

SERVICE INSTRUCTIONS

**MULTI SPLIT TYPE ROOM
AIR CONDITIONER**

DUAL ZONE TYPE

9,000 BTU/h

12,000 BTU/h

**WIRELESS REMOTE
CONTROL MODEL**

CONTENTS

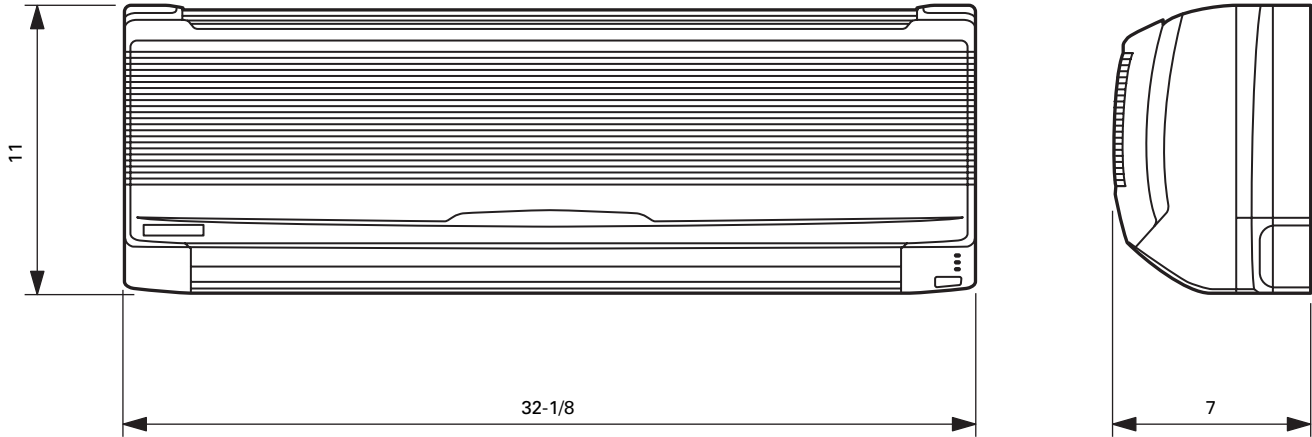
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DIMENSIONS

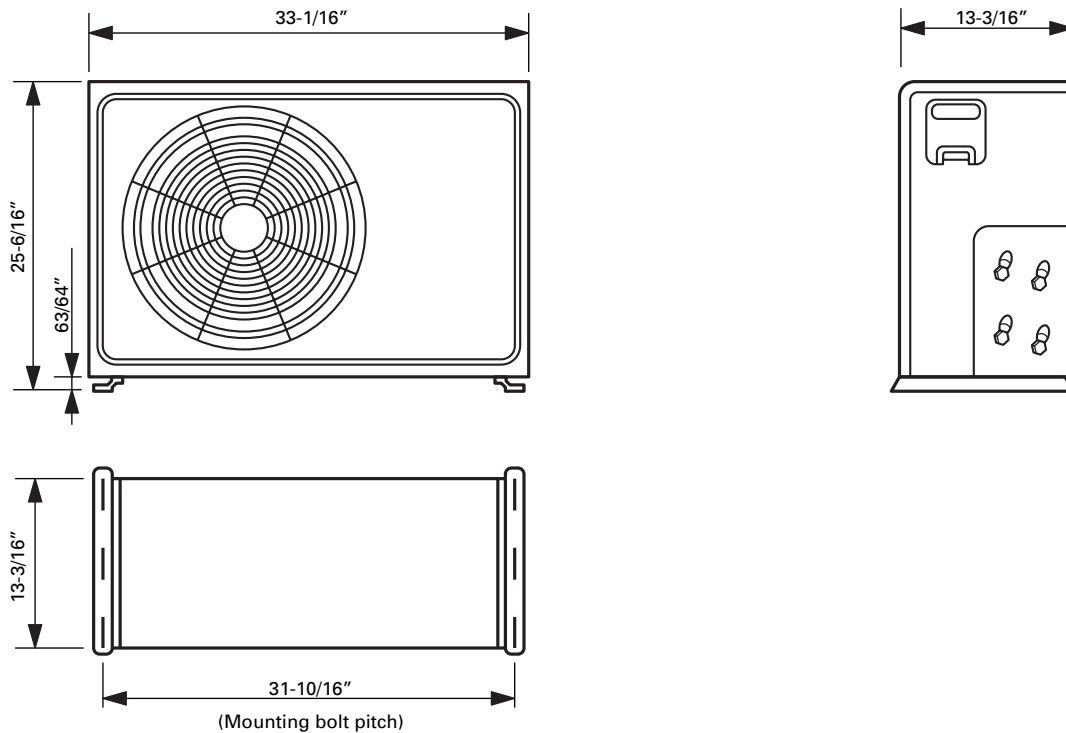
9000, 12000 BTU / h Models

1. INDOOR UNIT

Unit : in



2. OUTDOOR UNIT



DESCRIPTION OF FUNCTIONS

1. THREE MINUTES DELAY FUNCTION (3ST)

- (1) The outdoor unit does not operate for three minutes after the power switch is turned on. (Compressor protection, breaker off prevention, etc.)
- (2) When test operation is performed in heating during continuous operation, it takes some time until air blows out of the indoor unit because “Three minutes delay” and “Cold air prevention” have priority over TEST operation.

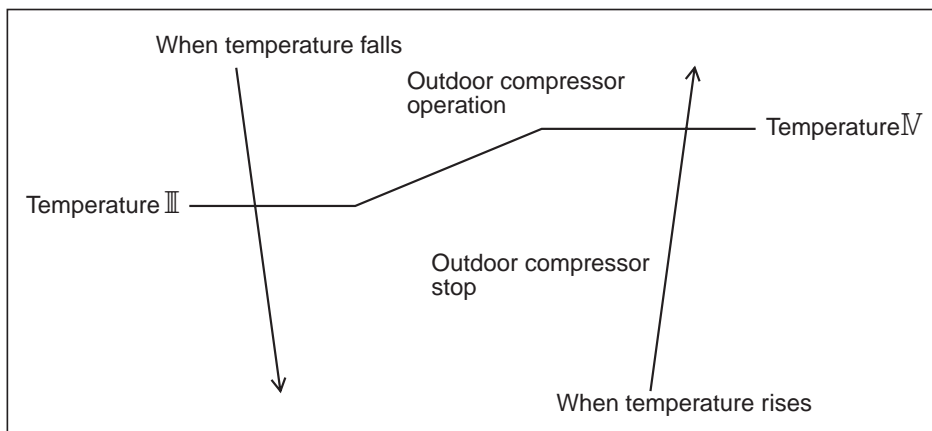
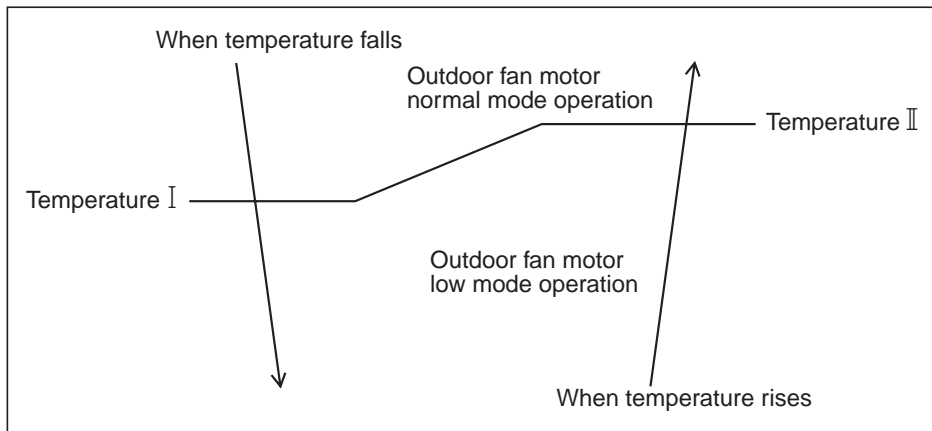
2. THREE MINUTES CONTINUOUS OPERATION TIMER (3HT)

The unit continues to run for three minutes after the compressor starts.

3. INDOOR HEAT EXCHANGER DE-ICING FUNCTION (Cooling & dry operations)

- (1) When the outdoor temperature drops to “Temperature I” or less, the outdoor unit fan motor operates in the low mode.
- (2) When the outdoor temperature reaches “Temperature II” or more, the outdoor unit fan motor operates in the normal mode.
- (3) When the indoor heat exchanger temperature drops to “Temperature III” or less, the outdoor unit fan motor and compressor stop (DE-ICING FUNCTION). However, the outdoor unit fan motor doesn’t operate for 5 minutes after the compressor starts.
- (4) When (3) above stopped the outdoor unit fan motor and compressor, the “3 minutes ST” starts simultaneously with stopping of the compressor. Thereafter, the compressor and outdoor unit fan remain stopped until the indoor unit heat exchanger temperature reaches “Temperature IV” or after “3 minutes ST” time-out. Indoor unit operation returns to normal operation, and the outdoor unit fan motor operates as described in (1) or (2) above.
- (5) The indoor unit fan motor operates in accordance with the set air flow even while the freezing protection function is operating.
- (6) The “Temperature I, II, III and IV” values are shown below.

Temperature I	Temperature II	Temperature III	Temperature IV
70°F	73°F	37°F	52°F



4. DEFROSTING OPERATION [REVERSE CYCLE] See Defrosting Flow Chart on Page 14.

- (1) The defrosting operation is performed when frost is produced on the outdoor heat exchanger. At this time, the heating mode will stop temporarily.
- (2) The defrosting operation time differs with such conditions as temperature, humidity, etc. (Approximately 6 to 15 minutes)
- (3) During defrosting, both the indoor and outdoor fans stop and the operation lamp flashes.
- (4) "Bushhhh", "goh, goh, goh" and other sounds will be heard during defrosting. These sounds are normal. (Four-way valve switching sound, refrigerant sound)

5. 4-WAY VALVE DELAY SWITCHING FUNCTION [REVERSE CYCLE]

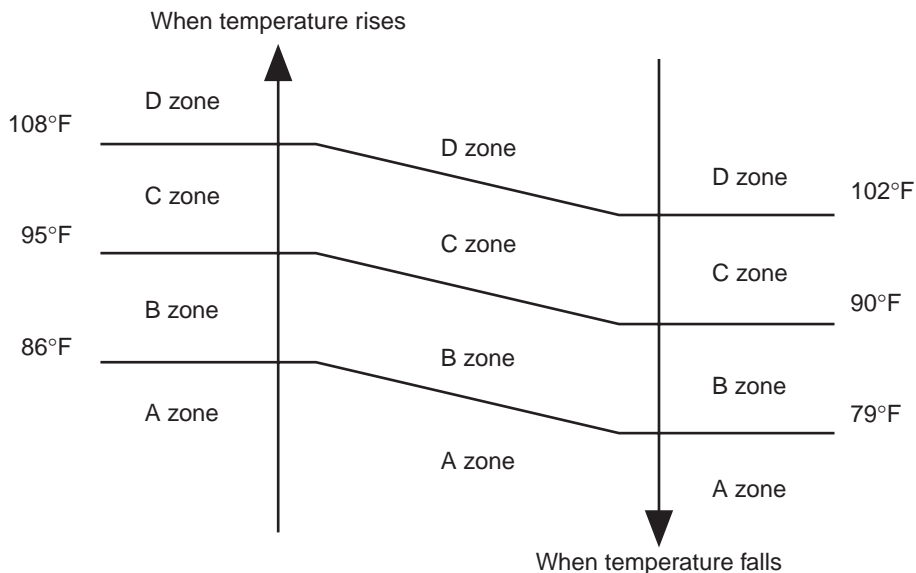
When the heating operation stops, the 4-way valve stops 3 minutes later.

