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# **Hisense**

SPLIT TYPE AIR CONDITIONER

SERVICE MANUAL

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AS-12HR4SVTVC

Hisense Corporation

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**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****AS-12HR4SVTVC**

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

## 2. SPECIFICATIONS

## AS-12HR4SVTVC

### 2-1. Unit specifications

Model No.		AS-12HR4SVTVC
Type		H/P,ON/OFF
Ratings		
Cooling Capacity	Btu/h	12200
Heating Capacity	Btu/h	13600
Rated Input-Cooling	W	1115
Rated Input-Heating	W	1104
Moisture Removal	L/H.r	1.5
Air Circulation	m3/h Max	550
EER for Cooling	Btu/h.W, W/W	10.94, 3.21
COP for Heating	W/W	3.61
Energy Class	Cooling	A
Energy Class	Heatling	A
Refrigerant		R410a
Refrigerant charge volume	g	1080
Indoor Unit Noise Level	High(dB (A))	37
	Low(dB (A))	32
Outdoor Unit Noise Level	dB (A)	54
Power Supply		
Voltage, Frequency, Phase	V	220-240V~,50Hz,1P
Rated Current	Cooling (A)	5.3
	Heating (A)	5.1
LRA	A	28
System		
Compressor type		Rotary
Compressor Model No.		PA145X2C-4FT
Compressor MFG		TOSHIBA
Expansion Device		Capillary
Evaporator		Copper tube and Aluminum Fin
Condenser		Copper tube and Aluminum Fin
Connecting Pipe Diameter		
Liquid Pipe	inch	1/4
Gas Pipe	inch	1/2
Features		
Display on Front Panel		LED
LCD Wireless Remote Controller		Yes
Removable and washable Panel		Yes
Washable PP Filter		Yes
Active Charcoal Filter		Optional
Electrostatic Filter		Optional

## 2. SPECIFICATIONS

AS-12HR4SVTVC

HEPA Filter		Optional
LTC Filter		Optional
Catechin filter		Optional
Negative ion filter		Optional
Photic Catalyst filter		Optional
Vitamin-C filter		Optional
24 Hours Timer		Yes
3 Speed and Auto Indoor Fan Control		Yes
Vertical Auto Swing Louver		Yes
Manual Adjustable Horizontal Swing Louver		Yes
Sleep Operation		Yes
Smart Function		Yes
Super Function		Yes
Compressor Indicator		Yes
Auto Restart		Yes
Other		
Net Dimensions WxHxD (mm)	Indoor Unit	818x270x192
	Outdoor Unit	715x482x240
Net Weight (Kg)	Indoor Unit	10
	Outdoor Unit	32
Packing Dimensions WxHxD (mm)	Indoor Unit	910X380X285
	Outdoor Unit	844x531x366
Gross Weight (Kg)	Indoor Unit	12
	Outdoor Unit	35
Loading Capacity (20'/40'/40'HC )		106/230/255
Approvals		CE, WEEE,RoHS

NOTE :Test conditions:

Cooling : Indoor: DB27℃/ WB19℃ Outdoor: DB35℃/ WB24℃

Heating: Indoor: DB20℃/ WB15℃ Outdoor: DB7℃/ WB 6℃

## 2-2. Major component specifications

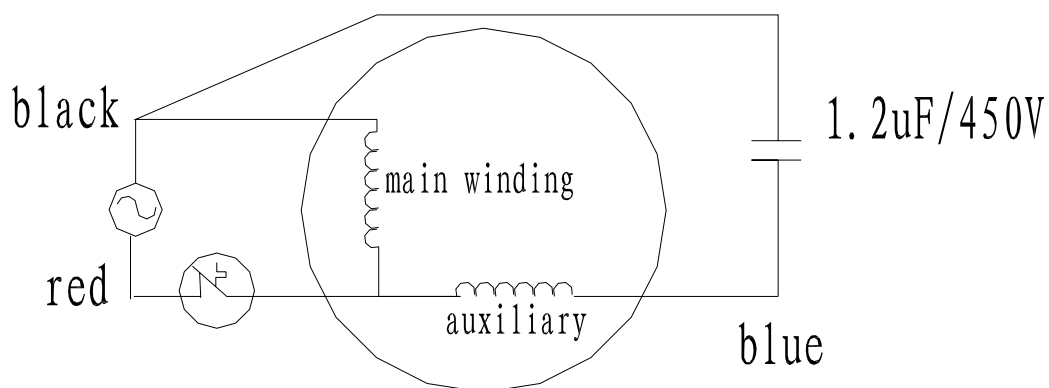
### 2-2-1.INDOOR FAN MOTOR

ELECTRIC PERFORMANCE	PARAMETER
Motor model	DG13G1-05
Rated power source	208V~240V; 50Hz~60Hz
Poles	4
Rated load output(W)	12W
Ambient temperature(℃)	-5℃~+43℃.

## 2. SPECIFICATIONS

AS-12HR4SVTVC

### WIRING DIAGRAM



90° C ± 5° C aluminium shell (thermostat)

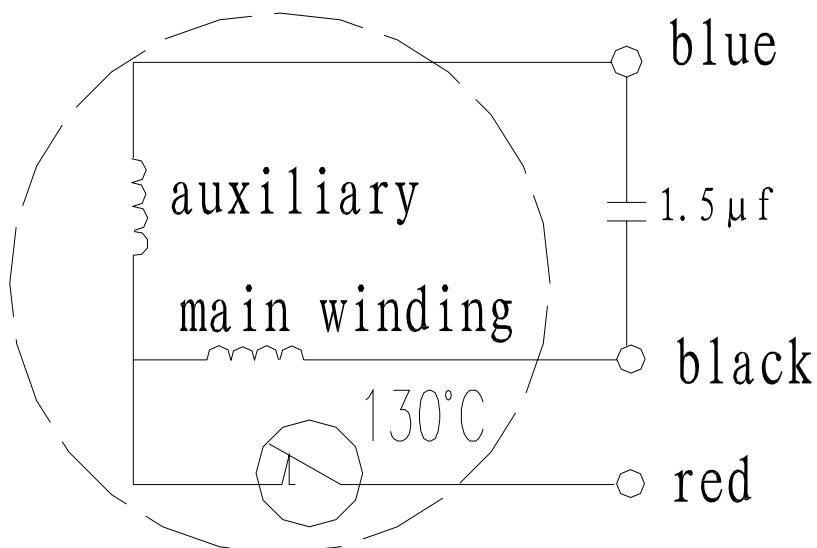
120° C ± 5° C plastic shell (thermostat)

130° C ± 5° C iron shell (thermostat)

### 2-2-2 OUTDOOR FAN MOTOR

ELECTRIC PERFORMANCE	PARAMETER
Motor model	+DG13Z1-10
Rated power source	208~240V 50Hz
Poles	----
Rated load output(W)	25W
Ambient temperature(°C)	-5°C ~ +43°C.

### WIRING DIAGRAM



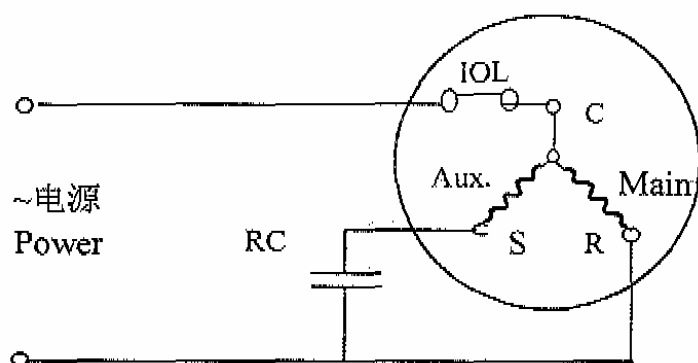
## 2. SPECIFICATIONS

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### 2-2-3. COMPRESSOR

ELECTRIC PERFORMANCE		PARAMETER
Compressor model		PA145X2C-4FT
Compressor type		Rotary
Motor	Motor type.	PSC
	Winding resistance (at 20℃)	Main:2.31 $\Omega$ $\pm$ 5%, aux:3.23 $\Omega$ $\pm$ 5%
	Running capacitor	35uF/450V
Number of cylinder		1
Oil type		RB68AF/T68/A68tf
Oil charge (cc)		480
Input power(W)		1195W/1235W (+5%)
Current (A)		5.52A/5.34A (+5%)
Ambient temperature(℃)		-5℃ $\sim$ +43℃.

