TAS-09VH，TAS-12VH

TAS-09VH/O，TAS-12VH/O

TAS-18V，TAS-24V，TAS-18V/O，TAS-24V/O

TAS-18VH，TAS-24VH，TAS-18VH/O，TAS-24VH/O

Service Manual for Wall split type Model

TAS-09VH，TAS-12VH

TAS-09VH/O，TAS-12VH/O

1.1 Indoor unit and Outdoor unit Figures

Indoor unit figure of Model TAS-09VH，TAS-12VH

Outdoor unit and remote controller figures of Model TAS-09VH/O，TAS-12VH/O

Figure 2-1

1.2 Exploded view of indoor unit TAS-09VH, TAS-12VH

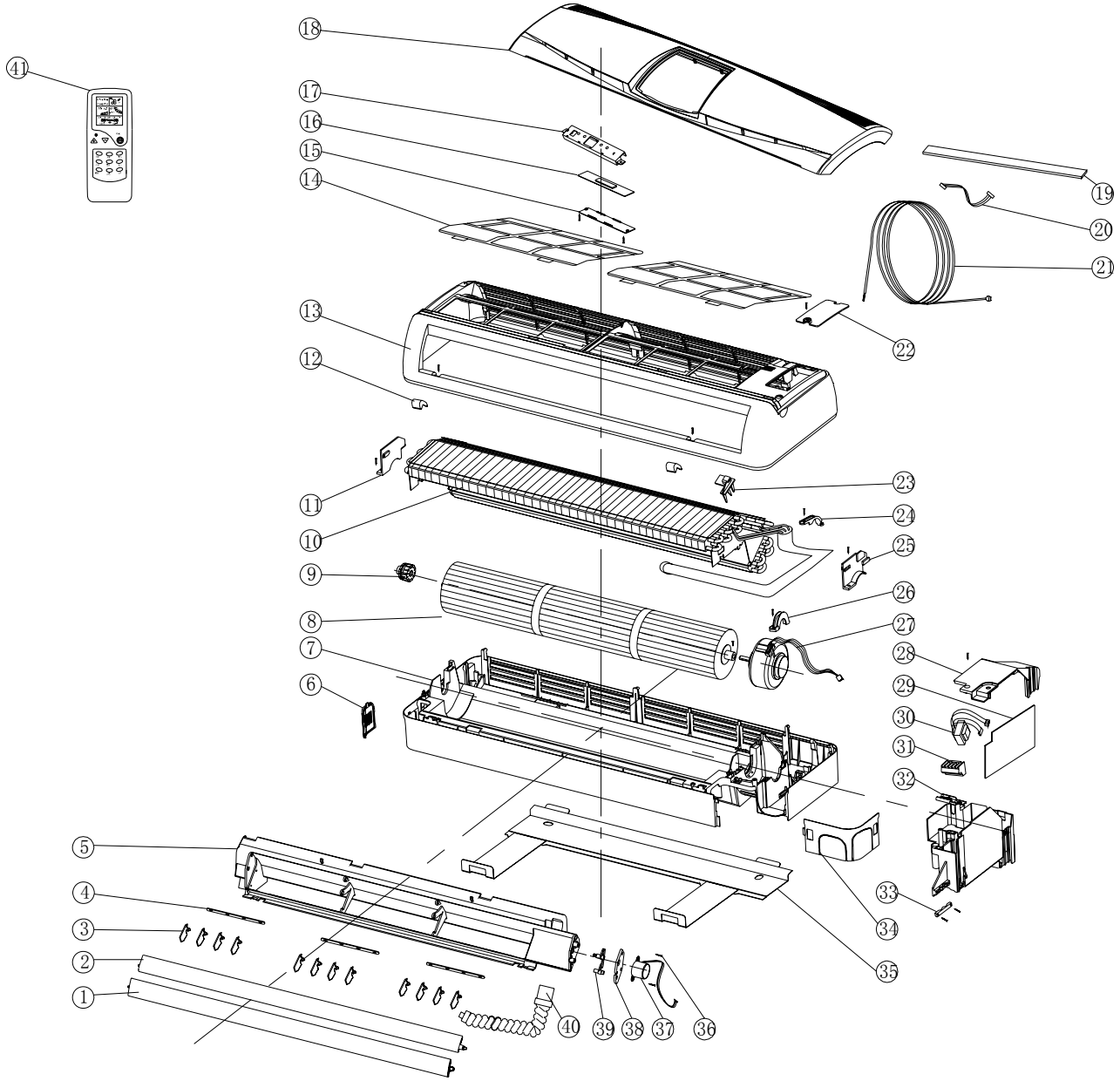


Figure 2-2

1.3 Spare parts list for indoor unit for TAS-09VH and TAS-12VH:

Table form 1-1

No.	Description	Part Code				Qty
		N/A	TAS-09VH	N/A	TAS-12VH	
1	Louver A	100420003	100420003	100420087	100420087	1
2	Louver B	100420083	100420083	100420088	100420088	1
3	Swing Louver	100420007	100420007	100420007	100420007	12
4	Connecting rod	100420072	100420072	100420048	100420048	3
5	Outlet part	391200006	391200006	100090129	100090129	1
6	Left angle plate	100360001	100360001	100360002	100360002	1
7	Base	100060108	100060108	100060138	100060138	1
8	Cross flow fan	100010016	100010016	100010026	100010026	1
9	Fan Bearing	401000006	401000006	401000007	401000007	1
10	Evaporator assembly	972900499	972900499	972900477	972900477	1
11	Evaporator left fixed plate	029993988	029993988	109990108	109990108	1
12	Screw cover	109990023	109990023	109995908	109995908	2
13	Middle frame	391070007	391070007	391070003	391070003	1
14	Air Filter	100190127	100190127	100190139	100190139	2
15	Display box cover	100410009	100410009	100410009	100410009	1
16	Display lamp plate	337000041	337000041	337000041	337000041	1
17	Display box	100410001	100410001	100410001	100410001	1
18	Front Panel	391022026	391022026	391022049	391022049	1
19	Sponge bar	----------	----------	----------	----------	
20	Connecting Cable	----------	----------	----------	----------	
21	Power Cord	----------	----------	----------	----------	
22	Middle frame coverplate	100080034	100080034	100080034	100080034	1
23	Room temp. Sensor Holder	079990030	079990030	100280105	100280105	1
24	Pipe Clamp	100430025	100430025	029991901	029991901	1
25	Evaporator right fixed plate	109990109	109990109	109990109	109990109	1
26	Motor platen	100130003	100130003	100130003	100130003	1
27	Motor	320204004	320204004	320204004	320204004	1
28	Electric box cover	391100011	391100011	391100011	391100011	1
29	Electric control plate	331200083	331400083	331200083	331400083	1
30	Transformer	321620014	321620014	321620014	321620014	1
31	Terminal Board	321000022	321000022	321000022	030090241	1
32	Electric box	391100011	391100011	391090014	391090014	1
33	Screw	150010058	150010058	150010058	150010058	2
34	Wire Clip	391110057	391110057	391110018	391110018	1
35	Right angle plate	100300003	100300003	100300026	100300026	1
36	Wall-mounting frame	020100010	020100010	020100011	020100011	1
37	Step motor	320273001	320273001	320273001	320273001	1
38	Step Motor plate	391200050	391200050	100420002	100420002	1
39	Crank connecting rod	100420082	100420082	100420082	100420082	1
40	Thermal insulation pipe	099990080	099990080	099990080	099990080	1
41	Remote controller	336821050	336821049	336821050	336821049	1

PLS NOTE:

The above data are subject to change without notice.