6. COLD AIR DISCHARGE PREVENTION FUNCTION [REVERSE CYCLE]

- (1) When the heating operation starts, the indoor unit fan operates in the "S-Lo (Super-Low)" mode. After that indoor unit fan motor operates as shown below.
- (2) About 20 seconds after the thermostat stops the compressor, the indoor fan enters the S-Lo mode.
- (3) In the S-LO mode, FLAPS are down forward (7 steps).

① Indoor unit heat exchanger temperature ② Indoor fan mode setting

① \ ②	AUTO	HIGH	MED	LOW	QUIET
D	AUTO	Setting fan air flow			
C	AUTO	MED	Setting fan flow		
B	AUTO	LOW		Setting air flow	
A	S-LO	S-LO	S-LO	S-LO	S-LO



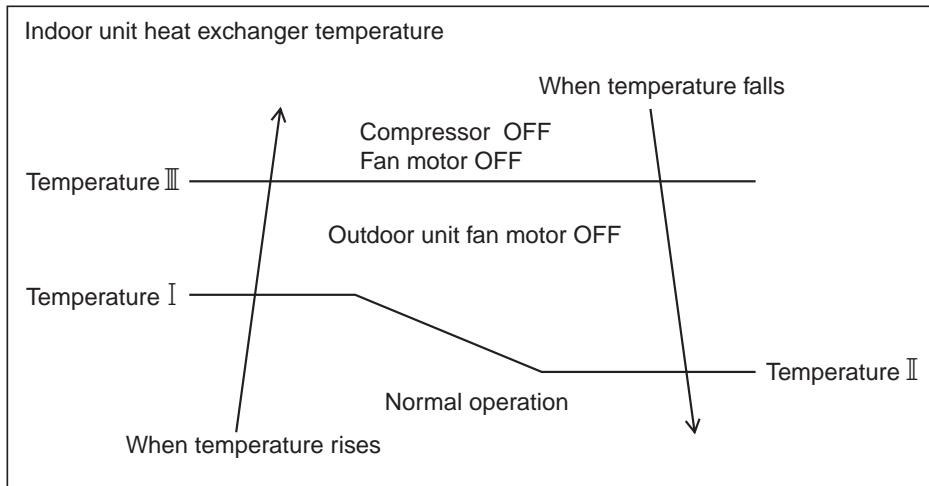
7. HEATING OVERLOAD PROTECTION FUNCTION [REVERSE CYCLE]

During heating operation, the compressor operates, but the outdoor fan may stop.

A function that suppresses the absorption of heat and protects the machine by stopping the outdoor fan motor when the indoor heat exchanger temperature has risen abnormally and the outdoor temperature is high is provided.

- (1) If the indoor unit heat exchanger temperature reaches "Temperature I" or more, the outdoor fan motor stops.
- (2) If the indoor unit heat exchanger temperature drops to "Temperature II" or less, the outdoor unit fan motor resumes normal operation.
- (3) If the indoor unit heat exchanger temperature reaches "Temperature III" or more, the outdoor compressor stops.
(This operation has priority over the 3 minutes hold timer (3 minutes HT).)
- (4) After (3) above stopped the outdoor unit fan motor and compressor, the "3 minutes ST" starts simultaneously with stopping of the compressor.
However, when the indoor unit heat exchanger temperature satisfies conditions (1) and (2) above and the compressor restarts after (3) stopped the compressor, the fan motor starts 90 seconds after the compressor starts.
- (5) The four way valve is not turned OFF even when the compressor is stopped by (3) above.
- (6) The "Temperature I, II, III" values conform to the operation values table shown below.

Temperature I	Temperature II	Temperature III
126°F	133°F	144°F



8. SET TEMPERATURE COMPENSATION AT OPERATION START

At the start of operation and when MASTER CONTROL is switched to cooling and heating, the set temperatures are compensated by +4°F for heating operation for 60 min. and by -2°F for cooling operation for 40 min.

9. OPERATION CONTROL PANEL AND REMOTE CONTROL UNIT BUTTON

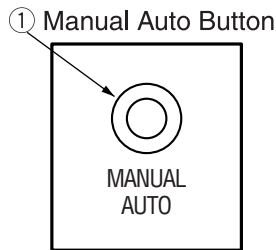
OPERATION CONTROL PANEL

① MANUAL AUTO BUTTON

Use this button for temporary manual operation in the event that the remote control unit batteries die, or the remote control unit is lost. Operation is the same as MASTER CONTROL "AUTO" position. In order to halt operation, either push the forced automatic button again or turn the POWER SWITCH off.

Operation Control Panel

Controls are located under the front panel.

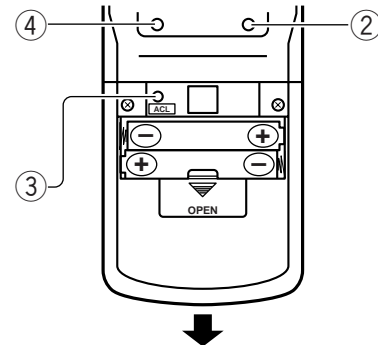
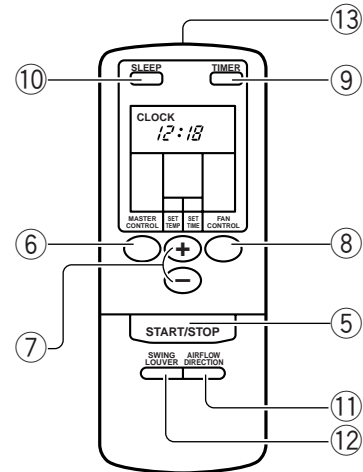


② "TEST" BUTTON (TEST position)

- (1) When switched to the "TEST" position, only the thermostat is short-circuited.
- (2) Set to this position when testing after installation.
- (3) If the air conditioner is used in the "TEST" state, since the compressor, heat exchanger, etc. will be damaged because temperature control can not be performed, always switch to "NORMAL" operation.
- (4) If the microcomputer or other electronic circuit is faulty, the air conditioner can not be operated even by test run.
- (5) The "TEST" operation mode is released after 60 minutes and then the unit is set to "Normal" operation.

- ② TEST RUN button
- ③ ACL button
- ④ TIME ADJUSTMENT button
- ⑤ START/STOP button
- ⑥ MASTER CONTROL button
- ⑦ SET TEMP./SET TIME buttons
- ⑧ FAN CONTROL button
- ⑨ TIMER button
- ⑩ SLEEP button
- ⑪ AIRFLOW DIRECTION button
- ⑫ SWING LOUVER button
- ⑬ Signal Transmitter

Remote control unit



③ "ACL" BUTTON

- (1) Press and slide the battery compartment lid on the reverse side to open it.
- (2) Insert batteries.
- (3) Press the ACL button.
- (4) Close the battery compartment lid.

NOTE : Never mix new batteries with used ones, or batteries of different types. Batteries will last about one year under normal use. If the remote control unit operating range becomes appreciably reduced, replace the batteries and press the ACL button with the tip of a ball-point pen or other small object.

④ "TIME ADJUSTMENT" BUTTON

- (1) Press the TIME ADJUSTMENT button.
- (2) Use the +/- SET TIME buttons to adjust the clock to the current time.
- (3) Press the TIME ADJUSTMENT button again.

⑤ START/STOP AND ⑥ MASTER CONTROL BUTTONS

- Press the START/STOP button.
The indoor unit operation indicator lamp (red) will light.
The air conditioner will begin to operate.
- Press the MASTER CONTROL button to select the desired mode.
Each time the button is pressed, the mode will change in the following order.



About three seconds later, the entire display will reappear.

⑦ SET TEMP. / SET TIME BUTTONS

- Press the SET TEMP. buttons
 - + button : Press to raise the thermostat setting.
 - button : Press to lower the thermostat setting.
- Thermostat setting range :
 - Heating..... 60°F to 88°F
 - Cooling / Drying 64°F to 88°F
 About three seconds later, the entire display will reappear.

NOTE:

- During Fan mode, set the unit to “- -” for continuous fan operation regardless of room temperature.

The thermostat setting should be considered a standard value, and may differ somewhat from the actual room temperature.

⑧ FAN CONTROL BUTTON

- Press the FAN CONTROL button.
Each time the button is pressed, the fan speed changes in the following order:



About three seconds later, the entire display will reappear.

When set to AUTO:

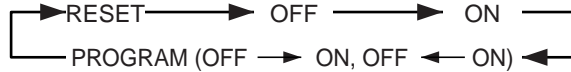
- Heating:** Fan operates so as to be optimally warm the air.
However, the fan will operate at very low speed when the temperature of the air issued from the indoor unit is low.
- Cooling:** As the room temperature approaches that of the thermostat setting, the fan speed becomes slower.
- Fan:** The fan alternately turns on and off; when on, the fan runs at a low speed.

The fan will operate at very low setting during Monitor operation and at the start of the Heating mode.

⑨ TIMER BUTTON

(A) To use the ON timer or OFF timer

- Press the START/STOP button (if the unit is already operating, proceed to step 2).
The indoor unit operation indicator lamp (red) will light.
- Press the TIMER button to select ON timer or OFF timer operation.
Each time the button is pressed the timer function changes in the following order:



The indoor unit TIMER indicator lamp (green) will light.

- Use the SET TIME button to adjust the desired OFF time or ON time.
Set the time while the time display is flashing (the flashing will continue for about five seconds).

- + button: Press to advance the time.
- button: Press to reverse the time.

About five seconds later, the entire display will reappear.

(B) To Use the Program timer

- Press the START/STOP button (if the unit is already operating, proceed to step 2).
The indoor unit operation indicator lamp (red) will light.
- Set the desired times for OFF timer and ON timer.
See the section “To Use the ON timer or OFF timer” to set the desired mode and times.
About three seconds later, the entire display will reappear.
The indoor unit timer indicator lamp (green) will light.
- Press the timer button to select the PROGRAM timer operation (either OFF → ON or OFF ← ON will display).

The display will alternately show “Off timer” and “On timer”, then change to show the time setting for the operation to occur first.
The PROGRAM timer will begin operation (if the ON timer has been selected to operate first, the unit will stop operating at this point).
About five seconds later, the entire display will reappear.

⑩ SLEEP BUTTON

To Use the SLEEP timer

- While the air conditioner is operating or stopped, press the SLEEP button.
The indoor unit operation indicator lamp (red) lights and the timer indicator lamp (green) lights.

To Change the Timer Settings

Press the SLEEP button once again and set the time using the SET TIME button.
Set the time while the Timer Mode Display is flashing (the flashing will continue for about five seconds).

- + button: Press to advance the time.
- button: Press to reverse the time.

About five seconds later, the entire display will reappear.

⑪ ADJUSTING THE DIRECTION OF AIR CIRCULATION

Vertical (up-down) direction of airflow is adjusted by pressing the Remote Control Unit's AIR FLOW DIRECTION button.

