PANASONIC

WALL MOUNTED SPLIT-TYPE AIR CONDITIONERS

SERVICE MANUAL

No.20190211

Models

CS-YV18UKS/CU-YV18UKS
CS-YW18UKS/CU-YW18UKS
CS-YV24UKS/CU-YV24UKS
CS-YW24UKS/CU-YW24UKS
CS-YV36UKS/CU-YV36UKS
CS-YW36UKS/CU-YW36UKS

CONTENTS

4.OPERATION DETAILS

Remote controller

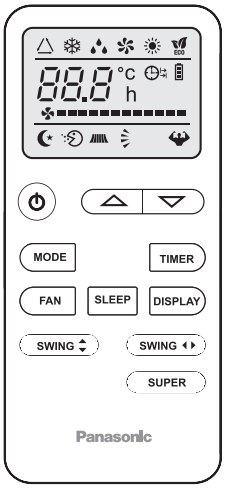
No.	Button	Function
1	▲ (TEMP UP)	Press it to increase temperature / time setting.
2	▼ (TEMP DN)	Press it to decrease temperature/ time setting.
3	ON/OFF	Press it to start or stop operation.
4	FAN	To select the fan speed of auto/low/mid/high
5	TIMER	Press it to set auto-off timer.
6	SLEEP	To activate the function "SLEEP"
7	MODE	To select the mode of operation
8	SUPER or TURBO	Press this button to activate / deactivate the Super function which enables the unit to reach the preset temperature in the shortest time. In COOL mode, the unit will give the maximum cooling temperature with 16°C, high fan speed. In HEAT ode, the unit will give the maximum heating temperature with 31°C, high fan speed.
9	SWING	To activate or deactivate of the movement of the deflectors.
10	DISPLAY	To switch on/off the LED display

⚠ *The out looking and some function of remote controller maybe difference.*

⚠ *The shape and position of buttons and indicators maybe difference according to the model, but their function is the same.*

⚠ *The unit confirms the correct reception of each press button with a beep.*

Remote controller DISPLAY
Meaning of symbols on the liquid crystal display



No.	Symbols	Meaning
1	or	FEEL mode indicator
2		COOLING indicator
3	or	DEHUMIDIFYING indicator
4		FAN ONLY OPERATION indicator
5		HEATING indicator
6	or TIMER or or or	TIMER OFF indicator
7	or TIMER or or or	TIMER ON indicator
8	AUTO or or or or (FLASH) or (FLASH)	AUTO FAN indicator
9	or or or or	LOW FAN SPEED indicator
10	or or or or	MIDDLE FAN SPEED indicator
11	or or or or	HIGH FAN SPEED indicator
12	QUIET or or or or or	SLEEP indicator
13		COMFORTABLE SLEEP indicator (optional)
14		I FEEL indicator(optional)
15	or or or or	FLAP SWING indicator
16	or TURBO or POWERFUL	SUPER indicator

Electronic controller

NOTES:

RT-------Room Temperature.
IPT------Indoor Pipe Temperature.
ST------indoor Setting Temperature.
OPT---Outdoor Pipe Temperature.
CRT---Compensated Room Temperature

1. Automatic mode

1) The initial RT determines A/C working mode and the setting temperature (ST), the mode is determined effective only once unless A/C shut-down and then re-started. If from other mode switches to automatic mode (including mode conversion after shutdown), it should be that the compress stop more than 3 min then temperature judgment 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;

With auto re-start 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-off after power-on; while if the auto restart function isn't activated, the A/C enters standby state.

Heat pump

Mode	Initial RT	Initial ST
Cooling	RT≥26℃	23℃
Dry	26℃＞RT≥20℃	7℃
Heating	RT＜20℃	23℃

Cooling-only

Mode	Initial RT	Initial ST
Cooling	RT≥26℃	23℃
Dry	26℃＞RT≥20℃	7℃
Ventilating	RT＜20℃	—

Under automatic mode (including from automatic converted into Dry mode), when A/C received the temperature UP or DOWN signals from the remote controller, the setting temperature (ST) adjusts correspondingly to the current room temperature plus or minus 1℃, the automatic regulating temperature range is ± 2℃.

