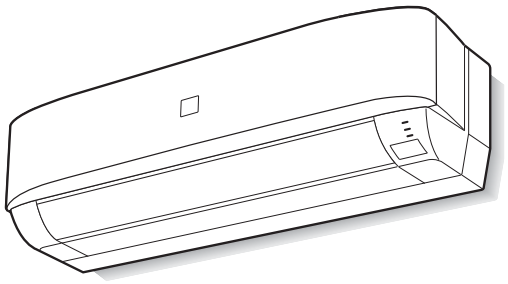
SHARP SERVICE MANUAL

SA209AYXPC5PU/T



SPLIT TYPE AIR CONDITIONER (INDOOR UNIT)

MODEL AY-XPC15PU
AY-XPC18PU
AY-XP24PU

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

CONTENTS

Parts marked with "⚠" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

CHAPTER 1. SPECIFICATION

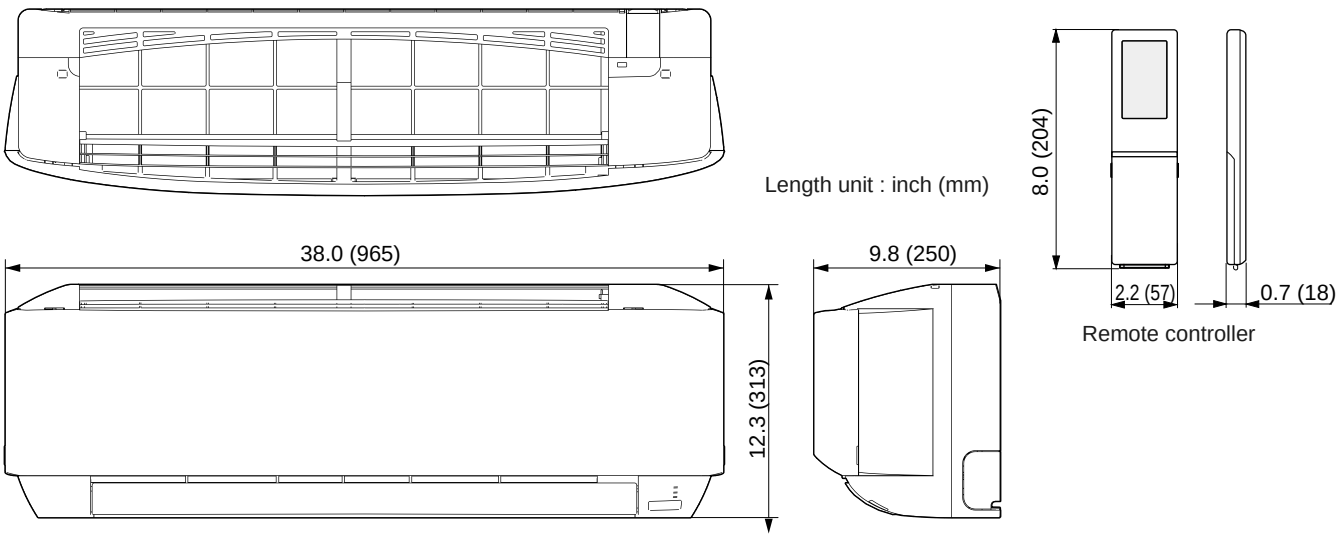
[1] SPECIFICATION

ITEMS	INDOOR MODEL		AY-XPC15PU	AY-XPC18PU	AY-XP24PU
Electrical data					
Phase			Single	Single	Single
Rated frequency	V		208/230	208/230	208/230
Reted voltage	Hz		60	60	60
Refrigerant system	Evaporator		Louver fin and Grooved tube type	Louver fin and Grooved tube type	Louver fin and Grooved tube type
	Refrigerant		R410A	R410A	R410A
Sound Presure Level (Cooling)	High	dB(A)	44	45	49
	Low	dB(A)	32	33	36
	Silent	dB(A)	27	28	32
Sound Presure Level (Heating)	High	dB(A)	44	46	49
	Low	dB(A)	34	35	38
	Silent	dB(A)	29	30	34
Net dimensions	Width	inch (mm)	38.0 (965)	38.0 (965)	38.0 (965)
	Height	inch (mm)	12.3 (313)	12.3 (313)	12.3 (313)
	Depth	inch (mm)	9.8 (250)	9.8 (250)	9.8 (250)
Net weight	lb (kg)		28.7 (13)	29.8 (13.5)	29.8 (13.5)
Fan system					
Fan motor			CMOT-A561JBKZ	CMOT-A561JBKZ	CMOT-A561JBKZ
			8poles,40W	8poles, 40W	8poles, 40W
Air flow quantity (Cooling)	High	CFM (m3/min)	467 (13.2)	476 (13.5)	511 (14.5)
	Low	CFM (m3/min)	306 (8.7)	310 (8.8)	444 (12.6)
	Silent	CFM (m3/min)	239 (6.8)	243 (6.9)	286 (8.1)
Air flow quantity (Heating)	High	CFM (m3/min)	503 (14.3)	501 (14.2)	525 (14.9)
	Low	CFM (m3/min)	332 (9.4)	338 (9.6)	469 (13.3)
	Silent	CFM (m3/min)	254 (7.2)	261 (7.4)	314 (8.9)
Fan speed (Cooling)	High	rpm	1060	1150	1220
	Low	rpm	750	800	1080
	Silent	rpm	620	660	750
Fan speed (Heating)	High	rpm	1130	1200	1250
	Low	rpm	800	850	1130
	Silent	rpm	650	700	810
Fan			Cross-flow fan Φ118	Cross-flow fan Φ118	Cross-flow fan Φ118
Connections					
Refrigerant coupling			Flare type		
Refrigerant tube size (A:Gas line,B:Liquid line)		inch (mm)	A: 1/2" (Flared connection 1/2") (12.7)		
		inch (mm)	B: 1/4" (Flared connection 1/4") (6.35)		
Drain hose		inch (mm)	Insulation O.D. Φ1.14 (29), Connected part O.D. Φ0.63 (16)		
Others					
Air filters			PFILMA282JBEA		
Cluster generator			CKITTA113AKKZ		
Rmote controller			CRMC-A868JBEZ		

The data of 18PU/24PU models is currently under revision.
Will be released after approval.

[2] EXTERNAL DIMENSION

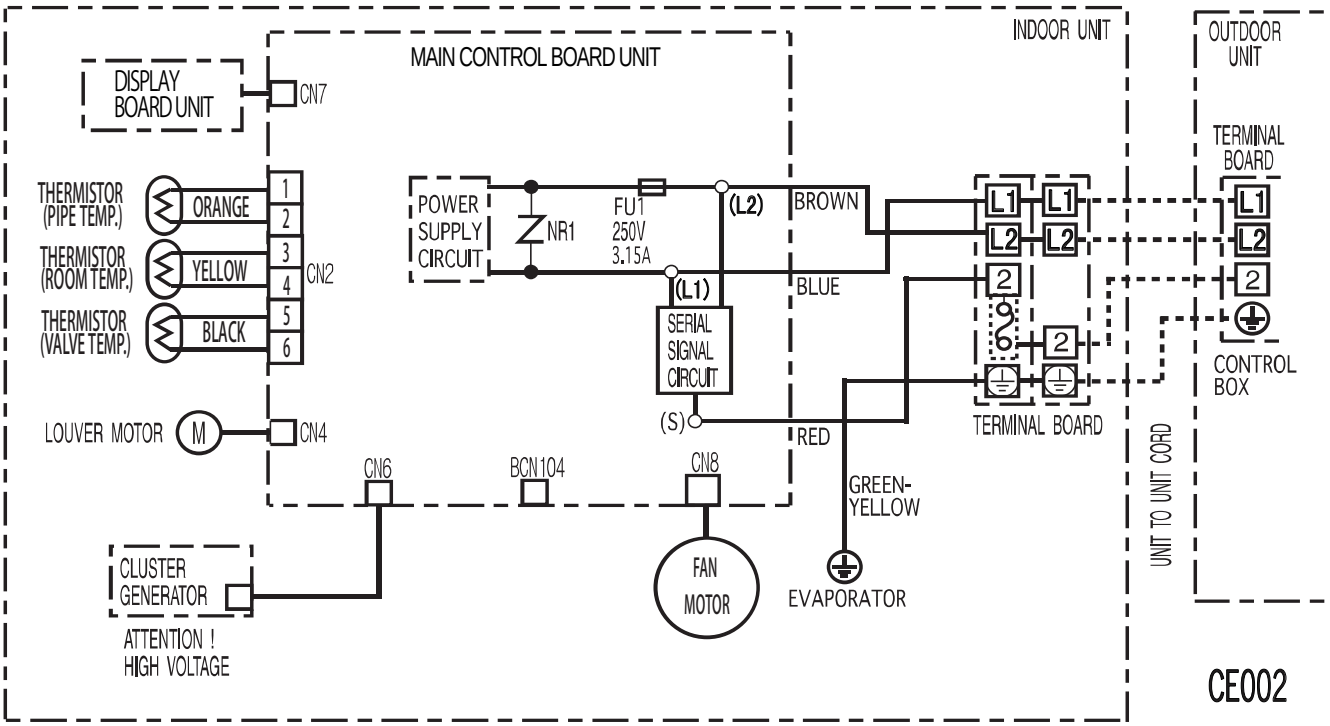
Indoor unit



[3] ELECTRICAL PARTS

Part Name	Model	Remarks
Fan motor	SHA-37CVJ-F440-1	DC motor (CMOT-A561JBKZ)
Louver motor	24BYJ48-1373	DC12V (RMOT-A223JBZZ)
Fu 1	-	QFS-GA078JBZZ (3.15A 250V)

[4] WIRING DIAGRM



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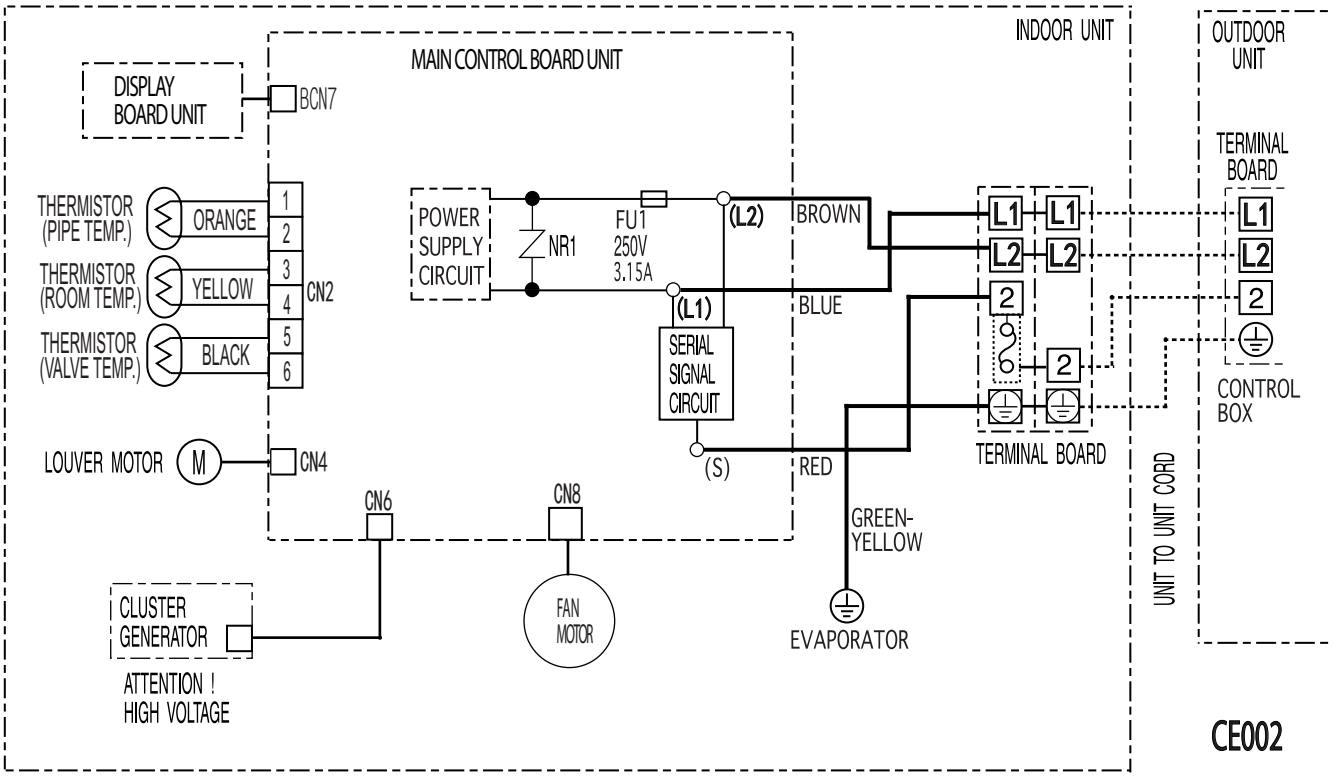
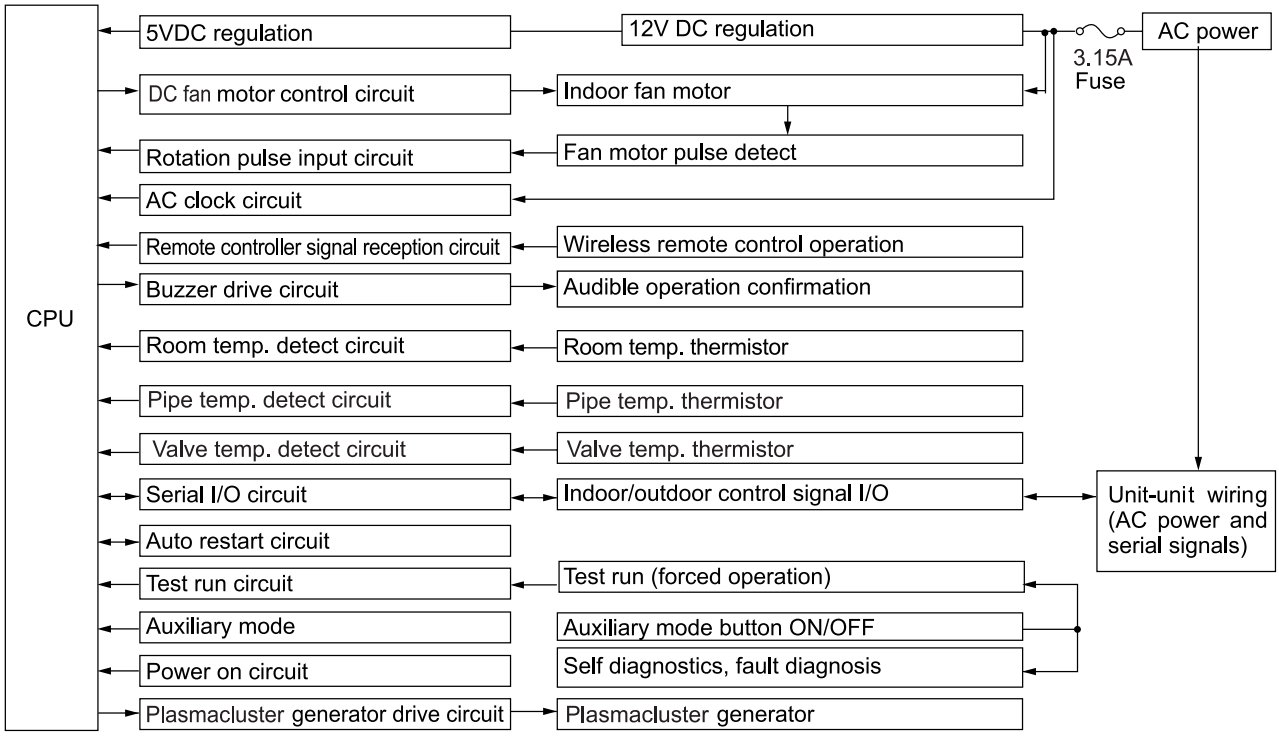


