

HEAT CONTROLLER, INC.

**Ceiling Cassette Type  
Single-Zone  
Air Conditioning**

*Service Manual*

**Model:** DMC24CA-1  
DMC36CA-1

**CAUTION**

Before servicing the unit, read the  
“safety precautions” in this manual.

Only for authorized service personnel.

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# Safety Precautions

To prevent injury to the user or other people and property damage, the following instructions must be followed.

■ Incorrect operation due to ignoring instruction will cause harm or damage. The seriousness is classified by the following indications.

**⚠ WARNING** This symbol indicates the possibility of death or serious injury.

**⚠ CAUTION** This symbol indicates the possibility of injury or damage to properties only.

■ Meanings of symbols used in this manual are as shown below.

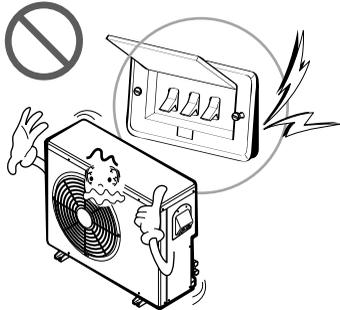
	<b>Be sure not to do.</b>
	<b>Be sure to follow the instruction.</b>

## ⚠ WARNING

### ■ Installation

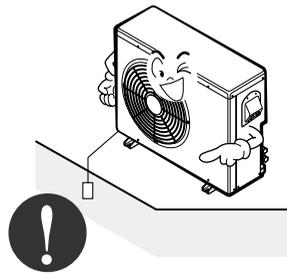
**Do not use a defective or under-rated circuit breaker. Use this appliance on a dedicated circuit.**

- There is risk of fire or electric shock.



**Always ground the product.**

- There is risk of fire or electric shock.



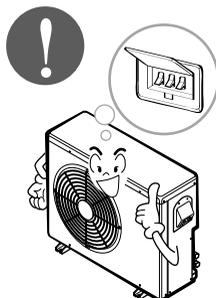
**Install the panel and the cover of control box securely.**

- There is risk of fire or electric shock.



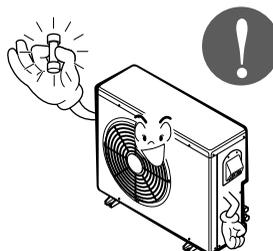
**Always install a dedicated circuit and breaker.**

- Improper wiring or installation may cause fire or electric shock



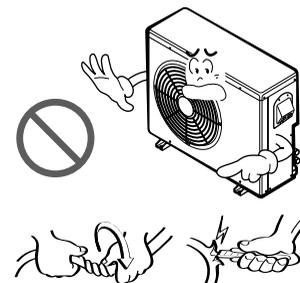
**Use the correctly rated breaker or fuse.**

- There is risk of fire or electric shock.



**Do not modify or extend the power cable.**

- There is risk of fire or electric shock.



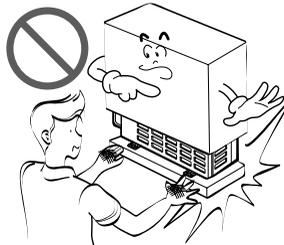
**Do not install, remove, or re-install the unit by yourself (customer).**

- There is risk of fire, electric shock, explosion, or injury.



**Be cautious when unpacking and installing the product.**

- Sharp edges could cause injury. Be especially careful of the case edges and the fins on the condenser and evaporator.



**For installation, always contact the dealer or an Authorized Service Center.**

- There is risk of fire, electric shock, explosion, or injury.



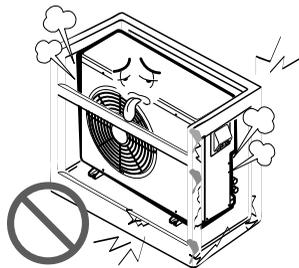
**Do not install the product on a defective installation stand.**

- It may cause injury, accident, or damage to the product.



**Be sure the installation area does not deteriorate with age.**

- If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.



**Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.**

- Moisture may condense and wet or damage furniture.



## Operational

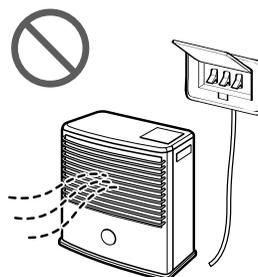
**Do not touch(operate) the product with wet hands.**

- There is risk of fire or electrical shock.



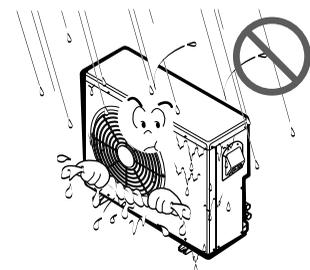
**Do not place a heater or other appliances near the power cable.**

- There is risk of fire or electric shock.



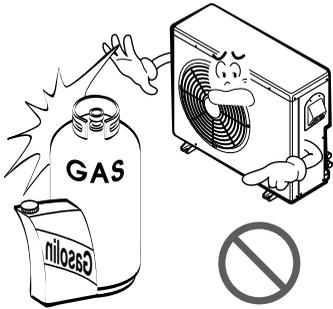
**Do not let electric parts of the product get wet.**

- There is risk of fire, failure of the product, or electric shock.



**Do not store or use flammable gas or combustibles near the product.**

- There is risk of fire or failure of product.



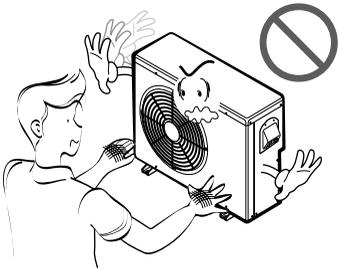
**If strange sounds, or small or smoke comes from product. Turn the breaker off or disconnect the power supply cable.**

- There is risk of electric shock or fire.



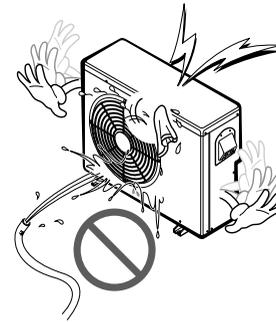
**Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)**

- There is risk of physical injury, electric shock, or product failure.



**Be cautious that water could not enter the product.**

- There is risk of fire, electric shock, or product damage.

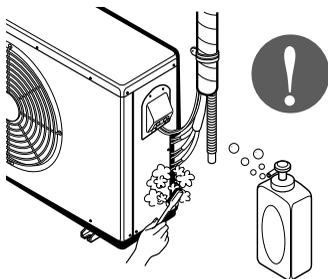


**CAUTION**

**Installation**

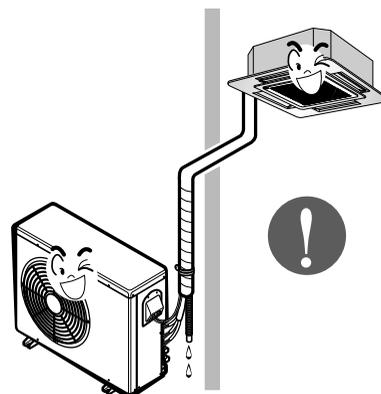
**Always check for gas (refrigerant) leakage after installation or repair of product.**

- Low refrigerant levels may cause failure of product.



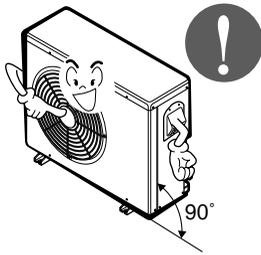
**Install the drain hose to ensure that water is drained away properly.**

- A bad connection may cause water leakage.



**Keep level even when installing the product.**

- To avoid vibration or water leakage.



**Use two or more people to lift and transport the product.**

- Avoid personal injury.



**Operational**

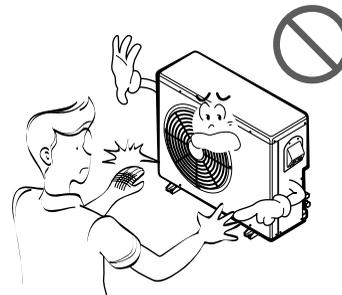
**Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.**

- There is risk of fire, electric shock, or damage to the plastic parts of the product.



**Do not touch the metal parts of the product when removing the air filter. They are very sharp!**

- There is risk of personal injury.



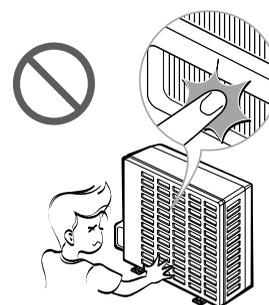
**Do not step on or put anything on the product. (outdoor units)**

- There is risk of personal injury and failure of product.



**Do not insert hands or other objects through the air inlet or outlet while the product is operated.**

- There are sharp and moving parts that could cause personal injury.



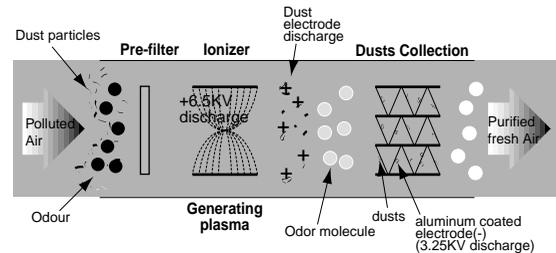
# Features & Benefits

## Environment Friendly Refrigerant :

- LG Ceiling Cassette Air Conditioners uses environment friendly refrigerant, which don't do any harm to the environment.

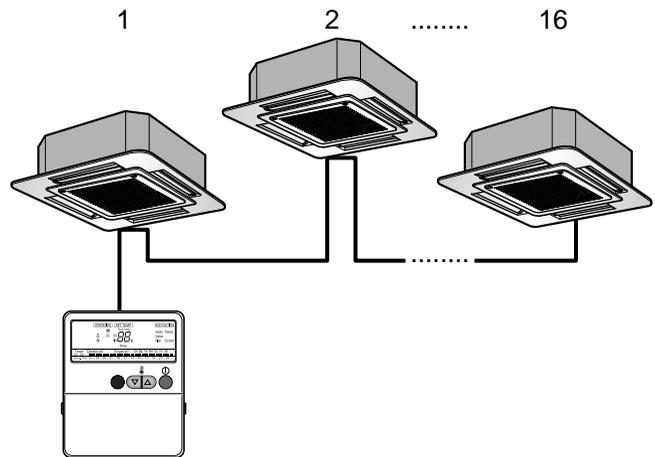
## Plasma Air Purifier :

- It removes not only microscopic contaminants & dust, but also house mites, pollen, and pet fur to help preventing allergic diseases like asthma. It provides odor free, dust free and allergy free air.



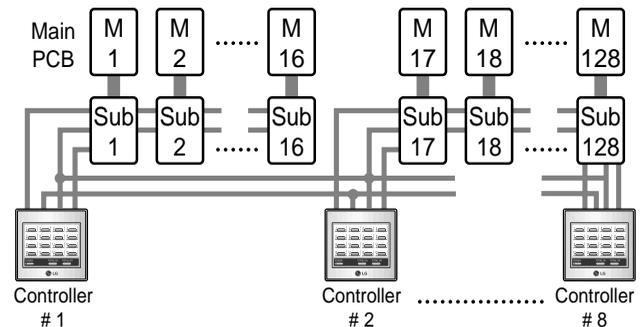
## Group Control :

- It enables to control as much as 16 units with the help of one wired remote controller. All the units will follow same setting of temperature & other sub functions.



## Central Control :

- It enables to control 16 x 8 = 128 units with the help of 8 controllers. All units can be put on and off from one Central Room. For Setting Temperature, Fan Speed and other sub functions, access the respective LCD wired remote controller of each unit.



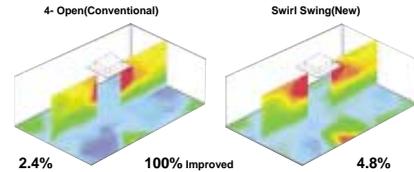
## Jet Cool :

-In this mode, quick and fast cooling is done. Cold and high velocity air is supplied to the room till the indoor temperature reaches 18°C(64°F). The unit will continue to run in jet cool mode till the Indoor temperature reaches 18°C(64°F).

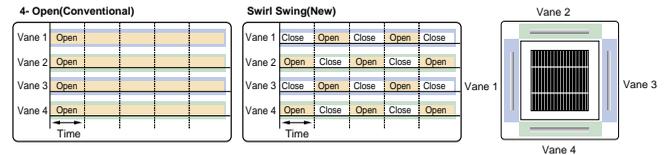
## Swirl Swing

- It is the function for comfort cooling/heating operation.
- The diagonal two louvers are opened the more larger than the other louvers. After one minute, it is opposite.

Comparison of Floor Temp. Distribution(20°C)



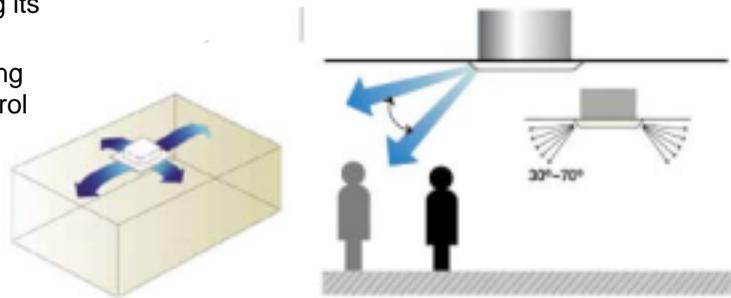
Comparison of Air Flow Types



## Space Control

Vanes angle can be controlled by pair, considering its installation environment.

- For example direct drafts can be annoying, leading to discomfort and reduced productivity vane control helps to eliminate this problem.
- Easily controlled by wired remote control.
- Air Flow can be controlled easily regarding any space environment.



## Auto Restart Operation :

- Whenever there is electricity failure to the unit, and after resumption of the power, unit will start in the same mode prior to the power failure. Memorized condition are on / off condition, operating mode, set temperature and fan speed. The unit will memorize the above conditions and start with same memorized condition.

## Two Thermistor Control :

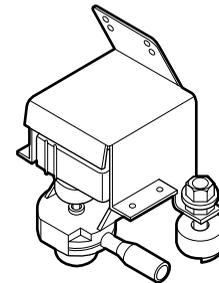
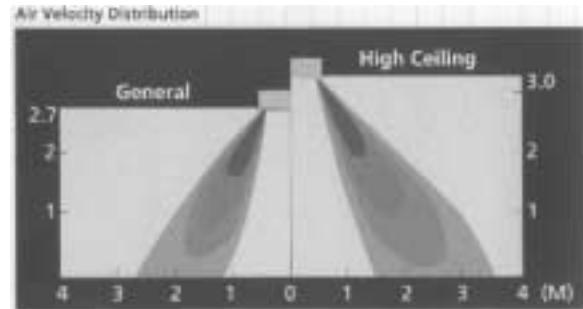
- There may be a significant difference between the temperature taken at the installed product and indoor temperature. Two thermistor control provides option to control temperature by referring any of the two temperatures. With the help of the slide switch at the back of the LCD wired remote controller, selection of the desired thermistor for controlling the unit can be done. One thermistor is in the Indoor unit & the other one is in the LCD wired remote.

### High Ceiling Operation

- According to the height of ceiling installation, it provides variability of indoor fan motor rpm. If the height of installation is low then you can adjust low rpm of indoor fan motor. On the other hand if the height of the installation is high you can adjust high rpm of indoor fan motor. Selection of speed can be done by slide switch at the back of the LCD wired remote.

ex:

Selection	Height	RPM
Lower	2.4m(7.9ft)	700/600/500
Standard	2.7m(8.9ft)	750/650/550
Higher	3.0m(9.8ft)	800/700/600



### Water Drain Pump :

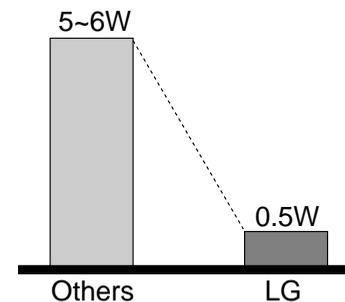
- In some of the places natural drainage is not possible. For such places drain pump is very useful. It removes condensed water from the unit.

### Time Delay Safety Function :

- It delays restarting of the compressor by three minutes thereby preventing damage to the compressor.

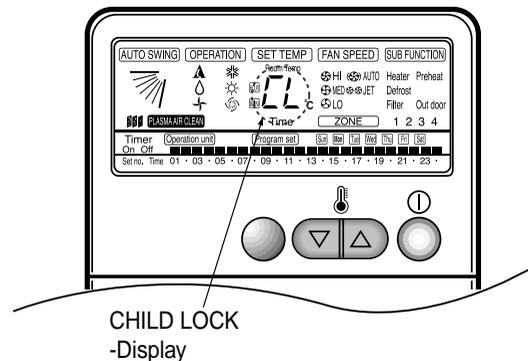
### Zero Standby Power:

- Due to SMPS (Switching Modulation Power Supply) technology, there is almost zero power consumption in the standby mode.



### Child Lock Function:

-It prevents the children or others from tampering the control buttons. Unit can be controlled by the wireless remote controller. This can be easily set by pressing timer key & Min key simultaneously. After child lock is set, pressing any key will display CL on the LCD for 3 seconds and all the keys will be ineffective.



### Self Diagnosis Function:

- This function provides diagnosis of the unit. An error code will be displayed on the LCD wired remote controller & diagnosis can be done as per the code indication. The same is also printed on key cover of the LCD wired remote controller.

