

Hisense

SPLIT TYPE AIR CONDITIONER

SERVICE MANUAL

AS-07HR4SYDTG

AS-09HR4SYDTG

AS-12HR4SVDTG

AS-18HR4SWATG

AS-24HR4SFBTG

AS-30HR4SQBTG

Hisense Corporation

Type of contents

1. OPERATION RANGE
2. INSTALLATION
3. REFRIGERANT FLOW DIAGRAM
4. ELECTRICAL DATA
5. CONTROL MODE
6. TROUBLE SHOOTING

NOTE: The figure, size and parameter of the product may not be identical with the service manual, please take the actual product as the standard.

1. OPERATING RANGE

| | Temperature | Indoor Air Intake Temp. | Outdoor Air Intake Temp |
|---------|-------------|-------------------------|-------------------------|
| COOLING | Maximum | 32°C D.B./23°C W.B. | 43 °C D.B./26°C W.B. |
| | Minimum | 21°C D.B./15°C W.B. | 21 °C D.B./15°C W.B. |
| HEATING | Maximum | 27°C D.B./18°C W.B. | 24°C D.B./18°C W.B. |
| | Minimum | 20°C D.B./≤15°C W.B | -7°C D.B./-8°C W.B. |

2. INSTALLATION

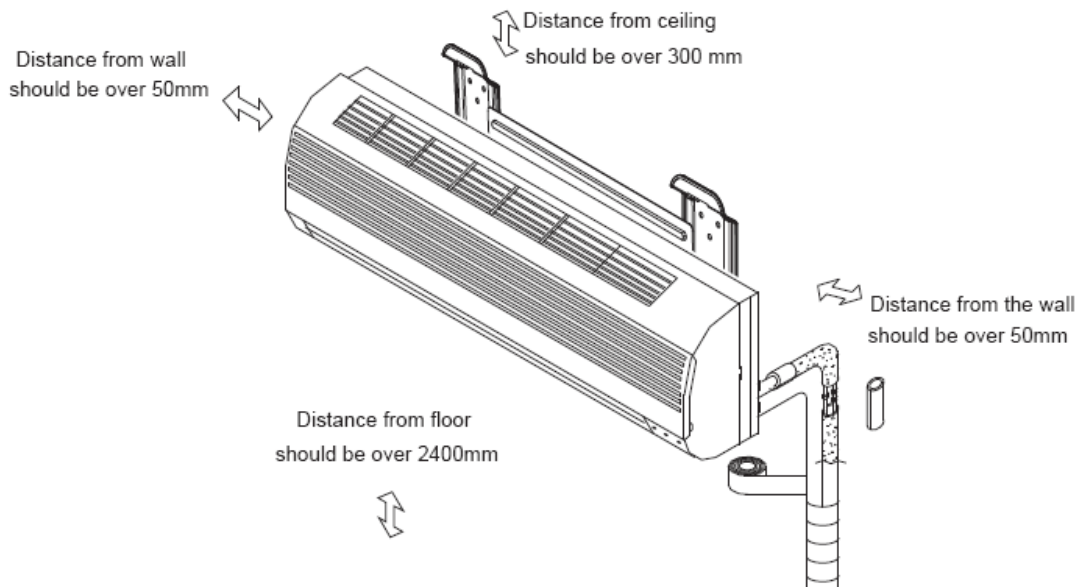
1、 How to choose an air conditioner (only for reference):

- a. Choice for reference: 170W/m² for average rooms;
- b. Choice for reference: 160-200W/m² for small size offices;
- c. Choice for reference: 220-350W/m² for restaurants;
- d. Choice for reference: 200-300W/m² for entertaining venues;
- e. Choice for reference: 220-280W/m² for the top floor.

Note: 1W = 3.412btu.

2、 Indoor Unit:

2.1. Distance for the indoor unit:

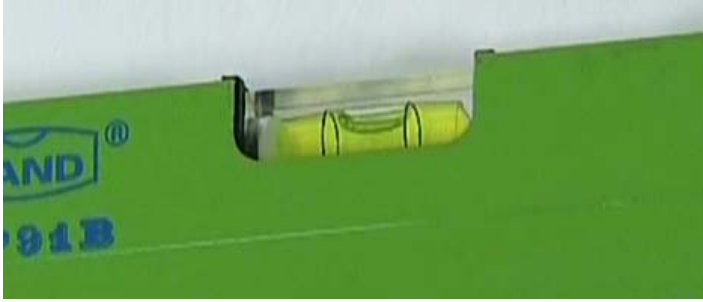


Note: a. The wallboard must be smooth and straight, with its supporting force of not less than 60 kg.

2.1 Install for the installation template:

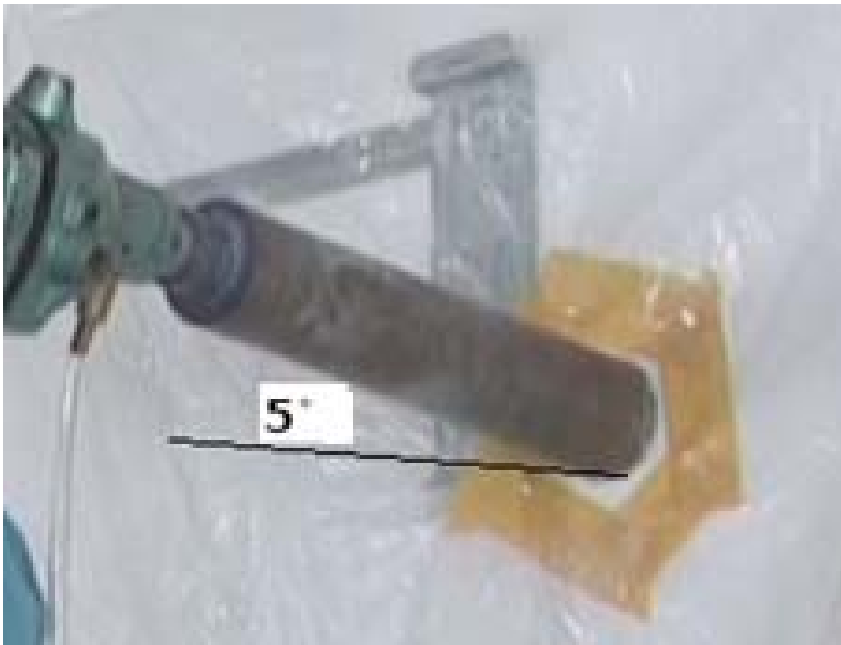


2. INSTALLATION



Note: The installation template should be installed level.

2.3. Drilling:



Note: The tool need to raise 5 degrees when drilling, so that the hole of the indoor side will be higher than the outdoor side, the water can drain smoothly.

2.4 Bend the evaporator pipe:

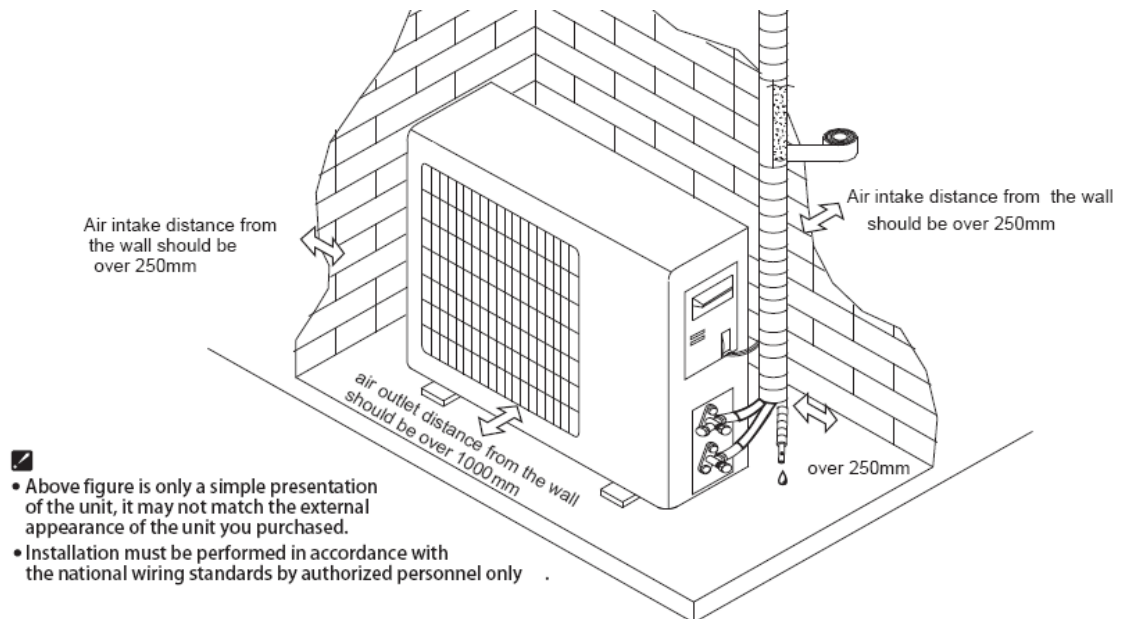


Note: When you bend the evaporator pipe, you should use your right hand hold the pipe tightly at bends, and then use the left hand bend the pipe slowly.