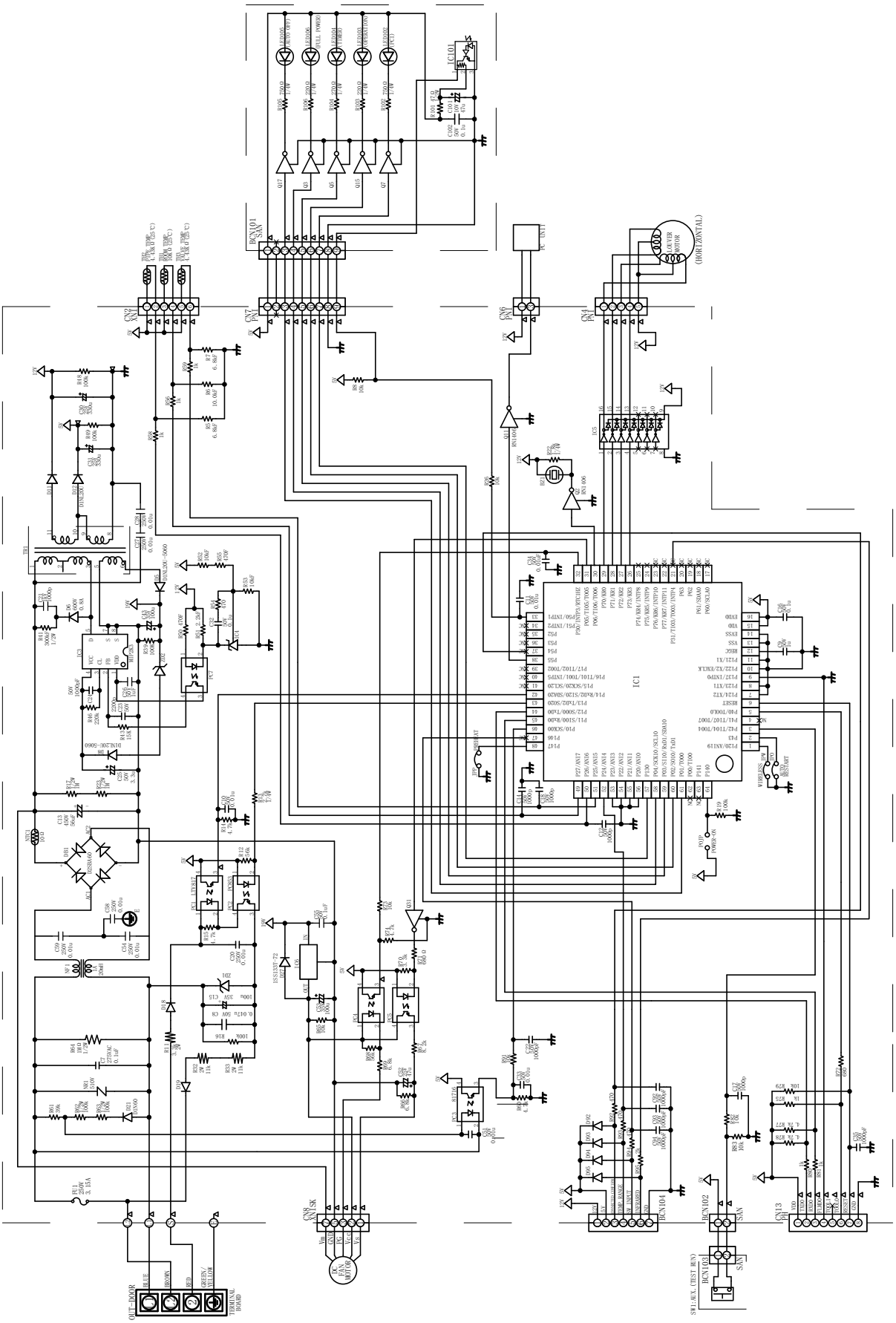
CHAPTER 2. EXPLAMATION OF CIRCUIT AND OPERATION

[1] BLOCK DIAGRAMS

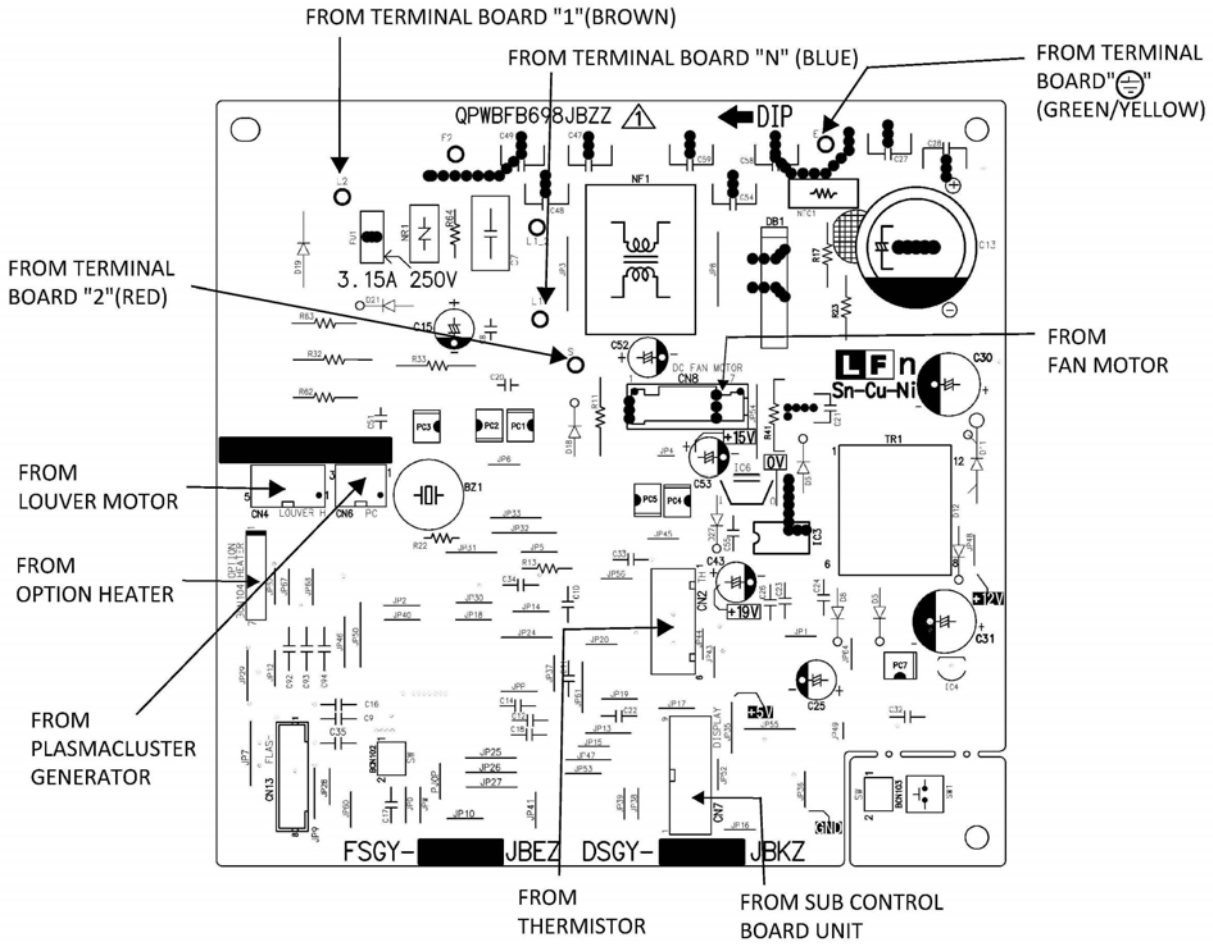


[2] MICROCOMPUTER CONTROL SYSTEM

1. Electronic control circuit diagram



2. Printed wiring board



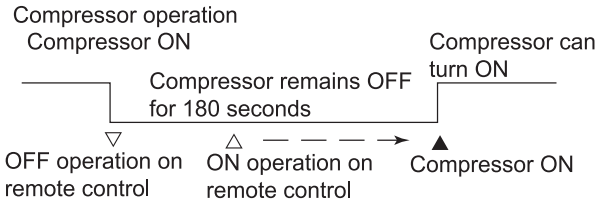
[3] FUNCTION

1. Restart control

Once the compressor stops operating, it will not restart for 180 seconds to protect the compressor.

Therefore, if the operating compressor is shut down from the remote control and then turned back on immediately after, the compressor will restart after a preset delay time.

(The indoor unit will restart operation immediately after the ON switch is operated on the remote control.)



2. Startup control

When the air conditioner starts in the cooling mode, if the room temperature is 2℃ higher than the set temperature the air conditioner operates with the operating frequency at maximum.Then, when the set temperature is reached, the air conditioner operates at the operating frequency determined by fuzzy logic calculation, then enters the normal control mode after a while.

3. ON timer

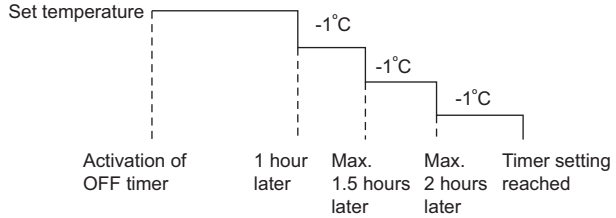
The ON timer can be activated by pressing the ON timer button. When the ON timer is activated, the operation start time is adjusted based on fuzzy logic calculations 1 hour before the set time so that the room temperature reaches the set temperature at the set time.

4. OFF Timer (Sleep Operation)

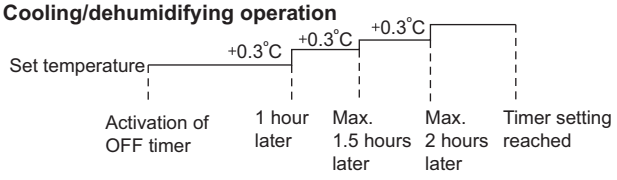
The OFF timer can be activated by pressing the OFF timer button. When the OFF timer is set, the operation stops after the set time.

When this timer is set, the compressor operating frequency lowers for quieter operation, and the room temperature is gradually varied after one hour (reduced 1˚C three times (max. 3˚C) in heating, or increased 0.3˚C three times (max. 1˚C) in cooling or dehumidifying operation) so that the room temperature remains suitable for comfortable sleeping.

Heating operation



Cooling/dehumidifying operation



5. Power ON start

If the connecting wire “POWER ON” (POJP) is put on the PWB assembly, when the power is supplied by turning on a circuit breaker, the air conditioner automatically starts of operation in “AUTO”.

(Refer to Printed Wiring Board.).

6. Self-diagnostic malfunction code display

1) When a malfunction is confirmed, all relays turn off and a flashing operation LED.timer LED.Plasamacluter LED is displayed to indicate the type of malfunction.

   When the air conditioner is in non-operating condition, holding down AUX button for more than 5 seconds activates the malfunction code display function.

   The operation continues only in the case of a serial open-circuit, and the main relay turns off after 30 seconds if the open-circuit condition remains.

   In the case of a serial short-circuit, the air conditioner continues operating without a malfunction code display, and the main relay turns off after 30 seconds if the short-circuit condition remains.

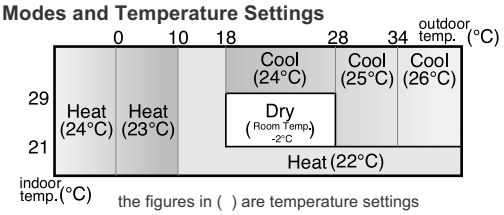
   The malfunction information is stored in memory, and can be recalled later and shown on display.

2) The self-diagnostic memory can be recalled and shown on the display by stopping the operation and holding down AUX button for more than 5 seconds.

   (For details, refer to the troubleshooting section.)

7. AUTOMATIC AIR CONDITIONING

In the AUTO mode, the unit will automatically select COOL or HEAT mode by comparing the room temperature and your desired temperature.
The unit will automatically switch between HEAT and COOL mode to keep the desired temperature.
COANDA and MULTI SPACE button will be inactivated during AUTO mode.



During operation, if the outdoor temperature changes, the temperature settings will automatically slide as shown in the chart.

8. Airflow control

8.1. VERTICAL AIR FLOW DIRECTION

1) Press the SWING button on the remote control once.
   - The vertical adjustment louvre will swing continuously.
2) Press the SWING button again when the vertical adjustment louvre is at the desired position.
   - The louvre will stop moving within the range shown in the diagram.
   - The adjusted position will be memoried and will be automatically set to the same position when operated the next time.

CAUTION: Never attempt to adjust the louvres manually.

- Manual adjustment on the louvres can cause the unit to malfunction.

  Position in the COOL or DRY mode for an extended period of time,

- When the vertical adjustment louvre is positioned at the lowest condensation may result.

8.2. HORIZONTAL AIR FLOW DIRECTION

Hold the horizontal airflow louver link and adjust the air flow direction.

9. Difference of operation in Auto and Manual modes

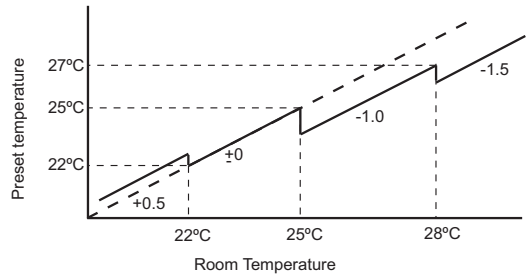
In the Auto mode, the temperature setting is automatically determined based on the outside air temperature. In addition, the air conditioner operation differs from the operation in the Manual mode as explained below.

9.1. Difference relating to set temperature

		Temperature setting method
Auto mode	Heating	Automatic temperature setting based on outside air temperature. Can be changed within± 2℃ using remote control.
	Cooling	
	Dehumidifying	
Manual mode	Heating	Can be changed between 18 and 32 ˚C using remote control.
	Cooling	Can be changed between 16 and 30℃ using remote control.
	Dehumidifying	Automatic setting. Can be changed within ± 2℃ using.

10. Dehumidifying operation control

In the Dehumidifying mode, the temperature setting is automatically determined based on the outside air temperature. In addition, the air conditioner operation differs from the operation in the Manual mode as explained below.



11. Full Power Operation

In this operation, the air/air heat pump works at the maximum power and optimum louvre direction to make the room cool or warm rapidly.

During operation, press the FULL POWER button.

- The remote control will display”“
- The temperature display will go off.
- The green FULL POWER lamp on.
- The unit will light up.

TO CANCEL

Press the FULL POWER button again.

- The FULL POWER operation will also be cancelled when the operation mode is changed, or when the unit is turned off.
- The geen FULL POWER lamp on the unit will turn off

NOTE:

- The air/air heat pump will operate at “Extra HIGH” fan speed for 5 minutes, and then shift to “HIGH” fan speed. The vertical adjustment louvre will be set obliquely downward.
- You can not set the temperature or fan speed during the FULL POWER operation.
- To turn off the FULL POWER lamp, press the DISPLAY button.

12. Self Clean operation

Heating or Fan operation and Cluster operation are performed simultaneously.

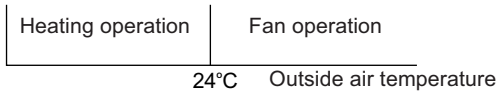
The judgment of whether Heating or Fan operation is used is based on the outside air temperature at 3 minutes after the start of internal cleaning.

The operation stops after 40 minutes.

• During this operation the horizontal louver moves and stays two positions.

It turns to the lower direction and stays for 30 minutes.

Next moves upward and stays for 10 minutes.



13. Plasmacluster Ion function

Operating the Plasmacluster Ion button while the air conditioner is in operation or in non-operation allows the switching of the operation mode in the following sequence: “Air Clean operation” → “Stop”.

- “Self Clean operation” generates about equal amounts of (+)ions and (-)ions from the cluster unit to provide clean air.

If the Plasmacluster Ion generation function is operated together with the air conditioner operation, the indoor unit fan speed and louver direction are in accordance with the air conditioner settings.

If the Plasmacluster Ion generation function is used without operating the air conditioning function, the indoor unit fan operates at a very low speed and the upper louver is angled upward and the lower louver remains horizontal. (The airflow volume and direction can be changed by using the remote control.)

14. Auto restart

When power failure occures, after power is recovered, the unit will automatically restart in the same setting which were active before the power failure.

14.1. Operating mode (Heat, Cool, Dry)

- Temperature adjustment (within 2℃ range) automatic operation
- Temperature setting
- Fan setting
- Air flow direction
- Power ON/OFF
- Automatic operation mode setting
- Swing louvre
- Plasmacluster mode

14.2. Setting not memorized

- Timer setting
- Powerful Jet setting
- Internal cleaning

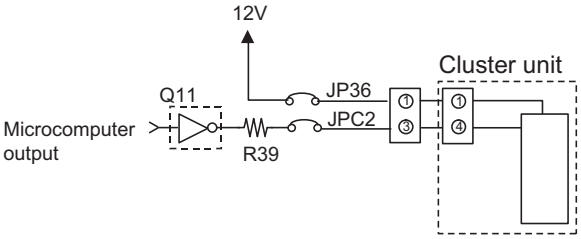
14.3. Disabling auto restart function

By removing (cutting) jumper ○ (JP ○) on the printed circuit board (PCB), the auto restart function can be disabled.