# List of Functions

## • Ceiling Cassette

Category	Function	DMC24CA-1	DMC36CA-1
Air flow	Air supply outlet	4	4
	Airflow direction control (left & right)	X	X
	Airflow direction control (up & down)	Auto	Auto
	Auto swing (left & right)	X	X
	Auto swing (up & down)	O	O
	Airflow steps(Fan / Cool / Heat)	3/4/-	3/4/-
	CHAOS swing	X	X
	CHAOS wind (Auto wind)	X	X
	Jet cool (Power wind)	O	O
	Swirl wind	O	O
Air purifying	Deodorizing filter	X	X
	Plasma air purifier	O	O
	Pre-filter(Washable)	O	O
Installation	Drain pump	O	O
	E.S.P. control	-	-
	Electric heater (Operation)	-	-
	High ceiling operation	O	O
Reliability	Hot start	X	X
	Self diagnosis	O	O
	Soft dry operation	O	O
Convenience	Auto changeover	X	X
	Auto cleaning	X	X
	Auto operation(Artificial intelligence)	O	O
	Auto restart operation	O	O
	Child lock	O	O
	Forced operation	O	O
	Group control	Option	Option
	Sleep mode	-	-
	Timer (On/Off)	O	O
	Timer (weekly)	O	O
Two thermistor control	O	O	
Individual Control	Standard wired remote controller	O	O
	Deluxe wired remote controller	-	-
	Simple wired remote controller	-	-
	Wired remote controller(for hotel use)	-	-
	Wireless remote controller(simple)	-	-
	Wireless LCD remote controller	PQWRHSF0	PQWRHSF0
CAC Network Function	General central control(Non LGAP)	Option	Option
	Dry contact	Option	Option
	Simple central control(LGAP)	Option	Option
	PDI(Power Distribution Indicator)	Option	Option
	PI 485	Option	Option
Special Function Kit	CTIE	X	X
	Zone control	X	X
Others	Thermistor	-	-

### Note :

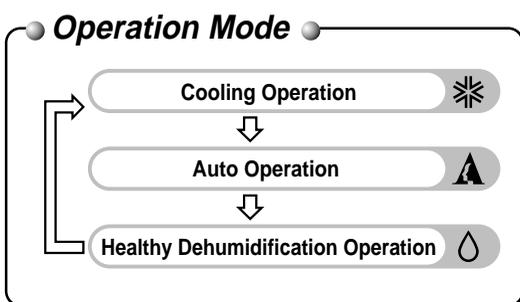
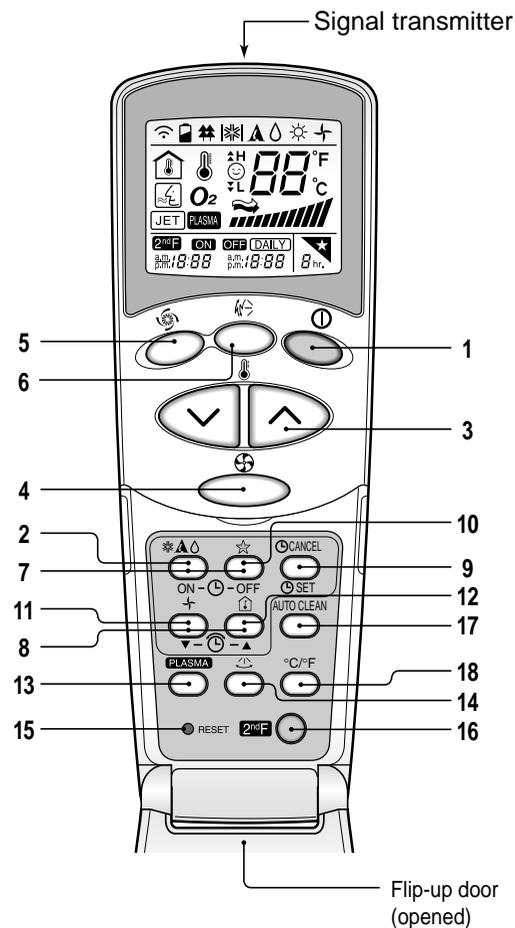
O : Applied, X : Not applied, - : No relation

Option: Model name & price are different according to options, and assembled in factory with main unit.

Accessory: Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

# Function of Remote Control

## 1. Wireless LCD Remote Control



### 1. START/STOP BUTTON

Operation starts when this button is pressed and stops when the button is pressed again.



### 2. OPERATION MODE SELECTION BUTTON

Used to select the operation mode.



### 3. ROOM TEMPERATURE SETTING BUTTONS

Used to select the room temperature.



### 4. INDOOR FAN SPEED SELECTOR

Used to select fan speed in four steps low, medium and high.



### 5. JET COOL

Used to start or stop the speed cooling. (speed cooling operates super high fan speed in cooling mode.)



### 6. AUTO SWING BUTTON

Used to stop or start louver movement and set the desired up/down airflow direction.



### 7. ON/OFF TIMER BUTTONS

Used to set the time of starting and stopping operation.

### 8. TIME SETTING BUTTONS

Used to adjust the time.

### 9. TIMER SET/CANCEL BUTTON

Used to set the timer when the desired time is obtained and to cancel the Timer operation.

### 10. SLEEP MODE AUTO BUTTON

Used to set Sleep Mode Auto operation.

### 11. AIR CIRCULATION BUTTON

Used to circulate the room air without cooling.

### 12. ROOM TEMPERATURE CHECKING BUTTON

Used to check the room temperature.

### 13. PLASMA AIR CLEAN BUTTON

Used to start or stop the plasma-purification function.

### 14. HORIZONTAL AIRFLOW DIRECTION CONTROL BUTTON (OPTIONAL)

Used to set the desired horizontal airflow direction.

### 15. RESET BUTTON

Used prior to resetting time.

### 16. 2nd F Button

Used prior to using modes printed in blue at the bottom of buttons.

### 17. AUTO CLEAN (OPTIONAL)

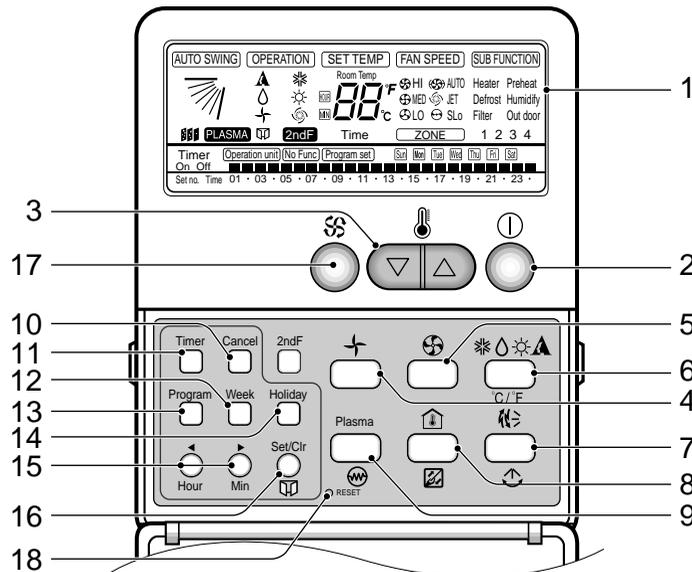
Used to set Auto Clean mode.

### 18. °C/°F SWITCH BUTTON

Used to switch temperature reading from Centigrade to Fahrenheit.

✱ The wireless remote controller do not operate the swirl mode.

## 2. Wired LCD Remote Control



### 1 Operation display

Displays the operation conditions.

### 2 On/Off Button

Operation starts when this button is pressed, and stops when the button is pressed again.

### 3 Set Temperature Button

Used to set the temperature when the desired temperature is obtained.

### 4 FAN Operation Button

Used to circulate room air without cooling.

### 5 Fan Speed & Jet Cool Button

Used to set the desired fan speed and select jet cool mode.

### 6 Operation Mode Selection Button

Used to select the operation mode.

- Auto Operation Mode
- Cooling Operation Mode
- Soft Dry Operation Mode

### 7 Auto Swing Button

Used to swing up and down.

### 8 Room Temperature Checking Button

Used to check the room temperature.

### 9 Plasma Air Clean Button

Used to start or stop the plasma-purification function.

### 10 Timer Cancel Button

Used to cancel the timer.

### 11 Timer Set Button

Used to set the timer when the desired time is obtained.

### 12 Week Button

Used to set a day of the week.

### 13 Program Button

Used to set the weekly timer.

### 14 Holiday Button

Used to set a holiday of the week.

### 15 Time Set Button

Used to set the time of the day and change the time in the weekly timer Function.

### 16 Set and Clear Button

Used to set and clear the weekly timer.

### 17 Swirl Button

Used to select swirl swing mode.

### 18 Reset Button

Used to set the current time and clear the setting time.

# Specifications

Indoor unit type			Ceiling Cassette - 4way		
Model			DMC24CA-1	DMC36CA-1	
Power supply	Phase/Volts/Hz		1 / 208-230 / 60	1 / 208-230 / 60	
Cooling capacity	kW		7.03	9.96	
	Btu/h		24,000	34,000	
Heating capacity	kW		-	-	
	Btu/h		-	-	
Current	Nominal running current	A	1.0	1.0	
Fan	Motor Type		BLDC	BLDC	
	Fan Type		Turbo Fan	Turbo Fan	
	Motor Output(W) * number of units		50.6 * 1	50.6 * 1	
	Air flow rate (H/M/L)	cmm		18.4/17.0/15.6	24.1/22.7/21.2
		cfm		650/600/550	850/800/750
	Capacitor	mF/V		-	-
	Drive			DC	DC
Coil	Row * stages * FPI	mm	2R * 9C * 18	2R * 9C * 18	
Dimensions (W*D*H)	Body	mm(inch)	840 * 840 * 225(33 <sup>1</sup> / <sub>16</sub> * 33 <sup>1</sup> / <sub>16</sub> * 8 <sup>7</sup> / <sub>8</sub> )	840 * 840 * 225(33 <sup>1</sup> / <sub>16</sub> * 33 <sup>1</sup> / <sub>16</sub> * 8 <sup>7</sup> / <sub>8</sub> )	
	Decorative Panel	mm(inch)	950 * 950 * 30(37 <sup>13</sup> / <sub>32</sub> * 37 <sup>13</sup> / <sub>32</sub> * 1 <sup>3</sup> / <sub>16</sub> )	950 * 950 * 30(37 <sup>13</sup> / <sub>32</sub> * 37 <sup>13</sup> / <sub>32</sub> * 1 <sup>3</sup> / <sub>16</sub> )	
Net Weight	Body	kg(lbs)	26(57.3)	26(57.3)	
	Decorative Panel	kg(lbs)	3(6.61)	3(6.61)	
Gross Weight	Body	kg(lbs)	30(66)	30(66)	
	Decorative Panel	kg(lbs)	4(9)	4(9)	
Air filter			Long Life filter	Long Life filter	
Sound Level (H/M/L)		dB(A)+3	38/35/32	40/37/34	
Piping Connections	Liquid	mm(inch)	6.35(1/4)	6.35(1/4)	
	Gas	mm(inch)	12.7(1/2)	15.88(5/8)	
Drain	OD/ID	mm(inch)	32/25(1.26/0.98)	32/25(1.26/0.98)	
Dehumidification rate		l/h(pts/h)	3.0(6.3)	3.7(7.8)	
Safety Devices			Fuse, Thermal protector for Fan motor		
Temperature sensor			Thermistor	Thermistor	
Refrigerant			R410A	R410A	
Refrigerant control			EEV	EEV	
Connectable outdoor Unit			Single	Single	
Power and Transmission interunit cable	No. * mm <sup>2</sup> (No. AWG)		4 * 2.1(14)	4 * 2.1(14)	

**Note :**

- Capacities are based on the following conditions:  
 Cooling: - Indoor Temperature 26.7°C(80°F) DB /19.4°C(67°F) WB  
 - Outdoor Temperature 35°C(95°F) DB /23.9°C(75°F) WB  
 Piping Length - Interconnecting Piping Length 7.5m(25ft)  
 - Level Difference of Zero.

## Conversion Formula

$$\text{kW} = \text{Btu/h} \times 0.0002931$$

$$\text{CFM} = \text{CMM} \times 35.3$$

## Specifications

Outdoor Unit			DMC24CA-1	DMC36CA-1
Rated Capacity	Cooling	kW	7.03	9.96
		Btu/h	24,000	34,000
	Heating	kW	-	-
		Btu/h	-	-
Rated Input	Cooling	kW	2.5	3.6
	Heating	kW	-	-
Energy Label			-	-
Testing combination			-	-
Running current	Cooling	A	11.5	17
	Heating	A	-	-
Starting current	(Cooling/Heating)	A	24	38
Power supply		Phase / Volts / Hz	1 / 208-230 / 60	2 / 208-230 / 60
Power supply Cable(outdoor)		No. * mm <sup>2</sup> (No. AWG)	3 * 2.1(14)	3 * 3.3(12)
Power and transmission cable		No. * mm <sup>2</sup> (No. AWG)	4 * 2.1(14)	4 * 2.1(14)
Dimensions	W * H * D	mm(inch)	870 * 800 * 320(34 <sup>1</sup> / <sub>2</sub> * 31 <sup>1</sup> / <sub>2</sub> * 12 <sup>19</sup> / <sub>32</sub> )	900 * 1160 * 370(35 <sup>7</sup> / <sub>16</sub> * 45 <sup>11</sup> / <sub>16</sub> * 14 <sup>9</sup> / <sub>16</sub> )
Net weight		kg(lbs)	73(160)	86(190)
Gross weight		kg(lbs)	78(172)	93(205)
Maximum number of connectable unit			1	1
Compressor (constant)	Type		ROTARY	ROTARY
	Qty * model		2*GK120KAA	GJ151KAA + GJ208KAA
	Motor Type		Induction	Induction
	Oil charge volume	cc	700	1200
	Oil type		PVE	PVE
Refrigerant	Charge(at 7.5m(25ft))	g(oz)	2100(74.1)	2500(88.2)
	Type		R410A	R410A
	Control		EEV	EEV
Heat Exchanger	Rows * Column * FPI		2R * 36C * 20	2R * 52C * 18
	Defrosting method		-	-
Fan	Capacitor	mF/Vac	6 / 370	6 / 370
	Drive		Direct Drive	Direct Drive
	Discharge Direction	Side / Top	Side discharge	Side discharge
	Air flow rate	cmm(cfm)	51(1801)	105(3708)
Noise level(H)	Sound press, 1m	db (A) + 3	55	58
Piping connections	Liquid	mm(inch)	6.35(1/4)	6.35(1/4)
	Gas	mm(inch)	12.7(1/2)	15.88(5/8)
Max. piping length	Main piping	m(ft)	30(100)	35(115)
Max. elevation	Indoor unit - Outdoor unit	m(ft)	15(50)	20(66)

### Note :

- Capacities are based on the following conditions:  
 Cooling: - Indoor Temperature 26.7°C(80°F) DB /19.4°C(66.9°F) WB  
 - Outdoor Temperature 35°C(95°F) DB /23.9°C(75°F) WB  
 Piping Length - Interconnecting Piping Length 7.5m(25ft)  
 - Level Difference of Zero.