Horizontal (right-left) airflow direction is adjusted manually, by moving the Air Flow Direction Louvers.

Whenever making horizontal airflow adjustments, start air conditioner operation and be sure that the vertical air direction louvers are stopped.

(A) Vertical Air Direction Adjustment

Press the AIR FLOW DIRECTION button.

Each time the button is pressed, the air direction range will change as follows:

Cooling/ Dry mode	① ↔ ② ↔ ③ ↔ (⑥) ^{NOTE}	
Heating mode	④ ↔ ⑤ ↔ ⑥ ↔ ⑦	
Fan mode	③ ↔ ② ↔ ① ↔ ⑦ ↔ ⑥ ↔ ⑤ ↔ ④	

- Use the air direction adjustments within the ranges shown above.
- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.
 - During cooling/Dry mode : Horizontal flow ①
 - During Heating mode : Downward flow ⑥
- If you wish to select a different airflow direction, you may use the remote control unit's AIR FLOW DIRECTION button to choose a different setting.
- When the temperature of the air being blown out is low at the start of heating operation or during defrosting, the airflow direction temporarily becomes ⑦ to prevent cold air being blown onto the body.
- When the AIR FLOW DIRECTION button of the remote control unit is pressed, some time is required until the airflow direction louvers reach the desired position. During this time, adjustment of the airflow direction is not possible even when the AIR FLOW DIRECTION button is pressed.

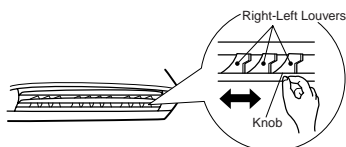
NOTE

During the cooling mode operation, you can select the air direction ①, ②, ③, or ⑥ (downward) by pressing the AIR FLOW DIRECTION button.
Use the air direction ⑥ when you want to cool yourself for a while after taking a bath or shower, or after coming back home in summer months.
But, for prevention of condensation on the louver, the air direction ⑥ is automatically released after 30 minutes and turned to the air direction ③.

(B) Right-Left Adjustment

Adjust the Right-Left Louvers

- Move the Right-Left Louvers to adjust air flow in the direction you prefer.



⚠ CAUTION

- Never place fingers or foreign objects inside the outlet ports, since the internal fan operates at high speed and could cause personal injury.

- Always use the remote control unit's AIR FLOW DIRECTION button to adjust the vertical airflow louvers. Attempting to move them manually could result in improper operation; in this case, stop operation and restart. The louvers should begin to operate properly again.
- When used in a room with infants, children, elderly or sick persons, the air direction and room temperature should be considered carefully when making settings.
- Always operate the Air Flow Direction Louvers and the Power Diffuser with the air flow direction buttons on the remote control. Forcible movement by hand can cause incorrect operation. In such a case, stop the operation to let the unit return to normal condition.
- Do not set the Air Flow Direction Louvers and the Power Diffuser for a long time to the heating mode (⑦) during cooling or drying operation. This can cause condensation at the discharge opening and dripping of water. (When operation is continued for 30 minutes or more in the heating mode ⑤ ⑥ ⑦, automatic return will be made to the direction ④.)

⑫ SWING OPERATION

Begin air conditioner operation before performing this procedure.

To Select SWING Operation

Press the SWING LOUVER button.

The SWING Indicator Lamp (orange) will light.

In this mode, the Air Flow Direction Louvers will swing automatically to direct the airflow both up and down

To Stop SWING Operation

Press the SWING LOUVER button once again.

The SWING Indicator Lamp (orange) will go out.

Airflow direction will return to the setting before swing was begun.

About Swing Operation

- The SWING range is as follows:

Cooling/ Dry mode	① ↔ ③, (④ ↔ ⑦) ^{NOTE}	
Heating mode	④ ↔ ⑦	

- The SWING operation may stop temporarily when the air conditioner's fan is not operating or when operating at very low speeds.
- The airflow direction can not be adjusted during SWING operation even when the AIR FLOW DIRECTION button is pressed.

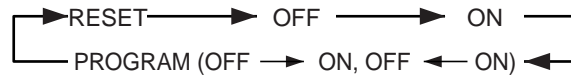
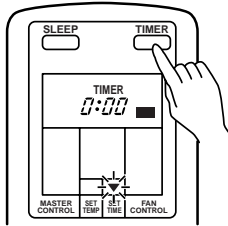
NOTE

During the cooling mode operation, the air swings between ④ and ⑦ by pressing the SWING LOUVER button after selecting the air direction ⑥ (downward) by pressing the AIR FLOW DIRECTION button.
Use this operation when you want to cool yourself for a while after taking a bath or shower, or after coming back home in summer months.
But, for prevention of condensation on the louver, the swing of the air direction ④ ↔ ⑦ is automatically released after 30 minutes and turned to the swing of the air direction ① ↔ ③.

10. TIMER

There are four timer modes: "SLEEP", "OFF TIMER", "ON TIMER" and "PROGRAM TIMER".

- (1) Set the clock time when the unit is in the stop mode (only the current time will be shown on the remote control unit display).
- (2) While adjusting the current clock time, do not use other remote control functions.
- (3) Each time the TIMER button is pressed, the remote control unit display will change in order shown below:

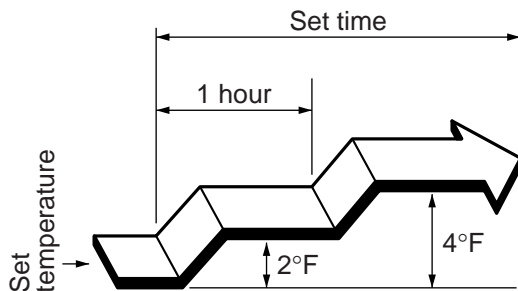


① SLEEP timer

When desiring to stop operation automatically after you go to bed, if the SLEEP button is pressed, operation stops while the "room temperature" is changed automatically.

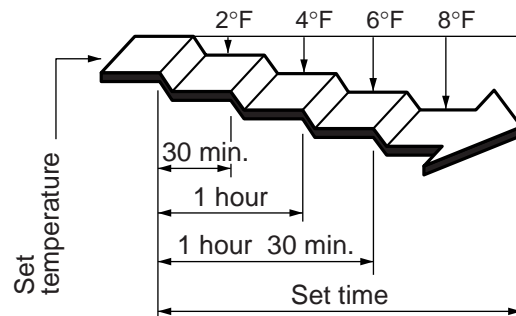
* Cooling/Drying

When set to "SLEEP", the set temperature is raised 2°F, then raised 2°F / 1 hour thereafter. When the temperature has been raised a total of 4°F, that temperature is held until the set time has elapsed, then operation automatically stops.



* Heating [REVERSE CYCLE]

When set to "SLEEP", the set temperature is lowered 2°F, then lowered 2°F / 30 minutes thereafter. When the temperature has been lowered a total of 8°F, that temperature is held until the set time has elapsed, then operation automatically stops.



② OFF TIMER

Use when going to bed or otherwise to stop operation. When the clock reaches the set time, the air conditioner will be turned off.

③ ON TIMER

Four wake-up operation or otherwise to start operation. Depending on the difference between the actual room temperature and the set temperature, the unit will start operation automatically in order to bring the room temperature to the desired set temperature by the time previously set.

The higher or lower the room temperature (relative to the set temperature), the earlier the unit will start to operate. ON-timer operation will start:
 For heating: 45 to 10 minutes before the set time
 For cooling: 20 to 10 minutes before the set time

In the FAN mode, operation will start precisely at the set time.

④ PROGRAM TIMER

The PROGRAM timer allows you to integrate OFF timer and ON timer operations in a single sequence. The sequence can involve one transition from OFF timer to ON timer, or from ON timer to OFF timer, within a twenty-four hour period.

The first timer function to operate will be the one set nearest to the current time.

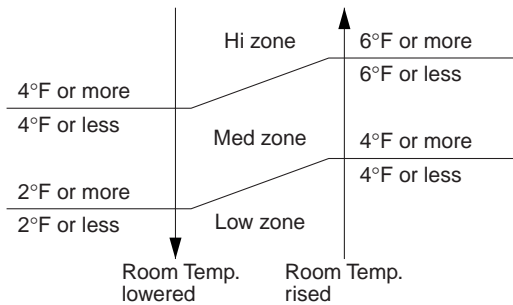
The order of operation is indicated by the arrow in the Remote Control Unit display (OFF → ON, or OFF ← ON).

One example of PROGRAM timer use might be to have the air conditioner automatically stop (OFF timer) after you go to sleep, then start (ON timer) automatically in the morning before you arise.

11. FAN CONTROL

(A) "AUTO" POSITION

(1) COOLING OPERATION



Airflow mode is set automatically in accordance with the condition "(Room temp. - Set temp.)" as shown at the left.

(2) HEATING OPERATION

- (1) When the indoor heat exchanger temperature reaches 116°F or more, the fan mode switches to the next higher position. ("LOW" → "MED", "MED" → "HIGH")
- (2) When the indoor heat exchanger temperature drops below 106°F while the compressor operates, the fan mode switches to the next lower position. ("HIGH" → "MED", "MED" → "LOW")
- (3) After switching the fan mode, it does not switch again within 2 minutes.
- (4) When "FAN CONTROL" is switched to "AUTO" while the unit is operated at the "FAN CONTROL" position of "HIGH", "MED" or "LOW", the unit operates in the "MED" fan mode at a room temperature of more than 106°F and in the "LOW" fan mode at a room temperature of less than 106°F.

(B) "LOW", "MED" and "HIGH" position

The indoor fan operates at the airflow set in the FAN CONTROL mode.

(C) QUIET position

Quiet operation begins. The indoor unit airflow will be reduced for quieter operation. Quiet operation cannot be used during Dry mode. (In the same way, when the dry mode is selected during AUTO mode operation, SUPER QUIET operation cannot be used.)

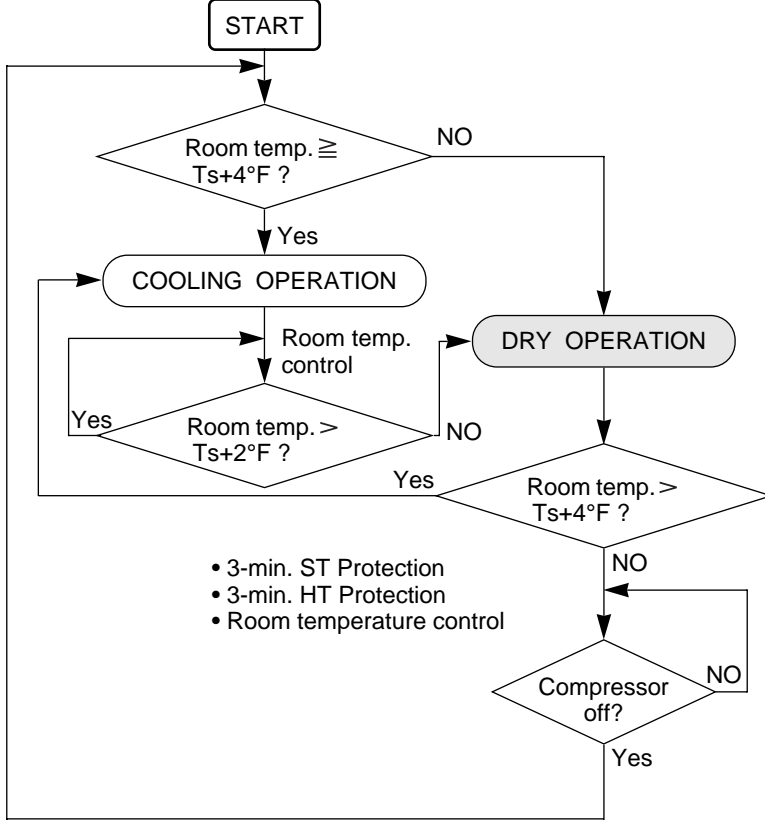
During Super Quiet operation, heating and cooling performance will be reduced somewhat.

