

## Corona Plus varmepumper

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## SERVICEMANUAL

MSC-18HRIN1



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## 1.Features

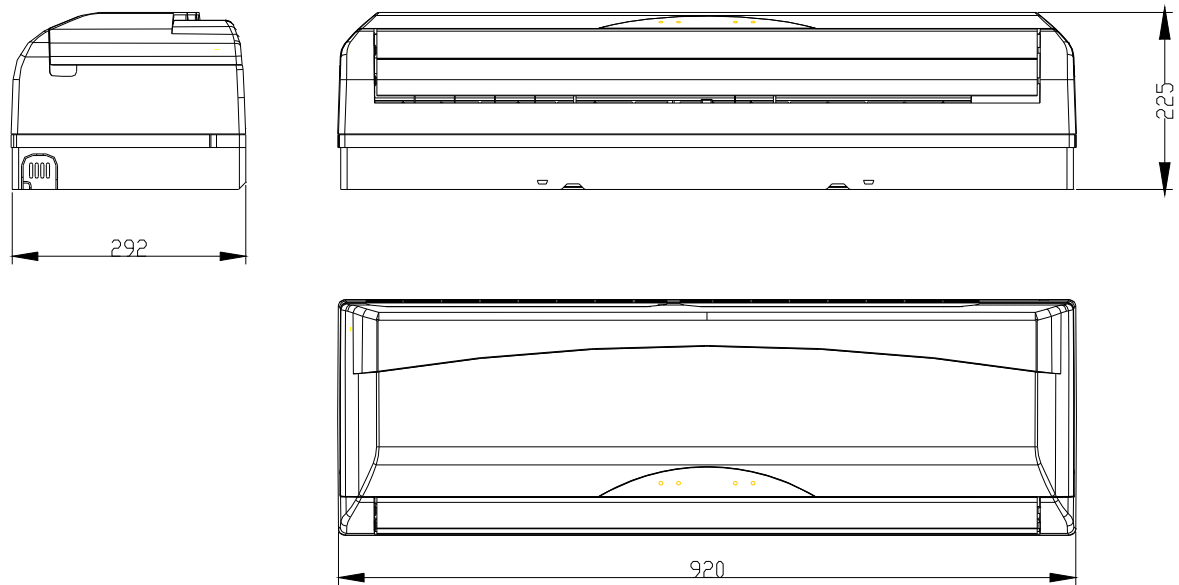
- 1.1 Powerful at cooling/heating.
- 1.2 Low voltage start-up function.
- 1.3 Anti-icing function at cooling mode.
- 1.4 Anti-cold air function at heating mode.
- 1.5 Auto-defrosting.
- 1.6 Outdoor electric current protection
- 1.7 Temperature protection of the outdoor compressor top.
- 1.8 Restart protection for the compressor.
- 1.9 Error self diagnosis function.
- 1.10 Protection against over-load or too-low current inputted.

## 2.Specification

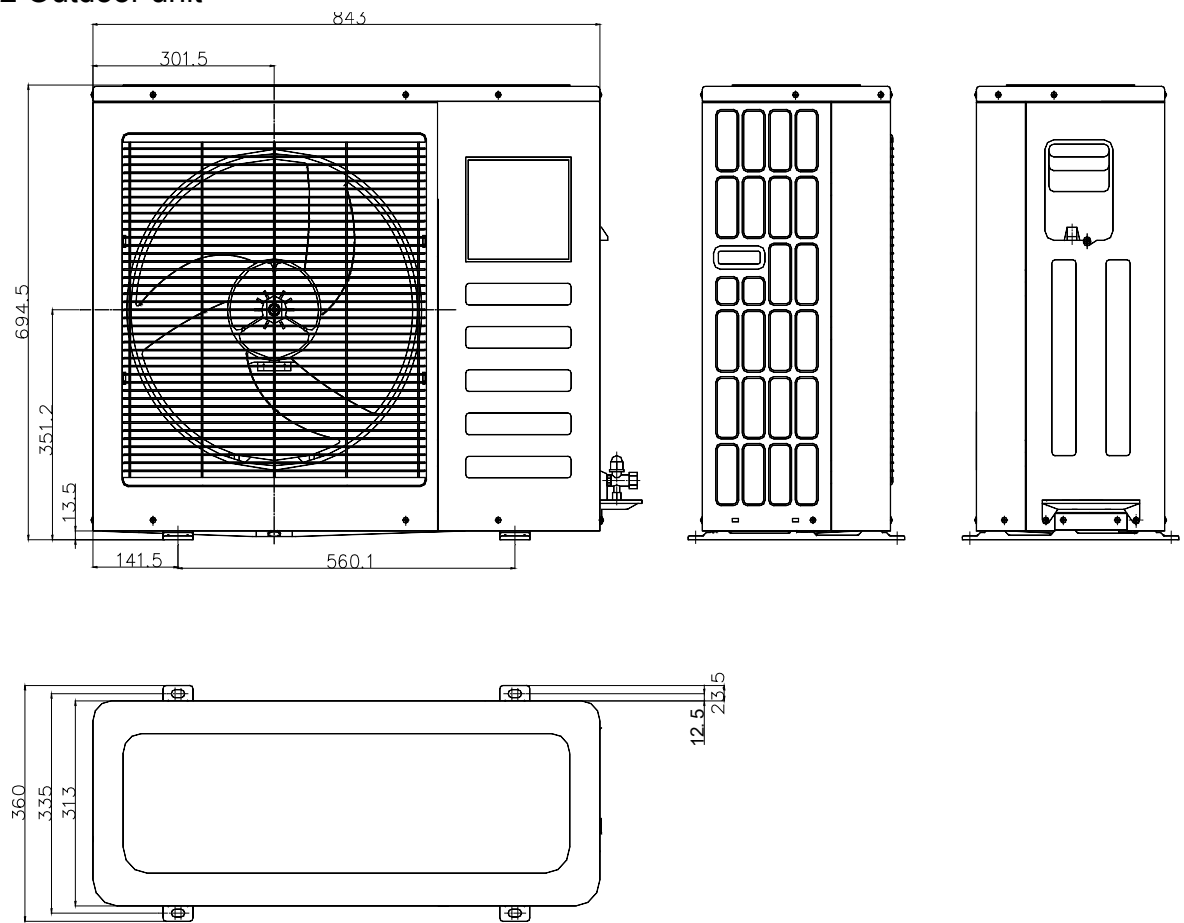
| Model                         |                              | MSC-18HRIN1 |                    |
|-------------------------------|------------------------------|-------------|--------------------|
| Power supply                  |                              | Ph-V-Hz     | 1, 220-240V~,50Hz  |
| Cooling                       | Capacity                     | Btu/h       | 18000              |
|                               | Input                        | W           | 1720               |
|                               | Rated current                | A           | 7.7                |
|                               | EER                          | Btu/w.h     | 10.5               |
| Heating                       | Capacity                     | Btu/h       | 20000              |
|                               | Input                        | W           | 1850               |
|                               | Rated current                | A           | 8.2                |
|                               | COP                          | Btu/w.h     | 10.8               |
| Moisture Removal              |                              | L/h         | 1.7                |
| Max. input consumption        |                              | W           | 3800               |
| Max. current                  |                              | A           | 18                 |
| Starting current              |                              | A           | 57                 |
| Compressor                    | Model                        |             | BA160X2CS-20KU     |
|                               | Type                         |             | Rotary             |
|                               | Brand                        |             | TOSHIBA            |
|                               | Capacity                     | Btu/h       | 16140              |
|                               | Input                        | W           | 1630               |
|                               | Rated current(RLA)           | A           | 10.95              |
|                               | Locked rotor Amp(LRA)        | A           | 55                 |
|                               | Thermal protector            |             | CS-74              |
|                               | Capacitor                    | uF          | No                 |
|                               | Refrigerant oil              | ml          | 750                |
| Indoor fan motor              | Model                        |             | RPG28D             |
|                               | Brand                        |             | Welling            |
|                               | Input                        | W           | 55                 |
|                               | Capacitor                    | uF          | 1.5                |
|                               | Speed(hi/mi/lo)              | r/min       | 1140/1060/980      |
| Indoor air flow (Hi/Mi/Lo)    |                              | m3/h        | 800/700/600        |
| Indoor noise level (Hi/Mi/Lo) |                              | dB(A)       | 44/40/37           |
| Indoor unit                   | Dimension (W*H*D)            | mm          | 920×292×220        |
|                               | Packing (W*H*D)              | mm          | 1015×368×295       |
|                               | Net/Gross weight             | Kg          | 13/15              |
| Outdoor fan motor             | Model                        |             | YDK53-6C           |
|                               | Brand                        |             | Welling            |
|                               | Input                        | W           | 125                |
|                               | Capacitor                    | uF          | 3                  |
|                               | Speed                        | r/min       | 800                |
| Outdoor air flow              |                              | m3/h        | 2500               |
| Outdoor noise level           |                              | dB(A)       | 58                 |
| Outdoor unit                  | Dimension(W*H*D)             | mm          | 845X695X335        |
|                               | Packing (W*H*D)              | mm          | 970X770X395        |
|                               | Net/Gross weight             | Kg          | 53/67              |
| Refrigerant type R410a        |                              | g           | 1770               |
| Design pressure               |                              | MPa         | 4.2                |
| Refrigerant piping            | Liquid side/ Gas side        | mm(inch)    | Φ 6.35/ Φ 12.7     |
|                               | Max. refrigerant pipe length | m           | 10                 |
|                               | Max. difference in level     | m           | 5                  |
| Connection wiring             |                              |             | No                 |
| Plug type                     |                              |             | NO PLUG            |
| Thermostat type               |                              |             | Electronic control |
| Operation temp                |                              | ℃           | 17-30              |
| Ambient temp                  |                              | ℃           | -15~50             |
| Application area              |                              | m2          | 28~45              |

★1 The noise date is base on hemi-anechoic chamber, during actual operation, these values are normally somewhat different as a result of ambient condition.