2. INSTALLATION

3. Outdoor Unit:

3.1. The distance of the outdoor unit:



Note: The wallboard supporting force should be able to withstand four times the weight of the outdoor unit, and not less than 180 kg.

3.2. Fix for the outdoor unit:



Shock pad



bolt

Note: The outdoor unit base must be fixed with the bolts to reduce vibration and noise, if necessary the shock pad can be used.

4. The height difference and the connection pipe length:

2. INSTALLATION

When install the unit, please follow the following principle:

4.1.The height difference between the indoor unit and the outdoor unit should not exceed 5m;

4.2.The connection pipe length should be not less than 1m;

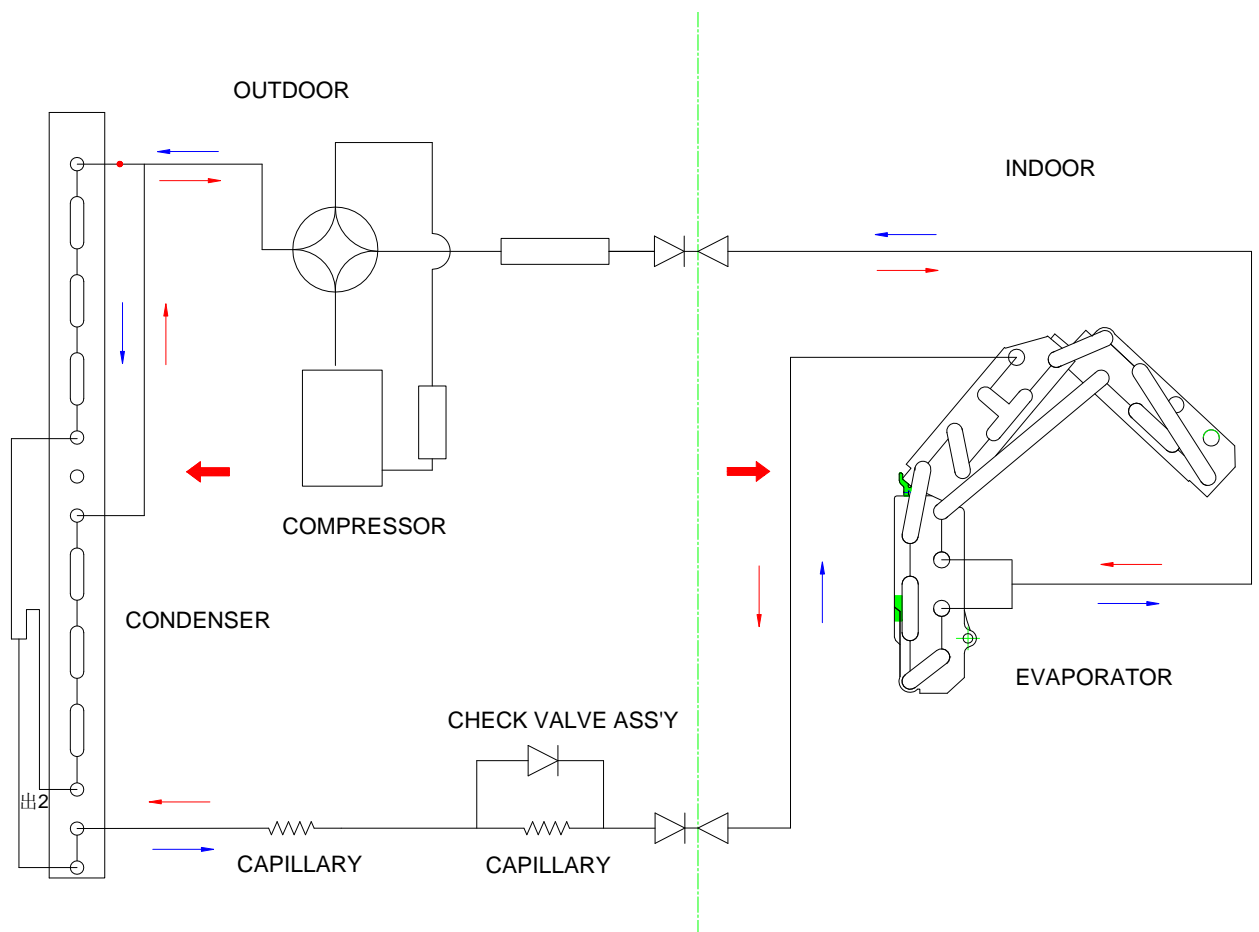
4.3.The longest connection pipe is 15m

4.4. Normally, the connection pipe does not exceed 5m, if the connection pipe exceed 5m, it should add some gas for the unit, the amount of the gas that recharged is based on the diameter and length of the liquid pipe, and the recharged gas $Xg=(\text{the liquid pipe length}-5m)*(\text{sheet}*g/m)$, for example, for one heat pump single split air conditioner, if the diameter of the liquid pipe is $\Phi 9.53$, and the liquid pipe length is 7m, it means that it should charge $(7m-5m)*50g/m=100g$ gas for the unit refer to the following sheet:

| The diameter for the connection pipe(mm) | | single split air conditioner | |
|--|------------------------------|------------------------------|-------------------|
| Liquid pipe | Gas pipe | cooling only (g / m) | heat pump (g / m) |
| $\Phi 6.35$ | $\Phi 9.53$ or $\Phi 12.7$ | 15 | 20 |
| $\Phi 6.35$ or $\Phi 9.53$ | $\Phi 15.88$ or $\Phi 19.05$ | 15 | 50 |

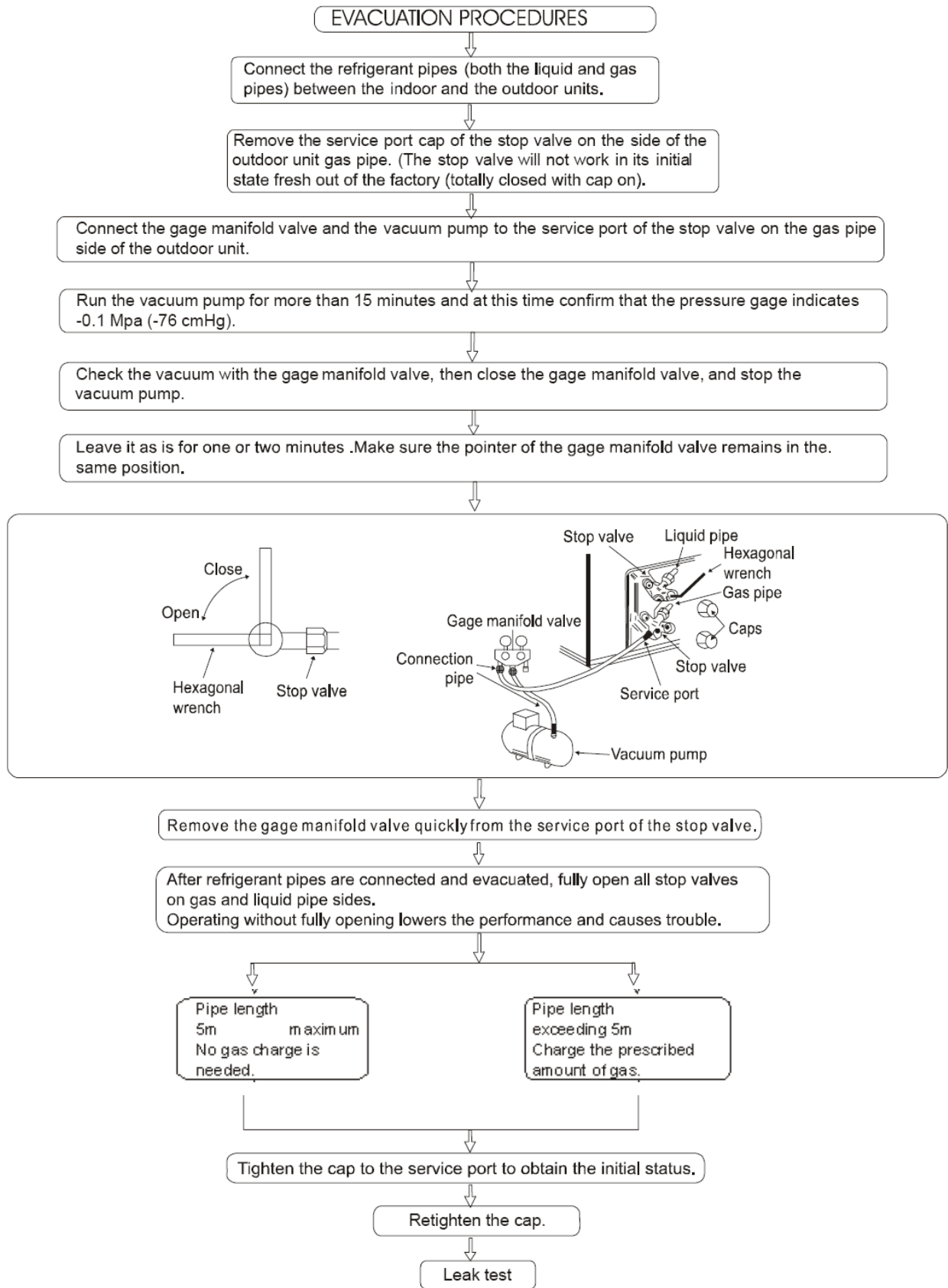
3. REFRIGERANT FLOW DIAGRAM

3-1. Refrigerant flow diagram :