2. Cooling mode

1) The control of the compressor
a. When RT－ST≥1℃，the compressor is running.
b. When RT－ST＜－1℃，the compressor stops.
c. When－1℃≤RT－ST＜1℃, 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, or high airflow speed circularly.

b. Indoor fan motor automatic airflow speed control, it works as shown in Figure 1:

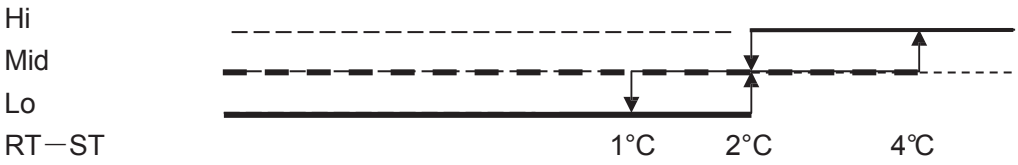


Figure 1 Cooling automatic airflow

When the temperature changing leads the fan speed variation, the switch can only be made orderly, and in every grade of air flow speed should run 1 minute at least.

3. Dry mode

While select to this mode, the air conditioner operates for 3 minutes according to cooling mode firstly (ST set at 7℃), and then takes the detected backflow air temperature minus 2℃ as a new set temperature (*the lowest temperature: 5°C*) and runs according to cooling mode, indoor fan operates at low-speed, at this moment the setting operation of fan speed invalid but Swing adjustable.

4. Heating mode

On the Heating mode, the room temperature (RT) is compensated (CRT), after that, the room temperature displayed on the LED is CRT=RT-3℃.

1) The control of the compressor

a. When ST－CRT≥1℃，the compressor is running.

b. When ST－CRT＜-1℃，the compressor stops.

c. When -1℃≤ST－CRT＜1℃, 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, or high airflow speed circularly.

b. Indoor fan motor automatic airflow speed control, it works as shown in Figure 2:

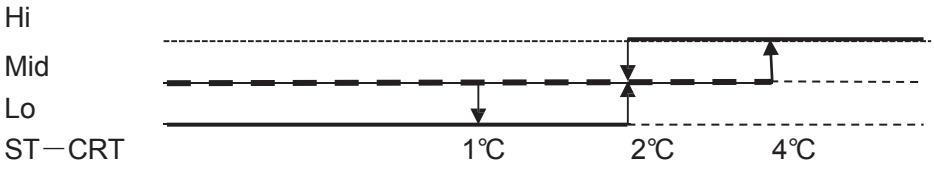


Figure 2 Heat automatic airflow

When the temperature changing leads the fan speed variation, the switch can only be made orderly, and every grade of air flow speed should run 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, except for the defrosting process)

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

6) Defrosting function:

During defrosting, once mode changing, economic operation or temperature setting signals received, the buzzer and display will make response immediately, but the other operations won't implement until defrosting finished;

During defrosting, the signals of On-Off, Timing, Sleep, Fan speed and/or Swing can respond, but the Fan speed and/or Swing should be in accordance with operation for Cold Air Prevention.

Except the above signal processing during defrosting, no other signals will deal with, only a voice of buzz for response.

During defrosting, electrical heating (*optional function*) 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/or 3 met.

Condition 1：As shown in figure 3

Definition:

The following conditions a, b and c all required to meet:

a. IPT1 settles for IPT1＝IPTmax－△IPT

b. t5≥50min（running time t5≥50min（the compressor runs cumulatively）t5 is removable，and could be less than t1）

c. IPT＜40℃，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.