1.4 Exploded view of outdoor unit for TAS-09VH/O

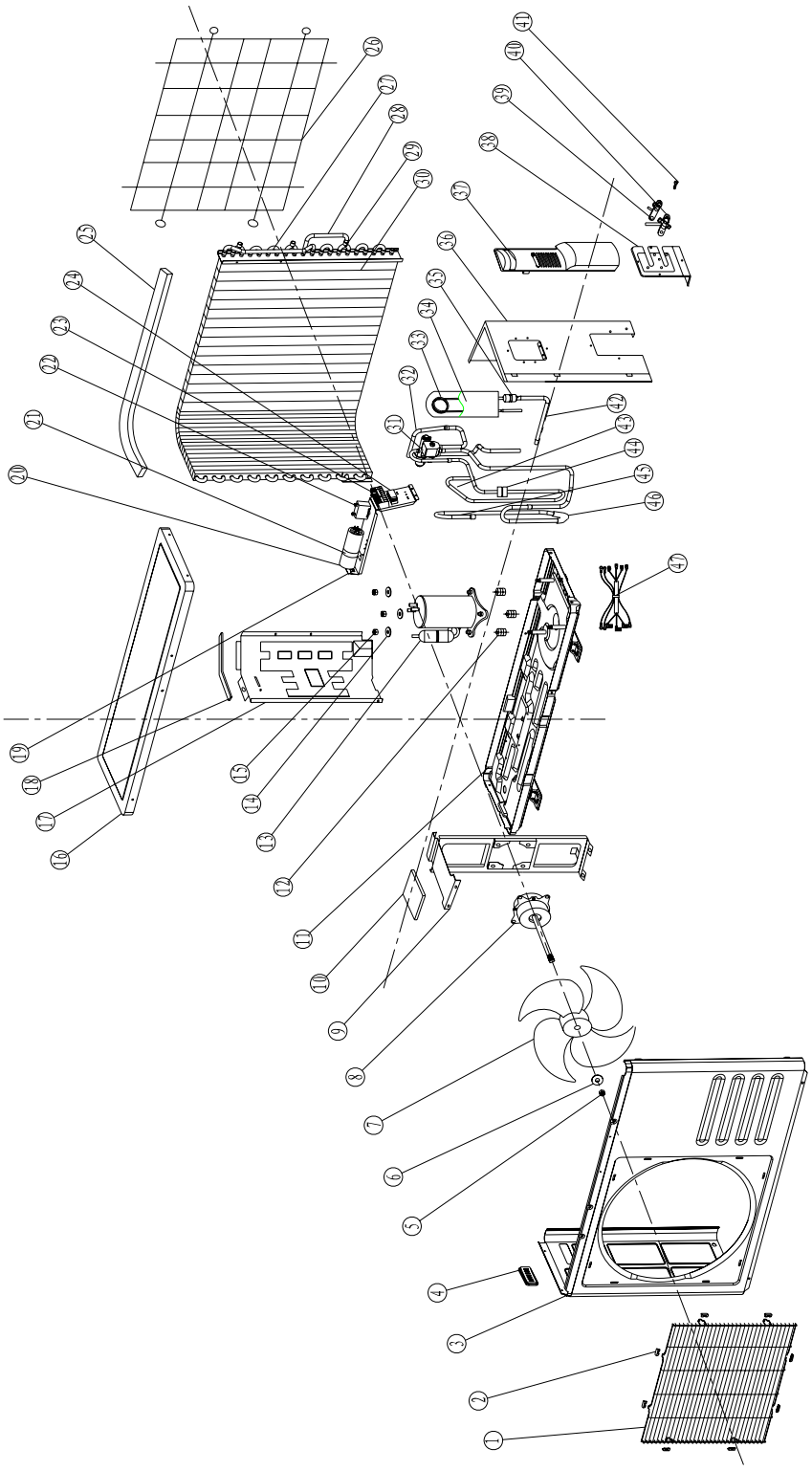


figure 2-3

1.5 **Spare parts list of outdoor unit for TAS-09VH/O**

Table 1-2

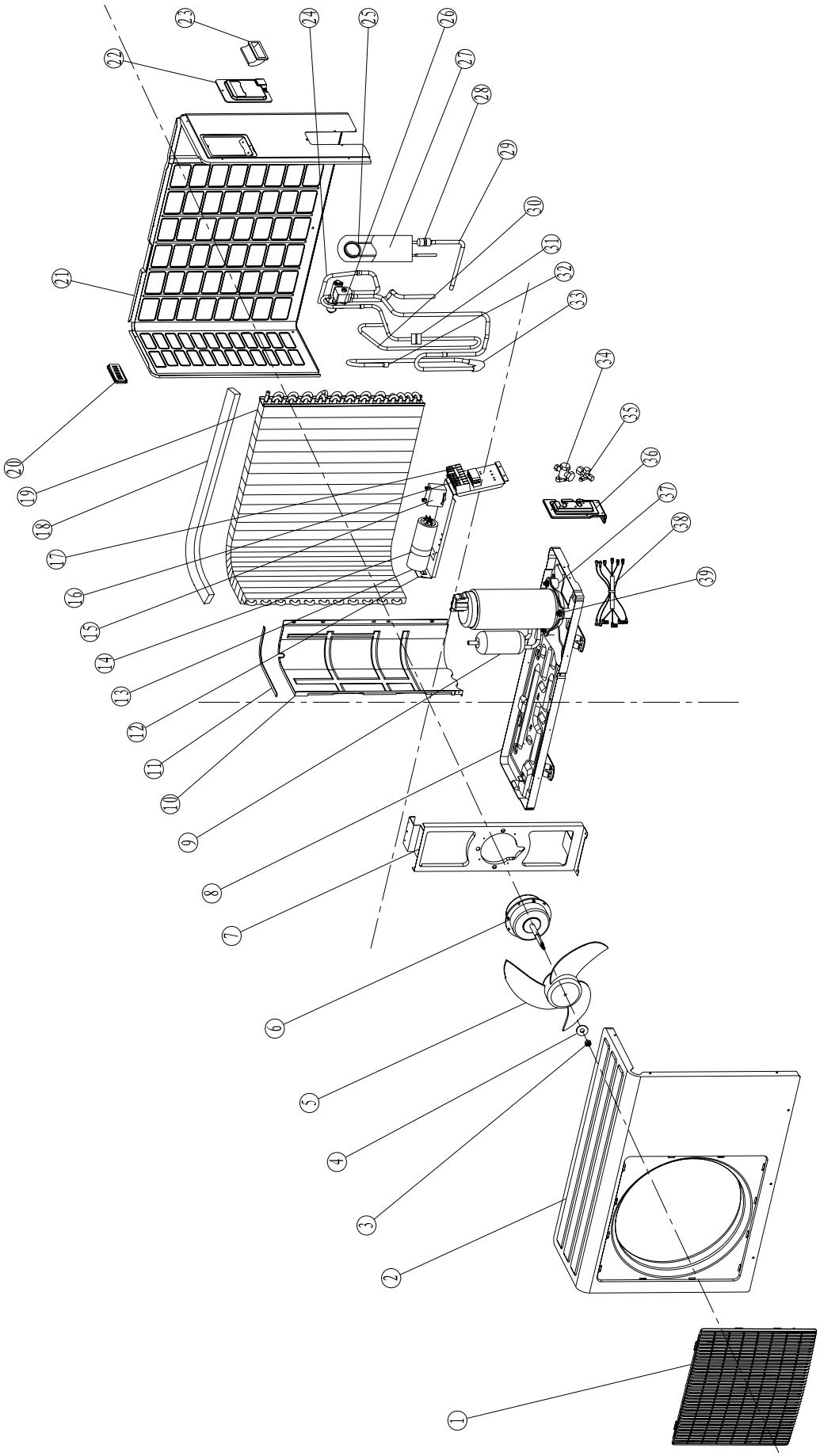
No	Description	Part No		Qty
		N/A	TAS-09VH/O	
1	Front Grill	020120015	020120015	1
2	Grill Clip	109990256	109990256	8
3	Front Plate	020070056	020070056	1
4	Small handle	100050021	100050021	1
5	Nut	150020009	150020009	1
6	Gasket	453000010	453000010	1
7	Axial flow fan	100030006	100030006	1
8	Motor	320224004	320224004	1
9	Motor support	020040045	020040045	1
10	PE Sponge	090020234	090020234	1
11	Base	313013036	313013036	1
12	Anti-vibration pad for the compressor	010011455	010011455	3
13	Compressor	303314002	303314002	1
14	Gasket	150030018	150030018	3
15	Nut	150010004	150010004	3
16	Top panel	029994517	029994517	1
17	Partition board	313030027	313030027	1
18	PU Sponge	090020027	090020027	1
19	Electric installation board	313120021	313120021	1
20	Compressor Capacitor	030010019	030010019	1
21	Capacitor Clamp	020140010	020140010	1
22	Terminal Board	030090061	030090061	1
23	Fan Capacitor	320110003	320110003	1
24	Wire Clip	321100011	321100011	1
25	PU Sponge	---	---	---
26	Rear Grill	020110002	020110002	1
27	Span Pipe	---	---	
28	Span Pipe	---	---	
29	3-way Pipe	070130049	070130049	1
30	Condenser	372200075	372200075	1
31	4-way Valve		973500044	1
32	Intake pipe for the condensor	960600019 360420016 360440030	960600019 360420016 360440030	1
33	Capillary Assy	971900145	971900145	1
34	Damping rubber	110030015	110030015	1
35	Filter	070190007	070190007	1
36	Right panel	313060028	313060028	1
37	Large handle	100040002	100040002	1
38	Valve installation plate	029994567	029994567	1
39	High-pressure valve	352120005	352120005	1
40	Low-pressure valve	352260005	352260005	1
41	Screw	150010043	150010043	4
42	Drainpipe for the condensor	360540049	360540049	1

43	Discharge pipe	070010551	070010005	1
44	Damping block	110020002	110020005	4
45	Suction pipe	360130131	360130131	1
46	Damping rubber	110030023	110030020	1
47	Connecting Wire	050030023	050030023	1

PLS NOTE THAT:

1. In the above table, " ---- " means that the related model don't have this component.
2. The data are subject to change without notice.

1.6 Exploded view of outdoor unit for TAS-12VH/O



1.7 Spare parts list for outdoor unit for TAS-12VH/O

(Table form 1-3)

No	Description	Part No		Qty
		N/A	TAS-12VH/O	
1	Front Grill	100380001	100380001	1
2	Front Plate	313070024	313070024	1
3	Nut	150020031	150020031	1
4	Gasket	150030017	150030017	1
5	Axial flow fan	100030005	100030005	1
6	Motor	320224003	320224003	1
7	Motor support	313040011	313040011	1
8	Base	313011057	313011057	1
9	Compressor	303314001	303314001	1
10	Partition Board	313030028	313030028	1
11	PU Sponge	090010222	090010222	1
12	Electric installation board	020130005	020130005	1
13	Compressor Capacitor	030010019	030010019	1
14	Capacitor clamp	020140010	020140010	1
15	Fan Capacitor	320110008	320110008	1
16	Terminal Board	030090265	030090265	1
17	Wire Clip	321100008	321100008	1
18	PU Sponge	090020150	090020150	1
19	Condenser	372200071	372200071	1
20	Small handle	100050018	100050018	1
21	Rear Grill	020270001	020270001	1
22	Large handle	020280001	020280001	1
23	Handle	100050022	100050022	1
24	Intake pipe for the condensor	070040063 070040064 070030102	070040063 070040064 070030102	1
25	Capillary Assy	960800037	960800037	1
26	4-way valve Assy	----------	990085101	1
27	Damping rubber for capillary	----------	---	
28	Filter	070190034	070190034	1
29	Drainpipe for the condensor	070040063 070040064 070040064	070040063 070040064 070040064	1
30	Discharge pipe	360230113	360230113	1
31	Anti-vibration pad	110020008	110020008	1
32	Suction pipe	360130127 070020013	360130127 070020013	1
33	Anti-vibration damping rubber	110030023	110030023	1
34	Low-pressure valve	352260005	352260005	1
35	High-pressure valve	352120005	352120005	1
36	Valve installation plate	313020013	313020013	1
37	Anti-vibration pad for the compressor	010011455	010011455	3
38	Compressor power cord	345100018	345100018	1
39	Anchor bolt for the compressor	313225047	313225047	3

Pls note: The data are subject to change without notice.

