SERVICE MANUAL

EdgeStar Portable Air Conditioner

MODELS COVERED:

AP13500G
Medium Room 120V Portable Air Conditioner

AP13500HG
Medium Room 120V Portable Air Conditioner with 11000 BTU Heater

CAUTION: READ ALL SAFETY PRECAUTIONS IN THIS MANUAL BEFORE SERVICING THE UNIT

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**Warranty service should be performed by an authorized service representative only.*

CONTENTS

SAFETY PRECAUTIONS

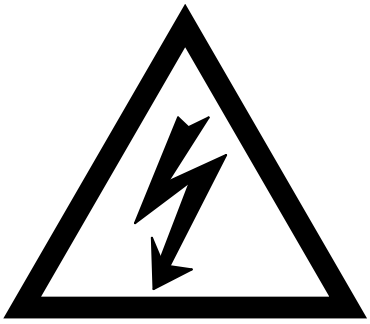
WARNING: This manual and the information contained herein is intended for use by certified technicians. The manufacturer or seller is not responsible for the interpretation or misuse of the information provided, nor does it assume any liability in connection with its use.

The safeguards and warnings indicated in this manual do not cover all possible conditions which may occur. Common sense, caution, and care must be exercised.

- To prevent electric shock, always unplug an appliance from the power supply before attempting any service.
- Disconnect the power cord by grasping the plug, not the cord.
- Do not bypass, cut, or remove the grounding plug.
- Prevent water from spilling onto electric elements or the machine parts.
- Always refer to the rating label on the appliance for rated current and voltage.
- Always check line voltage and amperage.
- Always use exact replacement parts.
- Any attempt to repair a major appliance may result in personal injury and property damage.

Electrical Safety

- Do not exceed the power outlet ratings.
- It is recommended that the unit be connected to its own circuit.
- A standard electrical supply that is properly grounded in accordance with the National Electrical Code and all state and local codes and ordinances is required.
- Do not use outlets that can be turned off by a switch or pull chain.
- Always turn the unit off and unplug it from the outlet when cleaning.
- Unplug the unit if it is not going to be used for an extended period of time.
- Do not operate the unit with a power plug missing the ground plug, a damaged cord, or a loose socket.
- Be sure the appliance is properly grounded.
- Do not bypass, cut, or remove the grounding plug.
- If the power cord is damaged, it must be replaced by the manufacturer or a qualified technician.
- Do not use extension cords or power strips with this unit. You may need to contact an electrician if it is necessary to use a longer cord or if you do not have a properly grounded outlet. Do not modify the power cord's length or share the outlet with other appliances.
- Do not start or stop the unit by switching the electrical circuit's power on and off.
- Immediately unplug the unit if it makes strange sounds, emits an odor or smoke and contact customer service.
- Do not remove any part of the casing unless instructed by an authorized technician.
- Before the appliance is removed from service or discarded, remove any doors and cut off the power cord.



General Safety

- Always unplug an appliance from the power supply before attempting any service. Disconnect the power cord by grasping the plug, not the cord.
- Do not allow children or pets to play on or in the appliance.
- This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the machine by a person responsible for their safety.
- Do not install or store this appliance where it will be exposed to the weather.
- Disconnect from the power socket before cleaning or maintenance.
- If the plug (power cord) is damaged, it must be replaced by the manufacturer or an authorized service representative.
- This machine shall be repaired only by an authorized service representative. Only genuine replacement parts should be used.
- If connected to a circuit protected by fuses, use time-delay fuses with this appliance.
- Do not lean items against the glass door.
- Please do not close the door with excessive force. If it is found difficult to close the door, please check for obstruction.
- When you plan to dispose of this unit in the future, please comply with the local waste disposal regulations. Remove any doors so that children and pets will not be trapped in the unit.