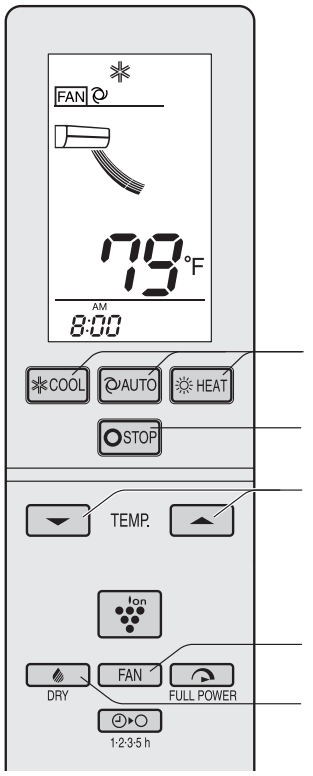
15. Explanation of cluster circuit

The cluster unit generates cluster ions, which are circulated throughout the room by the air flow created by the blower fan (indoor unit fan motor) in the air conditioner unit.

1) When microcomputer output turns "H," the Q11 output changes to "Lo," turning ON the SSR2 and applying 100 V to the cluster unit for the generation of cluster ions (positive and negative ions).



BASIC OPERATION



1 Press the HEAT, COOL , AUTO or DRY button .

: HEAT : COOL

: AUTO : DRY

• The green OPERATION lamp ( ) will light up.

TO TURN OFF

Press the STOP button.

• The green OPERATION lamp ( ) will turn off.

2 Press the TEMPERATURE button to set the desired temperature.

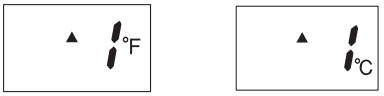
(HEAT/COOL/AUTO mode)

The temperature setting range:
61-86 °F (16-30 °C).

(DRY mode)

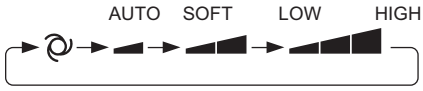
The temperature can be adjusted up to an additional ±3 °F (±2 °C) from the desired temperature automatically by pressing the TEMPERATURE button.

(Example: 1 °F / 1 °C higher)



(Example: 3 °F / 2 °C lower)

3 Press the FAN button to set the desired fan speed.



• In the DRY mode, the fan speed is preset to AUTO and cannot be changed.

NOTE:

TIPS ABOUT AUTO MODE

- In the AUTO mode, the unit will automatically select COOL or HEAT mode by comparing the room temperature and your desired temperature.
- The unit will automatically switch between HEAT and COOL mode to keep the desired temperature.
- COANDA and MULTI SPACE button will be inactivated during AUTO mode.

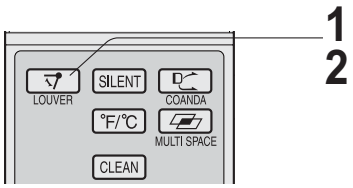
ADJUSTING THE AIR FLOW DIRECTION

VERTICAL AIR FLOW DIRECTION

1 Press the SWING button ( ).

• The vertical airflow louver will swing.

2 Press the SWING button ( ) again to stop at the desired position.



CAUTION:

Never attempt to adjust the louvers manually.

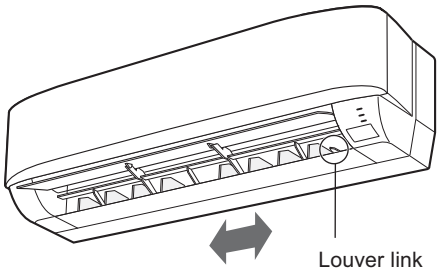
- Manual adjustment of the louvers can cause the unit to malfunction.
- When the vertical adjustment louver is positioned at the lowest position in the COOL or DRY mode for an extended period of time, condensation may result.

NOTE:

- The adjustment range is narrower than the SWING range in order to prevent condensation from dripping.

HORIZONTAL AIR FLOW DIRECTION

Hold the horizontal airflow louver link and adjust the air flow direction.



PLASMACLUSTER OPERATION

The Plasmacluster ion generator inside the air conditioner will release positive and negative Plasmacluster ions into the room to reduce airborne mold.

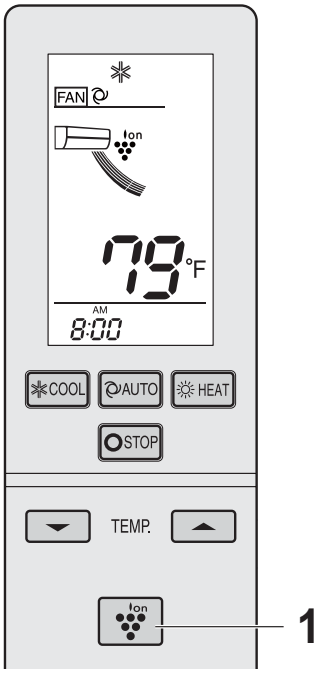
1 During operation, press the PLASMACLUSTER button.

- The remote control will display " ".
- The blue PLASMACLUSTER lamp will light up.

TO CANCEL

Press the PLASMACLUSTER button again.

- The blue PLASMACLUSTER lamp will turn off.



NOTE:

- Use of the PLASMACLUSTER operation will be memorized, and it will be activated the next time you turn on the unit.
- To perform Plasmacluster operation in FAN only mode, press the PLASMACLUSTER button when the unit is not operating.
  The mode symbol of the remote control will go off and the fan speed cannot be set to AUTO.
- Plasmacluster is Sharp's original technology. For more information, please visit:
  http://www.sharp-pci.com/en/

COANDA (GENTLE COOL / HEAT) AIRFLOW

By using this function, the louver will be automatically adjusted to deliver comfortable air gently and quickly across the ceiling or floor without cold/warm air blows directly on you as much as possible.
In heat mode, vertical airflow louver is set downward to deliver the warm air down to the floor. In cool or dry mode, vertical airflow louver is set obliquely upward to deliver cool air to the ceiling in order to avoid direct airflow.

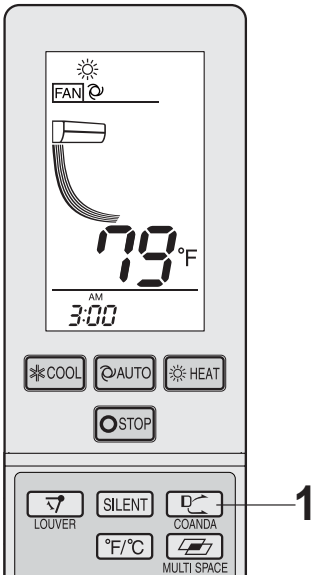
1 During operation, press the COANDA AIFLOW button.

(HEAT mode)
• The remote control will display " ".

(COOL / DRY mode)
• The remote control will display " ".

TO CANCEL

Press the COANDA AIFLOW button again.



NOTE:

- If you want COANDA AIRFLOW operation in FULL POWER mode, press COANDA AIRFLOW button during FULL POWER operation.
- The COANDA AIRFLOW setting and the MULTI SPACE setting can not be used together.

MULTI SPACE

The unit will operate to cool or warm multiple rooms in well insulated house by pressing this button.

1 During cooling or heating operation, press MULTI SPACE button.

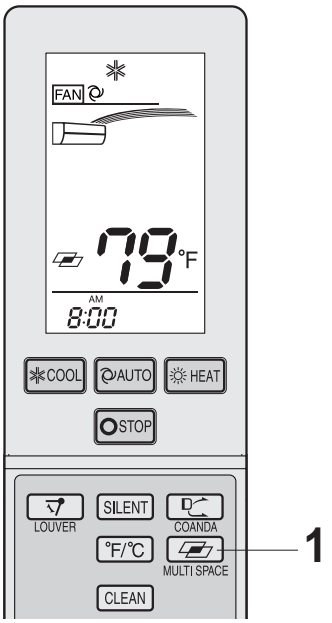
The remote controller will display " " and fan speed icon will be changed to " ". Louver angle will be changed to the position for long distance delivery of cool or warm air.

(HEAT mode)
• The remote control will display " ".

(COOL / DRY mode)
• The remote control will display " ".

TO CANCEL

Press MULTI SPACE button again.



NOTE:

- The unit will operate at "Extra HIGH" fan speed for 15 minutes for long distance delivery of conditioned air, and then shift to "HIGH" fan speed after 15 minutes.
- SILENT, COANDA, and FAN SPEED button will be disabled during this operation.
- Effectiveness of this function may differ depending on the room layout, installation position of the unit, and insulation level of the space concerned.

SILENT OPERATION

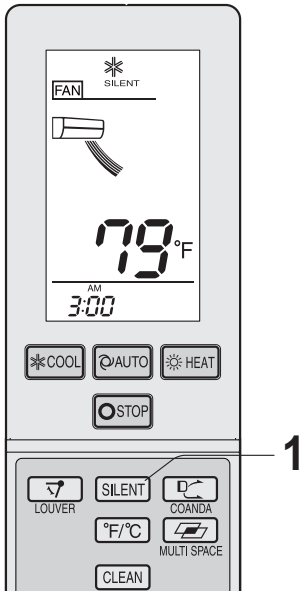
The unit will operate at “Extra LOW” fan speed for comfort and in need of quieter operation.

1 During COOL, HEAT, and AUTO operation, press the SILENT button.

- The speed icon on the remote control will display “SILENT”.

TO CANCEL

Press the SILENT button again.



FULL POWER OPERATION

The air conditioner works at the maximum power to makes the room cool or warm quicker.

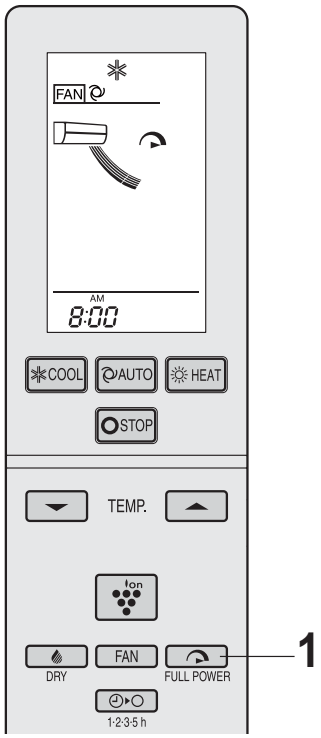
1 During operation, press the FULL POWER button.

- The remote control will display “” and AIR FLOW symbol will get longer.
- The temperature display will go off.
- The green FULL POWER lamp () will light up.

TO CANCEL

Press the FULL POWER button again.

- The green FULL POWER lamp () will turn off.



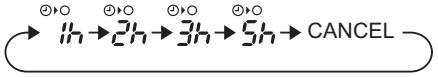
NOTE:

- The air conditioner will operate at “Extra HIGH” fan speed for 15 minutes, and then shift to “HIGH” fan speed.
- You can not set the temperature or fan speed during the FULL POWER operation.

1·2·3·5h OFF TIMER

When the 1·2·3·5h OFF TIMER is set, the unit will automatically turn off after the setting hours.

1 Press the 1·2·3·5h OFF TIMER button to set the desired time.



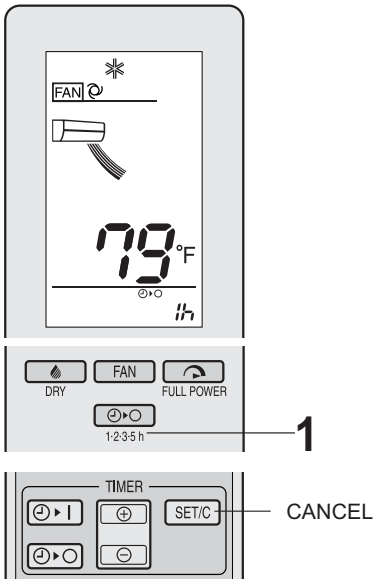
- The orange TIMER lamp () will light up.
- The remaining time will be indicated on the remote control in 1-hour increments.

TO CANCEL

Press the SET/C button.

Alternatively, press the 1·2·3·5h OFF TIMER button.

- The orange TIMER lamp () will turn off.



NOTE:

- The 1·2·3·5h OFF TIMER has priority over TIMER ON and TIMER OFF.
- If the 1·2·3·5h OFF TIMER is set while the unit is not operating, the unit will operate at the formerly set condition.
- If TIMER ON and/or TIMER OFF are set, TIMER CANCEL button cancels every setting.

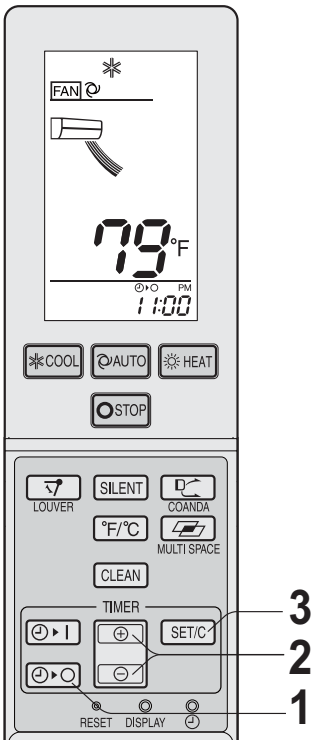
TIMER OPERATION

TIMER OFF

1 Press the TIMER OFF button.
- The TIMER OFF indicator will blink.

2 Press the TIME ADVANCE or REVERSE button to set the desired time.
- The time can be set in 10-minute increments.

3 Press the SET/C button.
- The orange TIMER lamp ( ) will light up.



NOTE:
- When the TIMER OFF is set, the temperature setting is automatically adjusted to prevent the room from becoming excessively cold or warm, for example while you sleep. (Auto Sleep function)
  HEAT mode: One hour after the timer is set, the temperature setting drops by 5 °F (3 °C).
  COOL mode: One hour after the timer is set, the temperature setting rises by 2 °F (1 °C).

TIMER ON

1 Press the TIMER ON button.
- The TIMER ON indicator will blink.

2 Press the TIME ADVANCE or REVERSE button to set the desired time.
- The time can be set in 10-minute increments.

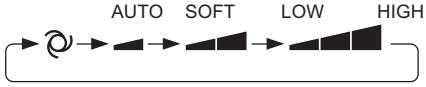
3 Press the SET/C button.
- The orange TIMER lamp ( ) will light up.

4 Select the mode, temperature, and fan speed as desired.
- Press below buttons to select mode;.

: HEAT : COOL

: AUTO : DRY

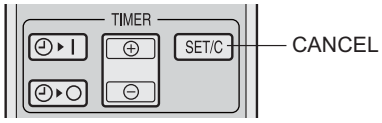
- Press the TEMPERATURE button (▲ or ▼) to set the desired temperature.
- Press the FAN button to set the desired fan speed.



NOTE:
- The unit will turn on prior to the set time to allow the room to reach the desired temperature. (Awaking function)

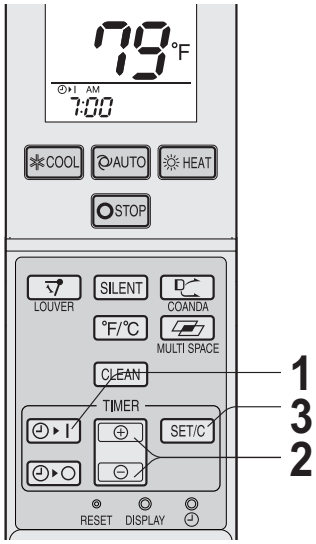
TO CANCEL

Press the SET/C button.
- The orange TIMER lamp ( ) will turn off.
- The current time will be displayed on the remote control.



TO CHANGE TIME SETTING

Cancel the TIMER setting, then set it again

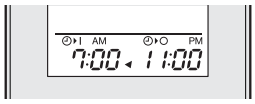


TO COMBINE TIMER ON AND TIMER OFF

Timer on and timer off can be set up at the same time

Set the TIMER OFF and TIMER ON. The settings will be automatically combined.

Example
(Current time: 9:00 p.m.)
OFF TIMER at 11:00 p.m.
ON TIMER at 7:00 a.m.



- The arrow (◀ or ▶) between the TIMER ON indicator and the TIMER OFF indicator shows which timer will activate first.

NOTE:
- You cannot program the ON-TIMER and OFF-TIMER to operate the unit at different temperatures or other settings.
- Either timer can be programmed to activate prior to the other.

SELF CLEAN OPERATION

SELF CLEAN operation will reduce the growth of mold fungus with Plasmacluster ions and dry inside of the unit. Utilize the operation at seasonal change over terms.