3. REFRIGERANT FLOW DIAGRAM

3-2. Evacuation procedures:



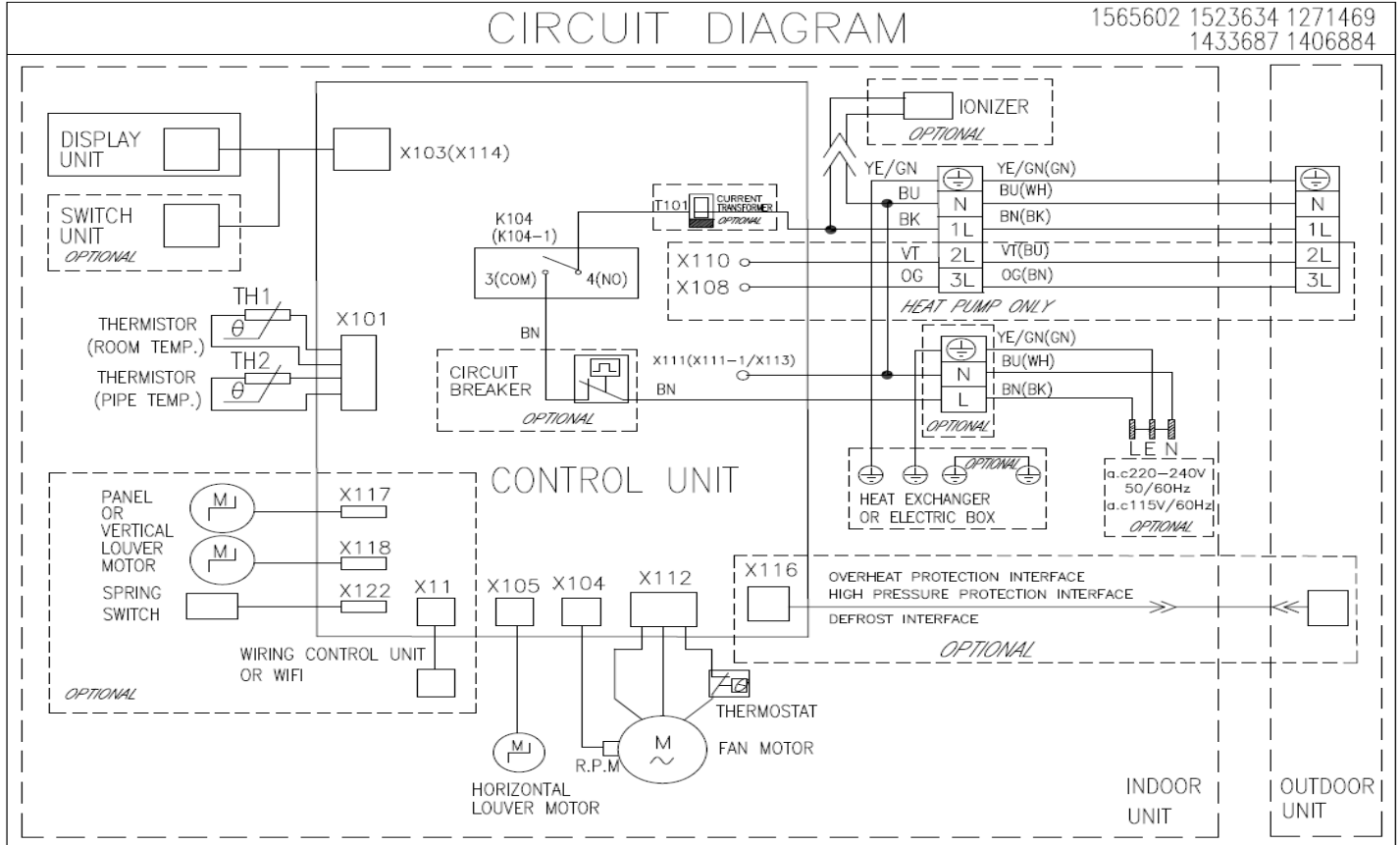
4. ELECTRICAL DATA

4-1. Electrical wiring diagrams

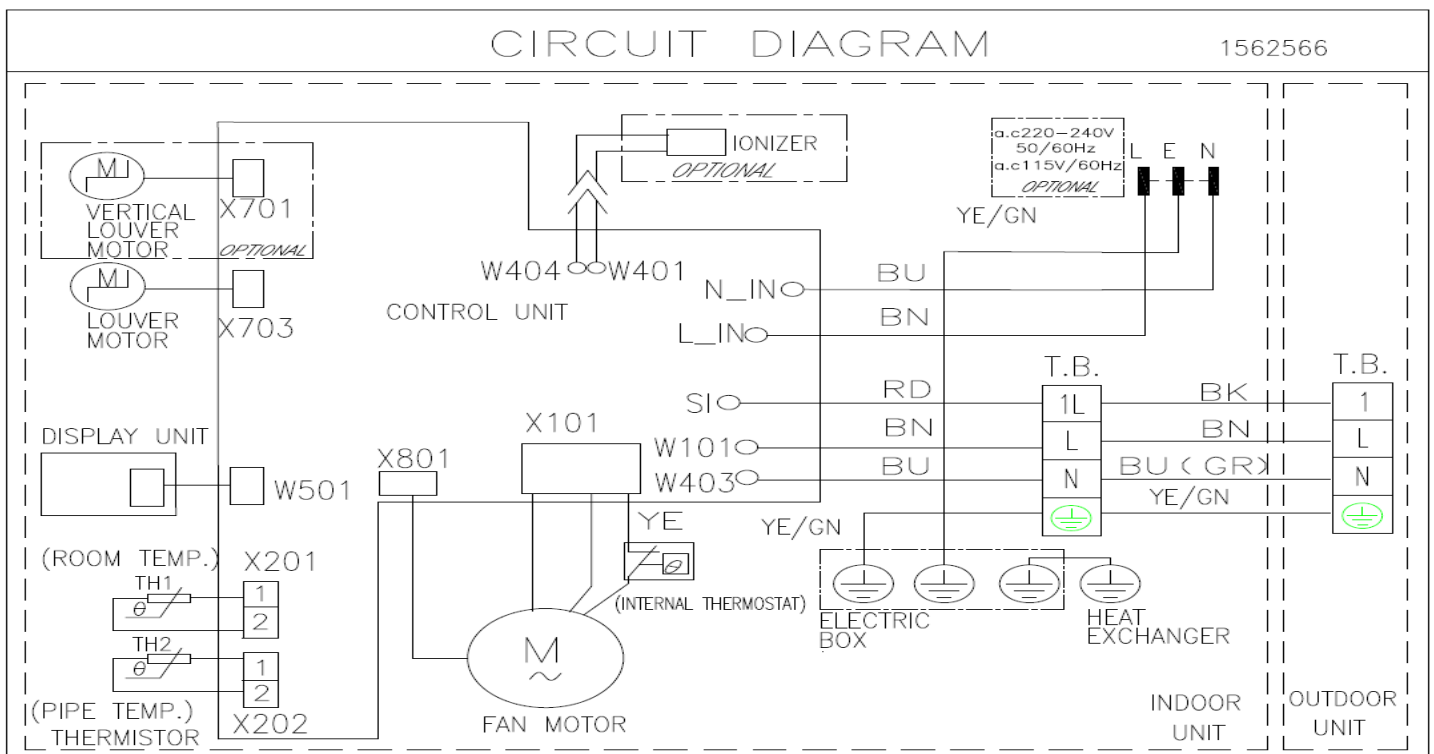
NOTE: YE/GN=YELLOW/GREEN, BU=BLUE, BN=BROWN, WH=WHITE, BK=BLACK, VT=VIOLET, OG=ORANGE, RD=RED

INDOOR:

(1) AS-07HR4SYDTG AS-09HR4SYDTG AS-12HR4SVDTG AS-18HR4SWATG AS-24HR4SFBTG (INDOOR) :



