



WALL MOUNT SPLIT TYPE AIR CONDITIONERS

MODELS:

KSW-09R5B / KPC-09HH5B

KSW-12R5B / KPC-12HH5B

KSW-18R5 / KPC-18HH5

KSW-24R5B / KPC-24HH5B



SERVICE MANUAL

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IMPORTANT NOTICE

This service manual is intended for use by individuals possessing adequate backgrounds of electrical, electronic and mechanical experience. Any attempt to repair the appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

The information, specifications and parameter are subject to change due to technical modification or improvement without any prior notice. The accurate specifications are presented on the nameplate label.

How to order spare parts

To have your order filled promptly and correctly, please furnish the following information:

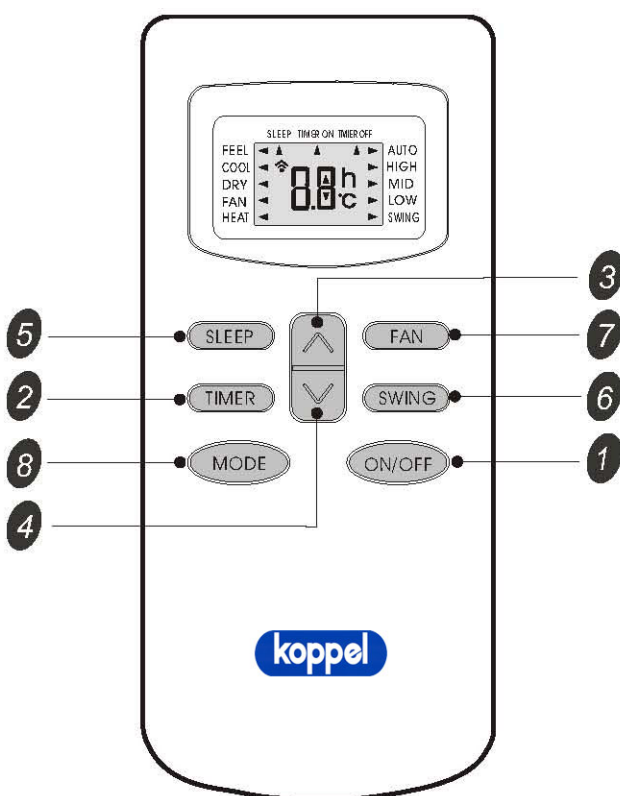
1. Model No. with Indoor or Outdoor
2. No. in the Explosion View
3. Part Name
4. The quantity you ordered

Operation Details

Remote controller

Remote controller

The remote controller transmits signals to the system.



- 1 ON/OFF button**
Used to start and stop operation when pressed.
- 2 TIMER button**
Used to select TIMER operation.
- 3 UP button (TOO COOL button)**
Used to increase the set room temperature and time.
- 4 DOWN button (TOO WARM button)**
Used to decrease the set room temperature and time.
- 5 SLEEP button**
Used to set or cancel sleep mode operation.
- 6 VANE control button**
Used to adjust airflow direction.
- 7 FAN SPEED control button**
Used to select the indoor fan motor speed: Auto, High, Mid and Low.
- 8 MODE button**
Used to select the type of operation mode: Feel, Cooling, Dry, Fan and Heating(Only for Heat Pump).

Note: Each mode and relevant function will be further specified in following pages.

Remote Control

The remote controller is not preset as Cooling Only Air Conditioner or Heat Pump by manufacturer. Each time after the remote controller replace batteries or is energized, the arrowhead will flashes on the front of "Heat" or "Cool" on LCD of the remote controller.

User can preset the remote controller type depending on the air conditioner type you have purchased as follows:

Press any button when the arrowhead flashes on the front of "Cool", Cooling Only is set.

Press any button when the arrowhead flashes on the front of "Heat", Heat Pump is set.

If you don't press any button within 10 seconds, the remote controller is preset as Heat Pump automatically.

Note :

If the air conditioner you purchased is a Cooling Only one, but you preset the remote controller as Heat Pump, it doesn't bring any matter. But if the air conditioner you purchased is a Heat Pump one, and you preset the remote controller as Cooling Only, then you CAN NOT preset the Heating operation with the remote controller.

Electronic controller:

1. Automatic mode

1) Initial RT determines the working mode and ST, the mode is determined effective only once unless A/C shut-down then re-started. If from other modes switches to autoamatic mode (including mode conversion after shutdown), it should be that the compress stop more than 3 min then temperature judgement and automatic mode are conducted (it can conduct immediately from fan mode switched to automatic, the indoor fan stops, three minutes later the response is made and start up). Within 3 min, the output as: Showing the room temperature, indoor fans starts (or anti-cold airflow), the outdoor fan stops;

2) With memory controller, once being turned off or in case of an accidently power cut, the A/C is able to retain and restore the original mode when being turned on or the power supply is resumed, if the auto restart function activated. power-down after power-on; while if the auto restart fundction isn't activated, the A/C enters standby state.

Heat pump

Mode	Initial RT	Initial ST
Cooling	$RT \geq 26^{\circ}\text{C}$	23°C
Dehumifying	$26^{\circ}\text{C} > RT \geq 20^{\circ}\text{C}$	18°C
Heating	$RT < 20^{\circ}\text{C}$	23°C

Cooling-only

Mode	Initial RT	Initial ST
Cooling	$RT \geq 26^{\circ}\text{C}$	23°C
Dehumifying	$26^{\circ}\text{C} > RT \geq 20^{\circ}\text{C}$	18°C
Ventilating	$RT < 20^{\circ}\text{C}$	—

Under automatic mode (including from automatic converted into dehumidifying Dry mode), when the temperature up and down signals from the remote controller is received, the setting temperature ST adjusts correspondingly to the current room temperature plus or minus 1°C , the automatic regulating temperature range is $\pm 2^{\circ}\text{C}$.

2. Cooling mode

1) The control of the compressor

- a. When $RT - ST \geq 1^{\circ}\text{C}$, the compressor is running.
- b. When $RT - ST < -1^{\circ}\text{C}$, the compressor is off.
- c. When $-1^{\circ}\text{C} \leq RT - ST < 1^{\circ}\text{C}$, the compressor keeps its original state.