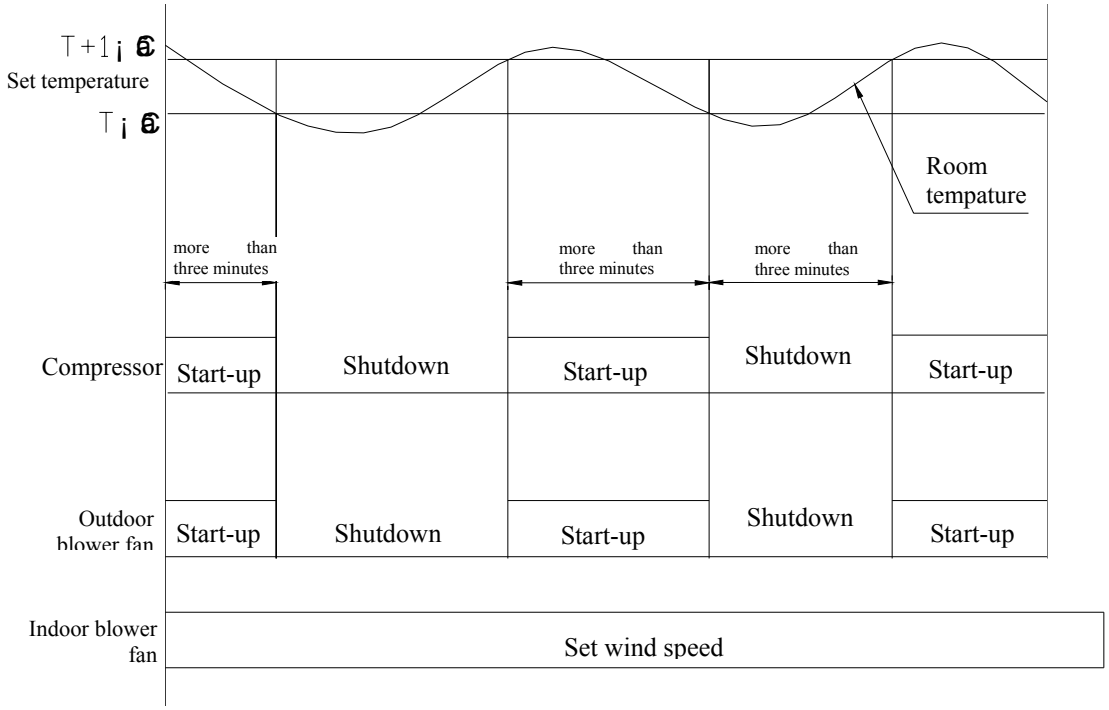
1.8 PCB function manual

Function

1.Cooling

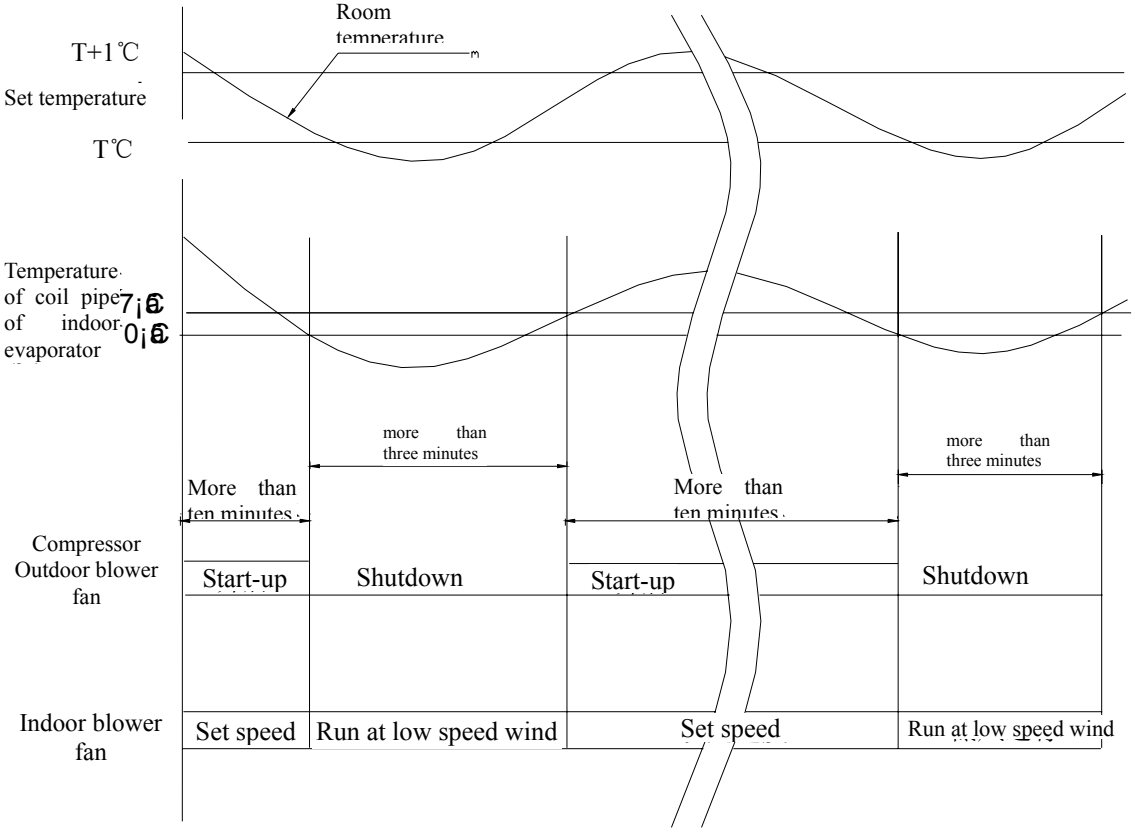
- The indoor temperature is detected by room temperature sensor of indoor units and the room temperature is controlled by the cyclic switch of compressor under the control of the electric control board.
- When power on for the first time, it is allowed to start up the compressor immediately; in order to protect the compressor, it is required to stop compressor immediately such as transforming mode, heating mode overheat protection and shutdown after starting up the compressor; furthermore, it is advisable to stop the compressor according to practical situations after it has run at least for three minutes. In general, the electric control board will not start up the compressor within three minutes at least after shutting down the compressor.
- Outdoor blower fan and compressor work synchronously; the indoor blower fan is running at the set wind speed; when the automatic wind is selected, the indoor blower fan running speed is select by the difference between room temperature and setting temperature.
- Start up the compressor: when the room temperature is more than Ts+1□(Ts□ is the set temperature), compressor → start-up
- Shut down the compressor: when the room temperature is less than the set temperature Ts□, compressor → shutdown

a. Working curve for temperature control



2.Anti freeze protection function of evaporator (cooling or dehumidify)

- This function is to prevent freezing on the surface of indoor evaporator.
- When the temperature of coil pipe of the indoor units is less than or equal to 1□ and the compressor has continuous run for more than ten minutes, the compressor and outdoor blower fan shut down through the electric control board and the indoor blower fan is running at low speed wind.
- When the temperature of coil pipe of the indoor units is more than or equal to 7□ and the compressor has shutdown for more than three minutes, the compressor and outdoor blower fan start to run and the indoor blower fan is running in the set mode.



3.Heating (only applicable to dual temperature units)

- The indoor temperature is detected by room temperature sensor of indoor units and the temperature controlled by the cyclic switch of compressor under the control of the electric control board.
- When power on for the first time, it is allowed to start up the compressor immediately; in order to protect the compressor, it is required to stop compressor immediately such as transforming mode, heating mode overheat protection and shutdown after starting up the compressor; furthermore, it is advisable to stop the compressor according to practical situations after it has run at least for three minutes. In general, the electric control board will not start up the compressor within three minutes at least after shutting down the compressor.
- In general, start up the compressor and the outdoor blower fan in the heating mode. The working mode of four-way valve is to open the four-way valve when starting up the compressor. In the course of defrost, the outdoor blower fan and the four-way valve are closed when the compressor starts up. In the course of heating, the compressor is closed without power breakdown or the mode is transformed and two minutes later, the four-way valve is closed.

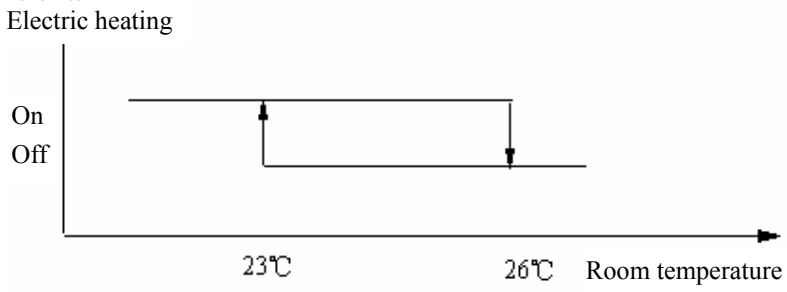
- In the heating mode, the indoor flower fan can be set as high/ medium/ low /automatic running mode by remote control. however, the anti cool air function is prior. In the heating mode, the anti cool air control function is to control shutdown of the indoor blower fan, lower (low speed)wind mode, setting the wind speed by detecting the temperature of coil pipe of evaporator so as to attain the purpose of preventing cold air from blowing. When the compressor starts up, the specific situations are shown in the following figure. When the compressor is closed and the temperature of coil pipe of indoor evaporator decreases and is less than 30□, the indoor blower fan is closed. When the compressor is turned on and the temperature of coil pipe of indoor evaporator decreases and is less than 20□, the indoor blower fan is closed. The operating lamp is light for 0.5s and close for 0.5s to indicate the anti cool air.

- Start up the compressor: when the room temperature is less than Ts□+2□(Ts□ is the set temperature), compressor → start-up

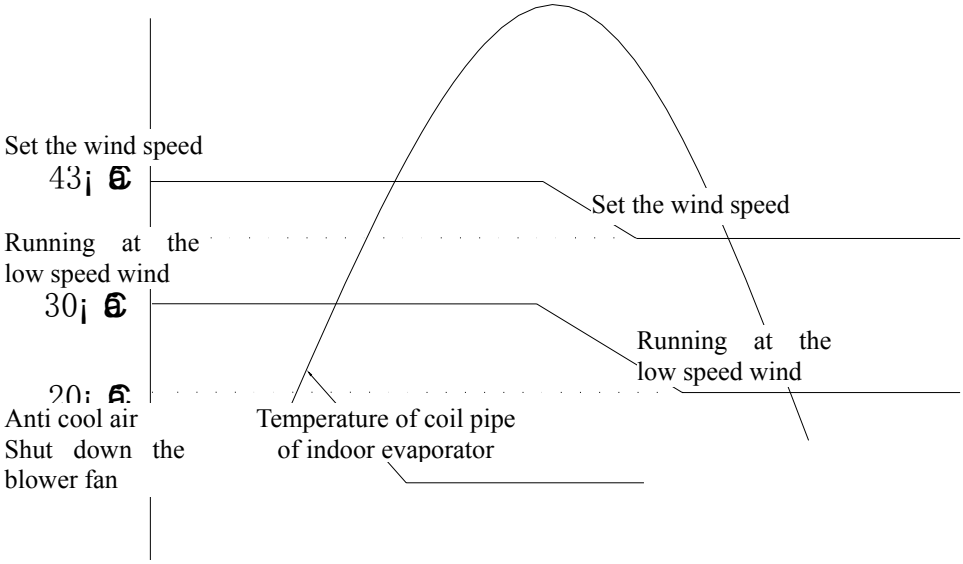
- Shut down the compressor: when the room temperature is more than or equal to the set temperature Ts□+3□, compressor → shutdown

- The electric heating start-up in the heating mode shall meet the following conditions: □ start up the compressor and indoor blower fan □ room temperature ≤ the set temperature －4□ and room temperature ≤23□ □ the temperature of indoor coil pipe < 50□ □ non defrosting mode □ no sensor failure.

- For the waste heat emission function in the heating mode, in principle, the indoor blower fan shall be on for one minute after the electric heating is closed. If electric heating with power breakdown in the defrosting mode, the indoor blower fan is closed after it is running 20s. When the remote controlled is used or emergency key is pressed to turn on and off, it is required to continue conducting the function if the waste heat emission time is less than one minute, that is to say, the indoor blower fan is running at the low speed wind and the air door is the position of all open and one minute later, it is closed.

