

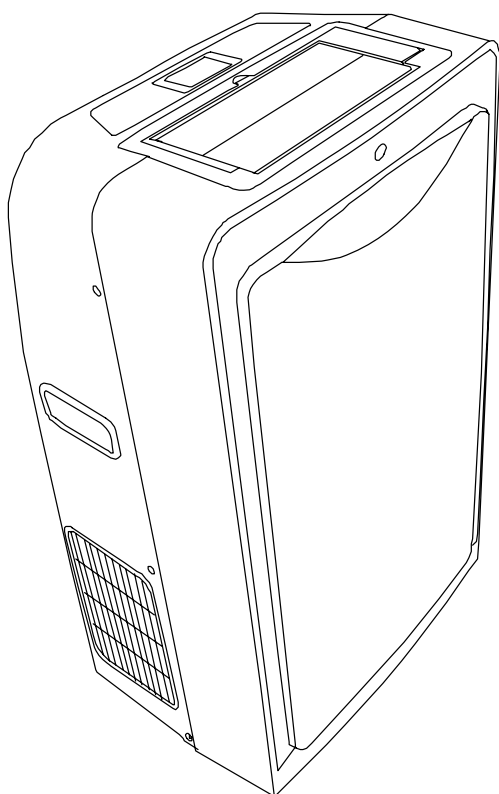
**Technical &  
Service manual***Portable air conditioner*

MPM1-10CEN1-BB6

MPM1-10EEN1-BB6

MPM1-10CRN1-BB6

MPM1-10ERN1-BB6



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## **1 Safety precaution**

### **1.1 Installation**

For electrical work, contact the dealer, seller, a qualified electrician, or an Authorized service center.

Do not disassemble or repair the product by yourself.

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

Be sure the installation area does not deteriorate with age.

Take care to ensure that power cable could not be pulled out or damaged during operation.

Do not place anything on the power cable.

Do not plug or unplug the power supply plug during operation.

Do not store or use flammable gas or combustible near the product.

When flammable gas leaks, turn off the gas and open a window for ventilation before turn the product on.

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

When the product is soaked (flooded or submerged), contact an Authorized service center.

Be caution that water could not enter the product.

Turn the main power off when cleaning or maintaining the product.

When the product is not be used for a long time, disconnect the power supply plug or turn off the breaker.

### **1.2 Caution**

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

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

Keep level even when installing the product.

Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.

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

Do not install the product where it will be exposed to sea wind (salt spray) directly.

### **1.3 Operational**

Do not expose the skin directly to cool air for long periods of time. (Do not sit in the draft).

Do not use the product for special purposes, such as preserving foods, works of art, etc. It is a consumer air conditioner, not a precision refrigerant system.

Do not block the inlet or outlet of air flow.

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

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

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

Always insert the filter securely. Clean the filter every two weeks or more often if necessary.

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

Do not drink the water drained from the product.

Use a firm stool or ladder when cleaning or maintaining the product.

Replace the all batteries in the remote control with new ones of the same type. Do not mix old and new batteries or different types of batteries.

Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.

If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote if the batteries have leaked.

## 2 Specification

Model		MPM1-10CEN1-BB6 MPM1-10CRN1-BB6	MPM1-10EEN1-BB6 MPM1-10ERN1-BB6
Nameplate marking			
Power supply	Ph-V-Hz	1φ,115V~,60Hz	1φ,115V~,60Hz
Cooling Capacity1	Btu/h	10000	10000
Cooling Power consumption1	W	1133	1133
Cooling Rated current1	A	10.0	10.0
Cooling EER2	Btu/W · h	8.9	8.9
Electrical heater	W	-----	1465
System data			
Refrigerant type	oz	R22/580	R22/580
Design pressure (Hi/Lo)	Psig	2.8	2.8
Moisture Removal	Pint/h	3.2	3.2
Water tank volume	Pint	inner water tank 4L	inner water tank 4L
Indoor air flow (Hi/Mi/Lo)	m3/h	480/410/360	480/410/360
Noise level (Hi/Mi/Lo)	dB(A)	52/50/48	52/50/48
Dimension & Weight			
Dimension (W*H*D)	mm	480×836×385	480×836×385
Packing (W*H*D)	mm	725×875×460	725×875×460
Net/Gross weight	Kg	40/52	40/52
Applicable ambient			
Operation temp	℃	17-30	17-30
Ambient temp	℃	10-35	≤35
Application area	m2	14-21	14-21
Water Pump 1 and 2			
Current	mA	40	40
Input	W	7	7
Water flow	ml/min	1500	1500
Height lift	m	0.9	0.9
Compressor			
Model		EH135X1CY-1DZDU2	EH135X1CY-1DZDU2
Type		Rotary	Rotary
Brand		GMCC	GMCC
Capacity	W	2820	2820
Input	W	925	925
Rated current(RLA)	A	8.2	8.2
Locked rotor Amp(LRA)	A	45.9	45.9
Thermal protector		B440-135-141E	B440-135-141E
Capacitor	uF	45uF/ 250V	45uF/ 250V
Refrigerant oil	cc	400	400
Fan Motor1			
Model		YDK62-4AS	YDK62-4AS
Input	W	145/126/64	145/126/64
Capacitor	uF	15uF/250V	15uF/250V
Speed(hi/mi/lo)	r/min	1125/1015/630	1125/1015/630
Fan Motor2			
Model		YDK65-4AS	YDK65-4AS
Input	W	114/106/95/83	114/106/95/83
Capacitor	uF	15uF/250V	15uF/250V
Speed(hi/mi/lo)	r/min	1190/1145/1075/980	1190/1145/1075/980
Evap.			

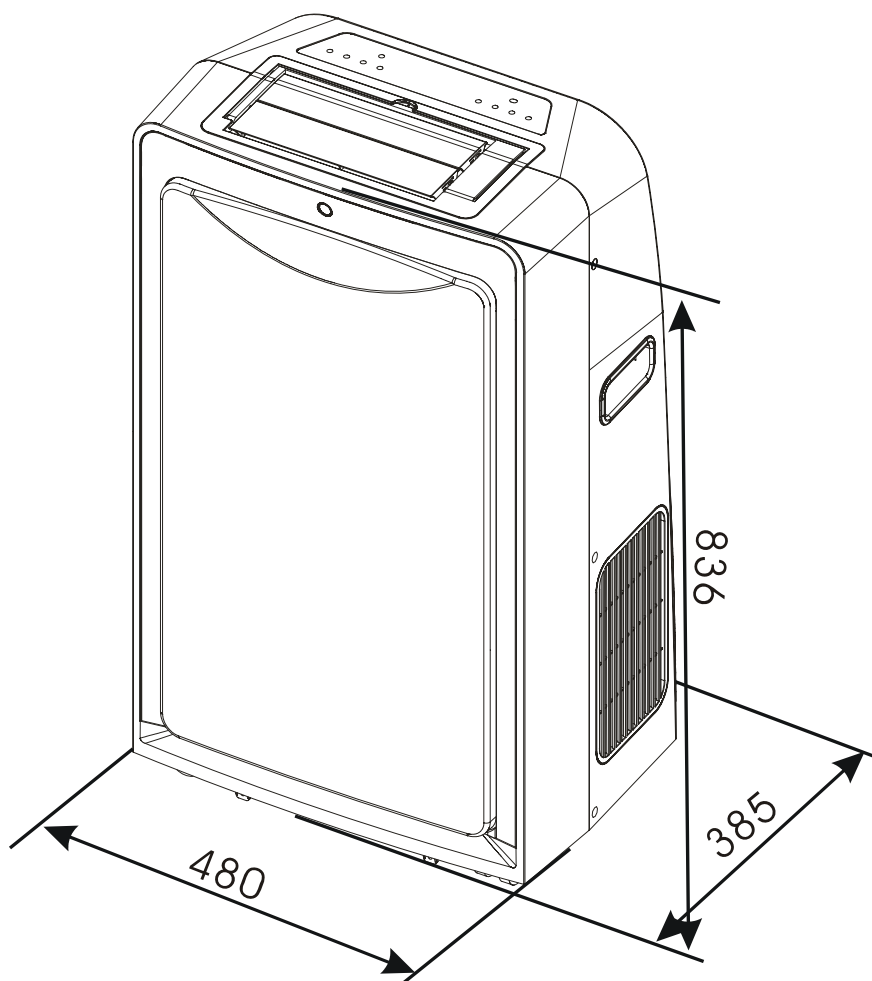
## Outer dimension

a. Number of rows		2	2
b. Tube pitch(a)x row pitch(b)	mm	21X13.37	21X13.37
c. Fin spacing	mm	1.5	1.5
d. Fin type (code)		Hydrophilic aluminum	Hydrophilic aluminum
etude outside diamante type	mm	Φ7×0.25×0.18, inner groove tube	Φ7×0.25×0.18, inner groove tube
facial length x height x width	mm	372x294x26.74	372x294x26.74
g. Number of circuits		2	2
Cond.			
a. Number of rows		2	2
b. Tube pitch(a)x row pitch(b)	mm	21X13.37	21X13.37
c. Fin spacing	mm	1.3	1.3
d. Fin type (code)		Hydrophilic aluminum	Hydrophilic aluminum
e. Tube outside dia. and type	mm	Φ7×0.25×0.18, inner groove tube	Φ7×0.25×0.18, inner groove tube
f. Coil length x height x width	mm	758x294x13.37+716x294x13.37	758x294x13.37+716x294x13.37
g. Number of circuits		2	2