### WIRING DIAGRAM



## 2-3. Other component specifications

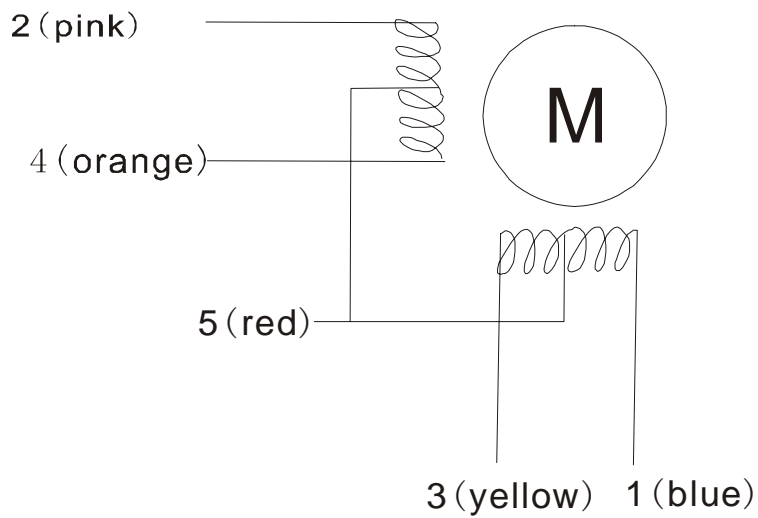
### 2-3-1. LOUVER MOTOR

ELECTRIC PERFORMANCE	PARAMETER
Stepper Motor model	DG13B1-09
Voltage(DC)	12V
Number of phase	4
Drive mode	1-2 phase excitation unipolar drive
Resistance per phase	200 $\Omega$ $\pm$ 7%
Relative humidity(RH)	45% $\sim$ 85%
Temperature range(℃)	-10℃ $\sim$ +40℃.

## 2. SPECIFICATIONS

AS-12HR4SVTVC

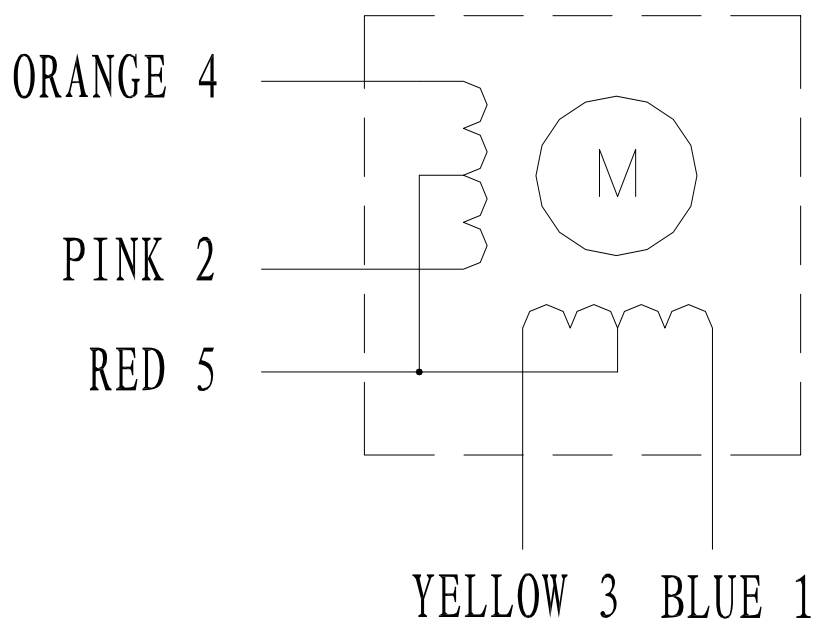
### WIRING DIAGRAM



### 2-3-2. PANEL MOTOR

ELECTRIC PERFORMANCE	PARAMETER
Stepper Motor model	DG13B3-02
Voltage(DC)	12V
Number of phase	4
Drive mode	1-2 phase excitation unipolar drive
Resistance per phase	90 $\Omega$ $\pm$ 7%
Relative humidity(RH)	45%~85%
Temperature range( $^{\circ}$ C)	-10 $^{\circ}$ C~+40 $^{\circ}$ C.

### WIRING DIAGRAM





**1. How to choose an air conditioner:**

- a. Choice for reference: 150-170W/m<sup>2</sup> for average rooms;
- b. Choice for reference: 160-200W/m<sup>2</sup> for small size offices;
- c. Choice for reference: 220-350W/m<sup>2</sup> for restaurants;
- d. Choice for reference: 200-300W/m<sup>2</sup> for entertaining venues;
- e. Choice for reference: 220-280W/m<sup>2</sup> for the top floor.

Note: 1W = 3.412btu.

**2. Indoor Unit:**

For indoor unit installation, the distance between its top and the ceiling shall not be less than 10 cm -20 cm, and the distance from the ground should be between 2m to 2.6m. Also the wallboard must be smooth and straight, with its supporting force of not less than 60 kg.

The location for installing the indoor unit shall be far away from heat source, the space between it and the door or window should exceed 0.6m

**3. Outdoor Unit:**

The air conditioner outdoor unit should not occupy public sidewalks, the distance between the mounting bracket installed along the road (on condition that the mounting bracket does not affect the public access, it can be installed horizontally) and the ground must exceed 2.5m. Also we shall remember that: a. the air flow must run freely. b. we should protect famous ancient buildings during installation. c. the installation does not affect the traffic.

The distance between air outlet of outdoor unit and the opposite object should be more than 1 meter, otherwise the machine would stop running because of overload by heat yield failure.

If the outdoor unit was opposite the resident's door or window, you should install the machine as far as possible away from the adjacent doors windows and plants, and the distance shall not be less than the following values: for the rated cooling capacity not more than 4.5KW, the distance should be 3m.; for the rated cooling capacity more than 4.5KW, the distance should be 4m.

It should remember to avoid installing at places where the natural environment is harsh, such as heavy fumes and wind, direct sunlight or high-temperature and heat, together with the place where children easily reach.

**4. The Unit:**

When installing the air conditioner, the outdoor unit should be below the indoor unit so as to facilitate circle of refrigerant and refrigeration oil .

The height difference between wall mounted indoor unit and the outdoor unit is generally not more than 5 meters.

The connection pipe can't exceed 5 meters, and the longest is 10 meters. (2) when the length exceeds 5 meters, 15g fluoride is required to be added for each exceeding 1m.