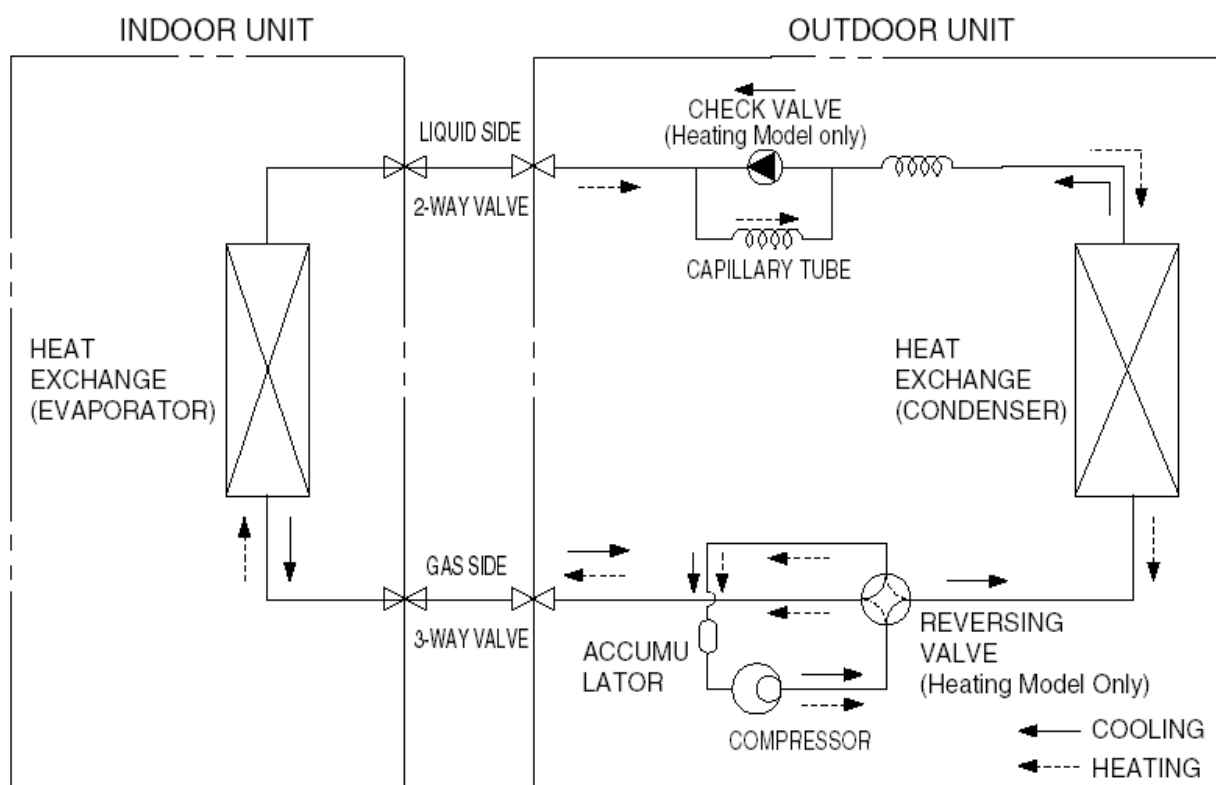
3.Dimensions  
3.1 Indoor unit



3.2 Outdoor unit



#### 4.Refrigeration cycle diagram



## 5. Pressure table

Note:

\*The pressure data is from 3 way valve, the pressure data are pressure above atmosphere.

\*D: Dry bulb temp.

\*W: Wet bulb temp.

MSC-18HRIN1

| Cooling mode      |                                    | Outdoor temperature (Dry bulb temp) |      |      |      |      |      |
|-------------------|------------------------------------|-------------------------------------|------|------|------|------|------|
| Indoor Conditions | Pressure                           | 25°C                                | 30°C | 35°C | 40°C | 45°C | 50°C |
| 21°C D<br>15°C W  | Pressure<br>( kg/cm <sup>2</sup> ) | 6.6                                 | 6.8  | 7.0  | 7.3  | 7.6  | 8.0  |
| 24°C D<br>17°C W  | Pressure<br>( kg/cm <sup>2</sup> ) | 6.8                                 | 7.0  | 7.1  | 7.7  | 8.3  | 8.7  |
| 27°C D<br>19°C W  | Pressure<br>( kg/cm <sup>2</sup> ) | 7.1                                 | 7.2  | 7.3  | 7.8  | 8.6  | 9.3  |
| 32°C D<br>23°C W  | Pressure<br>( kg/cm <sup>2</sup> ) | 7.1                                 | 7.4  | 7.6  | 8.4  | 9.4  | 9.8  |

| Heating mode      |                                    | OUTDOOR CONDITIONS |                |                 |                  |                  |                   |
|-------------------|------------------------------------|--------------------|----------------|-----------------|------------------|------------------|-------------------|
| Indoor Conditions | Pressure                           | 12°C D<br>11°C W   | 7°C D<br>6°C W | 0°C D<br>-1°C W | -4°C D<br>-6°C W | -7°C D<br>-9°C W | -15°C D<br>-x°C W |
| 15°C              | Pressure<br>( kg/cm <sup>2</sup> ) | 32.5               | 34.5           | 34.0            | 31.0             | 28.5             | 27.5              |
| 18°C              | Pressure<br>( kg/cm <sup>2</sup> ) | 35.0               | 34.5           | 35.5            | 32.5             | 29.5             | 28.0              |
| 20°C              | Pressure<br>( kg/cm <sup>2</sup> ) | 36.5               | 35.5           | 36.0            | 33.5             | 30.0             | 28.5              |
| 22°C              | Pressure                           | 36.5               | 37.0           | 36.5            | 35.0             | 32.5             | 29.5              |

## 6. Capacity table

### MSC-18HRIN1

| COOLING           |                       | OUTDOOR TEMPERATURE DRY |       |       |       |       |       |       |
|-------------------|-----------------------|-------------------------|-------|-------|-------|-------|-------|-------|
| Indoor Conditions |                       | 21°C                    | 25°C  | 30°C  | 35°C  | 40°C  | 45°C  | 50°C  |
| 21°C D<br>15°C W  | Total capacity kW     | 3.513                   | 3.903 | 4.550 | 4.849 | 4.177 | 3.251 | 2.333 |
|                   | Sensitive capacity kW | 2.635                   | 2.927 | 3.413 | 3.738 | 3.133 | 2.438 | 1.749 |
|                   | Input kW.             | 0.696                   | 1.050 | 1.607 | 2.163 | 1.976 | 1.810 | 1.654 |
| 24°C D<br>17°C W  | Total capacity kW     | 4.071                   | 4.430 | 4.938 | 5.268 | 4.508 | 3.625 | 2.667 |
|                   | Sensitive capacity kW | 3.052                   | 3.322 | 3.703 | 4.051 | 3.381 | 2.719 | 2.000 |
|                   | Input kW.             | 0.731                   | 1.183 | 1.621 | 2.106 | 2.012 | 1.851 | 1.680 |
| 27°C D<br>19°C W  | Total capacity kW     | 4.362                   | 4.921 | 5.205 | 5.287 | 5.024 | 4.213 | 3.271 |
|                   | Sensitive capacity kW | 3.287                   | 3.690 | 3.958 | 4.110 | 3.768 | 3.160 | 2.461 |
|                   | Input kW.             | 0.721                   | 1.196 | 1.647 | 1.700 | 2.077 | 1.902 | 1.700 |
| 32°C D<br>23°C W  | Total capacity kW     | 4.931                   | 5.409 | 6.092 | 6.319 | 5.613 | 4.782 | 3.500 |
|                   | Sensitive capacity kW | 3.698                   | 4.056 | 4.569 | 4.839 | 4.207 | 3.586 | 2.625 |
|                   | Input kW.             | 0.704                   | 1.206 | 1.755 | 2.213 | 2.118 | 1.962 | 1.720 |

| HEATING           |             |                  | OUTDOOR CONDITIONS |                |                |                 |                  |                  |                    |
|-------------------|-------------|------------------|--------------------|----------------|----------------|-----------------|------------------|------------------|--------------------|
| Indoor Conditions |             | 24°C D<br>18°C W | 12°C D<br>11°C W   | 7°C D<br>6°C W | 4°C D<br>3°C W | 0°C D<br>-1°C W | -5°C D<br>-6°C W | -7°C D<br>-8°C W | -15°C D<br>-16°C W |
| 15°C              | Capacity kW | 7.355            | 7.108              | 6.663          | 6.208          | 5.265           | 4.621            | 4.428            | 3.482              |
|                   | Input kW.   | 1.691            | 1.883              | 1.850          | 2.271          | 2.406           | 2.283            | 2.135            | 2.026              |
| 18°C              | Capacity kW | 7.310            | 7.021              | 6.582          | 6.133          | 5.255           | 4.689            | 4.507            | 3.638              |
|                   | Input kW.   | 1.780            | 1.947              | 1.875          | 2.571          | 2.730           | 2.581            | 2.378            | 2.180              |
| 20°C              | Capacity kW | 7.280            | 6.897              | 5.987          | 5.802          | 5.394           | 4.740            | 4.563            | 3.744              |
|                   | Input kW.   | 1.860            | 2.073              | 1.898          | 2.650          | 3.082           | 2.810            | 2.550            | 2.313              |
| 22°C              | Capacity kW | 7.241            | 6.821              | 5.947          | 5.750          | 5.400           | 4.768            | 4.592            | 3.738              |
|                   | Input kW.   | 1.993            | 2.231              | 2.173          | 2.700          | 2.980           | 2.693            | 2.487            | 2.308              |
| 27°C              | Capacity kW | 7.103            | 6.667              | 5.969          | 5.883          | 5.418           | 4.807            | 4.671            | 3.714              |
|                   | Input kW.   | 2.106            | 2.312              | 2.422          | 2.691          | 2.892           | 2.611            | 2.458            | 2.306              |