1 Cooling capacity estimated using room balance at 27°C db and 19°C wb

2 Cooling EER estimated using room balance at 35°C db and 24°C wb

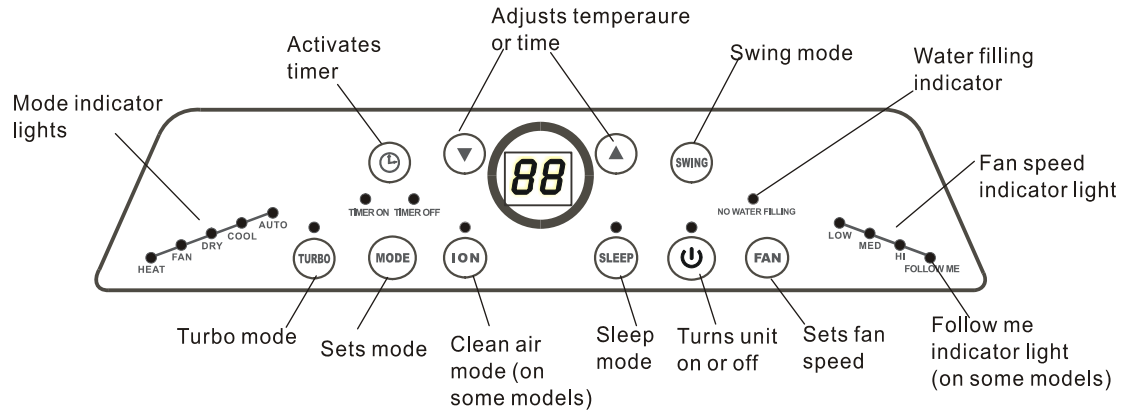
### 3 Out dimension



## 4 Display

### 4.1 LED display

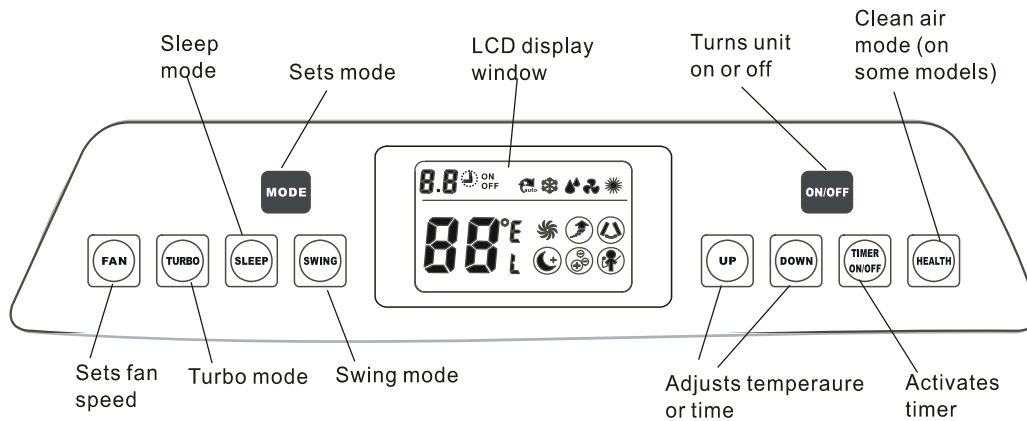
#### LED DISPLAY PANEL MODELS:



LED display window: Displays setting temperature, Auto timer and malfunction code.

### 4.2 LCD display

#### LCD DISPLAY PANEL MODELS:



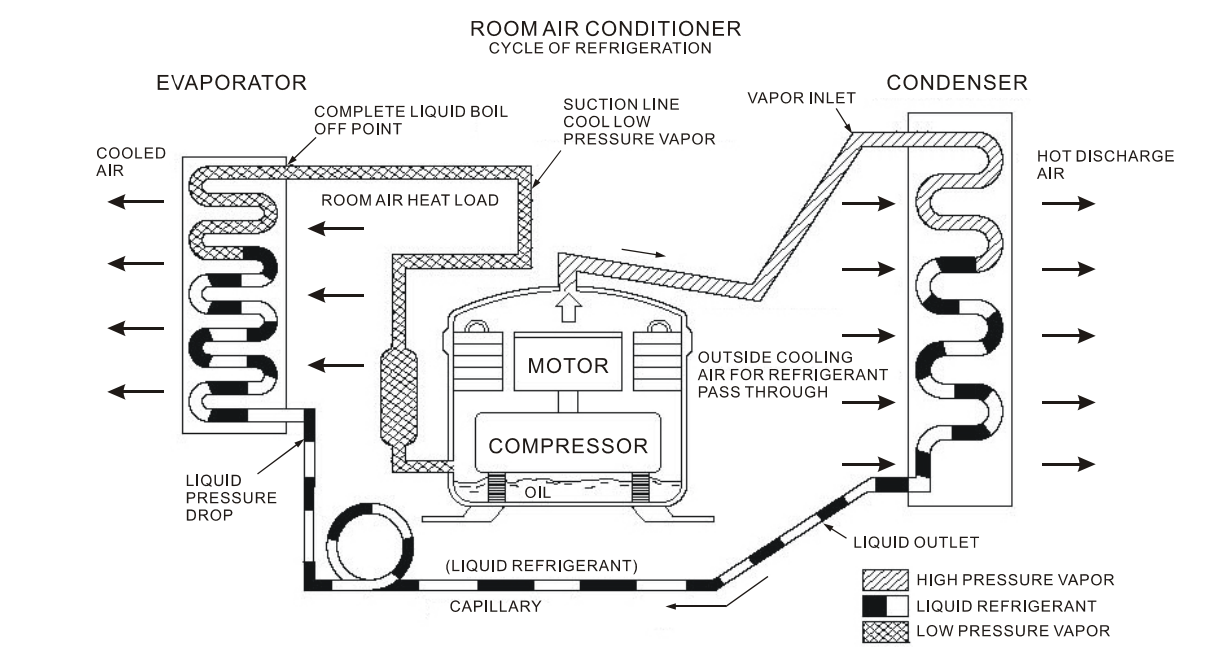
#### LCD display indicator :

- |                |                     |  |                     |
|----------------|---------------------|--|---------------------|
| <b>8.8</b> ON  | Timer on indicator  | ☼  | Fan speed indicator |
| <b>8.8</b> OFF | Timer off indicator | (Low( ☼ )---Med( ☼ )---Hi( ☼ )---Auto( No display )) |                     |
|                | Auto operation      | ☾  | Sleep operation     |
|                | Cooling operation   | ☼  | Turbo display       |
|                | Dry operation       | ☼  | Clean air display   |
|                | Fan operation       | ☼  | Auto swing display  |
|                | Heating operation   | ☼  | Follow me indicator |



## 5 Refrigerant cycle diagram

The figure below is a brief description of the important components and their function in what is called the refrigeration system