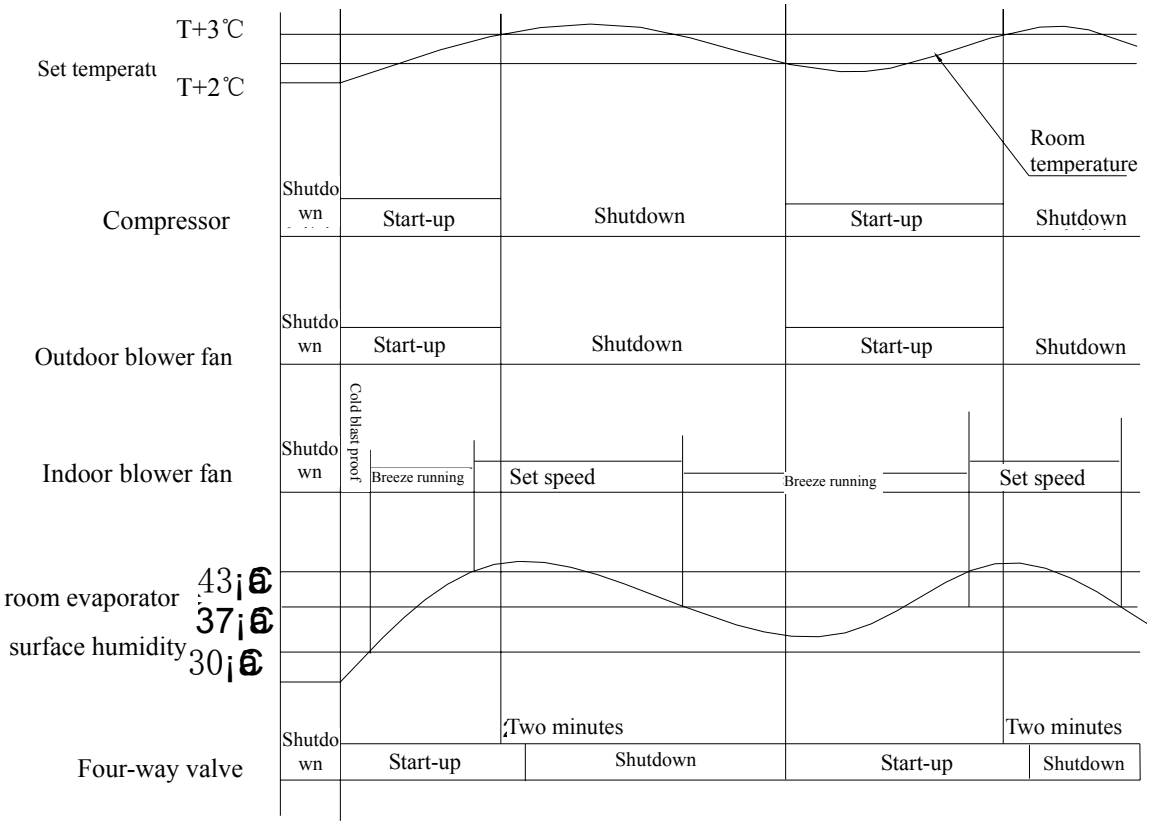


Turning on and off of electric heating and working curve of room temperature



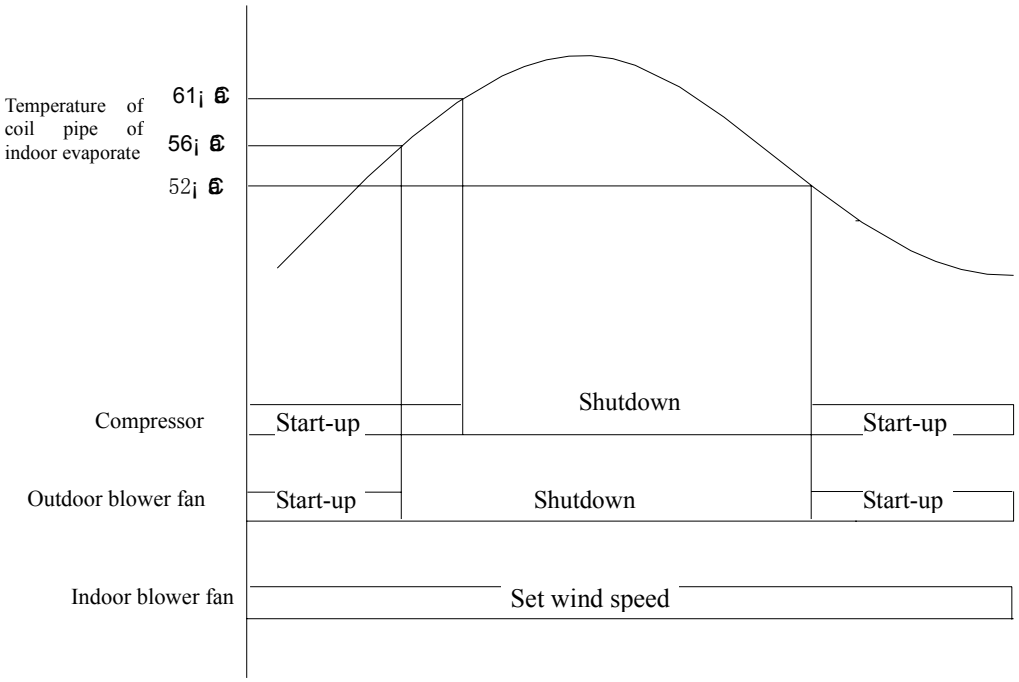
The running state of indoor blower fan when the compressor starts up

Working situations of compressor in the heating mode:



4.Overheat protection of evaporator (only applicable to the heating mode)

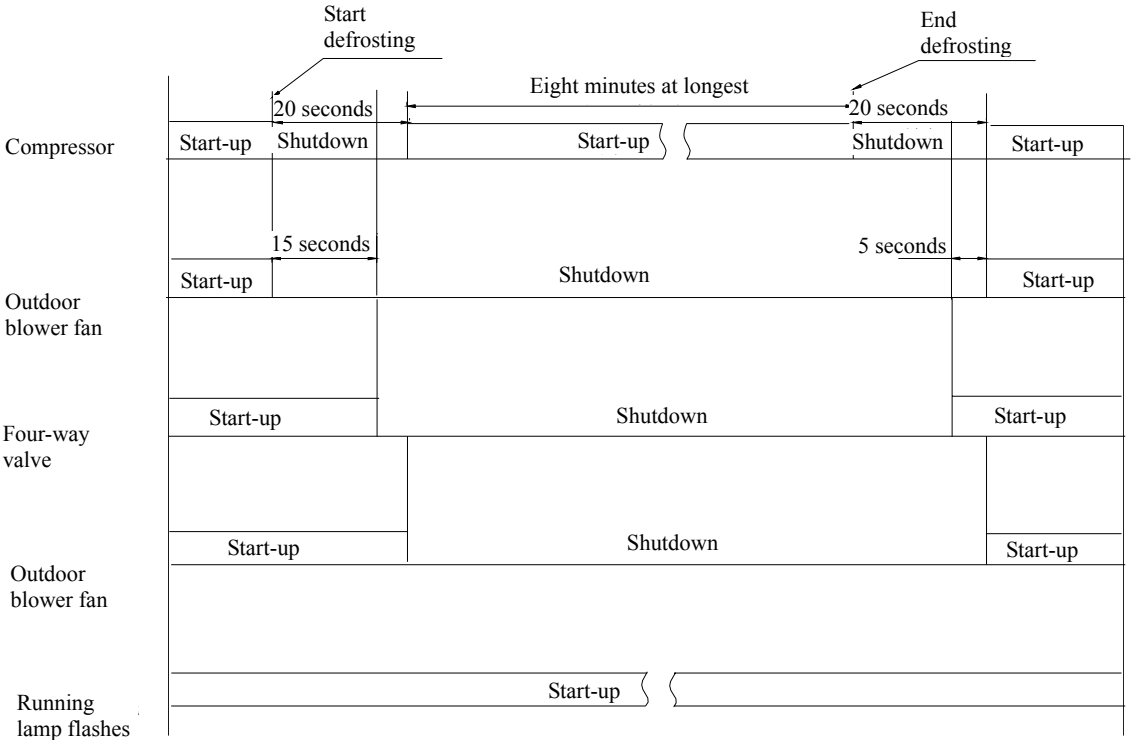
- This function is to prevent overheat of indoor evaporator.
- When the temperature of coil pipe of indoor units rises to 61□, the compressor and outdoor blower fan are closed and two minutes later, the change valve is closed. The indoor blower fan is running at the set speed. When the temperature of indoor coil pipe is less than or equal to 50□, it is allowed to reenter the heating mode.
- When the temperature of coil pipe of indoor units is more than or equal to 56□, the outdoor blower fan shuts down and it enters the overload protection; when the temperature of coil pipe of indoor units is less than or equal to 52□, the outdoor blower fan starts up and it exit the overload protection.



5. Defrosting (only applicable to the heating mode, the intelligent defrosting is adopted)

In the heating mode, the air conditioner defrosting by outdoor electric board, defrost start-up in the heating mode shall meet the following conditions: ① start up the compressor over seven minutes ② defrosting device of outdoor electric board has cut ③ the time of compressor continuous working over 50 minutes. When defrosting, close the indoor and outdoor blower fan and four-way valve. By detecting the conditions for defrosting treatment, the defrosting time is automatically determined to exit the defrosting and re-enter the heating mode to run. The defrosting scheme is as follows.

- Sequence chart in defrosting mode



6.Dehumidification

Dehumidification running is to eliminate the water vapor in the air by using the cool circulating capacity, but the dehumidification will not decrease the indoor temperature in great deal. The air conditioner automatically repeats on and off circulation according the room temperature, which is shown in the following figure.

1. The dehumidify procedure is run mode A one time and mode B seven times. Then repeat the procedure.

*** mode A of dehumidification (each period is 12 minutes)**

External blower fan of compressor: Intermittent running (run 3 minutes stop 3 minutes and run 3 minutes stop 3 minutes.)

FMI (indoor fan): Run 3 minutes stop 3 minutes and run 3 minutes stop 2 minutes and 40 seconds, air flaps are all open.

***mode B of dehumidification(each period is 8 minutes)**

External blower fan of compressor: according the difference between indoor temperature and set temperature decide running time.

FMI (indoor fan): (according the difference between indoor temperature and set temperature decide running time.).Air flaps are all open

Note

- In the dehumidification mode, the indoor fan is running at the set speed.
- When the indoor blower fan stops, the swinging leaves also stop at their current positions.

7.Ventilation working mode (only applicable to single cold machine)

In the ventilation mode, the set temperature range is 18□~30□(CONT when it is more than 30□ and less than 18□). When ventilating, the compressor, outdoor blower fan, four-way valve and electric heating are all closed and when indoor temperature is more than set temperature 2□, the indoor blower fan is running at the set speed, when indoor temperature is less than set temperature, the indoor blower fan stop.

8.Automatic mode

- Conditions for entering the automatic running mode are:

1. After power-up for the first time or shutdown for one hour, start up and select the automatic operating mode, the indoor blower fan runs 20 seconds by breeze and the working mode (cool, heating and dehumidification) depends on Tr and if the working mode had set ,it doesn't change with Tr.

2. If it is not showdown in the cooling, heating or dehumidification modes, or it is not shutdown after entering the automatic mode from the cooling, heating and dehumidification modes, start up and enter the automatic working mode, the indoor blower fan will run 20 seconds by freeze and the working mode depends on Tr.

3. If it is transformed to the automatic working mode after the running time is less than 25 seconds in the cooling, heating or dehumidification modes, it runs in the former working mode when running automatically; if it is transformed to the automatic working mode under the circumstances it is firstly powered up and the running time is less than 25 seconds in the cooling, heating or dehumidification modes, the working mode depends on Tr after the indoor blower fan runs 20 seconds by breeze.

4. If it is closed in the cooling, heating and dehumidification modes or it is closed when it is transformed from the cooling, heating and dehumidification modes to the automatically running mode, it will restore to the former working mode when restart-up within a hour after shutdown and the indoor blower fan will not run 20 seconds by breeze; if the former mode is the ventilation mode, the working mode depends on Tr after the indoor blower fan runs 20 seconds by breeze.

- When the automatic mode is selected, the electric control board calculates the difference value between the set temperature and room temperature, and then it is automatically switched into the cooling, heating and dehumidification modes to keep the expected temperature. (Note: Tr represents the room temperature and Ts represents the set temperature, the single cold machine changes from the heating mode to the ventilation mode.)

Room temperature	T_R＜21	21≤T_R≤26	T_R>26
State	cooling	Dehumidification	Heating

Note: □ the default set temperature in cooling mode is 25 □ ,in dehumidification and heating mode is 2 4□, actual set temperature can add or decrease 6 □ base on default value..