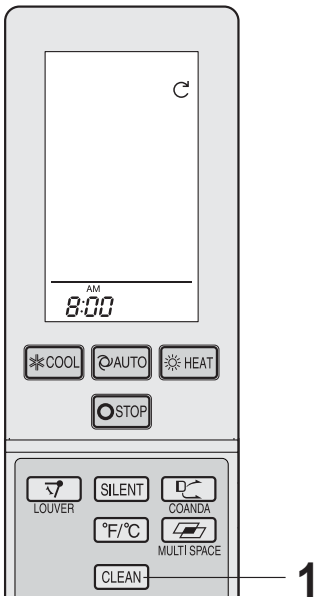
1 Press the SELF CLEAN button when the unit is not operating.

- The remote control will display " ↻ ". (The " ↻ " will disappear automatically in 1 minute.)
- The blue PLASMACLUSTER lamp (low) will light up.
- The unit will stop operation after 40 minutes.

TO CANCEL

Press the SELF CLEAN button.

- The blue PLASMACLUSTER lamp will turn off.



NOTE:

- You cannot set the temperature, fan speed, air flow direction or timer setting during the SELF CLEAN operation.
- Mold fungus already grown can not be eliminated by this operation.

DISPLAY BUTTON

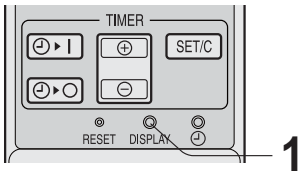
Press the DISPLAY button when the lamps on the unit are too bright. (The green OPERATION lamp and the orange TIMER lamp cannot be turned off.)

1 During operation, press the DISPLAY button.

- The blue PLASMACLUSTER lamp (low), 5°F/-15°C AUTO OFF lamp and/or the green FULL POWER lamp ( ) will turn off.

TO LIGHT UP

Press the DISPLAY button again.



AUXILIARY MODE

Use this mode when the remote control is not available.

TO TURN ON

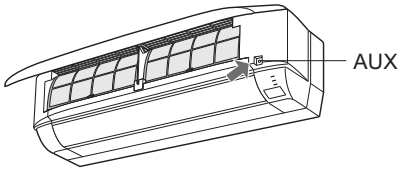
Press the AUX button.

- The green OPERATION lamp ( ) will light up.
- The mode and the temperature setting are automatically selected according to the room temperature and the outdoor temperature when the unit is turned on. The fan speed is set to AUTO.

TO TURN OFF

Press the AUX button again.

- The green OPERATION lamp ( ) will turn off.

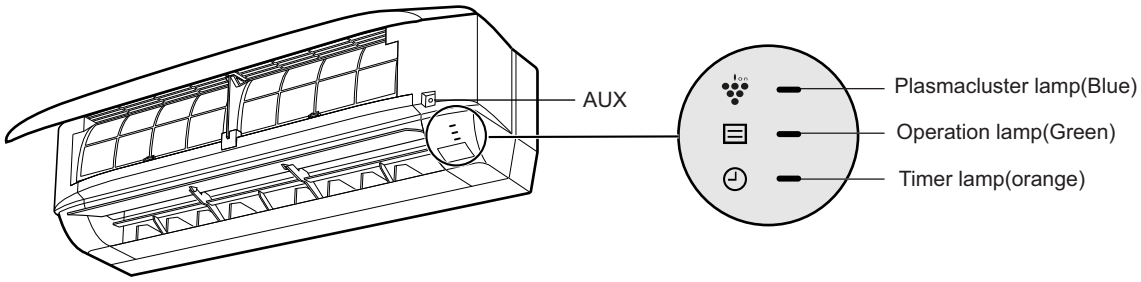


CHAPTER 3. TROUBLESHOOTING GUIDE

[1] SELF-DIAGNOSIS FUNCTION

1.DESCREPTION OF SELF-DIAGNOSIS FUNCTION

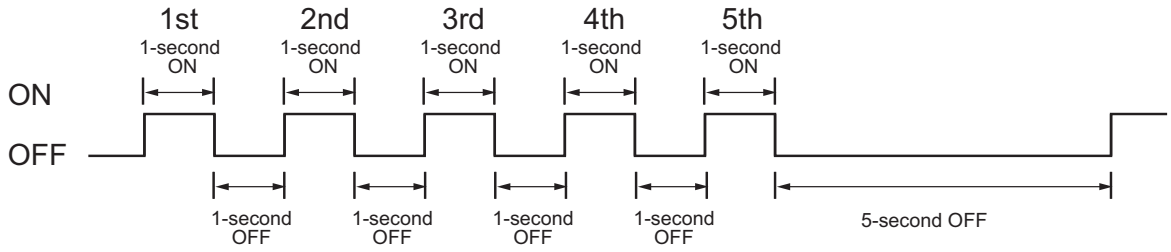
- To display the self-diagnosis, hold down the AUX button for over 5 seconds on the indoor unit when the indoor unit is not operating.
- The operation lamp (green), timer lamp (orange) and Plasmacluster lamp (blue) flash to indicate the information of malfunction.
- If the power cord is unplugged or the circuit breaker is turned off, the self-diagnosis memory is lost.



<Display of self-diagnosis result>

The operation lamp (green) and the Plasmacluster lamp (blue) flash in synchronization with the timer lamp (orange).

Timer lamp (1 cycle)



Remark

- When reading the result of self-diagnosis, you shall combine it with outdoor unit indication in order to get a correct conclusion.

2.CHART FOR READING SELF-DIAGNOSIS RESULT

<INDOOR UNIT> ○:1-second ON / 1-second OFF

Problem symptom	Outdoor unit indication (LED1)	Indoor unit →	Lamp	Malfunction No.* Main	Sub	Content of diagnosis Main	Sub	Check point	Action
Normal condition	Normal blinking	O O O O O	Timer (Orange)	0	0	Normal			
			Operation (Green)						
			Plasmacluster (Blue)						
Indoor and outdoor units do not operate.	1-time	O O O O O	Timer (Orange)	1	0	Outdoor unit thermistor short-circuit	Heat exchanger thermistor short circuit error	1) Measure the resistance of the outdoor unit thermistors. 2) Check the lead wire of the outdoor unit thermistor for torn sheath and shortcircuit. 3) 1) 2):Normal	1) Replace the outdoor unit thermistor assembly. 2) Replace the outdoor unit thermistor assembly. 3) Replace the outdoor unit control PCB assembly.
			Operation (Green)						
			Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		1		Outdoor temperature thermistor short circuit error		
			Operation (Green)						
			Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		2		Suction thermistor short circuit error		
			Operation (Green)						
			Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		3		Suction thermistor (for unit A, B, C) short circuit error		
			Operation (Green)						
			Plasmacluster (Blue)						

2.CHART FOR READING SELF-DIAGNOSIS RESULT

<INDOOR UNIT> ○:1-second ON / 1-second OFF

Problem symptom	Outdoor unit indication (LED1)	Indoor unit →	Lamp	Malfunction No.* Main	Sub	Content of diagnosis Main	Sub	Check point	Action
Indoor and outdoor units do not operate.	2-time	O O O O O	Timer (Orange)	2	0	Cycle temperature	Compressor high temperature error	1) Check the outdoor unit air outlet for blockage. 2) Check if the power supply voltage is AC 230V at full power. 3) Check the pipe connections for refrigerant leaks. 4) Measure resistance of the outdoor unit compressor thermistor. 5) Check the expansion valve for proper operation.	1) Ensure unobstructed air flow from the outdoor unit air outlet. 2) Connect power supply of proper voltage. 3) Charge the specified amount of refrigerant. 4) Replace the outdoor unit compressor thermistor assembly. 5) Replace the expansion valve coil, expansion valve or outdoor unit control PCB assembly.
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
Indoor unit operates. Outdoor unit does not operate temporarily		O O O O O	Timer (Orange)		1		Compressor discharge overheat.	(Temporary stop for cycle protection)	-
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		2		Outdoor unit heat exchanger overheat.	(Temporary stop for cycle protection)	-
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		3		Indoor unit heat exchanger overheat.	(Temporary stop for cycle protection)	-
		O	Operation (Green)						
		O O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		4		IPM high temperature error	Measure resistance of the heat-sink thermistor.	-
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
Indoor and outdoor units do not operate.		O O O O O	Timer (Orange)		5		IPM high temperature error	Replace the outdoor unit control PCB assembly.	-
		O	Operation (Green)						
		O O	Plasmacluster (Blue)						
Indoor unit operates. Outdoor unit does not operate temporarily.	3-time	O O O O O	Timer (Orange)	3	0	Dry operation	Temporary stop due to dehumidifying operation	(Temporary stop for cycle protection)	-
		O	Operation (Green)						
			Plasmacluster (Blue)						
Indoor and outdoor units do not operate.	5-time	O O O O O	Timer (Orange)	5	0	Outdoor unit thermistor open-circuit	Heat exchanger thermistor open circuit error	1) Check connector of outdoor unit thermistor for secure installation. 2) Measure resistance of outdoor thermistors 3) Check the lead wires of thermistors on the outdoor unit control PCB for open-circuit. 4) 1) 2) 3):Normal	1) Correct the installation 2) Replace the outdoor unit thermistor assembly. 3) Replace the outdoor unit thermistor assembly. 4) Replace the outdoor unit control PWB assembly.
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		1		Outdoor temperature thermistor open circuit error		
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		2		Suction thermistor open circuit error		
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		3		Suction thermistor open circuit error		
		O	Operation (Green)						
		O O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		4		Discharge thermistor open circuit error		
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		5		Heat sink thermistor open circuit error		
		O	Operation (Green)						
		O	Plasmacluster (Blue)						

Problem symptom	Outdoor unit indication (LED1)	Indoor unit →	Lamp	Malfunction No.* Main	Sub	Content of diagnosis Main	Sub	Check point	Action
Indoor and outdoor units do not operate.	6-time	O O O O O	Timer (Orange)	6	0	Outdoor unit DC Current	DC over current error	Go to “DC Over Current Error (6-0 error)”.	
		O O	Operation (Green)						
			Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		1		IPM pin level error	Check the IPM is attached correctly to the outdoor unit IPM PWB.	Replace the outdoor unit IPM PWB assembly.
		O O	Operation (Green)						
		O	Plasmacluster (Blue)						
Indoor and outdoor units do not operate.	7-time	O O O O O	Timer (Orange)	7	0	Outdoor unit AC Current	AC over current error	1) Ensure unobstructed air flow from the outdoor unit air outlet. 2) Check the outdoor unit fan motor.	1) Ensure unobstructed air flow from the outdoor unit air outlet. 2) Check the outdoor unit fan motor.
		O O O	Operation (Green)						
			Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		1		AC current error when OFF	1) IPM continuity check	1) Replace the outdoor IPM PWB
		O O O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		2		AC maximum current error	1) Ensure unobstructed air flow from the outdoor unit air outlet. 2) Check the outdoor unit fan motor.	1) Ensure unobstructed air flow from the outdoor unit air outlet. 2) Check the outdoor unit fan motor.
		O O O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		3		AC current deficiency error	1) Replace the outdoor unit control PCB assembly. 2) Charge the specified amount of refrigerant. 3) Correct refrigerant clogs. (Stop valve, pipe, expansion valve)	1) Replace the outdoor unit control PCB assembly. 2) Charge the specified amount of refrigerant. 3) Correct refrigerant clogs. (Stop valve, pipe, expansion valve)
		O O O	Operation (Green)						
		O O	Plasmacluster (Blue)						
Indoor and outdoor units do not operate.	8-time	O O O O O	Timer (Orange)	8	0	Abnormal wire check	Abnormal wire check error	1) Check the expansion valve. 2) Are four expansion valves connected by mistake. 3) Check the wiring between units.	1) Replace the outdoor control board assembly. 2) Reattach 3) Check the wiring between units.
		O	Operation (Green)						
			Plasmacluster (Blue)						
Indoor and outdoor units do not operate.	9-time	O O O O O	Timer (Orange)	9	0	Cycle temperature	Thermistor installation error or 4-way valve error.	1)Check the thermistor (heat exchanger) and (2-way valve) are installed in correct positions. 2)Check resistance of thermistors (heat exchanger and 2-way valve). 3)Check the 4-way valve for proper operation. 4)No abnormality found in above inspections (1), (2), (3).	1)Correct the installation. 2)Change the specified amount of refrigerant. 3)Replace the 4-way valve. 4)Replace the outdoor unit control PWB assembly.
		O	Operation (Green)						
			Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		4	Cycle temperature	4 way valve error or Gas leak error	1) Check the unit thermistor TH2 (exchange) and TH3 (pipe temperature) are installed in correct portions. 2) Check if the refrigerant volume is abnormally low. 3) Check the 4-way valve for proper operation.	1) Correct the installation. 2) Change the specified amount of refrigerant. 3) Replace the 4-way valve.
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
Indoor and outdoor units do not operate.	10-time	O O O O O	Timer (Orange)	10	0	EEPROM error	EEPROM (outdoor) data error	-	Replace the outdoor unit control PWB assembly.
		O	Operation (Green)						
			Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		1		EEPROM (outdoor) data error		
		O	Operation (Green)						
			Plasmacluster (Blue)						

Problem symptom	Outdoor unit indication (LED1)	Indoor unit →	Lamp	Malfunction No.* Main	Sub	Content of diagnosis Main	Sub	Check point	Action
Indoor and outdoor units do not operate.	10-time	O O O O O	Timer (Orange)	10	2	EEPROM error	EEPROM (outdoor) data error	-	Replace the outdoor unit control PWB assembly.
		O O	Operation (Green)						
		O	Plasmacluster (Blue)						
Indoor and outdoor units do not operate.	11-time	O O O O O	Timer (Orange)	11	0	Outdoor unit DC fan	Outdoor unit DC fan rotation error	1) Check connector CN3 of the outdoor unit DC fan motor for secure installation. 2) Check the outdoor unit fan motor for proper rotation. 3) Check fuse FUSE5. 4) Outdoor unit control PWB	1) Correct the installation. 2) Replace the outdoor unit fan motor. 3) Replace the outdoor unit control PWB assembly. 4) Replace the outdoor unit control PWB assembly.
		O O O O O	Operation (Green)						
			Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		1		Outdoor unit DC fan driver IC error	1) Check if the fan IPM terminal resistance values are uniform. 2) Outdoor unit fan motor continuity check.	1) Replace the outdoor unit control PWB assembly. 2) Replace the outdoor unit fan.
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		2		Outdoor unit DC fan lock error	1) Check the outdoor unit fan motor for proper rotation. 2) 1): Normal	1) Replace the outdoor unit control PWB assembly. 2) Replace the outdoor unit fan.
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		3		Detection error of DC fan negative rotation before compressor is driven	(Temporary stop for DC fan circuit protection)	-
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		4		Detection error of inverter current for DC fan	-	Replace the outdoor unit control PWB assembly.
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		5		Outdoor unit DC fan open connector error	1) Check connector CN3 of the outdoor unit DC fan motor for secure installation. 2) No abnormality found in above inspection 1).	1) Correct the installation. 2) Replace the outdoor unit control PWB assembly.
		O	Operation (Green)						
		O	Plasmacluster (Blue)						
Indoor and outdoor units do not operate.	12-time	O O O O O	Timer (Orange)	12	0	Thermal fuse in terminal board	Thermal fuse error in terminal board (for power supply)	1) Check the thermal fuse in terminal board (for Power supply) 2) Check connector CN5 of the outdoor unit. 3) 1) 2): Normal	1) Replace terminal board for Power supply. 2) Correct the installation. 3) Replace the outdoor unit control PCB assembly.
		O O	Operation (Green)						
			Plasmacluster (Blue)						
Indoor and outdoor units do not operate.	13-time	O O O O O	Timer (Orange)	13	0	DC compressor	Compressor startup error	1) Check the colors (red, white, orange) of the compressor cords for proper connection. (PWB side, compressor side) 2) Check if the IPM terminal resistance values are uniform. 3) Check if outdoor main relay (MRY1) turns on and voltage of both end of the condenser (C10) has become DC290-330V. 4) 1) 2) 3) : Normal	1) Correct the installation. (U: Red, V: White, W: Orange) 2) Replace the outdoor unit control PWB assembly. 3) Replace the outdoor unit control PWB assembly. 4) Replace the compressor.
		O O	Operation (Green)						
			Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		1		Compressor rotation error. (at 120° energizing)		
		O O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		2		Compressor rotation error (at 180° energizing)		
		O O	Operation (Green)						
		O	Plasmacluster (Blue)						
Indoor and outdoor units operate.		O O O O O	Timer (Orange)		3		Detection error of inverter current	Check the circuit of detection of inverter current.	Replace the outdoor unit control PWB assembly.
		O O	Operation (Green)						
		O	Plasmacluster (Blue)						