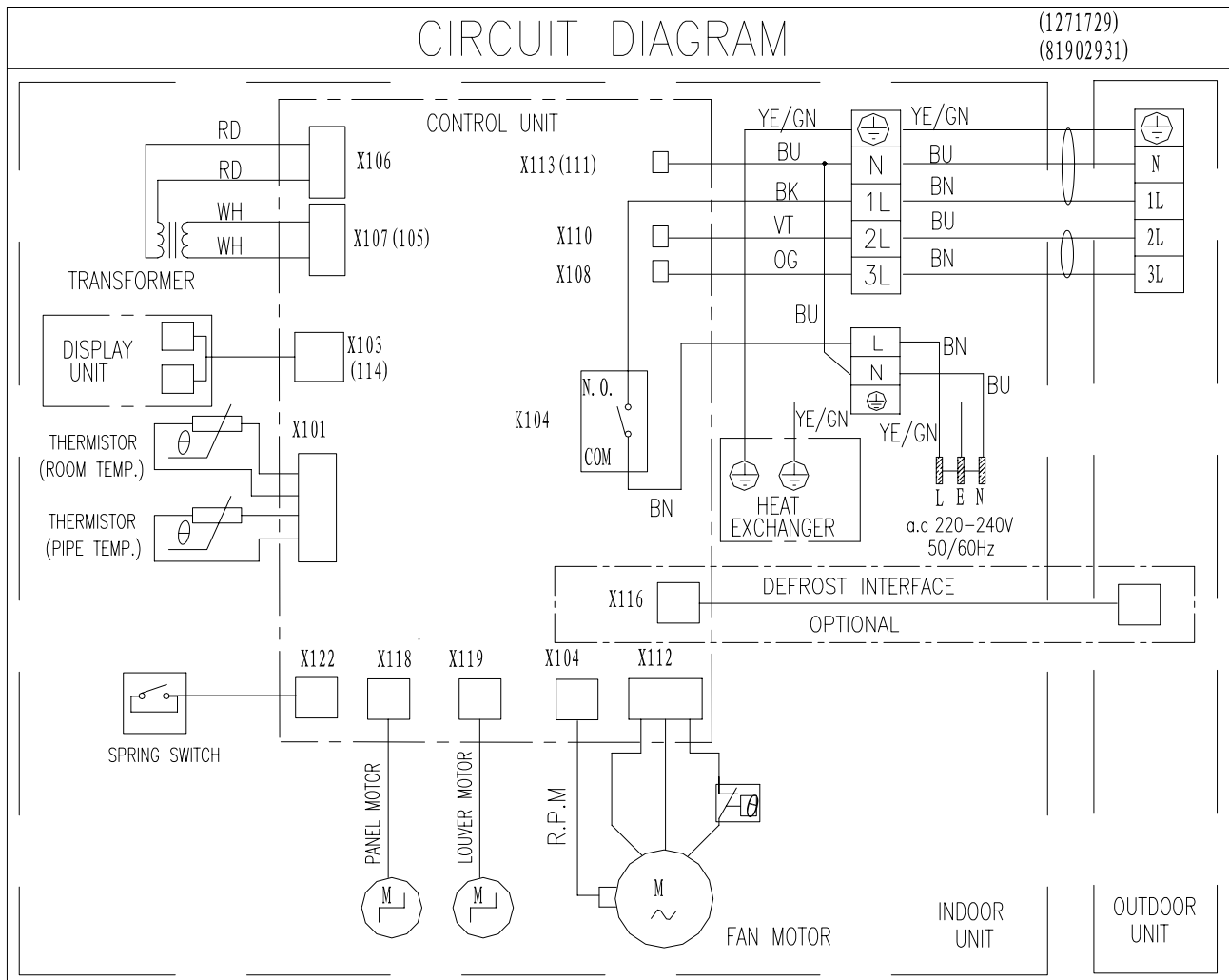
## 4. ELECTRICAL DATA

AS-12HR4SVTVC

### 4-1. Electrical wiring diagrams

#### 4-1-1. INDOOR

##### 4-1-1 AS-12HR4SVTVC

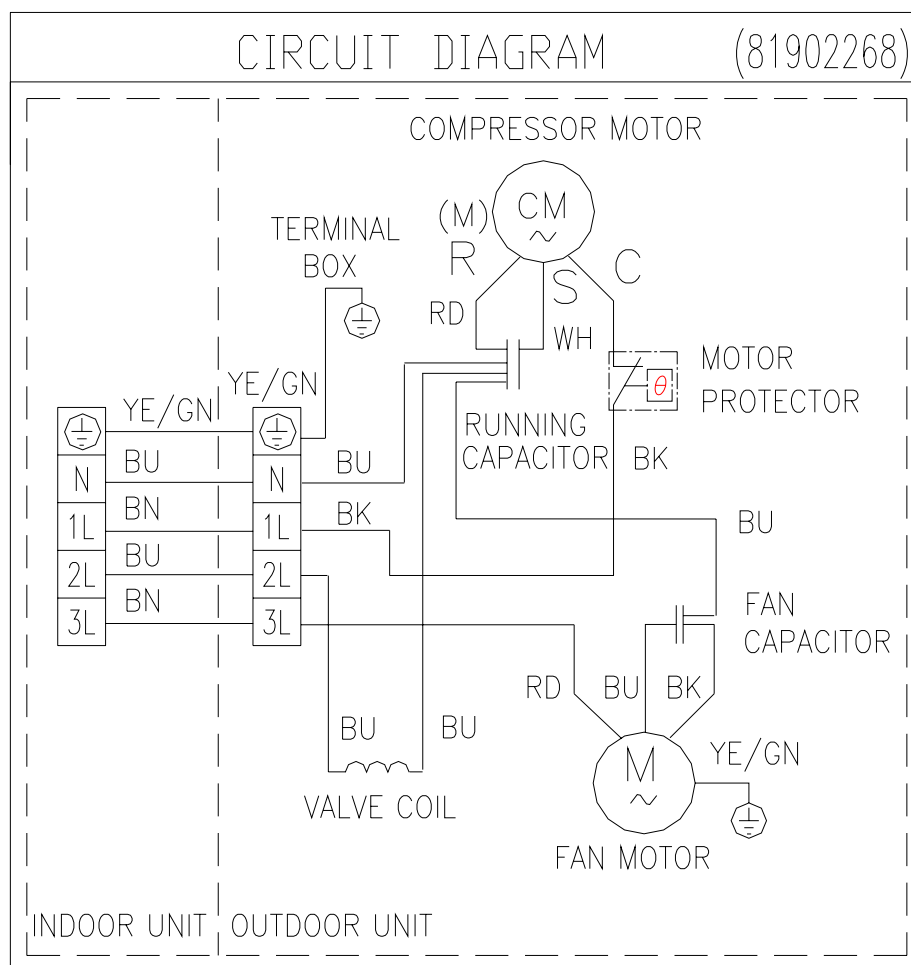


## 4. ELECTRICAL DATA

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### 4-1-2. OUTDOOR

#### 4-1-2-1. AS-12HR4SVTVC



### 4-2-1. THE PARAMETER OF SENSOR:

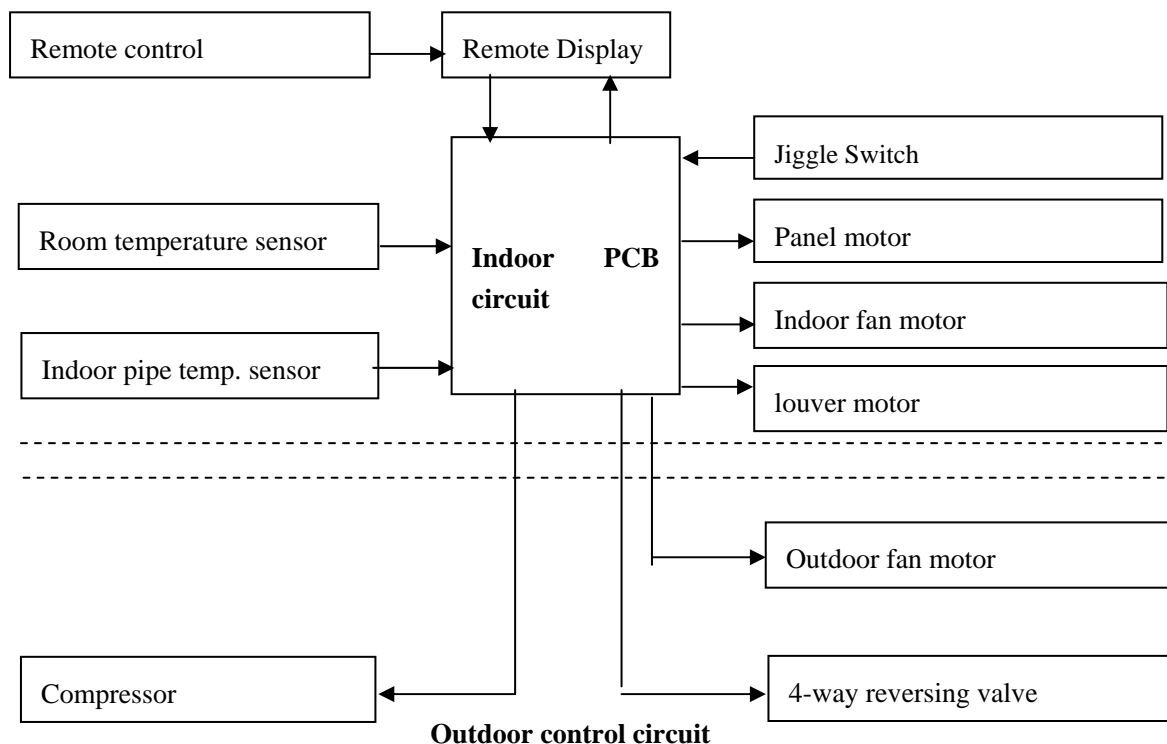
#### 1. THE PARAMETER OF THE COIL AND INDOOR AND OUTDOOR SENSOR: ( $R_0=15K\pm2\%$ )

T(°C)	R(KΩ)	V(v)	A/D
-20	152.5	4.5522388	E8
-19	143.9	4.528005	E7
-18	135.8	4.5026525	E6
-17	128.3	4.4766225	E4
-16	121.1	4.4489346	E3
-15	114.5	4.4208494	E1
-14	108.2	4.3912338	E0
-13	102.3	4.3606138	DE
-12	96.73	4.3287389	DD
-11	91.51	4.2958408	DB
-10	86	4.2574257	D9
-9	81.97	4.2265649	D8
-8	77.62	4.1902397	D6
-7	73.52	4.1527338	D4
-6	69.05	4.107674	D1

T(°C)	R(KΩ)	V(v)	A/D
30	11.99	2.221193	71
31	11.47	2.1666037	6E
32	10.98	2.113164	6C
33	10.51	2.0599765	69
34	10.06	2.0071828	66
35	9.634	1.9554275	64
36	9.229	1.9045359	61
37	8.842	1.8542907	5F
38	8.474	1.8049757	5C
39	8.123	1.7564762	5A
40	7.789	1.7089385	57
41	7.47	1.6622163	55
42	7.165	1.6162869	52
43	6.875	1.5714286	50
44	6.597	1.5272955	4E