### Conversion Formula

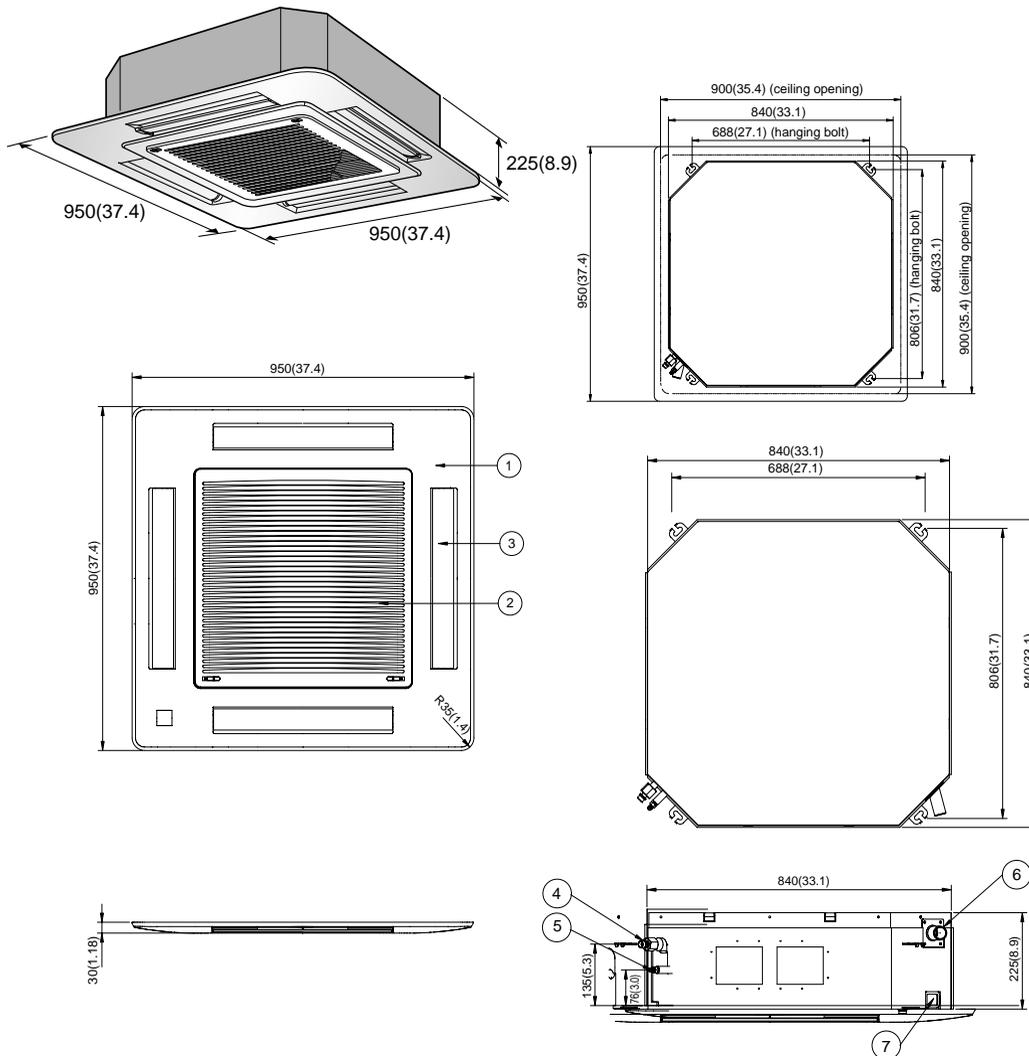
$$\text{kW} = \text{Btu/h} \times 0.0002931$$

$$\text{CFM} = \text{CMM} \times 35.3$$

# Dimensional Drawings

## 1. Indoor Units

Model No.: DMC24CA-1 / DMC36CA-1

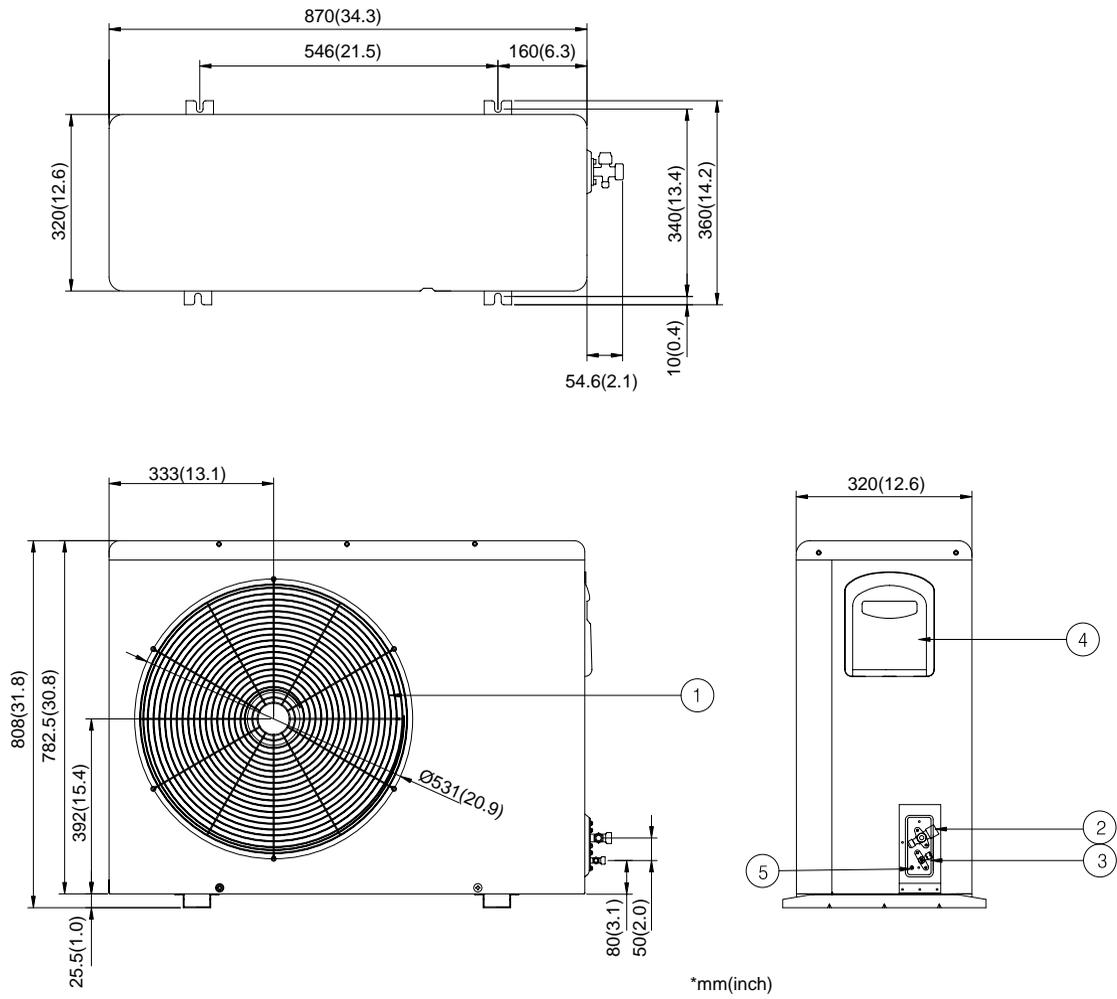


\* mm(inch)

No.	Part Name	Remark
1	Decoration panel	
2	Air suction grille	
3	Air discharge grille	
4	Gas pipe connection	
5	Liquid pipe connection	
6	Drain pipe connection	
7	Power supply connection	

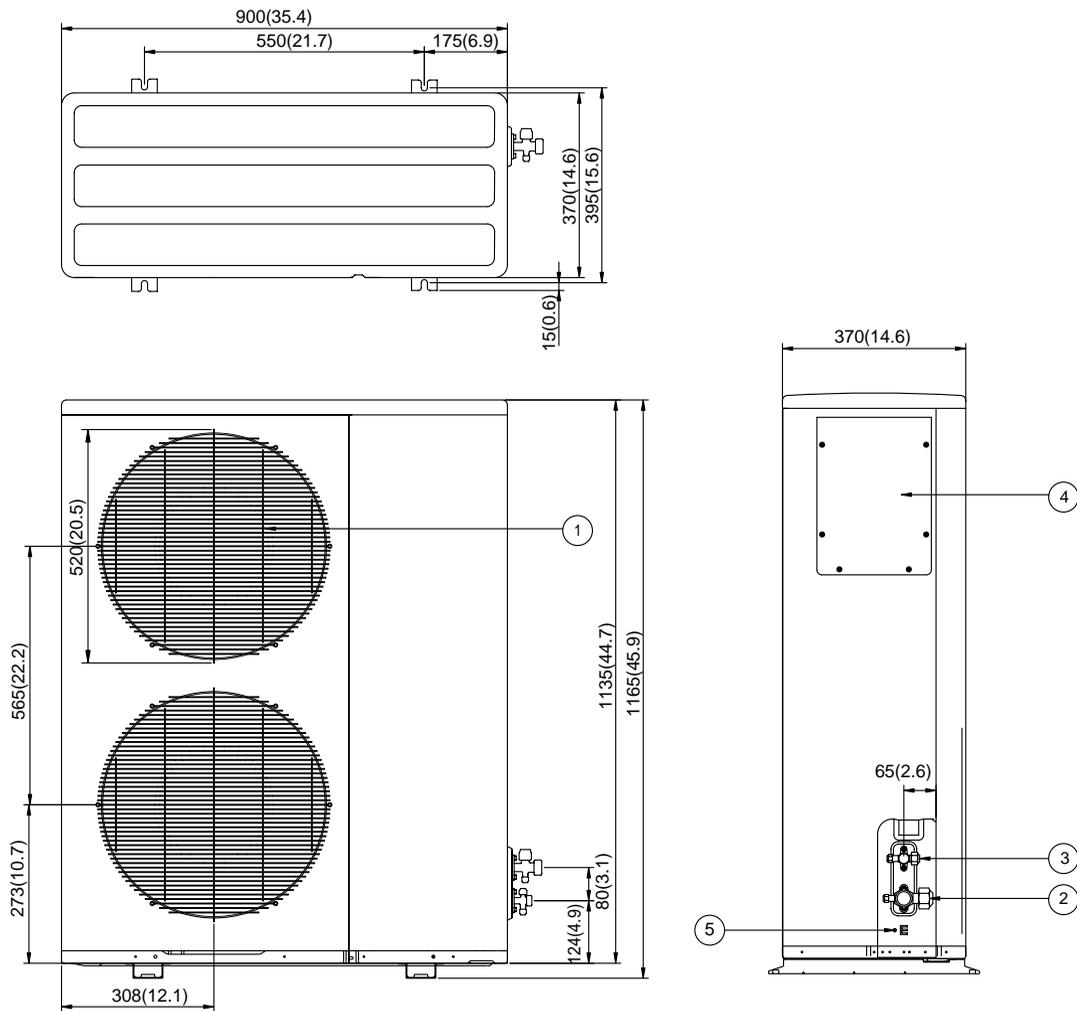
## 2. Outdoor Units

**Model No.: DMC24CA-1**



No.	Part Name	Remark
1	Air discharge grille	
2	Gas pipe connection	
3	Liquid pipe connection	
4	Power & transmission connection	
5	Earth screw	

**Model No.: DMC36CA-1**



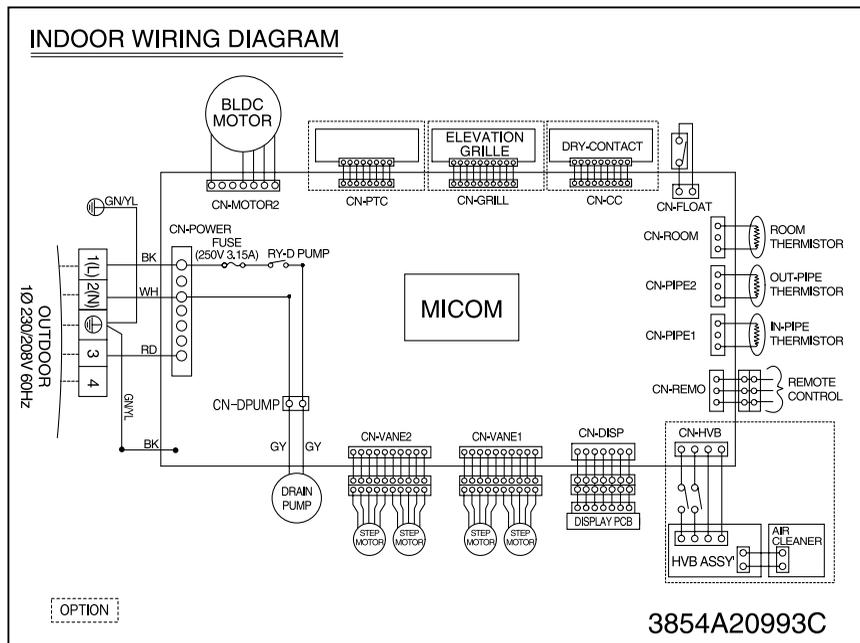
\*mm(inch)

No.	Part Name	Remark
1	Air discharge grille	
2	Gas pipe connection	
3	Liquid pipe connection	
4	Power & transmission connection	
5	Earth screw	

# Wiring Diagrams

## 1. Indoor Unit

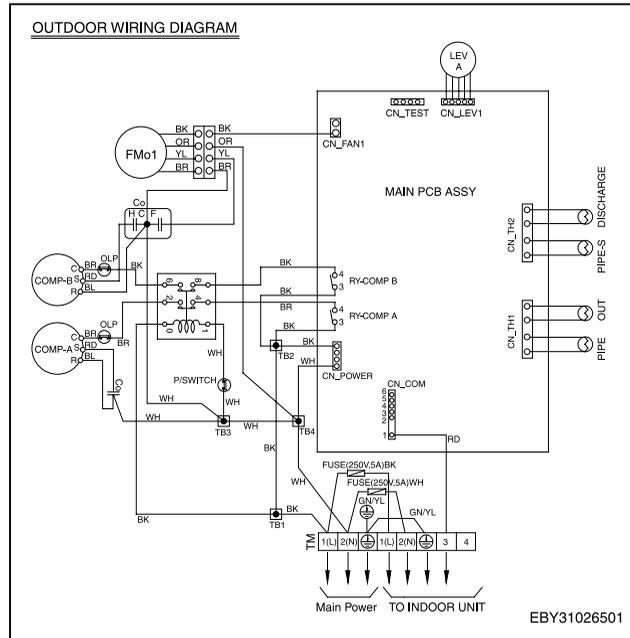
### DMC24CA-1 / DMC36CA-1



Connector Number	Location
CN-POWER	AC power supply
CN-MOTOR	BLDC fan motor output
CN-DPUMP	Drain pump output
CN-DISP	Display
CN-FLOAT	Float switch input
CN-REMO	Remote control
CN-CC	Dry-contact
CN-ROOM	Room sensor
CN-PIPE1	In-pipe thermistor
CN-PIPE2	Out-pipe thermistor
CN-GRILL	Elevation grille
CN-HVB	HVB Ass'y (Air cleaner)

## 2. Outdoor Unit

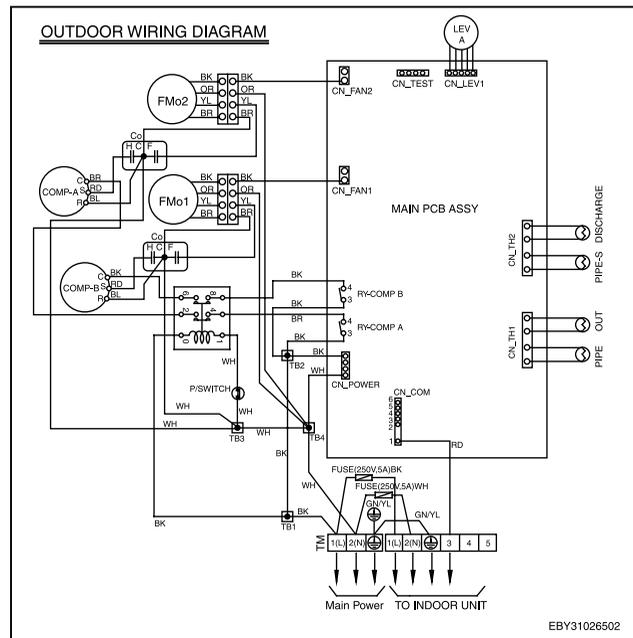
### DMC24CA-1



Notes:

BL	BLUE	BK	BLACK	BR	BROWN
RD	RED	OR	ORANGE	WH	WHITE
YL	YELLOW	GN/YL	GREEN/YELLOW	-----	FIELD WIRING

### DMC36CA-1

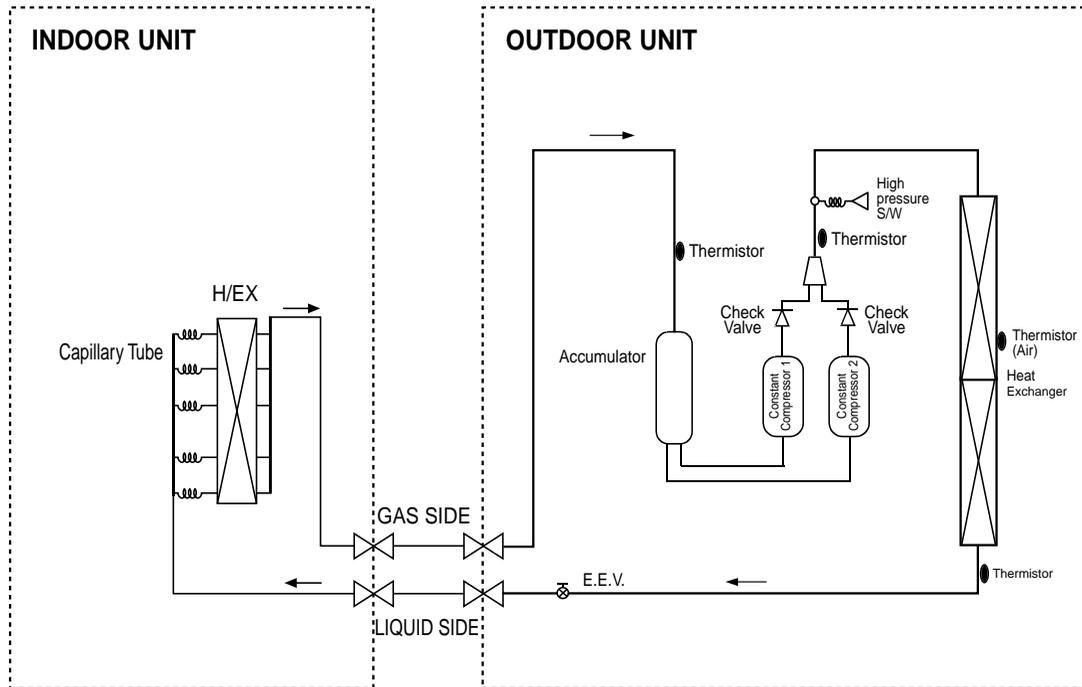


Notes:

BL	BLUE	BK	BLACK	BR	BROWN
RD	RED	OR	ORANGE	WH	WHITE
YL	YELLOW	GN/YL	GREEN/YELLOW	-----	FIELD WIRING

# Refrigerant Cycle Diagrams

## 1. Cooling Only Models



Capacity	Pipe Size(Diameter:Ø) inch		Piping length (ft.)		Elevation (ft.)		Additional Refrigerant (oz/ft)
	Gas	Liquid	Rated	Max.	Rated	Max.	
24k	1/4	1/2	25	100	16	50	0.22
34k	1/4	5/8		115	16	66	0.32

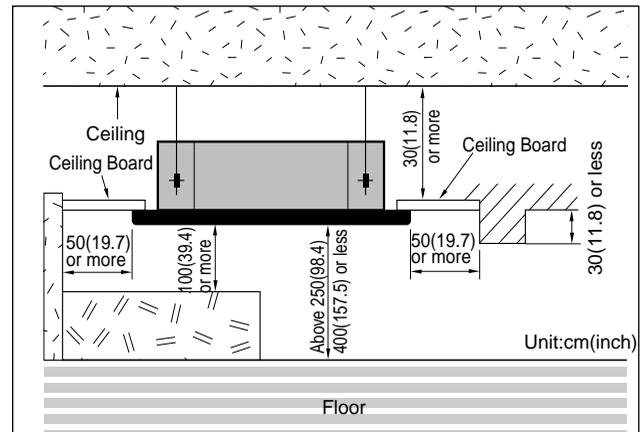
# Installation

## 1. Select the best location

Install the air conditioner in the location that satisfies the following conditions.

