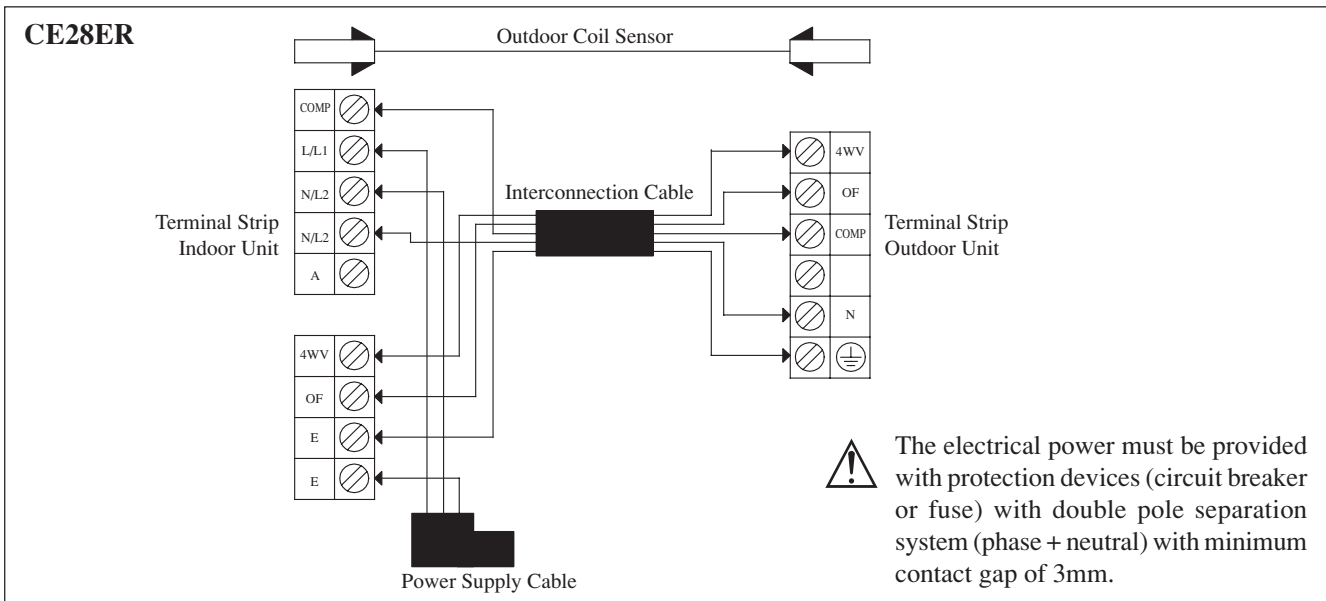
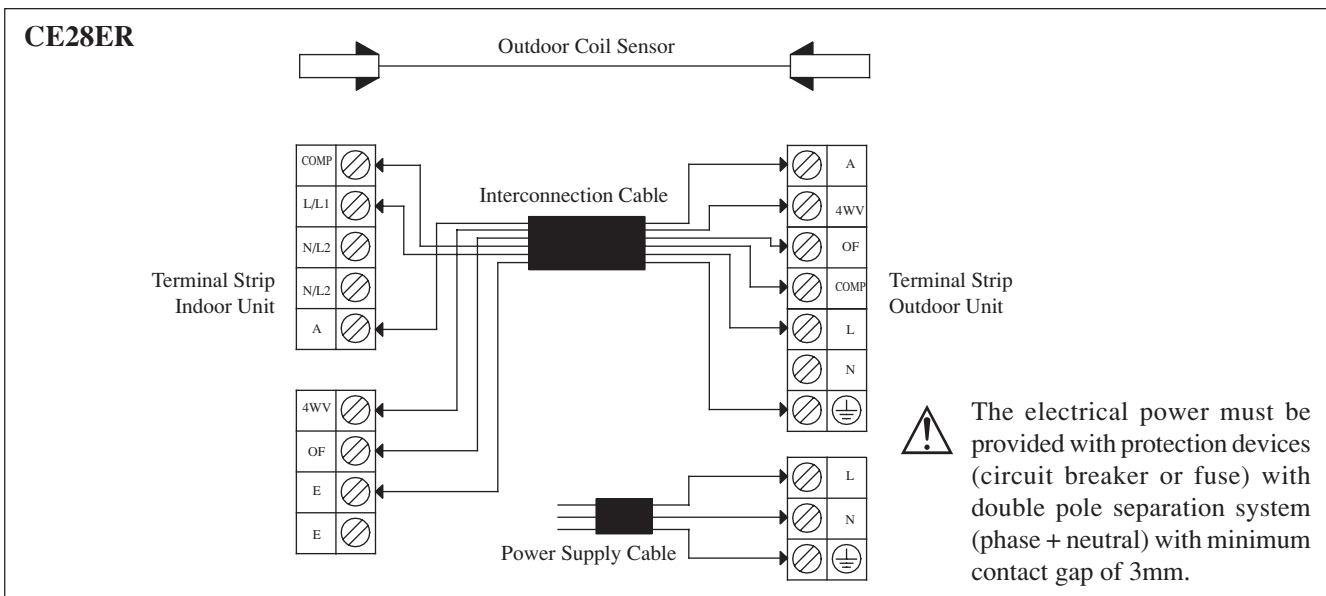
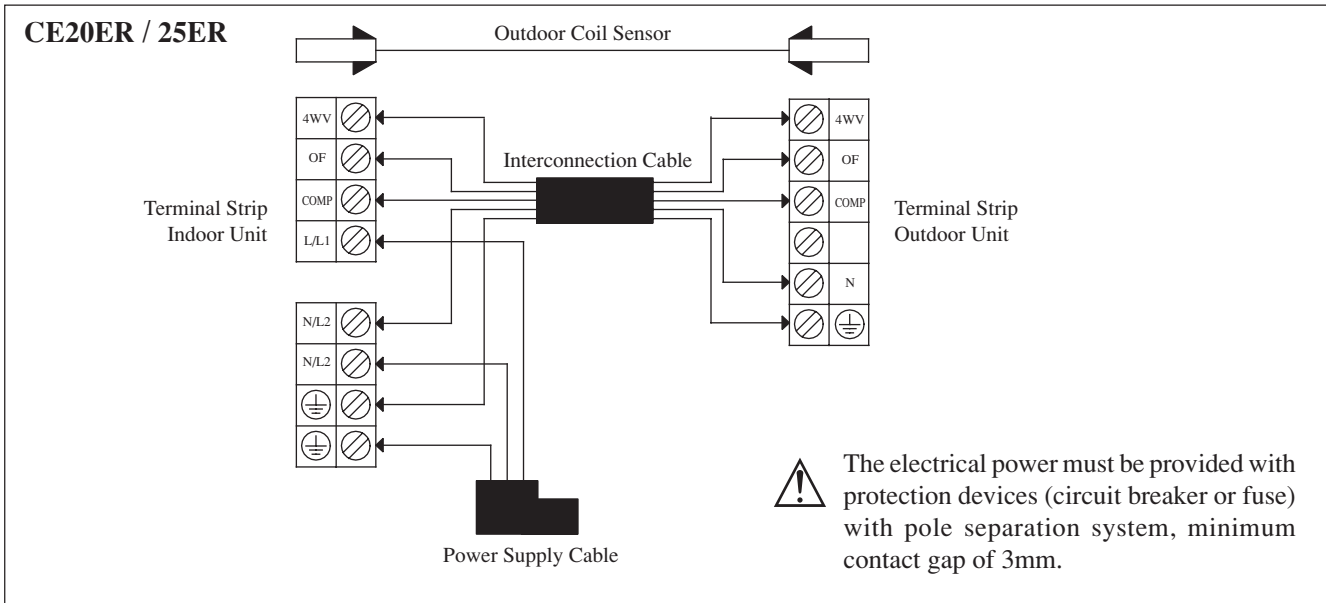