## 7. Operation Limits

### 7.1 Cooling mode

Indoor temperature: 17℃～32℃

Outdoor temperature: 0℃～50℃

### 2.2 Heating mode

Indoor temperature: 17℃～27℃

Outdoor temperature: -15℃～34℃

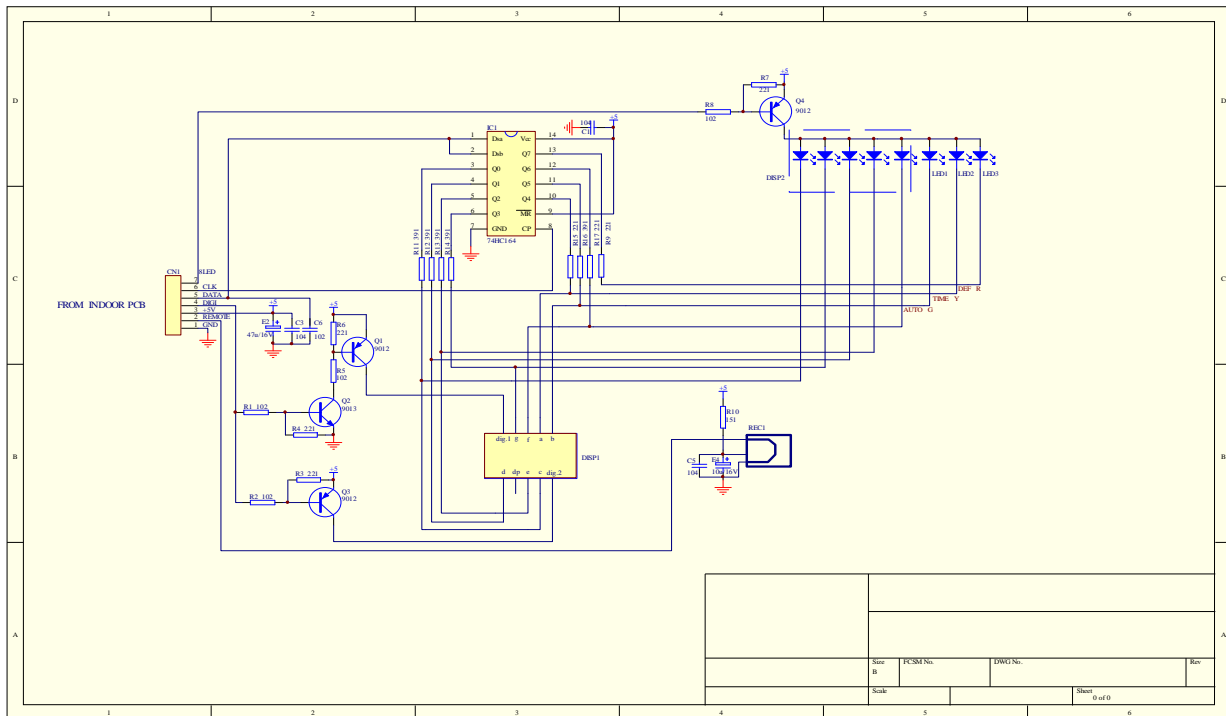
### 2.3 Dry mode

Indoor temperature: 10℃～32℃

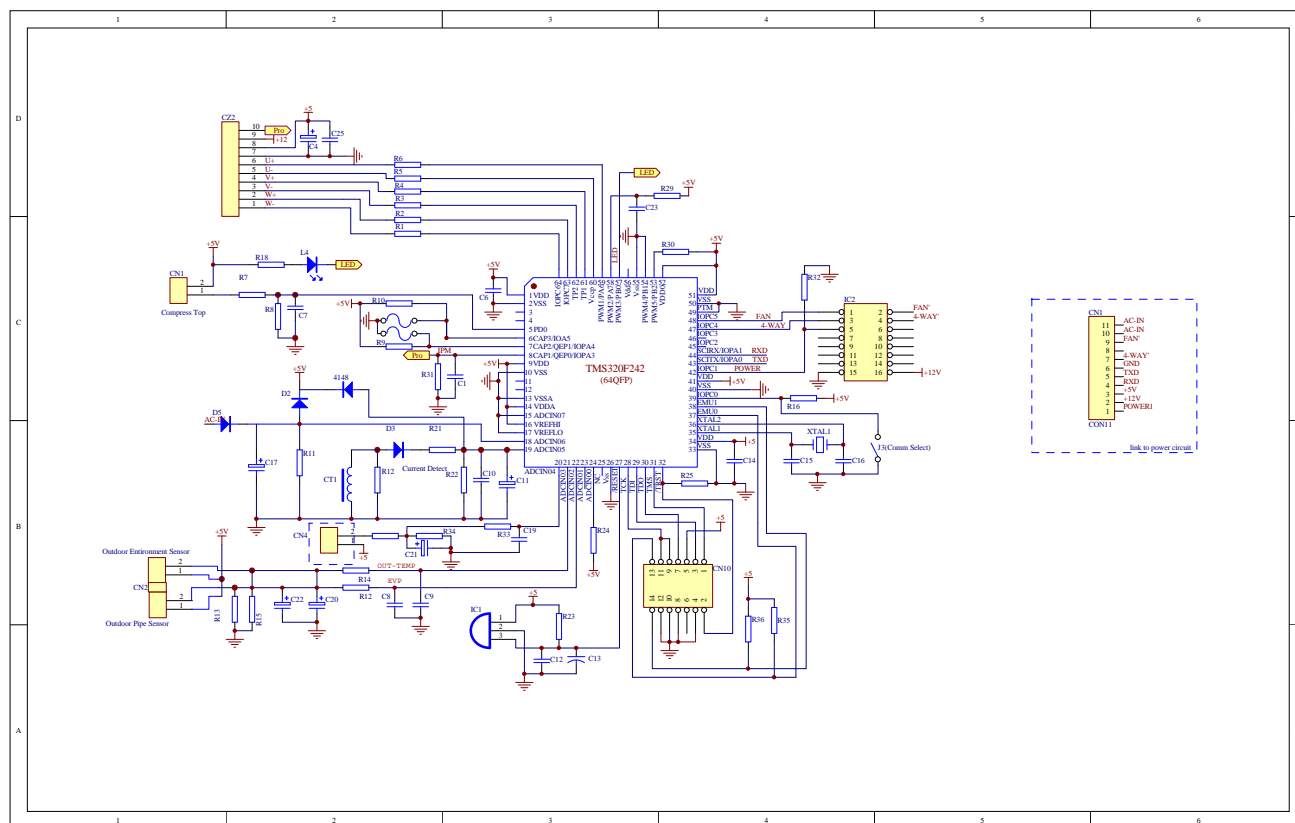
Outdoor temperature: 0℃～50℃

## 8 PCB diagram

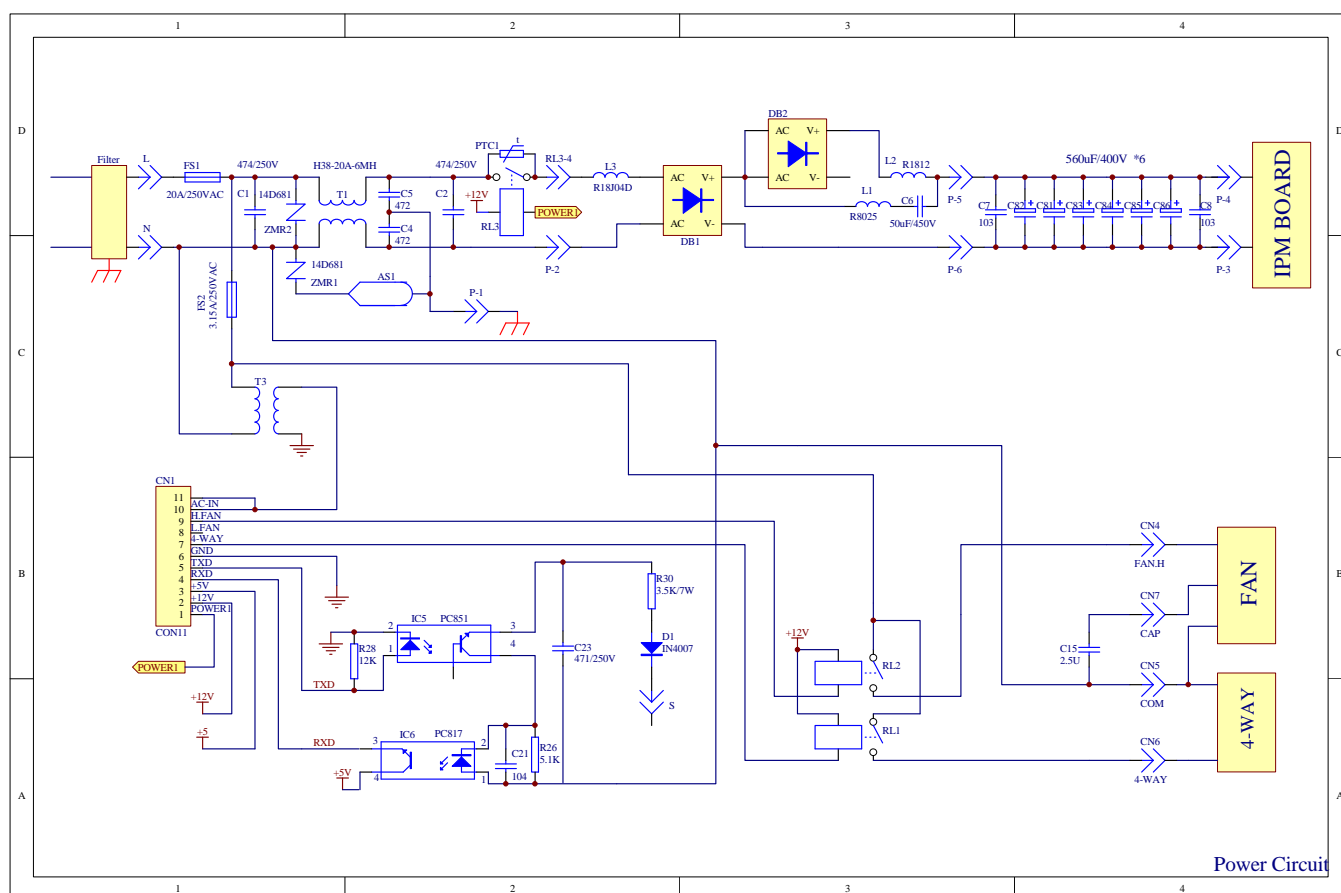
### 8.1 Display board



### 8.3 Outdoor main PCB

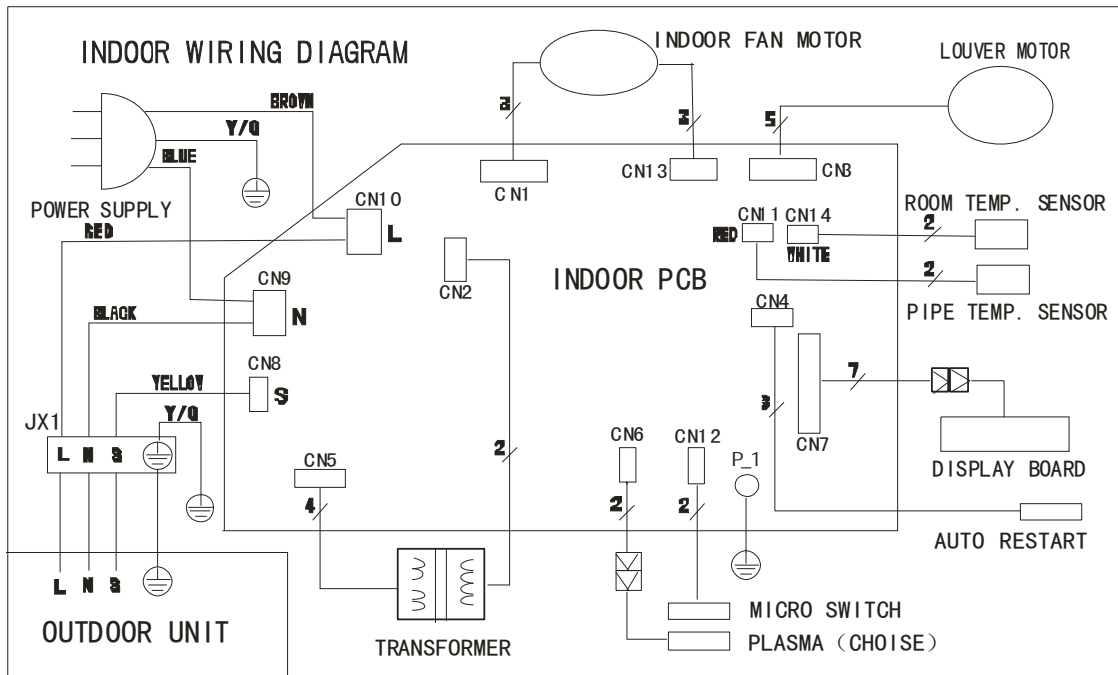


### 8.4 Outdoor power PCB

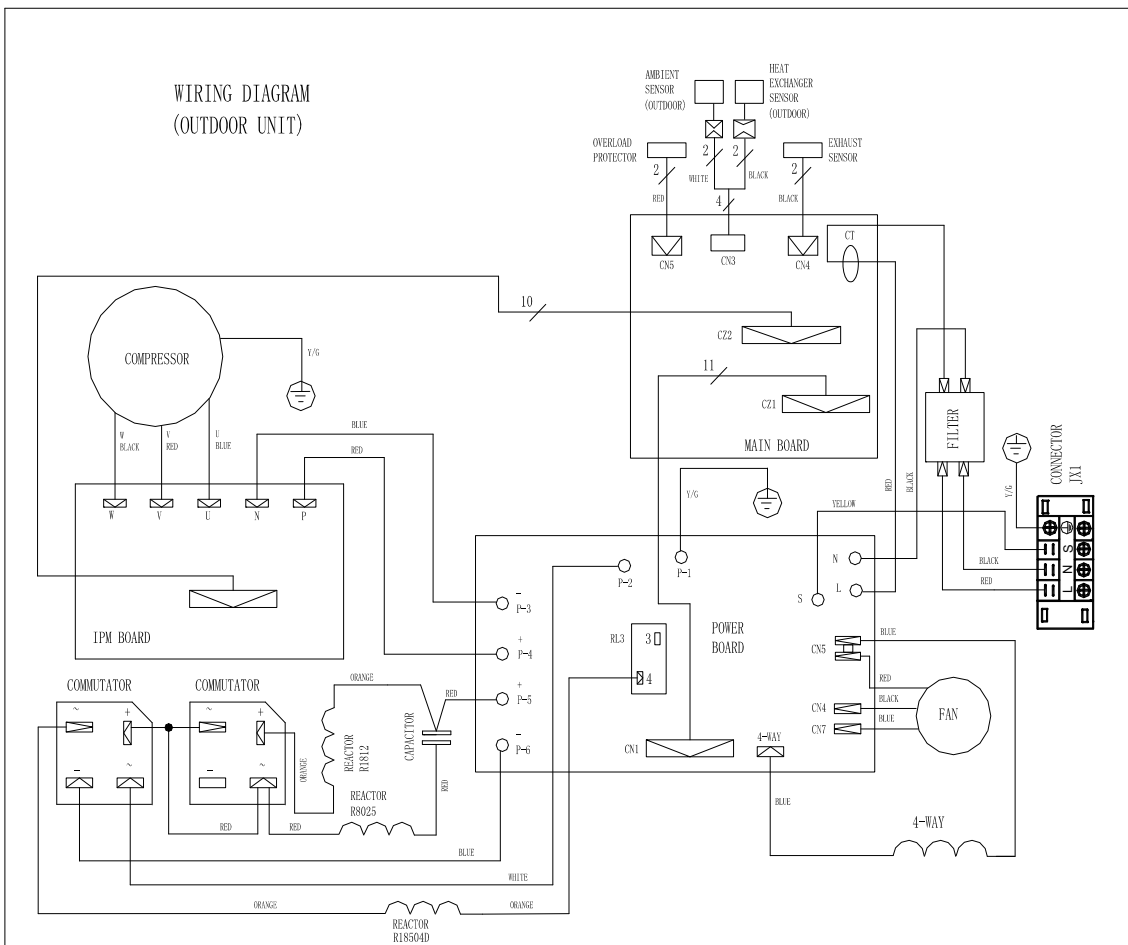