12. OPERATING MODES

(1) "AUTO" position

A : COOLING & DRY operation (COOLING ONLY MODEL)

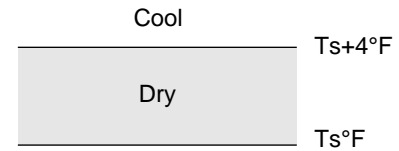
Operation flow chart



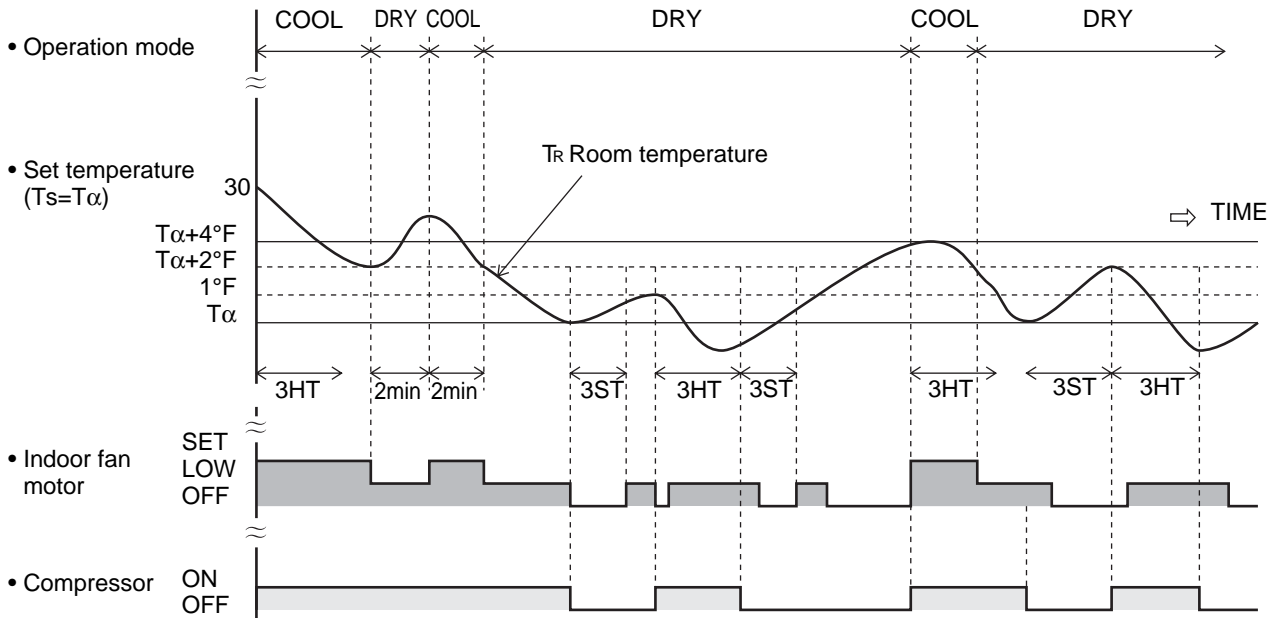
(1) When starting the operation at "AUTO" or when switched to "AUTO" from other modes, if the room temperature is higher than the set temperature +4°F (Room temp. \geq Set temp. (Ts) +4°F), "COOL" mode is set automatically and an air conditioner operates until the room temperature reaches the condition "Room temp. \leq Set temp. (Ts) +2°F".

(2) When the room temperature is less than the set temperature (Ts) +4°F at the start of operation or changing into "AUTO", or after the room temperature reaches the condition "Room temp. < Set temp. (Ts) +4°F", the unit is changed into the "DRY" mode.

"Room Temp. \leq Set Temp. (Ts) +4°F"



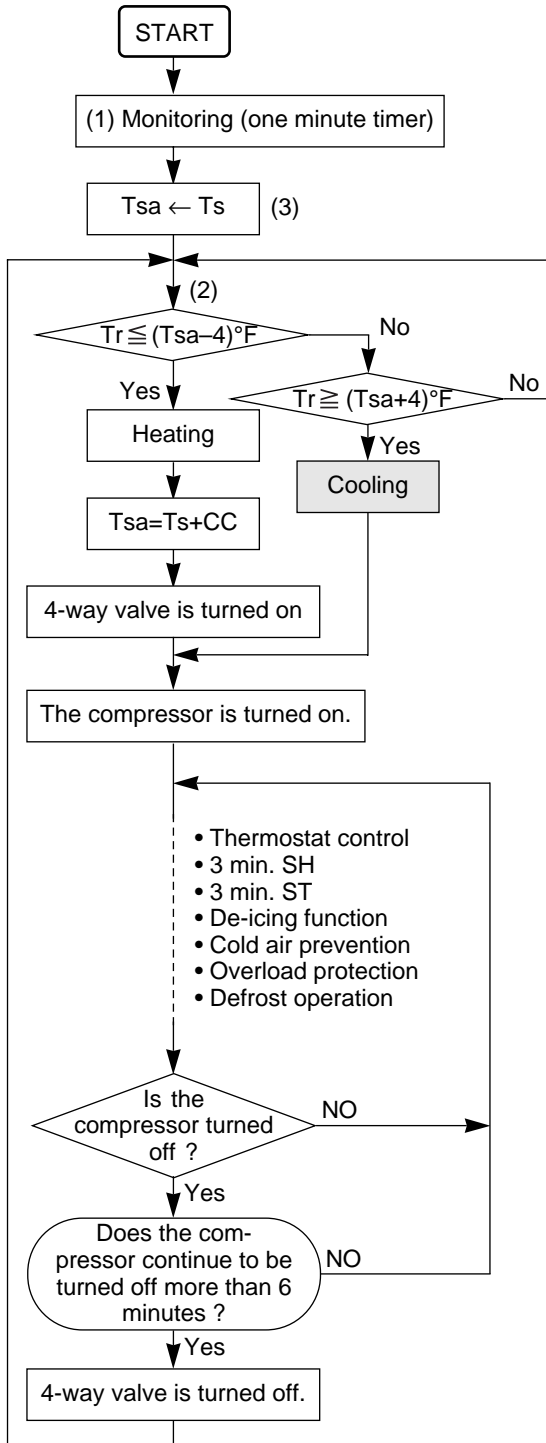
Cooling or Dry temperature control operation time chart



B : AUTO CHANGEOVER operation [REVERSE CYCLE ONLY]

- When AUTO CHANGEOVER operation is selected, the air conditioner selects the appropriate operation mode (Cooling or Heating) in response to your room's temperature.
- When AUTO CHANGEOVER operation first selected, the fan will operate at very LOW speed for about one minute, during which time the unit detects the room conditions and selects the proper operating mode.

Auto changeover flow chart



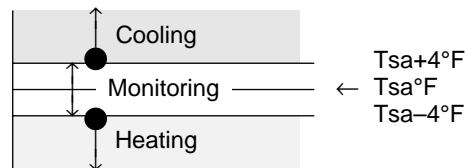
(a) Monitoring (Room temperature detection)

- * The monitoring is that the indoor fan motor rotates intermittently (0.5sec ON at Low/2.0sec OFF) for 60 seconds to detect the room temperature (Tr) after the unit starts with the MASTER CONTROL of AUTO.
- * In case that the 3-min delay function actuates or is actuating, the monitoring continues until the 3-min delay function is expired and furthermore 30 seconds elapses.
- * During the monitoring, the compressor and outdoor fan motor keep the OFF state. Then, the 4-way valve keeps the previous state.

(b) Auto operation

- * The cooling operation starts when the monitoring is expired and then the detected room temperature (Tr) is given in the formula $[Tr \geq (Tsa+4)^\circ F]$.
- * The heating operation starts when the monitoring is expired and then the detected room temperature (Tr) is given in the formula $[Tr \leq (Tsa-4)^\circ F]$.
- * The monitoring continues when the detected room temperature (Tr) is given in the following formula. $[(Tsa-4)^\circ F < Tr < (Tsa+4)^\circ F]$
- * The cooling or heating operation is performed in accordance with the microcomputer functions such as thermostat control, 3-min delay function, etc.
- * When the compressor continues to be in the OFF state for 6 minutes by the thermostat control in either of the cooling or heating, it is switched to the monitoring.

Room temperature (Tr) control zone

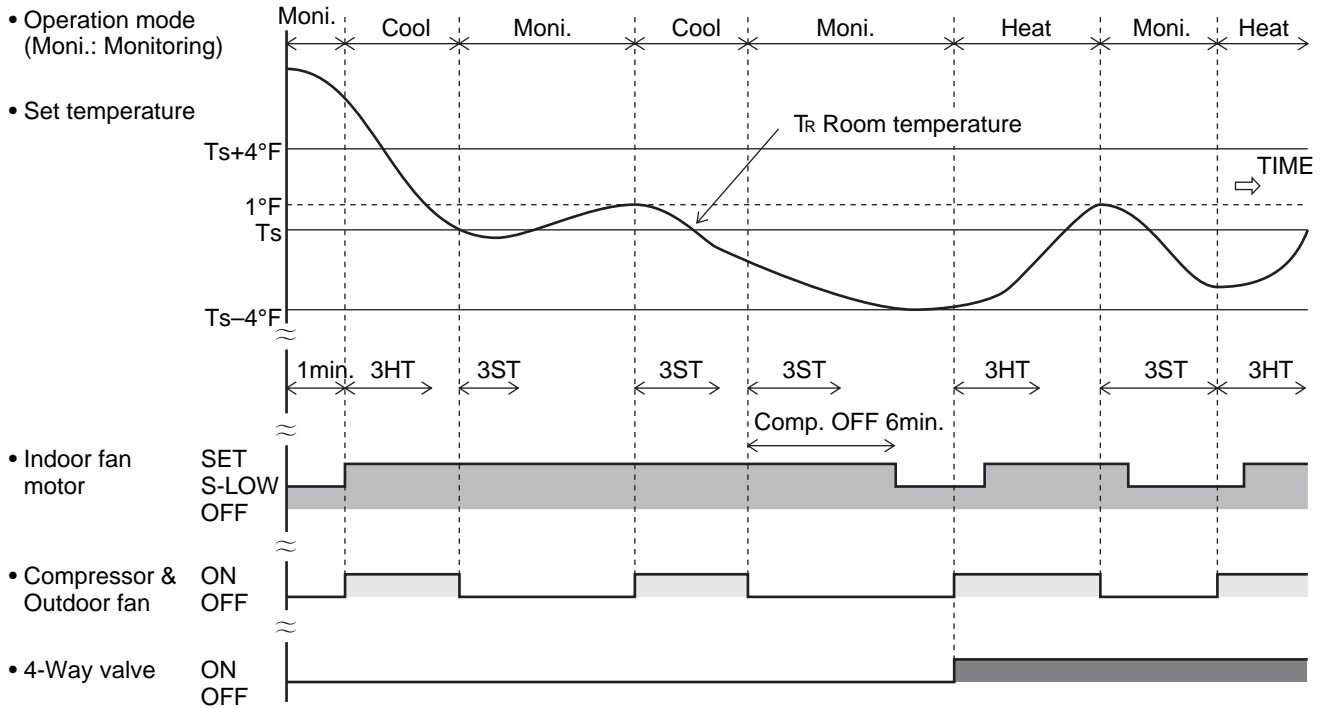


(c) Tsa : Set temperature in AUTO operation

- * During cooling operation or after switching to monitoring from cooling operation, Tsa is identical to the temperature (Ts) selected out of the THERMOSTAT.