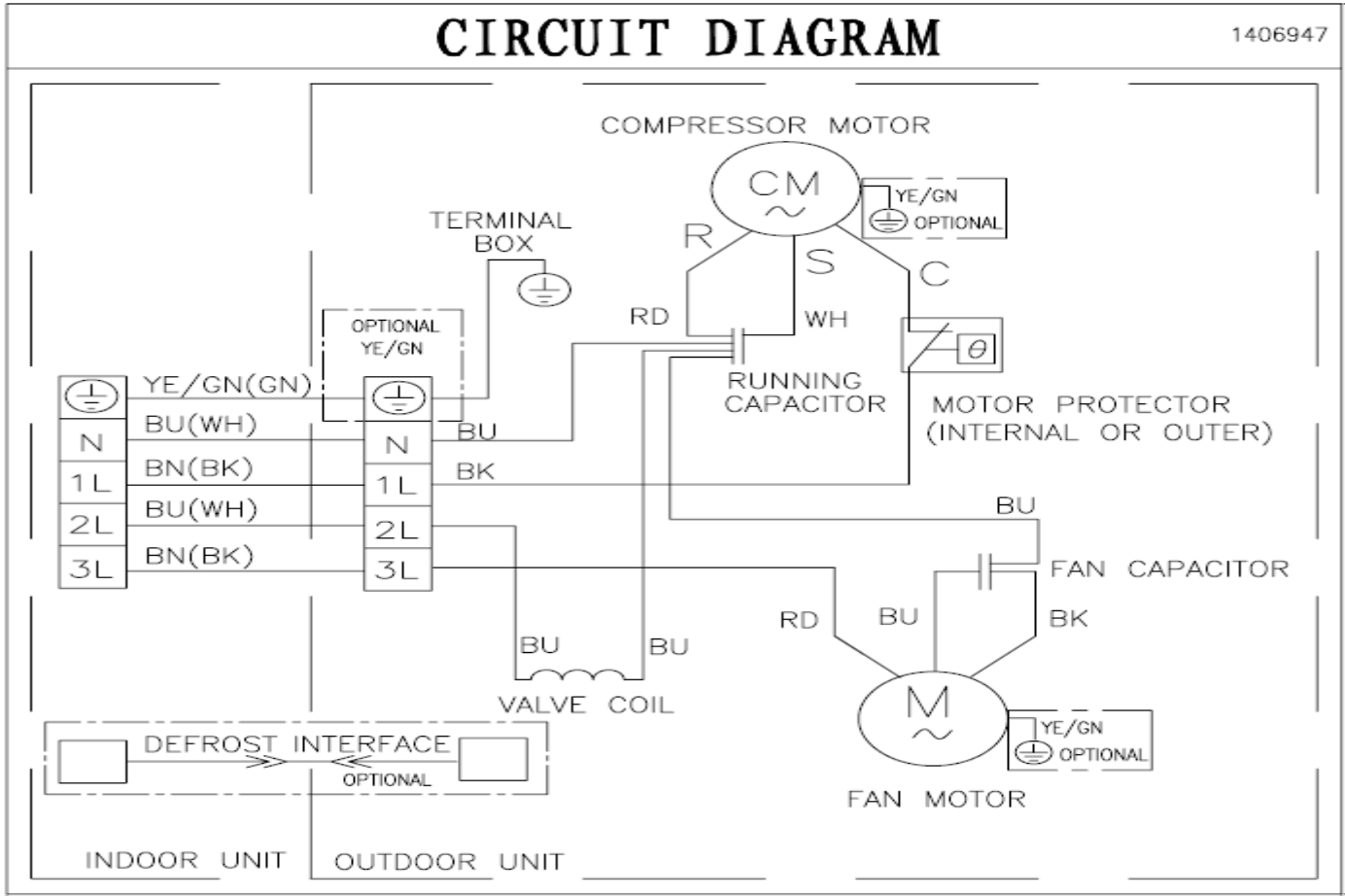
(2) AS-30HR4SQBTG (INDOOR) :



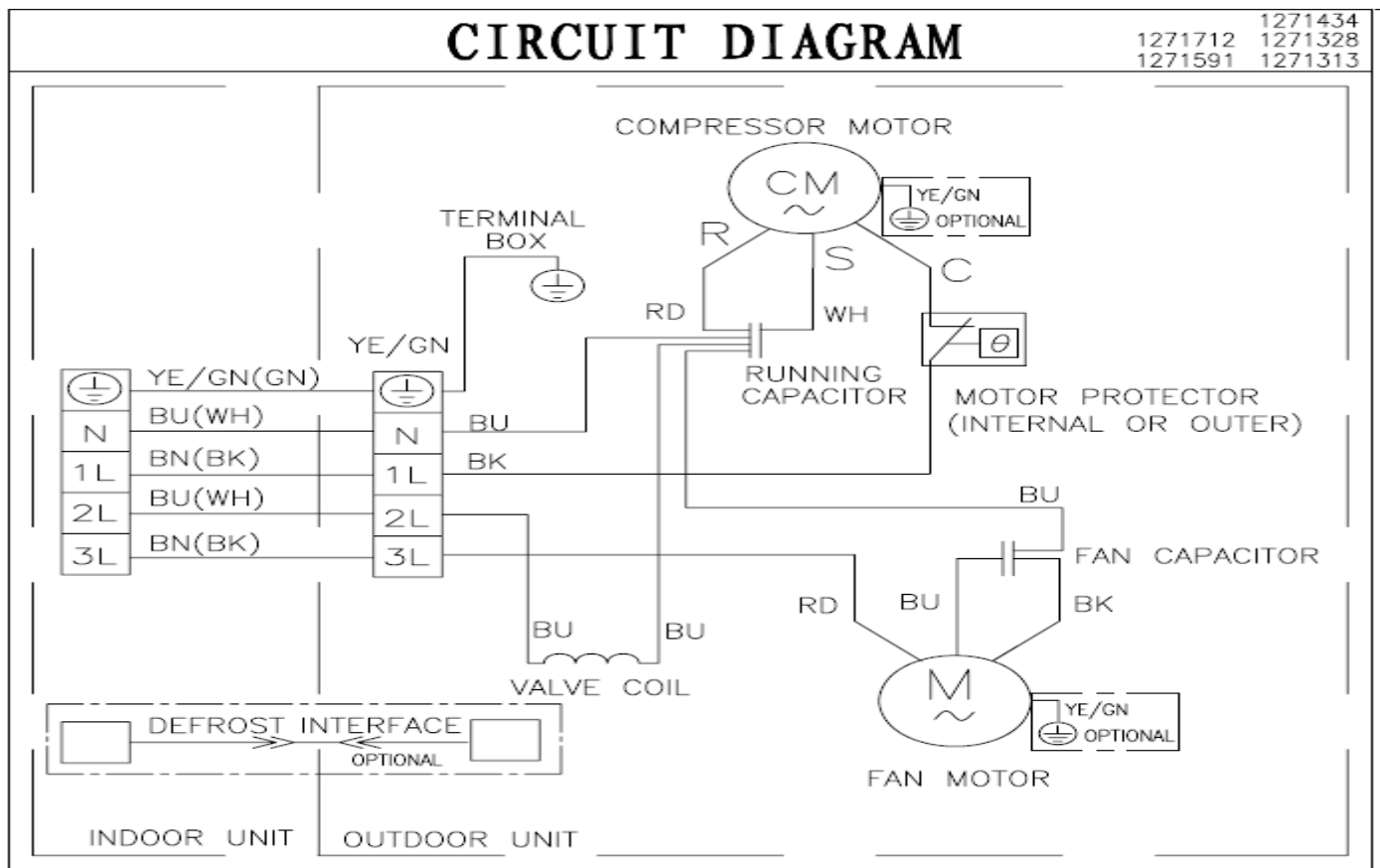
4. ELECTRICAL DATA

OUTDOOR

(1) AS-07HR4SYDTG AS-09HR4SYDTG AS-12HR4SVDTG (OUTDOOR) :