Problem symptom	Outdoor unit indication (LED1)	Indoor unit →	Lamp	Malfunction No.* Main	Sub	Content of diagnosis Main	Sub	Check point	Action
Indoor and outdoor units do not operate.	14-time	O O O O O	Timer (Orange)	14	0	Outdor unit PAM	PAM over voltage error	1) Check the AC power supply voltage for fluctuation. 2) No abnormality found in above inspection.	1) Correct the installation. 2) Replace the PWB assembly.
		O O O O	Operation (Green)						
			Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		1		PAM clock error	Check the PAM clock for proper input.	Replace the outdoor unit control PWB assembly.
		O O O O	Operation (Green)						
		O	Plasmacluster (Blue)						
		O O O O O	Timer (Orange)		2		PAM under voltage error	1) Check the AC power supply voltage for fluctuation. 2) No abnormality found in above inspection.	1) Correct the installation. 2) Replace the PWB assembly.
		O O O O	Operation (Green)						
		O	Plasmacluster (Blue)						
Indoor unit operates. Outdoor unit does not operate.	Lighting or OFF	O O O O O	Timer (Orange)	17	0	Wiring between units	Serial opencircuit	1) Check the wires between units. 2) Check voltage between N and 1 the indoor/ outdoor unit terminal boards. 3) Check the outdoor unit fuse. 4) Check 15-V,13-V and 5-V voltages on the PCB. Check resistance between IPM terminals. 5) Check pins No.5 and 8 of connector CN3 of the outdoor unit fan motor for shortcircuit. 6) Outdoor unit control PCB.	1) Connect stable power supply. Correct the wiring. 2) Replace the outdoor unit control PWB assembly. 3) Replace the fuse/ outdoor unit control PWB assembly. 4) Replace the outdoor unit control PWB assembly. 5) Replace the outdoor unit fan motor. 6) Replace the outdoor unit control PWB.
		O	Operation (Green)						
			Plasmacluster (Blue)						
Indoor unit operates. Outdoor unit does not operate.	Lighting or OFF	O O O O O	Timer (Orange)	18	0	Wiring between units	Serial opencircuit	Check the wiring between units.	Correct the wiring.
		O	Operation (Green)						
			Plasmacluster (Blue)						
Indoor and outdoor units do not operate.		O O O O O	Timer (Orange)		1			Check the wiring between units.	Correct the wiring.
		O	Operation (Green)						
			Plasmacluster (Blue)						
Indoor and outdoor units do not operate.	Normal blinking or OFF	O O O O O	Timer (Orange)	19	0	Indoor unit fan	Indoor unit fan error	1) Check the indoor fan motor for proper rotating operation. (Check fan lock.) 2) Check the lead wire of the indoor fan motor for open-circuit. 3) Check connector ofthe indoor unit fanmotor for secureinstallation. 4) 1) 2) 3): Normal	1) Replace the indoor fan motor. 2) Replace the indoor fan motor. 3) Correct the installation of the indoor fan motor connector. 4) Replace the indoorunit control PCB.
		O	Operation (Green)						
			Plasmacluster (Blue)						
Indoor and outdoor units do not operate.	Normal blinking or OFF	O O O O O	Timer (Orange)	20	0	Indoor unit control PCB	EEPROM data error	(EEPROM read data error)	Replace the indoor unit control PWB.
		O	Operation (Green)						
			Plasmacluster (Blue)						

Problem symptom	Outdoor unit indication (LED1)	Indoor unit →					Lamp	Malfunction No. Main	Sub	Content of diagnosis Main	Sub	Check point	Action
Indoor and outdoor units operate.	Normal blinking or OFF	○	○	○	○	○	Timer (Orange)	26	1	Indoor unit room temperature thermistor	Indoor unit room temperature thermistor	(1) Check connector of thermistor for secure installation.	(1) Replace the thermistor.
		○	○		○		Operation (Green)						
						○	Plasmacluster(Blue)					(2) Check the temperature properties of the thermistor.	(2) Replace the thermistor.
		○	○	○	○	○	Timer (Orange)		2	Indoor unit pipe temperature thermistor	Indoor unit pipe temperature thermistor	(1) Check connector of thermistor for secure installation.	(1) Replace the thermistor.
		○	○		○		Operation (Green)						
					○		Plasmacluster(Blue)					(2) Check the temperature properties of the thermistor.	(2) Replace the thermistor.
		○	○	○	○	○	Timer (Orange)		3	Indoor unit valve temperature thermistor	Indoor unit valve temperature thermistor	(1) Check connector of thermistor for secure installation.	(1) Replace the thermistor.
		○	○		○		Operation (Green)						
					○	○	Plasmacluster(Blue)					(2) Check the temperature properties of the thermistor.	(2) Replace the thermistor.

***Remark**

The malfunction No. is calculated using the following way.

Example)

Indoor unit lamp	→Lamp					Calculation	Main	Sub
	16	8	4	2	1			
Timer (orange)	O	O	O	O	O			
Operation (Green)			O		O	4+1=5	5	
Plasmacluster (blue)				O		2		2

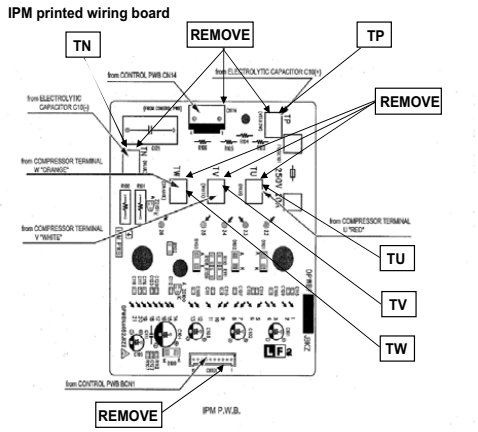
IPM CHECK METHOD

1. Turn off the power.
2. Make sure that the electrolytic capacitor voltage is approx. 0 V.
3. Remove all connectors of the IPM PWB.
4. Measure the resistance between terminals using a tester.

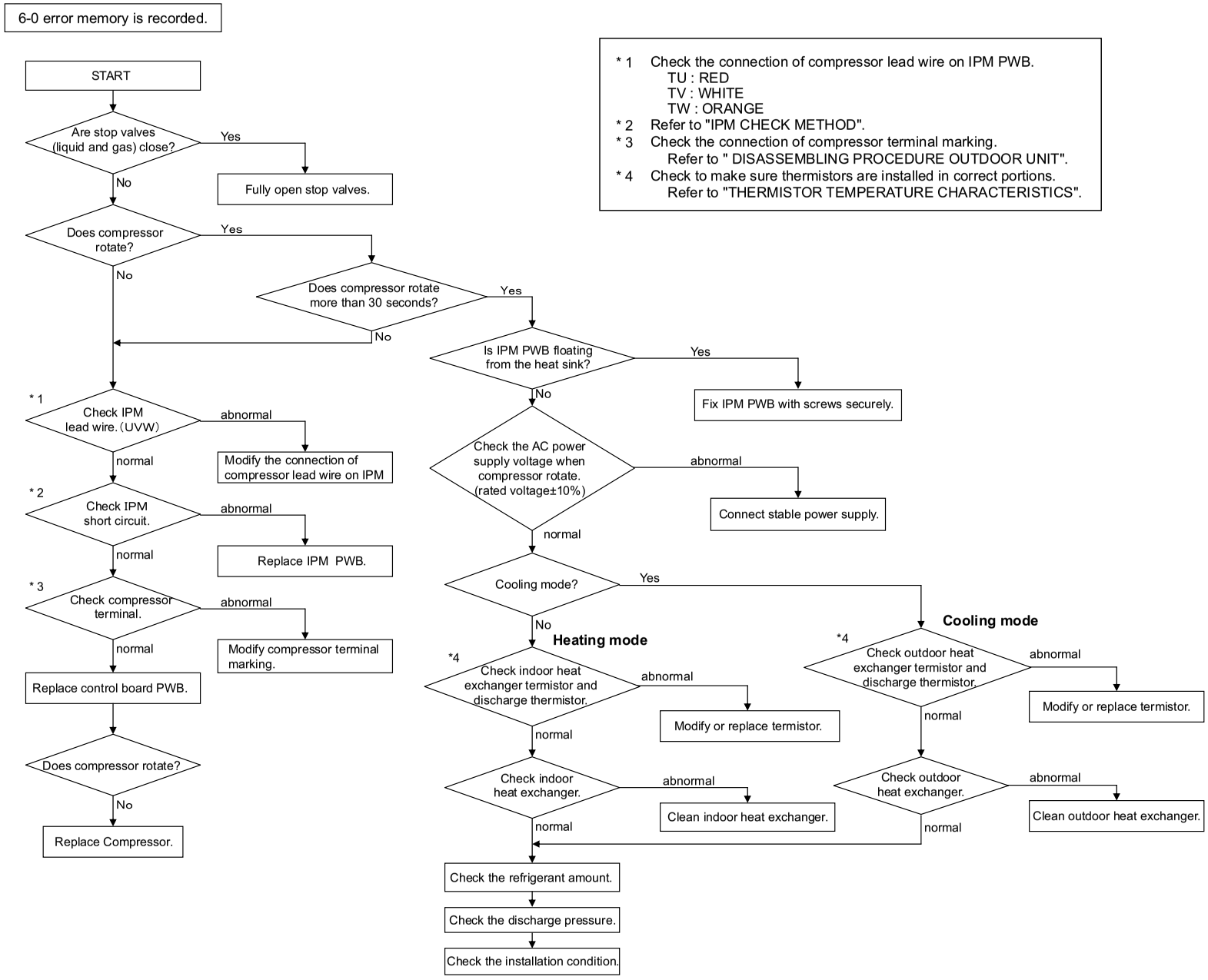
Measuring points of terminals are shown in the figure below.

Analog tester		Normal Resistance	Analog tester		Normal Resistance
-	+		-	-	
TP	TN	∞ *(Few MΩ)	TU	TN	∞ (Few MΩ)
	TU		TV		
	TV		TW		
	TW				

*( ) value: by Digital tester



DC Over Current Error (6-0 error)

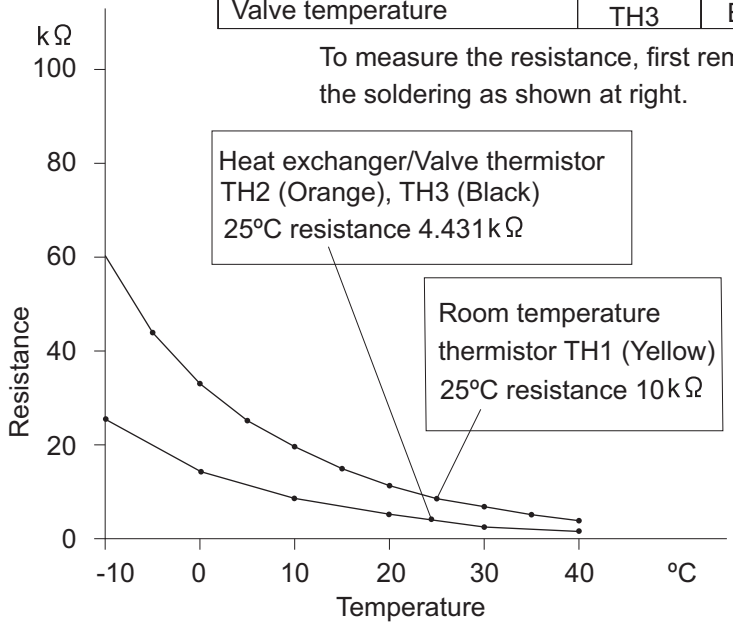


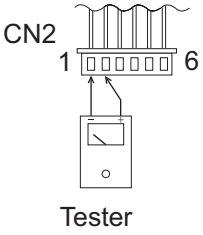
[2] THERMISTOR TEMPERATURE CHARACTERISTICS.

Thermistor	Signal	Color
Room temperature	TH1	Yellow
Heat exchanger temperature	TH2	Orange
Valve temperature	TH3	Black

To measure the resistance, first remove the soldering as shown at right.

Room temperature thermistor TH1 (CN2 ③ - ④)
Heat exchanger temperature thermistor TH2 (CN2 ① - ②)
Valve temperature thermistor TH3 (CN2 ⑤ - ⑥)





[3] AIR CONDITIONER OPERATION IN THERMISTOR ERROR

* These models have following thermistors.

INDOOR UNIT	
AY-XPC15PU, AY-XPC18PU, AY-XP24PU	TH1, TH2, TH3

The errors for the thermistors that are not mentioned above are irrelevant.
These indoor units don't have power relay.

Item	Mode	Control operation	When resistance is low (temperature judged higher than actual)	Short-circuit	When resistance is high (temperature judged lower than actual)	Open-circuit
Room temperature thermistor (TH1)	Auto	Operation mode judgment	Cooling mode is activated even if room temperature is low.	Cooling mode is activated in most cases.	Heating mode is activated even if room temperature is high.	Heating mode is always activated.
	Cooling	Frequency control	Room becomes too cold.	Air conditioner operates in full power even when set temperature is reached.	Room does not become cool.	Compressor does not operate.
	Dehumidifying	Room temperature memory Frequency control	Normal operation.	Room temperature is stored in memory as 31.0℃, and compressor does not stop.	Normal operation.	Room temperature is stored in memory as 18.5℃, and compressor does not operate.
	Heating	Frequency control	Room does not become warm.	Hot keep status results immediately after operation starts. Frequency does not increase above 30 Hz (40 Hz).	Room becomes too warm.	Air conditioner operates in full power even when set temperature is reached.
Heat exchanger thermistor (TH2)	Cooling Dehumidifying	Freeze prevention	Indoor unit evaporation may freeze.	Indoor unit evaporation may freeze.	Compressor stops occasionally.	Compressor does not operate.
	Heating	Cold air prevention	Cold air prevention deactivates too soon and cold air discharges.	Compressor operates at low speed or stop, and frequency does not increase.	Cold air prevention deactivates too slow.	Cold air prevention does not deactivate, and indoor unit fan does not rotate.

[4] GENERAL TROUBLESHOOTING CHART

* These models have following thermistors.

INDOOR UNIT	
AY-XPC15PU, AY-XPC18PU, AY-XP24PU	TH1, TH2, TH3

The errors for the thermistors that are not mentioned above are irrelevant.
These indoor units don't have power relay.

1. Indoor unit does not turn on

Main cause	Inspection method	Normal value/condition	Remedy
Cracked PWB. (Cracked pattern)	Check visually.	There should be no cracking in PWB or pattern.	Replace PWB.
Open-circuit in FU1 (250 V, 3.15 A).	Check melting of FU1.	There should be no open-circuit.	Replace PWB.

2. Indoor unit fan does not operate

Main cause	Inspection method	Normal value/condition	Remedy
Open-circuit in heat exchanger thermistor (TH2) (in heating operation)	Measure thermistor resistance (dismount for check)	Refer to THERMISTOR TEPERATURE CHARACTERISTICS-1	Replace thermistor.
		There should be no open-circuit or faulty contact.	Replace thermistor.
Disconnected heat exchanger thermistor (TH2) (in heating operation)	Inspect connector on PWB. Check thermistor installation condition.	Thermistor should not be disconnected.	Install correctly.

3. Indoor unit fan speed does not change

Main cause	Inspection method	Normal value/condition	Remedy
Remote control not designed to allow fan speed change.	Check operation mode.	Fan speed should change except during dehumidifying operation, ventilation, light dehumidifying operation, internally normal operation	Explain to user.

4. Remote control signal is not received

Main cause	Inspection method	Normal value/condition	Remedy
Batteries at end of service life.	Measure battery voltage.	2.5 V or higher (two batteries in series connection)	Install new batteries.
Batteries installed incorrectly.	Check battery direction.	As indicated on battery compartment.	Install batteries in indicated direction.
Lighting fixture is too close, or fluorescent lamp is burning out.	Turn off light and check.	Signal should be received when light is turned off.	Change light position or install new fluorescent lamp.
Use Sevick light (Hitachi).	Check if Sevick light (Hitachi) is used.	Signal may not be received sometimes due to effect of Sevick light.	Replace light or change position.
Operating position/angle is inappropriate.	Operate within range specified in manual.	Signal should be received within range specified in manual.	Explain appropriate handling to user.
Open-circuit or short-circuit in wiring of light receiving section.	Check if wires of light receiving section are caught.	Wires of light receiving section should not have any damage caused by pinching.	Replace wires of light receiving section.
Defective light receiving unit.	Check signal receiving circuit (measure voltage between terminals 8 and 9 of connector CN7).	Tester indicator should move when signal is received.	Replace PWB.
Dew condensation on light receiving unit.	Check for water and rust.	Signal should be received within range specified in manual.	Take moisture-proof measure for lead wire outlet of light receiving section.