2) Outdoor fan motor and the compressor run simultaneously (except for defrosting).

3) The control of indoor fan motor:

- a. Indoor fan motor can operate by automatic, low, middle, and high airflow speed circularly.
- b. Indoor fan motor's the automatic airflow speed control Indoor fan motor can operate by automatic, as shown in Figure 1:

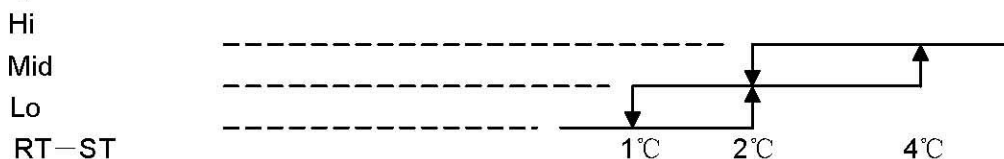


Figure 1 Cooling automatic airflow

When the temperature changes lead to changes in airflow speed, the switch can only be made orderly, and every grade of air flow speed runs 1 minute at least.

3. Dry mode

running into this mode, the Air cond. firstly operates for 3 minutes according to cooling mode (set temperature is 7°C), and then takes the detected backflow air temperature minus 2°C as a new set temperature (the minimum value of 5°C) and runs according to cooling mode, indoor fan operates at low-speed, at this moment the setting operation of Fan speed is invalid but Swing is adjustable.

4. Heating mode

On the Heating mode, the room temperature is repaired. After repaired, the room temperature display on the LED CRT= $\text{RT}-3^{\circ}\text{C}$.

1) The control of the compressor

a. When $\text{ST}-\text{CRT}\geq 1^{\circ}\text{C}$, the compressor is running.

b. When $\text{ST}-\text{CRT}< -1^{\circ}\text{C}$, the compressor is off.

c. When $-1^{\circ}\text{C}\leq \text{ST}-\text{CRT}< 1^{\circ}\text{C}$, the compressor keeps its original state

2) Outdoor fan motor and the compressor run simultaneously (except for defrosting)

3) The control of indoor fan motor:

a. Indoor fan motor can operate by automatic, low, middle, and high airflow speed circularly.

b. indoor fan motor's the automatic airflow speed control Indoor fan motor can operate by automatic, as shown in Figure 2:

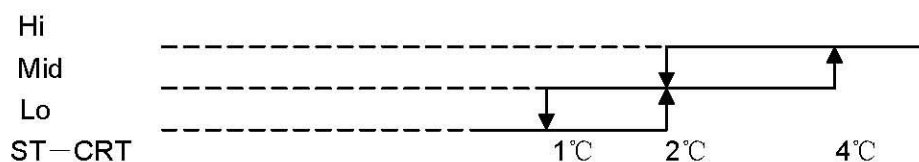


Figure 2 Heating automatic airflow

When the temperature changes lead to changes in airflow speed, the switch can only be made orderly, and every grade of air flow speed runs 1 minute at least.

4) Vane motor control: run as set state.

5) 4-way valve control:

a. Under heating mode, the four-way valve maintains well-connected status (including the compressor stops on set condition, but except for the defrosting process)

b. When the mode switches into the heating mode or start-up, four-way valves will open 5 Seconds before the compressor starts; while the mode exits from the heating mode or turn off, the four-way valve will close 2min after after the shut-down the compressor.

6) Defrosting function:

During defrosting, once mode switch, temperature setting signals received, and the buzzer and display make response immediately, but the other operations won't implemented until defrosting finished;

During defrosting, the signals of on-off, timing, sleep, airflow speed and swing will be responded, but the airflow speed and swing should be in accordance with anti-cold air rules.

Except the above signal processing during defrosting, no other signals will be dealt with, but only a loud buzz.

During defrosting, electrical heating stops compulsively.

Defrosting enter and exit program:

Option 1: with jumper JC

The condition of enter defrosting: run into defrosting once any of condition 1, 2, and 3 met.

Condition 1: As shown in figure 3

Defination:

The followings are all required to meet:

- a. $IPT1 = IPT_{max} - \Delta IPT$ ($8^{\circ}C$)
- b. $t5 \geq 50min$ (running time $t5 \geq 50min$ (the compressor runs cumulatively) , $t5$ is removable, and could be less than $t1$)
- c. $IPT < 40^{\circ}C$, and lasts 2min.

Running into defrosting on condition 1, the first running time of set defrosting is F (8min); after running a defrosting cycle, the defrosting time should be determined and adjusted.

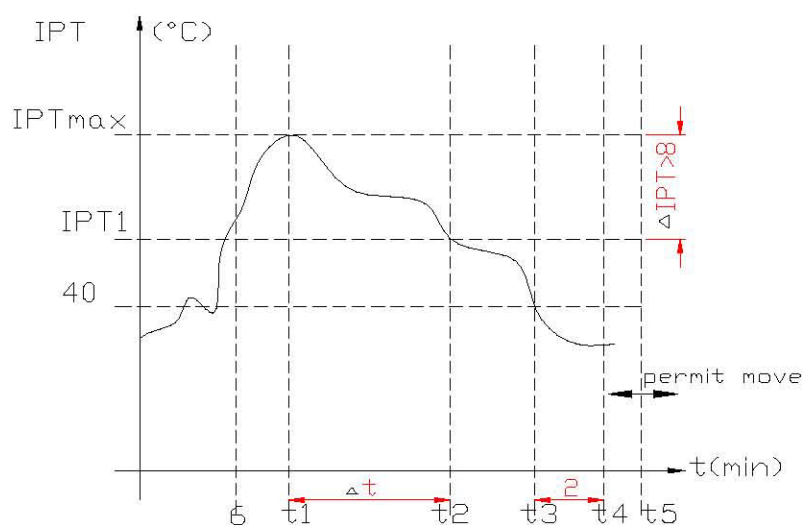


Figure 3

Condition 2: When running time is more than or equal to 120 min (compressor is running accumulatively), the indoor temperature is less than $35^{\circ}C$ for 2 min sustained. Running into defrosting under condition 2, defrosting time set is 8 min.