4. ELECTRICAL DATA				AS-12HR4SVTVC			
-5	66.01	4.0741884	D0	45	6.333	1.4843201	4C
-4	62.58	4.033256	CE	46	6.08	1.4421252	4A
-3	58.34	3.9773657	CB	47	5.838	1.4008062	47
-2	56.29	3.947959	C9	48	5.608	1.3606366	45
-1	53.41	3.9036691	C7	49	5.387	1.3211851	43
0	50.69	3.8582737	C5	50	5.177	1.2828964	41
1	48.12	3.8117871	C2	51	4.976	1.2454946	40
2	45.7	3.7644152	C0	52	4.783	1.2088662	3E
3	43.41	3.7159733	BE	53	4.599	1.1732741	3C
4	41.25	3.6666667	BB	54	4.423	1.1385986	3A
5	39.2	3.6162362	B8	55	4.255	1.1049078	38
6	37.27	3.5651425	B6	56	4.093	1.0718588	37
7	35.44	3.5130849	B3	57	3.939	1.0399176	35
8	33.71	3.4602751	B0	58	3.792	1.00894	33
9	32.08	3.4069669	AE	59	3.65	0.9785523	32
10	30.63	3.3563445	AB	60	3.515	0.9492304	30
11	29.06	3.2977758	A8	61	3.385	0.9205874	2F
12	27.68	3.2427366	A5	62	3.261	0.8928865	2E
13	26.36	3.1866538	A3	63	3.142	0.8659464	2C
14	25.12	3.1306082	A0	64	3.028	0.8398047	2B
15	23.84	3.069001	9D	65	2.918	0.814265	2A
16	22.82	3.0169223	9A	66	2.813	0.7895919	28
17	21.76	2.9597388	97	67	2.713	0.7658217	27
18	20.75	2.9020979	94	68	2.618	0.7429901	26
19	19.79	2.8442081	91	69	2.524	0.7201552	25
20	18.88	2.7863046	8E	70	2.436	0.6985547	24
21	18.03	2.729337	8B	71	2.36	0.6797235	23
22	17.21	2.6715306	88	72	2.268	0.656706	21
23	16.44	2.6145038	85	73	2.189	0.6367444	20
24	15.7	2.5570033	82	74	2.114	0.617623	1F
<b>25</b>	<b>15</b>	<b>2.5</b>	<b>80</b>	75	2.041	0.5988498	1F
26	14.33	2.4428912	7D	76	1.971	0.5806965	1E
27	13.7	2.3867596	7A	77	1.905	0.5634428	1D
28	13.1	2.3309609	77	78	1.84	0.5463183	1C
29	12.53	2.2756992	74	79	1.778	0.5298605	1B
				80	1.719	0.5140858	1A

## 1. System control diagram



## 2. Function Description

- a) Operation Mode: Cooling, Heat, Dry, Fan only.
- b) Intake air temperature sense, Indoor coil pipe temperature sensor .
- c) Indoor Fan mode Selector: Auto, High, Medium, Low.
- d) Air flow direction control
- e) Display function
- f) Panel switch function
- g) 4-way reversing valve control
- h) Compressor ON/OFF control
- i) Outdoor fan motor control
- j) Error inquiry
- k) Ceased delay protection for compressor
- l) Room temperature display(optional)

## 3. System Signal Input

Remote control signal, room temperature signal, coil pipe temperature signal, “ON/OFF” signal, Jiggle Switch signal.

## 4. System Signal Output

1.1H/C split unit: louver motor(step motor), panel motor(step motor), indoor fan

motor(PG regulating motor or tapped regulating motor), 7-segment tube and LED display, Buzzer, Outdoor fan motor, Coil of the 4-way reversing valve, Compressor(or AC contactor).

1.2 Cooling only split unit: louver motor(step motor), panel motor(step motor), indoor fan motor(PG regulating motor or tapped regulating motor), 7-segment tube and LED display, Buzzer, Outdoor fan motor, Compressor( or AC contactor).

## 5. Operation Mode

### 5.1 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, Delay time of Real Time Setting(High end) and 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 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 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 smart, 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		
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 Display function

1.13 Panel switch function

1.14 Auto-restart after blackout

1.15 Error inquiry

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 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.

### 3. Display function

Running status indication light and dual-bit digital tube should be lighted after the opening of panel, Strip lights will turn bright and dark softly in a certain frequency(concrete frequency will change freely according to the effect).

Compressor lights(blue, normal brightness): wlii be lighted when compressor is running. Under special mode,they will follow the corresponding pattern rules.

Run light(blue, normal brightness): wlii be lighted when the machine is in the running state . Under special mode, they will follow the corresponding pattern rules.

Timer light(blue, normal brightness): wlii be lighted when the machine is in the timer state . Under special mode, they will follow the corresponding pattern rules.

Sleep light(blue, normal brightness): wlii be lighted when the machine is in the sleep state .

Decorative strip lights (blue, high brightness): lighted when the machine is open, and change from bright to dark, and then from dark to bright, repeatedly change gradually.

Digital display (blue, normal brightness): LED tubes will shown set temperature when running, and shown “- -” on dehumidification mode and air distribution mode . When on timer mode, the LED tubes will show the set temperature for 10 seconds and then show the time(without the real-time timier state).

### 4. Panel Switch Function

When air-conditioning is on power,the panel is reset through the feedback signal of jiggle switch. If the signal sent by jiggle switch is disconnect signal,it means the panel is open, then close the panel;If the signal is jiggle switch closed signal , the panel is closed , the panel does not move.

When the air-conditioning is open,step motor of panel will open from 0° to the open-angle (VC is 80 ° temporary, VC2 is 103 ° temporary); When the air-conditioning is closed,the panel will reset to the closed state according to the closed angle (VC is 92 ° temporary, VC2 is 76 ° temporary), step motor of the panel stop immediately when the controller reads the closed signal of panel switch.

If the jiggle switch state have not changed after the panel starts move for 20 seconds,then the micro-switch will be identified damage,then the panel actions



according to the following rules:

After on power, the panel will reset (means closed) according to the closed angle, in open state the panel will open according to the open angle, closed state will according to the closed angle, the base is the closed angle. When the operation come back valid after on power, the status of the panel keeps the same as the status before power

## 5. Operation Mode

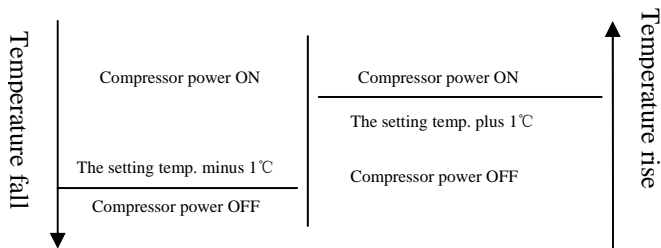
The appliance could be operated under Heat, Cooling, Dry and Fan Only mode, and also the super, smart operation mode

### 5.1 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.

### 5.2 Cooling Mode Operation

- 5.2.1 This mode could be selected by the remote control
  - 5.2.2 The 4-way reversing valve will be stopped under this mode.
  - 5.2.3 During this mode, the temperature setting, air volume and air flow direction could be adjusted.
- During the appliance run in normal condition, the compressor'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 dropped, the compressor will be power on.



### 5.2.4 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,

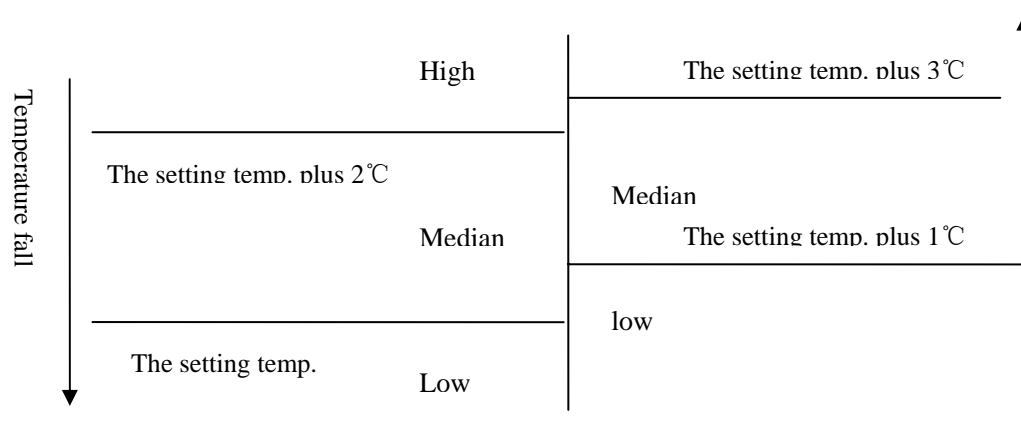
the compressor and outdoor fan motor turn OFF. When the indoor pipe temperature recovers to 5°C *and the compressor has been stopped for 3 minutes*, the compressor and outdoor fan motor will be turned ON.