## 9 Wiring diagram

### 9.1 MSC-18HRIN1 indoor unit



### 9.2 MSC-18HRIN1 outdoor unit



## 10 Electronic function

### 10.1 Electric Control working environment.

10.1.1 Input voltage: 175~253V.

10.1.2 Input power frequency: 50Hz.

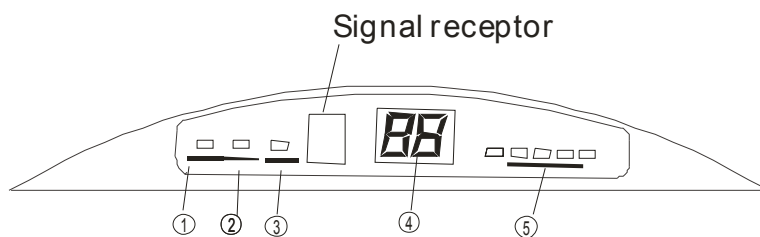
10.1.3 Indoor fan normal working amp is less than 1A.

10.1.4 Outdoor fan. Normal working amp is less than 1.5A.

10.1.5 Four-way valve normal working amp is less than 1A.

10.1.6 Swing motor: DC12V.

### 10.2 Display board



#### 10.2.1 AUTO indicator

This indicator illuminates when the air conditioner is in AUTO operation.