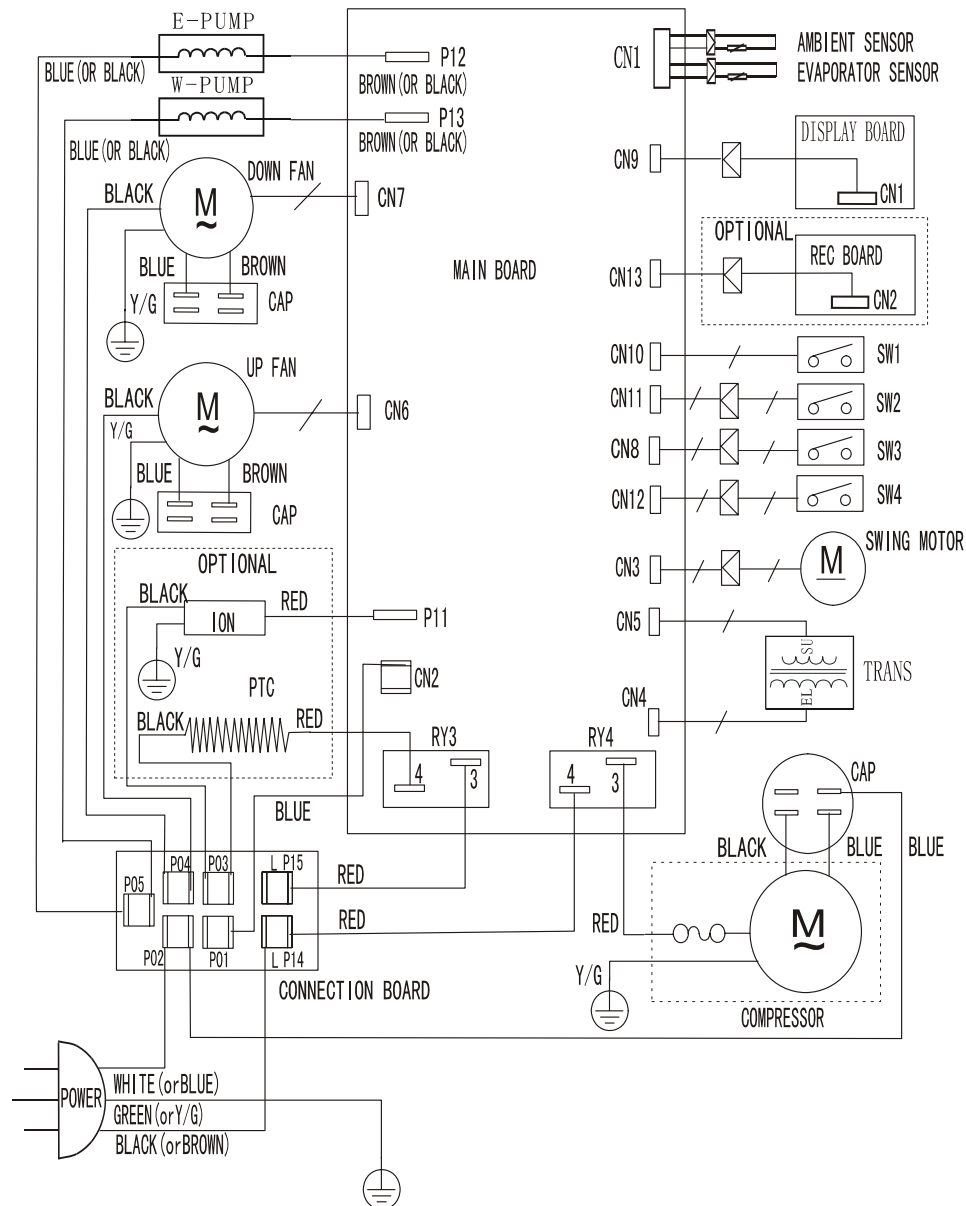


## 6 PCB drawing & wiring diagram

### 6.1 10K Model

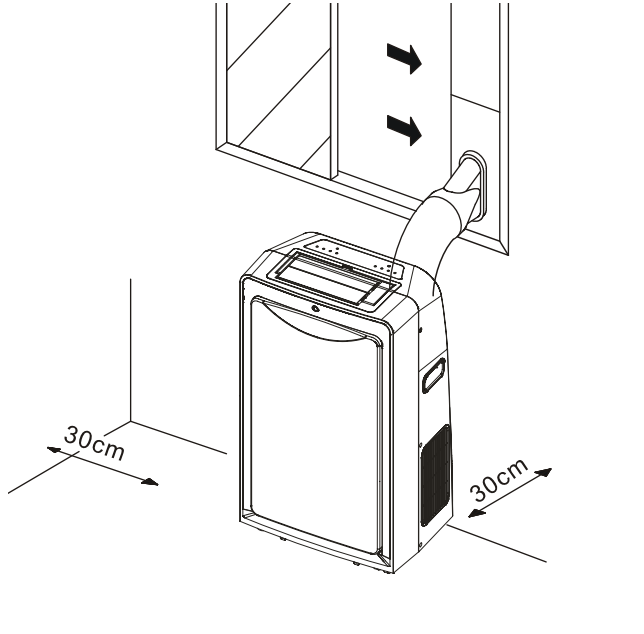
The below picture is fit for:

MPM1-10CEN1-BB6, MPM1-10CRN1-BB6, MPM1-10EEN1-BB6, MPM1-10ERN1-BB6



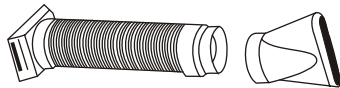
## 6.2 Position requirement for installation

Installation must be in a flat and spacious location where the air outlets will not be covered up. A minimum clearance of 30cm from a wall or other obstacles should be kept. The appliance shall not be used in the washroom. The plug shall accessible after appliance is positioned. Wiring shall be done according to National rules. Please see the picture show as below.

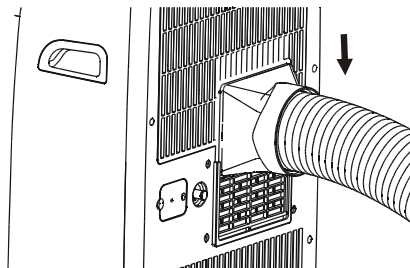


## 6.3 Preparation work

First of all, prepare the exhaust hose as the below picture show to you.



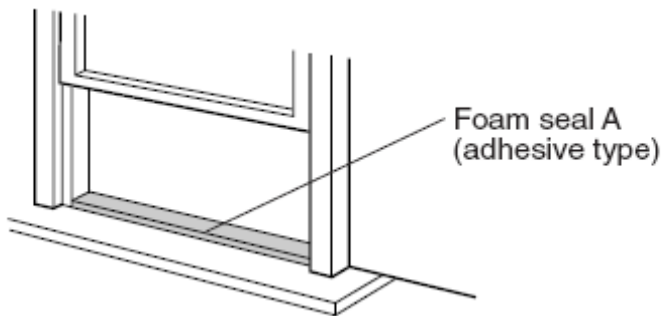
Second, connect the exhaust hose with unit, like the blow picture.



After this two steps, please make sure the exhaust hose's connect is OK.

#### 6.4 Installation in a double-hung sash windows

- 6.4.1 Cut the foam seal (adhesive type) to the proper length and attach it to the window stool.

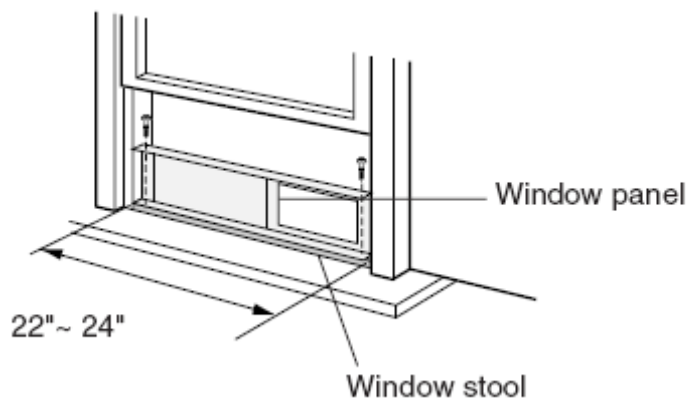


- 6.4.2 Attach the window panel to the window stool.

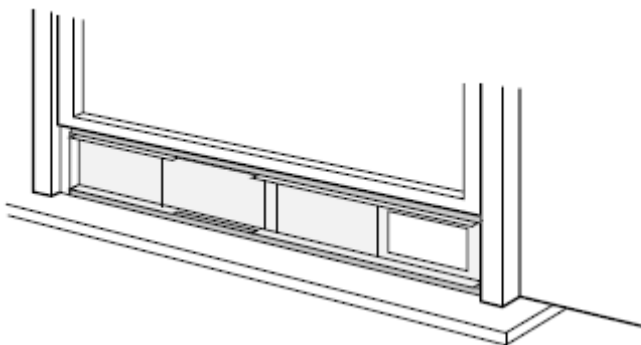
Adjust the length of the window panel according to the width of window, short the adjustable panel if the width of window is less than 26".

Open the window sash and place the window panel on the window stool.

Secure the window panel to the window stool with 2 screws.

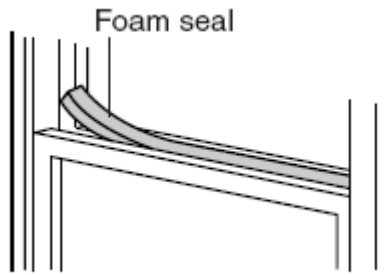


- 6.4.3 Cut the foam seal (adhesive type) to the proper length attach it on the top of window. Show as below picture.



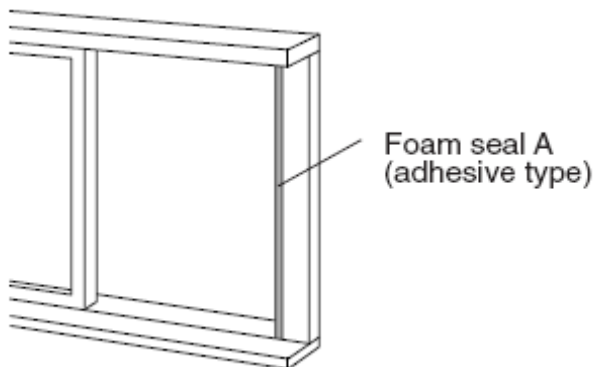
- 6.4.4 Close the window sash securely against the window.

- 6.4.5 Cut the foam seal to an appropriate length and sealing the open gap between the top window sash and outer window sash. Show as below picture.



