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## Air Conditional Service Manual



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каталоги, инструкции, сервисные мануалы, схемы.

# Model: AC-FR30HK

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## SPECIFICATION

<b>Model No.</b>		<b>AC-FR30HK</b>	
Type		Floor standing (Heating Pump)	
Cooling Capacity (Btu/h)		24000	
Heating Capacity (Btu/h)		26600	
Rated Input (w)	Cooling	2820	
	Heating	2650	
PTC Heater Power (W)		1900	
Moisture Removal (L/H.r)		3.0	
Air Circulation (CMH Max)		1200	
EER for Cooling (Btu/h.W)		8.5	
COP for Heating (W/W)		2.9	
<b>Power Supply</b>			
Volt/Phase/Hz		220-240V/1P/50Hz	
Rated Current (A)	Cooling	13.5	
	Heating	12.5	
	PTC Heater	8.7	
LRA (A)		65	
<b>Noise Level (dB (A))</b>	Indoor Unit	High	50
		Low	40
	Outdoor Unit		58
<b>System</b>			
Refrigerant (g)		R22	
Compressor type		Scroll	
Compressor Model No.		PH440X3CS-8KUC1	
Compressor MFG		TOSHIBA	
Expansion Device		Capillary	
Evaporator		Copper and Aluminum Fin	
Condenser		Copper and Aluminum Fin	
<b>Features</b>			
LCD Wireless Remote Controller		No	
LCD Display		Yes	
Washable Filter		Yes	
24 Hours Timer		Yes	
3 Speed Control		Yes	
Vertical Auto Swing Louver		Yes	
Horizontal Auto Swing Louver		No	

<b>Model No.</b>	<b>AC-FR30HK</b>	
Sleep Operation	No	
Smart Function	Yes	
Jet Function	Yes	
Electronic Lock	Yes	
Auto Restart	Yes	
PTC Heater	Yes	
<i>Other</i>		
Dimensions WxHxD(mm)	Indoor Unit	540x1765x275
	Outdoor Unit	832x702x380
Net Weight (Kg)	Indoor Unit	46
	Outdoor Unit	66
Packing Dimensions WxHxD(mm)	Indoor Unit	660x1890x420
	Outdoor Unit	980x780x420
Gross Weight (Kg)	Indoor Unit	54
	Outdoor Unit	80
Loading Capacity (40'/40' HC)	72/80	
Approvals	CCEE	

## FUNCTION DETAILS

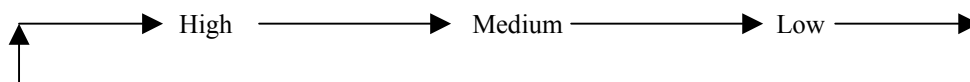
### Button Introducing

#### 1. ON/OFF button

Pressing this button at waiting orders to operate unit according to last operating mode. Pressing it for the first time after power supply, unit will operate in AUTO mode. Pressing it during operation, all loads stop, compressor turns into 3 minutes protection, LCD displays room temperature.

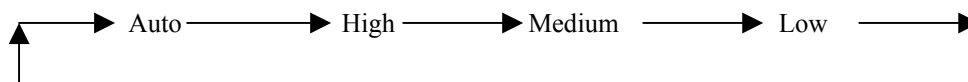
#### 2. FAN button

Indoor fan motor operates according to the following circle while pressing the button in FAN mode.



FAN button is ineffective in DRY mode.

Indoor fan motor operates according to the following circle while pressing the button in other modes.



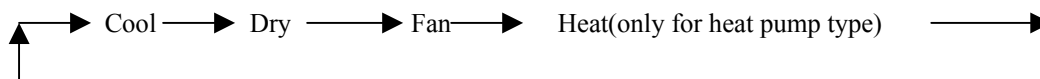
#### 3. SWING/LOCK button

Press once to turn on or off swing motor. Press this button for 5 seconds and buzzer sounds once, the key set is locked and not manipulative, operation with remote controller is ineffective. Lock is unchained only pressing Swing/Lock button for 5 seconds and buzzer sounds once.

Note: LOCK function only for E-type floor standing

#### 4. MODE button

A/C operates according to the following circle while pressing this button :



**5. TEMPERATURE RISE button**

Pressing this button once in cooling & heating mode, setting temperature is risen 1°C till 32°C. Pressing this button once in smart & dry modes, setting temperature is risen 1°C, but the maximum rise is 2°C. This button is ineffective in other modes.

**6. TEMPERATURE DROP button**

Pressing this button once in cooling & heating mode, setting temperature is dropped 1°C till 18°C. Pressing this button once in smart & dry modes, setting temperature is dropped 1°C, but the maximum drop is 2°C. This button is ineffective in other modes.

**7. TIMER button**

Pressing this button for the first time, —h is displayed and the TIMER symbol is flashed on the LCD. Pressing the button once to increase the preset time 0.5 hour (with 10 hours) or 1 hour (over 10 hours). Timing range is from 0.5 hour to 24 hours. Press TIMER function until —h is displayed, timing is cancelled. Indicative symbol lights or extinguishes after stopping pressing button for 5 seconds, affirming setting time to start timer or cancel it.