9.Emergency key function

There is a forcible execution key on the panel of indoor units and the air conditioner can enter the cool mode or heating mode by pressing the key when the remote controller is out of work or missing. 1. Press the key once in the state of shutdown and enter the automatic mode. 2. Pressure the key in the running the air conditioner is closed.

When pressing down the forcible execution key, then power up and enter the self-check program.

10.Abnormality of outdoor units

After the compressor runs five minutes, the lamp flashes 4 times per six seconds or display E4 if the temperature of indoor coil pips is more than 25□ (cool) or less than 30□ (heating) in the continuous 20 minutes. The controller will automatically shut down if the temperature of indoor coil pips is more than 25□ (refrigeration) or less than 30□ (heating) in another continuous 20 minutes, that is the abnormality protection of outdoor units and the indicator lamp keeps its former state of flashing. If the temperature of indoor coil pips is more than 25□ (cool) or less than 30□ (heating) in the second 20 minutes or the compressor shuts down, the electric control board will store to the normal display and the time is restarted when starting up the compressor next time.

Service Manual for

TAS-18V，TAS-24V,

TAS-18V/O, TAS-24V/O,

TAS-18VH，TAS-24VH,

TAS-18VH/O，TAS-24VH/O

2.1 Summary

figure 4-1

2.2 Explosive view of indoor unit for

TAS-18V，TAS-24V TAS-18VH/O，TAS-24VH/O

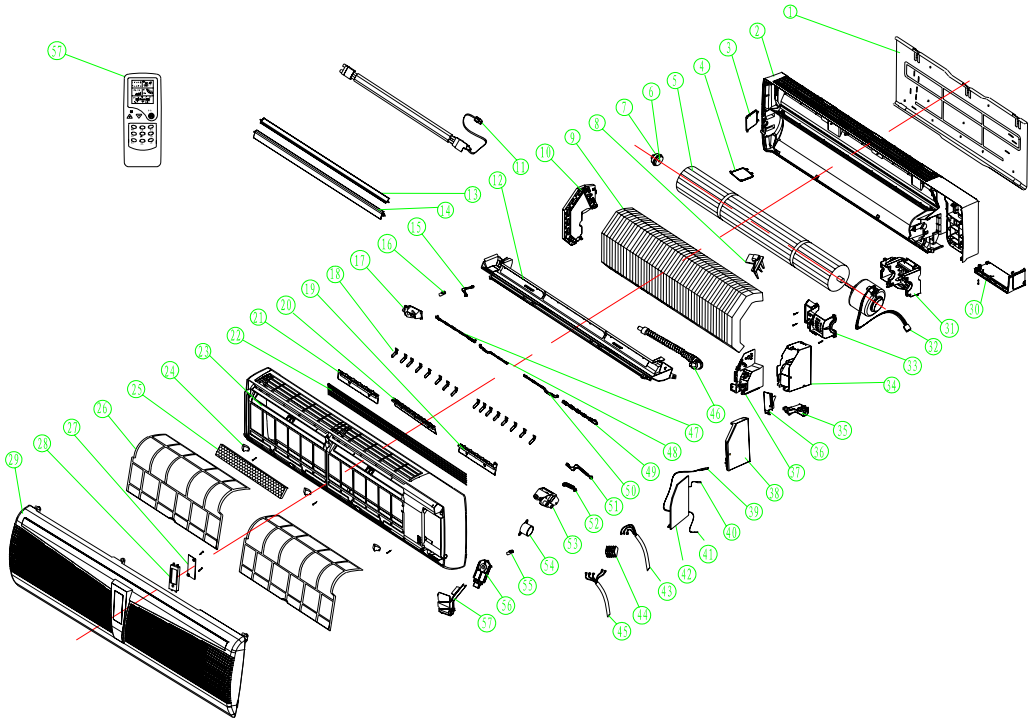


figure 4-2

2.3 Spare parts list of indoor unit for TAS-18V，TAS-24V, TAS-18VH，TAS-24VH

Table 2-1

No	Description	Part No		Qty
		TAS-18V，TAS-24V	TAS-18VH，TAS-24VH	
1	Wall-mounting frame	020100016	020100016	1
2	Base	100060127	100060127	1
3	Left angle plate	391990039	391990039	1
4	Front angle plate	391990040	391990040	1
5	Cross flow fan	100010025	100010025	1
6	Fan Bearing	401000059	401000059	1
7	Ring of Bearing	—	—	
8	Room temp. Sensor Holder	—	—	
9	Evaporator Assy	972900473	972900473	1
10	Evaporator fixed plate	090010342	090010342	1
11	Electric heater	—	—	1
12	Outlet part	391080006	391080006	1
13	Louver A	100390055	100390055	1
14	Louver B	100390056	100390056	1
15	Left Connecting rod A	10999A220	10999A220	1
16	Guide Louver Bearing A	10999A229	10999A229	3
17	Step motor left support	10999A227	10999A227	2
18	Swing louver	100390057 100390058 100390059	100390057 100390058 100390059	2
19	Swing louver right support	10999A226	10999A226	1
20	Swing louver middle support	10999A225	10999A225	1
21	Swing louver left support	10999A224	10999A224	1
22	Air outlet protect net	020440005	020440005	1
23	Middle frame	391070026	391070026	1
24	Screw cover	109990257	109990257	3
25	Cold Catalyst	119990011	119990011	1
26	Air filter	100190120	100190120	2
27	Display box cover	391140004	391140004	1
28	Display box	391110014	391110014	1
29	Front Panel	391022141	391022141	1
30	Right angle plate	391990038	391990038	1
31	Motor holder	100130015	100130015	1
32	Fan motor	320202004	320202004	1
33	Motor cover	100130016	100130016	1
34	Electrical box	020150086	020150086	1
35	Hook for the wire	----------	----------	
36	Wire Clamp	391110013	391110013	1
37	Electric box Panel 1	100430080	100430080	1
38	Electric box Panel 2	100430081	100430081	1
39	Display lamp plate	331800096	331800097	1
40	Room Temp. Sensor	338000009	338000009	1
41	Tube Temp. Sensor	338000009	338000009	1

42	Electric control plate	331200077	331400074	1
43	Power cord	----------	----------	
44	Terminal Board	030090250	030090250	1
45	Connecting cable	---------	----------	
46	Thermal insulation pipe	099990080	099990080	1
47	Left Connecting rod B	391200037	391200037	1
48	Left middle Connecting rod	391200033	391200033	1
49	Right middle Connecting rod	391200034	391200034	1
50	Right Connecting rod B	391200038	391200038	1
51	Right Connecting rod A	391200036	391200036	1
52	Right small Connecting rod	391200043	391200043	1
53	Step motor right support	391200045	391200045	3
54	Step motor	320273013 320273014 320273015	320273013 320273014 320273015	1
55	Guide Louver Bearing B	391200030	391200030	1
56	Wire Clip	391110015	391110015	1
57	Water-resistant board	100120008	100120008	1
58	Remote controller	336821047	336821046	1

The data are subject to change without notice.