## 6.5 Installation in a sliding sash windows

6.5.1 Cut the foam seal to a proper length and adhesive to the window frame.

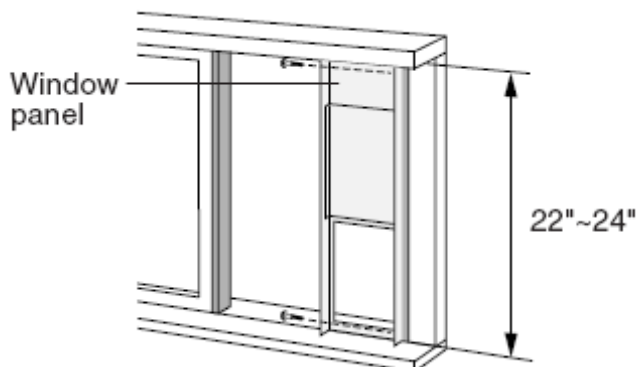


6.5.2 Attach the window panel to the window stool.

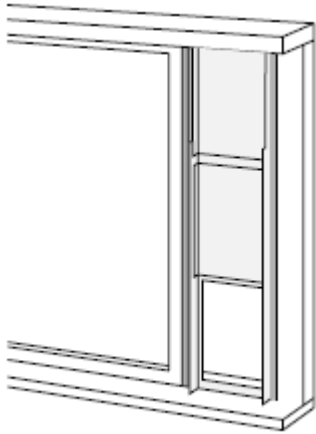
Adjust the length of the sliding window panel according to the width of window, short the adjustable panel if the width of window is less than 26".

Open the sliding sash and place the window panel on the window stool.

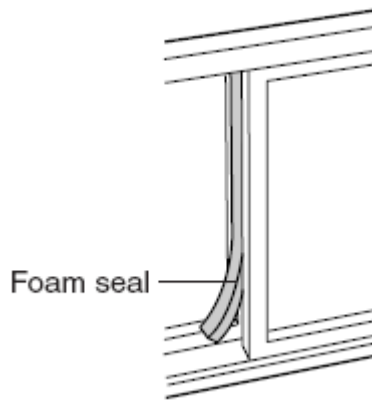
Secure the sliding window panel to the window stool with 2 screws.



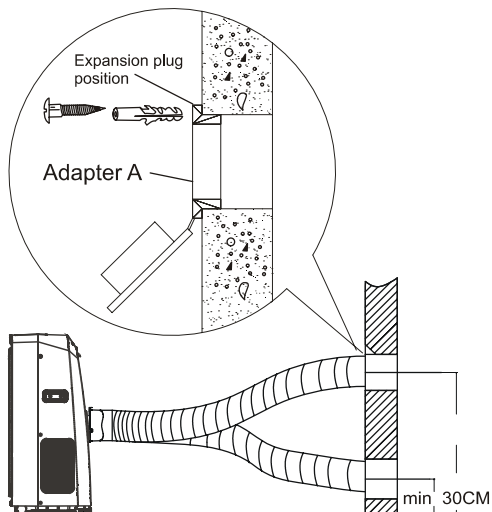
6.5.3 Cut the foam seal (adhesive type) to the proper length attach it on the top of window. Show as below picture.



- 6.5.4 Close the sliding sash securely against the window.
- 6.5.5 Cut the foam seal to an appropriate length and sealing the open gap between the top window sash and outer window sash. Show as below picture.



## 6.6 Permanent installation



- 6.6.1 Attach one end of the duct to the exhaust air outlet of the mobile air conditioner. According to the arrow direction, push it downwards, be sure to fix thoroughly.
- 6.6.2 Install the adaptor A onto the wall by using 4 expansion plugs and screws, be sure to fix thoroughly.
- 6.6.3 Attach the other end of the duct to adaptor A.

6.6.4 Cover the hole using the adaptor cap when not in use.

## 7 Feature



LED display (LCD optional)  
360° air out grille  
Flat plane design  
Sliver spray  
8 meters remote controller

Turbo cooling function  
Flexible air exhaust  
Advanced shower system  
24 hour on/off  
Cooling  
Dry  
Fan only  
No water tank design



## 8 Electronic function

### 8.1 Terms and definitions

TA: Temperature of ambient, (T1).

TC: Temperature of condenser, (T3).

TE: Temperature of evaporator, (T2).

TS: Setting temperature by remoter controller or control plane.

WL1: water level1.

WL2: water level2.

WL3: water level3.

WL4: water level4.

S1: Switch 1.

S2: Switch 2.

S3: Switch 3.

S4: Switch 4.

### 8.2 Electric part assembly condition that use

#### 8.2.1 Scope of application of voltage of the power:

UL: 97-127 VAC, 60Hz, 1 phase;

CE: 187- 264 VAC, 50Hz, 1 phase;

#### 8.2.2 Working environment: -10'C~+50'C.

#### 8.2.3 The humidity of electric part working environment: RH10%~RH95%.

#### 8.2.4 The electric storage working temperature: -20'C~+70'C.

### 8.3 PCB working environment.

#### 8.3.1 Tolerance of measure indoor side temperature: $\pm 1^{\circ}\text{C}$ , the scope of application: 50~99 Fahrenheit degree (+10~+37 Centigrade degree).

#### 8.3.2 Tolerance of measure evaporator temperature: $\pm 1^{\circ}\text{C}$ , the scope of application: 30~99 Fahrenheit degree (-1~+37 Centigrade degree).

#### 8.3.3 Tolerance of timer: 15 minutes per 24 hours.

#### 8.3.4 The signal receive distance should be more than 8 meters.

#### 8.3.5 EMC, EMI accord with CE authentication demand.

#### 8.3.6 The electric apparatus accords with CE, UL, GB4706.32-1996, GB/T7725-1996 demand safely.

## 8.4 Protection function

### 8.4.1 Time delay safety control (3 minutes).

When the compressor is stopped by the remote controller, it restarts after 3 minutes when the remote controller is turn ON.

When the setting temperature is reached during cooling operation, the compressor stop and it will not start for 3 minutes.

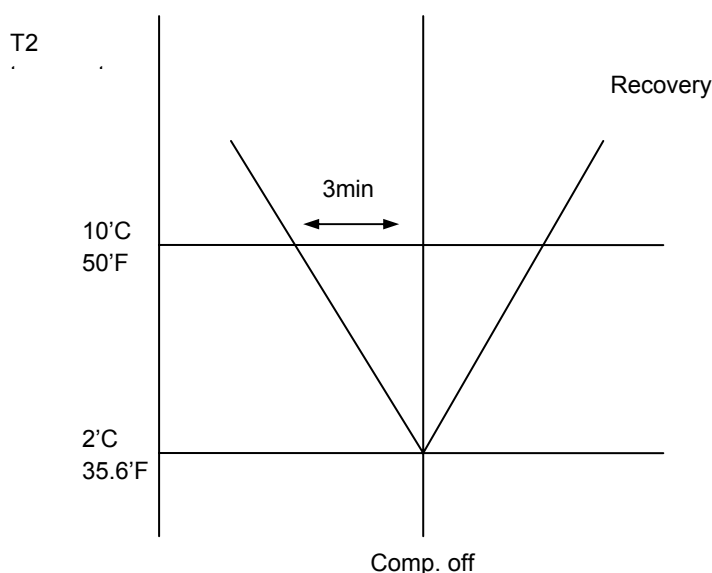
If the auto-restart is available, the compressor only needs to delay time and start the machine in 1 minute.

### 8.4.2 Anti-freezing protect control

If the temperature of the indoor evaporator falls continuously below 2°C (65°F) for 3 minutes or more, the compressor turn off to protect the indoor evaporator from freezing.

Compressor will restart again when the indoor evaporator temperature rises to 10°C.

See the below graph:



At the anti-freezing control, the pump 1 and pump 2 maintain the origin state. If the mode change to Fan or Heat mode, the time delays safety control cancel. If turn back to cooling mode, timing again.

### 8.4.3 Overheat protect

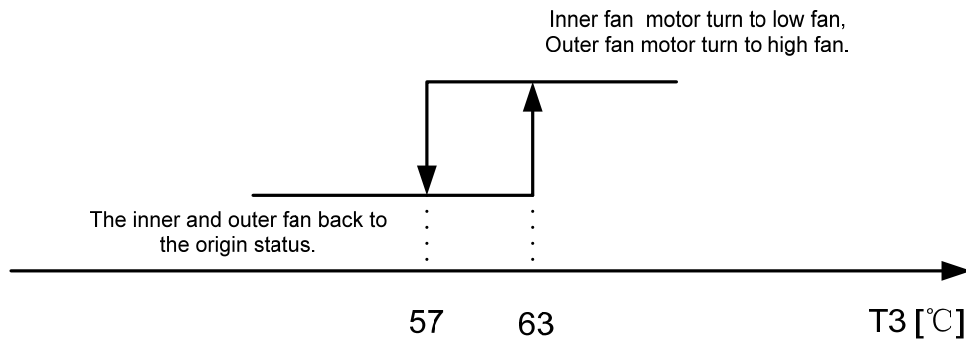
At cooling or dry mode, the unit state is ON.

#### 8.4.3.1 If the water level is being the WL1 above, and the $T3 \geq 63^\circ\text{C}$ for 3 seconds continuously.

The inner fan motor will be force to low wind and outer fan motor will be force to high wind. If the  $T3 \leq 57^\circ\text{C}$ , the unit fan motor back to the origin state that setting by customer.