## 5.2.5 Indoor fan operation

(1) When room temperature is higher than 35°C, the compressor is ceased 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.



## 5.2.6 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°.

## 5.3 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.

## 5.4 Heating mode operation

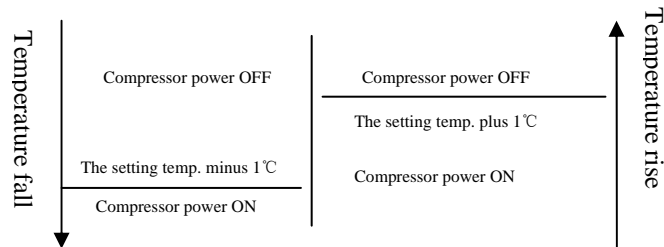
5.4.1 The 4-way reversing valve is turn ON under the Heating mode.

5.4.2 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 compressor' 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.

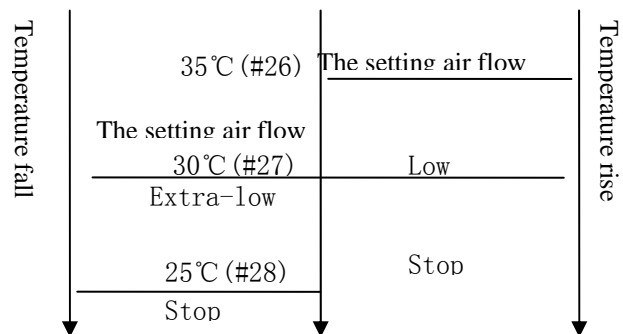
When the temperature rose, the compressor will be power ON.



#### 5.4.3 Indoor fan motor operation

Anti-cold air system

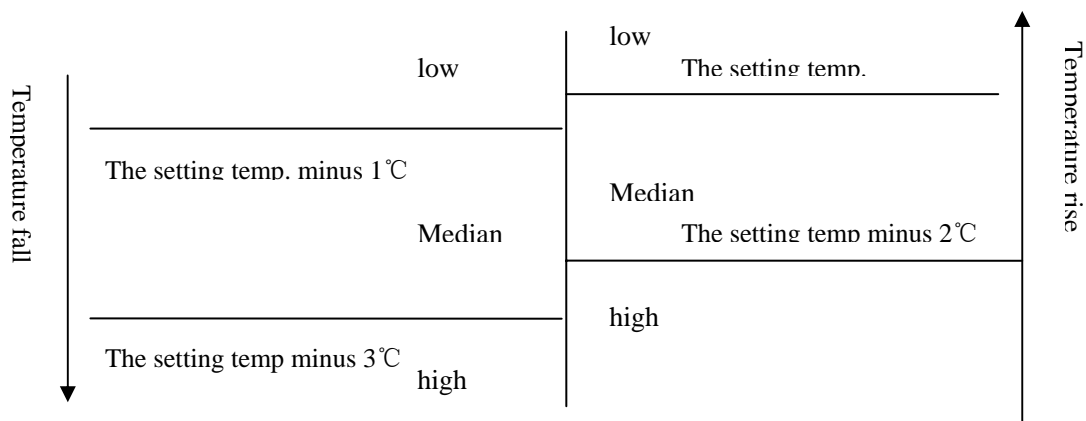
When the appliance run in Heat mode condition, the indoor fan motor operation is shown as following to prevent the cooling air come out during the appliance operation.



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

5.4.4 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 run 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



#### 5.4.5 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.

#### 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°.

#### 5.5 Smart control

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

##### (1) H/C appliance

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

##### (2) Cool only appliance

- When the room temperature exceeds 26°C, it will be ran in Cool mode, and the temperature is set to 22°C.
- 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 starts the smart operation, the setting temperature can be adjusted 2°C (the min accuracy is 1°C) up and down based 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.

#### 5.6 Super

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

## 6. Supplementary

### 6.1 Time mode operation

Real time of Timer with remote controls can be suitable 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.

### 6.2 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 max setting temperature raise 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 max 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 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 min elapse. Those indicators will be recovery when the temperature or Time setting is adjusted, after the setting, the indicators will be lit in 10 sec, then turn OFF except the Sleep light.

### 6.3 Self-diagnosis

The room temperature and indoor pipe temperature are the important factor for the appliance operation, when the room temperature sensor 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 min and OFF in 3 min.

When the temperature sensor of the indoor pipe coil temperature 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 min and OFF in 3 min. if the appliance run in Heat mode, it will be cycled Defrost in 8 min when the total run time of compressor exceed 50 min.

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

### 6.4 Error inquiry

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 control panel 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.

Error code: If the troubleshooting inquiry display by 7-segment tube, then the error code will be displayed, otherwise only the running light ON.

Error code	Power	Timer	Running	Sleep	Remark: ★: Light O: Flash ×: OFF	
	1	2	3	4	Content	Remark
1	×	O	×	×	The failure for temperature sensor of outdoor heater exchange	h/c
33	O	×	×	★	The failure for temperature sensor of indoor pipe coil	
34	O	×	★	×	The failure for temperature sensor of indoor heater exchange	
38	O	★	★	★	Indoor EEPROM failure	
39	O	×	★	★	Indoor fan motor failure	7,9,12,18K
41	★	★	×	★	The failure for Indoor grounding protective	
42	O	O	×	★	Overcooling protection	7,9=-1 12=-7

43	O	O	★	×	Overheating protection	
----	---	---	---	---	------------------------	--

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 EEPPOM self-check two times.

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

#### 6. 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 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.

#### 6. 6 Auto-restart after blackout

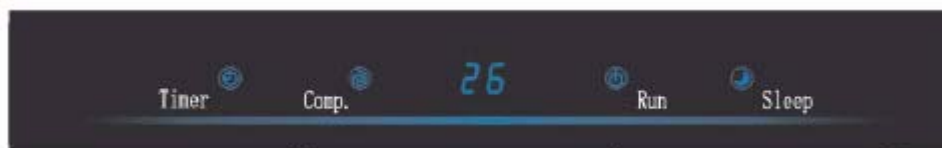
When the appliance loses power during the normal operation, it will recover with the last setting such as operation mode and temperature setting, except the air flow direction after power ON.

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.

## 6-1. Error codes

## 6-1-1.operating and display



## 6-1-2.Error codes:

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 control panel 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.

Error code: If the troubleshooting inquiry display by 7-segment tube, then the error code will be displayed, otherwise only the running light ON.

Error code	Power	Timer	Running	Sleep	Remark: ★: Light O: Flash ×: OFF	
	1	2	3	4	Content	Remark
1	×	O	×	×	The failure for temperature sensor of outdoor heater exchange	h/c
33	O	×	×	★	The failure for temperature sensor of indoor pipe coil	
34	O	×	★	×	The failure for temperature sensor of indoor heater exchange	
38	O	★	★	★	Indoor EEPROM failure	
39	O	×	★	★	Indoor fan motor failure	7,9,12,18K
41	★	★	×	★	The failure for Indoor grounding protective	
42	O	O	×	★	Overcooling protection	7,9=-1 12=-7
43	O	O	★	×	Overheating protection	

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 EEPPOM self-check two times.

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



## 6-2. TROUBLE SUSPENSION TABLE

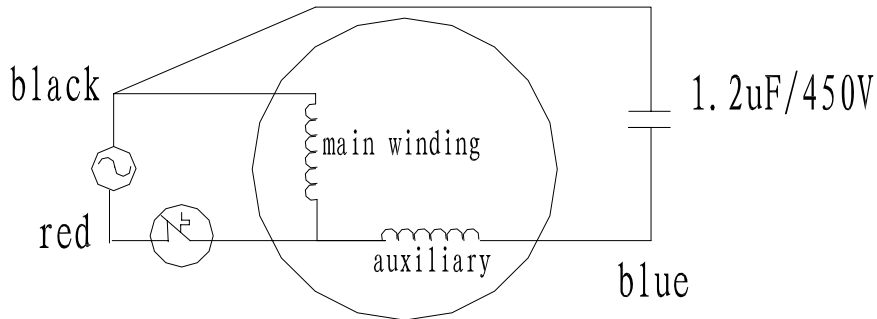
SYMPTON	PROBABLE CAUSE	CORRECTIVE ACTION
The RUN indicator (green) does not light up	The power source voltage is lower than 198V	Repair the power supply
	No voltage	Repair general wiring
	Correct voltage	Replace control P.C.B or display P.C.B
	The remote controller batteries are used up	Reload new batteries
The indoor fan does not function correctly	No voltage between indoor fan motor terminals	Replace the control P.C.B
	Indoor fan motor is broken	Replace indoor fan motor
The outdoor fan does not function correctly	No voltage between outdoor fan motor terminals on the indoor power P.C.B	Replace the control P.C.B
	No voltage between outdoor fan motor terminals on the outdoor unit	Check and repair electrical wiring between indoor and outdoor units
	Outdoor fan is blocked	Remove obstructions
	Outdoor fan motor is broken	Replace outdoor fan motor
	Outdoor fan motor capacitor is broken	Replace capacitor
The compressor does not start up	No voltage between compressor terminals on the indoor unit	Repair control P.C.B
	Low voltage between compressor terminals on the indoor unit	Repair control P.C.B
	No voltage between compressor terminals on the outdoor unit	Repair electrical wiring between indoor and outdoor units
	The running capacitor is broken	Replace running capacitor
	OLP of compressor trips	Wait for one hour or so
	Compressor winding shorted or broken	Replace compressor

## 7-1. Check parts unit

### 1. INDOOR FAN MOTOR

#### .MOTOR EXAMINE AND REPAIR

Circuit diagram



90° C ± 5° C aluminium shell (thermostat)

120° C ± 5° C plastic shell (thermostat)

130° C ± 5° C iron shell (thermostat)

Test in resistance.