2.4 Explosive view of outdoor unit for TAS-18V/0，TAS-24V/0, TAS-18V/0，TAS-24V/0

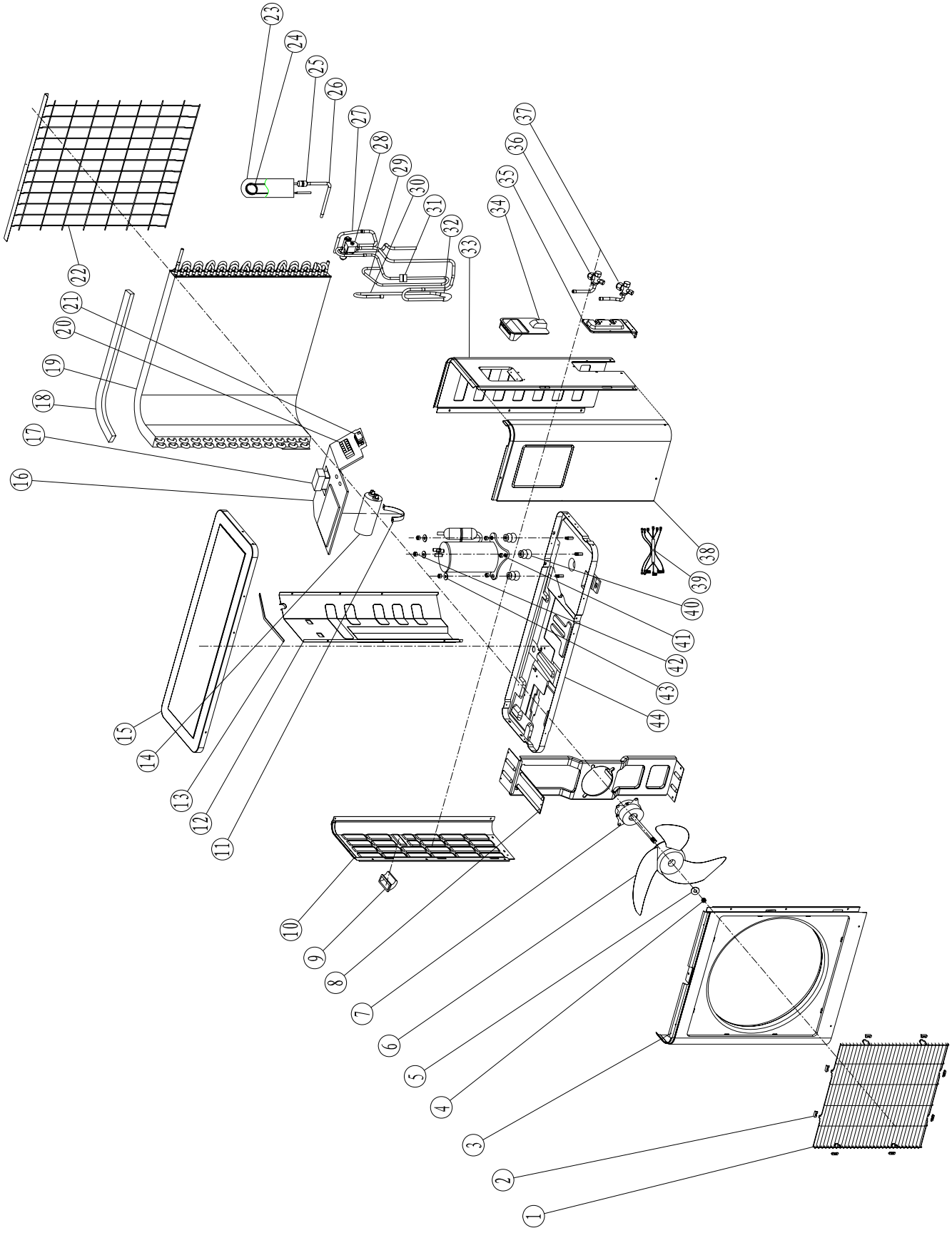


figure 4-4

2.5 Spare parts list of outdoor unit TAS-18V/O，TAS-24V/O, TAS-18V/O，TAS-24V/O

Table 2-2

No	Description	Part No		Qty
		TAS-18V/O，TAS-24V/O	TAS-18VH/O，TAS-24VH/O	
1	Front Grill	020120001	020120001	1
2	Grill Clip	109990256	109990256	8
3	Front Plate	020070036	020070036	1
4	Nut	150020031	150020031	1
5	Gasket	150030217	150030217	1
6	Axial flow fan	100030008	100030008	1
7	Motor	030020236	030020236	1
8	Motor support	020040013	020040013	1
9	Small handle	100050018	100050018	1
10	Left panel	313050001	313050001	1
11	Cpacitor clamp	313130012	313130012	1
12	Partition board	020030017	020030017	1
13	PU Sponge	090020203	090020203	1
14	Compressor Capacitor	030010066	030010066	1
15	Top panel	020080032	020080032	1
16	Electric installation board	020130035	020130035	1
17	Fan Capacitor	030010034	030010034	1
18	PU Sponge	090020150	090020150	1
19	Condenser	372100090	372100090	1
20	Terminal Board	030090265	030090265	1
21	Wire Clip	321100004	321100004	1
22	Rear Grill	020110003	020110003	1
23	Damping rubber for capillary tube	110030017	110030017	1
24	Capillary Assy	960800026	960800026	1
25	Filter	070190007	070190007	1
26	Drainpipe for the condensor	—	—	
27	Intake pipe for the condensor	070030191 070030023 070030021	070030191 070030023 070030021	1
28	4-way valve Assy	—	990088813	1
29	Discharge pipe	070010419	070010517	1
30	Suction pipe	070020468	070020467 070020468	1
31	Anti-vibration pad	110020016	110020016	1
32	Anti-vibration damping rubber	110030023	110030023	1
33	Right panel	020060011	020060011	1
34	Large handle	100040004	100040004	1
35	Valve installation plate	020020007	020020007	1
36	Low-pressure valve	060020025	060020108	1
37	High-pressure valve	060020022	060020102	1
38	Maintenance plate	020090001	020090001	1
39	Compressor power cord	050040058	050040058	1
40	Anti-vibration pad for the compressor	305146005	305146005	3

41	Compressor	302115007	302115007	1
42	Nut	150020031	150020031	1
43	Gasket	150030017	150030017	1
44	Base	313011072	313011072	1

The data are subject to change without notice.

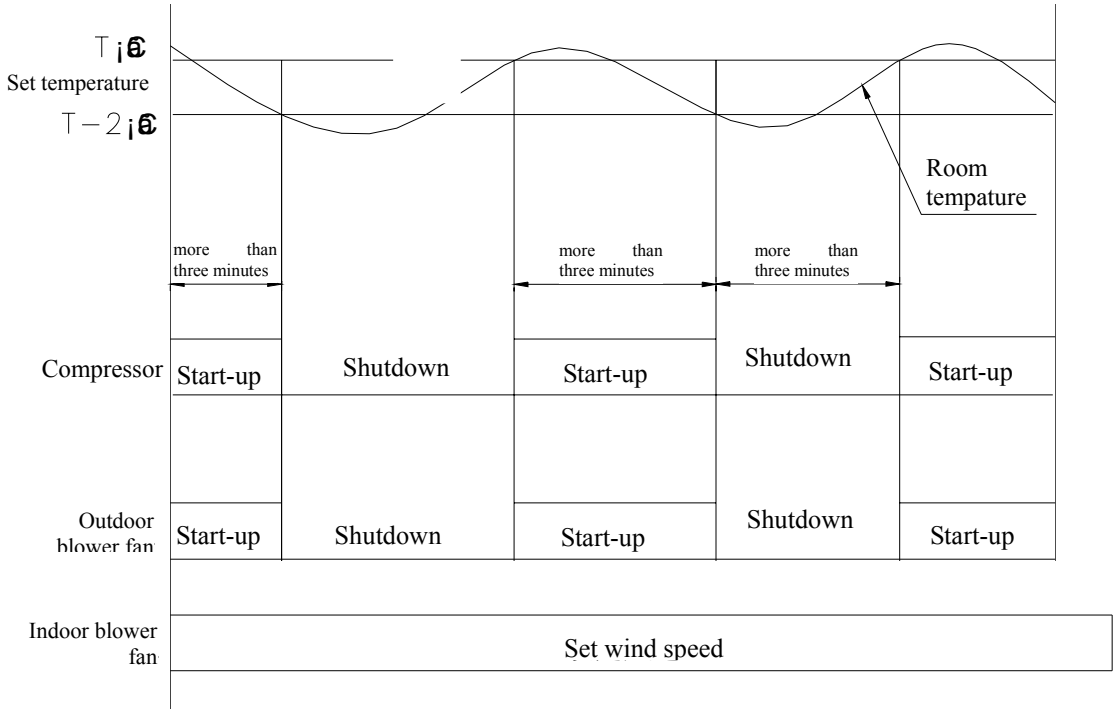
2.6 PCB function manual

Function

1.Cooling

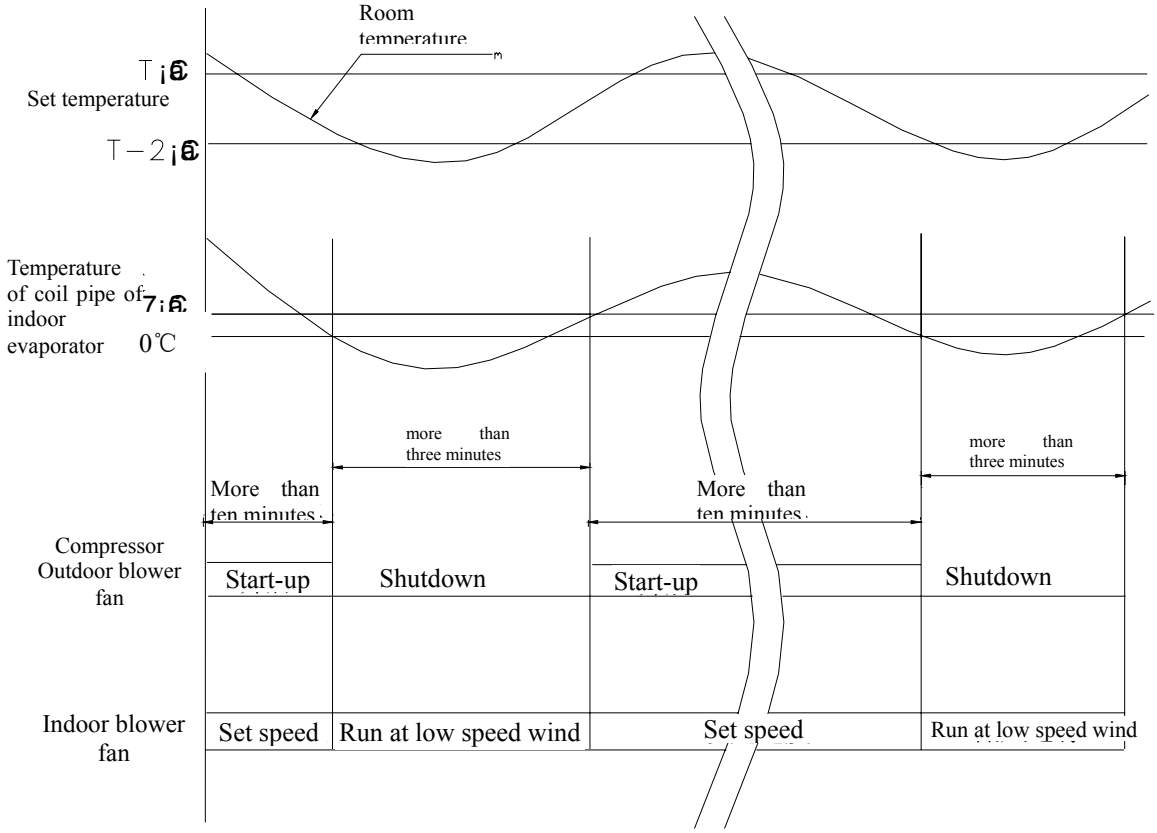
- The indoor temperature is detected by room temperature sensor of indoor units and the temperature controlled by the cyclic switch of compressor under the control of the electric control board.
- When power on for the first time, it is allowed to start up the compressor immediately; in order to protect the compressor, it is required to stop compressor immediately such as transforming mode, heating mode overheat protection and shutdown after starting up the compressor; furthermore, it is advisable to stop the compressor according to practical situations after it has run at least for three minutes. In general, the electric control board will not start up the compressor within three minutes at least after shutting down the compressor.
- Outdoor blower fan and compressor work synchronously; the indoor blower fan is running at the set wind speed; when the automatic wind is selected, the indoor blower fan works in the state of high-speed wind.
- Start up the compressor: when the room temperature is more than Ts℃(Ts℃ is the set temperature), compressor → start-up
- Shut down the compressor: when the room temperature is equal to or less than the set temperature Ts℃-2℃, compressor → shutdown

a. Working curve for temperature control



2.Anti freeze protection function of evaporator (cooling or dehumidify)

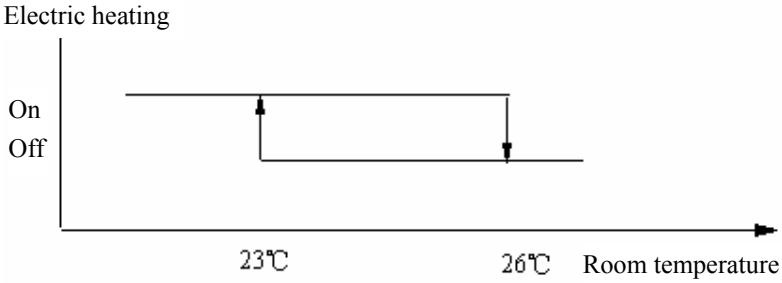
- This function is to prevent freezing on the surface of indoor evaporator.
- When the temperature of coil pipe of the indoor units is less than or equal to 0℃ and the compressor has continuous run for more than ten minutes, the compressor and outdoor blower fan shut down through the electric control board and the indoor blower fan is running at low speed wind.
- When the temperature of coil pipe of the indoor units is more than or equal to 7℃ and the compressor has shutdown for more than three minutes, the compressor and outdoor blower fan start to run and the indoor blower fan is running in the set mode.