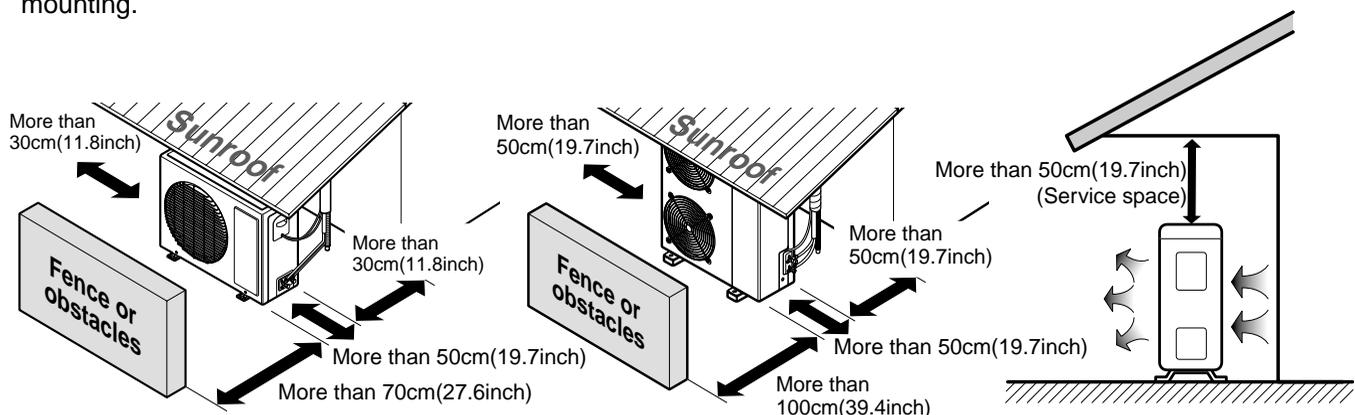
### 1.1 Indoor Unit

- There should not be any heat source or steam near the unit.
- There should not be any obstacle to the air circulation.
- A place where air circulation in the room will be good.
- A place where drainage can be easily obtained.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the door way.
- Ensure the spaces indicated by arrows from the wall, ceiling, or other obstacles.
- The indoor unit must have sufficient maintenance space.



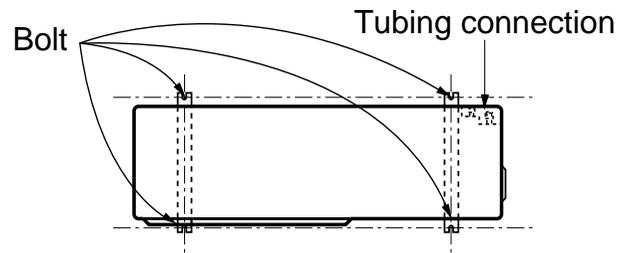
### 1.2 Outdoor Unit

- If an awning is built over the unit to prevent direct sunlight or rain exposure, make sure that heat radiation from the condenser is not restricted.
- Ensure that the space around the back is more than 30cm (11.8 inch) and sides is more than 30cm (11.8 inch). The front of the unit should have more than 70cm (27.6 inch) of space.
- Do not place animals and plants in the path of the warm air.
- Take the air conditioner weight into account and select a place where noise and vibration are minimum.
- Select a place so that the warm air and noise from the air conditioner do not disturb neighbors.
- Rooftop Installations : If the outdoor unit is installed on a roof structure, be sure to level the unit. Ensure the roof structure and anchoring method are adequate for the unit location. Consult local codes regarding rooftop mounting.

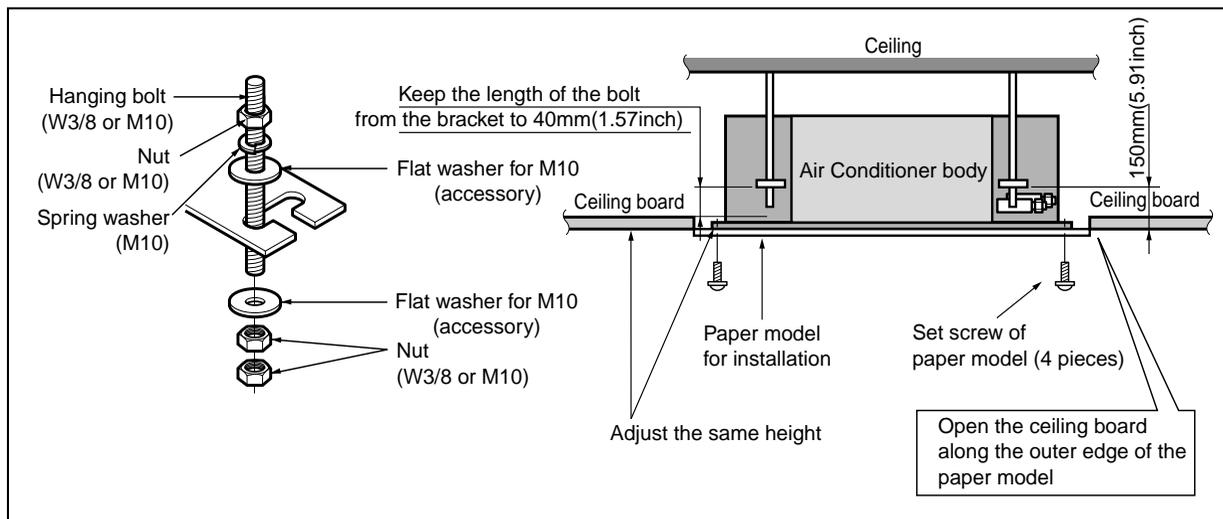


## 2. Settlement of outdoor unit

- Anchor the outdoor unit with a bolt and nut( $\phi 10\text{mm}(0.39\text{inch})$ ) tightly and horizontally on a concrete or rigid mount.
- When installing on the wall, roof or rooftop, anchor the mounting base securely with a nail or wire assuming the influence of wind and earthquake.
- In the case when the vibration of the unit is conveyed to the hose, secure the unit with an anti-vibration rubber.



## 3. Indoor Unit Installation

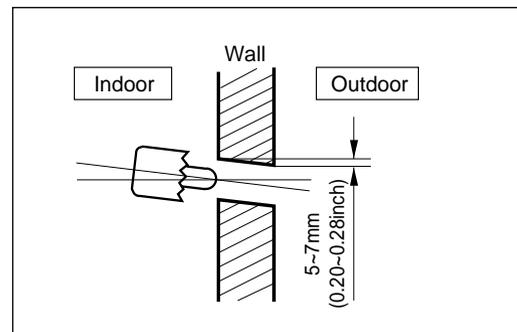


- The following parts is option.
  - ① Hanging Bolt - W 3/8 or M10
  - ② Nut - W 3/8 or M10
  - ③ Spring Washer - M10
  - ④ Plate Washer - M10

### CAUTION

- Tighten the nut and bolt to prevent unit falling.

- Drill the piping hole on the wall slightly tilted to the outdoor side using a  $\phi 70(2.76\text{inch})$  hole-core drill.

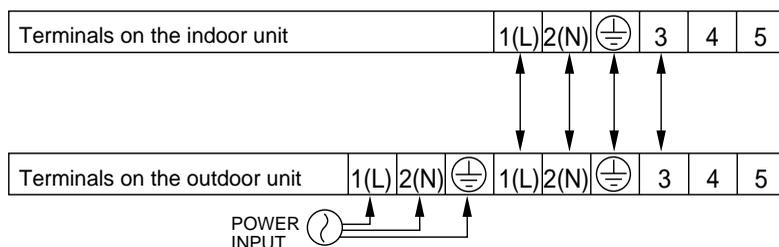


## 4. Wiring Connection

1. All wiring must comply with local and national electrical codes.
2. Select a power source that is capable of supplying the current as required by the air conditioner.
3. Feed the power source to the unit via a distribution switch board designed for this purpose.
4. The terminal screws inside the control box may be loose due to vibration during transport.  
Check the screws for loose connection.  
(Running the air conditioner with loose connection can overload and damage electrical components.)
5. Always ground the air conditioner with a grounding wire and connector to meet the local and national codes.

### ■ 24k/34k Btu/h (1Ø)

#### • Cooling & Heating type



### CAUTION!

Power wire sizing and overcurrent selection must be made based on minimum circuit ampacity and maximum fuse size indicated on the outdoor unit rating plate. Interconnecting wiring between the indoor and outdoor unit must comply with local and national electrical codes.

### **⚠ WARNING**

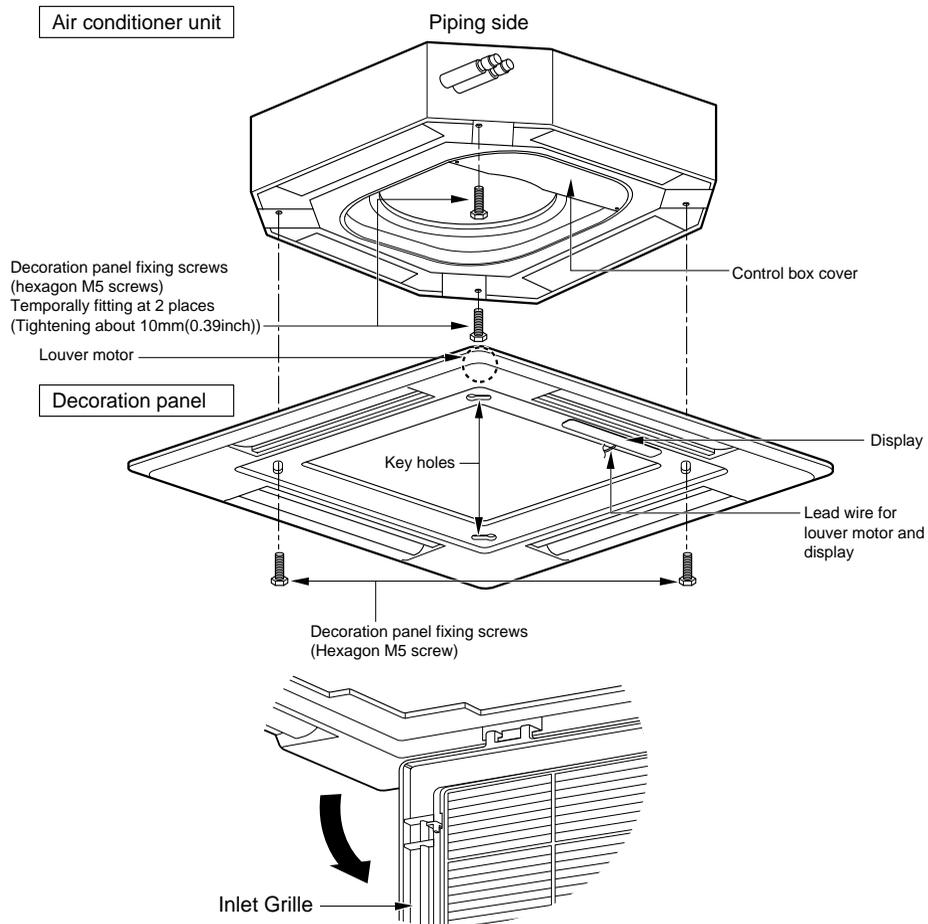
Make sure that the screws of the terminal are free from looseness.

## 5. Installation of Decoration Panel

The decoration panel has its installation direction.

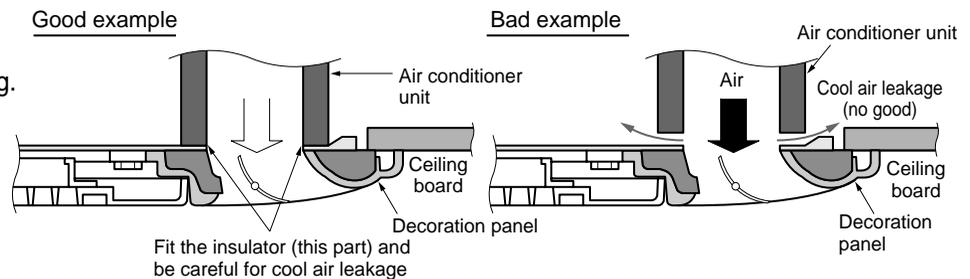
Before installing the decoration panel, always remove the paper template.

1. Temporarily fix two decoration panel fixing screws (hexagon M5 screw) on the unit body. (Tighten by amount 10mm(0.39inch) in length.)  
The fixing screws (hexagon M5 screw) are included the indoor unit box.
2. Remove the air inlet grille from the decoration panel. (Remove the hook for the air inlet grille cord.)
3. Hook the decoration panel key hole (  ) on the screws fixed in step above, and slide the panel so that the screws reach the key hole edge.
4. Retighten completely two temporarily fixed screws and other two screws. (Total 4 screws)
5. Connect the louver motor connector and display connector.
6. After tightening these screws, install the air inlet grille (including the air filter).



### CAUTION

Install certainly the decoration panel.  
Cool air leakage causes sweating.  
⇒ Water drops fall.



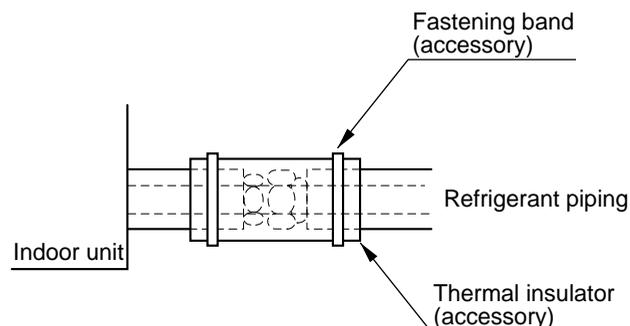
## 6. Heat Insulation and pipings

### HEAT INSULATION

1. Use the heat insulation material for the refrigerant piping which has an excellent heat-resistance (over 120°C(248°F) ).

2. Precautions in high humidity circumstance:

This air conditioner has been tested according to the "KS Standard Conditions with Mist" and con here is not any default. However, if it is operated for a long time in high humid atmosphere (dew point temperature: more than 23°C(73.4°F)), water drops are liable to fall. In this case, add heat insulation material according to the following procedure:



- Heat insulation material to be prepared... Adiabatic glass wool with thickness 10 to 20mm(0.39 to 0.79inch).
- Stick glass wool on all air conditioners that are located in ceiling atmosphere.
- In addition to the normal heat insulation (thickness: more than 8mm(0.31inch)) for refrigerant piping (gas piping: thick piping) and drain piping, add further 10mm to 30mm(0.39inch to 1.18 inch) thickness material.

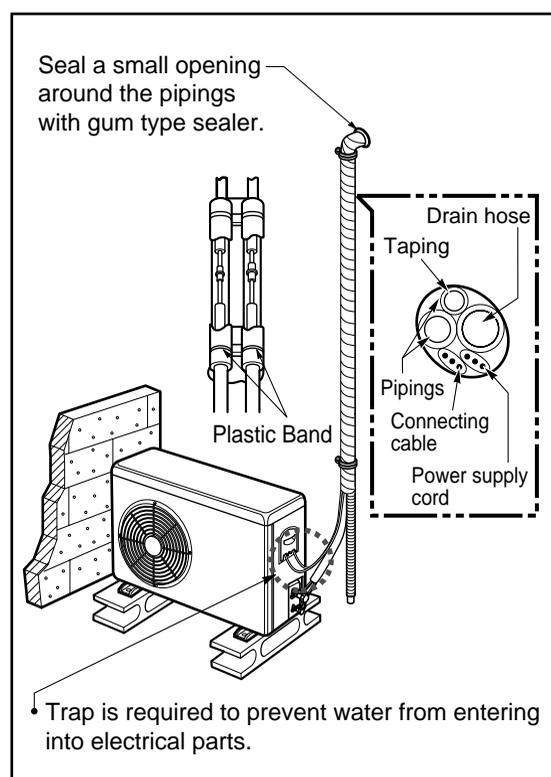
### FORM THE PIPINGS

1. **Wrap the connecting portion of indoor unit with the Insulation material and secure it with two Plastic Bands. (for the right pipings)**

- If you want to connect an additional drain hose, the end of the drain-outlet should be kept at a distance from the ground. (Do not dip it into water, and fix it on the wall to avoid swinging in the wind.)