5. Louvers do not move

Main cause	Inspection method	Normal value/condition	Remedy
Caught in sliding section.	Operate to see if louvers are caught in place.	Louvers should operate smoothly.	Remove or correct catching section.
Disconnected connector	Inspect connectors.	Connectors or pins should not be disconnected.	Install correctly.
Contact of solder on PWB (connector section on PWB)	Check visually.	There should not be solder contact.	Correct contacting section.

6. There is noise in TV/radio

Main cause	Inspection method	Normal value/condition	Remedy
Grounding wires not connected properly.	Check grounding wire connections.	Grounding wires should be connected properly.	Connect grounding wires properly.
TV/radio is placed too close to outdoor unit.	Check distance between TV/radio and outdoor unit.	If TV/radio is placed too close, it may become affected by noise.	Move TV/radio away from outdoor unit.
Other than above.	Check for radio wave interference.		

7. Malfunction occurs

Main cause	Inspection method	Normal value/condition	Remedy
Malfunction caused by noise.	Check for radio wave interference.		

CHAPTER 4. DISASSEMBLY PROCEDURE

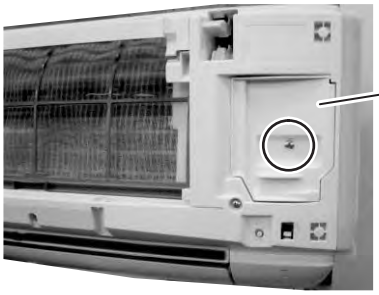
Be sure to disconnect the power cord from the AC power outlet before starting the disassembly procedure.
Be sure to install screws to their original positions after repairing
After the air conditioner is repaired or parts are replaced, measure insulation resistance of the equipment using an insulation resistance meter. If the measured resistance is lower than 1 MΩ,inspect parts and repair or replace defective parts.

[1] INDOOR UNIT

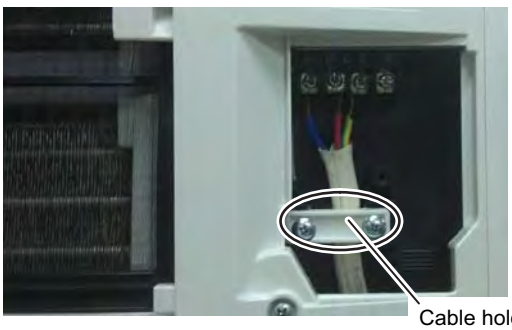
1. Open the open panel to the horizontal position and remove with pulling it forward.

2. Remove the 2 air filters.

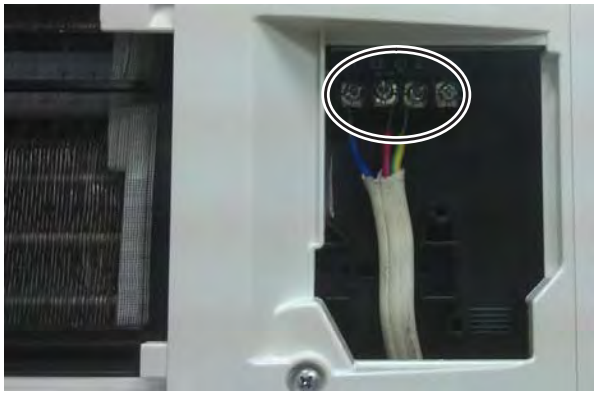
3. Unscrew the screw fixing cable cover and remove it.



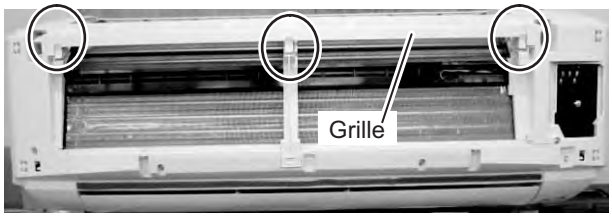
4. Unscrew the 2 screws and remove the cable holder.



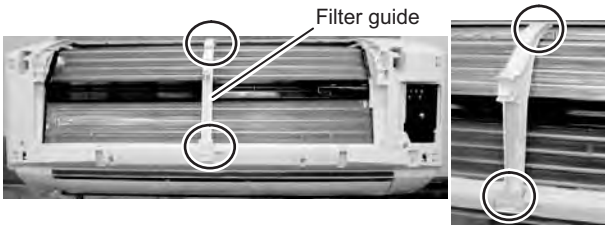
5. Remove the connecting cable and power supply cable from terminal board.



6. Remove the grille by releasing the 3 hooks.

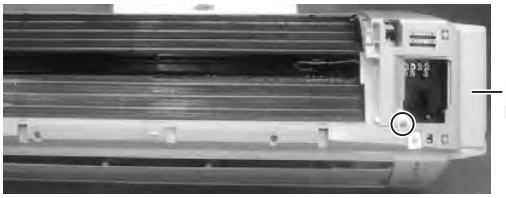


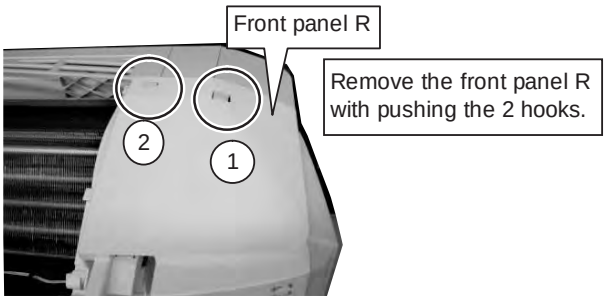
7. Release the 2 hooks and remove the filter guide.



8. Unscrew the screw fixing the front panel L and remove it.

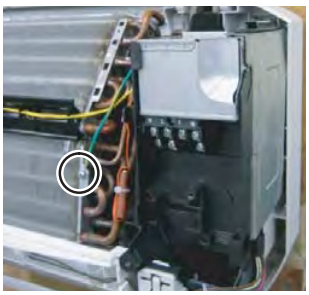
9 . Unscrew the screw fixing the front panel R and remove it.



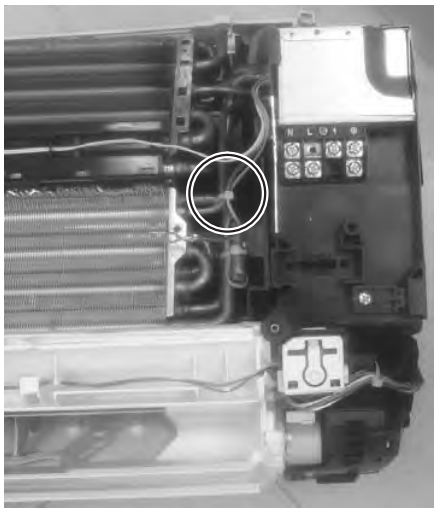


10. Unscrew the 2 screws and remove the front cover.

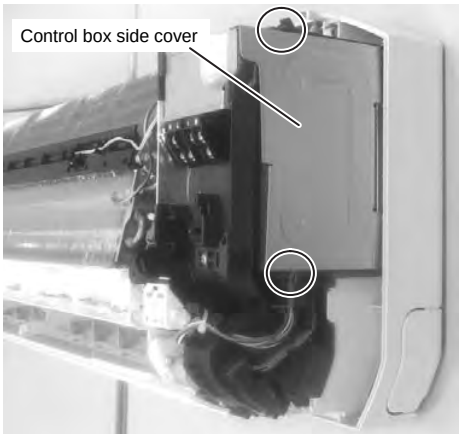
11. Unscrew the screw fixing earth wire.



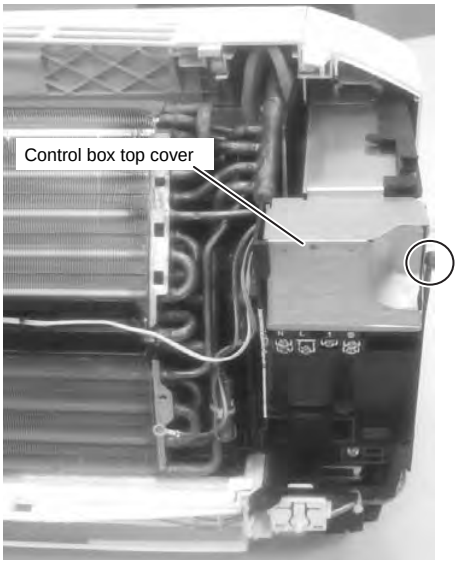
12. Cut the fixing bands.



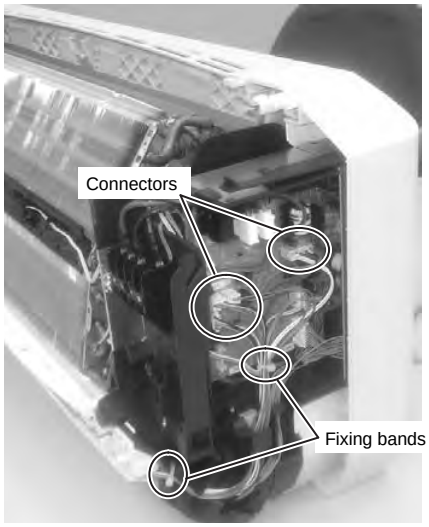
13. Release the 2 hooks of the control box side cover and remove it.



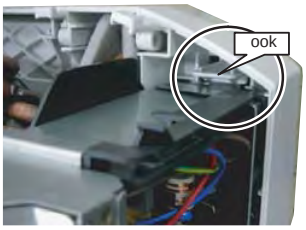
14. Release the hook of the control box top cover and slide it up to remove.



15. Cut the 2 fixing bands and disconnect the connectors from the control board unit.



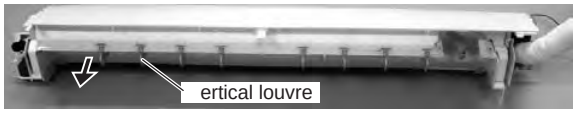
1 .Remove the control box b releasing the upper hook and pulling out.



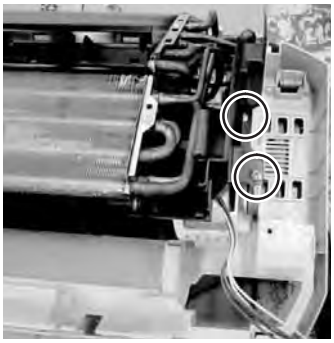
1 .Unscrew the 2 screws fixing drain pan and remove it.

1 .Unscrew the 2 screws and remove the motor bracket.

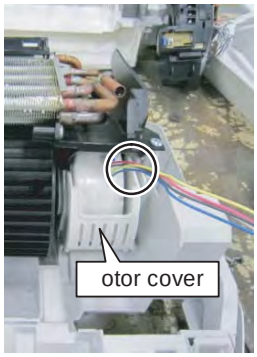
19. lide the vertical louvre and remove it

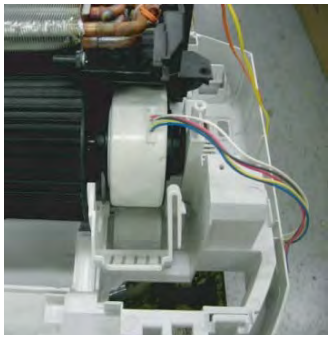


20.Unscrew the 3 screws fixing side cover and side cover R.

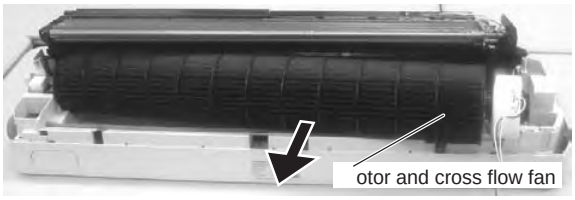


21.Release the hook of the motor cover from cabinet.

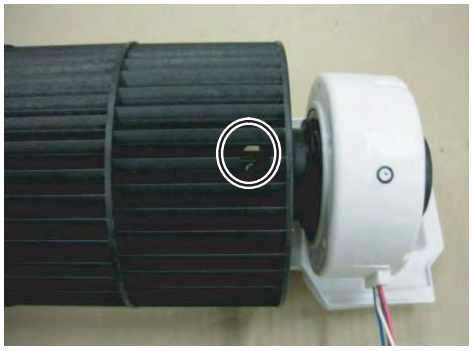




22. ake out the motor and cross flow fan.



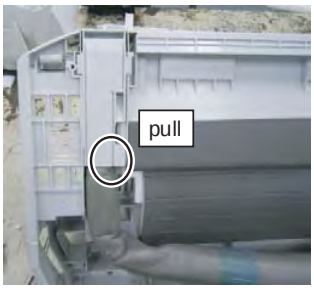
23.Unscrew the screw of the cross flow fan and remove it.



24.Remove the pipe holder.

- Push the hook of the pipe holder and remove it b pulling lower part.

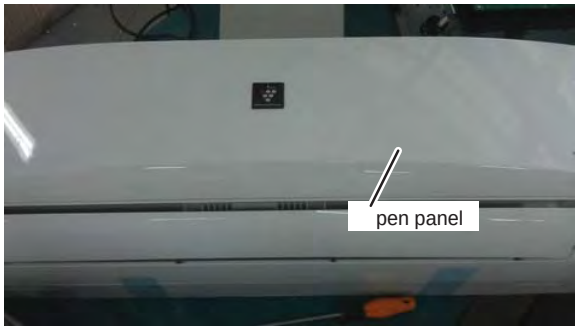
Front side



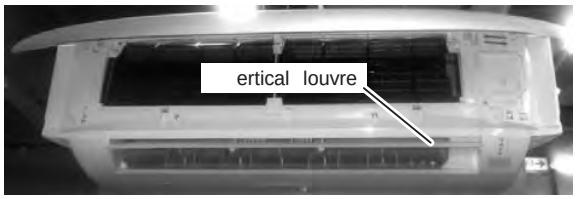
ack side

[2] PLASMACLUSTER UNIT

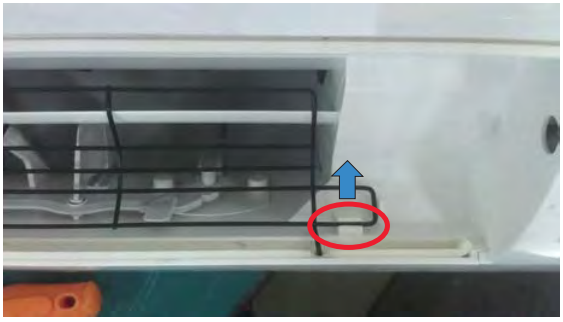
1. pen the open panel.



2. Remove the vertical louvre.



3. Pull wire guard from drain pan hook.

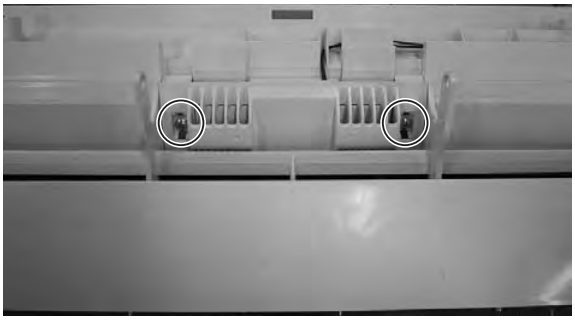


4. lide the wire guard to right and remove it.

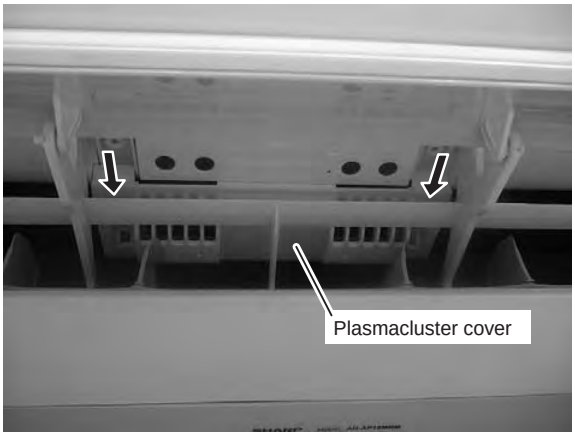
5. Remove the 2 screw covers.

nsert a flat t pe screw driver to hole of screw cover.

. Unscrew 2 screws.

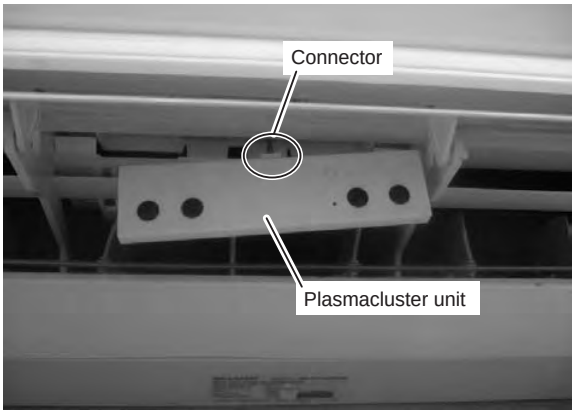


. lide Plasmacluster cover to the back.