#### 10.2.2 TIMER indicator

This indicator illuminates when TIMER is set ON/OFF.

#### 10.2.3 PRE.-DEF. Indicator (For Cooling & Heating models only)

This indicator illuminates when the air conditioner starts defrosting automatically or when the warm air control feature is activated in heating mode.

#### 10.2.4 TEMPERATURE indicator

Usually it displays the temperature settings. When change the setting temperature, this indicator begins to flash, and stops 20 seconds later.

It displays the room temperature when the air conditioner is in FAN only operation.

When the unit stops operation, it returns to original factory settings.

Displays the malfunction code or protection code.

#### 10.2.5 OPERATION indicator

This indicator flashes after power is on and illuminates when the unit is in operation.

#### 10.2.6 FREQUENCY indicator

This indicator appears only when the compressor is in operation and indicates the current operating frequency.

### 10.3 Protection

10.3.1. 3 minutes delay at restart for compressor.

10.3.2. Temperature protection of compressor top, compressor stops when the temp. of top of compressor is more than 115℃, compressor runs when the temp. of top of compressor is less than 100℃.

10.3.3. Voltage protection, unit stop when the voltage is more than 260V and less than 175V.

10.3.4. Inverter module Protection , Inverter module Protection itself has a protection function against current, voltage and temperature.

10.3.5. Sensor protection at open circuit and breaking disconnection

10.3.6. Fan Speed is out of control. When Indoor Fan Speed is too high(higher than High Fan+300RPM)or too low(lower than 400RPM), the unit stops and LED displays failure information and can't return to normal operation automatically.

10.3.7. Cross Zero signal error warning. If there is no Cross Zero signals in 4 minutes, the unit stops and LED displays failure information and can't return to normal operation automatically.

### 10.4 Fan-only mode

Fan speed is high/mid/low/ Auto

### 10.5. Cooling mode

10.5.1 The 4-way valve is closed at cooling mode.

10.5.2 The action of the compressor and the outdoor fan:

|                 | Condition<br>T=Indoor Temp.<br>Ts=Setting Temp. | Compressor | Outdoor fan |
|-----------------|---|------------|-------------|
| Room temp. up   | $T > T_s + 1$                                   | On         | On          |
|                 | $T < T_s + 1$                                   | Off        | Off         |
| Room temp. down | $T > T_s$                                       | On         | On          |
|                 | $T < T_s$                                       | Off        | Off         |

10.5.3 Auto fan at cooling mode:

|                 | Condition<br>T=Indoor Temp.-Setting Temp. | Indoor fan speed |
|-----------------|---|------------------|
| Room temp. up   | $T < 1.5℃$                                | Low              |
|                 | $1.5℃ < T < 4℃$                           | Mid.             |
|                 | $T > 4℃$                                  | High             |
| Room temp. down | $T > 3℃$                                  | High             |
|                 | $1℃ < T < 3℃$                             | Mid.             |
|                 | $T < 1℃$                                  | Low              |

10.5.4 Anti-freezing control to indoor evaporator at cooling mode( T: evaporator temp. )

|  | Evaporator Temp. | Compressor                       |
|--|------------------|----------------------------------|
|  | $0℃ < T < 4℃$    | Decrease frequency of compressor |
|  | $T < 0℃$         | Off                              |

### 10.5.5 Current protection

|              | Model       | Current       | Compressor                       |
|--------------|-------------|---------------|----------------------------------|
| Current up   | MSC-18HRIN1 | I>18 A        | Off                              |
|              |             | 14.5A<I<18A   | Decrease frequency of compressor |
|              |             | I< 12.0A      | On                               |
| Current down | MSC-18HRIN1 | I>17.5 A      | Off                              |
|              |             | 14.0A<I<17.5A | Decrease frequency of compressor |
|              |             | I< 11.5A      | On                               |

### 10.5.6 Rated capacity test

Set mode to cooling mode

Set temp. to 17°C

Set fan speed to high speed

Push turbo button 5 times in 10 seconds.

After 5 hours, cancel rated capacity test

### 10.5.7 Condensing temp. protection

When outdoor pipe temperature is more than 65°C, compressor stops, .

Operation will be resumed when outdoor pipe temperature is less than 54°C.

## 10.6. Dehumidifying mode

10.6.1. The 4-way valve is off

10.6.2. the indoor fan is fixed in breeze speed

10.6.3. Compressor run in low frequency

10.6.4. Low room temperature protection:

When room temperature decreases to below 10°C, compressor and outdoor fan will stop(indoor fan is Breeze). Dehumidifying operation will be resumed when room temperature restores to over 12°C.

10.6.5. At dehumidifying mode, the anti-freezing function of the indoor heat exchanger is the same as that of cooling mode.

## 10.7. Heating mode

### 10.7.1. Action of compressor and outdoor fan motor at heating mode:

|                 | Condition       | Compressor | Outdoor fan |
|-----------------|-----------------|------------|-------------|
| Room temp. up   | $T > T_s + T_c$ | Off        | Off         |
|                 | $T < T_s + T_c$ | On         | On          |
| Room temp. down | $T < T_s + T_c$ | On         | On          |
|                 | $T > T_s + T_c$ | Off        | Off         |

$T_c$ : The temp. compensation

When room temp. up,  $T_c$  is 3;

When room temp. down,  $T_c$  is 2;

Jump setting in indoor PCB

\* This temp. compensation can be changed through Jump setting in indoor PCB.

|       |    |     |     |     |
|-------|----|-----|-----|-----|
| JJ2   | On | On  | Off | Off |
| JJ3   | On | Off | On  | Off |
| $T_c$ | 0□ | -4□ | -2□ | 0□  |

### 10.7.2. Indoor Fan actions at heating mode

Indoor Fan can be set at HIGH/MID/LOW/AUTO by using a remote controller, but Anti-cold wind function prevails.

Anti-cold wind control function at heating mode

|                             | Condition<br>$T = \text{Indoor exchanger temp.}$ | Indoor fan speed  |
|-----------------------------|--|-------------------|
| Indoor exchanger temp. up   | $T < 34□$  | Off               |
|                             | $34□ < T < 37□$                                  | Breeze            |
|                             | $37□ < T < 44□$                                  | Low speed         |
|                             | $T > 44□$  | Setting fan speed |
| Indoor exchanger temp. down | $T > 38□$  | Setting fan speed |
|                             | $33□ < T < 38□$                                  | Low speed         |
|                             | $24□ < T < 33□$                                  | Breeze            |
|                             | $T < 24□$  | Off               |

When the indoor temp. gets to setting temp, indoor changes to breeze speed immediately, after 127 second, indoor fan stop.

### 10.7.3. Auto wind at heating mode

|                 | Condition<br>$T = \text{Indoor Temp.} - \text{Setting Temp.}$ | Indoor fan speed |
|-----------------|---|------------------|
| Room temp. up   | $T < 1.5□$  | High             |
|                 | $1.5□ < T < 2.5□$   | Med.             |
|                 | $T > 2.5□$  | Low              |
| Room temp. down | $T < 1.0□$  | High             |
|                 | $1.0□ < T < 2.0□$   | Med.             |
|                 | $T > 2.0□$  | Low              |



#### 10.7.6 Indoor evaporator high-temperature protection at heating mode

| Condition<br>T= Indoor exchanger temp. | Compressor                       |
|--|----------------------------------|
| T<48□                                  | On                               |
| 53□<T<63□                              | Decrease frequency of compressor |
| T>63□                                  | Off                              |

#### 10.7.7 The current protection

|              | Model      | Current        | Compressor                       |
|--------------|------------|----------------|----------------------------------|
| Current up   | 12000btu/h | I>19.0 A       | Off                              |
|              |            | 15.0.A<I<19.0A | Decrease frequency of compressor |
|              |            | I< 12.5A       | On                               |
| Current down | 12000btu/h | I>18.5 A       | Off                              |
|              |            | 14.5A<I<18.5A  | Decrease frequency of compressor |
|              |            | I< 12.0A       | On                               |

### 10.8. Defrosting operation (Available for heating only).

#### 10.8.1 Defrosting condition:

##### 10.8.1.1 When outdoor temp. is more than 0□,

Defrosting starts when meeting one of the following conditions,

- The temperature of outdoor heat exchanger remains consecutively lower than 3°C for more than 40 minutes, and the temperature remains consecutively -4°C for more than 3 minutes,
- The temperature of outdoor heat exchanger remains consecutively lower than 3°C for more than 80 minutes, and the temperature remains consecutively -2°C for more than 3 minutes

##### 10.8.1.2 When outdoor temp. is less than 0□,

Defrosting starts when meeting one of the following conditions,

- The temperature of outdoor heat exchanger remains consecutively lower than 3°C for more than 40 minutes, and the temperature remains consecutively -6°C for more than 3 minutes,
- The temperature of outdoor heat exchanger remains consecutively lower than 3°C for more than 40 minutes, and the temperature remains consecutively -6°C for more than 3 minutes,
- The temperature of indoor unit pipe decreases 5°C than before