- * During heating operation or after switching to monitoring from heating operation, "Tsa" is a value which the heating correction coefficient (CC) is added to the temperature (Ts) select out of the THERMOSTAT. (Tsa=Ts+CC)
- * When the set temperature of the THERMOSTAT (Ts) is changed, the last temperature has priority over the former set temperature.
- * Even though the set temperature is changed to switch from cooling to heating or from heating to cooling, such a switching is carried out after the compressor continues to be in the OFF state for 6 minutes by the thermostat control.

An example for AUTO CHANGEOVER TEMPERATURE CONTROL time chart



(2) "FAN" position

- ① In this position, the fan operates alone to circulate air. The room temperature will not be changed.
- ② Operates at the airflow set in the FAN CONTROL mode.

(3) "DRY" position

- ① In the dry mode, since preference will be given to remove humidity, the room temperature may not be lowered to the selected value.
- ② When using the dry mode, set the temperature to a value lower than the current room temperature. If it is set higher than the current room temperature, the unit will not enter the dry mode.
- ③ Room heating cannot be performed in the dry mode.
- ④ In the dry mode, the optimum fan speed will be set automatically and cannot be changed. The fan will emit a very weak stream of air.
- ⑤ In the dry mode, the room fan may occasionally stop in order to prevent the room humidity from rising.

(4) "COOL" position

When using the cooling mode, set the temperature to a value lower than the current room temperature. If it is set higher than the current room temperature, the unit will not enter the cooling mode and only the fan will operate.

(5) "HEAT" position [REVERSE CYCLE]

- ① Set the temperature higher than the current room temperature. If it is set to a lower temperature, heating will not start.
- ② For about 3 to 5 minutes after the start of heating, the fan will operate very slowly, then switch to the selected fan setting. This period allows the indoor unit heat exchanger to warm-up before emitting warm air.
- ③ During defrosting, the OPERATION indicator lamp will flash slowly, and the heating mode will be temporarily interrupted.

13. AUTO RESTART

The air conditioner power has been interrupted by a power failure. When the power is restored, the air conditioner will then restart automatically in its previous mode.

Operated by setting before the power failure. Then the airflow direction louvers will automatically change to their standard direction.

If a power failure occurs during TIMER operation, the timer will be reset and the unit will begin (or stop) to operate at the new time setting. If this kind of timer fault occurs, the TIMER indicator lamp (green) will flash.

Use of other electrical appliances (electric shaver, etc.) or nearby use of a radio transmitter may cause the air conditioner to malfunction. In this event, temporarily disconnect the power supply plug, reconnect it, and then use the power control unit to resume operation.

14. PROTECTING THE FAN MOTOR BY LOCKING

When the indoor fan motor starts, or the fan control mode is changed, the indoor fan motor detects the number of revolutions in 56 seconds.

When the indoor fan motor shows the unusual revolutions, it then stops.

15. ELECTRONIC EXPANSION VALVE CONTROL [REVERSE CYCLE]

After the power is turned on, the following operation is controlled automatically to control refrigerant charge to the most suitable value according to the operation mode and operation conditions of each indoor unit.

[ELECTRONIC EXPANSION VALVE CONTROL PROCESS AND THERMISTORS DETECTION TEMPERATURE]

- (1) The electronic control valve controls the discharge temperature to the set temperature.
- (2) The controlled temperature changes with the outdoor temperature and operation mode as shown below.

		Outdoor detection temperature [°F]		Discharge temperature [°F]
		When temperature rises	When temperature falls	
Cooling	Controlled temperature	$122 < T$	$118 < T$	203
		$104 < T \leq 122$	$100 < T \leq 118$	194
		$86 < T \leq 104$	$82 < T \leq 100$	185
		$68 < T \leq 86$	$64 < T \leq 82$	167
		$50 < T \leq 68$	$46 < T \leq 64$	149
		$T \leq 50$	$T \leq 46$	140
Heating	Controlled temperature	$64 < T$	$61 < T$	167
		$52 < T \leq 64$	$48 < T \leq 61$	167
		$41 < T \leq 52$	$37 < T \leq 48$	171
		$30 < T \leq 41$	$27 < T \leq 37$	176
		$19 < T \leq 30$	$16 < T \leq 27$	181
		$T \leq 19$	$T \leq 16$	176

16. SIMULTANEOUS COOLING AND HEATING OPERATION [REVERSE CYCLE]

When one indoor unit operates in the COOL mode and the other indoor unit operates in the HEAT mode, the outdoor unit performs SIMULTANEOUS COOLING AND HEATING OPERATION

- (1) The compressor, four way valve and electronic expansion valve perform each operation (COOLING or HEATING)
- (2) The outdoor unit fan motor starts to operate in the High mode. The priority is shown below.

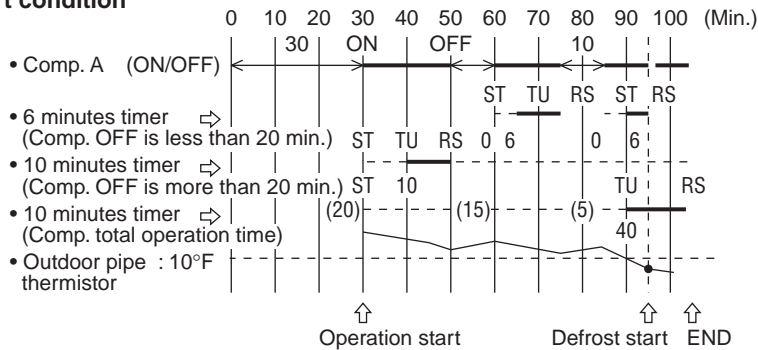
DEFROST > HEATING OVERLOAD PROTECTION > DE-ICING

DEFROSTING OPERATION

1. DEFROSTING OPERATION

When the temperature detected by the outdoor piping thermistor is 10°F or less, after 6 minutes timer or 10 minutes timer and the 40 minutes timer time-up, defrosting starts.

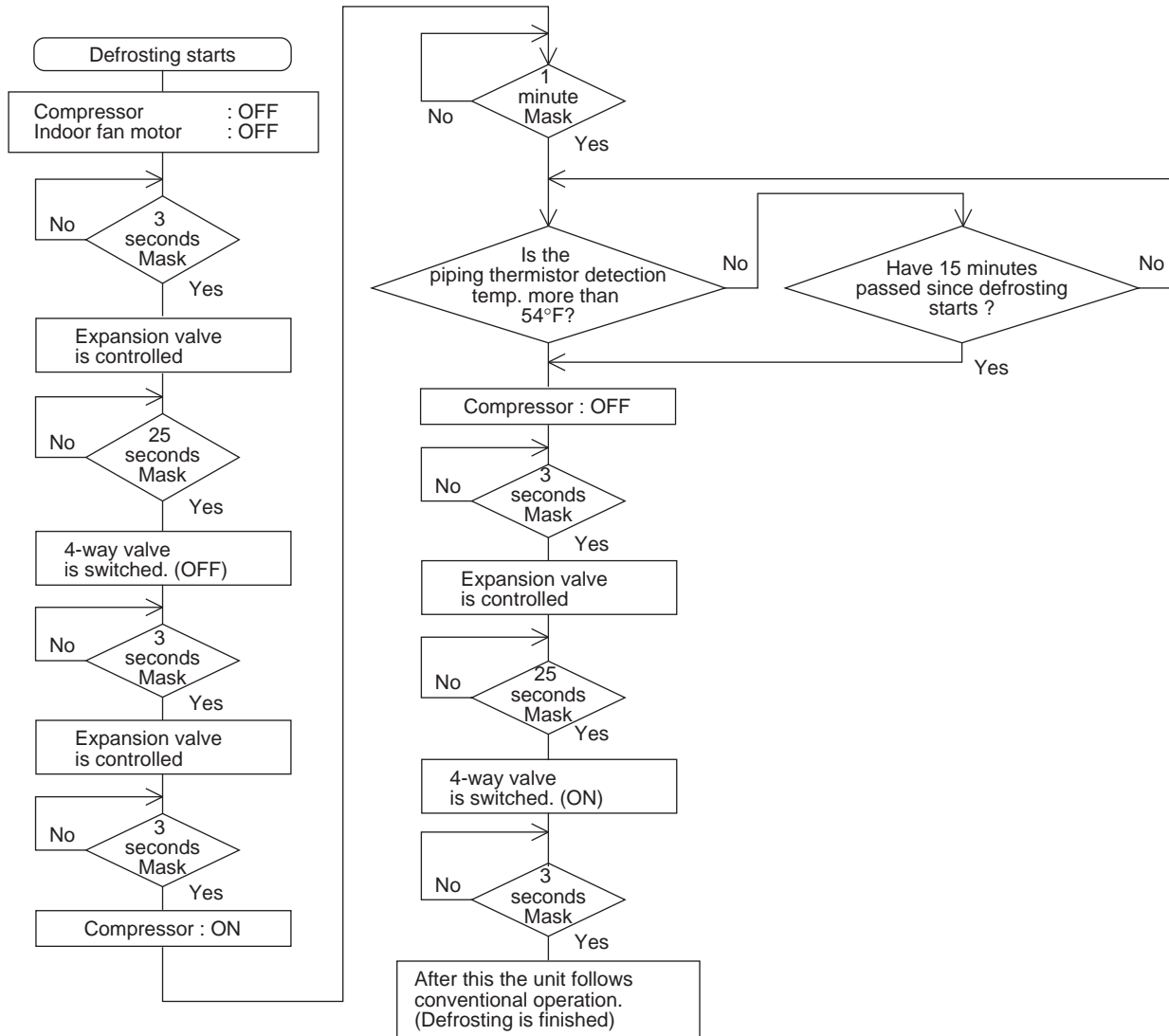
Defrosting start condition



[Note]

- ST : Timer Start (Comp. A OFF → ON)
- TU : Time up 6,10,40 after the setting time elapsed
- RS : Reset (Comp. A ON → OFF)

2. DEFROSTING FLOW-CHART



3. DEFROSTING FINISH

Defrosting is performed after the compressor is turned on and one minute mask is finished.

It is completed when the outdoor piping thermistor temperature reaches 54°F or more or the time of the 15 minutes timer is up.