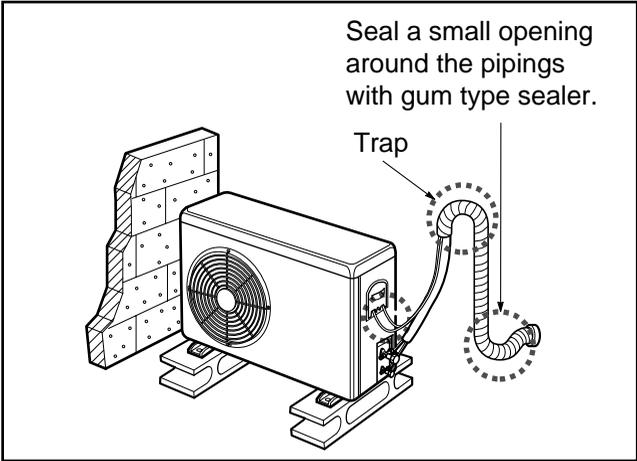
**In case of the Outdoor unit being installed below position of the Indoor unit.**

2. **Tape the Piping, drain hose and Connecting Cable from bottom to top.**
3. **Form the piping gathered by taping along the exterior wall and attach it to the wall by saddle or equivalent.**



**In case of the Outdoor Unit being installed above position of the Indoor Unit.**

2. Tape the Piping and Connecting cable from bottom to top.
3. Form the pipings gathered by taping along the exterior wall, and make the trap prevent water from entering into the room.
4. Attach the piping onto the wall by saddle or equivalent.



## 7. Drain Pipe Work

### ■ Drain Piping of Ceiling Cassette

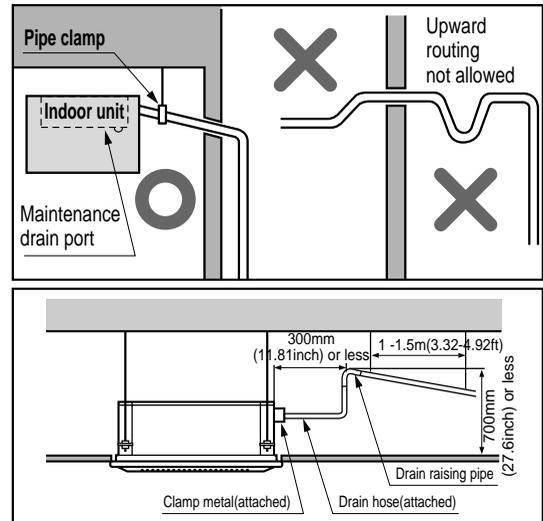
- Drain piping must have down-slope (1/50 to 1/100); be sure not to provide up-and-down slope to prevent reversal flow.
- During drain piping connection, be careful not to exert extra force on the drain port on the indoor unit.
- The outside diameter of the drain connection on the indoor unit is 32mm(1.26inch).

Piping material: Polyvinyl chloride pipe VP-25 and pipe fittings

- Be sure to install heat insulation on the drain piping.

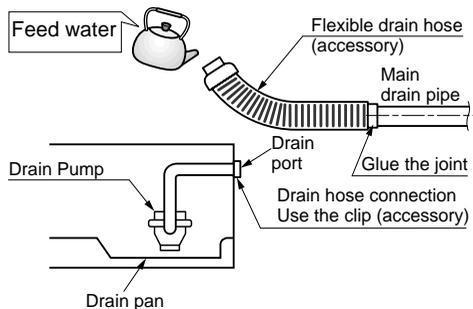
Heat insulation material: Polyethylene foam with thickness more than 8 mm(0.31inch).

- Install the drain raising pipes at a right angle to the indoor unit and no more than 300mm(11.81inch) from the unit.



### Drain test

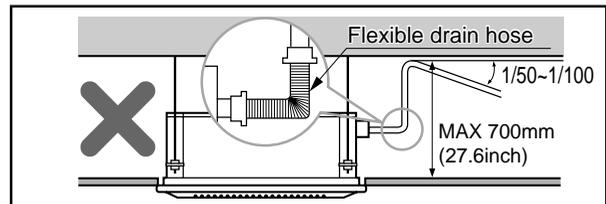
The air conditioner uses a drain pump to drain water. Use the following procedure to test the drain pump operation:



### CAUTION

The supplied flexible drain hose should not be curved, neither screwed. The curved or screwed hose may cause a leakage of water.

- Connect the main drain pipe to the exterior and leave it provisionally until the test comes to an end.
- Feed water to the flexible drain hose and check the piping for leakage.
- Be sure to check the drain pump for normal operating and noise when electrical wiring is complete.
- When the test is complete, connect the flexible drain hose to the drain port on the indoor unit.



## 8. Test running

### 1) PRECAUTIONS IN TEST RUN

- The initial power supply must provide at least 90% of the rated voltage. Otherwise, the air conditioner should not be operated.

#### CAUTION

- ① For test run, carry out the cooling operation first even during winter season.
- ② Carry out the test run more than 5 minutes without stopping.  
(Test run will be cancelled 18 minutes later automatically)
- The test run is started by pressing the room temperature checking button and down timer button for 3 seconds at the same time.
- To cancel the test run, press any button.

#### CHECK THE FOLLOWING ITEMS WHEN INSTALLATION IS COMPLETE

- After completing work, be sure to measure and record trial run properties, and store measured data, etc.
- Measuring items are room temperature, outside temperature, suction temperature, blow out temperature, wind velocity, wind volume, voltage, current, presence of abnormal vibration and noise, operating pressure, piping temperature, compressive pressure.
- As to the structure and appearance, check following items.
 

<input type="checkbox"/> Is the circulation of air adequate?	<input type="checkbox"/> Is the remote controller switch operated?
<input type="checkbox"/> Is the draining smooth?	<input type="checkbox"/> Is there any faulty wiring?
<input type="checkbox"/> Is the heat insulation complete (refrigerant and drain piping)?	<input type="checkbox"/> Are not terminal screws loosened?
<input type="checkbox"/> Is there any leakage of refrigerant?	

M4.....118N.cm{12kgf.cm}{10.4lbf.in}

M5.....196N.cm{20kgf.cm}{17.4lbf.in}

M6.....245N.cm{25kgf.cm}{21.7lbf.in}

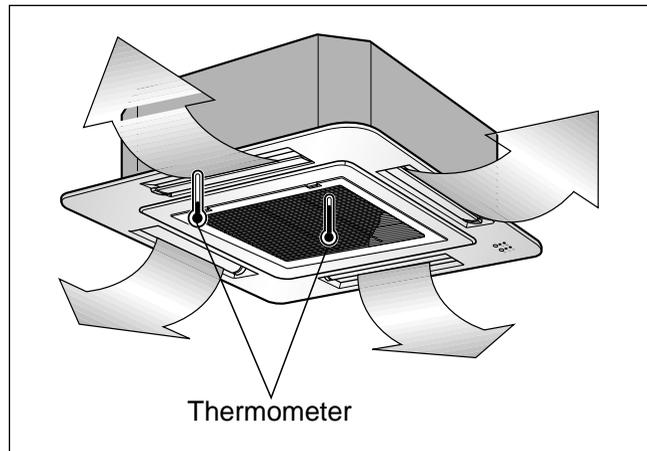
M8.....588N.cm{60kgf.cm}{52.1lbf.in}

## 2) Connection of power supply

1. Connect the power supply cord to the independent power supply.
  - Circuit breaker is required.
2. Operate the unit for fifteen minutes or more.

## 3) Evaluation of the performance

1. Measure the temperature of the intake and discharge air.
2. Ensure the difference between the intake temperature and the discharge one is more than 8°C(14.4°F).



### CAUTION

After the confirmation of the above conditions, prepare the wiring as follows:

- 1) **Always use a dedicated circuit for the air conditioner. As for the method of wiring, see the circuit diagram pasted on the inside of control box cover.**
- 2) **Provide a circuit breaker switch between power source and the unit.**
- 3) **The screws which fasten the wiring in the casing of electrical fittings are liable to come loose from vibrations during transportation. Check them and make sure they are all tight. (If they are loose, it could give rise to burn-out of the wires.)**
- 4) **Specification of power source**
- 5) **Confirm that electrical capacity is sufficient.**
- 6) **Be sure that the starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.**
- 7) **Confirm that the cable size is selected using the minimum circuit ampacity on label. (Particularly note the relation between cable length and wire gauge.)**
- 8) **Use GFCI breaker where it is wet or moist and/or required by local and national codes.**
- 9) **The following troubles would be caused by excess voltage drop.**
  - Vibration of a magnetic switch, damage on the contact point there of, fuse blowing, disturbance to the normal function of a overload protection device.
  - Proper starting power is not given to the compressor.

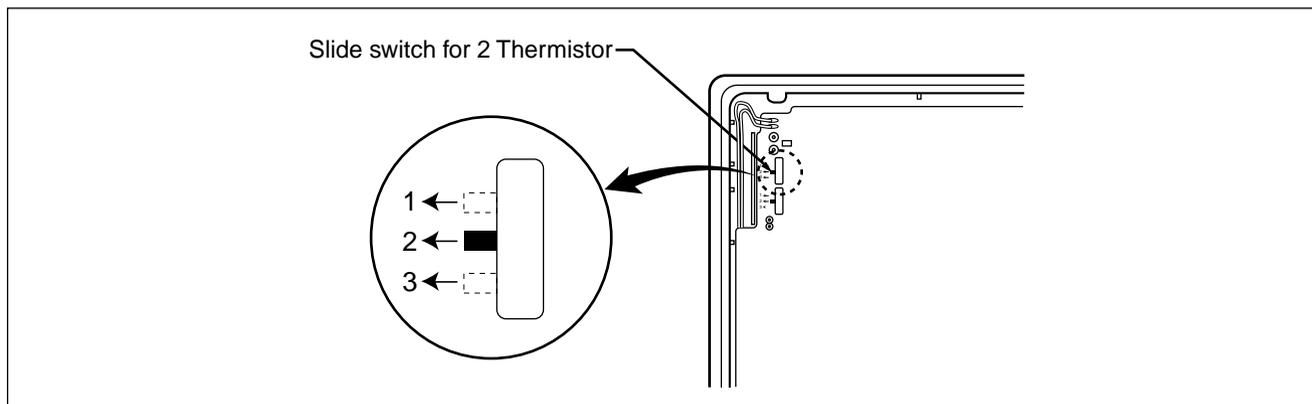
### HAND OVER

Teach the customer the operation and maintenance procedures, using the operation manual (air filter cleaning, temperature control, etc.).

## 9. Optional Operation

### 1) Two Thermistor System

- (1) Open the rear cover of the wired remote-controller to set the mode.
- (2) Select one of three selectable modes as follows.
  - Position 1: The room temperature is controlled by the thermistor of the wired remote-controller, control the temperature according to the position of wired remote-controller.
  - Position 2: The room temperature is controlled by the thermistor of the main body.
  - Position 3: The room temperature is controlled by lower temperature between the temperature of main body and of remote-controller sensor.
- (3) Move the slide switch to set position.



- (4) Close the rear cover and check if it works normally.

#### **CAUTION**

- Select the position after counselling with a customer.
- In case of cooling mode, room temperature is controlled by the main body sensor.
- To control the room temperature by a wired remote controller, install controller(room temp. sensor) to sense the temperature more accurately.
- Manufactured in the position 3.

## 2) Adjusting air volume to the height of ceiling

You can choose the RPM(or air volume) of indoor motor according to the height of ceiling to supply the comfortable atmosphere to consumers.

### Procedure

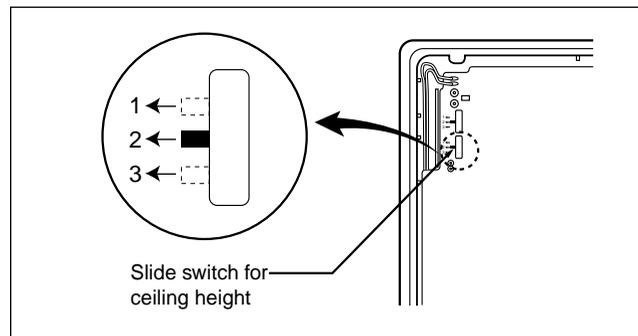
1. Choose the selectable position in the table after measuring the height of ceiling.

Ceiling height	Mode of slide switch	Change of air volume	Remark
more than 3.3m(10.8ft)	High Ceiling	Increasing	Manufactured in standard mode
2.7~3.3m(8.9~10.8ft)	Standard	-	
less than 2.7m(8.9ft)	Low Ceiling	Decreasing	

2. In the case of changing the height as "high" or "low", open the rear cover of the wired remote-controller.

3. Move the slide switch to the set position.

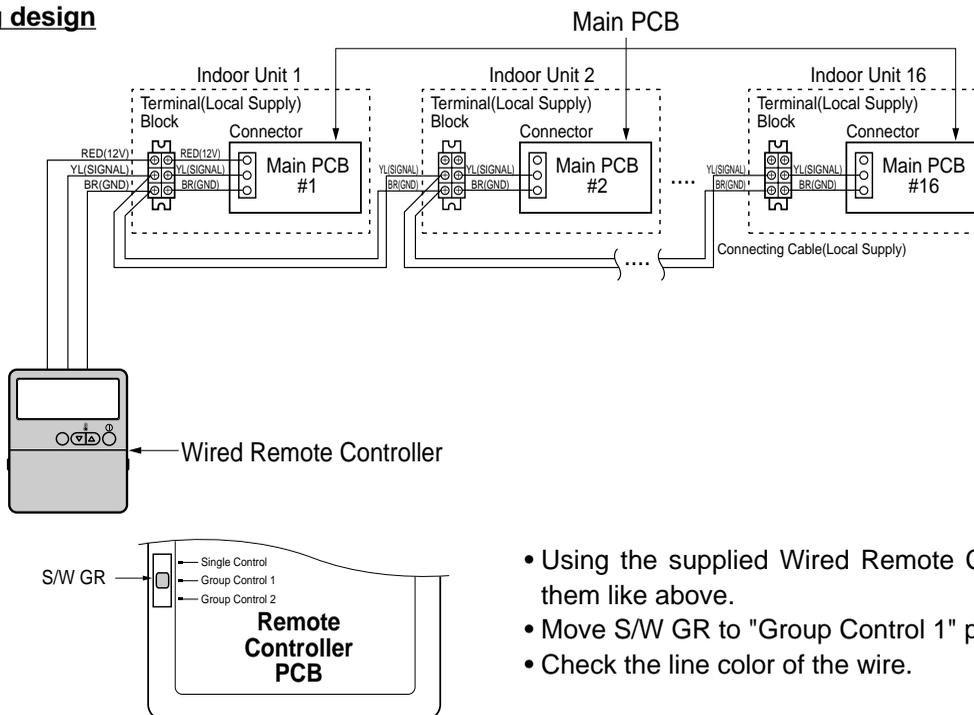
4. Close the rear cover and check if it works normally.



## 3) Group Control

It operates maximum 16 Units by only one Wired Remote Controller, and each Unit starts sequentially to prevent overcurrent.

### Wiring design



- Using the supplied Wired Remote Controller, wire them like above.
- Move S/W GR to "Group Control 1" position.
- Check the line color of the wire.

### CAUTION

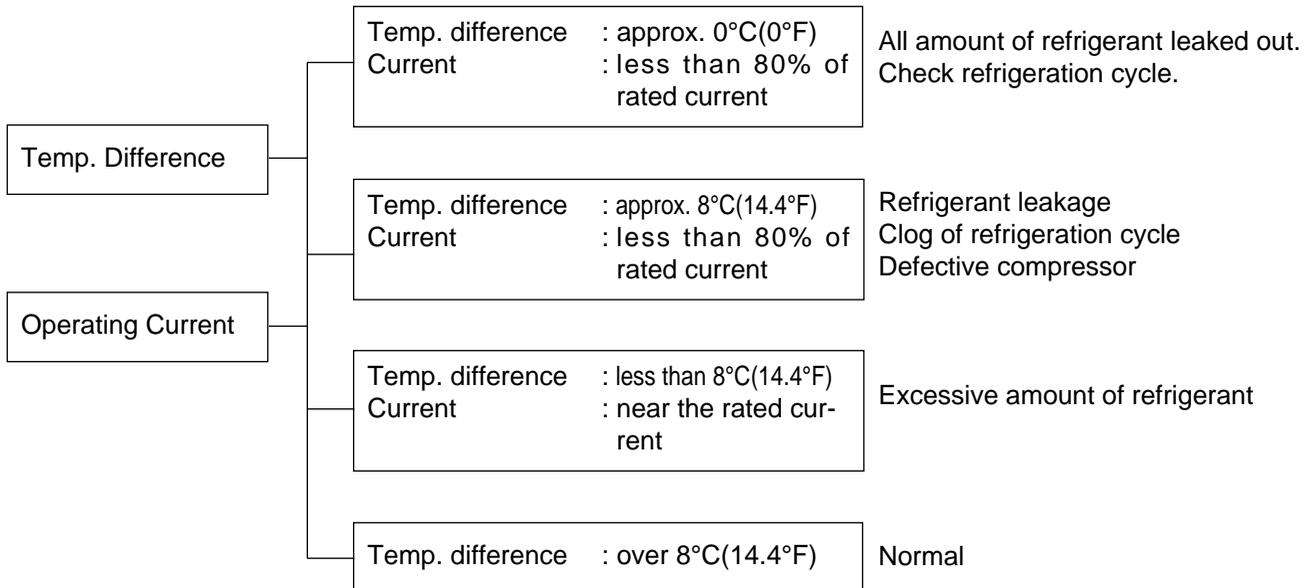
- Be careful not to exchange the color of wires.
- The maximum length of connecting wire should be below 200m(656ft)(25Ω) on connecting each units.
- Use a wire more than 0.5mm<sup>2</sup>

# Troubleshooting Guide

## Cycle Troubleshooting Guide

### Trouble analysis

1. Check temperature difference between intake and discharge air, and operating current.



**Notice:**

Temperature difference between intake and discharge air depends on room air humidity. When the room air humidity is relatively higher, temperature difference is smaller. When the room air humidity is relatively lower temperature difference is larger.