See the below graph:

Note: The over-heat protect have priority to the WL protect.



#### 8.4.4 Water full protection.

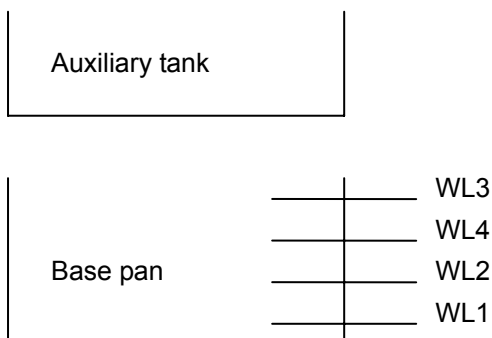
There are four switches on the base-pan water tank. S1, S2, S3, S4.

As you see the below graph.

If the water level exceed WL1, S1 activity, the Pump 1 that in charge of shower system start to work. The fan motor maintains the origin state. After 1 hour, if the water level still exceed WL1, but not exceed WL2. The outer fan motor will turn to low fan. If the water level drop below the WL1, the pump 1 will have 2 minutes delay to shut down.

If the water level continues rise and reaching WL2, S2 activity, the outer fan turn to the low fan, after 20 minutes later, the pump 2 that in charge of drain water out start to work, drain the water to the auxiliary tank. If the water level drops below WL1, the pump 2 stop and the outer fan motor maintain the low fan.

At the above 2 steps, if the unit turn from cooling mode to heating and dry mode, the pump 1 and pump 2 stop immediately.



If the water level meets to the WL4, S4 activity, the display will show the P1 protect. All of the loads will into the status of sleep, the unit will back to the origin setting mode unless the water level drops down. The TURBO button is available at P1 protection.

If the water level meets to the WL3, S3 activity, the display will show the P2 protect, at this status, the unit will shut-down. After re-power and drain out water by base-pan drainage hose, the unit could be back to the origin status.

## 8.4.5 Malfunction

LCD or LED display	Malfunction
P2	Water full protection.
P1	Drainage protection.
E3	T3 sensor malfunction.
E2	T2 sensor malfunction.
E1	T1 sensor malfunction.

**8.5 Cooling operation**

8.5.1 At cooling mode, the range of work is 17°C~30°C (62°F ~88°F).

8.5.2 The fan setting: AUTO, low, middle, high, turbo.

8.5.3 The action of compressor at cooling mode:

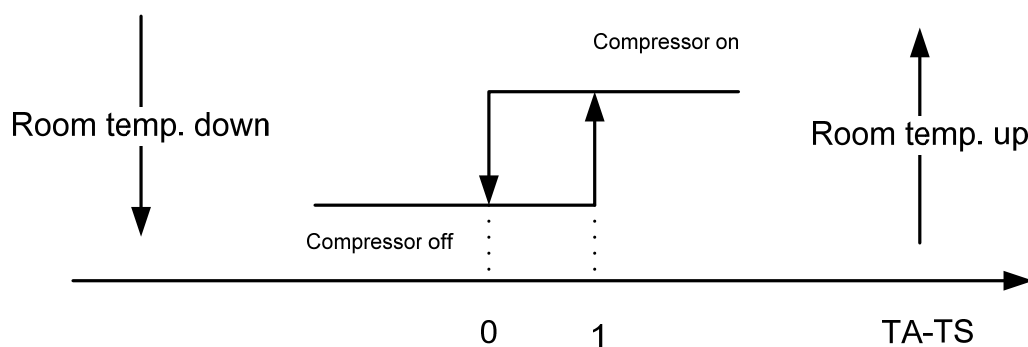
The inner fan motor will start when the unit into cooling mode, the outer fan motor work status needs according to the TA-TS and the water level.

If the water level is exceed WL1 and below WL3 or WL4, the outer fan motor start at once, otherwise, the fan motor work status according to the compressor status.

If the  $TA-TS > 1$ , the outer fan motor on and the compressor will start after 13 s.

If the  $TA < TS$ , the compressor off and the fan motor will stop after 13 s.

See the below graph.



8.5.4 The compressor status was judged by TA and TS, but the compressor will work 5 minutes at least for each start up. If the TS changed during this period, judge TS and TA at once, the 5 minutes wait will be cancel.

8.5.5 If shutdown unit at cooling mode, the inner and outer fan will stop after 15 second. If turn from cooling mode to heating mode or dry mode, the outer fan motor will stop after 15 s.

8.5.6 Auto fan at cooling mode.

The fan motor speed is decided by the TA and TS different.

If the inner fan is at low wind and  $TA-TS \geq 1^\circ\text{C}$ , the fan motor turn to middle fan and the continue running 1 minute at least.

If the inner fan is at middle wind and  $TA-TS \geq 1^\circ\text{C}$ , the fan motor turn to high fan and continue running 1 minute at lease.

If the inner fan is at middle wind and  $TA=TS$ , the fan motor maintain the middle wind and continue running 1 minute at lease.

If the inner fan is at middle wind and  $TA-TS \geq -1^{\circ}\text{C}$ , the fan motor turn to low fan and continue running 1 minute at lease.

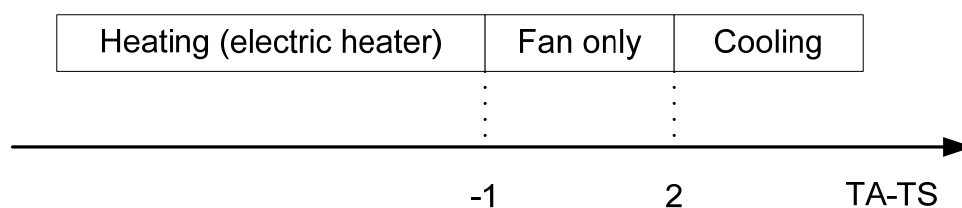
8.5.7 The ionizer and timer are available at cooling mode.

## 8.6 Auto mode

8.6.1 At auto mode, the range of work is  $17^{\circ}\text{C} \sim 30^{\circ}\text{C}$  ( $62^{\circ}\text{F} \sim 88^{\circ}\text{F}$ ).

8.6.2 At auto mode, the inner fan speed is only judge by the TA and TS, people can't set it.

8.6.3 At auto mode, the air conditioner automatically selects one of following operation modes: Cooling, Heating, Fan mode according to the temperature different between TA and TS.



## 8.7 Fan mode

8.7.1 At the fan mode, the inner fan motor always on and compressor and outer fan motor off.

8.7.2 The display shows the ambient temperature at fan mode, the temperature can not be adjusted.

8.7.3 The fan speed can by changed at fan mode; the auto fan mode function is same as the fan speed control on auto mode at  $24^{\circ}\text{C}$ .

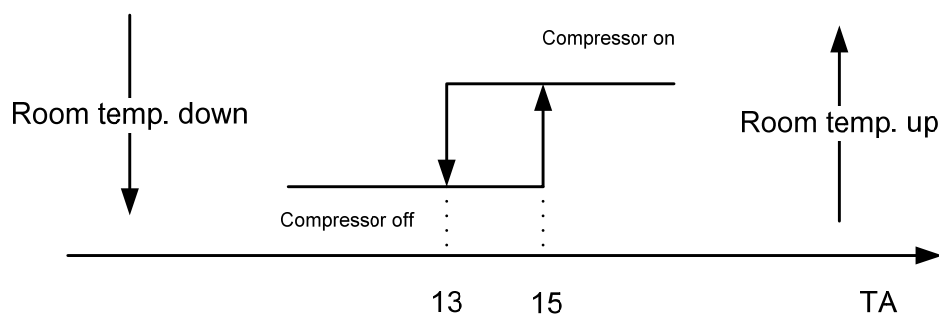
8.7.4 The ionizer and timer are available at fan mode.

8.7.5

## 8.8 Dry mode

8.8.1 At dry mode, the setting temperature can not be changed. The display shows the ambient temperature.

8.8.2 The action of compressor at Dry mode.



8.8.3 At the dry mode, the fan speed can not be adjusted. The inner fan motor is at low fan and the outer fan motor is at middle fan.

8.8.4 At the dry mode, the ionizer and timer are available.

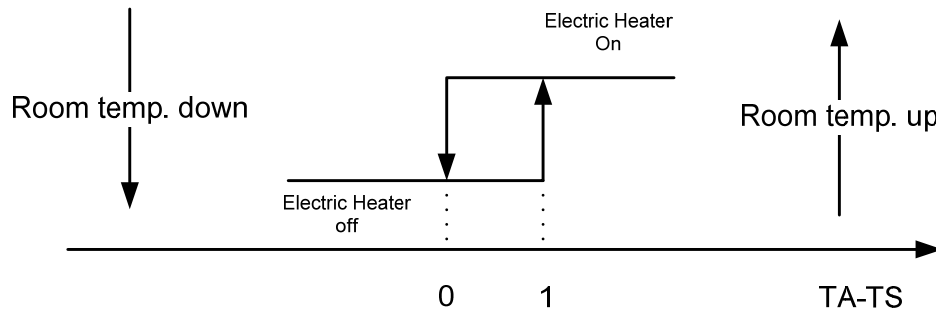
8.8.5 If shut-down the unit, the compressor will shut-down at once, the inner and outer fan will have 15s delay for shut down. If turn the unit to the fan or heating mode, the compressor shut-down at once, the outer fan will have 15s delay only.