CE28E



Electrical Wiring Connection For CE20ER / CE25ER / CE28ER

Model	20ER	25ER	28ER
Voltage Range**	220V – 240V /1Ph /50Hz + ⊕ or 208V – 230V /1Ph /60Hz + ⊕		
Power Supply Cable Size	2.5	2.5	4.0
Number Of Conductors*	3	3	3
Interconnection Cable Size	2.5	2.5	1.5
Number Of Conductors*	5	5	7
Recommended Fuse*	16	20	25



⚠ Caution

Ensure that the colors of wires on the outdoor unit and the terminal markings are the same as the indoor unit respectively.

VACUUMING AND CHARGING

Purging The Piping And The Indoor Unit

Except for the outdoor unit which is pre-charged with refrigerant R22, 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 -76mmHg (0~76mmHg).

Caution

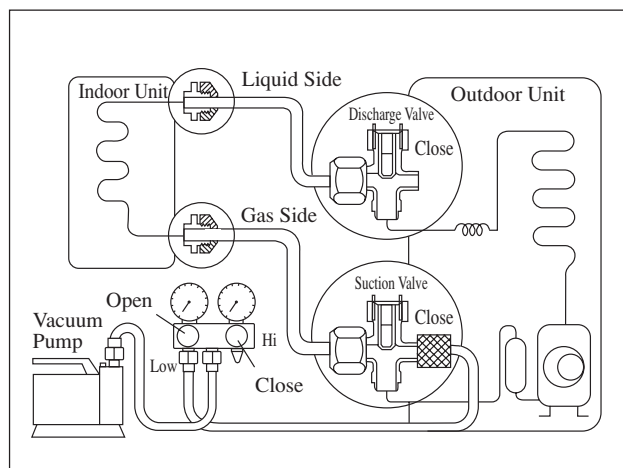
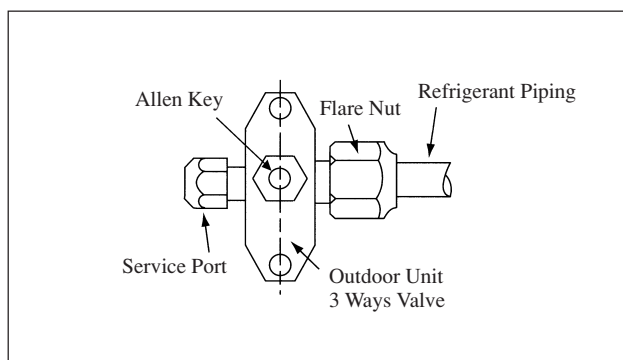
- If the gauge needle does not move to 0~76mmHg, be sure to check for gas leaks (using the refrigerant detector) at flare type connection of the indoor and outdoor unit and repair the leak before proceeding to the next step.
- Close the valve of the changing gauge and stop the vacuum pump.
- On the outdoor unit, open the suction valve (3 way) and liquid valve (2 way) (in anti-clockwise direction) with 4mm key for hexagon sacked screw.