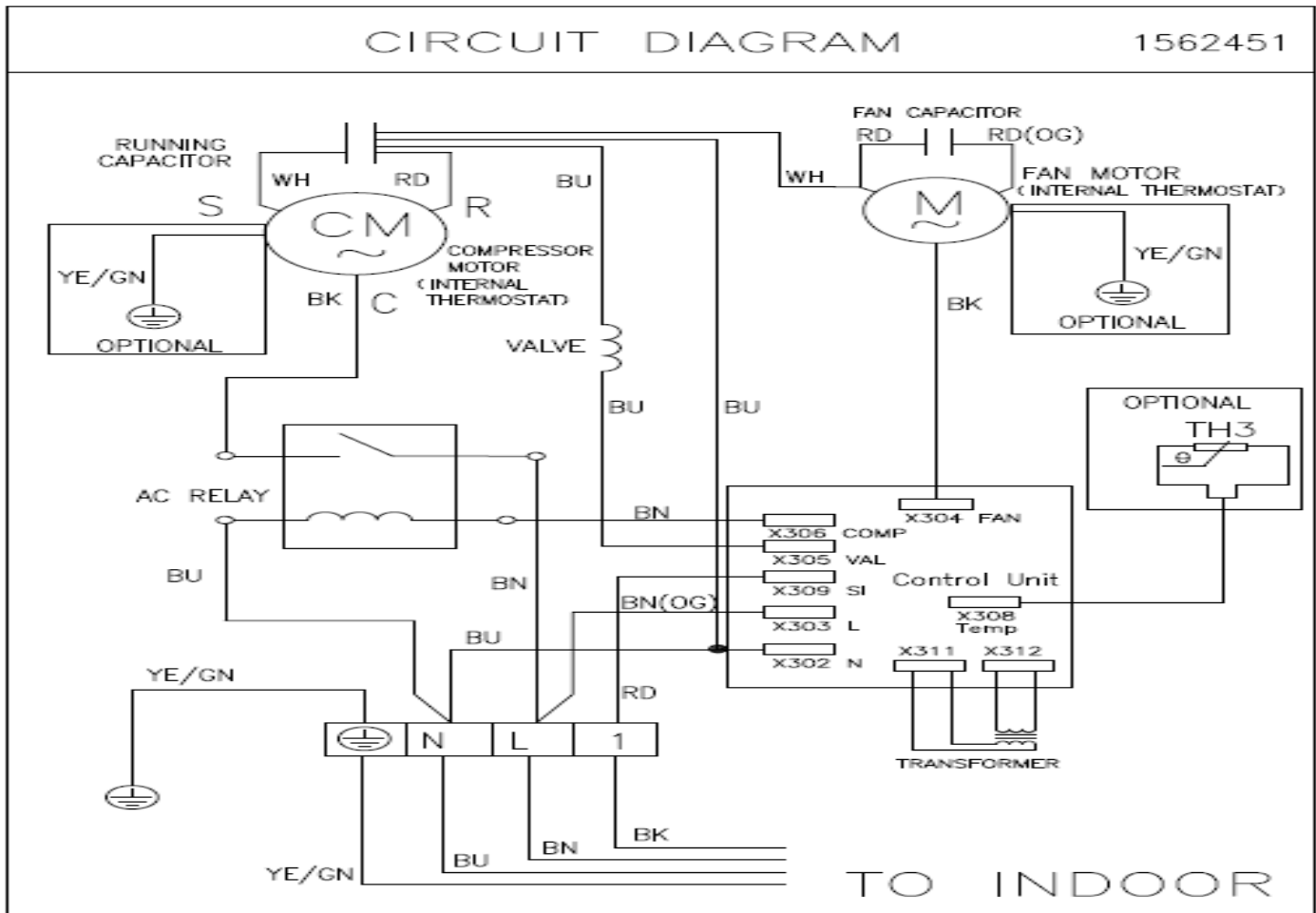


(2) AS-18HR4SWATG AS-24HR4SFBTG (OUTDOOR):



4. ELECTRICAL DATA

(3) AS-30HR4SQBTG (OUTDOOR):



4. ELECTRICAL DATA

4-2. Sensor parameter

1. THE PARAMETER OF THE COIL AND INDOOR SENSOR: ($R_0=15K\pm 2\%$)

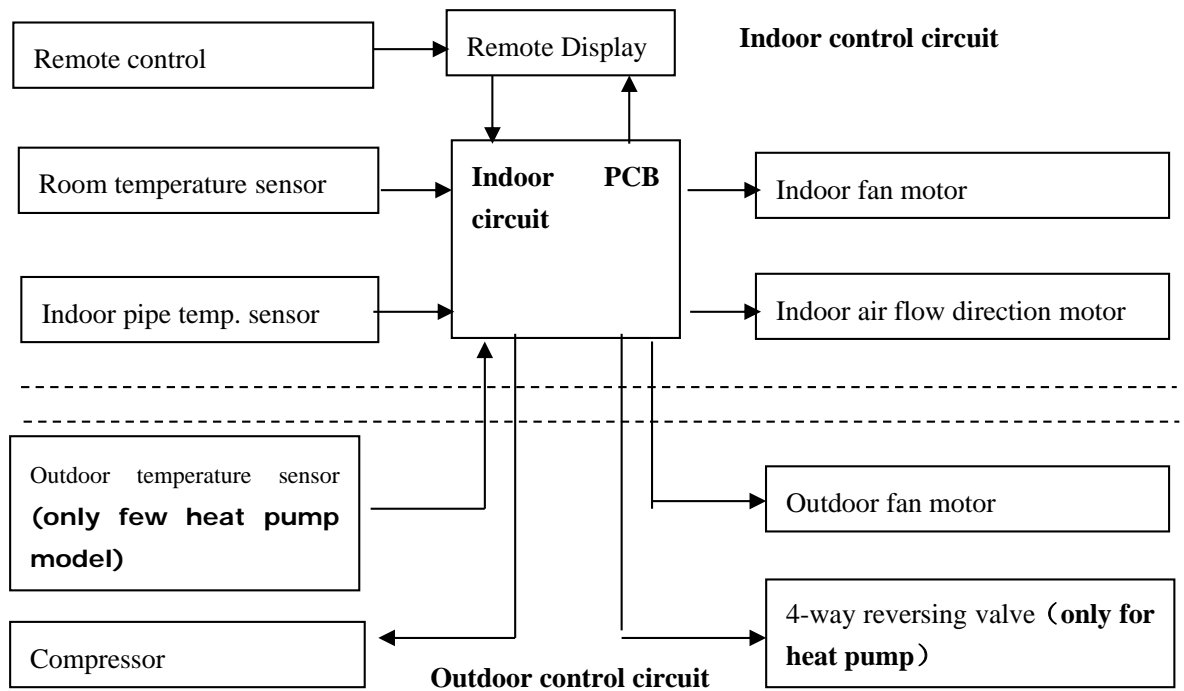
| T(°C) | R(KΩ) | V(v) |
|-----------|-----------|------------|
| -20 | 152.5 | 4.5522388 |
| -19 | 143.9 | 4.528005 |
| -18 | 135.8 | 4.5026525 |
| -17 | 128.3 | 4.4766225 |
| -16 | 121.1 | 4.4489346 |
| -15 | 114.5 | 4.4208494 |
| -14 | 108.2 | 4.3912338 |
| -13 | 102.3 | 4.3606138 |
| -12 | 96.73 | 4.3287389 |
| -11 | 91.51 | 4.2958408 |
| -10 | 86 | 4.2574257 |
| -9 | 81.97 | 4.2265649 |
| -8 | 77.62 | 4.1902397 |
| -7 | 73.52 | 4.1527338 |
| -6 | 69.05 | 4.107674 |
| -5 | 66.01 | 4.0741884 |
| -4 | 62.58 | 4.033256 |
| -3 | 58.34 | 3.9773657 |
| -2 | 56.29 | 3.947959 |
| -1 | 53.41 | 3.9036691 |
| 0 | 50.69 | 3.8582737 |
| 1 | 48.12 | 3.8117871 |
| 2 | 45.7 | 3.7644152 |
| 3 | 43.41 | 3.7159733 |
| 4 | 41.25 | 3.6666667 |
| 5 | 39.2 | 3.6162362 |
| 6 | 37.27 | 3.5651425 |
| 7 | 35.44 | 3.5130849 |
| 8 | 33.71 | 3.4602751 |
| 9 | 32.08 | 3.4069669 |
| 10 | 30.63 | 3.3563445 |
| 11 | 29.06 | 3.2977758 |
| 12 | 27.68 | 3.2427366 |
| 13 | 26.36 | 3.1866538 |
| 14 | 25.12 | 3.1306082 |
| 15 | 23.84 | 3.069001 |
| 16 | 22.82 | 3.0169223 |
| 17 | 21.76 | 2.9597388 |
| 18 | 20.75 | 2.9020979 |
| 19 | 19.79 | 2.8442081 |
| 20 | 18.88 | 2.7863046 |
| 21 | 18.03 | 2.729337 |
| 22 | 17.21 | 2.6715306 |
| 23 | 16.44 | 2.6145038 |
| 24 | 15.7 | 2.5570033 |
| 25 | 15 | 2.5 |
| 26 | 14.33 | 2.4428912 |
| 27 | 13.7 | 2.3867596 |
| 28 | 13.1 | 2.3309609 |
| 29 | 12.53 | 2.2756992 |

| T(°C) | R(KΩ) | V(v) |
|-------|-------|-----------|
| 30 | 11.99 | 2.221193 |
| 31 | 11.47 | 2.1666037 |
| 32 | 10.98 | 2.113164 |
| 33 | 10.51 | 2.0599765 |
| 34 | 10.06 | 2.0071828 |
| 35 | 9.634 | 1.9554275 |
| 36 | 9.229 | 1.9045359 |
| 37 | 8.842 | 1.8542907 |
| 38 | 8.474 | 1.8049757 |
| 39 | 8.123 | 1.7564762 |
| 40 | 7.789 | 1.7089385 |
| 41 | 7.47 | 1.6622163 |
| 42 | 7.165 | 1.6162869 |
| 43 | 6.875 | 1.5714286 |
| 44 | 6.597 | 1.5272955 |
| 45 | 6.333 | 1.4843201 |
| 46 | 6.08 | 1.4421252 |
| 47 | 5.838 | 1.4008062 |
| 48 | 5.608 | 1.3606366 |
| 49 | 5.387 | 1.3211851 |
| 50 | 5.177 | 1.2828964 |
| 51 | 4.976 | 1.2454946 |
| 52 | 4.783 | 1.2088662 |
| 53 | 4.599 | 1.1732741 |
| 54 | 4.423 | 1.1385986 |
| 55 | 4.255 | 1.1049078 |
| 56 | 4.093 | 1.0718588 |
| 57 | 3.939 | 1.0399176 |
| 58 | 3.792 | 1.00894 |
| 59 | 3.65 | 0.9785523 |
| 60 | 3.515 | 0.9492304 |
| 61 | 3.385 | 0.9205874 |
| 62 | 3.261 | 0.8928865 |
| 63 | 3.142 | 0.8659464 |
| 64 | 3.028 | 0.8398047 |
| 65 | 2.918 | 0.814265 |
| 66 | 2.813 | 0.7895919 |
| 67 | 2.713 | 0.7658217 |
| 68 | 2.618 | 0.7429901 |
| 69 | 2.524 | 0.7201552 |
| 70 | 2.436 | 0.6985547 |
| 71 | 2.36 | 0.6797235 |
| 72 | 2.268 | 0.656706 |
| 73 | 2.189 | 0.6367444 |
| 74 | 2.114 | 0.617623 |
| 75 | 2.041 | 0.5988498 |
| 76 | 1.971 | 0.5806965 |
| 77 | 1.905 | 0.5634428 |
| 78 | 1.84 | 0.5463183 |
| 79 | 1.778 | 0.5298605 |
| 80 | 1.719 | 0.5140858 |