**8. SMART button**

Press the SMART button, the unit enters smart mode (fuzzy logic operation) directly regardless of the unit is on or off. In this mode, temperature and fan speed are automatically set based on the actual room temperature. Operation mode and temperature are determined by indoor temperature according to the following table:





### Heat pump models

Indoor temperature	Operation mode	Target temperature
21 $\text{°C}$ or below	HEATING	22 $\text{°C}$
21 $\text{°C}$ -26 $\text{°C}$	DRY	Room temperature decrease 1.5 $\text{°C}$ after operate for 3 minutes
Over 26 $\text{°C}$	COOLING	26 $\text{°C}$

### Cooling only models

Indoor temperature	Operation mode	Target temperature
26 $\text{°C}$ or below	DRY	Room temperature decrease 1.5 $\text{°C}$ after operate for 3 minutes
Over 26 $\text{°C}$	COOLING	26 $\text{°C}$

SMART button is ineffective in SUPER mode. Temperature and airflow are controlled automatically in SMART mode. However, a decrease or rise of up to 2  $^{\circ}\text{C}$  can be set with the remote controller according to the following table if you still feel uncomfortable.

A decrease or increase up to 2 $\text{°C}$ can be set in SMART mode		
Your feeling	button	adjustment procedure
<b>Slightly warmer</b> A decrease up to 2 $\text{°C}$ can be set	▼	 Press once to lower the set temp by 1 $\text{°C}$ <div style="float: right; text-align: center;"> <u>High</u>  <u>Low</u> </div>
		 Press twice to lower the set temp by 2 $\text{°C}$ <div style="float: right; text-align: center;"> <u><u>High</u></u>  <u><u>Low</u></u> </div>
<b>Slightly cooler</b> A rise up to 2 $\text{°C}$ can be set	▲	 Press once to raise the set temp by 1 $\text{°C}$ <div style="float: right; text-align: center;"> <u>High</u>  <u>Low</u> </div>
		 Press twice to raise the set temp by 2 $\text{°C}$ . <div style="float: right; text-align: center;"> <u><u>High</u></u>  <u><u>Low</u></u> </div>
Uncomfortable because of unsuitable air flow volume.	FAN	Indoor fan speed alternates among High, Medium and Low each time this button is pressed.
Uncomfortable because of unsuitable flow direction.	SWING/LOCK	Press it once, the vertical adjustment louver swings to change vertical airflow direction. Press it again, swings stops. For horizontal airflow direction, please refer to the previous page for details.



### 9. AUTO RESTART button

Pressing this button to start AUTO RESTART function, LCD displays AUTO RESTART symbol. Pressing it again to cancel AUTO RESTART function.

### 10. SUPER button

Pressing this button at waiting orders to operate unit in super cool or heat mode. Pressing this button while running to go out of primary operation and into super cool or heat mode.

### 11. LIGHT button (only for E-type floor standing)

Pressing this button to turn on or off the fluorescent light.

## Function Introducing

### 1. BUZZER FUNCTION

Buzzer exports different period of time according to different operation.

**Turn on:** sound twice, phonate for 100MSEL, stall for 50MSEL, phonate for 100MSEL

**Turn off:** sound twice, phonate for 250MSEL, stall for 50MSEL, phonate for 50MSEL

**Overheating protection:** sound times, phonate for 50MSEL, stall for 50MSEL, phonate for 50MSEL, stall for 50MSEL, phonate for 50MSEL, stall for 50MSEL, phonate for 100MSEL

**Common cue symbol:** sound once, phonate for 50MSEL

### 2. VERTICAL VANE CONTROL

Using "SWING/LOCK" button to set various angles of flow or specific angle as you like. Pressing "SWING/LOCK" button once, the vertical adjustment louver will swing up and down automatically. Pressing the "SWING/LOCK" button again when the louvers swing to a suitable angle as desired.

### 3. INDOOR FAN MOTOR CONTROL

Indoor fan motor elicited wiring rev depends on relay. It has 3 speeds.

### 4. ELECTRICAL HEATING FUNCTION (only for heat pump type)

Electrical heating starts automatically according to the following conditions when A/C operates in heating mode. If inlet air temperature of indoor unit is below 20°C, the temperature difference between inlet and outlet of indoor unit is more than 2.5°C, compressor operates for 3 minutes, indoor fan motor operates normally and indoor pipe temperature is below 48°C. If it falls short of these conditions, system pauses electrical heating. If it accords with conditions again after pause, A/C requires 5 seconds delay for starting electrical heater. If electrical heater pauses because indoor pipe temperature is more than 48°C, it starts again only while indoor pipe is below 43°C. Cold wind prevention is canceled automatically after electrical heater start.

## 5. DEFROST FUNCTION

During HEATING operation, when outdoor pipe temperature falls to  $-8^{\circ}\text{C}$  and compressor operates for 50 minutes, defrosting starts, outdoor fan motor & compressor stop, indoor fan motor operates in preventing cold air mode. 4-valve turns off after 59 seconds, compressor starts to defrost after stalling for over 1 minute.

When outdoor pipe temperature rises to  $12^{\circ}\text{C}$ , defrosting rescinds automatically, compressor stalls. 4-valve starts after 59 seconds, compressor and outdoor fan motor start after stalling for over 1 minute, indoor fan motor operates in preventing cold air mode, the system operates at HEATING mode. Next defrosting starts after compressor operates for 50 minutes in HEATING mode. Every defrosting time doesn't exceed 10 minutes. If defrosting time exceeds 10 minutes, system rescinds defrosting forcibly and operates at HEATING mode. Button is ineffective besides ON/OFF button during defrosting.