Additional Charge

The refrigerant is pre-charged in the outdoor unit. If the piping length is less than 7.6m, then additional charge after vacuuming is not necessary. If the piping length is more than 7.6m, then use the additional charge valve as indicated in the table below.

Additional Charge In Gram

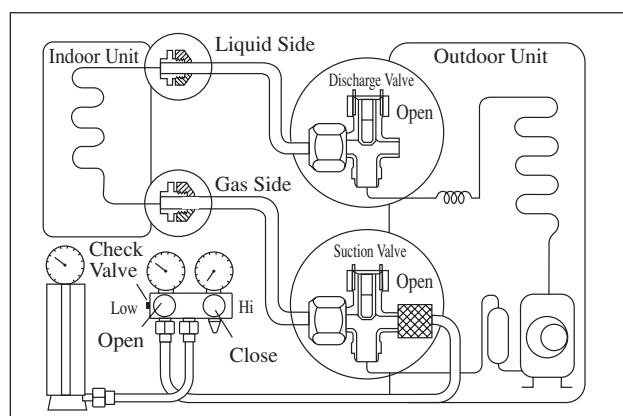
Model	R22 Charge (g)		
	10m	15m	20m
20E / 20ER	75/125	150/250	225/375
25E / 25ER	190/250	380/500	570/750
28E / 28ER	250/250	500/500	750/750



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.



STANDARD OPERATING CONDITIONS

Cooling unit

Temperature	Ts °C / °F	Th °C / °F
Minimum indoor temperature	19.4 / 66.9	13.9 / 57.0
Maximum indoor temperature	26.7 / 80.1	19.4 / 66.9
Minimum outdoor temperature	19.4 / 66.9	13.9 / 57.0
Maximum outdoor temperature	46 / 114.8	24 / 75.2

Heat Pump Unit

Temperature	Ts °C / °F	Th °C / °F
Minimum indoor temperature	10 / 50	-
Maximum indoor temperature	26.7 / 80.1	-
Minimum outdoor temperature	-8 / 17.6	-9 / 15.8
Maximum outdoor temperature	24 / 75.2	18 / 64.4

Ts: Dry bulb temperature.

Th: Wet bulb temperature.

Warning

- 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.

AUTO RANDOM RE-START FUNCTION

If there is a power cut when the unit is operating, it will automatically resume the same operating mode when the power is restored. (Applicable only to units with this feature)

Caution

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.

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. 	At least once every 2 weeks. More frequently if necessary.
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. 	At least once every 2 weeks. More frequently if necessary.

Caution

Do not operate any heating apparatus too close to the air conditioner unit. This may cause the plastic panel to melt or deform as a result of the excessive heat.

TROUBLE SHOOTING

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 trouble shooting tips.

Fault	Causes / Action
1. The compressor does not operate 3 minutes after the air conditioner unit is started.	- Protection against frequent starting. Wait for 3 to 4 minutes for the compressor to start operating.
2. The air conditioner unit does not operate.	- Power failure, or the fuse needs to be replaced. - The power plug is disconnected. - It is possible that your delay timer has been set incorrectly. - If the fault persist after all these verifications, please contact the air conditioner unit installer.
3. The air flow is too low.	- The air filter is dirty. - The doors or windows are open. - The air suction and discharge are clogged. - The regulated temperature is not high enough.
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.	- 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 dealer.
7. Hissing air flow sound from the air conditioner unit during operation.	- Refrigerant fluid flowing into the evaporator coil.

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

No	Event	CDF LED	Timer LED	Others 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	Gas leak		Blink 3 times	Blink Cool & Dry	Blink E5
6	Water pump fault		Blink 2 times	Blink Cool & Fan	Blink E6
7	Outdoor defrost		-	Blink Heat	-
8	Outdoor coil sensor exist (MS model)		Blink 5 times	Blink Cool & Heat	Blink E7
9	Hardware error (tact switch pin short)		Blink 6 times	Blink Heat, Cool, follow by Fan, Dry	Blink E8

Note: CDF LED : Cool/Dry/Fan LED, turns on in these modes

The unit will not detect sensor missing when the compressor is ON

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