5. CONTROL MODE

Chapter 1 System Description

1. System control diagram



2. Function Description

- Operation Mode: Cooling, Heat, Dry, Fan only.
- Intake air temperature sense, Indoor coil pipe temperature sensor and Outdoor coil pipe sensor (**only some HEAT PUMP model**)
- Indoor Fan mode Selector: Auto, High, Medium, Low
- Air flow direction control
- Control panel display
- 4-way reversing valve control (**only available for Heat Pump**)
- Compressor ON/OFF control
- Outdoor fan motor control
- Error inquiry
- Ceased delay protection for compressor
- Dimmer
- Room temperature display (**optional**)

3. System Signal Input

- Remote control signal, room temperature signal, coil pipe temperature

signal, "ON/OFF" signal, Filter Monitor reset signal

4. System Signal Output

- H/C split unit: Air flow direction motor(step motor), indoor fan

5. CONTROL MODE

motor(PG regulating motor or tapped regulating motor), digital tube and LED display, Electrical heating signal, Buzzer, Outdoor fan motor, Coil of the 4-way reversing valve, Compressor(or AC contactor).

4.2 Cooling only split unit: Air flow motor (step motor), indoor fan motor(PG regulating motor or tapped regulating motor),digital tube and LED display, Buzzer, Outdoor fan motor, Coil of the 4-way reversing valve, Compressor(or AC contactor).

5. Operation Mode

5.1 Operation mode

Operation mode: Cooling mode, Heat mode, Dry mode, Fan only mode.

5.2 Mode and function combination

These 4 modes contain the combination of the hereinbefore functions, and run these operations control by remote control also.

5.3 Emergent start

If the appliance under the Stand-by state, all the Operation Mode, Air volume, Temperature Setting , Forced Cooling function will be restored as the last time setting when you press on the "ON/OFF" button, but lost the Air flow direction setting, Delay time of Non-real Time Setting(Low end), and sleep function.

If the appliance was connected to the power at first time, it would operate in the smart mode, and set the mode, swing louver angle and the Air volume when you press the "ON/OFF" button. It will keep in stand-by state if you press the "ON/OFF" button during the normal operation.

5.4 Other control mode

(1) When the PCB circuit was connected to the power at first time, the buzzer triggered and beep.

(2) The compressor responded the variation of temperature after the compressor operated in 3 min, and it will be ceased for 3 min then re-start. When the operation mode changed or power off, the compressor turned off immediately. For the other normal operation, the compressor has a 3 min delay protection. If the compressor Power ON or OFF, the outdoor fan motor will be ON or OFF correspondingly.

(3) *The appliance* is ceased for 3 min delay protection when the auto-restart after blackout.

(4)The appliance is ceased for 5 sec delay protection to perform the other operation after it receive the signal of specific operation, but no any delay for the response.

(5) When the appliance power OFF, the indoor fan motor operated as below condition:

a. Cooling and Dry mode: After the compressor power off, it will be operated in 30 sec under the presetting speed then turn off.

b. Fan only mode: it will be stopped immediately after the compressor power off.

c. Heating mode: After the compressor stopped, the indoor fan motor

5. CONTROL MODE

will stop if the indoor coil pipe lower than 33°C, otherwise the indoor fan motor would operate on the Low air speed setting to cool down the coil pipe, and it would stop for the max 30 sec.

(6) When the Heating mode set at first time or turn to the Heating mode from other mode, the 4-way reversing valve will be triggered after the compressor power ON. If the appliance turn off under the Heating mode, the 4-way reversing valve would be OFF after 3 min delay.

Chart 2 System Function Design

1. Function description

1.1 The appliance could be operate by Manual and Remote control, and the Remote control could be set all the Auto, Cooling, Dry, Heating and Fan only functions.

1.2 The temperature setting range from 18°C to 32°C; and the indoor air temperature sensor working range from 15°C to 33°C.

1.3 Indoor air volume setting:

| RPM | High | Medium | Low |
|----------|--|--------|-----|
| Heat | Refer to the parameter list (Heat Pump) | | |
| Cooling | Refer to the parameter list | | |
| Dry | According to the Dry mode | | |
| Fan only | the RPM same as Heating mode | | |

1.4 Indoor louver swing control

1.5 Overcooling protection control (**only available for Cooling**)

1.6 Anti-cold air system (**only available for Heat Pump**)

1.7 Auto-Defrost (**only available for Heat Pump**)

1.8 Overheating protection of heater exchange (**only available for Heat Pump**)

1.9 3 minutes delay protection for compressor

1.10 Timer operation

1.11 Self-diagnosis

1.12 Control panel display

1.13 Auto-restart after blackout

1.14 Error inquiry

1.15 Dimmer

1.16 Super

1.17 Room temperature display (**optional**)

2. General protection system

General protection system means the appliance would be protected when overloading, high temperature and high pressure occurs during the each operation mode(Cooling, Heat, Dry and the smart mode). If the appliance works under some special mode, the specific protection system

5. CONTROL MODE

would be triggered respectively.

2.1 Compressor delay protection

The compressor is ceased for 3 minutes to balance the pressure in the refrigeration cycle in order to protect the compressor.(This protection include the Cooling or the exchange Dry and Heat mode, but the unit has no this function after it restored. If the unit restored and turn ON, then this protection would be functioned.)

2.2 Fan motor(PG motor) protection

When the Fan motor(PG motor) receive the signal, it will be stopped after it detected the speed less than 200RPM, at the same time, the error code, "E4", will be displayed.

3. Control panel and display

3. 1 Digital Tube display

3. 2 LED indicator description

3.2.1 Running Indicator:

It lights in the running operation and flashing in the Defrost mode.(except the Sleep and Dimmer mode)

3.2.2 Timer Indicator:

It lights in the Timer ON condition. (except the Sleep and Dimmer mode)

3.2.3 Sleep Indicator

It lights in the Sleep mode. (except the Dimmer mode)

3.2.4 Compressor Indicator:

It lights up when the compressor is on.

3.2.5 Signal Receptor.

3. 3 emergency button :

The operation mode, air volume and temperature setting will recovery as the last time setting when press the emergency button in the stand-by state. If the appliance connects to power source and the Emergency button press, it will operate in the Auto-mode, if the Emergency button select again, the appliance will turn in stand-by sate.

4. Operation Mode

The appliance could be operated under Heat, Cooling, Dry and Fan Only mode,

and also the super, the smart operation mode

4.1 Fan Only Mode Operation

During the appliance run in this mode, the compressor and outdoor fan stop, the indoor fan operate under the pre-setting of air volume, and the louver swing, and the indoor fan speed same as the Heating Mode.

4.2 Cooling Mode Operation

5. CONTROL MODE

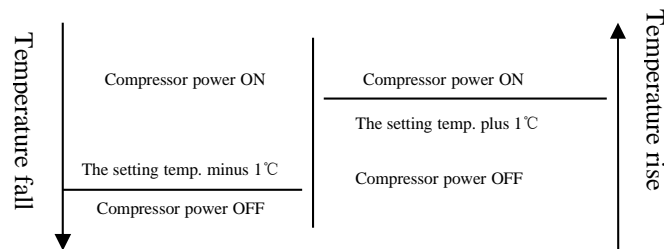
4.2.1 This mode could be selected by the remote control

4.2.2 The 4-way reversing valve will be stopped under this mode.

4.2.3 During this mode, the temperature setting, air volume and air flow direction could be adjusted.

During the appliance run in normal condition, the room's temperature can be adjusted by 1°C up and down base on the setting temperature, the compressor operation diagram is shown as following.

When the temperature dropped, the compressor will be power on.



4.2.4 Overcooling protection control

When the indoor coil pipe temperature is lower than 3°C and higher than -7°C *during Cooling or Dry operation* for 3 min, indoor fan speed turns to high and outdoor fan turn off. After the temperature recovers to 7°C, the air conditioner turn to run in normal condition. When the indoor coil pipe temperature falls below -7°C *during COOLING or DRY operation* for 3 minutes, the compressor and outdoor fan motor turn OFF. When the indoor pipe temperature recovers to 5°C *and the compressor has been stopped for 3 minutes*, the compressor and outdoor fan motor will be turned ON.