. Replace the Plasmacluster unit.

isconnect the connector and replace Plasmacluster unit.

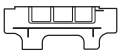


CHAPTER 5. INSTALLATION INSTRUCTION

[1].SAFETY PRECAUTIONS

- **Installation must be made in accordance with the installation manual by qualified service personnel.**
  Incorrect work can cause electric shock, water leak, fire.
- **Be sure to use the attached accessories parts and specified parts for installation.**
  Use of other parts can cause electric shock, water leak, fire, the unit falling.
- **The appliance shall be installed and wired in accordance with national electrical code and by qualified personnel only.**
  Wrong connection can cause overheating or fire.
- **After installation has complete, check that there is no leakage of refrigerant gas.**
  If the refrigerant gas contact with fire, it will generate toxic gas.
- **Ventilate the room if refrigerant gas leaks during installation.**
  If the refrigerant gas contact with fire, it will generate toxic gas.
- **Use the specified electrical cable.**
  Make sure the cable is secured in place and that the terminals are free of any excess force from the cable. Otherwise overheating or fire may result.
- **Form the cable so that the control box cover, the cord holder and cable holder are not loose.**
  Otherwise overheating, fire or electric shock may result.
- **Tighten the flare nut with a torque wrench according to the specified method.**
  If the flare nut is tightened too hard, the flare nut may crack or break after a long time and cause refrigerant gas leakage.
- **When installing the unit, take care not to enter air substance other than the specified refrigerant(R410A) in the refrigerant cycle.**
  Otherwise, it can cause burst and injury as a result of abnormal high pressure in the refrigerant cycle.
- **Be sure to connect the refrigerant pipe before running the compressor.**
  Otherwise, it can cause burst and injury as a result of abnormal high pressure in the refrigerant cycle.
- **Earth the unit.**
  Incomplete earth may cause electrical shock.
- **Install an earth leakage breaker to avoid electric shock in case of leak.**
  Use the current-activated, high-sensitivity, high-speed type breaker with a rated sensitivity current of below 30 mA and an operating time of below 0.1 second.
- **Arrange the drain hose to ensure smooth drainage.**
  Insufficient drainage may cause water damage to the room, furniture etc.
- **This room air conditioner uses refrigerant R410A.**
  Use refrigerant pipes, flare nuts and tools exclusively for R410A.

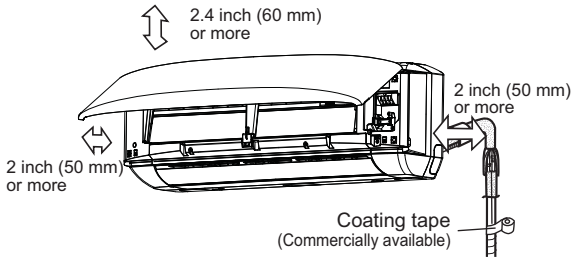
[2].ACCESSORIES

ITEMS	Q'ty	APPLICATION	ITEMS	Q'ty	APPLICATION	ITEMS	Q'ty	APPLICATION
1 Mounting plate 	1	To mount the indoor unit on the wall.	4 Dry battery 	2	For the remote control. AAA batteries.	7 Manuals 	1	Operation manual
							1	Installation manual
2 Long screw 5/32" x 39/32" L (M4.5x30) 	7	To fix the mounting plate.	5 Short screw 3/16" x 13/16" L (M4x20) 	3	To fix the remote control holder. (1) To fix the cable cover. (2)	8 Cable cover 	1	To secure the cable
3 Remote control 	1	To control remotely.	6 Remote control holder 	1	To mount the remote control on the wall.			

[3].NOTES ON LOCATIONS

1. Keep the air outlet clear of any obstacle so that outgoing air flows smoothly in the entire room.
2. Make a drain hose hole that will allow easy condensate water drainage.
3. Provide sufficient space on both sides and above the unit.
4. The unit must be installed with enough space allowance so that the air filters can be removed and replaced easily
5. Keep TV set, radio and other similar appliances at least 1 m or more away from the unit and the remote control.
6. Keep the air inlet clear of obstacles that could block incoming air, and clean the air filter regularly.
7. The remote control may not function properly in a room equipped with an electronic simultaneous-start or rapid-start fluorescent lighting.
8. Select a location that does not cause loud operation noise and extreme vibrations.

[4].INSTALLATION DIAGRAM



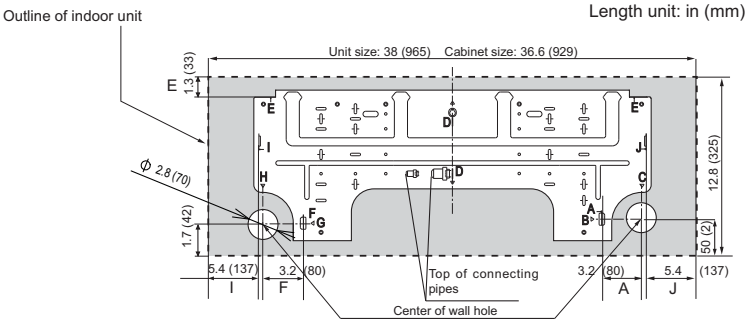
Provide as much installation space as possible for efficient air-conditioning.

Use the refrigerant pipes shown in the table below.

Pipe size		Pipe thickness	Thermal insulation
Liquid Side	1/4"(ø 6.35 mm)	0.03 in (0.8 mm)	Thickness: 0.2 inch (6 mm) or thicker Material: Polyethylene foam
Gas Side	1/2" (ø 12.7 mm)		

• The thermal insulation should cover both the gas and liquid pipes.

[5].INSTALLATION DIMENSION OF INDOOR UNIT



[6].INSTALLATION PROCEDURE

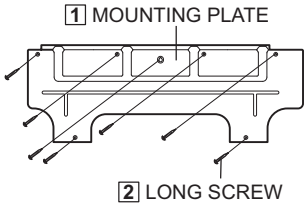
1 PLACING THE MOUNTING PLATE AND MAKING A PIPING HOLE

Installing the mounting plate

- The mounting plate should be installed on a wall which can support the weight of the indoor unit.

(1) Referring to the following illustration, mark the location for the fixing holes and the piping hole.
- Recommended fixing holes are marked in circle around the hole. (7 points)
- Make sure that the mounting plate is horizontally.

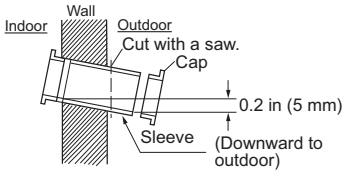
(2) Secure the mounting plate to the wall with the long screws and check the stiffness.



Making a piping hole

(1) Drill a piping hole with concrete drill or a hole saw with a 0.2inch (5mm) down ward slant to the outside.
the diameter is 2.8inch (70mm).

(2) Set the sleeve and caps.

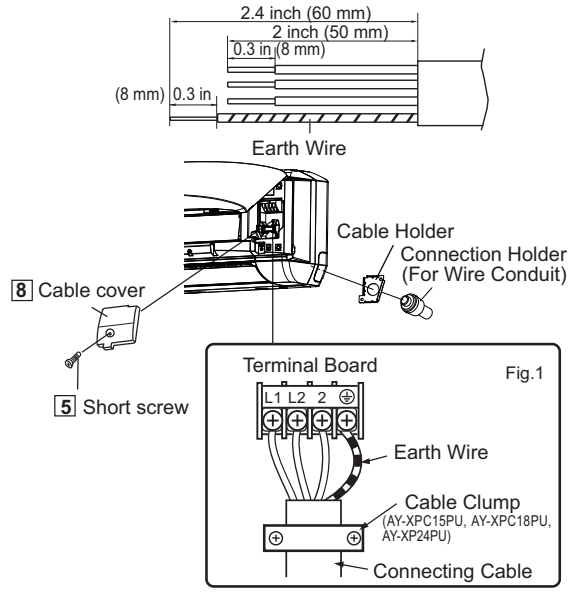


2 CONNECTING THE CABLE TO THE INDOOR UNIT

Connecting wires and the ground wire

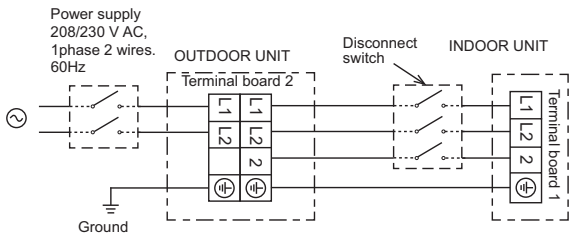
- Use solid conductor AWG14 or stranded conductor AWG14. (14 AWG or larger if required by local electrical code)
- Use double insulated copper wire with 600 V insulation.
- Use copper conductors only.
- Follow local electrical codes.
- Use a cable which is not lighter than polychloroprene sheathed flexible cord.

(1) Process the end of the connecting cable for the indoor side.
(2) Take off the Cable Holder from the backside of the indoor unit.
(3) Take off the Connection Holder from the Wire Conduit and attach the Connection holder to Cable Holder with Lock Nut. (Fig.2)
(4) Make the connecting cable get through the Cable holder.
(5) Attach the Cable Holder and Connection Holder to Cabinet with screw. Refer to "**ATTACH THE CABLE HOLDER AND CONNECTION HOLDER**". (Fig.3 and Fig.4)
(6) Insert the connecting cable into the unit from backside.
(7) Open the Open Panel.
(8) Connect the Connecting Cable to Terminal Board. (Fig.1)
(9) Fix the Cacle cover with the screw.
(10) Tighten the Connection Holder to Wire Conduit.
(11) Close the Open Panel.



Cautions:

- Be sure to put the cable leads deep into the terminal board and tighten up the screws. Poor contact can cause overheating or fire, or malfunction.
- Be very careful not to confuse the terminal connections. Wrong cabling may damage the internal control circuit.
- Be sure to connect the cable to match the markings on the indoor unit's terminal board and those of the outdoor unit.
- Firmly tighten the lock nut of wire conduit. After tightening, pull the wire conduit lightly to confirm that they do not move.



ATTACH THE CABLE HOLDER AND CONNECTION HOLDER

- Attach Wire conduit to Cable Holder with Lock Nut. The thread of the installed Wire Conduit should be less than 3/8 in. (10 mm)
- Fix the Cable Holder with screw firmly.

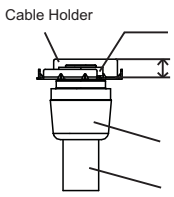
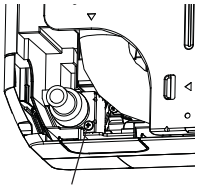
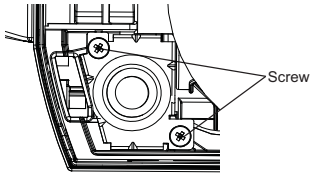


Fig.2



(AY-XPC15PU, A3-XPC18PU, AY-XP24PU) Fig.3



(AY-XPC07PU, AYXPC09PU, AY-XPC12PU) Fig.4

3 SETTING UP THE INDOOR UNIT

Mounting the indoor unit

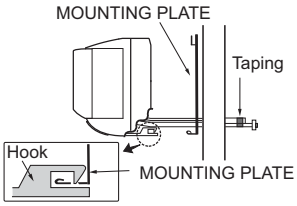
For right side piping

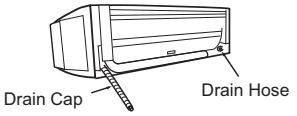
(1) Pass the pipes and the drain hose through the piping hole.
(2) Hook the unit onto the mounting plate.
(3) Pull the connecting cable into the indoor unit.
(4) Push the unit and apply the bottom hooks to the mounting plate's support.
(5) Pull the bottom of the unit to check that the unit is fixed in place.

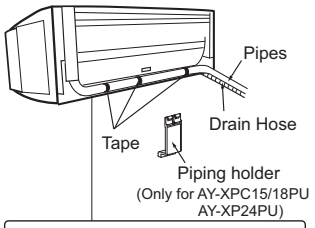
For left side piping

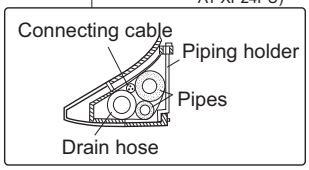
(1) Reverse the positions of the drain hose and drain cap. Refer to "**Exchange the drain hose**".
(2) Connect the pipes and wrap tape around the insulation of the piping joints tightly not to become thick.
(3) Pass the pipes, connecting cable and the drain hose through the piping hole.
(4) Hook the unit onto the mounting plate.
(5) Push the unit and apply the bottom hooks to the mounting plate's support.
(6) Pull the bottom of the unit to check that the unit is fixed in place.

Notes:
- Bend the pipes carefully as not to damage them.
- Lay the drain hose below the pipes.



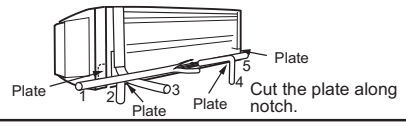






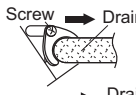
Piping route

For directions 1, 2 ,4 and 5, cut out the specific zone without leaving any sharp edge.

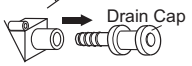


Exchange the drain hose

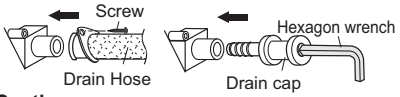
(1) Remove the screw and pull out the drain hose.



(2) Pull out the drain cap.



(3) Reconnect the drain hose to the right and insert the drain cap to the left.
- Fully insert the drain hose until it stops and fix the screw removed in (1).
- Insert a hexagon wrench (4 mm diagonal) into the drain cap, and press it fully.

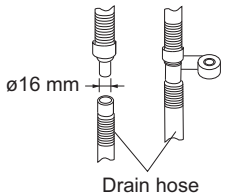


Caution:
After replacing, make sure that both the drain hose and drain cap are firmly inserted.

4 CONNECTING THE DRAIN HOSE

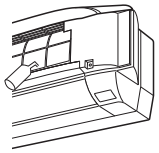
Connecting the drain hose

(1) Glue and Connect a drain hose.
(2) Tape over the connecting part.

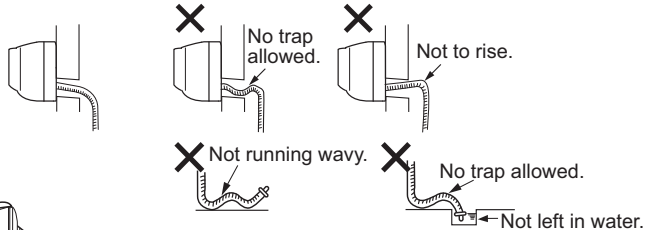


Checking drainage

(1)Open the open panel.
(2)Remove the air filters.
(3)Pour some water into the drain pan.
(4)Check the water drains smoothly.



Notes:
- Be sure to lay the drain hose downward for smooth drain flow.
- Be careful not to allow the drain hose to rise, form a trap or leave its end in water, as shown below.
- Coil thermal insulation around a drain hose extension, if running in the room.



5 CONNECTING THE REFRIGERANT PIPES

Flaring the pipe end

(1) Cutting with a pipe cutter
Cut at a right angle.

(2) Deburring
Allow no cuttings in the pipe.

(3) Putting in the flare nut

Connecting the pipes

Connect the pipes for the indoor unit first and then for the outdoor unit.

(1) Tighten the flare nuts by hand for the first 3-4 turns.

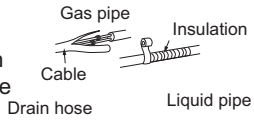
(2) Use a wrench and torque wrench to tighten up the pipes.

• Do not over tighten the pipes. It may be deformed or damaged.

(3) Wind coating tape around refrigerant pipes together with drain hose and cable for general.

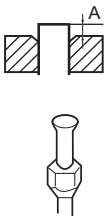
• Lay the drain hose below the pipes.

• The thermal insulation should cover both the gas and liquid pipe. As insulation, use polyethylene foam 6 mm or thicker.

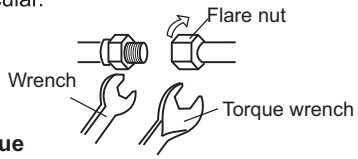


(4) Flaring
Flare processing dimensions(A)

Tool	A
R410A tool	0-0.02 in (0 - 0.5 mm)
Conventional tool	0.04-0.06 in (1.0 - 1.5 mm)



(5) Checking
To be flared perfectly circular.
Flare nut not missing.