2. Check temperature and pressure of refrigeration cycle.

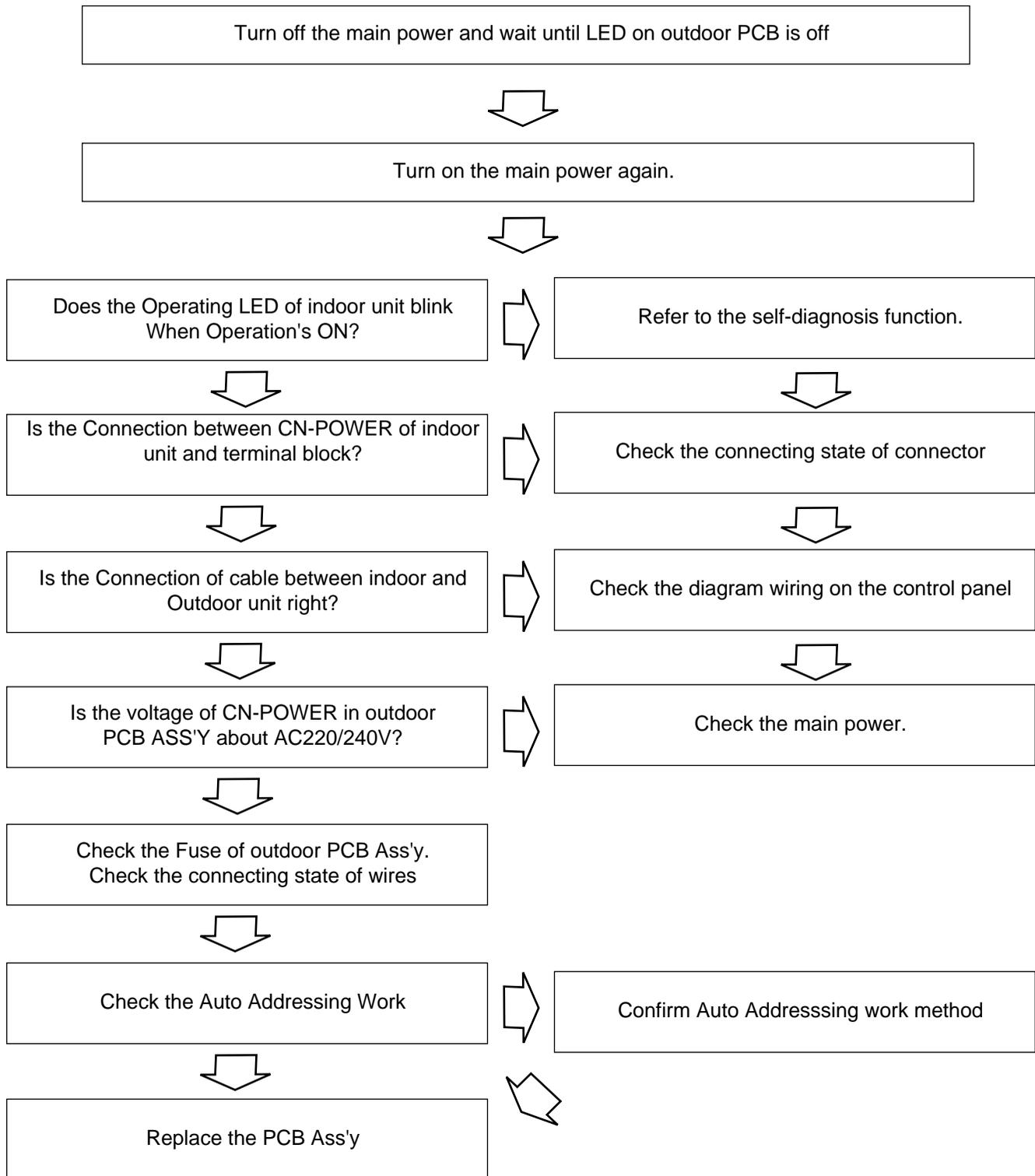
Suction pressure (Compared with the normal value)	Temperature (Compared with the normal value)	Cause of Trouble	Description
Higher	High	Defective compressor	Current is low.
	Normal	Excessive amount of refrigerant	High pressure does not quickly rise at the beginning of operation.
Lower	Higher	Insufficient amount of refrigerant(Leakage) Clogging	Current is low.

**Notice:**

1. The suction pressure is usually 4.5~6.0 kg/cm<sup>2</sup>G (65-85 psig) at normal conditions.
2. The temperature can be measured by attaching the thermometer to the low pressure tubing and wrap it with putty.

## Electronic Parts Troubleshooting Guide

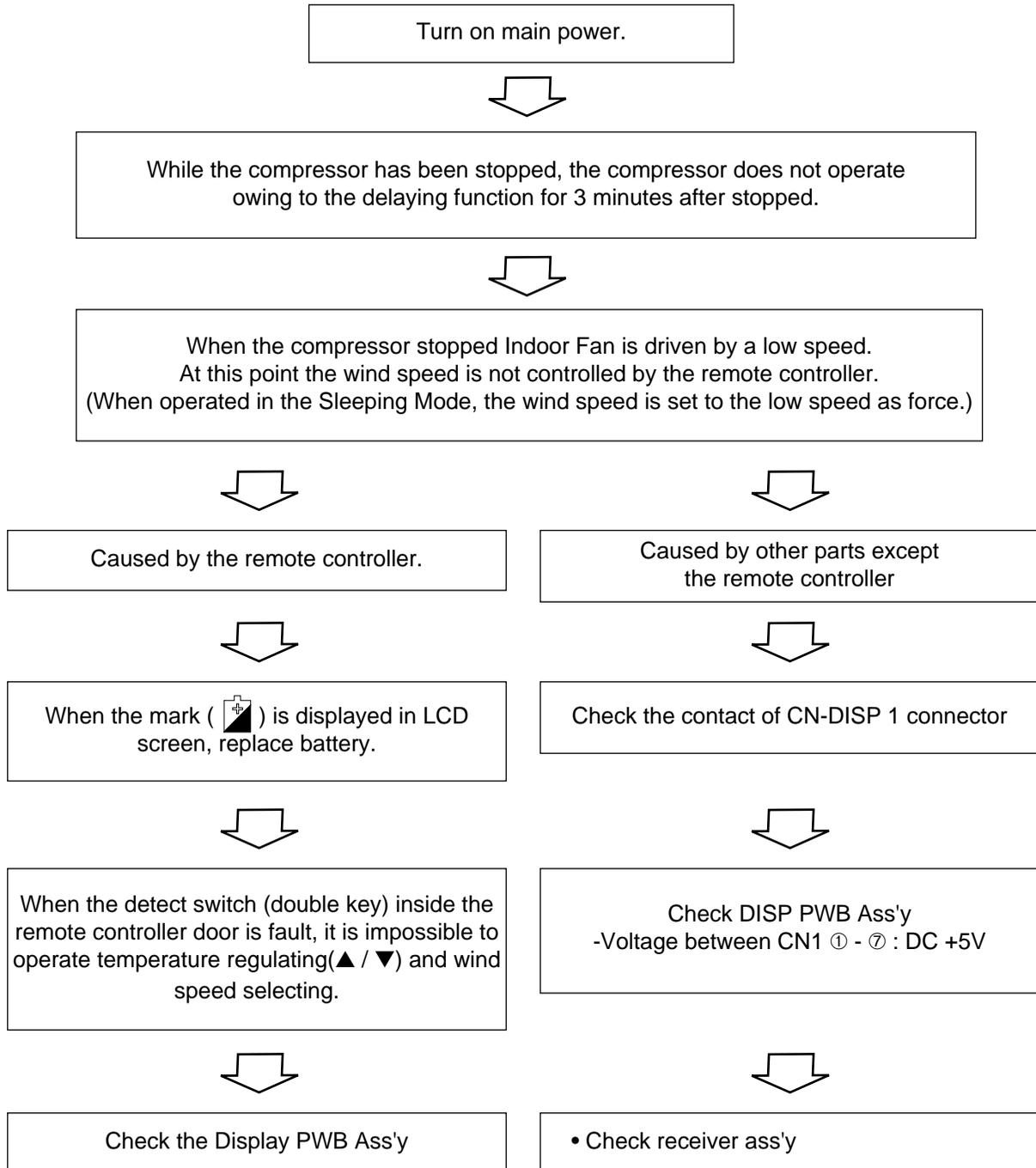
### Trouble 1 The Product doesn't operate at all.



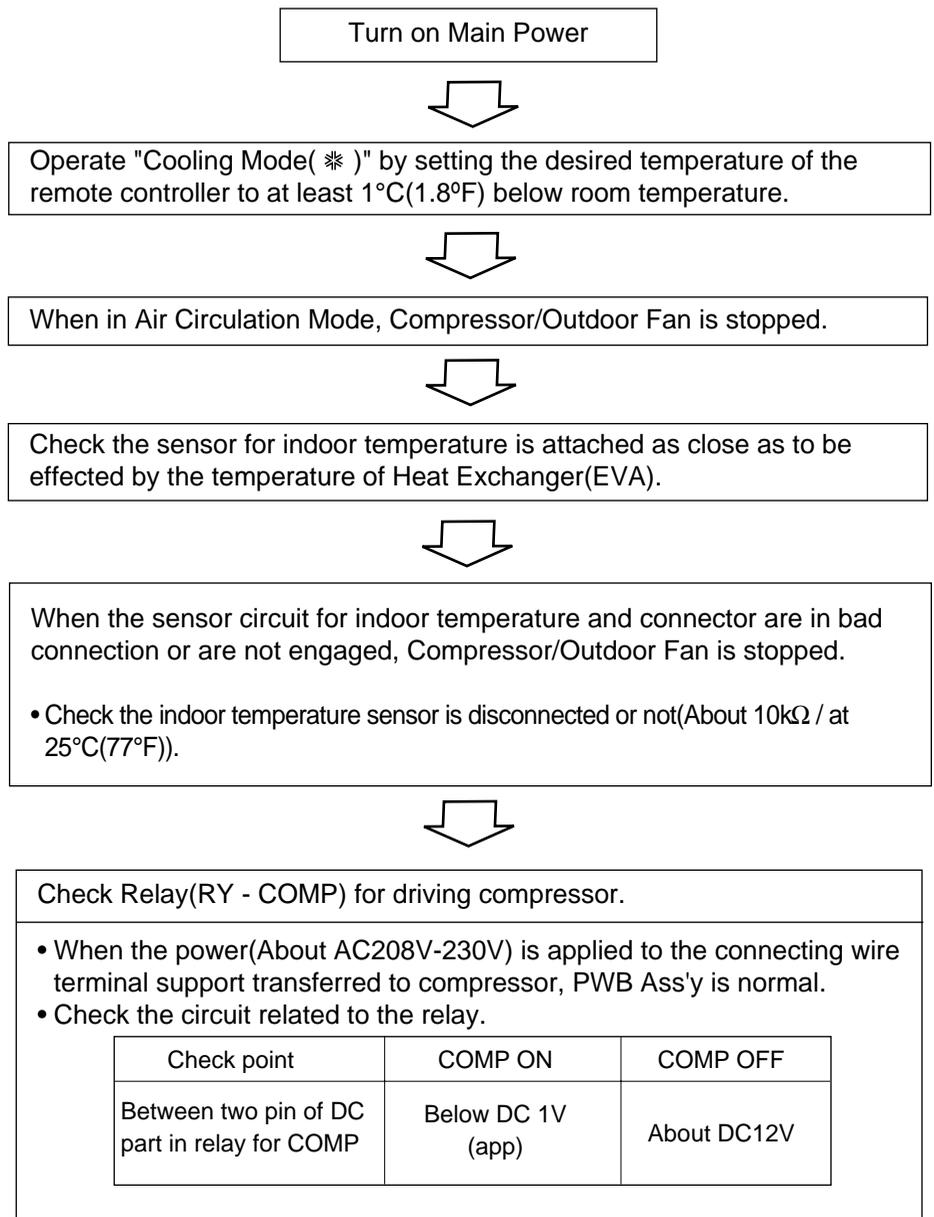
\* The product's operation starts at three minutes after main power turning on

**Trouble 2**

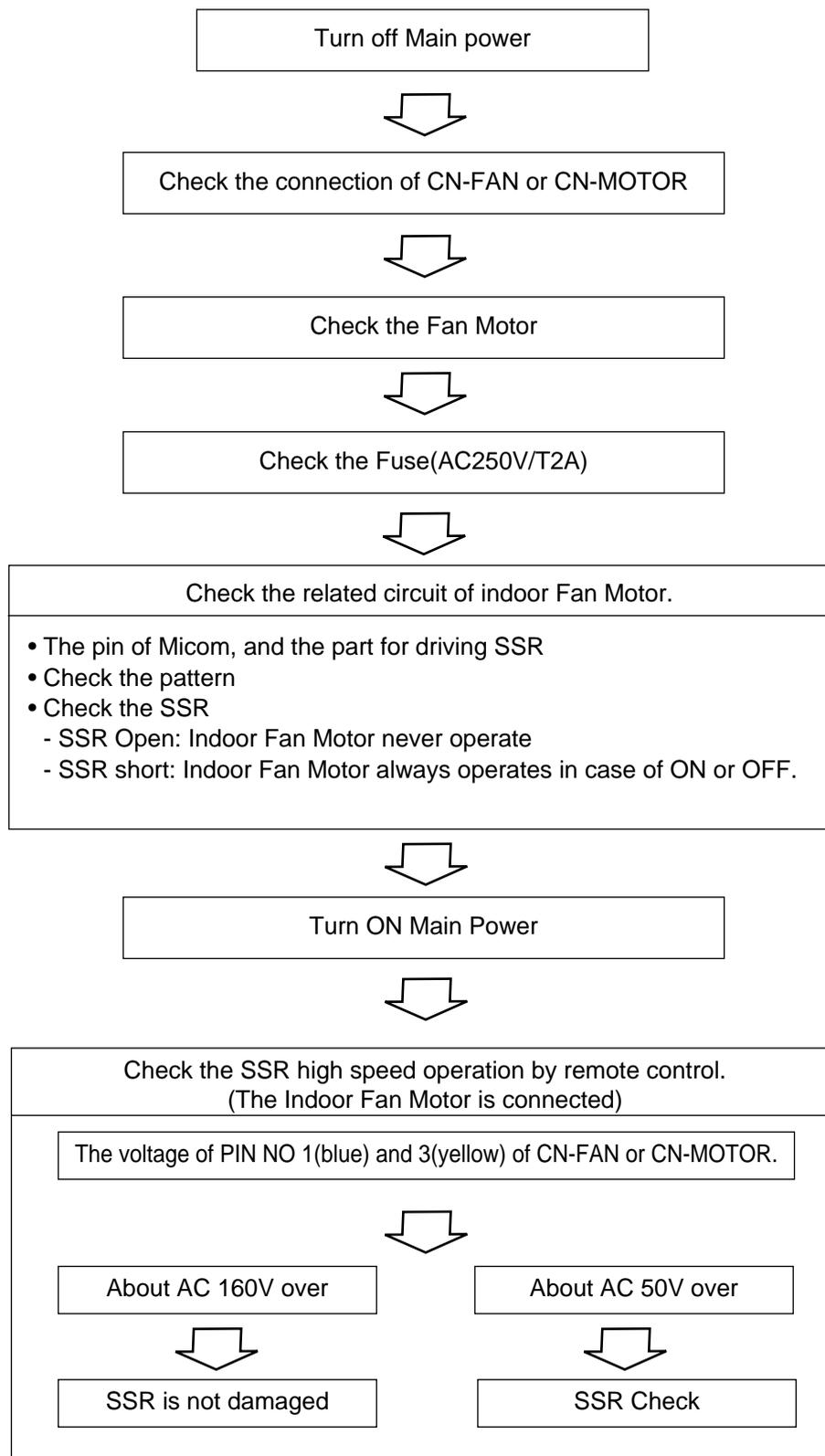
**Product doesn't operate with the remote controller.**



**Trouble 3** When cooling does not operate



**Trouble 4** When indoor Fan does not operate



**Trouble 5**

**When Vertical Louver does not operate**

- Confirm that the Vertical Louver is normally geared with the shaft of Stepping Motor.
- If the regular torque is detected when rotating the Vertical Louver with hands ⇒ Normal



- Check the connecting condition of CN-U/D Connector
- Check the soldering condition(on PWB) of CN-U/D Connector



Check the operating circuit of the Vertical Louver

- Confirm that there is DC +12V between pin ①(RE D) of CN-U/D and GND.