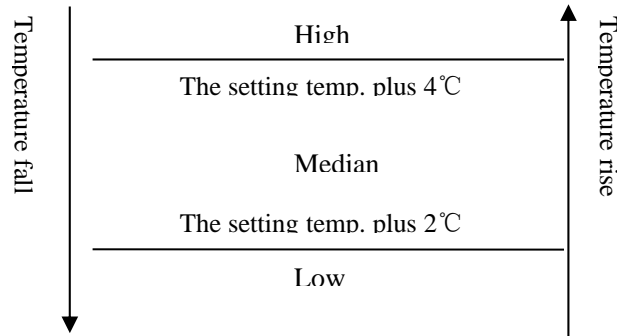
4.2.5 Indoor fan operation

(1) When room temperature is higher than 35°C, the compressor is stopped for 1 min then turn on, (when the compressor ceased for 3 min protection, the indoor fan should be turn on immediately)

(2) When the indoor fan keep in running condition, this operation state could be controlled by the remote control with High, Median, Low and Automatic setting.

(3) When the appliance is set Automatic condition in the Cool mode for the first time, the fan speed will run at Low setting. After that, temperature and fan speed is shown as following.

5. CONTROL MODE



When the difference between the setting temperature and the room temperature equal to 2°C or 4°C, the indoor fan speed will keep in current speed.

4.2.6 Air flow direction control

The louver is derived by a step motor, and it swings the horizontal louver automatically. Press the SWING button to swing or stop the louver.

During the louver swing in normal operation, the current position will be stored. When the appliance turn off and louver swing automatically to the default position, it will position at the stored position plus 5°.

4.3 Dry mode operation

When the appliance run into the Dry mode, it starts as Cooling mode operation. If 3 minutes elapses after starting, the appliance will sense the intake air temperature and minus 2°C as the setting temperature and operate in Cooling mode, and the indoor motor speed is low. During this operation, the air flow direction could be set but the air volume is unavailable, and the setting temperature can only be adjusted by 2°C up and down(the minimum accuracy is 1°C).

When the appliance run in this mode, it will not influenced by under the 18°C limit.

4.4 Heating mode operation

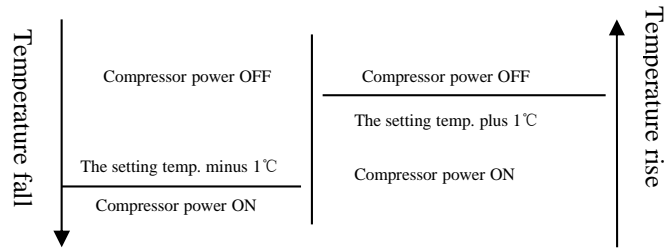
4.4.1 The 4-way reversing valve is turn ON under the Heating mode.

4.4.2 During this mode operation, the setting temperature and air volume can be adjusted, and the air flow direction could be swang.

When the appliance run in normal condition, the room's temperature can only be adjusted by 1°C up and down base on the setting temperature, the compressor operation diagram is shown as following.

When the temperature rose, the compressor will be power ON.

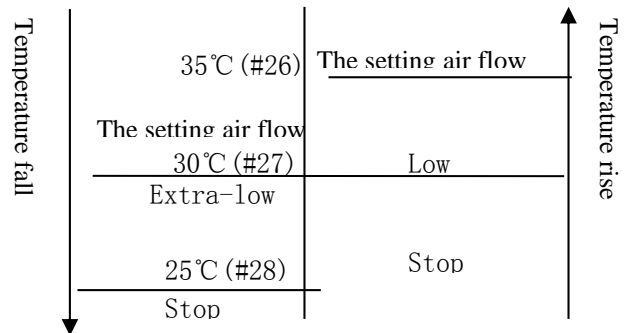
5. CONTROL MODE



4.4.3 Indoor fan motor operation

Anti-cold air system:

When the appliance runs in Heat mode condition, the indoor fan motor operation is shown as following to prevent the cooling air from coming out during the appliance operation.



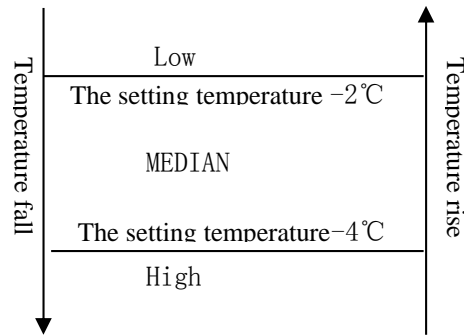
When the appliance turns in the anti-cold air system in the Extra-LOW (Tapped motor set in LOW, sic passim) during the compressor operation, the louver swings to the Cool air protection position, the louver recovers to the original position after the air volume change to LOW. When the room temperature reaches the setting temperature, the compressor will be turned off, and the air flow changes to LOW, the louver swings to the Cool air protective position to prevent the air drop into human body directly; when the indoor pipe coil temperature drops continuously, it will turn in the Cooling air protective system in the Extra-LOW or stop the fan motor.

The indoor fan motor is only controlled by the signal of indoor pipe coil temperature, no matter the compressor turns ON/OFF, even the appliance turns in Heat mode at first time.

4.4.4 The indoor fan motor will operate according to the different setting (High, Median, Low and Automatic) by the remote control, but the anti-cold air system is prior.

When the appliance runs in the Heat mode with the Automatic setting at first time, the fan speed will be in the LOW setting, and the operation diagram is shown as following

5. CONTROL MODE



When the difference between the setting temperature and the room temperature equal to 2°C or 4°C , the indoor fan speed will keep in current speed.

4.4.5 Overheating protection control

When overloading occurs during the heating operation, this system controls the outdoor fan motor and compressor according to the indoor coil pipe temperature to prevent the overloading of the compressor and restrict the pipe pressure to rise up. When the indoor pipe temperature exceeds 53°C , the outdoor fan motor will be turned OFF, and when the indoor pipe temperature falls below 49°C , the outdoor fan motor recovers to ON; When the indoor pipe temperature exceeds 63°C , the appliance will be turned OFF with 4 beeps of buzzer and cannot recover automatically. At the same time, the error code, "E2", display.

4.4.6 Air flow direction control

The horizontal louver is controlled by a step motor, press the SWING button to swing or stop the louver.

During the louver run in normal operation, the current position will be stored. When the appliance turn off and louver swing automatically to the default position, it will position at the stored position plus 5° .

4.5 The smart control

When the appliance operates at the smart, the air flow direction can be adjusted.

(1) H/C appliance

a. When the setting temperature is 26°C , the appliance will be ran in the Cool if the room temperature exceeds 26°C .

b. When the room temperature exceeds 23°C , but below 26°C , it will be ran in the Dry mode(It will turn in Automatic setting After 3 min LOW air volume running.).

c. When the room temperature exceeds 21°C , but below 23°C , it will be operated in the Fan only, the air volume is set by LOW and the fan speed can be adjusted

d. When the room temperature is not more than 21°C , it will be operated in Heat mode, and the temperature is set to 22°C .

5. CONTROL MODE

(2) Cool only appliance

a. When the room temperature exceeds 26°C, it will be ran in Cool mode, and the temperature is set to 26°C.

b. When the room temperature exceeds 23°C, but not more than 26°C, it will be operated in the Dry mode.

c. When the room temperature is not more than 23°C, it will be operated in the Fan only, the air volume is set to LOW and the fan speed can be adjusted

After the appliance start the smart operation, the setting temperature can be adjusted 2°C (the min accuracy is 1°C) up and down base on the automatic temperature setting, also the presetting temperature of PCB circuit.

In case of the specific operation selected, it could be re-select the other modes after the compressor ceased for 5 min or the setting temperature changed.

4.6 Super

Whether the appliance is in operation or stand-by, when the "Super" signal is received from the remote control, it will operated at the Cool mode and set the temperature at 18°C and fan speed setting is High.

5. Supplementary

5.1 Time mode operation

Non-real time of Timer with remote controls can be suit for the appliance.

5.1.1 Real time of Timer setting

(1) The max Timer ranges is 24 hours.

(2) Timer ON/OFF

(3) Timer ON/OFF can be set available in turn.

(4) The Timer accurate more than 97%

(5) The Timer can be adjusted by 1 min increase.

(6) The appliance can be set the ON-Timer and OFF-Timer in the same time, but no any timer setting indicated.

5.1.2 Non-Real time of Timer setting

(1) The max Timer ranges is 24 hours.

(2) Timer ON/OFF

(3) Timer ON/OFF can be set available in turn.

(4) The Timer accurate more than 97%

(5) The Timer can be adjusted by 0.5 hour increase.

(6) The OFF-Timer can be set when the appliance is in operation, the ON-timer can be set when the appliance is in suspension, and the Timer setting is display.

5. CONTROL MODE

5. 2 Sleep mode operation

(1) The Sleep mode can only be set during Cool, Heat and Dry mode.