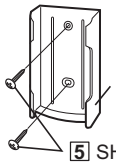


Flare nut tightening torque

Pipe size		Torque
Liquid side	1/4" (ø 6.35 mm)	16±2 N·m (1.6±0.2 kgf·m)
Gas side	1/2" (ø 12.7 mm)	55±5 N·m (5.5±0.5 kgf·m)

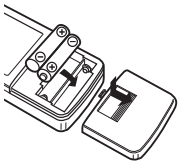
6 HANGING THE REMOTE CONTROL

Fix the remote control holder to the wall with the short screws.



Loading the batteries

(1) Slide and open the cover.
(2) Insert the batteries.
(3) Replace the cover.
(4) Press the RESET button using a thin stick.

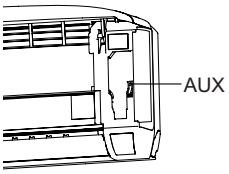


7 TEST RUN

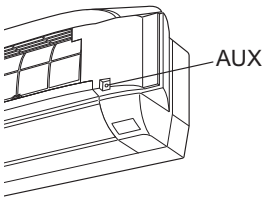
(1) Start the operation with the remote control.

(2) To start test run in cooling, hold down the AUX button on the unit for over 5 seconds until a beep sound is heard and an operation lamp flashes.

(3) Make sure the system runs well.
To stop the operation, press the AUX button again.



(AY-XPC07PU, AYXPC09PU, AY-XPC12PU)



(AY-XPC15PU, AYXPC18PU, AY-XP24PU)

8 ITEMS TO CHECK

☐ Is the specified power supply voltage used?

☐ Is the connecting cable fixed to terminal board firmly?

☐ Is the earth wire connected properly arranged?

☐ Is the drainage properly?

☐ Is the indoor unit hooked to the mounting plate firmly?

☐ Is there any gas leakage at the pipe connection?

☐ Confirm with the customers whether the 5°F/-15°C AUTO OFF function will be used or not.

EXPLANATION TO CUSTOMER

• Explain to the customer how to use and maintain the system, referring to the operation manual.

• Ask the customer to carefully read the operation manual.

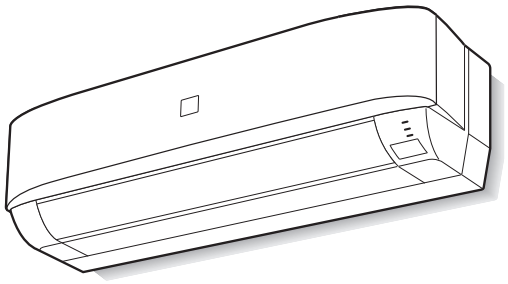
• When the system has been set up, hand the installation manual to the customer.

[7].DETACHING THE UNIT FROM THE MOUNTING PLATE

Push the "△" marks at the bottom of the indoor unit to release the hooks from the mounting plate, and pull the unit toward you.

"△" mark

SHARP PARTS LIST



SPLIT TYPE
ROOM AIR CONDITIONER

MODELS AY-XPC15PU
AY-XPC18PU
AY-XP24PU

CONTENTS

*Parts of AY-XPC18PU and AY-XP24PU are still under revision, may change for reliability improvement. New edition of this manual will be issued after revision is completed.

HOW TO ORDER REPLACEMENT PARTS

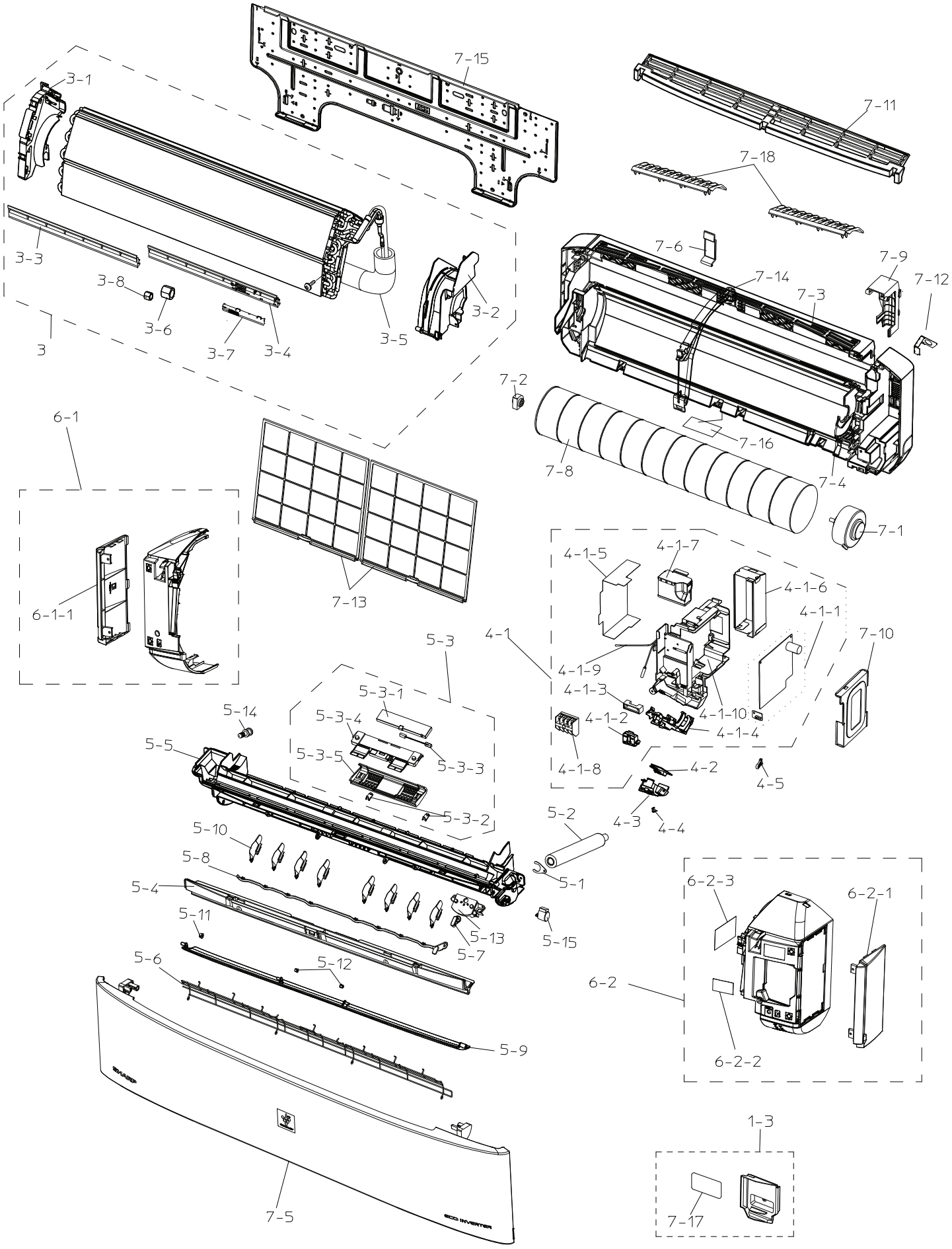
To have your order filled promptly and correctly, please furnish the following information.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

Parts marked with "⚠" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

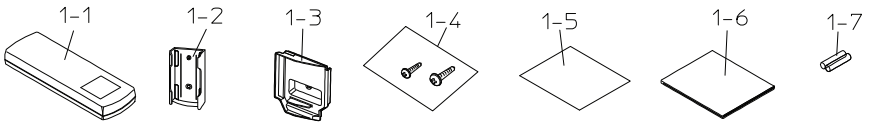
SHARP CORPORATION

[1] INDOOR UNIT PARTS



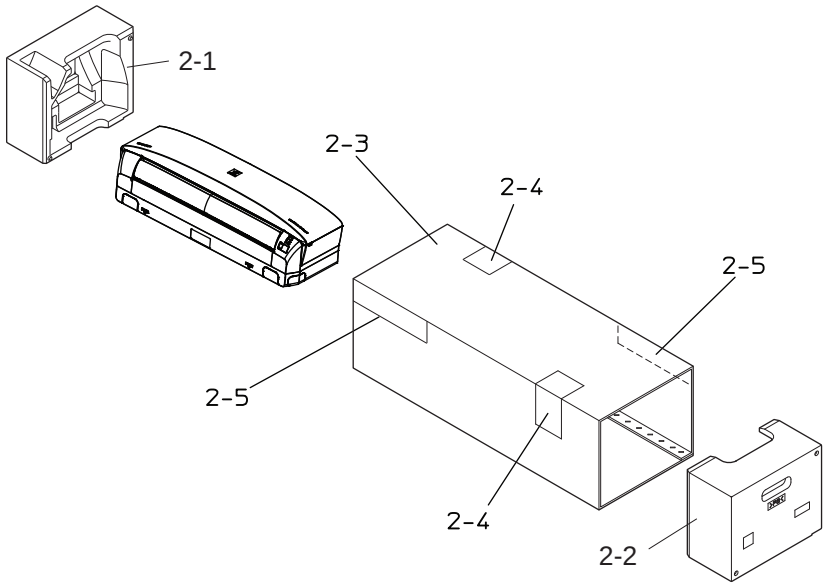
NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
[1] INDOOR UNIT PARTS					
CYCLE PARTS					
3	CCYC-E038JBKZ	CA	N		CYCLE ASS'Y(AY-XPC15PU)
3	CCYC-E039JBKZ	CG	N		CYCLE ASS'Y(AY-XPC18PU,AY-XP24PU)
3-1	DCOV-A389JBKZ	AL	N		COVER-L ASS'Y
3-2	PCOV-B987JBFZ	AH	N		SIDE COVER R
3-3	PGID-A200JBFA	AG	N		EVA COVE L
3-4	PGID-A201JBFA	AG	N		EVA COVE R
3-5	PFPFPE436JBEZ	AK			INSULATOR
3-6	PSEN-A086JBKZ	AP			FLARE NUT ASS'Y
3-7	LHLD-B207JBFZ	AE	N		THERMISTOR HOLDER
3-8	PSEN-A080JBKZ	AH			FLARE NUT ASS'Y
CONTROL BOX					
4-1	DBOX-A136JBKZ	BR	N		CONTROL BOX ASS'Y(AY-XPC15PU)
4-1	DBOX-A137JBKZ	BL	N		CONTROL BOX ASS'Y(AY-XPC18PU)
4-1	DBOX-A149JBKZ	BQ	N		CONTROL BOX ASS'Y(AY-XP24PU)
4-1-1	DSGY-F028JBKZ	BL	N		CONTROL BOARD UNIT(AY-XPC15PU)
4-1-1	DSGY-F032JBKZ	BL	N		CONTROL BOARD UNIT(AY-XPC18PU)
4-1-1	DSGY-F121JBKZ	BL	N		CONTROL BOARD UNIT(AY-XP24PU)
4-1-2	GBTN-A015JBFA	AC	N		BUTTON
4-1-3	LHLD-A539JBFA	AE			CORD HOLDER
4-1-4	LHLD-B210JBFA	AE	N		DISPLAY HOLDER
4-1-5	PCOV-B854JBWZ	AV			CONT.BOX COVER A
4-1-6	PCOV-C099JBWZ	AH	N		CONT.BOX COVER B
4-1-7	PCOV-B858JBWZ	AY			TERMINAL COVER
4-1-8	QTANZA090JBZZ	AR	N		TERMINAL BOARD
4-1-9	RH-HXA165JBZZ	AS			THERMISTOR
4-1-10	PBOX-A587JBFA	AX	N		CONTROL BOX
4-3	PCOV-B988JBFA	AE	N		DISPLAY COVER
4-4	PCOV-B989JBFZ	AC	N		LED COVER
4-5	LHLD-B233JBFA	AC	N		CORD HOLDER
DRAIN PAN PARTS					
5-1	LPLT-A058JBPZ	AC			HOSE HOLDER
5-2	PHOS-A052JBEZ	AM			DRAIN HOSE
5-3	CKITTA087JBKZ	BN	N		CLUSTER ASS'Y
5-3-1	CKITTA133AKKZ	BM			PLASMACLUSTER UNIT
5-3-2	PCOV-B990JBFA	AC	N		SCREW COVER
5-3-3	QW-VZG595JBZZ	AK			LEAD WIRE
5-3-4	LHLD-B211JBFA	AG	N		HOLDER
5-3-5	LHLD-B212JBFA	AG	N		COVER
5-4	DCOV-A390JBKZ	AV	N		FRONT PANEL ASS'Y
5-5	DSRA-A403JBKZ	BC	N		DRAIN PAN SUB ASS'Y
5-6	GGAD-A076JBTA	AT	N		WIRE GUARD
5-7	MARMPA078JBFA	AD	N		ARM
5-8	MJNTPA191JBFA	AE	N		LOUVER LINK
5-9	MLOV-A574JBFA	AQ	N		HORAIZONTAL LOUVER
5-10	MLOV-A562JBFA	AE			VERTICAL LOUVER
5-11	NBRG-A026JBFA	AB			LOUVER BUSHING
5-12	NBRG-A038JBFA	AC			BEARING C
5-13	PDAI-A291JBFA	AD	N		MOTOR BRACKET
5-14	PGUMMA381JBEZ	AF			DRAIN PLUG
5-15	RMOT-A223JBZZ	AS			LOUVER MOTOR
FRONT PANEL PARTS					
6-1	CWAK-E203JBKZ	AX	N		FRONT PANEL L ASS'Y
6-1-1	HDEC-B226JBFA	AL	N		DECORATION PANEL L
6-2	CWAK-E202JBKZ	BA	N		FRONT PANEL R ASS'Y
6-2-1	HDEC-B227JBFA	AL	N		DECORATION PANEL R
6-2-2	TCAUSA002JBRZ	AD			UL WARNING LABEL -2
6-2-3	TLABCE002JBRZ	AD	N		WIRING DIAGRAM
CABINET & UNIT PARTS					
7-1	CMOT-A561JBKZ	BM	N		FAN MOTOR SUB ASS'Y
7-2	CHLD-A122JBKZ	AG			BEARING ASS'Y
7-3	DCHS-A833JBKZ	BD	N		CABINET SUB ASS'Y
7-4	PCOV-B996JBFZ	AE	N		MOTOR COVER
7-5	DPNL-A123JBKZ	BD	N		OPEN PANEL ASS'Y
7-6	LHLD-B213JBFA	AD	N		STOPPER
7-8	NFANCA149JBEZ	BD	N		CROSS FLOW FAN
7-9	PCOV-B994JBFA	AF	N		PIPE HOLDER
7-10	PCOV-B851JBWZ	AV			BOX COVER
7-11	PCOV-B995JBFA	AP	N		GRILL
7-12	PCOV-B983JBWZ	AE	N		CABLE HOLDER
7-13	PFILMA282JBEA	AL	N		AIR FILTER
7-14	PGID-A202JBFA	AH	N		FILTER GUIDE
7-15	PPLTNA134JBWZ	AX			MOUNTING ANGLE
7-16	TSPC-H648JBRA	AF	N		NAME LABEL(AY-XPC15PU)
7-16	TSPC-H655JBRA	AF	N		NAME LABEL(AY-XPC18PU)
7-16	TSPC-H815JBRA	AF	N		NAME LABEL(AY-XP24PU)
7-17	TCAUSA003JBRZ	AF	N		UL WARNING LABEL-3
7-18	PGID-A127JBFZ	AG			GUIDE

[2] ACCESSORY PARTS



NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
[2]ACCESSORY PARTS					
1-1	CRMC-A868JBEZ	BE	N		REMOTE CONTROL
1-2	LHLD-A484JBFA	AE			HOLDER
1-3	DHLD-A071JBKZ	AK	N		CORD HOLDER ASS'Y
1-4	FFZK-A256JBKZ	AF			SCREWS KIT
1-5	TINS-B404JBRZ	AE	N		INSTALLATION MANUAL
1-6	TINSEA760JBRZ	AF	N		OPERATION MANUAL
1-7	UBATUA027JBE0	AE			BATTERY PACK

[3] INDOOR PACKING PARTS



NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
[3] INDOOR UNIT PACKING PARTS					
2-1	SPADBA579JBEZ	AP			PACKING PAD L
2-2	SPADBA580JBEZ	AP			PACKING PAD R
2-3	SPAKCE212JBEZ	AS			PACKING CASE
2-4	TLABMB224JBRZ	AE	N		PRODUCT LABEL(AY-XPC15PU)
2-4	TLABMB225JBRZ	AE	N		PRODUCT LABEL(AY-XPC18PU)
2-4	TLABMB301JBRZ	AE	N		PRODUCT LABEL(AY-XP24PU)
2-5	TLAB-F722JBRZ	AE			NO CLAMP LABEL