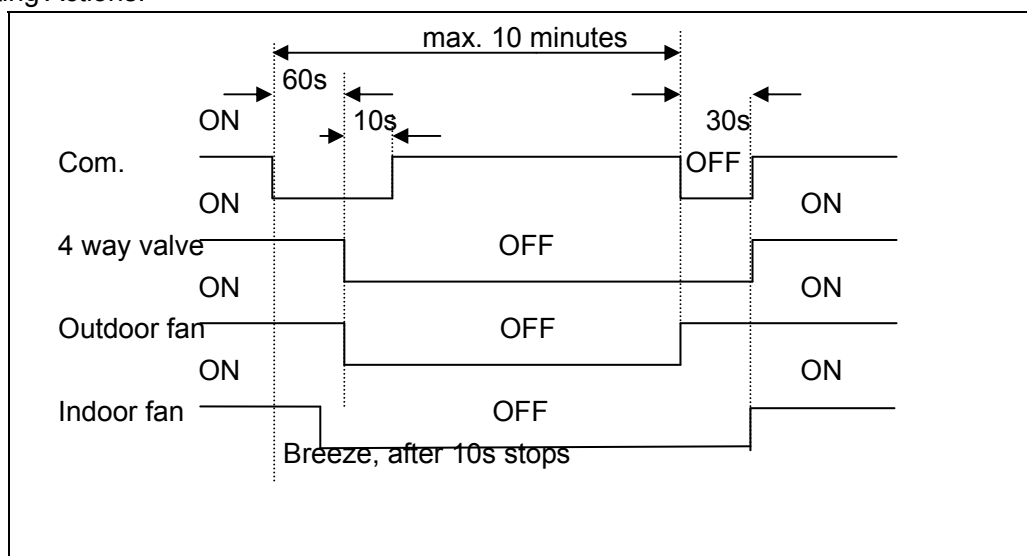
##### 10.8.1.3 The temperature of outdoor heat exchanger remains consecutively lower than 3°C for more than 120 minutes, and the temperature remains consecutively -2°C for more than 3 minutes

#### 10.8.2 Ending condition of defrosting

If one of following conditions is satisfied, end the defrost and turn into heating mode:

- The defrost time has reached to 10 minutes.
- When the temperature of outdoor heat exchanger rises up to 8°C and this continues for more than 80 seconds.
- When the temperature of outdoor heat exchanger rises up to 12°C

### 10.8.3 Defrosting Actions:



### 10.8.4 Rated capacity test

Set mode to cooling mode

Set temp. to 30 °C

Set fan speed to high speed

Push turbo button 5 times in 10 seconds.

After 5 hours, cancel rated capacity test

### 10.9 Outdoor low temperature protection (optional)

Factory standard unit has not this function.

Unit stops when outdoor temp. is low than -15°C and lasting time more than 60 minutes, and unit runs again when outdoor temp. more than -12°C.

When indoor PCB J1 jump is on, this function is available.

### 10.10. Automatic operation mode

The air conditioner automatically selects one of the following operation modes: cooling, heating or fan only according to the temp. difference between room temp. (TA) and set temp. (TS).

| TA—TS   | Operation mode                           |
|---|--|
| $TA - TS > 2^\circ\text{C}$                           | Cooling                                  |
| $-1^\circ\text{C} \leq TA - TS \leq +2^\circ\text{C}$ | Fan-only                                 |
| $TA - TS < -1^\circ\text{C}$                          | Heating (air-only for cooling only type) |

### 10.11. Manual switch

#### 10.11.1 Mode changes when push this button .

Cooling mode → Auto mode → Unit off → Cooling mode

#### 10.11.2. At Cooling mode, after 30 minutes cooling operation whose fan speed is set as low, the A/C operates with a setting temp. of 24°C.

#### 10.11.3. At auto mode, the A/C operates with a set temp. of 24°C

### 10.12. Timer Function

#### 10.12.1. The maximum length of timer is 24 hours and the minimum resolving power is 15 minutes.

- 10.12.2. Timer on: first turn off the A/C, the A/C will be automatically on at the set time.
- 10.12.3. Timer off: first turn on the A/C, the A/C will be automatically off at the set time
- 10.12.4. Timer on/off function( on time is earlier than off time): first turn off the A/C, it will be automatically on at set time, and later be off at the set time, then unit turns on at set time.
- 10.12.5. Timer off/on function( off time is earlier than on time): first turn on the A/C, it will be automatically off at set time, and later be on at the set time, then unit turns off at set time.

#### 10.13. Sleep mode

10.13.1 It is available at cooling, heating or auto mode.

##### 10.13.2 Cooling:

The set temperature rise 1°C per hour. Two hours later, the set temperature will maintain as a constant and the fan speed is kept at low speed.

##### 10.13.3 Heating:

The set temperature decrease 1°C per hour. Two hours later, the set temperature will maintain as a constant and the air circulation is kept at low speed (Cold air proof function takes precedence over all).

##### 10.13.4 Auto:

The Sleep Mode running function operates in accordance with selected running mode by auto mode.

10.13.5 After 7 hours, unit cancels this modes automatically.

#### 10.14 Auto restart function

In case of a sudden power failure, this function automatically sets the unit to previous settings before the power failure when power returns.

#### 10.14 Turbo function

The indoor fan will work in super high speed, the frequency of compressor will increase, the max run time is 30 minutes. After 30 minutes, the unit will work in previous setting.

#### 10.15 Plasma

Plasma turns on when the indoor fan runs.

Plasma turns off automatically when front panel is opened.

This is optional function

#### 10.16

## 11.Troubleshooting

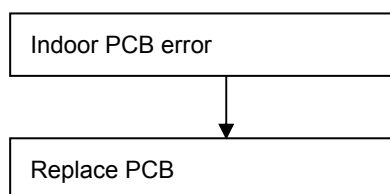
### 11.1 Indoor Unit Error Display

| Display | LED STATUS   |
|---------|--|
| E0      | EEPROM error   |
| E1      | Indoor / outdoor units communication protection                            |
| E2      | Zero-crossing examination error  |
| E3      | Fan speed beyond control   |
| E5      | Open or short circuit of outdoor temperature sensor                        |
| E6      | Room temperature or evaporator temperature sensor open or short circuit of |
| P0      | Module protection  |
| P1      | Over voltage or too low voltage protection                                 |
| P2      | Compressor top protection against temperature                              |
| P3      | Outdoor low temp. protection   |
| P4      | Inverter compressor drive error  |