TROUBLESHOOTING GUIDE

1. WORKING INSPECTION (When cooling)

Symptom	Possible causes	Remedy
(1) Indoor unit evaporator is covered with frost. a. Frost near inlet. b. Frost all over	Gas leakage Clogged filter Low ambient temperature (less than 68°F)	Check the leaking part, and charge gas. Clean the filter. Check the ambient temperature.
(2) Compressor operates, but does not cool.	Dirty condenser	Clean.
(3) Water does not come out of the drain hose.	When the compressor operates normally, the gas leaks.	Charge gas and replace the parts.
(4) Compressor return pipe (low pressure) is not cold.	Gas leakage	Charge gas. Replace the parts.
(5) Compressor outlet pipe (high pressure) is not hot.	Gas leakage	Charge gas.
(6) Compressor operates, but does not cool. a. Indoor unit evaporator is cold. b. Outdoor unit condenser is hot, it does not cool.	Overload operation Dirty condenser	Eliminate overload. Clean.
(7) Indoor unit air outlet temperature is low, but it does not cool.	Clogged filter The cooled air is short-circuited. Overload operation	Clean. Isolate the problem and correct. Eliminate the overload.

2. SYMPTOMS AND CHECK ITEMS

Symptom	Possible causes	Check item	Check points
No operation.	Power supply circuit faulty Microcomputer reset circuit faulty Remote control faulty External wiring receiving section faulty	CHECK 1 CHECK 2	Power supply circuit Microcomputer input signal Remote control troubleshooting
Erroneous operation. (Runaway)	Microcomputer runaway	CHECK 3	Reset circuit
Display does not light correctly.	Display unit faulty LED driver faulty	CHECK 4	Display unit Microcomputer output signal Driver output signal
Room temperature cannot be controlled.	Room thermistor faulty Pipe temperature thermistor faulty A/D converter input section faulty Compressor relay circuit faulty	CHECK 5 CHECK 8 CHECK 6	Thermistor resistance value Microcomputer output signal Relay output
Room fan does not run and wind speed cannot be switched.	Wind speed relay faulty	CHECK 7	Microcomputer output signal Driver output signal
Indication panel abnormal	Thermistor short-circuited or opened	CHECK 9	Thermistor resistance value

CHECK 1

Symptom --- No operation
Remote control is not received.

Preliminary checks

- * Is the power cord plugged in?
- * Is power present at the plug socket?
- * Is power turned off?

(1) Power connection check

- * Is power received at power supply PCB terminal W103-104? (220 or 240V AC)
- * Is the fuse (3.15A) blown?

(2) Power transformer check

- * Are CN104 and CN102 inserted firmly?
- * Is 15 to 20V AC output at CN104?

(3) Power supply circuit check

① 12V line

0V D101, Q101 faulty
D102, C107 short-circuited
R101 open

② 5V line

0V D103 open, IC102 faulty
C109, C110 short-circuited.
Other parts short-circuited.

(4) Power interrupt signal faulty

R3, R5 open, IC2 faulty,
C5 short-circuited.

(5) Reset IC faulty

IC5 faulty.

(6) Microcomputer oscillator faulty

Is the oscillator waveform (8.38 MHz) output at microcomputer pins 30 and 31?
If the oscillation waveform is not output, X1 or the microcomputer is faulty.

(7) Microcomputer faulty

CHECK 2

Preliminary checks

- * If the air conditioner operates when the remote control battery is changed, there are no problems. (The battery life is six months to one year.)
- * When the receiving part of the remote control unit is exposed to direct sunlight, the remote control receiver may not receive the signal.
- * When the infrared signal between the remote control unit and receiver is blocked, the remote control receiver does not receive the signal.

(1) Remote control unit check

If the signal tone is heard when a transistor radio is tuned to an unused frequency in the medium wave band and the remote control button is pressed within 5cm of the radio, the remote control unit is normal.

(2) When the remote control unit is normal, is CN9 disconnected?

The receiver on the air conditioner switch PC board is faulty, or the main PC board is faulty.

CHECK 3

Symptom --- Erroneous operation (Runaway)

Preliminary checks

- * Set the wall outlet to OFF and wait at least 30 seconds. Then, set the wall outlet to ON again. If remote control is received normally, there is no trouble.

(1) Reset circuit faulty

IC5 faulty, C16 short-circuited

CHECK 4

Symptom --- Display does not light correctly

Preliminary checks

- * Is display PC board connector CN4 inserted firmly?
- * Is the display unit cable open?

(1) LED driver faulty

IC3 faulty, R41 to R43 open. If all of the above are normal, the display unit is faulty.

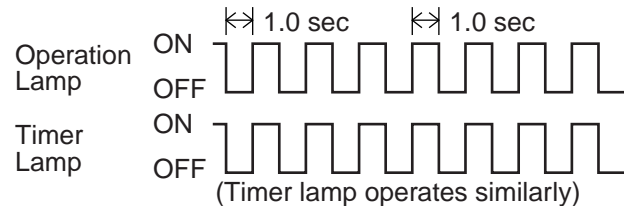
CHECK 5

Symptom --- Room temperature cannot be controlled.
(Compressor does not run or does not stop.)

Preliminary checks

- * Is the TEST-MANUAL AUTO switch in the TEST position?

TEST indication check



- * Is room temperature or thermistor connector CN12 inserted firmly?

- * Is the set temperature correct?

(1) Thermistor faulty

The room temperature thermistor resistance values are shown on page 17.
When there is a large error, the thermistor is faulty.

(2) A/D input circuit faulty

R37 open or short-circuited, R34 open, C18 and C20 short-circuited. If all of the above are normal, advance to CHECK 6.

CHECK 6

Symptom --- Room temperature cannot be controlled.

Preliminary checks

- * Is each Faston terminal of the power relay inserted firmly?
- * Is the indoor unit and outdoor unit connection wiring open or loose?

(1) IC3 faulty

IC3-11 output port short-circuited.
Power relay faulty

CHECK 7

Symptom --- Room fan does not run.

Preliminary checks

- * At dehumidification operation, the room fan is stopped while the compressor is stopped.
- * Turn the fan once or twice by hand.
If the fan does not turn easily, the fan motor is faulty.

(1) Fan motor faulty

Fan motor winding open (check between all windings)

(2) Fan motor capacitor faulty.

(3) Relay drive circuit faulty

IC3 faulty
IC3-12 output port short-circuited
SSR101 faulty, L101 open

- (4) Protecting the indoor fan motor by locking
 When the indoor fan will not run and the lamp is flashing on and off as shown in Fig.1, indoor fan motor protection by locking is functioning.
 This function is released once by disconnecting the power plug.

CHECK 8

- Room temperature thermistor
- * CN2 disconnected. CN2 No.1-2 short-circuited.
 - * Thermistor faulty
 - * R37 open, short-circuited.
 - * C18, C20 short-circuited
 - * R33, R34 open.
 - * See Fig. 2 at the right.

Heat exchanger (Pipe) thermistor

- * CN3 disconnected. CN3 No.1-2 short-circuited.
- * Thermistor faulty
- * R38 open, short-circuited.
- * C19, C21 short-circuited.
- * R35, R36 open.
- * See Fig. 3 at the right.

CHECK 9

Thermistor Abnormal Indication

- (1) Whether during operation or non-operation, when the room temperature thermistor or heat exchanger thermistor is opened or short-circuited, operation is immediately stopped and failure indication (see item (3) described below) is displayed.
- (2) If this function stops the operation, any operation instruction cannot resume the operation.
- (3) Failure indications stated in (1) are shown in the Fig.2.

Fig.1

* Protecting the indoor fan motor by locking.

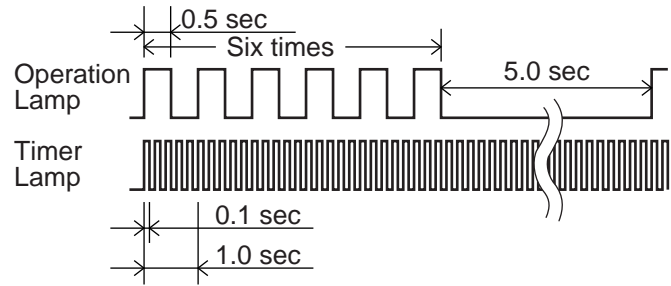


Fig.2

* Room temperature thermistor is abnormal.

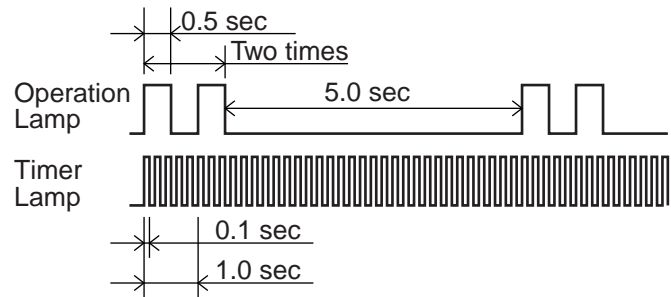
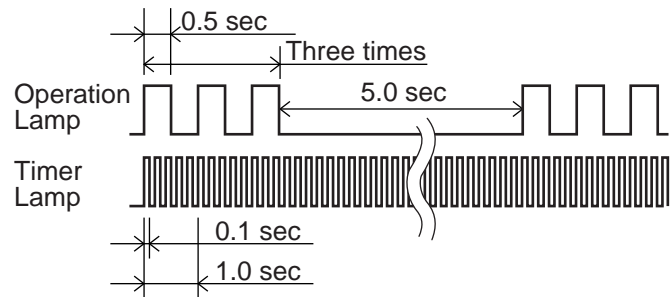












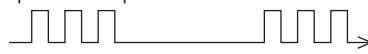

































Fig.3

* Heat exchanger (Pipe) is abnormal.















3. TROUBLESHOOTING DISPLAY TABLE















(1) INDOOR UNIT INDICATOR LAMP

No.	TROUBLE INDICATOR LAMP		FLASH/TIME (SEC)	OPERATION	PROBABLE CAUSE	
	OPERATION LAMP (red)	TIMER LAMP (green)			INDOOR UNIT	OUTDOOR UNIT
A	 1.0 sec ON 1.0 sec OFF	 1.0 sec ON 1.0 sec OFF	Operation lamp:  Timer lamp: 	• Test operation	_____	_____
B	 Flashes 2 times (0.5 sec) 5 sec OFF	 0.1 sec ON 0.1 sec OFF	Operation lamp:  Timer lamp: 	• Indoor unit room thermistor abnormal	_____	_____
C	 Flashes 3 times (0.5 sec) 5 sec OFF	 0.1 sec ON 0.1 sec OFF	Operation lamp:  Timer lamp: 	• Indoor unit piping thermistor abnormal	_____	_____
D	 Flashes 4 times (0.5 sec) 5 sec OFF	 0.1 sec ON 0.1 sec OFF	Operation lamp:  Timer lamp: 	• Serial reverse transmit signal faulty Reverse signal faulty (Indoor fan motor stop)	• F cable connection error • Main PCB faulty	• Fuse blown • Main PCB faulty
E	 Flashes 6 times (0.5 sec) 5 sec OFF	 0.1 sec ON 0.1 sec OFF	Operation lamp:  Timer lamp: 	• Indoor unit fan motor defective (Indoor fan motor locked and fan speed faulty)	• Indoor fan motor faulty • Indoor fan motor connector removed • Power PCB faulty • Main PCB faulty	_____
F	 0.1 sec ON 0.1 sec OFF	 Flashes 1 time (0.5 sec) 5 sec OFF	Operation lamp:  Timer lamp: 	• Outdoor discharge A thermistor abnormal	_____	• Compressor locked • Thermistor lead wire disconnected • Thermistor connector removed • Thermistor element faulty • Main PCB faulty
G	 0.1 sec ON 0.1 sec OFF	 Flashes 2 times (0.5 sec) 5 sec OFF	Operation lamp:  Timer lamp: 	• Outdoor discharge B thermistor abnormal	_____	Same as above
H	 0.1 sec ON 0.1 sec OFF	 Flashes 3 times (0.5 sec) 5 sec OFF	Operation lamp:  Timer lamp: 	• Outdoor condenser A thermistor abnormal	_____	• Thermistor lead wire disconnected • Thermistor connector removed • Thermistor element faulty • Main PCB faulty
I	 0.1 sec ON 0.1 sec OFF	 Flashes 4 times (0.5 sec) 5 sec OFF	Operation lamp:  Timer lamp: 	• Outdoor condenser B thermistor abnormal	_____	Same as above
J	 0.1 sec ON 0.1 sec OFF	 Flashes 5 times (0.5 sec) 5 sec OFF	Operation lamp:  Timer lamp: 	• Outdoor ambient thermistor abnormal	_____	Same as above
K	 0.1 sec ON 0.1 sec OFF	 Flashes 6 times (0.5 sec) 5 sec OFF	Operation lamp:  Timer lamp: 	• Outdoor pressure switch A abnormal	_____	• Pressure switch lead wire disconnected • Pressure switch connector removed • Pressure switch element faulty • Main PCB faulty























NOTE : No. SHOWS TROUBLE DIAGNOSIS.