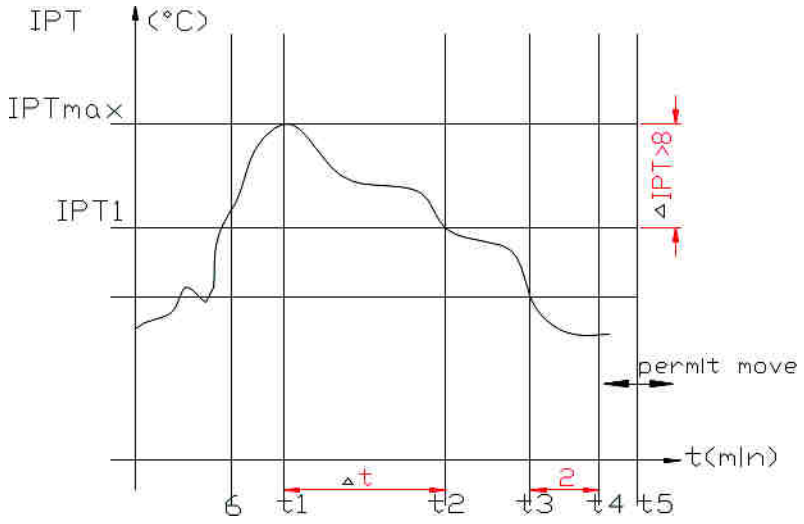


Figure 3

Condition 2: When running time is more than or equal to 120 min (compressor is running accumulatively), the indoor temperature is less than 35℃ 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 pipe temperature is less than 23°C (cold air prevention wind temperature) when the fan stops running (including temperature dropping when compressor operating, not including the compressor's starting up course), and the machine runs into defrosting according to any one condition 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: Without Jumper JC, and no OPT outdoor sensor

when the compressor runs for 45 min (accumulated), if the indoor coil temperature is less than 40℃ for 2 min, the machine runs into defrosting, and lasts for 3min, otherwise when the compressor runs for 120 min (accumulated), the machine runs into defrosting automatically and last for 10 min.

Option 3: Without jumper JC, but with OPT outdoor sensor

While heating, when the temperature of condenser is lower than E ℃ (-4°C), and the compressor runs for 45 min (accumulated), then the machine runs into defrosting and lasts for 10 min.

Option 4. On heating, while the outdoor fan motor stopped but the compressor operated accumulative totally 30min, then the machine runs into defrosting and last for 8 min. if the accumulative totally less than 30min, but accord with one of the condition option 1-3 then 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, option 2 and 4, 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℃ or above from the bottom point.

(2) The quitting conditions for option 3.

When OPT ≥ 20℃ or defrosting for more than 10 min, then quit from defrosting.