## 6. SLEEP FUNCTION

Pressing SLEEP button of remote controller in any mode, buzzer sounds once after controller receive and system is turned into SLEEP function, indoor fan motor speed translates tiny speed, LCD displays SLEEP symbol.

If air inlet temperature of indoor unit is equal to or more than  $26^{\circ}\text{C}$  in cooling mode, setting temperature is invariable, otherwise setting temperature rises  $0.5^{\circ}\text{C}$  per 1 hour within 2 hours. The total setting temperature rise is  $1^{\circ}\text{C}$ , airflow direction according to primary setting mode, but it can be adjusted, operation mode is invariable. A/C turn off automatically after setting SLEEP function 8 hours later.

## 7. PROTECTION FUNCTION

### 7.1 3-minutes delay for compressor:

In all modes, compressor doesn't respond temperature changed until it operate for 3 minutes, compressor can restart after it stall for 3 minutes.

### 7.2 OVERCOOL PROTECTION

If indoor pipe temperature is below  $-3^{\circ}\text{C}$  for continuous 3 minutes in cool and dry modes, compressor and outdoor fan motor stall, LCD displays protection code E1. If indoor pipe temperature is over  $5^{\circ}\text{C}$ , the system retreats from overcool protection and operates normally.

### 7.3 OVERHEAT PROTECTION(only for heat pump type)

If indoor pipe temperature is over  $53^{\circ}\text{C}$  in heat mode, outdoor fan motor stalls. If indoor pipe temperature is below  $48^{\circ}\text{C}$ , the system retreats from overheat protection and operates normally. If indoor pipe temperature is over  $63^{\circ}\text{C}$  when A/C operates for 1 minutes in heat mode, buzzer sounds 4 times, LCD displays protection code E2

#### 7.4 PRESSURE PROTECTION

When the system pressure is too high, the compressor and outdoor fan stalls, LED displays blooey code “E3”. The A/C can’t operate until the system pressure drops to normal level.

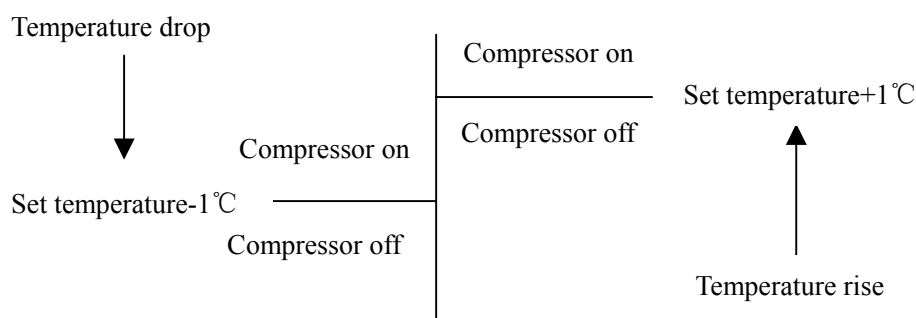
#### 7.5 TROUBLE CODE

LCD displays setting temperature or timing hour when A/C is normal. LCD displays trouble code if protection function appears.

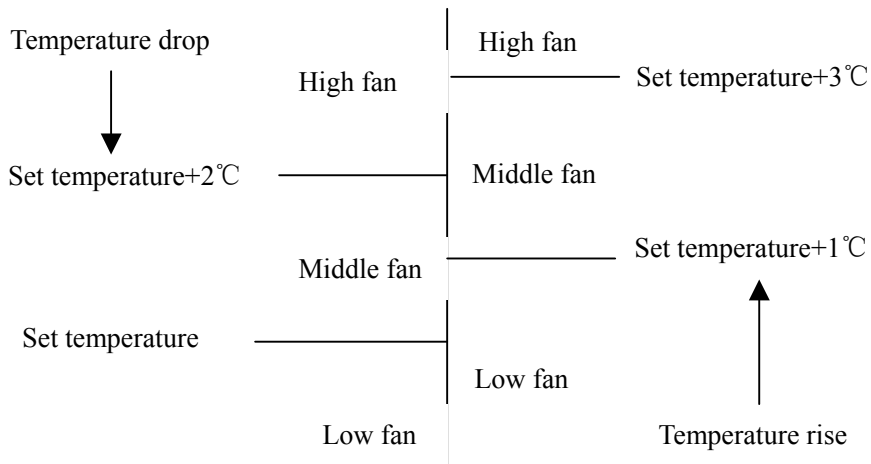
## Operation Mode

### 1. COOLING MODE

When the COOLING mode operation is selected without setting temperature after power supply, the appliance will set the preset temperature at 26°C automatically. The compressor operates according to the following chart:



In COOLING model, if indoor fan motor speed is set automatism, it operates according to the following chart:



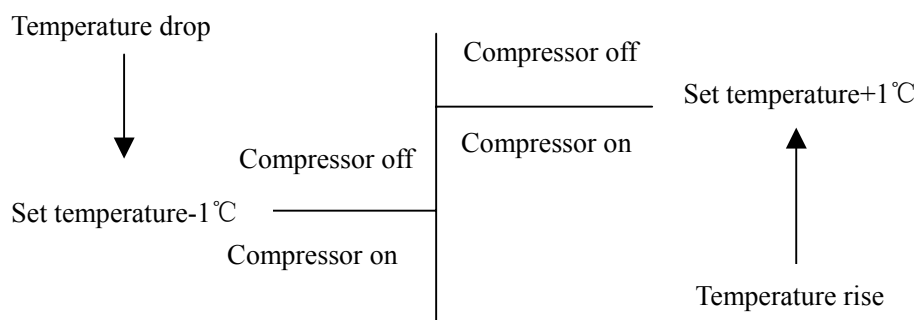
## 2. DRY MODE

When room temperature is 18°C-32°C, A/C operates in COOLING mode for 3 minutes, then it will sense the intake air temperature and minus 1.5°C as the setting temperature, indoor motor speed is **TINY**, compressor and outdoor fan motor operates in COOLING mode. The setup for fan motor speed is not viable at this time, but airflow direction can be adjusted, setting temperature can be adjusted  $\pm 1^\circ\text{C}$ . Overcool protection is effective.

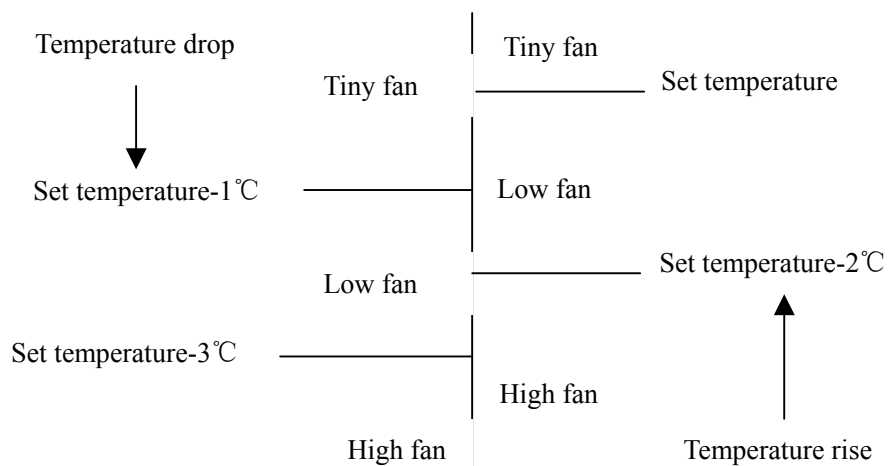
## 3. HEATING MODE

When A/C operates in heating mode, setting temperature, indoor fan motor speed and airflow direction can be adjusted, preventing cold air function starts. If indoor pipe temperature is below 30°C, indoor fan motor speed switches to tiny automatically, if indoor pipe temperature is below 23°C, indoor fan motor stalls, if indoor temperature is over 35°C, indoor fan motor operates normally. During heating operation, overheating protection starts. If indoor pipe temperature is over 53°C, outdoor fan motor stalls. If indoor pipe temperature is below 48°C, the system retreats from overheating protection and operates normally. If indoor pipe temperature is over 63°C when A/C operates for 1 minutes in heat mode, buzzer sounds 4 times and A/C stalls.

Compressor starts and stalls as the following chart:



In HEATING model, if indoor fan motor speed is set automatism, it operates according to the following chart:

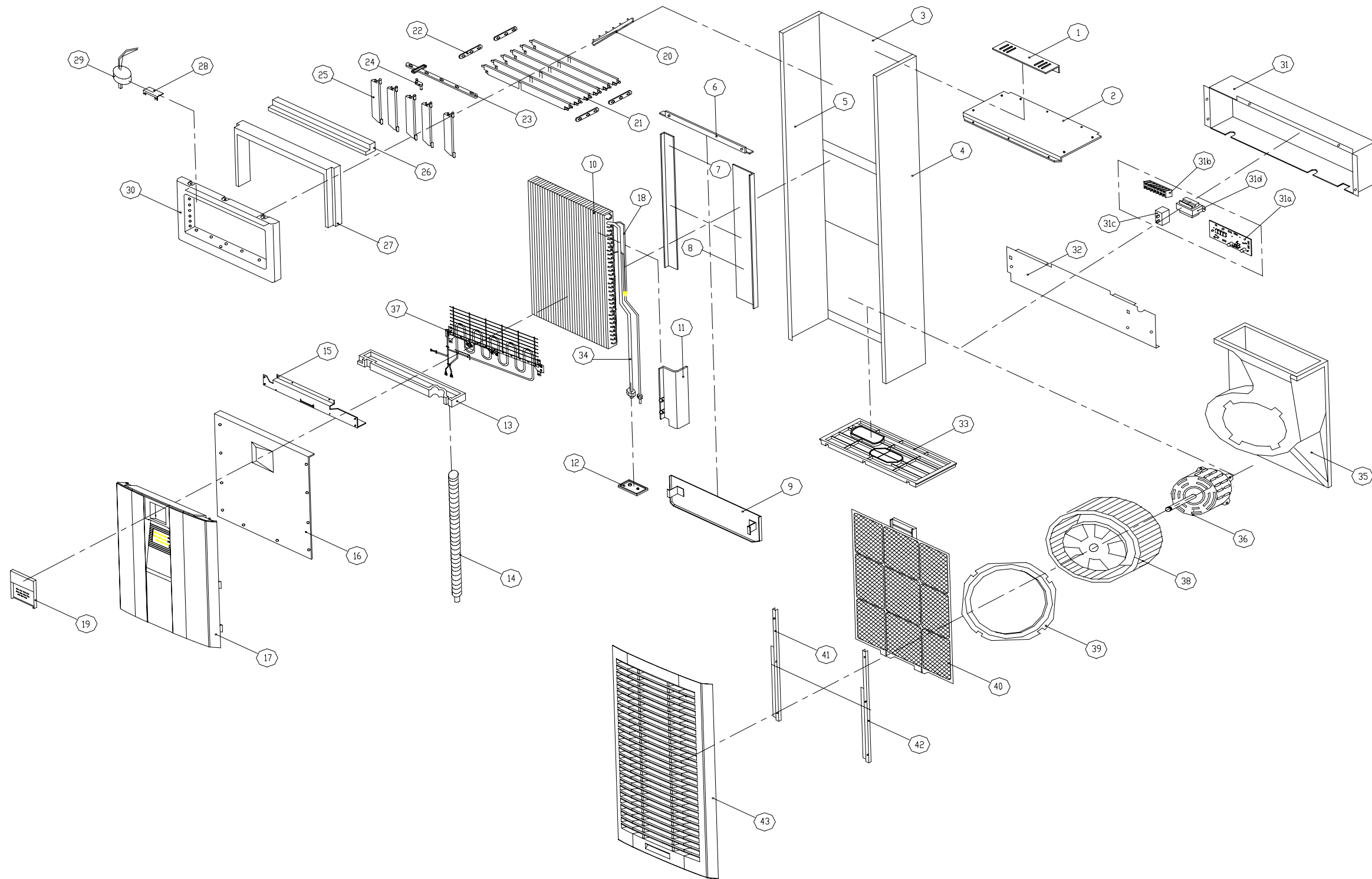


#### 4. FAN MODE

Indoor fan motor operates according to setting mode, airflow direction can be adjusted, compressor and outdoor fan motor stall.