TOOL: Multimeter.

Test the resistance of the main winding. The indoor fan motor is fault if the resistance of main winding 0 (short circuit) or  $\infty$  (open circuit).

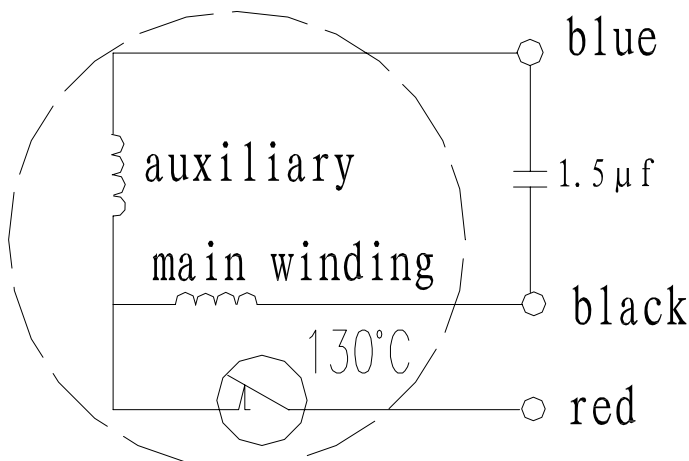
Notes:

- 1) Please don't hold motor by lead wires.
- 2) Please don't plug IN/OUT the motor connector while power ON.
- 3) Please don't drop .Hurl or dump motor against hard material. Malfunction may not be observed at early stage after such shock. But it may be found later, This type of mishandling void our warranty.

**Note:** The wiring color for the motor may not be identical with the picture shows, pls take the actual material as the standard

### 2. OUTDOOR FAN MOTOR

#### MOTOR EXAMINE AND REPAIR



Test in resistance.

TOOL: Multimeter.

Test the resistance of the main winding. The outdoor fan motor is fault if the resistance of main winding 0(short circuit)or $\infty$  (open circuit) .

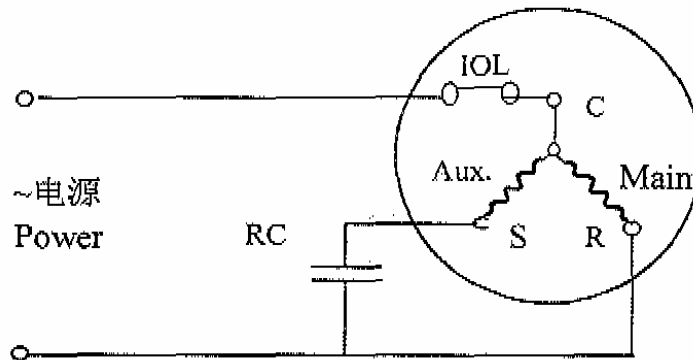
Notes:

- 1) Please don't hold motor by lead wires.
- 2) Please don't plug IN/OUT the motor connector while power ON.
- 3) Please don't drop .Hurl or dump motor against hard material.Malfunction may not be observed at early stage after such shock.But it may be found later,This type of mishandling void our warranty.
- 4) The wiring color of the motor may not be identical with the picture shows, please take the actual material as standard.

### 3. COMPRESSOR

1.Coil Resistance: Main:2.31  $\Omega \pm 5\%$ , aux:3.23  $\Omega \pm 5\%$

2.COMPRESSOR EXAMINE AND REPAIR.



Test in resistance.

TOOL: Multimeter.

Test the resistance of the winding. The compressor is fault if the resistance of winding 0(short circuit)or $\infty$  (open circuit)

Familiar trouble: 1)Compressor motor lock. 2) Discharge pressure value approaches static pressure value .3)Compressor motor winding abnormality.

Notes: 1) Don't put a compressor on its side or turn over.

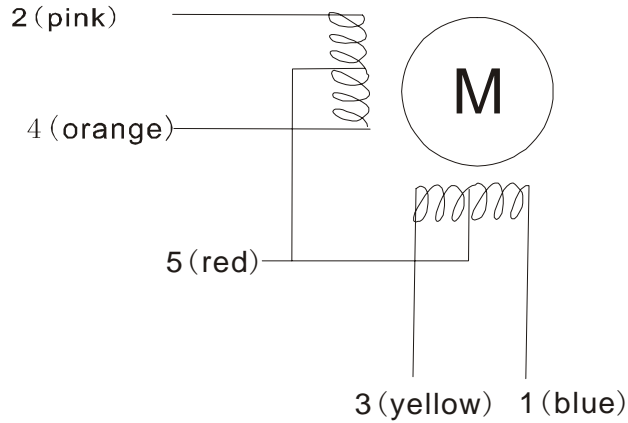
2) Please assembly the compressor in your air conditioner rapidly after removing the plugs.Don't place the comp. In air for along time.

3) Avoiding compressor running in reverse caused by connecting electrical wire incorrectly.

### 4. STEPPER MOTOR

#### 4.1 LUVER MOTOR

Resistance per phase: 200  $\Omega \pm 7\%$



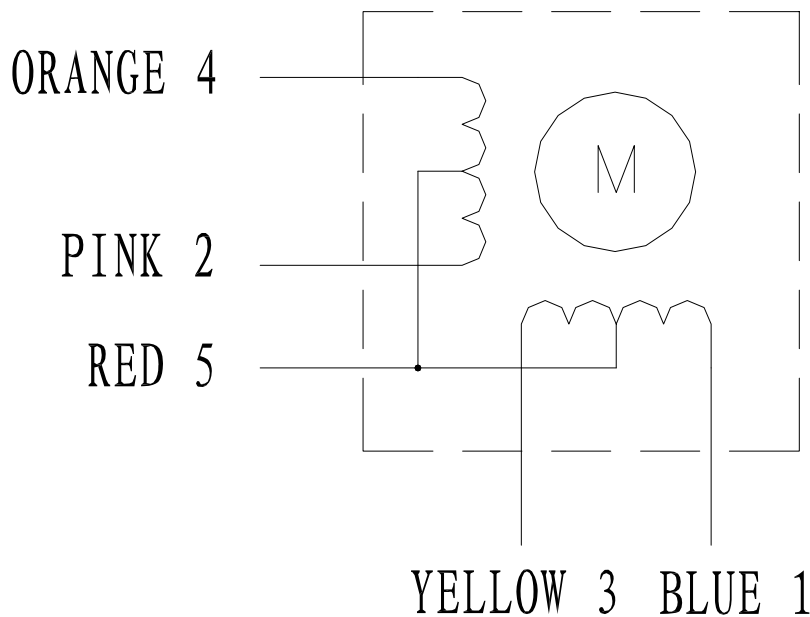
Test in resistance.

TOOL: Multimeter.

Test the resistance of winding. The stepper motor is fault if the resistance of winding 0(short circuit)or $\infty$  (open circuit) .

#### 4.2 PANEL MOTOR

Resistance per phase:  $90\ \Omega \pm 7\%$



Test in resistance.

TOOL: Multimeter.

Test the resistance of winding. The stepper motor is fault if the resistance of winding 0(short circuit)or $\infty$  (open circuit) .

### 7-2. Check others

#### 1. FUSE

Checking continuity of fuse on PCB ASS'Y.