## 8.9 Heating mode

8.9.1

8.9.2 At heating mode, the setting temperature range is 17°C~30°C. (62°F~88°F)

8.9.3 At heating mode, the action of the electric heater:



8.9.4 The inner fan speed can be select at heating mode----Auto, low, middle, and high. The outer fan is off and compressor is off at heating mode.

8.9.5 Auto wind at heating mode.

8.9.5.1 The fan motor is decided by the temperature different between TA and TS.

8.9.5.2 If the fan motor is at low speed, and  $TA - TS \leq -1^\circ\text{C}$ , the fan motor turn to middle fan and continue running 1 minute at least.

8.9.5.3 If the fan motor is at middle speed, and  $TA \leq TS - 1^\circ\text{C}$ , the fan motor turn to high fan and continue running 1 minute at least.

8.9.5.4 If the fan motor is at middle speed, and  $TA = TS$ , the fan motor maintain the middle fan and continue running 1 minute at least.

8.9.5.5 If the fan motor is at middle speed, and  $TA \geq TS + 1^\circ\text{C}$ , the fan motor turn to low fan and continue running 1 minute at least.

8.9.6 The ionizer and timer are available at heating mode.

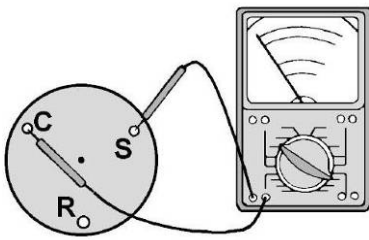
## 9 Basic test procedure

### 9.1 Defective compressor

Compressors are single phase, 115 or 230/208 volt, depending on the model unit. All compressor motors are permanent split capacitor type using only a running capacitor across the start and run terminal.

All compressors are internally spring mounted and externally mounted on rubber isolators.

#### 9.1.1 Compressor wiring test



Remove compressor terminal box cover and disconnect wires from terminals. Using an ohmmeter, check continuity across the following:

Terminal "C" and "S" - no continuity

- Open winding - replace compressor.

Terminal "C" and "R" - no continuity

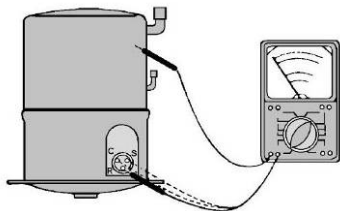
- Open winding - replace compressor.

Terminal "R" and "S" - no continuity

- Open winding - replace compressor.

#### 9.1.2 Ground test

Use an ohmmeter set on its highest scale. Touch one lead to the compressor body (clean point of contact as a good connection is a must) and the other probe in turn to each compressor terminal (see Figure 2.) If a reading is obtained, the compressor is grounded and must be replaced.



#### 9.1.3 Checking the compressor efficiency

The reason for compressor inefficiency is normally due to broken or damaged suction and/or discharge valves, reducing the ability of the compressor to pump refrigerant gas.

This condition can be checked as follows:

1. Install a piercing valve on the suction and discharge or liquid process tube.
2. Attach gauges to the high and low sides of the system.
3. Start the system and run a "cooling or heating performance test."

If test shows:

- A. Below normal high side pressure.
- B. Above normal low side pressure.
- C. Low temperature difference across coil.

The compressor valves are faulty - replace the compressor.

#### 9.1.4 Terminal overload (external)

Some compressors are equipped with an external overload which is located in the compressor terminal box adjacent to the compressor body the overload is wired in series with the common motor terminal. The overload senses both major amperage and compressor temperature. High motor temperature or amperage heats the disc causing it to open and break the circuit to the common motor terminal.

Heat generated within the compressor shell is usually due to:

- High amperage.
- Low refrigerant charge.
- Frequent recycling.
- Dirty condenser.

#### 9.1.5 Terminal overload – Test (compressor external type)

- 1. Remove overload.
- 2. Allow time for overload to reset before attempting to test.
- 3. Apply ohmmeter probes to terminals on overload wires. There should be continuity through the overload.

#### 9.1.6 Terminal overload (internal)

Some model compressors are equipped with an internal overload. The overload is embedded in the motor windings to sense the winding temperature and/or current draw. The overload is connected in series with the common motor terminal.

Should the internal temperature and/or current draw become excessive; the contacts in the overload will open, turning off the compressor? The overload will automatically reset, but may require several hours before the heat is dissipated.

#### 9.1.7 Checking the internal overload

- With no power to unit, remove the leads from the compressor terminals.
- Using an ohmmeter, test continuity between terminals C-S and C-R. If not continuous, the compressor overload is open and the compressor must be replaced.

## **9.2 Sealed refrigeration system repairs**

### 9.2.1 Equipment require

- Voltmeter
- Ammeter
- Ohmmeter
- E.P.A. Approved Refrigerant Recovery System.
- Vacuum Pump (capable of 200 microns or less vacuum.)



- Acetylene Welder
- Electronic Halogen Leak Detector (G.E. Type H-6 or equivalent.)
- Accurate refrigerant charge measuring device such as:
  - a. Balance Scales - 1/2 oz. accuracy
  - b. Charging Board - 1/2 oz. accuracy
- High Pressure Gauge - (0 - 400 lbs.)
- Low Pressure Gauge - (30 - 150 lbs.)
- Vacuum Gauge - (0 - 1000 microns)

#### 9.2.2 Equipment must be capable of:

- Recovery CFC's as low as 5%.
- Evacuation from both the high side and low side of the system simultaneously.
- Introducing refrigerant charge into high side of the system.
- Accurately weighing the refrigerant charge actually introduced into the system.
- Facilities for flowing nitrogen through refrigeration tubing during all brazing processes.

#### 9.2.3 Hermetic compressor replacement.

The following procedure applies when replacing components in the sealed refrigeration circuit or repairing refrigerant leaks. (Include Compressor, condenser, evaporator, capillary tube, refrigerant leaks, etc.)

- Recover the refrigerant from the system at the process tube located on the high side of the system by installing a line tap on the process tube. Apply gauge from process tube to EPA approved gauges from process tube to EPA approved recovery system. Recover CFCs in system to at least 5%.
- Cut the process tube below pinch off on the suction side of the compressor.
- Connect the line from the nitrogen tank to the suction process tube.
- Drift dry nitrogen through the system and unsolder the more distant connection first. (Filter drier, high side process tube, etc.)
- Replace inoperative component, and always install a new filter drier. Drift dry nitrogen through the system when making these connections.
- Pressurize system to 30 PSIG with proper refrigerant and boost refrigerant pressure to 150 PSIG with dry nitrogen.
- Leak test complete system with electric halogen leak detector, correcting any leaks found.
- Reduce the system to zero gauge pressure.
- Connect vacuum pump to high side and low side of system with deep vacuum hoses, or copper tubing. (Do not use regular hoses.)
- Evacuate system to maximum absolute holding pressure of 200 microns or less. NOTE: This process can be speeded up by use of heat lamps, or by breaking the vacuum with refrigerant or dry nitrogen at 5,000 microns. Pressure system to 5 PSIG and leave in system a minimum of 10 minutes. Recover refrigerant, and proceed with evacuation of a pressure of 200 microns or a minimum of 10%.
- Break vacuum by charging system from the high side with the correct amount of refrigerant specified. This will prevent boiling the oil out of the crankcase.

NOTE: If the entire charge will not enter the high side, allow the remainder to enter the low side in small increments while operating the unit.

- Restart unit several times after allowing pressures to stabilize. Pinch off process tubes, cut and solder the ends. Remove pinch off tool, and leak check the process tube ends.

#### 9.2.4 Special procedure in the case of compressor motor burnout.

- Recover all refrigerant and oil from the system.
- Remove compressor, capillary tube and filter drier from the system.
- Flush evaporator condenser and all connecting tubing with dry nitrogen or equivalent, to remove all contamination from system. Inspect suction and discharge line for carbon deposits. Remove and clean if necessary.
- Reassemble the system, including new drier strainer and capillary tube.
- Proceed with processing as outlined under hermetic component replacement.

#### 9.2.5 Rotary compressor special troubleshooting and service

Basically, troubleshooting and servicing rotary compressors is the same as on the reciprocating compressor with only a few exceptions.

- Because of the spinning motion of the rotary, the mounts are critical. If vibration is present, check the mounts carefully.
- The electrical terminals on the rotary are in a different order than the reciprocating compressors. The terminal markings are on the cover gasket. Use your wiring diagram to insure correct connections.

#### 9.2.6 Refrigerant charge

- The refrigerant charge is extremely critical. It must be measured charge carefully - as exact as possible to the nameplate charge.
- The correct method for charging the rotary is to introduce liquid refrigerant into the high side of the system with the unit off. Then start compressor and enter the balance of the charge, gas only, into the low side.