## EXPLODED VIEW AND PART LIST

### INDOOR UNIT

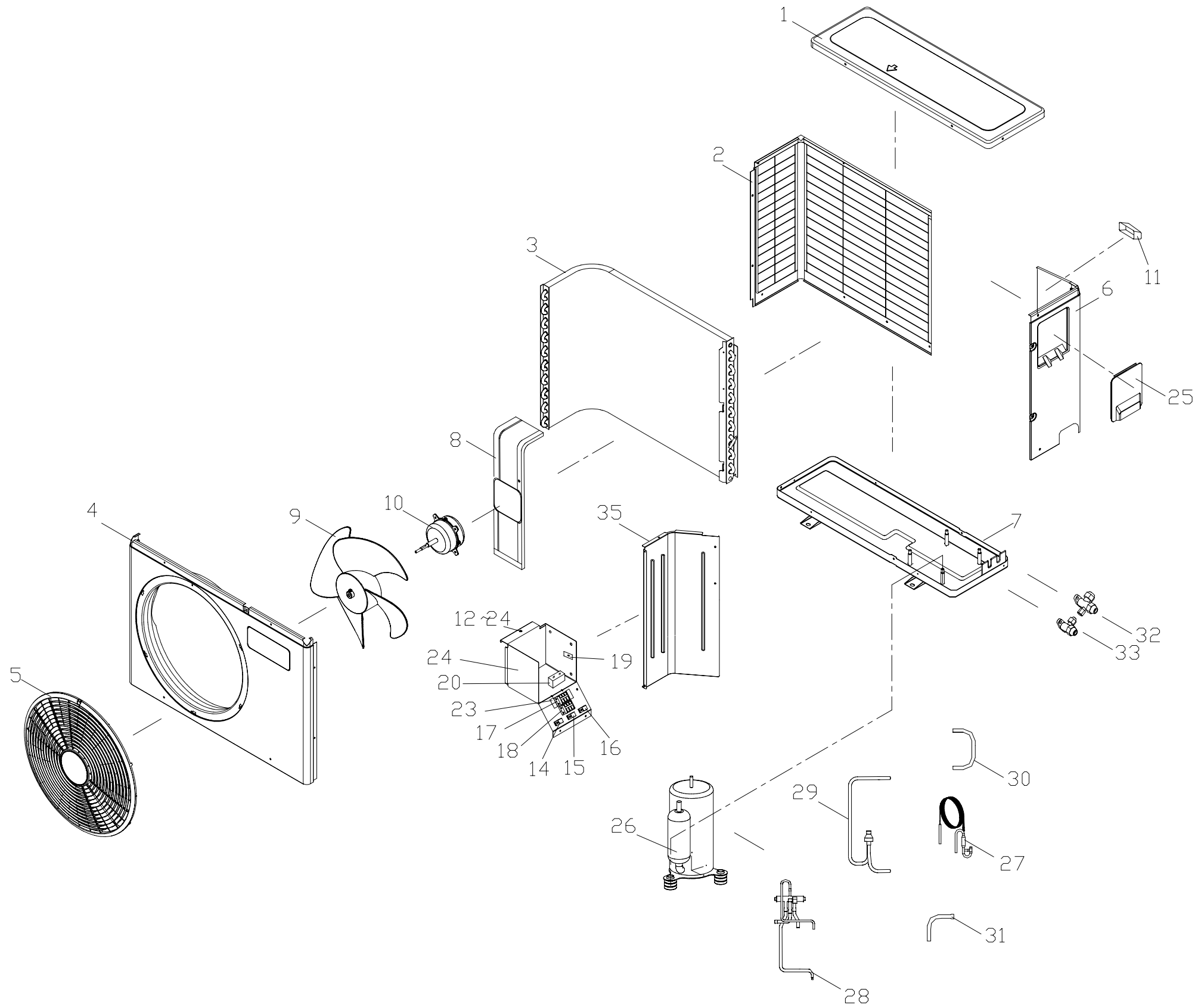


## INDOOR UNIT

No.	Description	Part No.	Qty
1	Upper installation shelf	12033011	1
2	Topmost cover	1105376	1
3	Rear cover	8100914	1
4	Right side cover	8100314	1
5	Left side cover	8100313	1
6	Evaporator topmost installation plate	12033017	1
7	Evaporator left installation plate	12033044	1
8	Evaporator right installation plate	12033045	1
9	Evaporator support	11023032	1
10	Evaporator	1301138	1
11	Evaporator baffle	10083002	1
12	Containing water rubber bowl	21063001	1
13	Condensate plate assembly	2106303	1
14	Drain hose	21093006	1
15	Middle support	100853	1
16	Adiabatic board	16053005	1
17	Front panel	1006545	1
18	Evaporator import pipe	13031950	1
19	Controller assembly	8140166	1
20	Mid pitman	12013019	1
21	Horizontal vane	1201378	6
22	Side pitman	12013018	4
23	Transverse pitman	12013022	1
24	Rocker	12013006	1
25	Vertical vane	12013020	5
26	Air outlet bottom foam	1107552	1
27	Air outlet side foam	1107551	1
28	Synchronous motor retainer	11023011	1
29	Synchronous motor A	14023037	1
30	Air outlet	1201377	1
31	Electrical box	10053004	1
31a	Pc board	8140932	1
31b	Terminal 8PUB	1502106	1
31c	Fan motor capacitor	14113055	1
31d	Transformer	140561	1
32	Electrical box cover	11053001	1
33	Base	1106276	1
34	Evaporator deferent pipe	81303857	1
35	Volute	1007122	1
36	Fan motor	1402282	1
37	Electrical heater assembly	814047	1
38	Centrifugal fan	1402155	1
39	Air inpour annulus	13031108	1
40	Air filter	12043006	1
41	Filter left retainer	11023012	1
42	Filter right retainer	11023013	1
43	Nether panel	1006547	1