(3) Defrosting process shown in Figure 4

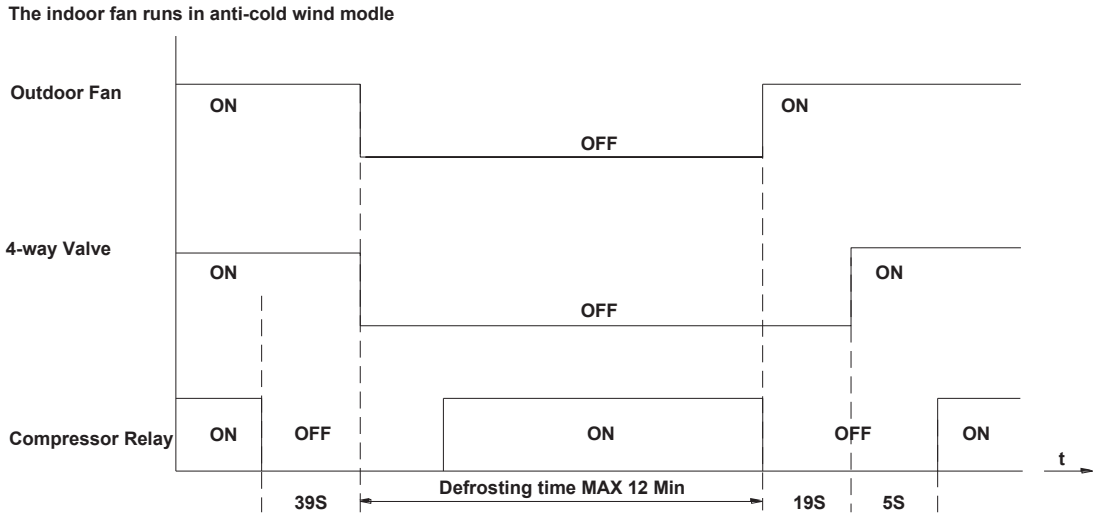


Figure 4 Defrosting process

7) Auxiliary electric heating function (optional)

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

(2) The conditions of auxiliary electric heating works (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≥0°C;
f. RT < 25°C;
g. IPT≤43°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≥27°C;
c. IPT≥50℃
d. indoor fan stops。
e. running into sleeping function

5. Fan mode

1) Indoor fan motor is running at setting speed (the speed same as heating mode).
2) Vane motor control: running according to the setting condition.
3) The outdoor unit doesn't work under fan mode.

6. Sleeping mode

1) Under sleep mode, the indoor fan motor running at low speed, except the power light and sleep light are ON, timer lights ON/OFF according to the setting state, running light OFF. LED will be OFF after displaying 30S.
2) Temperature control:
(1) While changing from Cool mode to Sleep mode, one hour later, the operation Temp.=ST＋1°C，another one hour later, the operation Temp.=ST＋2°C，after then the temperature has no changed anymore.
(2) When changing from Heating mode to Sleep mode, one hour later, the operation Temp.= ST-1°C，another one hour later, the operation Temp.=ST-2°C，after then no changed anymore.
3) The machine will automatically shut up after running 10 hours under sleep mode.
When Timer ON and Sleep mode are implemented at the same time, the Sleep mode can not be functioned.

7. Timer function

The timer can preset between 10min to 24h, when the time set less than "10" hours, the displayed time shown by 0.5 hour as the unit, when the time set more than or equal to "10" hours, the displayed time 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:
Press the emergency switch within 3 seconds, release emergency switch while the buzzer rings once, the machine goes into Cooling mode. If the buzzer rings twice while release emergency switch, Heating mode is selected. To press the Emergency switch while A/C is on, the buzzer rings once and then A/C will shut down.
2) The machine runs mandatorily as selected mode within 30min when Emergency operated, meanwhile indoor fan motor runs in high-speed, and stepping vane swinging as well. 30min later the A/C goes into automatic mode under the same operation manner, the set temperature to be 23°C, and the rotate speed of indoor fan motor automatic control, stepping vane swinging all the way.
3) To press the emergency button when the A/C goes on operation, then the machine runs into stand-by.

4) Under emergency operation, the function of compressor's time-delay protection, Anti-frosting protection in cooling mode, Overheating protection in heating mode, sensor fault protection and defrost operate are effective.

5) Under emergency operation, once effective signal from remote controller received, the A/C exits form of emergency mode without delay, and operates according to the setting value from remote controller immediately.

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.

To press the emergency button and power on the unit, and hold on for10 seconds, The buzzer

2) will ring **three times**, after this operation, the auto restart function activated.

3) To close auto restart function while it is activated, repeat process as above 2), the buzzer will ring four times.

10. Protection / Failure code

10.1 Protection

1) Compressor's protection:

a. The PCB which with Auto-restart function, once it is activated, the compressor goes along 3min delay protection when power on, otherwise the compressor without this protection even when the PCB is power-on.

b. The compressor's 3 min interval protection: the compressor can't start-up until it stops 3 min later. (*except for the defrosting process*).

c. . After the compressor started, it's operation state remains the same within 3 min even when ST, RT variation.

2) Anti-frosting protection of indoor evaporator (Cooling mode):

If IPT≤0°C detected in consecutive 3 min, compressor and outdoor fan motor to be stopped operation, indoor fan motor runs at high-speed forcibly; if IPT≥5°C detected 3min later, then outdoor fan motor and compressor will start up, and indoor fan motor restores to it's original state.