**Note: E4: Reserved function**

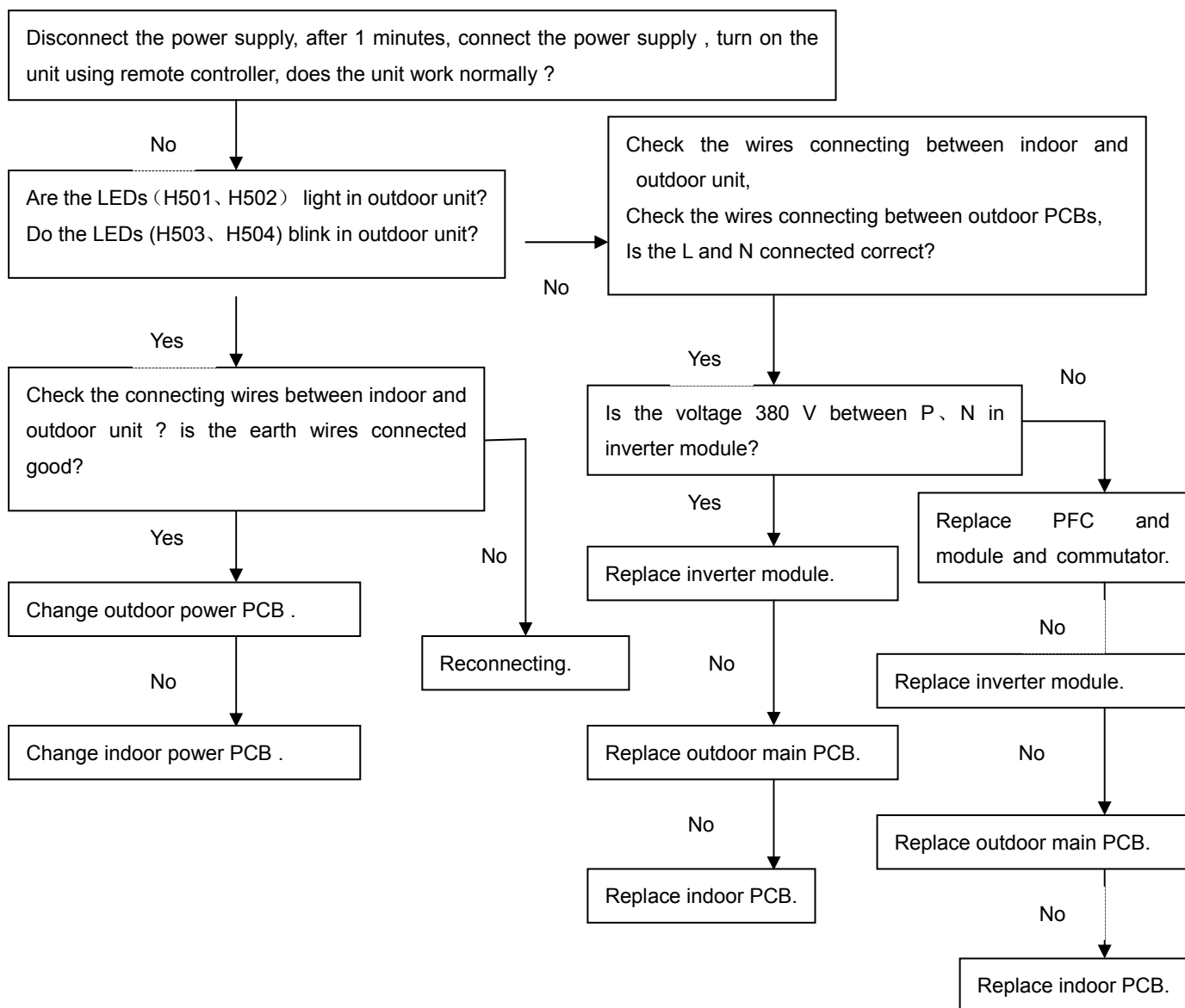
#### 11.1.1

| Display | LED STATUS   |
|---------|--------------|
| E0      | EEPROM error |



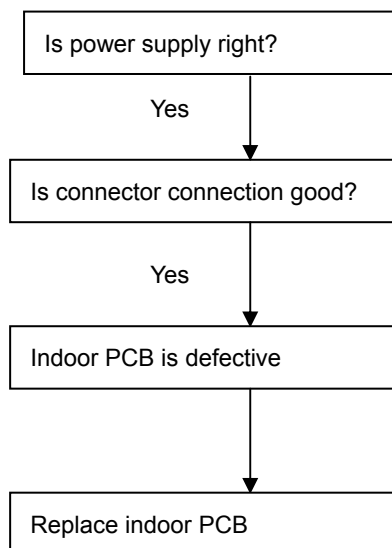
#### 11.1.2

| Display | LED STATUS                                      |
|---------|---|
| E1      | Indoor / outdoor units communication protection |



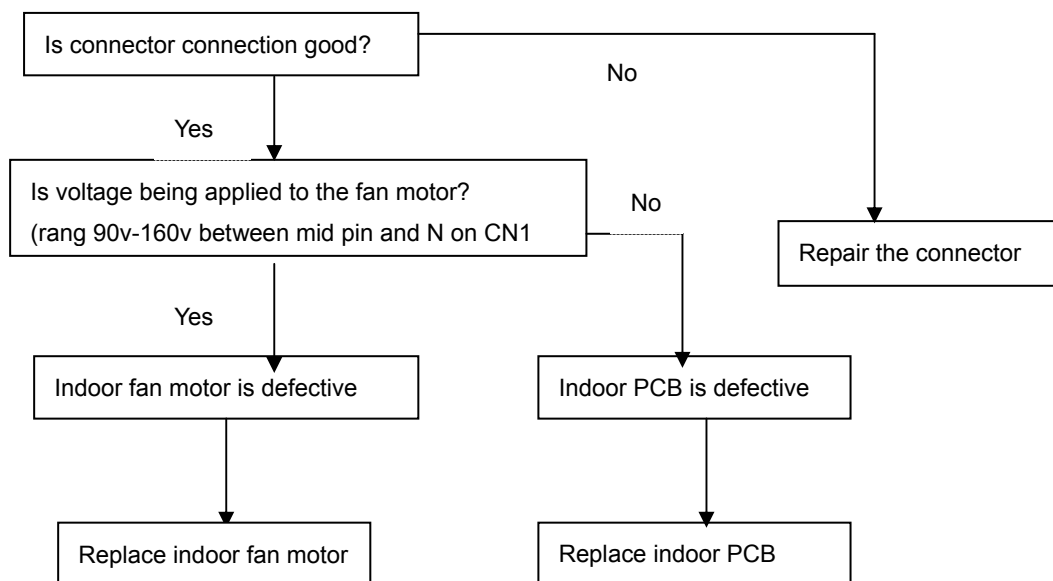
### 11.1.3

| Display | LED STATUS                      |
|---------|---------------------------------|
| E2      | Zero-crossing examination error |



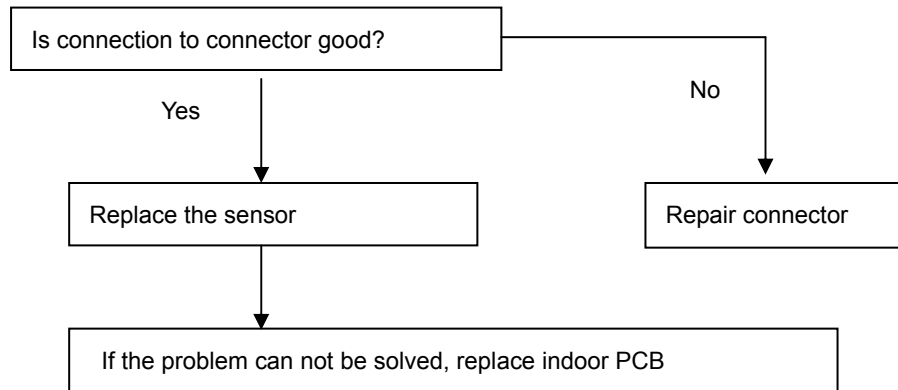
### 11.1.4

| Display | LED STATUS               |
|---------|--------------------------|
| E3      | Fan speed beyond control |



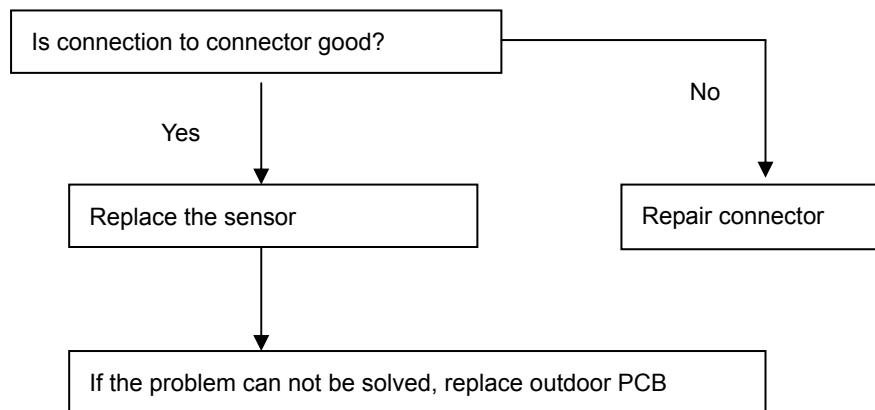
### 11.1.5

| Display | LED STATUS  |
|---------|---|
| E5      | Open or short circuit of outdoor temperature sensor |



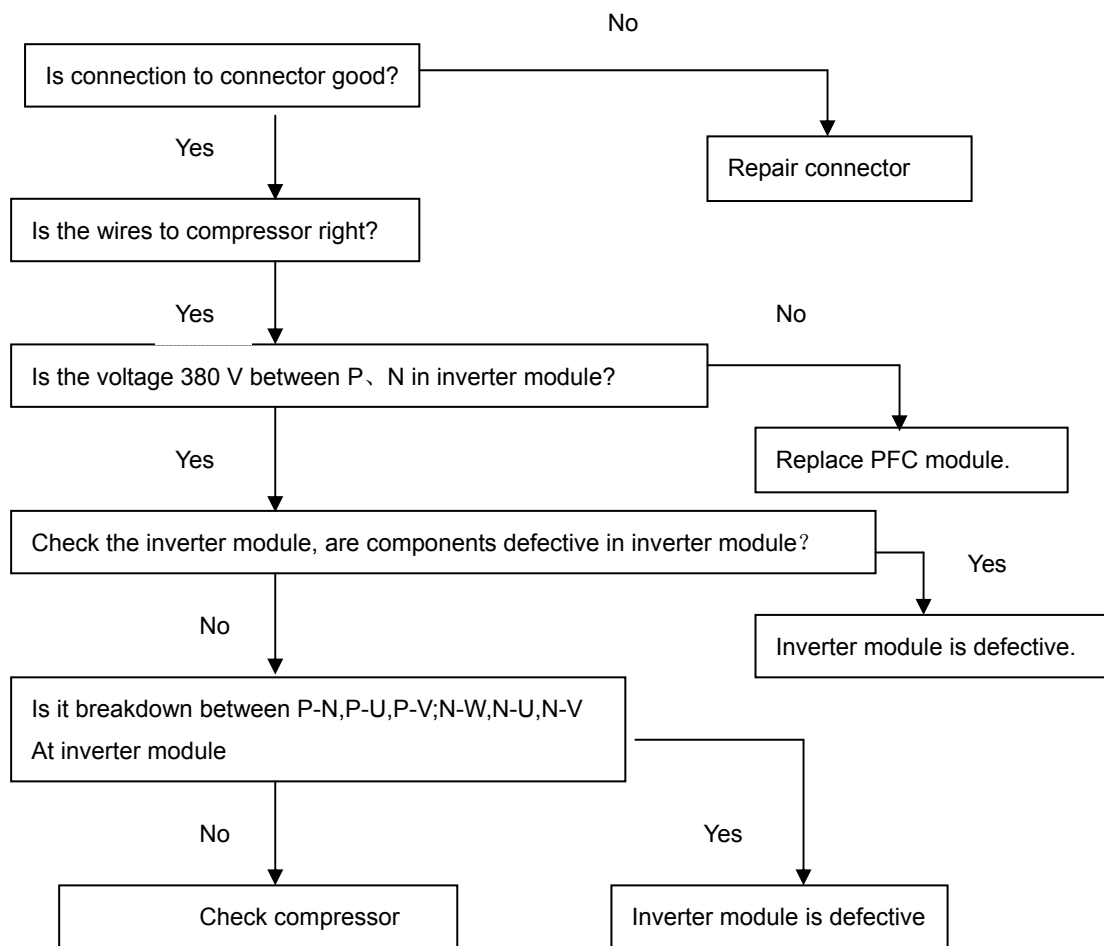
### 11.1.6

| Display | LED STATUS   |
|---------|--|
| E6      | Room temperature or evaporator temperature sensor open or short circuit of |