No.	TROUBLE INDICATOR LAMP		FLASH/TIME (SEC)	OPERATION	PROBABLE CAUSE	
	OPERATION LAMP (red)	TIMER LAMP (green)			INDOOR UNIT	OUTDOOR UNIT
L	 0.1 sec ON 0.1 sec OFF	 Flashes 7 times (0.5 sec) 5 sec OFF	Operation lamp:  Timer lamp: 	• Outdoor pressure switch B abnormal	—	• Pressure switch lead wire disconnected • Pressure switch connector removed • Pressure switch element faulty • Main PCB faulty
M	 0.1 sec ON 0.1 sec OFF	 Flashes 8 times (0.5 sec) 5 sec OFF	Operation lamp:  Timer lamp: 	• Main PCB model information abnormal	—	• Main PCB faulty
N	 0.1 sec ON 0.1 sec OFF	 Flashes 9 times (0.5 sec) 5 sec OFF	Operation lamp:  Timer lamp: 	• Main PCB EEPROM abnormal	—	Same as above

(2) OUTDOOR UNIT MAIN PCB LAMP

No.	TROUBLE INDICATOR LAMP	FLASH/TIME (SEC)	OPERATION	PROBABLE CAUSE
O	 Flashes 1 time 0.5 sec ON/2.5 sec OFF	LED : D8 	• Indoor unit A communication signal faulty	• Compressor locked • F-cable connection error (Indoor unit 1) • Main PCB faulty (IC1 or IC7) • IThermistor connector removed
	 Flashes 1 time 0.5 sec ON/2.5 sec OFF	LED : D15 	• Indoor unit B communication signal faulty	
P	 Flashes 2 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D10 	• Outdoor discharge thermistor A abnormal	• Thermistor lead wire disconnected • Thermistor connector removed • Thermistor element faulty • Main PCB faulty
	 Flashes 3 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D10 	• Outdoor discharge thermistor B abnormal	
	 Flashes 4 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D10 	• Outdoor heat exchanger thermistor A abnormal	
	 Flashes 5 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D10 	• Outdoor heat exchanger thermistor B abnormal	
	 Flashes 6 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D10 	• Outdoor temperature abnormal	

NOTE : No. SHOWS TROUBLE DIAGNOSIS.

No.	TROUBLE INDICATOR LAMP	FLASH/TIME (SEC)	OPERATION	PROBABLE CAUSE
Q	 Flashes 2 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D9 	<ul style="list-style-type: none"> Indoor Unit A heating overload protection 	<ul style="list-style-type: none"> High ambient temperature Dirty filter Gas leakage
	 Flashes 3 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D9 	<ul style="list-style-type: none"> Indoor Unit A de-icing protection 	<ul style="list-style-type: none"> Low ambient temperature Dirty filter
	 Flashes 4 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D9 	_____	_____
	 Flashes 5 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D9 	<ul style="list-style-type: none"> Outdoor Unit A discharge temperature abnormal 	<ul style="list-style-type: none"> Gas leakage Electronic expansion valve faulty Outdoor unit heat exchanger dirty
	 3 sec ON / 1 sec OFF /2.5 sec OFF	LED : D9 	<ul style="list-style-type: none"> Outdoor Unit A defrost operation 	
	 Flashes 2 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D16 	<ul style="list-style-type: none"> Indoor Unit B heating overload protection 	<ul style="list-style-type: none"> High room temperature Filter dirty Gas leakage
	 Flashes 3 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D16 	<ul style="list-style-type: none"> Indoor Unit B de-icing protection 	<ul style="list-style-type: none"> Low room temperature Filter dirty
 Flashes 4 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D16 	_____	_____	
 Flashes 5 times (0.5 sec ON / 0.5 sec OFF) /2.5 sec OFF	LED : D16 	<ul style="list-style-type: none"> Outdoor Unit B discharge temperature abnormal 	<ul style="list-style-type: none"> Gas leakage Electronic expansion valve faulty 	
 3 sec ON / 1 sec OFF /2.5 sec OFF	LED : D16 	<ul style="list-style-type: none"> Outdoor Unit B defrost operation 		
R	 ALL LED flash 0.1 sec ON / 0.1 sec OFF		_____	<ul style="list-style-type: none"> Main PCB faulty

NOTE : No. SHOWS TROUBLE DIAGNOSIS.

4. TROUBLESHOOTING THE INDOOR UNIT

TRouble DIAGNOSIS A TEST OPERATION (Test run button of the remote control unit)

- (1) This button is used when installing the air conditioner, and should not be used under normal conditions, as it will cause the air conditioners thermostat function to operate incorrectly.
- (2) If this button is pressed during normal operation, the unit will switch to the test operation mode, and the indoor unit's OPERATION Indicator Lamp and TIMER Indicator Lamp will begin to flash simultaneously.
- (3) To stop the test operation mode, either press the TEST RUN button again, or press the START/STOP button to stop the air conditioner.

TRouble DIAGNOSIS B INDOOR UNIT ROOM THERMISTOR ABNORMAL

If flashing No.B in the troubleshooting display table in the preceding item is performed, the room temperature thermistor is faulty. (The unit does not operate at all.)

<Check point>

Thermistor resistance values

Room temperature (°F)	37	41	46	50	59	68	77	84	89	91	97	104	111
Resistance value (kΩ)	28.7	25.9	22.3	20.1	15.8	12.5	10.0	8.4	7.7	7.0	6.2	5.3	4.5

- * Replace the main PCB of the indoor unit.
- * The indoor room thermistor is open or short-circuited.

TRouble DIAGNOSIS C INDOOR UNIT PIPING THERMISTOR ABNORMAL

The piping temperature thermistor is faulty.(The unit does not operate at all.)

<Check point>

Thermistor resistance values

Pipe temperature (°F)	32	36	43	50	57	64	72	79
Resistance value (kΩ)	176.0	157.8	127.3	103.3	84.4	69.3	57.2	47.5
Pipe temperature (°F)	86	93	100	111	122	132	140	
Resistance value (kΩ)	39.6	33.2	27.9	21.7	17.0	13.5	11.6	

- * Replace the main PCB of the indoor unit.
- * The indoor pipe thermistor is open or short-circuited.

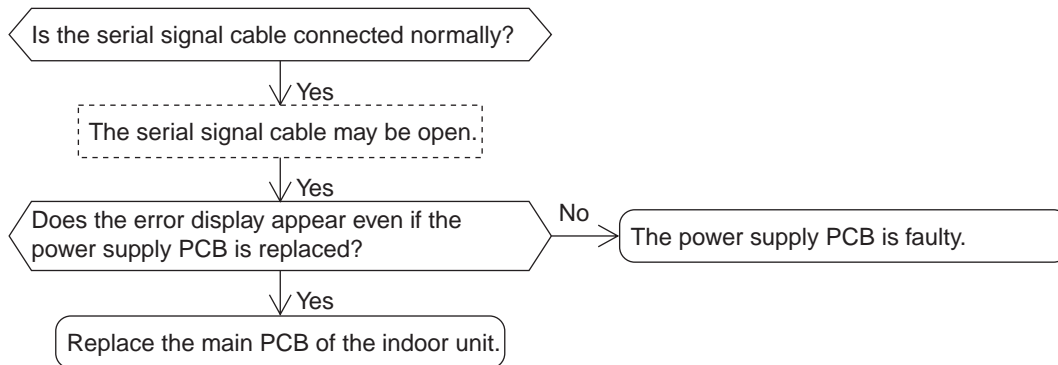
TROUBLE DIAGNOSIS D SERIAL REVERSE TRANSFER SIGNAL ABNORMAL

Serial reverse transfer signal reception is faulty.(Indoor fan motor stops.)

<Check point>

* Check if the serial signal cable connecting the indoor unit to the outdoor unit is connected normally.

<Check procedure>



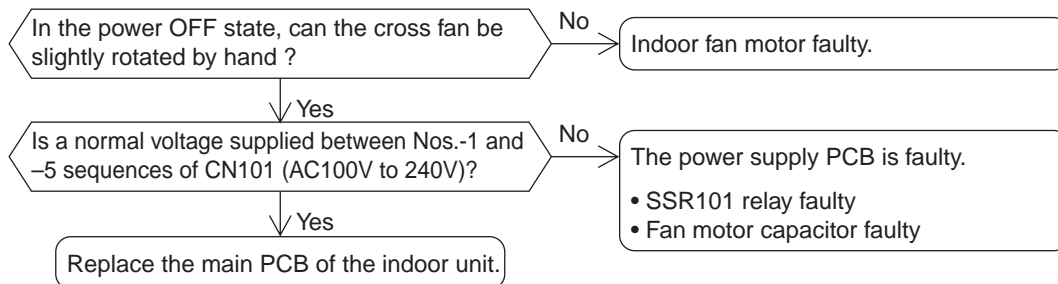
TROUBLE DIAGNOSIS E INDOOR FAN MOTOR FAULTY

Indoor fan motor does not rotate.

<Check point>

* Are the main PCB connector CN1, and the power PCB connectors CN101 and CN103 firmly inserted?