The introduction of liquid into the low side, without the use of a capillary tube, will cause damage to the discharge valve of the rotary compressor.

NOTE: All inoperative compressors returned to Friedrich must have all lines properly plugged with the plugs from the replacement compressor.

### 9.3 Fan motor

A single phase permanent split capacitor motor is used to drive the evaporator blower and condenser fan. A self-resetting overload is located inside the motor to protect against high temperature and high amperage conditions.

#### 9.3.1 Fan motor test

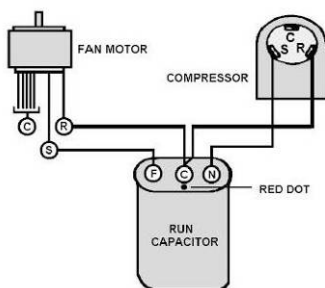
- Determine that capacitor is serviceable.
- Disconnect fan motor wires from fan speed switch or system switch.
- Apply "live" test cord probes on black wire and common terminal of capacitor. Motor should run at high speed.
- Apply "live" test cord probes on red wire and common terminal of capacitor. Motor should run at low speed.

- Apply "live" test cord probes on each of the remaining wires from the speed switch or system switch to test intermediate speeds.

## 9.4 Capacitor

A run capacitor is wired across the auxiliary and main winding of a single phase permanent split capacitor motor such as the compressor and fan motor. A single capacitor can be used for each motor or a dual rated capacitor can be used for both.

The capacitor's primary function is to reduce the line current while greatly improving the torque characteristics of a motor. The capacitor also reduces the line current to the motor by improving the power factor of the load. Run capacitor hook-up line side of the capacitor is marked with a red dot and is wired to the line side of the circuit



### 9.4.1 Capacitor test

- Remove capacitor from unit.
- Check for visual damage such as bulges, cracks, or leaks.
- For dual rated, apply an ohmmeter lead to common (C) terminal and the other probe to the compressor (HERM) terminal. A satisfactory capacitor will cause a deflection on the pointer, and then gradually move back to infinity.
- Reverse the leads of the probe and momentarily touch the capacitor terminals. The deflection of the pointer should be two times that of the first check if the capacitor is good.
- Repeat steps 3 and 4 to check fan motor capacitor.

NOTE: A shorted capacitor will indicate a low resistance and the pointer will move to the "0" end of the scale and remain there as long as the probes are connected.

An open capacitor will show no movement of the pointer when placed across the terminals of the capacitor.

## 10 Characteristic of temperature sensor

Temp. °C	Resistance KΩ	Temp. °C	Resistance KΩ	Temp. °C	Resistance KΩ
-10	62.2756	17	14.6181	44	4.3874
-9	58.7079	18	13.918	45	4.2126
-8	56.3694	19	13.2631	46	4.0459
-7	52.2438	20	12.6431	47	3.8867
-6	49.3161	21	12.0561	48	3.7348
-5	46.5725	22	11.5	49	3.5896
-4	44	23	10.9731	50	3.451
-3	41.5878	24	10.4736	51	3.3185
-2	39.8239	25	10	52	3.1918
-1	37.1988	26	9.5507	53	3.0707
0	35.2024	27	9.1245	54	2.959
1	33.3269	28	8.7198	55	2.8442
2	31.5635	29	8.3357	56	2.7382
3	29.9058	30	7.9708	57	2.6368
4	28.3459	31	7.6241	58	2.5397
5	26.8778	32	7.2946	59	2.4468
6	25.4954	33	6.9814	60	2.3577
7	24.1932	34	6.6835	61	2.2725
8	22.5662	35	6.4002	62	2.1907
9	21.8094	36	6.1306	63	2.1124
10	20.7184	37	5.8736	64	2.0373
11	19.6891	38	5.6296	65	1.9653
12	18.7177	39	5.3969	66	1.8963
13	17.8005	40	5.1752	67	1.83
14	16.9341	41	4.9639	68	1.7665
15	16.1156	42	4.7625	69	1.7055
16	15.3418	43	4.5705	70	1.6469

## 11 Trouble shooting

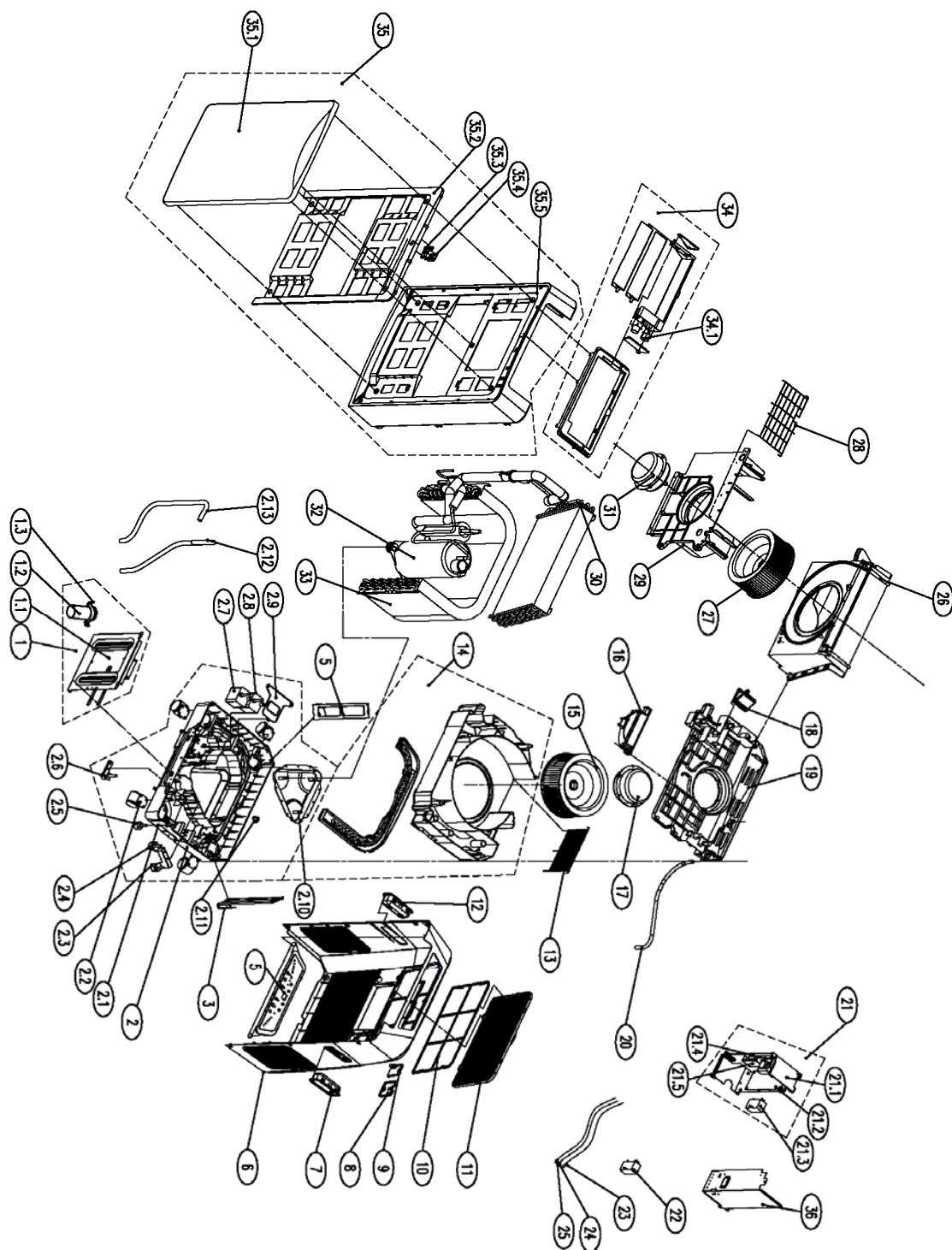
PROBLEM	POSSIBLE CAUSE	REMEDY
No power display on panel or any one of the buttons failure.	Power failure	Check the power supplier if the power supplier is supplied to the unit. Check the power cord and correct if damaged.
	Transformer (Discharge transformer before testing)	Check resistance between the two input/output lines on transformer. Replace the transformer if either of the input/output is open or the transformer is damaged.
	Display board or main PCB failure	Check the voltage on display board. Replace the display board if it is +5V else replace the main PCB.
Remote control failure.	Battery failure	Check the voltage of battery. Replace batteries if the voltage is lower than 2.3V.
Fan motor runs intermittently	Cycles on overload.	Check voltage. Call an electrician if not within limits.
		Test capacitor. Replace if not within +/-10% of manufacture's rating.
		Check bearings. Replace the motor if the blower wheel cannot rotate freely.
		Pay attention to any change from high speed to low speed. Replace the motor if the speed does not change.
Compressor stops instantly after startup.	Refrigerant	The amount of the refrigerant is too much, making the compressor load too big. Recycle and recharge the refrigerant after checking for the reason.
	Compressor	The compressor is blocked inside. Replace after checking for the reason.
Fan motor will not run.	No power	Check voltage at electrical outlet. Correct if none.
	Water alarm	Check and correct if water alarm happens.
	Power supply cord	Check voltage at the power cord terminal on Main PCB. Replace the power cord if none.
	Transformer (Discharge transformer before testing)	Check resistance between the two input/output lines on transformer. Replace the transformer if either of the input/output is open or the transformer is damaged.
	Wire disconnected or connection loose	Connect wire. Refer to wiring diagram for terminal identification. Repair or replace loose terminal.
	Main PCB failure	Select fan speed and Check the voltage on main PCB. Replace the main PCB if no voltage in anyone.
	Capacitor (Discharge capacitor before testing)	Test capacitor. Replace if not within +/-10% of manufacture's rating. Replace if shorted, open or damaged.
	Will not rotate	Fan blower hitting scroll. Realign assembly. Check fan motor bearings. Replace the motor if motor shaft do not rotate.
Fan motor noise.	Fan blower	Replace the fan blower if cracked, out of balance, or partially missing.