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**OUTDOOR UNIT**

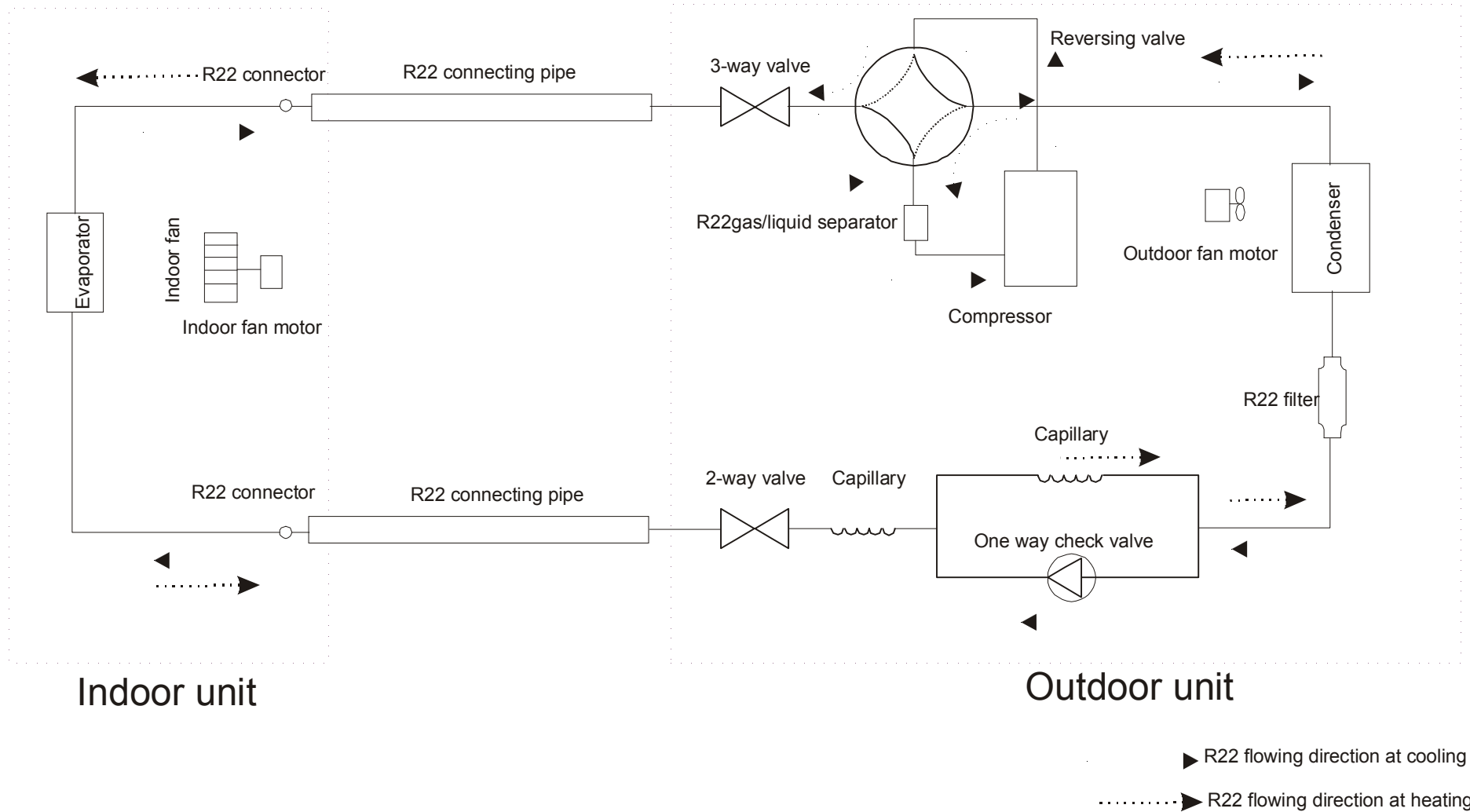




## OUTDOOR UNIT

No.	Description	Part No.	Q'ty
1	Upper cover	810132	1
2	Rear cover	810091	1
3	Condenser	813022	1
4	Front cover	810135	1
5	Fan guard	<a href="https://splitsystema48.ru/instrukcii-po-ekspluatácii-kondicionerov.html">https://splitsystema48.ru/instrukcii-po-ekspluatácii-kondicionerov.html</a>	
6	Right side cover	10033028	1
7	Base	810022	1
8	Motor support	811021	1
9	Propeller fan	140239	1
10	Fan motor	1402370	1
11	Gripe	21093063	1
12	Electrical assembly	814018	1
13	Thermionic resistance	11053010	1
14	Capacitor clamp	12033022	1
15	Wire clamp	1203234	1
16	Power wire nether Clamp	110963	1
17	Power wire upper Clamp	1109147	1
18	Terminal 5P3	150288	1
19	Terminal 4P2	15023004(A)	1
20	Terminal 2U	150217(A)	1
21	Fan capacitor	14113058	1
22	AC contactor	1411941	1
23	Wire fixer	1109186	1
24	Electrical box	10053005	1
25	Terminal cover	2109236	1
26	Compressor (GD Toshiba)	1304340	1
27	Capillary assembly	81303787	1
28	4- valve assembly	81303530	1
29	Inspiratory pipe assembly	81303290	1
30	Liquid outlet pipe	813035	1
31	Transition pipe	13033038	1
32	3-valve assembly	8130914	1
33	2-valve assembly	8130918	1
34	Compressor capacitor	14113044	1
35	Clapboard	12033035	1