<Check procedure>



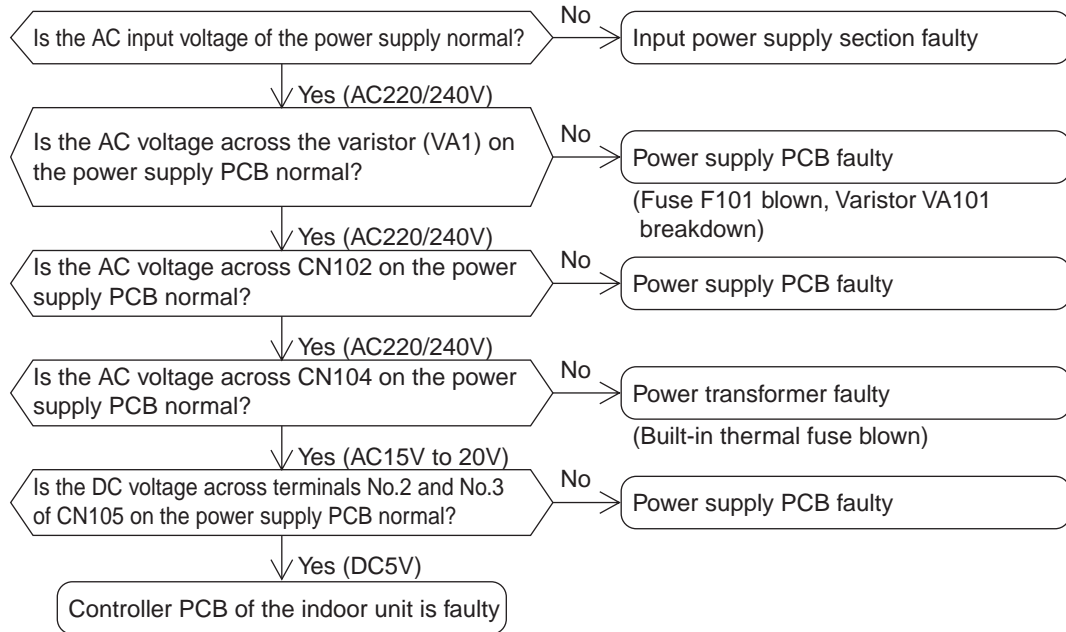
OTHER TROUBLESHOOTING

[1.Symptom] : The unit does not run at all. (The OPERATION lamp and the TIMER lamp do not light.)

<Check point>

- * Is the voltage normal?
- * Is the connecting cable connected normally?
- * Is each connector inserted firmly?
- * Is the fuse in the outdoor unit blown?

<Check procedure>

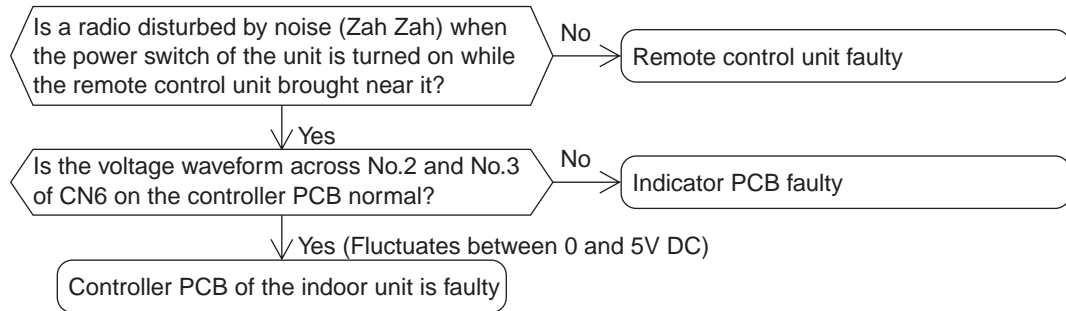


[2.Symptom] : The remote control unit does not receive the signal.

<Check point>

- * In connector CN6 on the controller PCB inserted firmly?
- * Doesn't a battery of the remote control unit run low?
- * Does the unit run by MANUAL AUTO switch (SW1 on the controller PCB)?

<Check procedure>

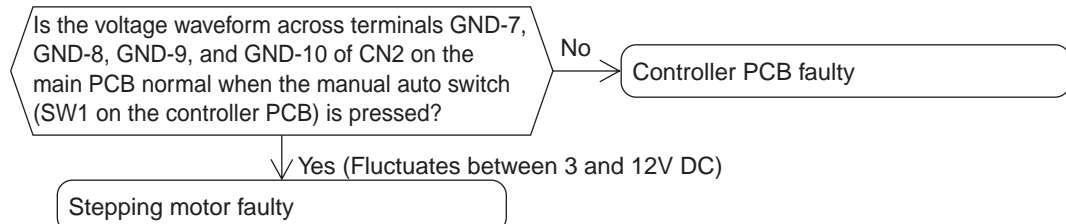


[2.Symptom] : The louver does not function.

<Check point>

- * Is connector CN2 of the controller PCB inserted firmly?

<Check procedure> (GND: Ground or connector CN4-3)



5. TROUBLESHOOTING THE OUTDOOR UNIT

If the OPERATING LED and TIMER LED trouble display at the indoor unit is troubleshooting display table Nos. F to N, the problem exists in the outdoor unit.

Remove the cabinet so that the controller PCB of the outdoor unit can be seen, and observe LEDs D8 to D16 inside the controller PCB.

(Refer to troubleshooting display table Nos. O and P on page 19.)

TROUBLE DIAGNOSIS F to J OUTDOOR UNIT THERMISTOR FAULTY

If D10 flickers, follow troubleshooting display table Nos. F to J, Thermistor is faulty.

<Check point>

- * Remove the thermistor from the main PCB of the outdoor unit, and measure the resistance value of the thermistor.

No.	THERMISTOR	CONNECTOR (CN9)		RESISTANCE VALUES VS TEMPERATURE (kΩ)				
		PIN NO.	WIRE COLOR	58 °F	68 °F	78 °F	88 °F	98 °F
F	Discharge A thermistor	CN9-1 CN9-2	Green	175.70	104.59	64.50	41.07	26.91
G	Discharge B thermistor	CN9-3 CN9-4	Yellow	175.70	104.59	64.50	41.07	26.91
H	Condenser A thermistor	CN9-5 CN9-6	Orange	16.05	9.72	6.10	3.94	2.62
I	Condenser B thermistor	CN9-7 CN9-8	Pink	16.05	9.72	6.10	3.94	2.62
J	Outdoor temperature thermistor	CN9-9 CN9-10	Gray	16.05	9.72	6.10	3.94	2.62

Note : This list shows representative resistance values, ±10% of resistance values is within allowance.

<Check procedure>

JUDGEMENT : When the representative resistance value does not conform to the above list, a thermistor is faulty.
When the resistance value conforms to the above list, the main PCB is faulty.

NO. F,G : Discharge thermistor
The electronic expansion valve may be faulty.

NO. H,I : Condenser thermistor
Abnormal conditions are considered to exist in the refrigerant circuit.

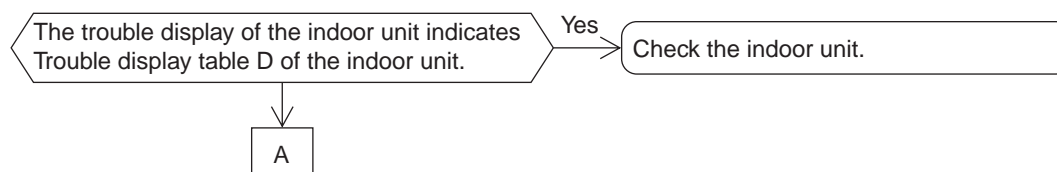
TROUBLE DIAGNOSIS O COMMUNICATION SIGNAL FAULTY

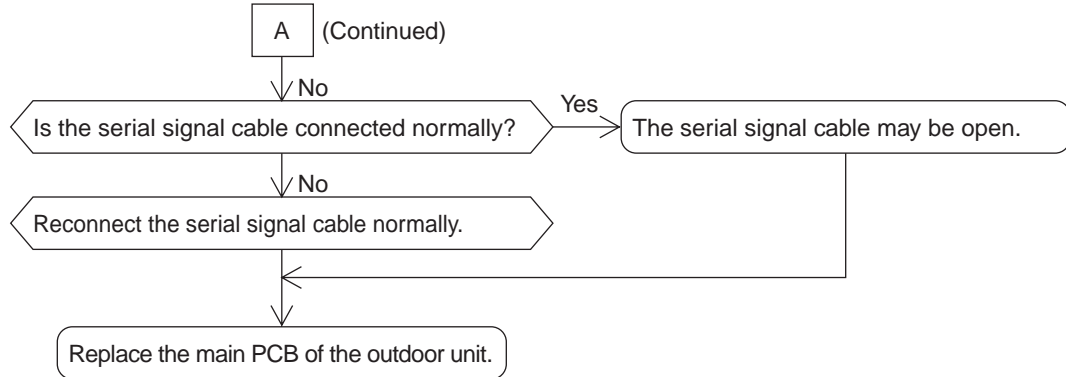
If D8, D15 flash only one time, the serial transfer signal is erroneous.

<Check point>

- * Check if the serial signal cable is wired normally.
- * See the trouble display of the indoor unit.

<Check procedure>





If D8 and D15 flicker once, check as described above.

OTHER TROUBLESHOOTING

[1.Symptom] : The unit does not run at all.

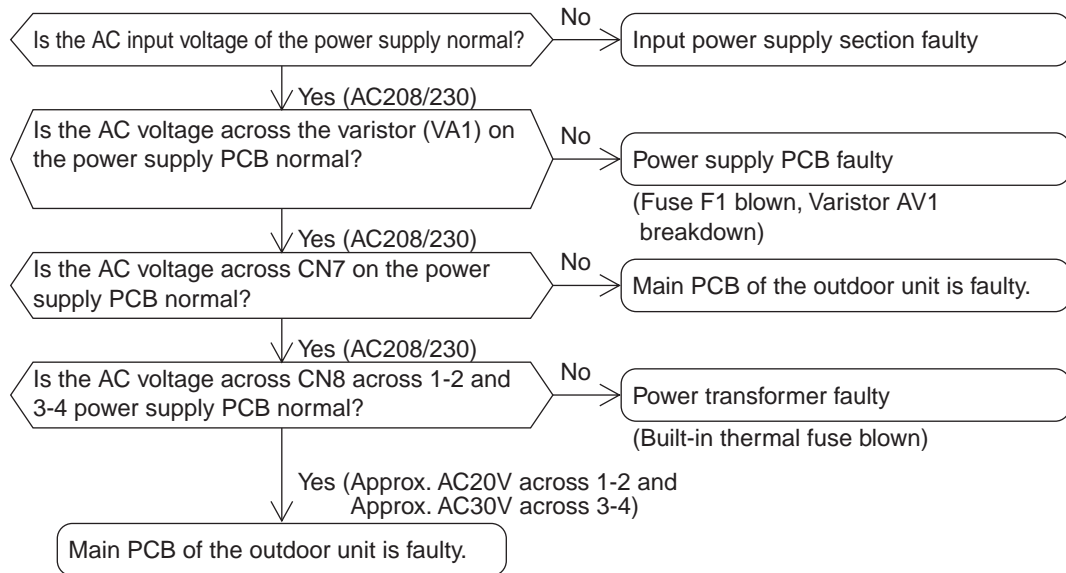
(LED D8, D10 and D15 for trouble display do not flicker.)

※ When LED D8,D10 and D15 are flickering, follow the preceding trouble display.

<Check point>

- * Is the input voltage of the power supply input terminal normal?
- * Check if the connecting cable is connected normally.
- * Is each connector inserted firmly?

<Check procedure>



Parts Orders

Parts maybe ordered from

FUJITSU GENERAL AMERICA, INC

353 RTE 46 W.

FAIRFIELD NJ 07004 PHONE 1-973-575-0380

FAX 1-973-575-2194

Specify complete Parts No., Model & Description to ensure correct parts are supplied.

FUJITSU GENERAL AMERICA, INC.
353 ROUTE 46W., FAIRFIELD, N.J. 07004