(2) When the appliance runs in the Sleep mode, it will stop after 8 hours operation, then it will cancel the Sleep setting. When the appliance operates under the OFF-Timer setting condition, if the OFF-Timer setting is less than 8 hours, it will keep the Sleep mode till the OFF-Timer setting; if the OFF-Timer setting is more than 8 hours, it will cancel the OFF-Timer setting after the Sleep mode OFF.

(3) When the Sleep mode is selected with Cooling mode, if the room temperature is not less than 26°C, the setting temperature will not be adjusted, otherwise, the setting temperature will be raised by 1°C per hour, but the maximum setting temperature increase is 1°C.

(4) When the Sleep mode is selected with Heat mode, the setting temperature will be decreased by 1°C per hour during the successive 3 hours, but the maximum setting temperature decrease is 3°C.

(5) When the appliance operates with Sleep mode, the indoor fan runs in the LOW setting, and the air flow direction is the same as the last setting and the temperature and air flow direction can be adjusted by user. The Running indicator will be flashed 10 times per 1 Hz frequency, then all the indicators turn OFF except the Sleep light after 5 minutes elapse. Those indicators will be recovered when the temperature or Time setting is adjusted, after the setting, the indicators will be lit for 10 seconds, then turn OFF except the Sleep light.

5.3 Self-diagnosis

The room temperature and indoor pipe temperature are the important factors for the appliance operation, when the room temperature sensor is broken or shorted is detected, it will set the room temperature at 23°C, and the compressor will be cycled with power ON in 20 minutes and OFF in 3 minutes.

When the temperature sensor of the indoor pipe coil temperature is broken or shorted is detected, it will set the indoor pipe temperature at 35°C, and the compressor will be cycled power ON in 20 minutes and OFF in 3 minutes. If the appliance runs in Heat mode, it will be cycled Defrost in 8 minutes when the total run time of compressor exceeds 50 minutes.

When the failure of the room temperature and indoor pipe temperature sensor occurs, the compressor will be cycled with Power ON 20 minutes successively and OFF 3 minutes. When the indoor pipe failure occurs, the protection will be cancelled and the Defrost will be operated as aforesaid.

5. 4 Dimmer

The DIMMER button is pressed to turn ON/OFF all display. When the DIMMER signal is received for the first time, the appliance will turn OFF all the display (include the Sleep and Filter cleaning light), and any of signal from the remote control is received, the DIMMER is turned OFF, all the display recovery.

The DIMMER is available under the stand-by state.

After the appliance runs under the DIMMER, Power ON/OFF or Filter

5. CONTROL MODE

Monitor could be available with respective button, but the DIMMER remain on.

5. 5 Room temperature display (optional)

When the appliance operates with the Room Temperature Display, the room temperature can be displayed in any mode except Sleep and Dimmer mode. It will display the setting temperature in 10 sec after receive any signal from remote control, then display the room temperature. (Only is the Delay time(Setting Timer) display with the Non-real time condition, include the stand-by state)

Remark: The Room Temperature Display can be available after the EEPROM parameter selection.

5. 6 Auto-restart after blackout

When the appliance loses power during the normal operation, it will recover with the last setting such as operation mode and temperature setting, except the air flow direction after power ON.

When the appliance run in normal operation, the Emergent button is press and hold for over 1.5 sec, and the buzzer beep 2 times, the Auto-restart after blackout is available.

When the appliance run in normal operation, the Emergent button is press and hold for over 1.5 sec, and the buzzer beep 1 times, the Auto-restart after blackout is cancel.

5.7 Defrosting mode:

Defrosting starts when it meet one of the following condition 1, or 2, or 3, or 4:

1. Need to meet 1.1 and 1.2

1.1 The indoor coil temperature below 40°C last for 2min and the compressor has worked for 50 min;

1.2 After the compressor has worked for 8min, the indoor coil temperature has dropped more than 5°C based on the second max point;

2. Need to meet 2.1 and 2.2

2.1 The indoor coil temperature below 40°C last for 2min and the compressor has worked for 80 min;

2.2 After the compressor has worked for 8min, the indoor coil temperature has dropped more than 4°C based on the second point;

3. Need to meet 3.1 and 3.2

3.1 The indoor coil temperature below 40°C last for 2min and the compressor has worked for 120 min;

3.2 After the compressor has worked for 8min, the indoor coil temperature has dropped more than 3°C based on the second point;

4. Need to meet 4.1

4.1 The necessary condition is the compressor has worked exceed

5. CONTROL MODE

50mins, during this period, if the indoor coil temperature below 28°C once happened after the compressor has worked last for 20mins.

Defrosting procedure is like this:

1. Defrost start;
2. the 4 way valve will not be electrified during defrosting;
3. the outdoor fan motor will turn off during defrosting;
4. Compressor operates all long during defrosting;
5. The the outdoor fan motor will turn on when defrost finish;
6. The 4 way valve will be electrified after the outdoor fan motor turns on for 10 sec

Please note: The defrost time will be adjusted by the actually..

6.TROUBLE SHOOTING:

6.1. The LED of indoor display board will show the error sequence automatically when the unit has the following trouble:

| Error code | Remark: ★Light ○ Flash x OFF | | |
|------------|--|--------|--|
| | Content | Remark | The root cause is may be one of the following |
| E2 | When the evaporator pipe temperature is higher than 63 °C, the error code will display | | a. It is normally for protection, When the indoor pipe temperature between $53^{\circ}\text{C} < T < 63^{\circ}\text{C}$, the outdoor fan motor will stop running. When the indoor coil temperature is higher than 63°C , the error code will display. After the indoor pipe temperature is lower than 49°C , the air conditioner will restart normally. b. The indoor coil temperature sensor is loose; c. The indoor coil temperature sensor is failure; d. The indoor control board is failure. |
| E4 | When the indoor fan speed is lower than 200 rpm, the error code will display | | a. There are something block the indoor fan motor; b. The fan motor cord connect loose; c. The fan motor is failure; d. The indoor control board is failure |
| EA | the error code will display when the communication between display board and control board have in trouble | | a. The connection between the display board and control board is loose; b. The indoor control board is failure. c. The wiring of the display board is failure. |

6.2. The Error inquiry should be operate in the stand-by state, keep 5 sec press and hold on the Emergency button, the error code will be displayed in 10 sec, then the indoor unit display will recovery to the original. If two or more malfunction happened, each error code will be displayed alternatively. If the appliance could save information under no power condition, then the error code can be inquired as aforesaid with stand-by state after power resume.

NOTE: If the troubleshooting inquiry display by 7-segment tube, then the error code will be displayed, otherwise only the LED of the display board can show.

| Error code | Remark: ★Light ○ Flash x OFF | | |
|------------|---|-----------|--|
| | Content | Remark | The root cause is may be one of the following |
| 1 | The failure for temperature sensor of outdoor coil | Heat pump | a. The outdoor temperature sensor loose; b. The outdoor temperature sensor is failure; c. The indoor control board is failure |
| 33 | The failure for temperature sensor of indoor room | | a. The indoor room temperature sensor loose; b. The indoor room temperature sensor is failure; c. The indoor control board is failure. |
| 34 | The failure for temperature sensor of indoor coil temperature | | a. The indoor coil temperature sensor loose; b. The indoor coil temperature sensor is failure; c. The indoor control board is failure. |

6.TROUBLE SHOOTING:

| | | | |
|----|---|--|--|
| 38 | Indoor EEPROM failure | | <ul style="list-style-type: none"> a. The EEPROM chip loose; b. The indoor control board is failure |
| 39 | Indoor fan motor run abnormally | | <ul style="list-style-type: none"> a. There are something block the indoor fan motor; b. The fan motor cord connect loose; c. The fan motor is failure; d. The indoor control board is failure |
| 41 | The failure for Indoor grounding protective | | The indoor control board is failure |
| 42 | Overcooling protection | | <ul style="list-style-type: none"> a. It is normally for protection, When the indoor pipe temperature below $T < -1^{\circ}\text{C} (-7^{\circ}\text{C})$. Outdoor fan motor and compressor will stop running. When the Indoor pipe temperature is higher than $-1(-7^{\circ}\text{C})$, the unit will restart normally b. The indoor coil temperature sensor is loose; c. The indoor coil temperature sensor is failure; d. The indoor control board is failure. |
| 43 | Overheating protection | | <ul style="list-style-type: none"> a. It is normally for protection, When the indoor pipe temperature between $53^{\circ}\text{C} < T < 63^{\circ}\text{C}$, the outdoor fan motor will stop running. When the indoor coil temperature is higher than 63°C, the error code will display. After the indoor pipe temperature is lower than 49°C, the air conditioner will restart normally. b. The indoor coil temperature sensor is loose; c. The indoor coil temperature sensor is failure; d. The indoor control board is failure. |

The failure is detected when the room temperature sensor broken or shorted over 5 sec.

The failure is detected when the temperature sensor of heater exchange broken or shorted over 5 sec.

The failure is detected when each setting data is not match after the EEPROM self-check two times.

The failure is occur when the grounding signal is not detected after the appliance power ON.