3) Overheating protection (Heating mode):

If IPT≥55°C, the outdoor fan motor: OFF.

If IPT≥65°C, the compressor: OFF, and indoor fan motor runs at high-speed forcibly.

When IPT≤48°C, the outdoor fan motor and the compressor start up, indoor fan motor restores to it's original state.

4) Cold air prevention (Heating mode):

This function is intend to prevent cold air from being discharged when the heating operation starts or when defrosting.

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

Under heating process, while the compressor stop (including stopping for protection), the fan motor's operation (including stopping the indoor fan motor) is regulated according to the coil temperature within 1min, 1min later the fan will be stopped forcibly.

b. When the indoor fan motor running at a low-speed under cold air prevention operation, once auxiliary electric heating works, the vane immediately withdraws from the cold air prevention location and turn back to normal vane angle. While auxiliary electric heating stops, indoor fan motor goes on to run at low-speed accordingly, the vane turns to cold air prevention location

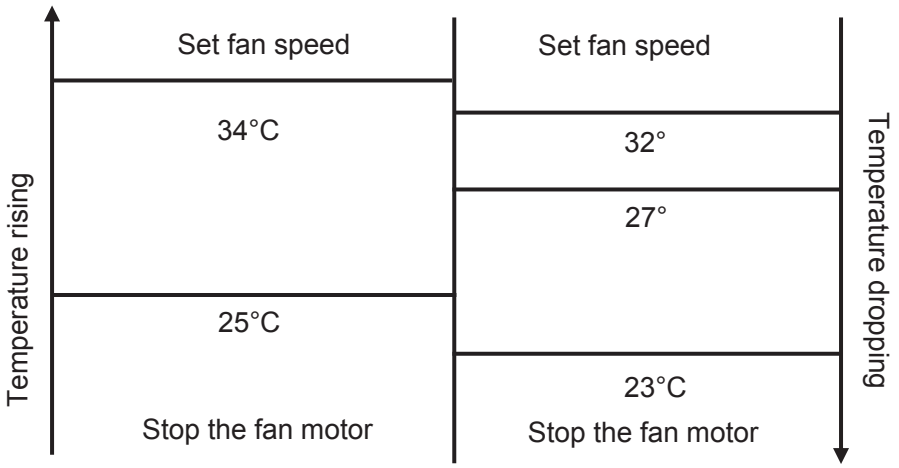


Figure 5 Cold air prevention

10.2 Failure code

The following table shows the fault protections.

When failures happens, the PCB alarms and buzzer rings three times, Failure code shows on display board, and the PCB operates protection procedures.

Failure code: For the machine with LED display (**88**), the code shows on LED, for machine without LED, the code reflects by the running light.

Failure	Running Light Flash	LED Display (**88**)
RT Sensor Failure	Once / cycle	E1
IPT Sensor Failure	Twice / cycle	E2
Outdoor Unit Protected	5 times / cycle	E5
Indoor Fan Motor Failure	6 times / cycle	E6

While failure happens, the code displayed statically, if there are several failure codes reported at the same time, then failure codes appears by turns every eight seconds correspondingly.

a. Sensor's failure protection: when the sensor tested temperature out of the range --- 50°C≤T≤110°C, sensor failure is determined.

Once RT and/or IPT sensor failure appears, 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 rotated speed within 5s, the indoor fan motor stops, meanwhile, the compressor, outdoor fan motor, four-way valve and/or auxiliary electric heater etc. also cut down.

The indoor fan motor restarts again 10 seconds later, if still there is no feedback signal of rotated speed within 5 seconds, the A/C stops and goes into indoor fan motor failure protection, buzzer rings three times, and running light flashes at 6 times per 8 seconds. Once there is feedback signal while the failure recovery, the failure will relieve automatically.