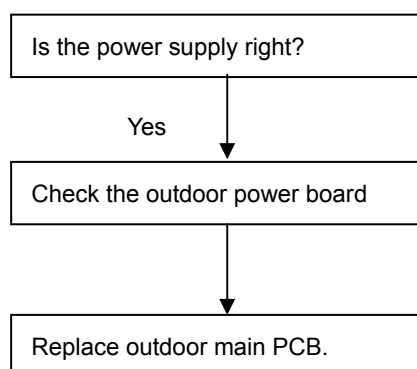
### 11.1.7

| Display | LED STATUS        |
|---------|-------------------|
| P0      | Module protection |



### 11.1.8

| Display | LED STATUS                                 |
|---------|--|
| P1      | Over voltage or too low voltage protection |

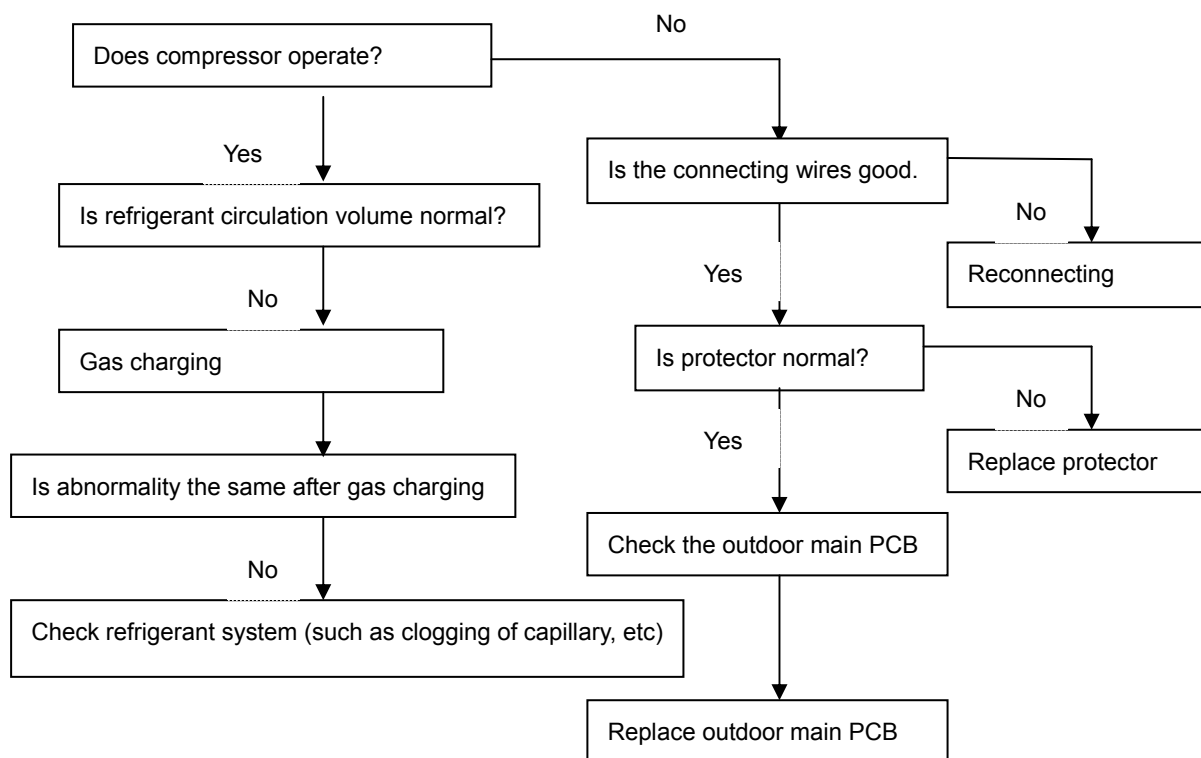




### 11.1.9

| Display | LED STATUS                                    |
|---------|---|
| P2      | Compressor top protection against temperature |

Off: 115 °C; On: 100 °C

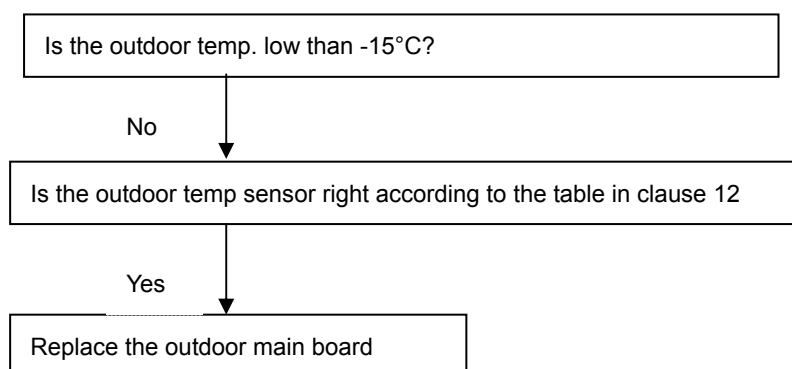


### 11.1.10

| Display | LED STATUS                   |
|---------|------------------------------|
| P3      | Outdoor low temp. protection |

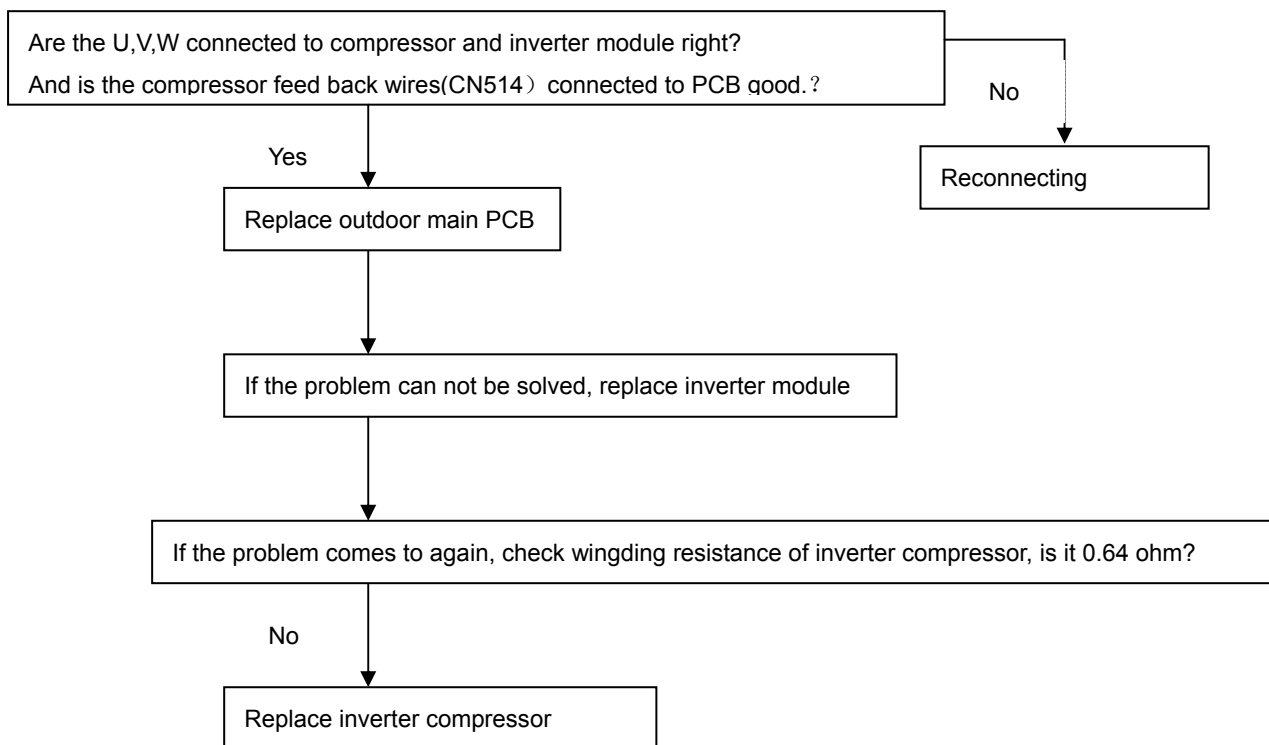
This is optional, factory standard unit has not this function.

Unit stops when outdoor temp. is low than -15°C and lasting time more than 60 minutes, and unit runs again when outdoor temp. more than -12°C.



### 11.1.11

| Display | LED STATUS                |
|---------|---------------------------|
| P4      | Inverter compressor error |



## 12. Characteristic of temp. sensor

| Temp.□ | Resistance KΩ |  | Temp.□ | Resistance KΩ |  | Temp.□ | 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     | 1.830         |
| 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        |



**ISO 9001 : 2000**

**Certificate No.: CC 454**

GD Midea Refrigeration Equipment Co.,Ltd.  
 Have received **ISO 9001** certification for quality assurance.  
**Certificate Number. CC 454**



**ISO 14001 : 1996**

**Certificate No. CC 1417**

GD Midea Refrigeration Equipment Co.,Ltd.  
 have received environmental management system  
 standard **ISO 14001** certification  
**Certificate Number. CC 1417**

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