Condition 3: after the compressor is operating for 20min continuously, the indoor temperature is less than $23^{\circ}C$ which is anti-cold wind temperature when the fan stops running(including temperature dropping when compressor operating, not including the compressor's starting course), and the machine runs into defrosting according to any one condiciton as below) Running into defrosting under condition 3, defrosting time set is 10 min.

- a) Running into the first defrosting in 20 min after start-up.
- b) The interval from last defrosting equivalent to or more than 50 min (stopping the compressor or the machine in standby is allowed in the meantime).

Option 2: No Jumper JC, and no OPT outdoor sensor

when the compressor runs for 45 min, if the indoor coil temperature is less than $40^{\circ}C$ for 2 min, the machine runs into defrosting, and lasts for 3min, otherwise when the compressor runs for 120 min, the machine runs into defrosting automatically and last for 10 min.

Option 3: No jumper JC, but with OPT outdoor sensor

When heating, when the temperature of outdoor unit under heat-exchange is lower than $E^{\circ}C$ ($-4^{\circ}C$), and the compressor runs for 45 min, then the machine runs into defrosting and last for 10 min.

Option 4. When heating, when the outdoor fan motor stopped but the compressor not stopped

accumulative total 30min, then the machine runs into defrosting and last for 8 min. if the accumulative total less than 30min, but accord with one of the condition option 1-3 them the machine runs into defrosting at the option 1-3 and the accumulative total time restarts from 0.

Conditions for quitting defrosting

(1) The quitting conditions for option 1 and option 2, the machine quits from defrosting if any one below condition met.

a. Defrosting time is over.

b. When it runs in defrosting for three minutes, the IPT indoor coil temperature rises 15 ° C or above from the bottom point.

(2) The quitting conditions for option 3.

When $OPT \geq 20\text{ }^{\circ}\text{C}$ or defrosting for more than 10 min, then quit from defrosting.

(3) Defrosting process shown in Figure 4

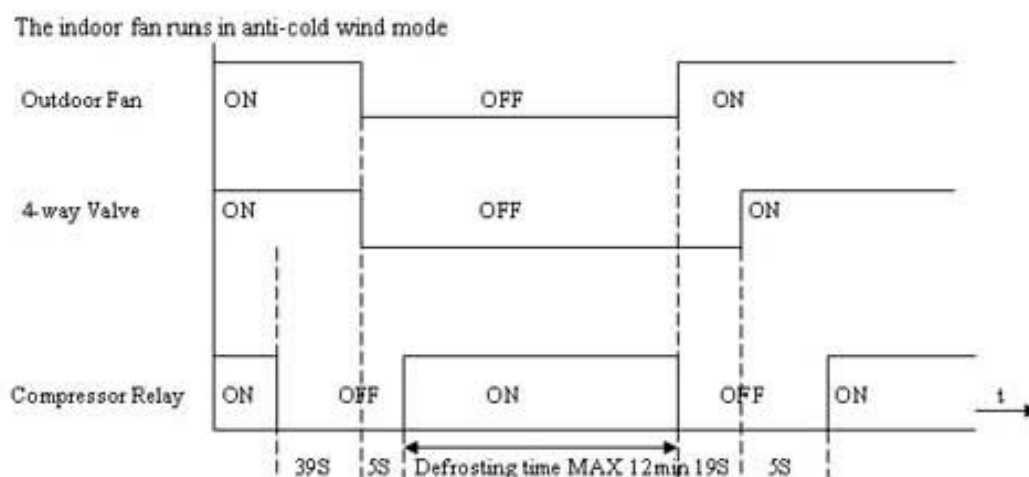


Figure 4 Defrosting process

7) Auxiliary Electric heating function

(1) The default condition is automatic on/off the electric heating function.

(2) The conditions of auxiliary electric heating(all the following conditions must be met)

a. the compressor runs for more than 3min;

b. indoor fan runs normally;

c. not in defrosting state;

d. auxiliary electric heating is turned off for more than 30s.

e. $ST-RT \geq 3\text{ }^{\circ}\text{C}$;

f. $RT < 22\text{ }^{\circ}\text{C}$;

g. $IPT \leq 43\text{ }^{\circ}\text{C}$;

(3) The conditions of stopping auxiliary electric heating(any one of the following conditions met, the state stops)

a. the compressor stops

b. $RT \geq 24\text{ }^{\circ}\text{C}$;

c. $IPT \geq 48\text{ }^{\circ}\text{C}$

d. indoor fan stops.

e. running into sleeping function

5. Fan mode

1) Indoor fan motor control:

indoor fan motor is running at setting speed (the speed is same as that of heating).

2) Vane motor control: running according to the setting.

3) The outdoor unit is not working under fan mode.

6. Sleeping mode

1) Under sleep mode, the indoor fan motor is running at a low-airflow speed, except that the power light and sleep light are on, timer light is on/off according to the setting state, running light is off. LED is off after displaying 5min.

2) Temperature control:

(1) From cool mode to sleep mode, one hour later, the operates $Temp.=ST+1$, another one hour later, the operates $Temp.=ST+2$, after then unchanged.

(2) From heating mode to sleep mode, one hour later, the operates $Temp.=ST-1$, another one hour later, the operates $Temp.=ST-2$, after then unchanged.

3) the machine will automatically shut up after running 8 hours under sleep mode.

Timer on start-up and sleep mode are implemented at the same time, and the sleep mode can not be functioned.

7. Timing fuction

The timing scale is between 10min to 24h, when the time fixed is less than "10" hours, the displayed time is shown by 0.5 hour as the unit, when the time fixed is more than or equal to "10" hours, the displayed time is shown by 1 hour as the unit.

8. Emergency switch (ON/OFF)

1) When stand-by, to operate by pressing the emergency switch as follows:

To Press the emergency switch in three seconds, the buzzer rings once, and to release, the machine runs into cooling mode; if to holding on, the buzzer rings twince, then the machine runs into heating mode, while when the machine is on, to press the emergency Switch, the buzzer rings once and then the machine shut down.