If there are no problems after above checks

- Confirm the assembly conditions that are catching and interfering parts in the rotation radial of the Vertical Louver

## Self-diagnosis Function

### ■ Error Indicator

- The function is to self-diagnosis airconditioner and express the troubles identifiably if there is any trouble.
- Error mark is ON/OFF for the operation LED of evaporator body in the same manner as the following table.
- If more than two troubles occur simultaneously, primarily the highest trouble fo error code is expressed.
- After error occurrence, if error is released, error LED is also released simultaneously.
- To operate again on the occurrence of error code, be sure to turn off the power and then turn on.
- Having or not of error code is different from Model.

### Indoor Error

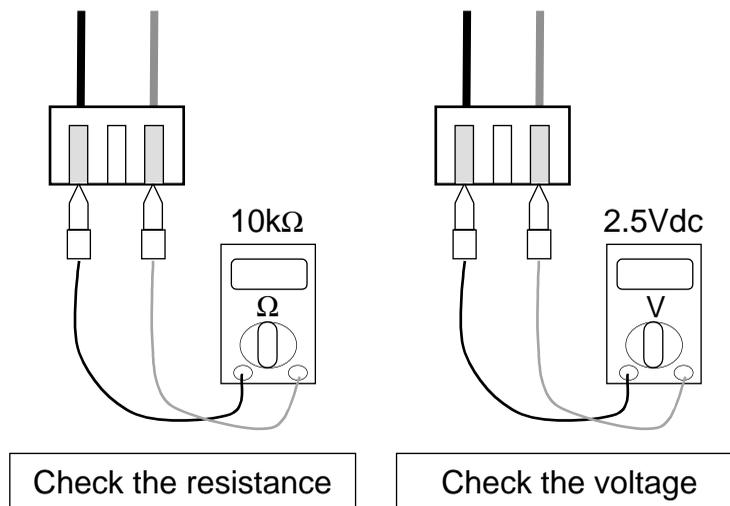
Error code	Description	MPS Variable	MPS Inverter	LED 1 (Red)	LED 2 (Green)	Indoor Status
00	No Error	●	●			ON
01	Indoor Room Thermistor Error	●	●		1 time ●	OFF
02	Indoor In-Piping Error	●	●		2 times ●	OFF
03	Remote controller Error	●	●		3 times ●	OFF
04	Drain Pump Error	●	●		4 times ●	OFF
05	Communication Error between In and Out	●	●		5 times ●	OFF
06	Indoor Out-Piping Error	●	●		6 times ●	OFF

### Outdoor Error

Error Code	Description	MPS Variable	MPS Inverter	LED 1 (Red)	LED 2 (Green)	Indoor Status
21	DC Peak(IPM Fault)		●	2 times ●	1 time ●	ON
22	CT2(Max CT)		●	2 times ●	2 times ●	OFF
23	DC Link Low Volt		●	2 times ●	3 times ●	OFF
24	High/Low Pressure/Heatsink Switch	●	●	2 times ●	4 times ●	OFF
25	Low Voltage / Over Voltage	●	●	2 times ●	5 times ●	OFF
26	DC COMP Position Error		●	2 times ●	6 times ●	OFF
27	PSC Fault Error		●	2 times ●	7 times ●	OFF
28	DC Link High Volt		●	2 times ●	8 times ●	OFF
32	D-Pipe High(INV)		●	3 times ●	2 times ●	OFF
33	D-Pipe High(Normal)	●	●	3 times ●	3 times ●	OFF
40	CT Sensor(open/short)		●	4 times ●		OFF
41	INV. D-Pipe Thermistor Error(Open/Short)		●	4 times ●	1 times ●	OFF
44	Outdoor Air Thermistor Error(Open/Short)	●	●	4 times ●	4 times ●	OFF
45	Cond Pipe Thermistor Error(Open/Short)	●	●	4 times ●	5 times ●	OFF
46	Suction Pipe Thermistor Error(Open/Short)		●	4 times ●	6 times ●	OFF
47	Const. D-Pipe Thermistor Error(Open/Short)	●	●	4 times ●	7 times ●	OFF
51	Capacity Error(High/Low)	●	●	5 times ●	1 times ●	OFF
53	Signal Error(Indoor_Outdoor)		●	5 times ●	3 times ●	OFF
54	Phase Error	●		5 times ●	4 times ●	OFF
60	EEPROM Check Sum Error		●	6 times ●		OFF
61	Cond Pipe High	●	●	6 times ●	1 times ●	OFF
62	Heatsink High		●	6 times ●	2 times ●	OFF
63	Cond Pipe Low		●	6 times ●	3 times ●	OFF
65	Heatsink Thermistor Error(Open/Short)		●	6 times ●	5 times ●	OFF

**Troubleshooting CH01, CH02, CH06**

Display code	Title	Cause of error	Check point & Normal condition
01	Indoor air sensor	<ul style="list-style-type: none"> <li>• Open / Short</li> <li>• Soldered poorly</li> <li>• Internal circuit error</li> </ul>	Normal resistor : 10KΩ/ at 25°C(77°F) (Unplugged) Normal voltage : 2.5Vdc / at 25°C(77°F) (plugged)
02	Indoor inlet pipe sensor	<ul style="list-style-type: none"> <li>• Open / Short</li> <li>• Soldered poorly</li> <li>• Internal circuit error</li> </ul>	Normal resistor : 5KΩ/ at 25°C(77°F) (Unplugged) Normal voltage : 2.5Vdc / at 25°C(77°F) (plugged)
06	Indoor outlet pipe sensor	<ul style="list-style-type: none"> <li>• Open / Short</li> <li>• Soldered poorly</li> <li>• Internal circuit error</li> </ul>	Normal resistor : 5KΩ/ at 25°C(77°F) (Unplugged) Normal voltage : 2.5Vdc / at 25°C(77°F) (plugged)

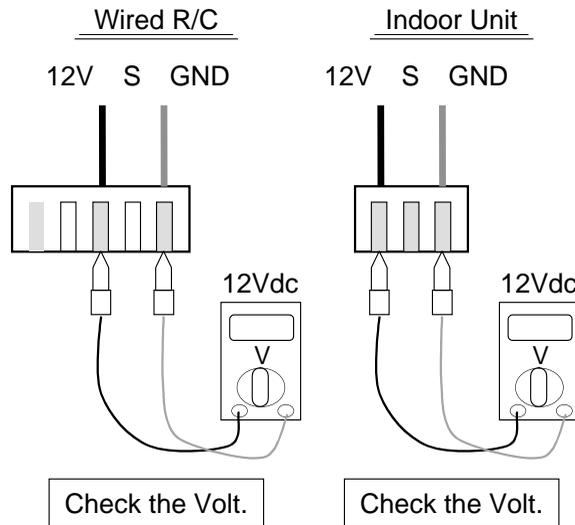


**Check Point**

1. Unplug the sensor on Indoor unit PCB.
2. Estimate the resistance of each sensor.
3. If the resistance of the sensor is 10KΩ/ 5KΩ at 25°C(77°F), then sensor is normal.
4. If the resistance of the sensor is 0 KΩ or ∞, then sensor is abnormal. → Change the sensor.
5. Plug the sensor on Indoor unit PCB and Power ON.
6. Estimate the voltage of each sensor.
7. If the voltage of the sensor is 2.5Vdc at 25°C(77°F), then sensor is normal.
8. If the resistance of the sensor is 0 or 5Vdc, then sensor is abnormal. → Repair or Change the PCB.

## Troubleshooting CH03

Display code	Title	Cause of error	Check point & Normal condition
03	Communication Wired R/C	<ul style="list-style-type: none"> <li>• Open / Short</li> <li>• Wrong connection</li> </ul>	<ul style="list-style-type: none"> <li>• Connection of wire</li> <li>• Main PCB Volt. DC12V</li> <li>• Noise interference</li> </ul>

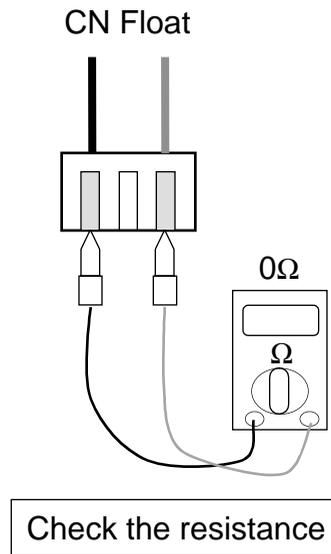


### Check Point

1. Check the wire connection. (Open / Short) → Repair the connection
2. Check the soldering state of connector. (Soldered poorly) → Repair or Change the PCB.
3. Check the volt. Of main PCB power source. (DC 12V, DC 5V) → Repair or Change the main PCB.
4. Check the installation of wired remote controller. (Noise interference) → Adjust the state of installation

**Troubleshooting CH04**

Display code	Title	Cause of error	Check point & Normal condition
04	Drain pump / Float switch	<ul style="list-style-type: none"> <li>• Float switch Open. (Normal : short)</li> </ul>	<ul style="list-style-type: none"> <li>• The connection of wire(Drain pump/ Float switch)</li> <li>• Drain pump power input. (220V)</li> <li>• Drain tube installation.</li> <li>• Indoor unit installation. (Inclination)</li> </ul>



**Check Point**

1. Check the wire connection. (Open, Soldered poorly) → Repair the connection or change the PCB.
2. Check the resistance of float switch (Abnormal : Open, Normal : short) → Check the float switch.
3. Check the level of water
4. Check the volt. Of Drain pump power supply. (AC 230V) → Repair or Change the main PCB.

## Troubleshooting CH05, CH53

Display code	Title	Cause of error	Check point & Normal condition
05 / 53	Communication (Indoor → Outdoor)	<ul style="list-style-type: none"> <li>• Communication poorly</li> </ul>	<ul style="list-style-type: none"> <li>• Power input AC 220V. (Outdoor, Indoor)</li> <li>• The connector for transmission is disconnected.</li> <li>• The connecting wires are misconnected.</li> <li>• The GND1,2 is not connected at main GND.</li> <li>• The communication line is shorted at GND.</li> <li>• Transmission circuit of outdoor PCB is abnormal.</li> <li>• Transmission circuit of indoor PCB is abnormal.</li> </ul>

### Check Point

1. Check the input power AC230V. (Outdoor, Indoor unit)
  2. Check the communication wires are correctly connected.
    - Adjust the connection of wire
    - Confirm the wire of "Live", "Neutral"
  3. Check the resistance between communication line and GND. (Normal : Over 2MΩ)
  4. Check the connector for communication is correctly connected.
  5. Check the connection of GND1, GND2, and main GND.
  6. If one indoor unit is operated normally, outdoor PCB is no problem.
    - Check the another indoor unit.
- \* CH05 is displayed at indoor unit, CH53 is displayed at outdoor unit.

## Troubleshooting CH24, CH25

Display code	Title	Cause of error	Check point & Normal condition
24	Press S/W Open	<ul style="list-style-type: none"><li>• Low / High press S/W open.</li></ul>	<ul style="list-style-type: none"><li>• Check the connection of "CN_Press".</li><li>• Check the components.</li></ul>
25	Input voltage	<ul style="list-style-type: none"><li>• Abnormal Input voltage (140Vac ↓ , 300Vac ↑ .</li></ul>	<ul style="list-style-type: none"><li>• Check the power source.</li><li>• Check the components.</li></ul>

### Check Point

#### • CH 24

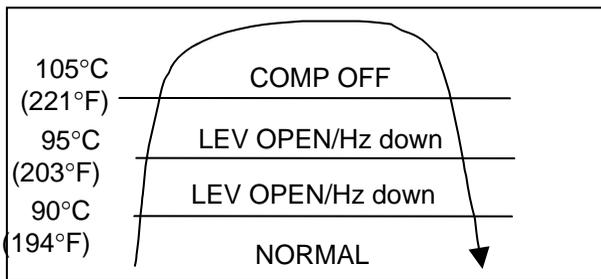
1. Check the connection of "CN\_PRESS"
2. Check the install condition for over load.
3. Check the SVC V/V open.
4. Check the leakage of refrigerant.

#### • CH 25

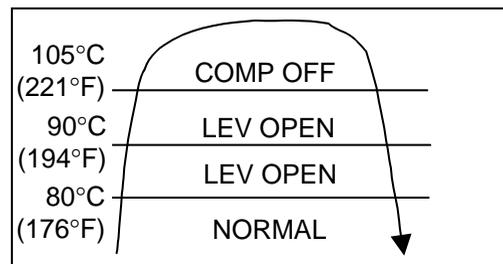
1. Check the power source.
2. Check the components (Trans1, B/Diode, Diode, Resistance)

**Troubleshooting CH32, CH33**

Display code	Title	Cause of error	Check point & Normal condition
32	D-pipe (Inverter) temp. high (105°C(221°F) ↑)	• Discharge sensor (Inverter) temp. high	<ul style="list-style-type: none"> <li>• Check the discharge pipe sensor for INV.</li> <li>• Check the install condition for over load.</li> <li>• Check the leakage of refrigerant.</li> <li>• Check the SVC V/V open.</li> </ul>
33	D-pipe (Constant) temp. high (105°C(221°F) ↑)	• Discharge sensor (Cons.) temp. high	<ul style="list-style-type: none"> <li>• Check the discharge pipe sensor for Cons.</li> <li>• Check the install condition for over load.</li> <li>• Check the leakage of refrigerant.</li> <li>• Check the SVC V/V open.</li> </ul>



**Inverter**



**Constant**

**Check Point**

• CH 32

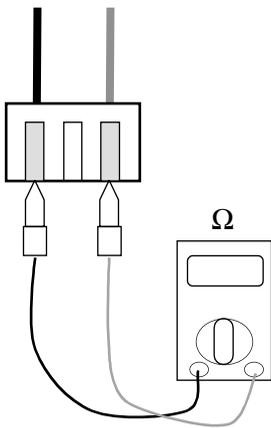
1. Check the install condition for over load.
2. Check the SVC V/V open.
3. Check the leakage of refrigerant.

• CH 33

1. Check the install condition for over load.
2. Check the SVC V/V open.
3. Check the leakage of refrigerant.
4. Check the constant compressor. (same with CH21)

**Troubleshooting CH41, CH44, CH45, CH46, CH47, CH65**

Display code	Title	Cause of error	Check point & Normal condition
41	D-pipe sensor (Inverter)	<ul style="list-style-type: none"> <li>• Open / Short</li> <li>• Soldered poorly</li> <li>• Internal circuit error</li> </ul>	<ul style="list-style-type: none"> <li>• Normal resistor : 200K<math>\Omega</math> / at 25°C(77°F) (Unplugged)</li> <li>• Normal voltage : 4.5Vdc / at 25°C(77°F) (plugged)</li> </ul>
44	Air sensor	<ul style="list-style-type: none"> <li>• Open / Short</li> <li>• Soldered poorly</li> <li>• Internal circuit error</li> </ul>	<ul style="list-style-type: none"> <li>• Normal resistor : 10K<math>\Omega</math> / at 25°C(77°F) (Unplugged)</li> <li>• Normal voltage : 2.5Vdc / at 25°C(77°F) (plugged)</li> </ul>
45	Condenser Pipe sensor	<ul style="list-style-type: none"> <li>• Open / Short</li> <li>• Soldered poorly</li> <li>• Internal circuit error</li> </ul>	<ul style="list-style-type: none"> <li>• Normal resistor : 5K<math>\Omega</math> / at 25°C(77°F) (Unplugged)</li> <li>• Normal voltage : 2.5Vdc / at 25°C(77°F) (plugged)</li> </ul>
46	Suction Pipe sensor	<ul style="list-style-type: none"> <li>• Open / Short</li> <li>• Soldered poorly</li> <li>• Internal circuit error</li> </ul>	<ul style="list-style-type: none"> <li>• Normal resistor : 5K<math>\Omega</math> / at 25°C(77°F) (Unplugged)</li> <li>• Normal voltage : 2.5Vdc / at 25°C(77°F) (plugged)</li> </ul>
47	D-pipe sensor (Constant)	<ul style="list-style-type: none"> <li>• Open / Short</li> <li>• Soldered poorly</li> <li>• Internal circuit error</li> </ul>	<ul style="list-style-type: none"> <li>• Normal resistor : 200K<math>\Omega</math> / at 25°C(77°F) (Unplugged)</li> <li>• Normal voltage : 4.5Vdc / at 25°C(77°F) (plugged)</li> </ul>
65	Heat sink sensor	<ul style="list-style-type: none"> <li>• Open / Short</li> <li>• Soldered poorly</li> <li>• Internal circuit error</li> </ul>	<ul style="list-style-type: none"> <li>• Normal resistor : 10K<math>\Omega</math> / at 25°C(77°F) (Unplugged)</li> <li>• Normal voltage : 2.5Vdc / at 25°C(77°F) (plugged)</li> </ul>



**Check Point**

1. Estimate the resistance of each sensor.(Unplugged)
2. Estimate the voltage of each sensor.(Plugged)
3. If the resistance of the sensor is 0 k $\Omega$  or  $\infty$ , then sensor is abnormal.  
If the voltage of the sensor is 0 V or 5Vdc, then sensor is abnormal.