- 1) Remove the PCB ASS'Y from the electrical component box..Then pull out the fuse from the PCB ASS'Y (Fig.1)

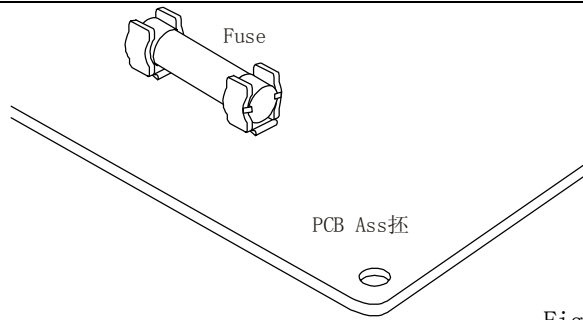


Fig. 1

2) Check for continuity using a multimeter as shown in Fig.2.

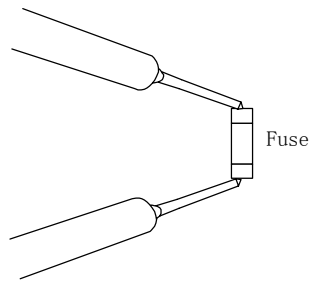


Fig. 2

## 2.CAPACITOR

Remove the lead wires from the capacitor terminals, and then place a probe on the capacitor terminals as shown in Fig.3. Observe the deflection of the pointer, setting the resistance measuring range of the multimeter to the maximum value.

The capacitor is "good" if the pointer bounces to a great extent and then gradually returns to its original position.

The range of deflection and deflection time differ according to the capacity of the capacitor.

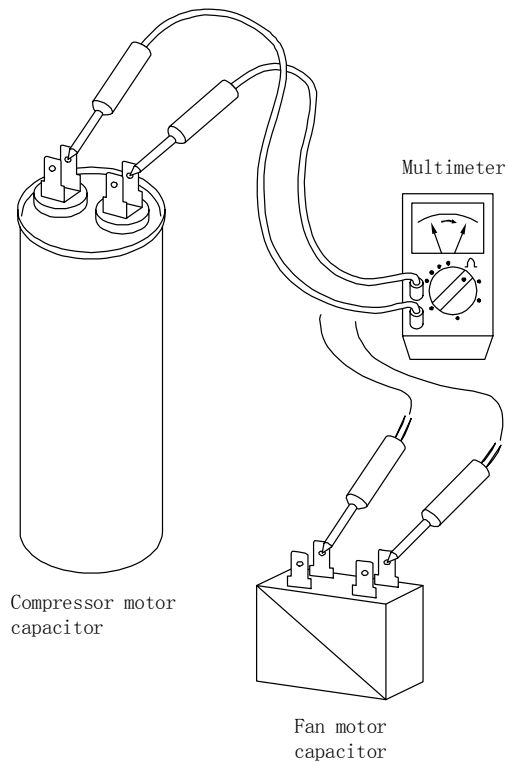





















Fig. 3

## 8-1. Panel instruction

PANEL INSTRUCTIONS		
1. Remove the three sliders to the right side, then open the front panel.		
		
2.Remove the screw, then open the safe cover.		
3.Loose the plug connections of the panel motor and the jiggle switch.		
4.Remove the panel buckle with the tool. then take out the front panel components.		
5.a.Remove the screw of the motor cover, then take out the motor cover. b.Remove the two mounting screws, then can change the panel motor.		

## 8. Panel instruction

AS-12HR4SVTVC

		
<p>6. a. Remove the two mounting screws, then take out the jiggle switch cover.</p> <p>b. Remove the mounting screw, then can change the jiggle switch.</p>		
<p>7. Remove the panel buckle with the tool. then take out the front panel from the front panel seat.</p>		
<p>8. Remove the parts step by step. then can remove the transmission shaft.</p>		
		

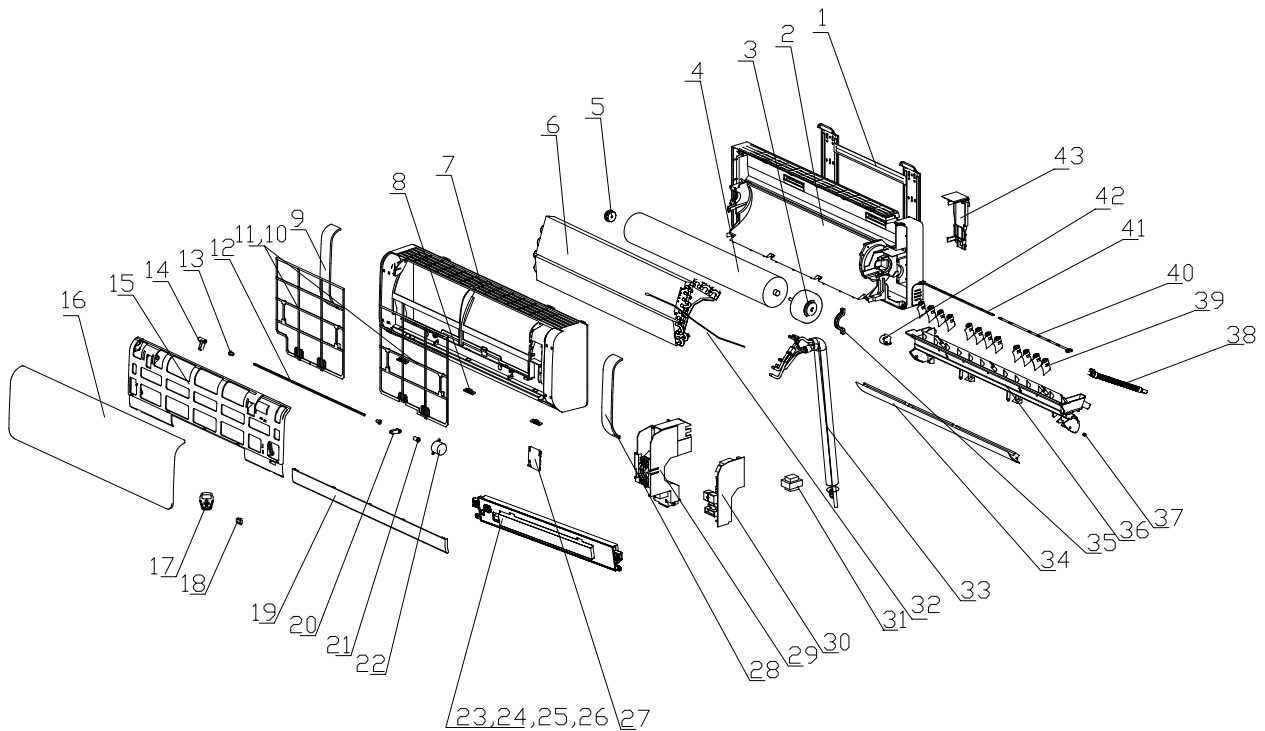


## 9. PART LIST

AS-12HR4SVTV

### 9-1. Indoor unit

#### 9-1-1. Exploded View



#### 9-1-2. Part list

Part List of Indoor Unit for AS-12HR4SVTV

No.	DESCRIPTION	New Part No.	Q' ty	UNIT PRICE	
1	Installation Plate	1248031	1	\$2. 23	KT13G0-13
2	Chassis	1246083	1	\$13. 98	G1J00/R00. 01. 01-00
3	Indoor Fan Motor	1260336	1	\$12. 79	DG13G1-05
4	Indoor Fan	1247636	1	\$4. 26	DG22G1-13
5	Bearing	1223739	1	\$0. 44	KT33F0-04
6	Evaporator Assembly	1249363	1	\$33. 87	G1J00/R01. 04. 01-00
7	Cabinet	1246705	1	\$9. 05	G1J00/R00. 02-01
8	Glide hook	1248921	3	\$0. 34	G1J00/R00. 02-07
9	Decorative Board	1263779	1	\$3. 29	G1J00/R00. 02-03
10	Air Filter(Right)	1248250	1	\$1. 75	KT31F30-08
11	Air Filter(Left)	1248282	1	\$1. 75	G1J00/R00. 02-05
12	Transmission Shaft	1248904	1	\$2. 79	G1J00/R00. 02. 01-03
13	Axle Sleeve	1248736	2	\$0. 05	G1C40/00. 02-08
14	Connecting Rod B	1248907	1	\$0. 07	G1C40/00. 02-09
15	Front Panel Seat	1247162	1	\$2. 62	G1J00/R00. 02. 01-02
16	Removable front panel	1247161	1	\$10. 69	G1J00/R00. 02. 01-01
17	Remote Controller	1222186	1	\$3. 74	+DG11E4-01 (E)