2) The machine is running mandatorily as the selected mode within 30min after emergency operation, indoor fan motor is running in high-speed, and vane board is swinging. The machine runs into automatic mode 30min later, the selected mode unchanged, the set temperature is 23° C ,the rotate speed of indoor fan motor is automatic, and vane board is swinging too.

3) To press the emergency button when the machine operating, then the machine runs into stand-by state.

4) Under emergency operation. the Compressor's time-lapse protection, anti-frosting protection in cooling, Overheating protection in heating and sensor fault protection and defrost operate are effective.

5) Under emergency operation, once effective signal from remote controller is received, then the machine exits form the emergency mode, and operate according to the setting from remote controller.

9. Auto-restart function

1) The PCB retains the setting parameters in case of power off. When the power supply is resumed, the machine, which has been started up the power-off memory function, is able to restore into the original running state automatically.

2) To press the emergency button and power on, and hold on 10 seconds, exit from the power-off memory function, buzzer rings four tomes.(default: no this function)

10. Protection/ Troubleshooting functions

1) Compressor's protection function:

- a. The PCB which has Power-off memory function, once this function is started up, the compressor goes along 3min delay protection when power on. If the PCB hasn't been started up this function, even when the PCB is power-on, the compressor doesn't process 3 min delay function.
- b. Compressor's 3 min interval protection: the compressor can't start-up until 3 min later(except for defrosting process).
- c. After the compressor started, the compressor's state isn't subject to the changes on ST,RT in 3min.

2) Anti-frosting protection of indoor evaporator:

If $IPT \leq 0\text{ }^{\circ}\text{C}$ detected in consecutive 5 min, compressor and outdoor motor stoped, indoor fan motor runs at high-speed forcibly; $IPT \geq 5\text{ }^{\circ}\text{C}$ detected 3min later, then outdoor fan is activated. And the compressor, indoor fan motor restores the original state.

3) Overheating protection:

$IPT \geq 55\text{ }^{\circ}\text{C}$, the outdoor fan stops, $IPT \geq 65\text{ }^{\circ}\text{C}$, the compressor stops, indoor fan motor runs at high-speed forcibly. When $IPT \leq 48\text{ }^{\circ}\text{C}$, outdoor fan motor and the compressor open, indoor fan motor restores the original state.

4) Anti-cold wind control in heating:

a. When runing into the heating mode, once the compressor fails to comply with the start-up conditions, the wind speed is regulated according to the coil temperature in 2 min(including stopping the indoor fan motor), 2 min later the indoor fan motor stops.If the compressor starts up within 2 min, then operating by Figure 5.

Under heating process, to close the compressor (including the downtime protection), the wind speed is regulated according to the coil temperature in 1min(including stopping the indoor fan), 1min later the fan is stoped forcibly.

b. When the indoor fan motor running at a low-speed wind and in anti-cold wind operation, once electric heating opens,the vane immediately withdraws from the anti-cold windy location and turn back to normal vane angle. When electric heating closes, indoor fan motor go on to run at low-speed wind, accordingly, the vane turns to anti-cold windy location.

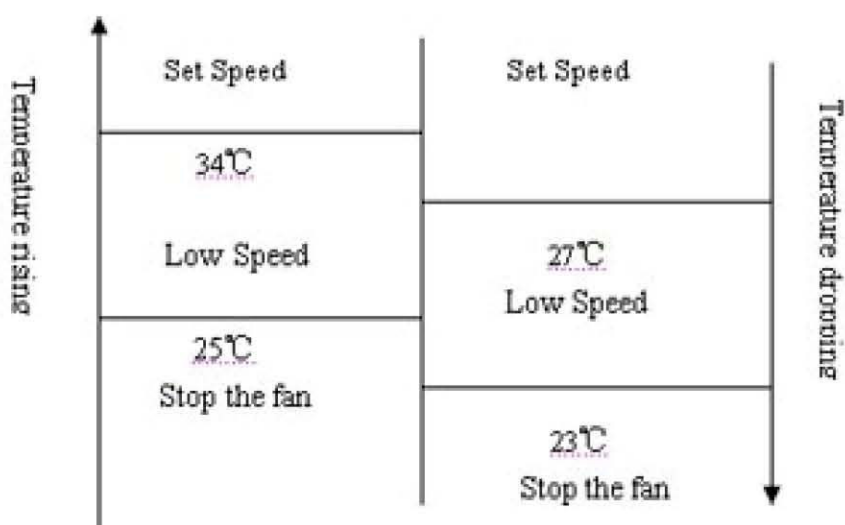


Figure 5 Anti-cold Wind

2) The following table shows the fault protections. When failures happens, the PCB alarms and buzzer rings three times. Failure code appears, and the PCB operates protection procedures.

Failure code: For the machine has LED, the code displays on LED, for no LED machine, the code reflects by the running light.

Failure	Running Light Flash	LED Display
RT Sensor Failure	Once / Period	E1
IPT Sensor Failure	Twice / Period	E2
Indoor Fan Motor Failure	6 times / Period	E6

When there is LED displaying failure code, the code is displayed statically, if there are several failure codes should be reported at the same time, then failure codes appears one by one every eight seconds correspondingly.