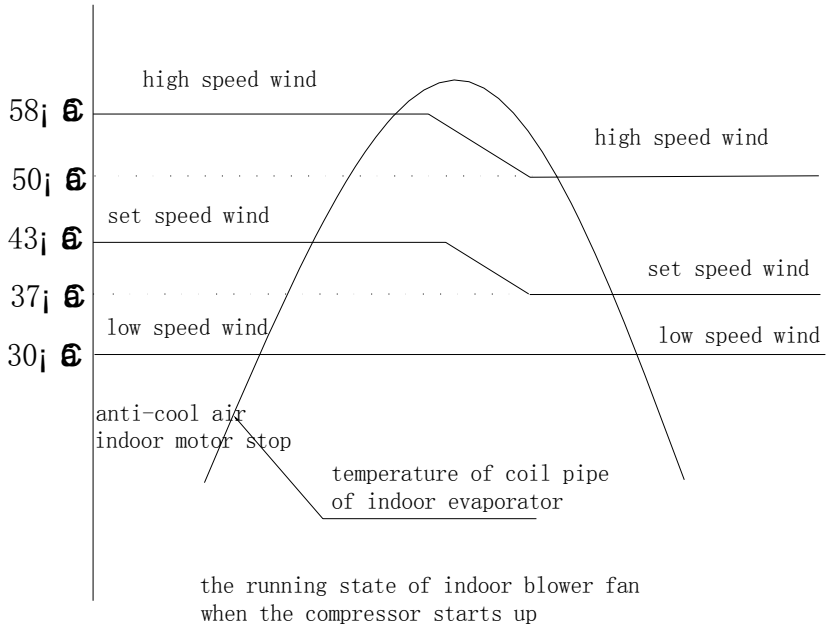
3.Heating (only applicable to dual temperature units)

- The indoor temperature is detected by room temperature sensor of indoor units and the temperature controlled by the cyclic switch of compressor under the control of the electric control panel.
- When power on for the first time, it is allowed to start up the compressor immediately; in order to protect the compressor, it is required to stop compressor immediately such as transforming mode, heating mode overheat protection and shutdown after starting up the compressor; furthermore, it is advisable to stop the compressor according to practical situations after it has run at least for three minutes. In general, the electric control board will not start up the compressor within three minutes at least after shutting down the compressor.
- In general, start up the compressor and the outdoor blower fan in the heating mode. The working mode of four-way valve is to open the four-way valve when starting up the compressor. In the course of frost melting, the outdoor blower fan and the four-way valve are closed when the compressor starts up. In the course of heating, the blower fan is closed without power breakdown or the mode is transformed and two minutes later, the four-way valve is closed.
- In the heating mode, the indoor flower fan can be set as high/ medium/ low /automatic running mode by remote control. however, the anti-cool air function is prior. In the heating mode, the anti-cool air function is to control shutdown of the indoor blower fan, breeze (low speed wind) mode, setting the wind speed by detecting the temperature of coil pipe of evaporator so as to attain the purpose of preventing cold blast from blowing. When the compressor starts up, the specific situations are shown in the following figure. When the compressor is closed and the temperature of coil pipe of indoor evaporator decreases and is less than 30℃, the indoor blower fan is closed. When the compressor is turned on and the temperature of coil pipe of indoor evaporator decreases and is less than 30℃, the indoor blower fan is closed. The operating lamp is light for 0.5s and close for 0.5s to indicate the cold blast proof.
- Start up the compressor: when the room temperature is less than Ts℃(Ts℃ is the set temperature), compressor → start-up

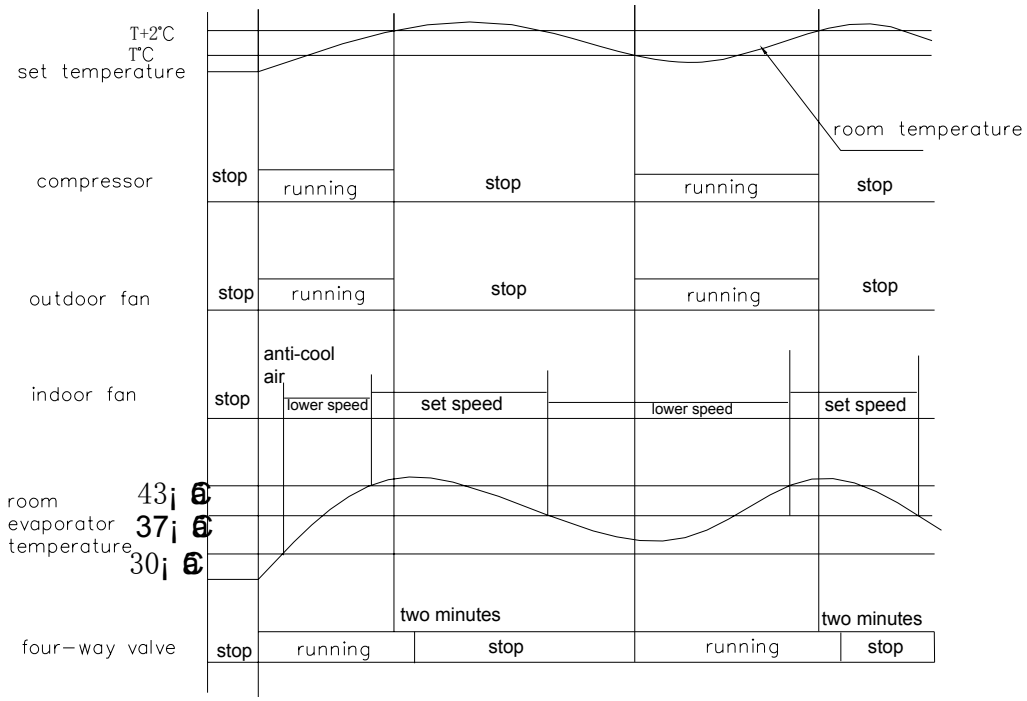
- Shut down the compressor: when the room temperature is more than or equal to the set temperature Ts℃+2℃, compressor → shutdown
- The electric heating start-up in the heating mode shall meet the following conditions: ① start up the compressor and indoor blower fan ② room temperature ≤ the set temperature －3℃ ③ the temperature of indoor coil pipe < 50℃ ④ non defrosting mode ⑤ no sensor failure.
- For the waste heat emission function in the heating mode, in principle, the indoor blower fan shall be on for one minute after the electric heating is closed. If electric heating with power breakdown in the defrosting mode, the indoor blower fan is closed after it is running 20s. When the remote controlled is used or emergency key is pressed to turn on and off, it is required to continue conducting the function if the waste heat emission time is less than one minute, that is to say, the indoor blower fan is running at the low speed wind and the air door is the position of all open and one minute later, it is closed.



Turning on and off of electric heating and working curve of room temperature

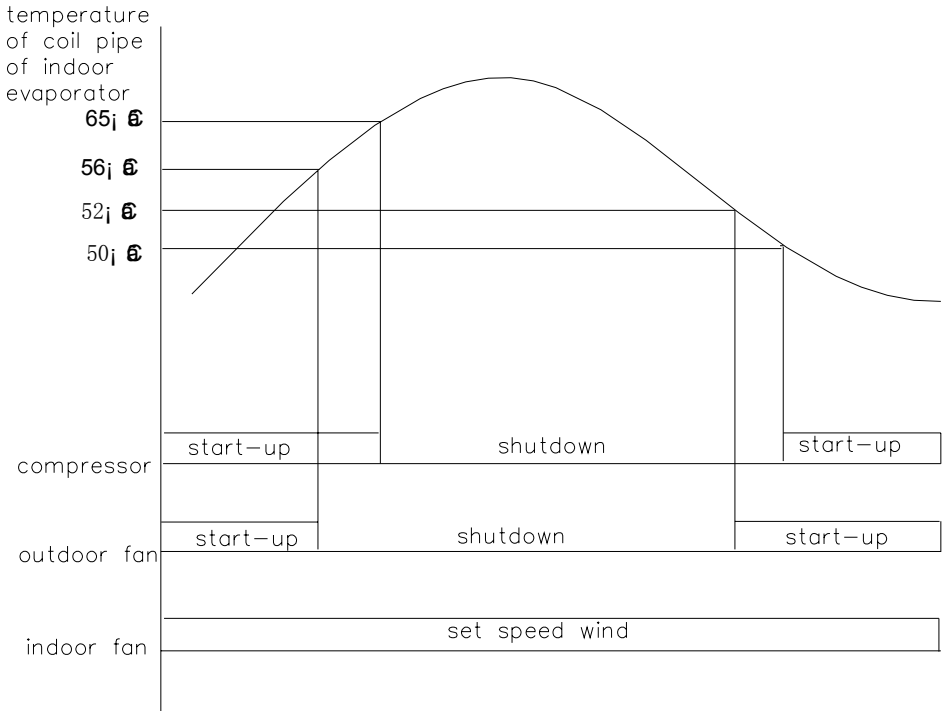


Working situations of compressor in the heating mode:



4.Overheat protection of evaporator (only applicable to the heating mode)

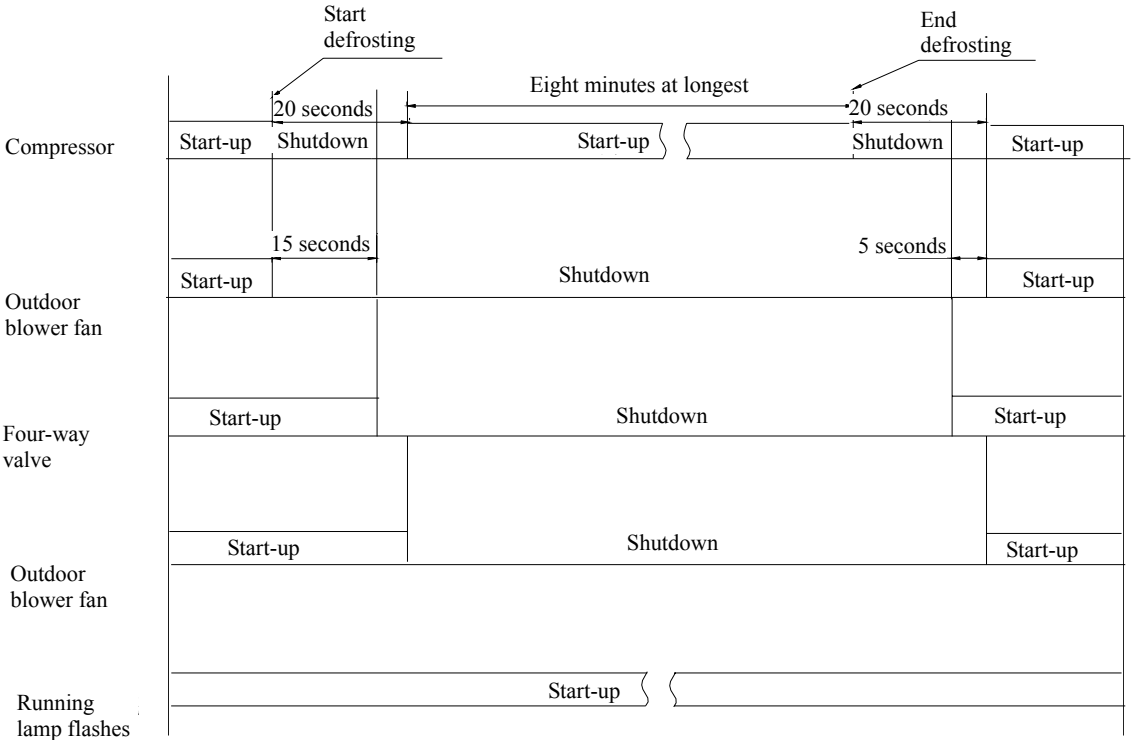
- This function is to prevent overheat of indoor evaporator.
- When the temperature of coil pipe of indoor units rises to 65℃, the compressor and outdoor blower fan are closed and two minutes later, the change valve is closed. The indoor blower fan is running at the set speed. When the temperature of indoor coil pipe is less than or equal to 50℃, it is allowed to reenter the heating mode.
- When the temperature of coil pipe of indoor units is more than or equal to 56℃, the outdoor blower fan shuts down and it enters the overload protection; when the temperature of coil pipe of indoor units is less than or equal to 52℃, the outdoor blower fan starts up and it exit the overload protection.



5.Defrosting (only applicable to the heating mode, the intelligent defrosting is adopted)

In the heating mode, the air conditioner defrosting by outdoor electric board, defrost start-up in the heating mode shall meet the following conditions: ① start up the compressor over seven minutes ② defrosting device of outdoor electric board has cut ③ the time of compressor continuous working over 50 minutes. When defrosting, close the indoor and outdoor blower fan and four-way valve. By detecting the conditions for defrosting treatment, the defrosting time is automatically determined to exit the defrosting and re-enter the heating mode to run. The defrosting scheme is as follows.