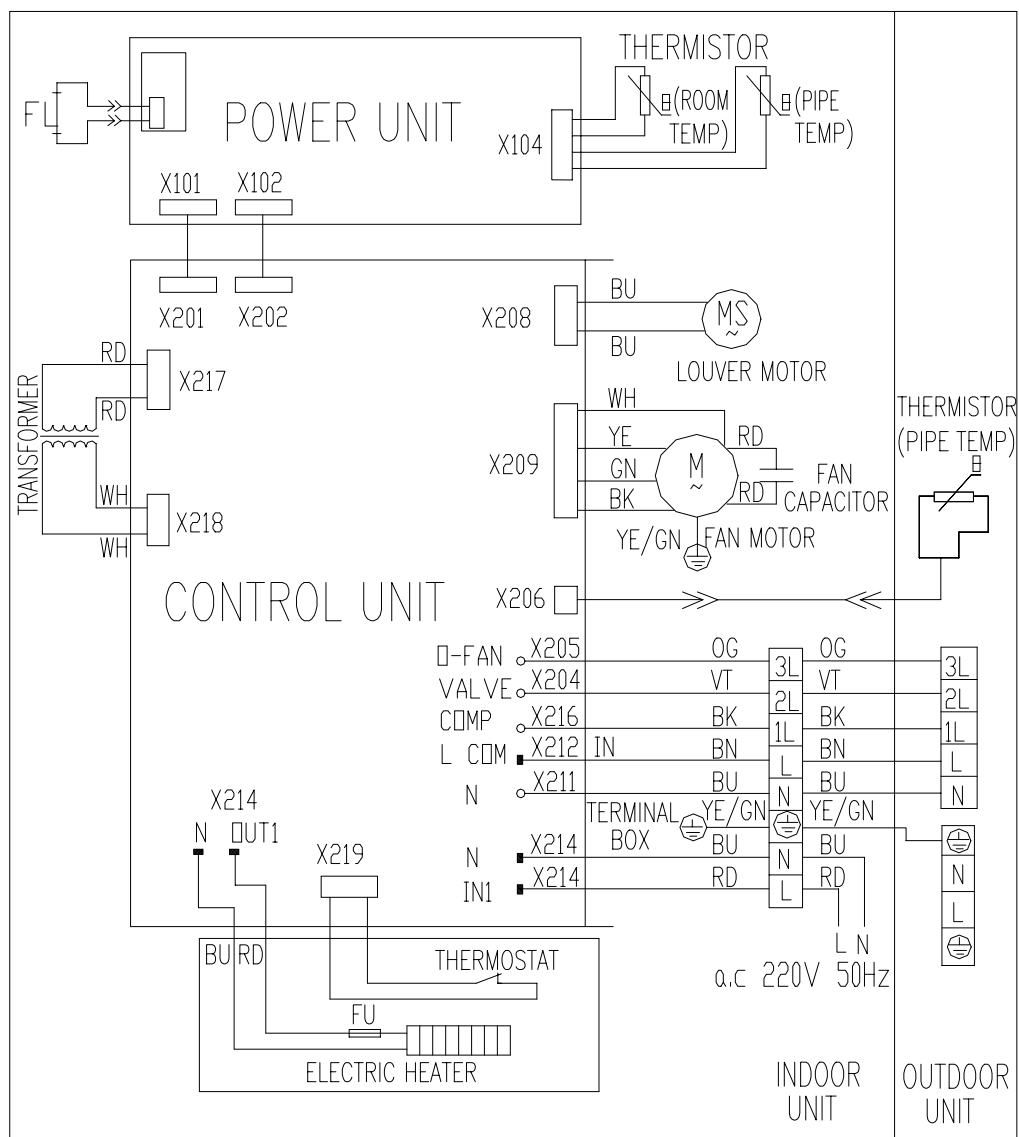
## REFRIGERATION DIAGRAM



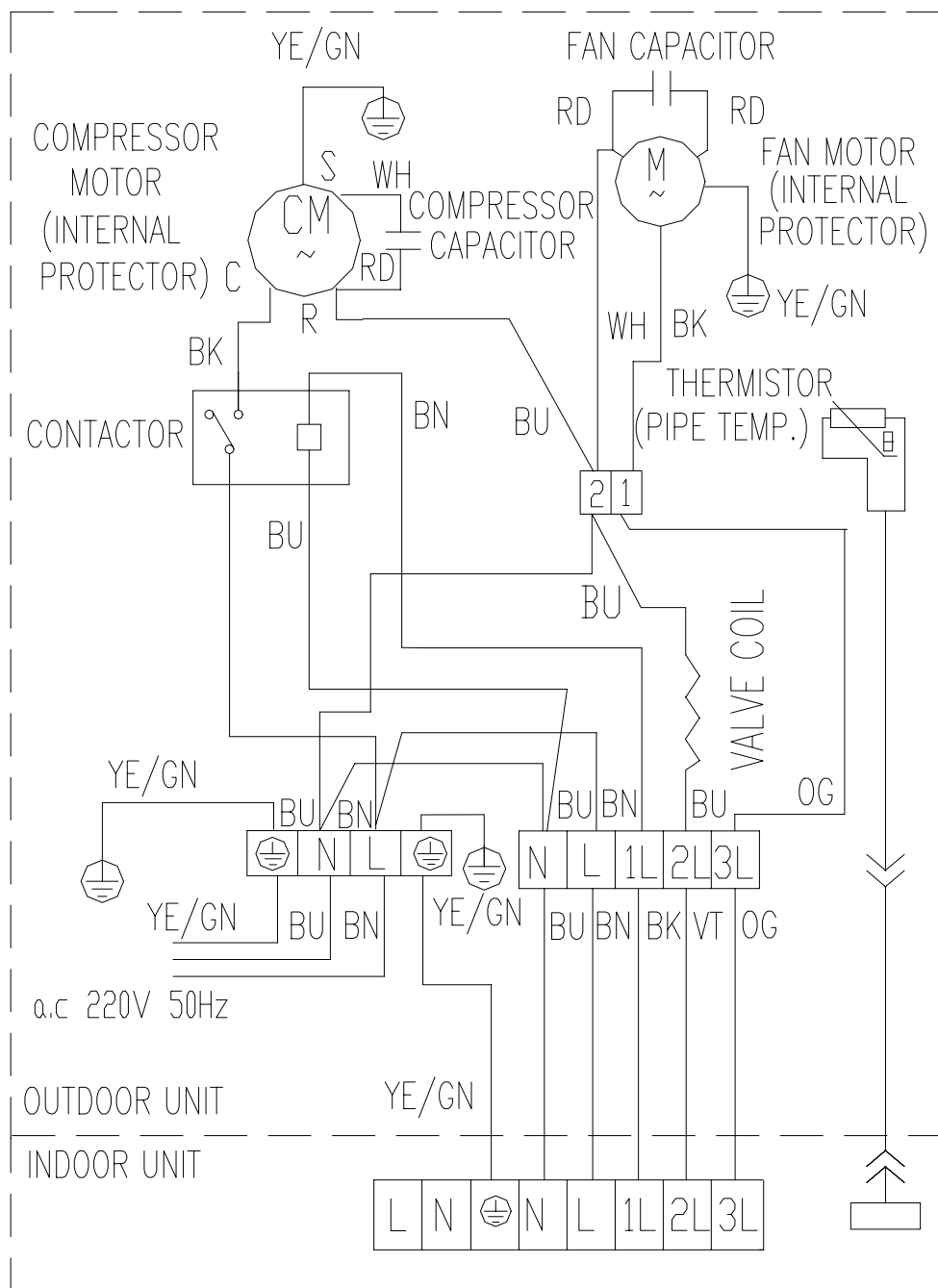
Model No: AC-FR30HK  
Version 1.0

## WIRING DIAGRAM

### Indoor Unit



**Outdoor Unit**





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