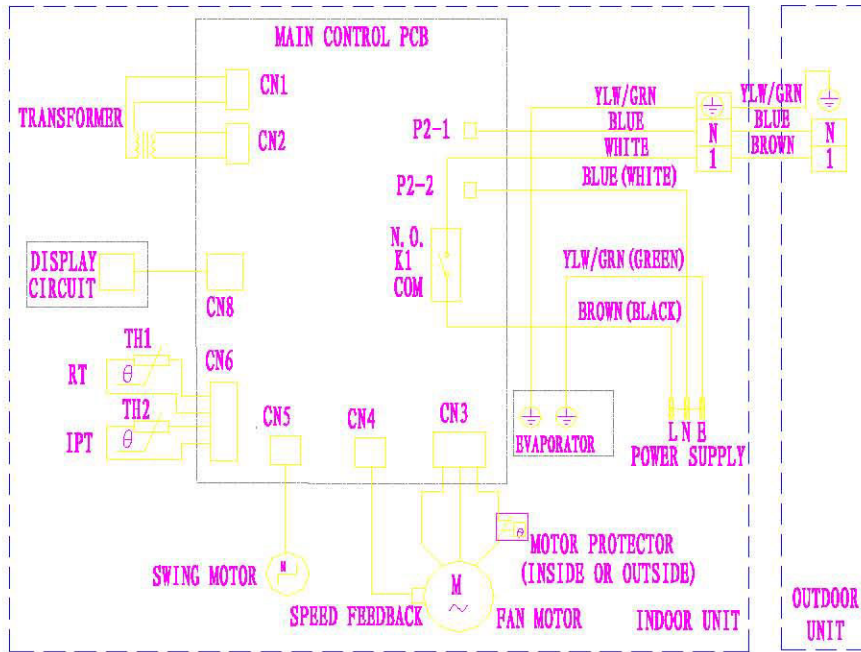
a. Sensor's failure protection: when the sensor's temperature is out of the range $-50 \leq T \leq 110$ °C, then sensor failure is determined. Once RT, IPT sensor failures appear, the compressor stops and indoor and outdoor fan motors shut off. Remote controller doesn't response to any signal except for shutdown. During failure the machine can run in fan mode. After the failure is settled, the PCB restores to standby status.

b. Failure protection of Indoor PG fan motor: If there is no feedback signal of rotate speed within 5, the indoor fan motor stops, at the same time, the compressor, outdoor fan motor, four-way valve and auxiliary electric heater etc cut down. 10 seconds later, the indoor fan motor restarts, once there is no feedback signal of rotate speed within 5 seconds either, then the machine stops and goes into indoor fan motor failure protection, buzzer rings three times, and running light flashes at 6 times per 8 seconds. When the failure is confirmed, once there is feedback signal, the failure is relieved automatic.

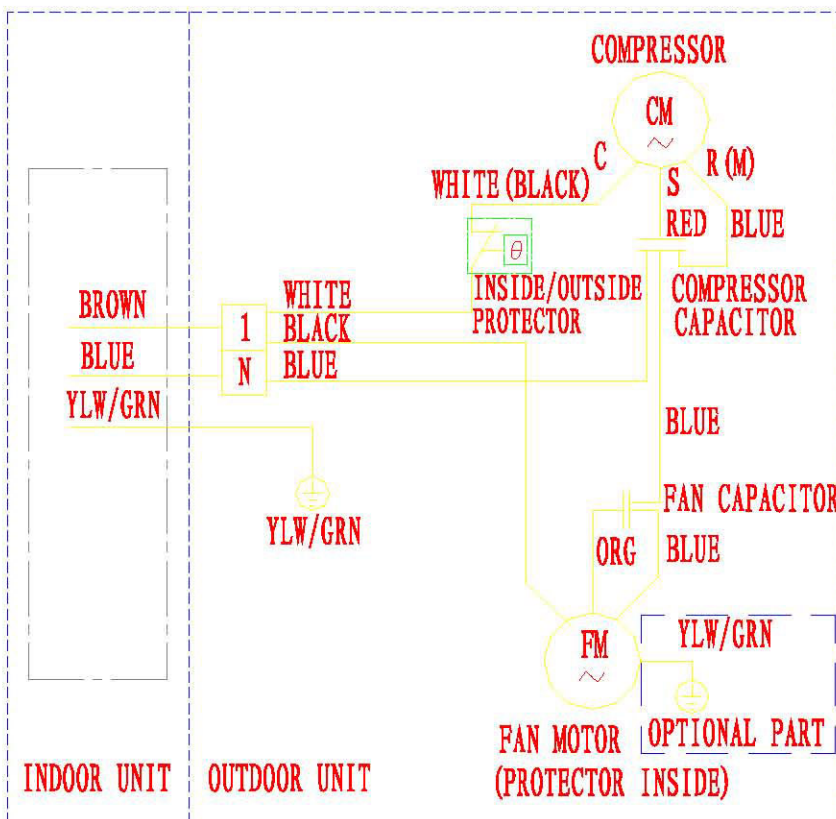
WIRING DIAGRAM

MODEL: KSW-09R5B, KSW-12R5B

INDOOR UNIT:



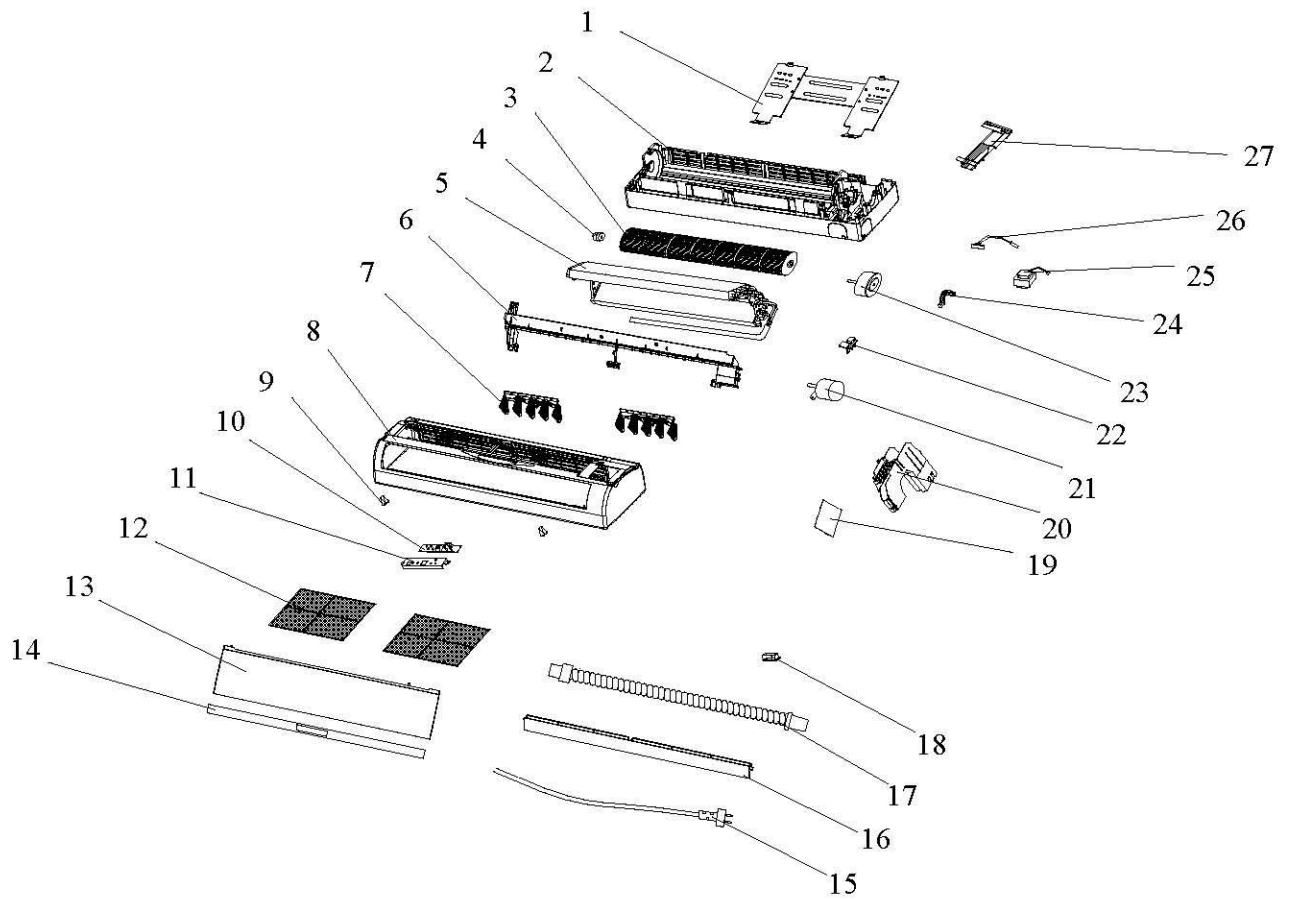
OUTDOOR UNIT



EXPLOSION VIEW

MODEL: KSW-09R5B, KSW-12R5B, KSW-18R5

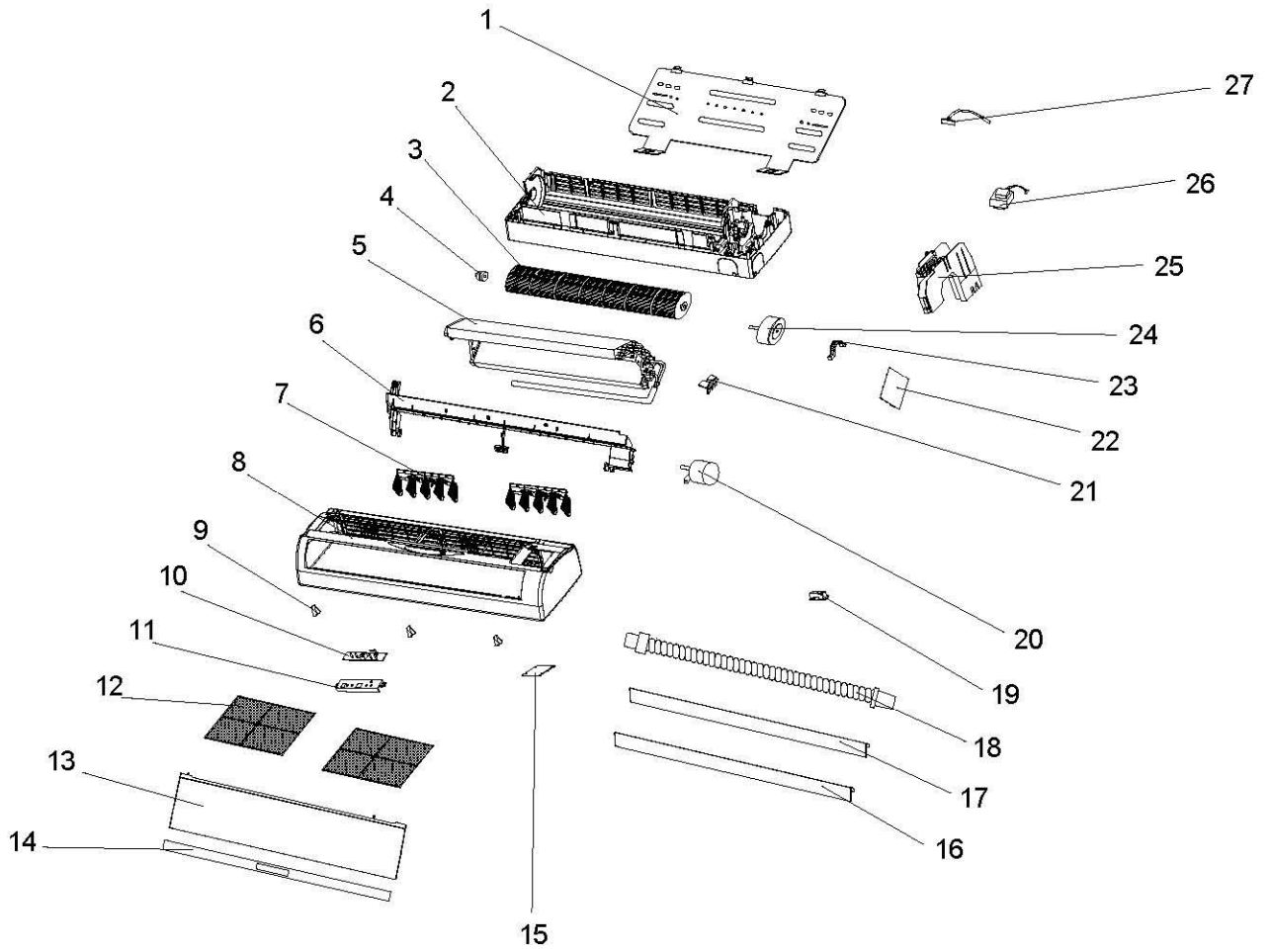
INDOOR UNIT:



EXPLOSION VIEW

MODEL: KSW-24R5B

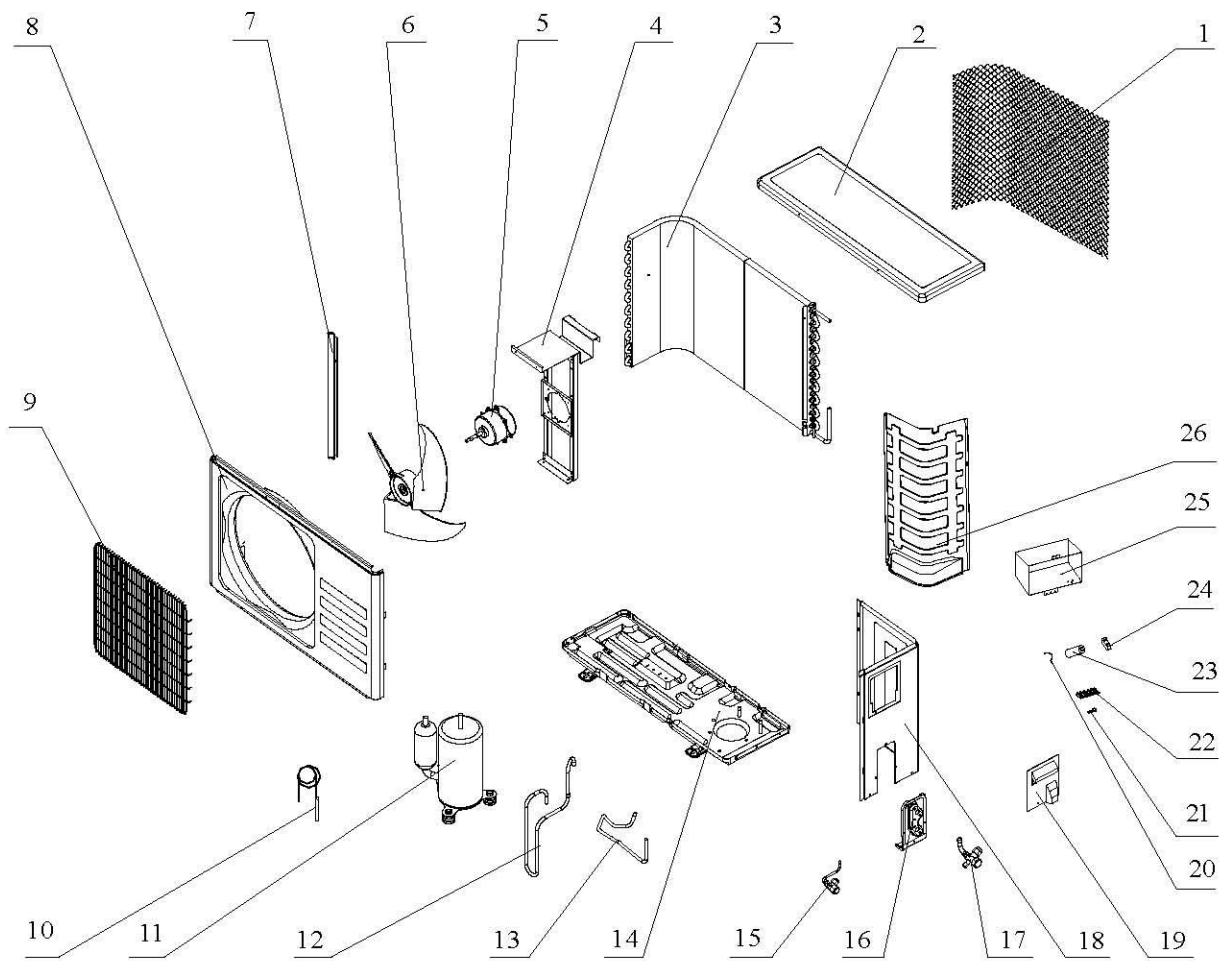
INDOOR UNIT:



EXPLOSION VIEW

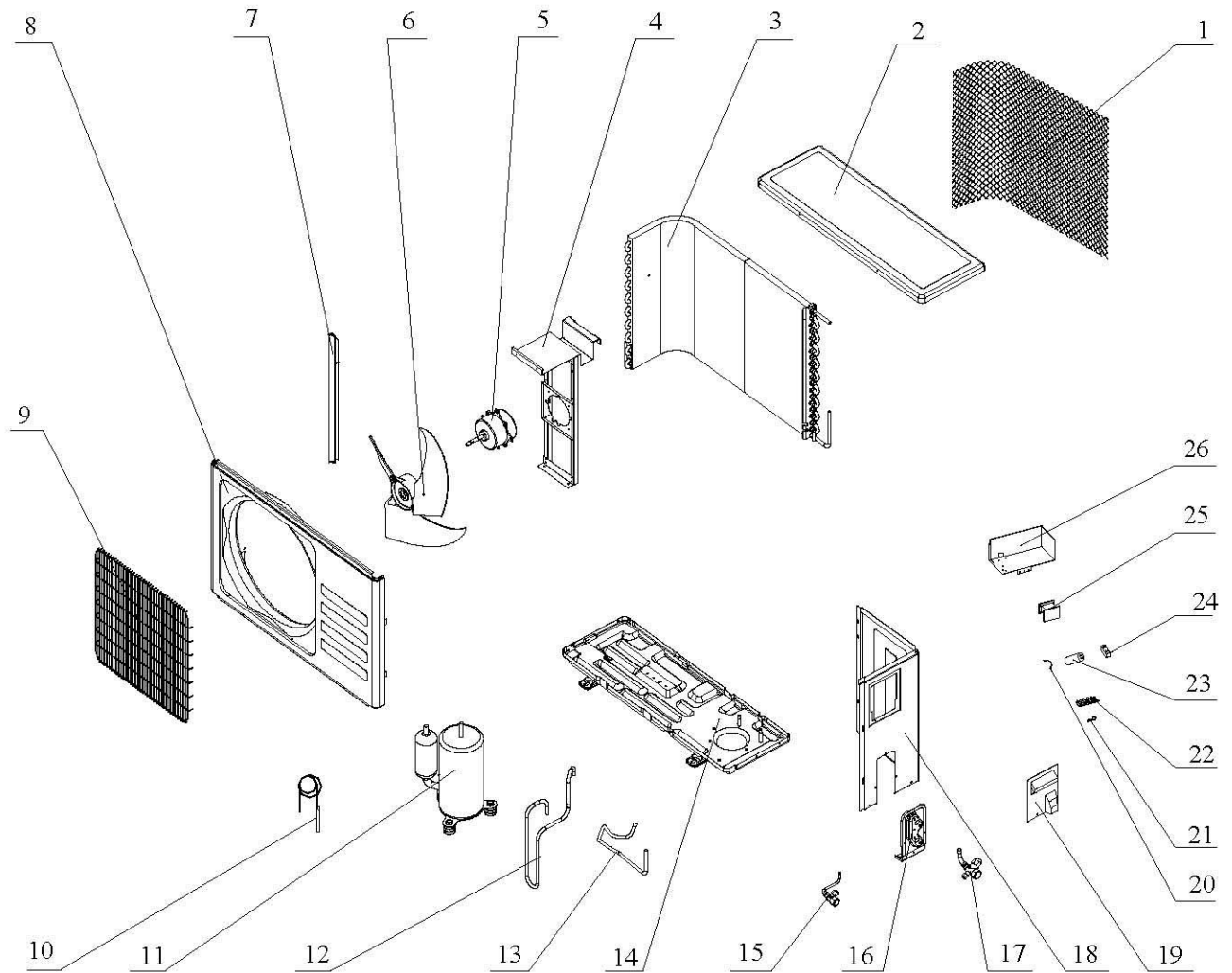
MODEL:

OUTDOOR UNIT: KPC-09HH5B, KPC-12HH5B, KPC-18HH5



EXPLOSION VIEW

Mode: KPC-24HH5B
OUTDOOR UNIT:



Part List

Indoor Unit- KSW-09R5B, KSW-12R5B, KSW-18R5

No.	Part No.	Part Name	Q'ty	Remark
1		Installation Plate	1	
2		Base	1	
3		Cross Fan	1	
4		Bearing Mount	1	
5		Evaporator	1	
6		Water Drainage Assembly	1	
7		Vertical Vane Assembly	2	
8		Face Frame	1	
9		Screw Cover	2	
10		Display PCB(Digital)		
11		Display PCB Box	1	
12		Air Filter	2	
13		Front Panel	1	
14		Display PCB Cover	1	
15		Power Supply Cord	1	
16		Vane	1	
17		Drainage Hose	1	
18		Cable Clamp	1	
19		Main PCB(Digital)		
20		Electrical Box	1	
21		Vane Motor	1	
22		Sensor Holder	1	
23		Indoor Motor	1	
24		Indoor Motor Cover	1	
25		Transformer	1	
26		Indoor Sensor Assembly	1	
27		In And Out Pipe Fixer	1	
28		Remote Controller	1	Not shown in Explosion view
29		Remote Controller Supporter	1	
30		Indoor Carton	1	
31		Left Foaming	1	
32		Right Foaming	1	

Part List**Indoor Unit- KSW-24R5B**

No.	Part No.	Part Name	Q'ty	Remark
1		Installation Plate	1	
2		Base	1	
3		Cross Fan	1	
4		Bearing Mount	1	
5		Evaporator	1	
6		Water Drainage Assembly	1	
7		Vertical Vane Assembly A	1	
		Vertical Vane Assembly B	1	
8		Face Frame	1	
9		Screw Cover	3	
10		Display PCB (digital)	1	
11		Display PCB Box	1	
12		Left Air Filter	1	
		Right Air Filter	1	
13		Front Panel	1	
14		Display PCB Cover	1	
15		Electrical Box Cover	1	
16		Vane A	1	
17		Vane B	1	
18		Drainage Hose	1	
19		Cable Clamp	1	
20		Vane Motor	2	
21		Sensor Holder	1	
22		Main PCB(digital)	1	
23		Indoor Motor Cover	1	
24		Indoor Motor	1	
25		Electrical Box	1	
26		Transformer	1	
27		Indoor Sensor Assembly	1	
28		Remote Controller	1	Not shown in Explosion view
29		Remote Controller Supporter	1	
30		Indoor Carton	1	
31		Left Foaming	1	
32		Right Foaming	1	
33		Middle Pasteboard Supporter	1	
34		Middle Foaming Supporter	1	

Part List

Outdoor Unit- KPC-09HH5B, KPC-12HH5B, KPC-18HH5

No.	Part No.	Part Name	Q'ty	Remark
1		Grille	1	Optional
2		Top Cover	1	
3		Condenser	1	
4		Outdoor Motor Supporter	1	
5		Outdoor Motor	1	
6		Propeller Fan	1	
7		Left Grille Supporter	1	
8		Front Plate	1	
9		Fan Guard	1	
10		Capillary Assembly	1	
11		Compressor And It Accessories	1	
12		Discharge Pipe	1	
13		Suction Pipe	1	
14		Base	1	
15		Two-way Valve	1	
16		Valve Supporter	1	
17		Three-way Valve	1	
18		Right Plate	1	
19		Electrical Box Cover	1	
20		Capacitor Strip	1	
21		Cable Clamp(ϕ 7)	1	
22		Terminal	1	
23		Compressor Capacitor	1	
24		Fan Motor Capacitor	1	
25		Electrical Parts Box	1	
26		Partition plate	1	
27		Base Carton	1	Not shown in the Explosion view.
28		Cabinet Carton	1	
29		Base Foaming	1	
30		Cover Forming	1	



A Tradition of leadership and excellence for over 50 years

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