## Troubleshooting CH51, CH60

Display code	Title	Cause of error	Check point & Normal condition
51	Capacity Error	<ul style="list-style-type: none"> <li>• Over Capacity Combination</li> <li>• Under Capacity Combination</li> </ul>	<ul style="list-style-type: none"> <li>• Check the indoor unit capacity.</li> <li>• Check the combination table.</li> </ul>
60	EEPROM Check sum	<ul style="list-style-type: none"> <li>• Check sum error</li> </ul>	<ul style="list-style-type: none"> <li>• Check the PCB ASM P/No.</li> <li>• Check the poor soldering.</li> </ul>

### Check Point

• CH 51

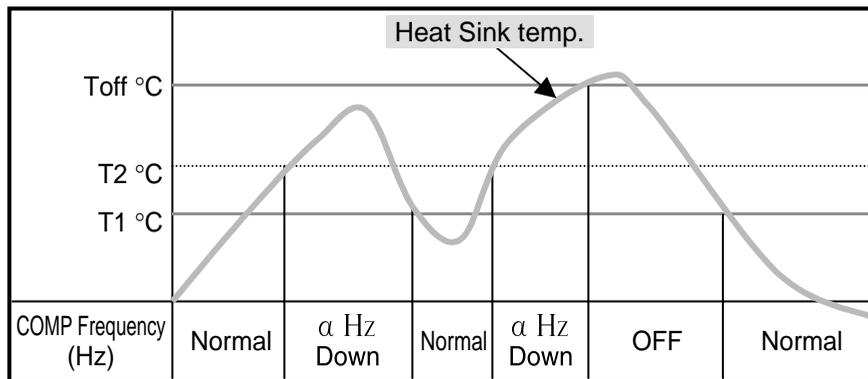
1. Check the indoor unit capacity.

• CH 60

1. Check the insertion condition of EEPROM.
2. Check the poor soldering

**Troubleshooting CH61, CH62**

Display code	Title	Cause of error	Check point & Normal condition
61	Condenser pipe sensor temp. high	<ul style="list-style-type: none"> <li>Condenser pipe sensor detected high temp.(65°C)(149°F)</li> </ul>	<ul style="list-style-type: none"> <li>Check the load condition.</li> <li>Check the sensor of Condenser pipe sensor.</li> </ul>
62	Heat sink sensor temp. high	<ul style="list-style-type: none"> <li>Heat sink sensor detected high temp.(85°C)(185°F)</li> </ul>	<ul style="list-style-type: none"> <li>Check the fan is locked.</li> <li>Check the sensor of heat sink.</li> </ul>



**Check Point**

**• CH 61**

1. Check the install condition for over load.  
(Refrigerant, Pipe length, Blocked, ...)

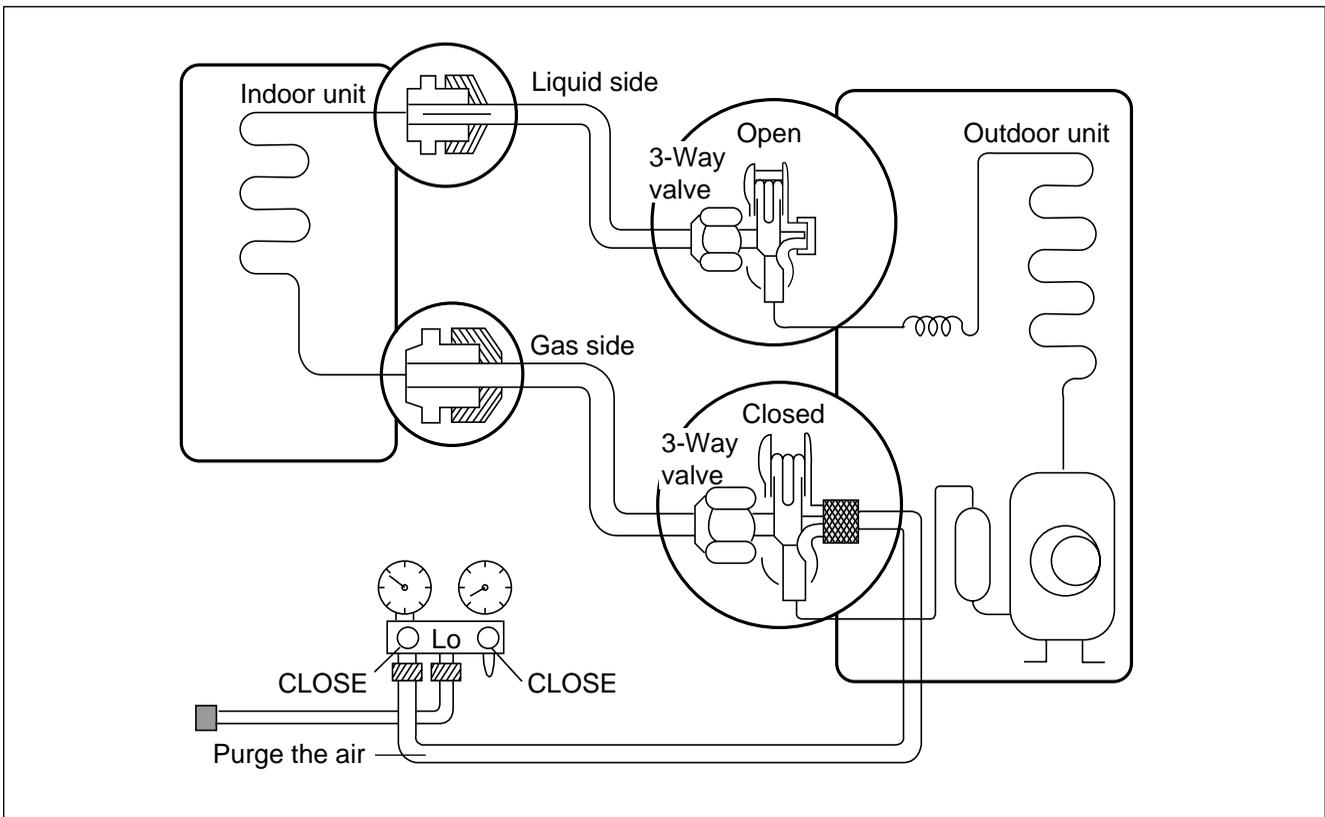
**• CH 62**

1. Check the fan is locked.
2. Check the Outdoor temp. is very high.

# (3-way) Valve

		3-way Valve (Liquid Side)		3-way Valve (Gas Side)	
Works		Shaft position	Service port	Shaft position	Service port
Shipping		Closed (with valve cap)	Closed (with cap)	Closed (with valve cap)	Closed (with cap)
1.	Air purging (Installation)	Open (counter-clockwise)	Open (push-pin or with vacuum pump)	Closed (clockwise)	Open (push-pin or with vacuum pump)
Operation		Open (with valve cap)	Closed (with cap)	Open (with valve cap)	Closed (with cap)
2.	Pumping down (Transferring)	Closed (clockwise)	Closed (with cap)	Open (counter-clockwise)	Open (connected manifold gauge)
3.	Evacuation (Servicing)	Open	Open (connected manifold gauge)	Open	Open (connected manifold gauge)
4.	Gas charging (Servicing)	Open	Closed (with cap)	Open	Open (with charging cylinder)
5.	Pressure check (Servicing)	Open	Open (connected manifold gauge)	Open	Open (connected manifold gauge)
6.	Gas releasing (Servicing)	Open	Open (connected manifold gauge)	Open	Open (connected manifold gauge)

## (1) Pumping down



### • Procedure

For pumping down, firstly short the Low Pressure s/w at the outside and then operate below procedure.

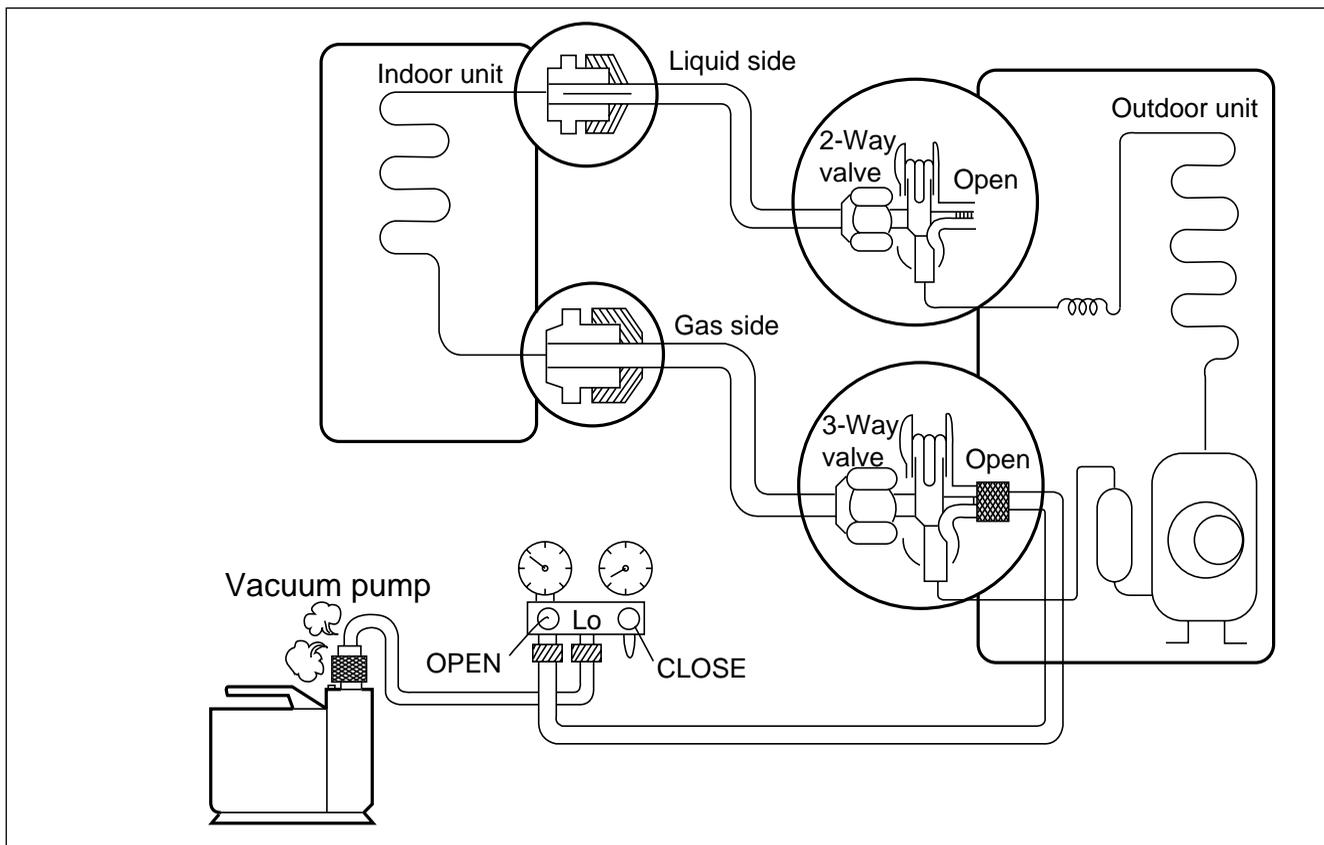
- 1. Confirm that both the gas side and liquid side valves are set to the open position.**
  - Remove the valve stem caps and confirm that the valve stems are in the raised position.
  - Be sure to use a hexagonal wrench to operate the valve stems.
- 2. Operate the unit for 10 to 15 minutes.**
- 3. Stop operation and wait for 3 minutes, then connect the manifold gauge to the service port of the gas side valve.**
  - Connect the hose of the gauge with the push pin to the service port.
- 4. Air purging of the charge hose.**
  - Open the Low-handle valve on the gauge slightly to air purge from the hose.
- 5. Set the liquid side valve to the closed position.**

- 6. Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 1kg/cm<sup>2</sup>g.**
- 7. Immediately set the gas side valve to the closed position.**
  - Do this quickly so that the gauge ends up indicating 1kg/cm<sup>2</sup>g (14 psig).
- 8. Disconnect the charge set, and mount the liquid side and gas side valve caps and the service port nut.**
  - Use torque wrench to tighten the service port nut to a torque of 1.8kg.m.(13 lb-ft).
  - Be sure to check for gas leakage.

- Be sure to short pressure S/W. otherwise Low pressure S/W detect low pressure skete and stops the compressor.

**(2) Evacuation**

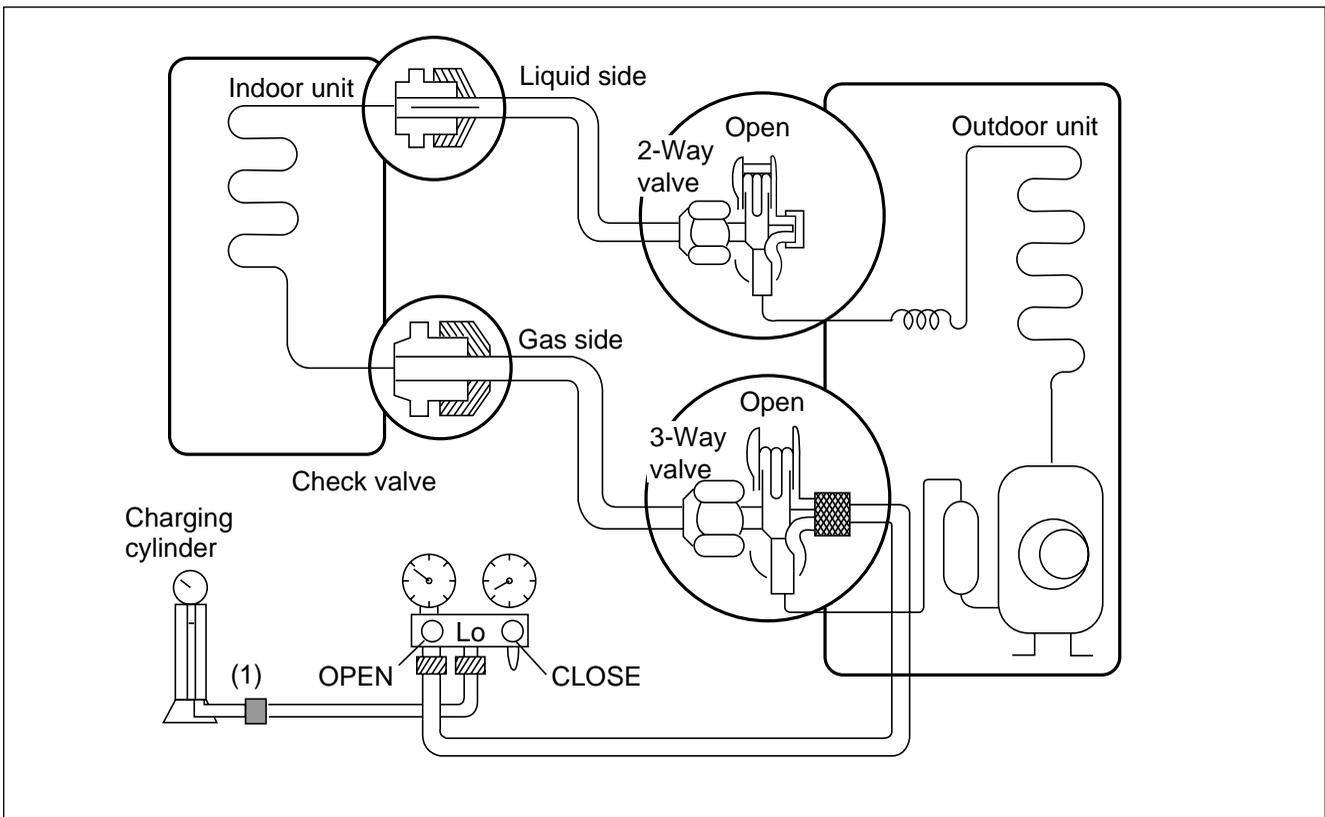
(All amount of refrigerant leaked)

**• Procedure**

1. Confirm that both the liquid side valve and gas side valve are set to the opened position.
2. Connect the vacuum pump to the center hose of the manifold gauge.
3. Connect the service port of the gas side valve to the low side of the gauge.
4. Evacuation for approximately one hour.
  - Confirm that the gauge needle has moved toward -76 cmHg (vacuum of 4 mmHg or less).
5. Close the Low handle of the gauge, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
6. Disconnect the charge hose from the vacuum pump.
  - Vacuum pump oil.
  - If the vacuum pump oil becomes dirty or depleted, replenish as needed.
7. Mount the valve caps and the service port caps.

### (3) Gas Charging

(After Evacuation)



#### • Procedure

**1. Connect the gauge to the charging cylinder.**

- Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder.
- If you are using a gas cylinder, also use a scale and reverse the cylinder so that the system can be charged with liquid.

**2. Purge the air from the charge hose.**

- Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air. (Be careful of the liquid refrigerant). The procedure is the same if using a gas cylinder.

**3. Open the low handle on the gauge and charge the system with liquid refrigerant.**

- If the system can not be charged with the specified amount of refrigerant, it can be charged with a little at a time (approximately 150g(5.3oz) each time) while operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure(pumping down-pin).

**4. Immediately disconnect the charge hose from the gas side valve's service port.**

This is different from previous procedures. Because you are charging with liquid refrigerant from the gas side, absolutely do not attempt to charge with larger amounts of liquid refrigerant while operating the air conditioner.

- Stopping partway will allow the gas to be discharged.
- If the system has been charged with liquid refrigerant while operating the air conditioner turn off the air conditioner before disconnecting the hose.

**5. Mount the valve stem nuts and the service port nut.**

- Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.(13 lb-ft).
- Be sure to check for gas leakage.



**Specifications and performance data subject to change without notice.**

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