- Sequence chart in defrosting mode

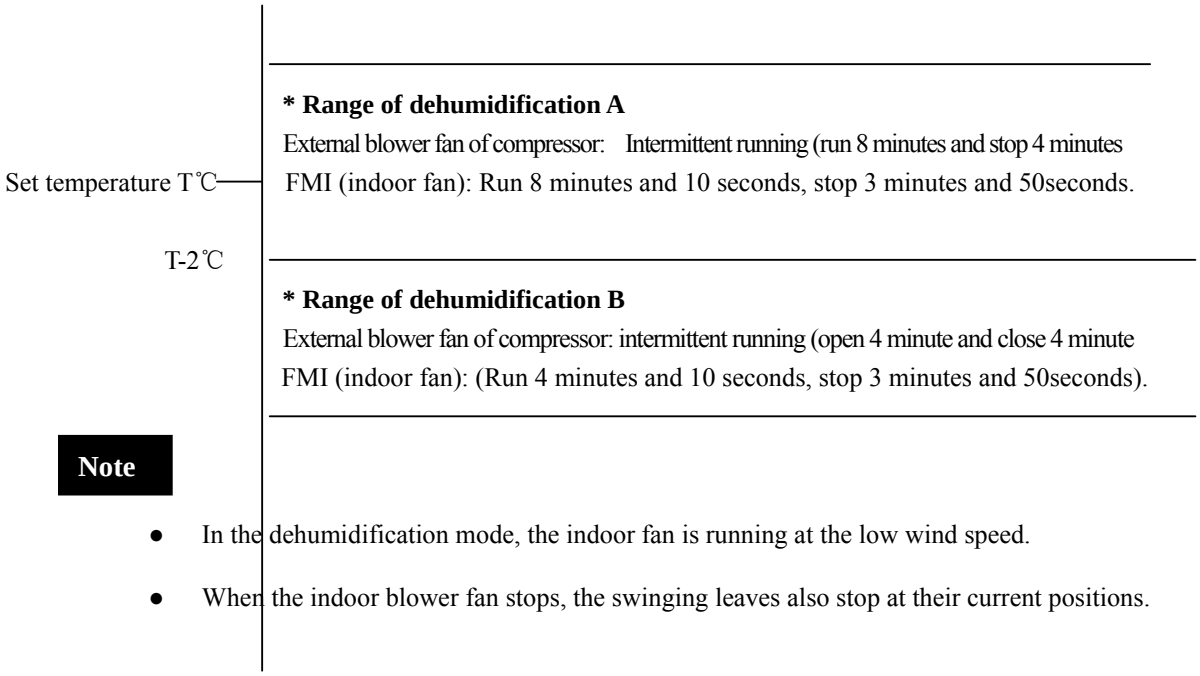


6.Dehumidification

Dehumidification running is to eliminate the water vapor in the air by using the cool circulating capacity, but the dehumidification will not decrease the indoor temperature in great deal. The air conditioner automatically repeats on and off circulation according the room temperature, which is shown in the following figure.

2. The set temperature is 24°C.

Room temperature



Note

- In the dehumidification mode, the indoor fan is running at the low wind speed.
- When the indoor blower fan stops, the swinging leaves also stop at their current positions.

7.Ventilation working mode (only applicable to single cold machine)

In the ventilation mode, the set temperature range is 16℃~31℃. When ventilating, the compressor, outdoor blower fan, four-way valve and electric heating are all closed : when the room temperature is less than Ts-2℃(Ts℃ is the set temperature), close indoor blower fan, when the room temperature is more than or equal to the set temperature Ts ℃,start running indoor blower fan.

8.Automatic mode

- Conditions for entering the automatic running mode are:

5. After power-up for the first time or shutdown for one hour, start up and select the automatic operating mode, the indoor blower fan runs 20 seconds by breeze and the working mode (cool, heating and dehumidification) depends on Tr and if the working mode had set ,it doesn't change with Tr.

6. If it is not showdown in the cooling, heating or dehumidification modes, or it is not shutdown after entering the automatic mode from the cooling, heating and dehumidification modes, start up and enter the automatic working mode, the indoor blower fan will run 20 seconds by freeze and the working mode depends on Tr.

7. If it is transformed to the automatic working mode after the running time is more than 25 seconds in the cool, heating or dehumidification modes, it runs in the former working mode when running automatically; if it is transformed to the automatic working mode under the circumstances it is firstly powered up and the running time is less than 25 seconds in the cool, heating or dehumidification modes, the working mode depends on Tr after the indoor blower fan runs 20 seconds by breeze.

8. If it is closed in the cool, heating and dehumidification modes or it is closed when it is transformed from the cool, heating and dehumidification modes to the automatically running mode, it will restore to the former working

mode when restart-up within a hour after shutdown and the indoor blower fan will not run 20 seconds by breeze; if the former mode is the ventilation mode, the working mode depends on Tr after the indoor blower fan runs 20 seconds by breeze.

- When the automatic mode is selected, the electric control board automatically switched into the cool, heating and dehumidification modes to keep the expected temperature by the room temperature. (Note: Tr represents the room temperature and Ts represents the set temperature, the single cold machine changes from the heating mode to the ventilation mode.)

Room temperature	Ts>26	$21 \leqslant T_R \leqslant 26$	$T_R<21$
State	cooling	Dehumidification	Heating

9.Time start-up and shutdown function

When the time start-up and shutdown are used, the clock of remote controller shall be corresponding to the current clock and the timing times is less than or equal to 24 hours; if the time start-up is set in the state of start-up, the air conditioner shuts down immediately and if the time shutdown is set in the state of shutdown, the air conditioner starts up immediately; the minimum measure unit of timing time is ten minutes; when the time is set and it is stable and displayed after flashing one minute. It is feasible to set the time start-up and time shutdown at the same time; the air conditioner will work by the earlier timing time; the combination time in the timing method is the same time, the air conditioner runs and it is closed when reaching its timing time.

10.Emergency key function

There is a forcible execution key on the panel of indoor units and the air conditioner can enter the cool mode or heating mode by pressing the key when the remote controller is out of work or missing. 1. Press the key once in the state of shutdown and enter the cool mode. 2. Press the key in the running, non-heating mode and enter the heating mode. 3. Pressure the key in the running and heating mode and the air conditioner is closed.

When pressing down the forcible execution key, then power up and enter the self-check program; the display lamps ,compressor ,indoor fan, four-way valve, outdoor fan, electric heating, buzzer, step motor will run sequence.

11.Power failure memory function

I. Data store

1. When receiving correct remote control code in the starting or waiting state, effective remote control code, data check and 3s time delay will be written in the specified cell in E2PROM.
2. When start-up or shutdown by the emergency key or the state of air conditioning is set by pressing the key, the operational result of pressing the key will transformed to the control code and together with 3s time delay is written in the specified cell in E2PROM.
3. When it is set as the time start-up function, immediate start-up is selected if power-up after power failure. When it is set as the time shutdown function, immediate shutdown is selected if power-up after power failure.
4. If the key locking function exists before power failure, the key locking function is cancelled after power up.

II. E2PROM data reading and processing

1. Immediately read data (control code) in E2PROM when powering up and it is discriminated whether there is E2PROM chip or not according the state of ASK signal of reading operation; if no chip, there is no need to execute E2PROM reading and writing operations. If the chip exists, check the read data and if it passes the check, the air conditioner is controlled by the read data. If it fails to pass the check, the air conditioner is controlled according to the power-up situation for the first time.
2. Start-up or shutdown is up to the data in E2PROM. If start-up, the compressor requires the time delay protection of three minutes.

12.Abnormality of outdoor units

After the compressor runs five minutes, the lamp flashes 4 times per six seconds if the temperature of indoor coil pips is more than 25℃ (cool) or less than 30℃ (heating) in the continuous 20 minutes. The controller will automatically shut down if the temperature of indoor coil pips is more than 25℃ (refrigeration) or less than 30℃ (heating) in another continuous 20 minutes, that is the abnormality protection of outdoor units and the indicator lamp keeps its former state of flashing. If the temperature of indoor coil pips is more than 25℃ (cool) or less than 30℃ (heating) in the second 20 minutes or the compressor shuts down, the electric control board will store to the normal display and the time is restarted when starting up the comp

13. Failure code (one of the two display mode)

failure	display
Indoor coil pipe temp. sensor failure	E3
Indoor room temp. sensor failure	E2
Outdoor unit abnormal	E4
Evaporator freeze or overheat protection	E8
Outdoor coil pipe temp. sensor failure	E1

14. Diagnosis Function

A、Block，the unit maybe need to be repaired

No.	Block	Block Display		Symptom	Judgment & Action
		Running LED	Timer LED		
1	Room temperature sensor	Blinks 2 times/4 seconds	—	1. The sensor is short circuit or open circuit 2. PC board	1. Check the sensor according to the temperature-resistance table; 2. Check the indoor PC board
2	Indoor coil temperature sensor	Blinks 3 times/4 seconds	—	1. The sensor is short circuit or open circuit 2. PC board.	1. Check the sensor according to the temperature-resistance table; 2. Check the indoor PC board.
3	Outdoor coil temperature sensor	Blinks 7times/9 seconds	—	1. The sensor is short circuit or open circuit 2.Cable connection 3. PC board	1. Check the sensor according to the temperature-resistance table; 2. Check the cable connection; 3. Check the indoor PC board.
4	Other parts	Blinks 5 times/7 seconds	—	1. Gas leak 2. Indoor coil temperature sensor 3.Cable connection 4. PC board 5. Compressor	Turn off the unit first, then turn on again in cooling or heating mode, after 5 minutes, please feel the temperature of air flow. 1. if the air flow is cold or hot，check the indoor coil temperature sensor; if this can not solve it, please remove the sensor to adjacency copper pipe. 2. if the air flow is not cold or hot，check the gas leak，or cable connection，or PC board，or compressor.

B、Unit abnormity state，but maybe the unit is normal.

No.	Operation function	Display		Remark
		Running LED	Timer LED	
1	Anti-freeze	Blinks 4 times/6 seconds	_	If the unit always keep this states, please check this unit: 1. Check the indoor fan, if it is not running, please verify fan & motor. 2. If the indoor fan can run well, check the coil temperature sensor. 3. If sensor normal, might is the evaporator tube jammed. 4. If the above-mentioned situations are not all, it can be the PC board fault, change the PC board.
2	Outdoor environment temperature goes beyond the range		Blinks 1 time/1 second	When first time start the unit or shut down for over 30 minutes, enter heating mode. If outdoor tube temperature lower than -10℃, the unit doesn't run. The timer LED blinks 1 times/1 seconds.
3	Defrosting	Blinks 1 time/1 second		When the unit defrosting, Running LED blinks 1 time in 1 second.
4	Defend the cold wind	Blinks 1 time/3 seconds		When enter heating mode, the compressor running but coil temperature has not reached 28℃, the indoor fan doesn't run, Running LED blinks 1 time in 3 seconds, the unit enter the state of defending the cold wind. When coil temperature over 28℃, then withdraw from the state of defending the cold wind.