	Loose screws	Tighten them.
	Worn bearings	Replace the motor if knocking sounds continue when running or loose, or the motor hums or noise appears to be internal while running.
Compressor will not run while fan motor runs.	Voltage	Check voltage. Call Supply Authority if not within limits.
	Wiring	Check the wire connections, if loose, repair or replace the terminal. If wires are off, refer to wiring diagram for identification, and replace. Check wire locations. If not per wiring diagram, correct.
	Main PCB failure	Check voltage of main PCB. Replace the main PCB if open.
	Capacitor (Discharge capacitor before testing)	Check the capacitor. Replace if not within +/-10% of manufacturers rating. Replace if shorted, open, or damaged.
	Room temp sensor	Check the temperature setting if not at the coolest (in cooling mode) or the warmest (in heating mode). Set it if not.
	Compressor	Check the compressor for open circuit or ground. If open or grounded, replace the compressor.
Excessive noise.	Copper tubing	Remove the cabinet and carefully rearrange tubing not to contact cabinet, compressor, shroud and barrier.
Water full alarm	Water tank full	Check and pour if the water tank is full.
	Water depth sensor if failure	Check and replace if failure.
	Water pump failure	Check and replace if the pump if failure.
	Water depth is over load in chassis	Check and drainage the water in the chassis by open the drainage hose on the chassis.
	Water depth sensing structure	Check and replace or realign if the structure is failure.
Cooling or heating feels not good	Air filter	Clean or replace if restricted.
	Air discharge pipe	Realign and assemble if the installation of the air discharging pipe failure. Replace if damaged.
	Unit undersized	Determine if the unit is properly sized for the area to be cooled or heated.
	Condenser and Evaporator	Clean or replace if restricted.
	Water shower failure	Check the structure of water showering system and clean if blocked.
	Fan motor	Check the fan capacitor and replace if not within +/-10% of manufactures rating.
	Air flow	Clean or remove if any barrier is found to block the inlet/outlet wind flow of the unit.
	Less refrigerant	Check the tubes for reasons of leakage. Recycle the refrigerant, correct the leakage points and recharge.

	Capillary tube	Regulate the flow if capillary tube and make the evaporating temperature appropriate if the evaporator is frosted. Replace if blocked. Repair joint if leaking.
	Compressor	The inlet and outlet valve of the compressor is damaged, making the low pressure connected with the high pressure. The refrigerating system can not produce high pressure and low pressure. Replace the compressor after checking for the reason.
	Heat sources	Reduce if too many.
No cooling or heating.	No power	Check the voltage. Call an electrician if no within the limit.
	Wiring	Check the terminals. Repair and correct if loose.
	Temperature setting	Check and adjust the temperature setting.
	Mode setting	Check and adjust the mode setting.
	Compressor	Check and replace if the compressor, the over-load protector or wiring is broken.
	Electric heater failure	Check and replace if the heater is damaged.
	Over heat fuse failure	Check and replace if the fuse is damaged.
	Main PCB	Check the voltage of main PCB. Replace the main PCB when the unit failure in heating mode.
The unit starts and stops frequently.	Power supply	The input power supply voltage is too low. Call an electrician if not within limits.
	Main PCB	Check and replace the main PCB if the compressor relay on PCB is shorted or damaged.
	Room temperature	When the room temperature is too high, the compressor will protect.

## 12 Exploded view & spare-part

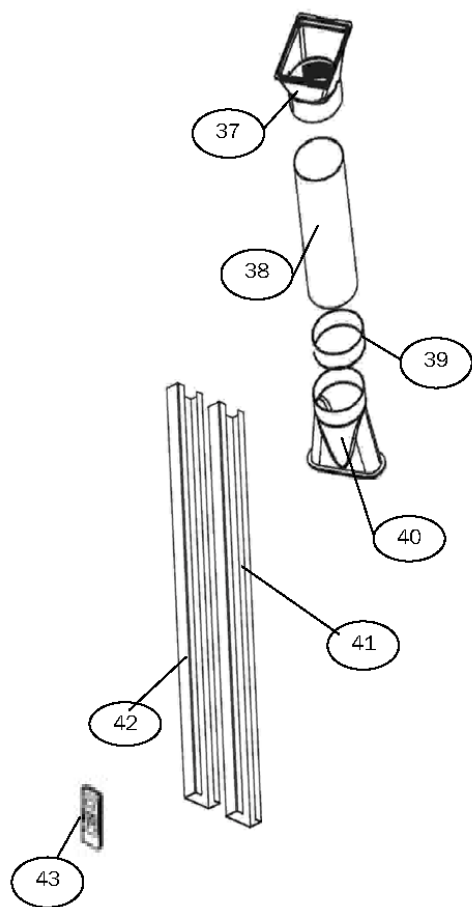
### 12.1 Exploded view of unit





## 12.2 Exploded view of accessory part

Accessory part.



### 12.3 Spare part list

Model name			UL-KC30Y1-M1(B6)(MPM1-10CR-BB6)
Compressor			EH135X1CY-1DZDU2(Toshiba)
Fan motor (inner)			YDK62-4AS
Fan motor (outer)			YDK65-4AS
NO.	Name	Quantity	Factory code
1	E. part installation plane assembly	1	2332549085
1.1	Installation plane assembly	1	2122549014
1.2	Comp. capacitor	1	2240109021
1.3	Holder of capacitor	1	2120010010
2	Chassis assembly	1	2112549128
2.1	Base-pan	1	2112549107
2.2	Universal wheel	4	2272500002
2.3	Switch 1	1	2230180152
2.4	Switch 2	1	2230180153
2.5	Switch 3	1	2230180154
2.6	Switch 4	1	2230180155
2.7	Pump 1	1	2240060019
2.8	Pump 2	1	2240060020
2.9	Pump fix plane	1	2122549022
2.10	Comp. base-pan	1	2122549017
2.11	Rubber	1	2272509015
2.12	Pump 1 drainage tube	1	2112549078
2.13	Pump 2 drainage tube	1	2112549105
3	Left support strip	1	2122549015
4	Righth support strip	1	2122549016
5	Display assembly	1	2332549078
6	Rear plane	1	2112549124
7	Righth holder	1	2112549122
8	Power cord cover	1	2112539008
9	Valve of add water	1	2112549121
10	Air filter	1	2112549119
11	Inner grille	1	2112549120
12	Left holder	1	2112549123
13	Exhaust net protect	1	2122549012
14	Exhaust scroll assembly	1	2112549112
15	Exhaust fan	1	2112509517
16	Anti-water cover	1	2272549004
17	Fan motor (outer)	1	2240042253
18	Watershed cover	1	2112549103
19	Exhaust scroll cover	1	2112549100

20	Drainage tube	1	2112549129
21	E. part aseembly	1	2332539006
21.1	E. part box	1	2112549075
21.2	Main PCB assembly	1	2132549020
21.3	Cpacitor	1	2240110105
21.4	Transformer	1	2230090122
21.5	Main connect PCB	1	2132549019
22	Cpacitor	1	2240110104
23	Room sensor	1	2230130110
24	Evap. Sensor	1	2242049075
25	Cond. Sensor	1	2244200406
26	Discharge scroll solar halo	1	2112549098
27	Exhaust fan	1	2112509517
28	Air outlet net cover	1	2122549013
29	Discharge scroll	1	2112549097
30	Evap. Assembly	1	2152539004
31	Fan motor (Inner)	1	2240042252
32	Compressor	1	2140062230
33	Cond. Assembly	1	2152539006
34	Air outlet assembly	1	2112549118
34.1	Step motor	1	2240020039
35	Front plane assembly	1	2112549126
35.1	Front plane	1	2112549131
35.2	Front plane broder	1	2112549087
35.3	Receiveor assembly	1	2132549017
35.4	Receiveor cover	1	2112549089
35.5	Front cover	1	2112549130
36	E. box cover	1	2122549020
37	Fixing tie-in for outdoor wind discharge	1	2112508107
38	Outdoor wind discharging pipe	1	2112500013
39	Mid-tie-in for outdoor wind discharge	1	2112509064
40	Air discharger	1	2112509063
41	Window sealing board I	1	2112509001
42	Window sealing board II	1	2112509002
43	Remote control	1	2335509205