**9. PART LIST****AS-12HR4SVTVC**

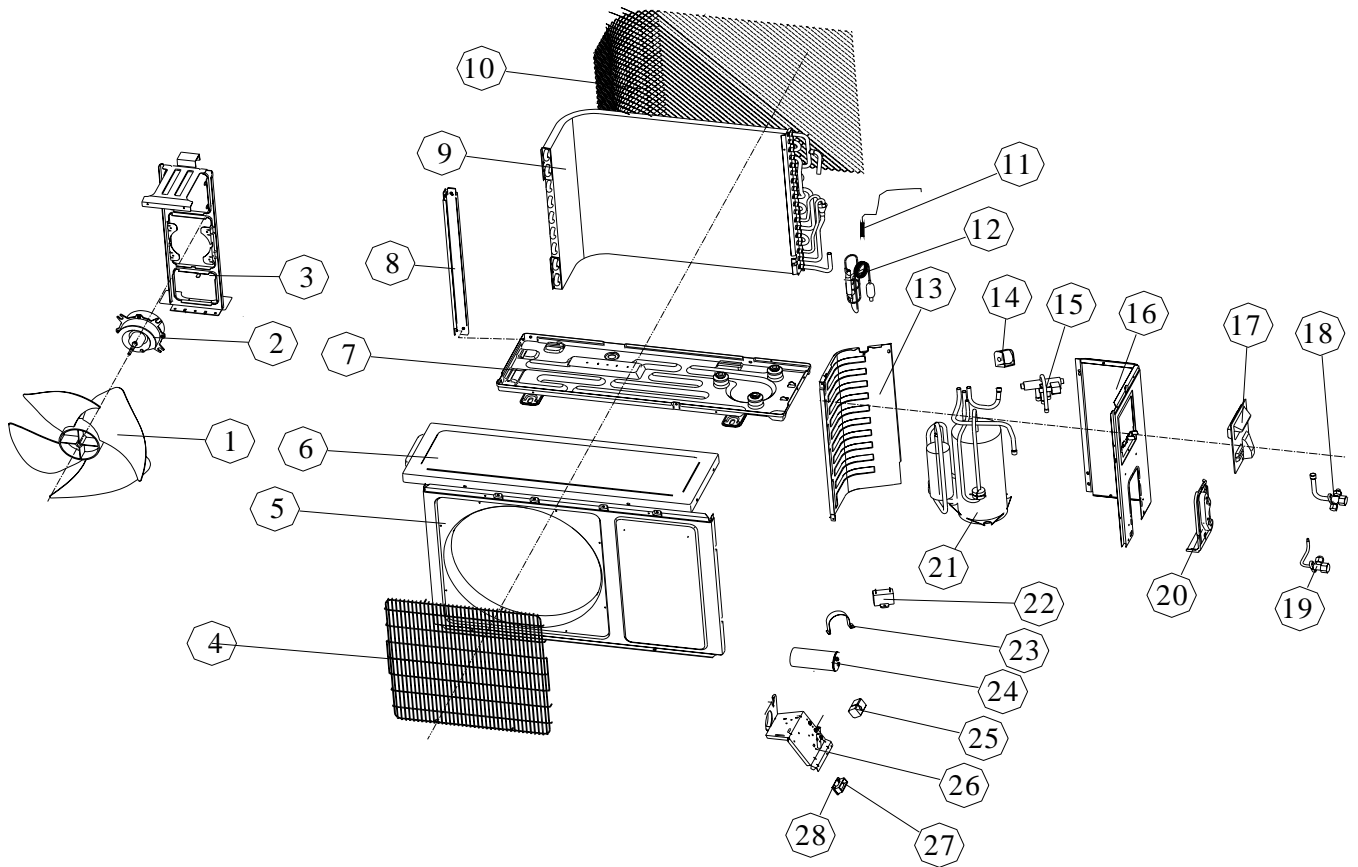
18	Jiggle Switch	1327018	1	\$0. 89	+G1C40/00. 05. 02-00
19	Decorative Part	1263778	1	\$4. 00	G1J00/R00. 02-02
20	Connecting Rod A	1248905	1	\$0. 06	G1C40/00. 02-05
21	Coupler	1258230	1	\$0. 07	G1C40/00. 02-10
22	Panel Louver Motor	1260241	1	\$5. 41	DG13B3-02
23	Display PCB Box	1276739	1	\$0. 95	G1J00/R00. 05. 01-01
24A	Display PCB A	1361811	1	\$6. 90	K36430226
24B	Display PCB B	1361811		\$6. 90	K36430226
25	Display Film	1276857	1	\$0. 81	G1J00/R00. 05. 01-04
26	Display PCB Cover	1330809	1	\$0. 20	G1J00/R00. 05. 01-05
27	Safety Cover	1276738	1	\$0. 69	G1J00/R00. 02-06
28	Right Decorative Board	1263780	1	\$1. 71	G1J00/R00. 02-04
29	Electric Box	1276599	1	\$2. 87	G1G00/R00. 05-01
30	Control PCB	1361710	1	\$14. 20	K36412031
31	Transformer	1222247	1	\$3. 76	+DG20B0-07
32	Thermistor	1222260		\$1. 33	+DG19R2-05
33	Pipe Assembly	1221862	1	\$5. 32	+G1G10/R03. 04. 02-00
34	Horizontal Louver	1248629	1	\$3. 00	G1J00/R00. 01. 02-02
35	Clasp	1223749	1	\$0. 08	G1A00/R00. 00-02
36	Draining Pan	1248432	1	\$3. 29	G1J00/R00. 01. 02-01
37	Louver Bearing	1222824	3	\$0. 12	KT25F0-05
38	Drain Hose	1276892	1	\$0. 88	KT20P0-10
39	Vertical Deflector	1248630	12	\$0. 10	G1J00/R00. 01. 02-03
40	Right Gear pole	1248902	1	\$0. 30	G1J00/R00. 01. 02-05
41	Left Gear pole	1248901	1	\$0. 30	G1J00/R00. 01. 02-04
42	Louver Motor	1260312	1	\$2. 44	DG13B1-09
43	Baffle	1248993	1	\$1. 48	<b>G1J00/R00.00-01</b>

## 9. PART LIST

AS-12HR4SVTVC

### 9-2.Outdoor unit

#### 9-2-1. Exploded View



#### 9-2-2. PARTLIST

Part List of Outdoor Unit for AS-12HR4SVTVC					
No.	DESCRIPTION	New Part No.	Q' ty	UNIT PRICE	
1	Outdoor Fan	1313821	1	\$4. 00	DG22Z1-20
2	Outdoor Fan Motor	1222216	1	\$20. 00	+DG13Z1-10
3	Motor Stay Bracket	1308210	1	\$3. 43	W1EOL/R00. 02-05
4	Fan Guard	1276845	1	\$3. 50	W1EOD/R00. 02. 01-02
5	Cabinet	1247914	1	\$7. 33	W1EOD/R00. 02. 01-01
6	Top Cover	1247912	1	\$5. 60	W1EOL/R00. 02. 02-01
7	Chassis	1221623	1	\$8. 90	+W1EOD/R01. 01. 01-00
8	Side Support	1248091	1	\$1. 61	W1EOL/R00. 02-03
9	Condenser	1249852	1	\$45. 00	W1EOS/R01. 04. 01-00
10	Back Lattice Plate	1247481	1	\$1. 32	W1EOD/R00. 04-06
11	Thermistor	#N/A	#N/A	#N/A	#N/A
12	Capillary Tube Assembly	1255497	1	\$6. 00	W1EOD/R10. 01. 02-00
13	Bulkhead	1248504	1	\$3. 30	W1EOL/R00. 04-03
14	4 Way Valve Coil	1222020	1	\$3. 00	+DG20S0-03 (A)
15	4 Way Valve	1258657	1	\$9. 34	DG26D2-01 (A)
16	Right Side Plate	1246331	1	\$5. 16	W1EOL/R00. 04-02

**9. PART LIST****AS-12HR4SVTVC**

17	Terminal Cover	1276574	1	\$0. 67	W1A1L/00. 02-01
18	3 Way Valve Assembly	1258658	1	\$4. 60	DG26C2-04 (A)
19	2 Way Valve Assembly	1258653	1	\$4. 64	DG26B1-06 (A)
20	Valve Fixing Plate	1248461	1	\$1. 67	W1A1L/00. 01. 01-03
21	Compressor	1224702	1	\$114. 00	PA145X2C-4FT
22	Fan motor Capacitor	1225552	1	\$0. 61	+CBB61-1. 5 $\mu$ /450-1
23	Capacitor Fixing Ring	1248747	1	\$0. 16	W1A1L/00. 05-02
24	Compressor Capacitor	1225652	1	\$3. 36	+CBB65-35 $\mu$ /450-1
25	Terminal Board 5PU	1221319	1	\$1. 00	+DG17D5-01
26	Electrical Assembly Plate	1276683	1	\$1. 29	W1E0L/R00. 05-01
27	Power Supply Cord Clamp 1	1221112	1	\$0. 15	+KT14X0-10
28	Power Supply Cord Clamp 2	1221119	1	\$0. 15	+KT14X0-05