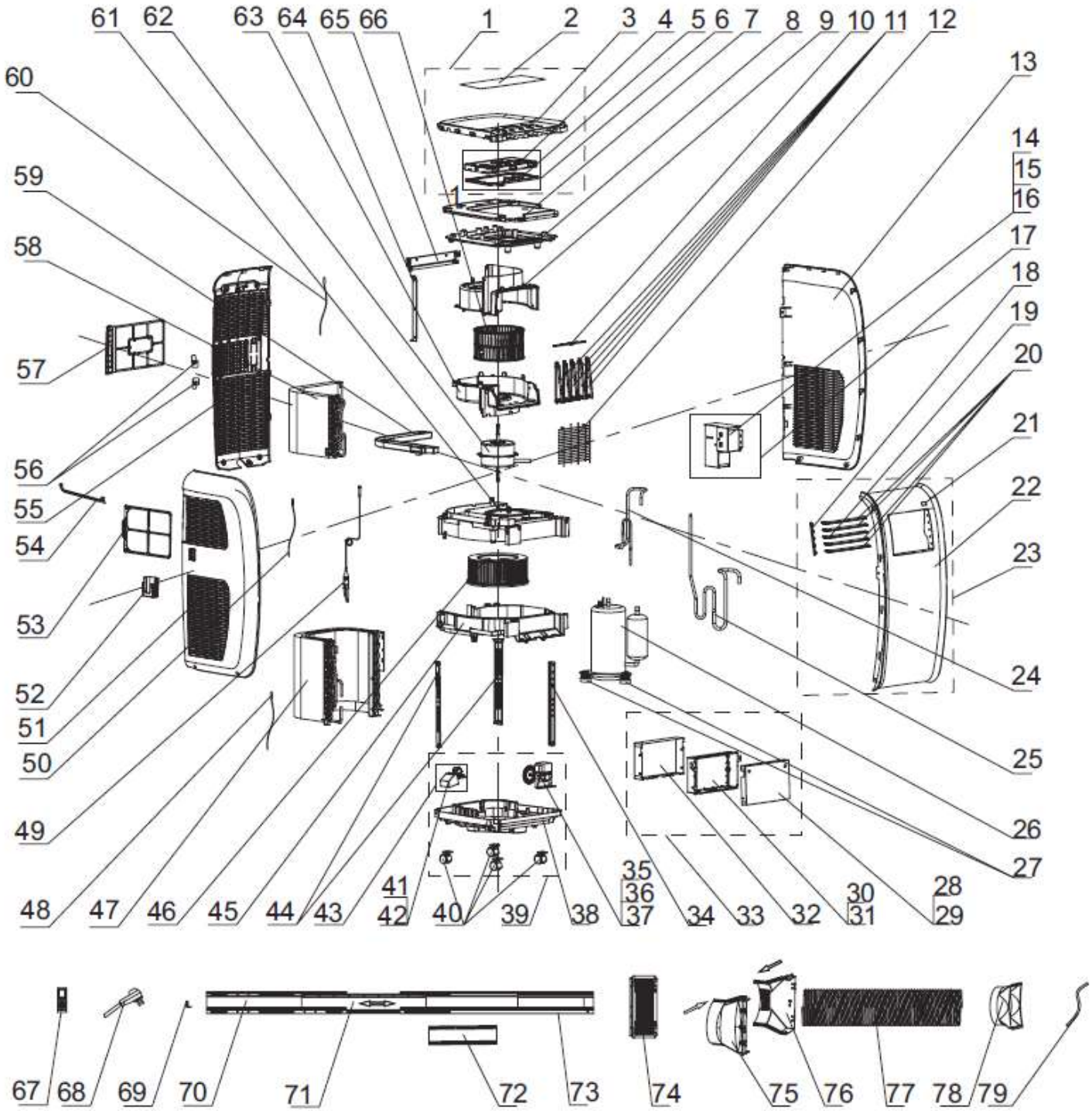
1 Specifications

Model			AP13500G	AP13500HG
Power	Rated Voltage	V~	115	115
	Rated Frequency	Hz	60	60
	Phases		1	1
Cooling Capacity		Btu/h	13500	13500
Heating Capacity		Btu/h	/	11000
Cooling Power Input		W	1465	1465
Heating Power Input		W	/	1250
Cooling Power Current		A	11.5	11.5
Heating Power Current		A	/	10.5
Rated Input		W	1550	1550
Rated Current		A	15	15
Air Flow Volume(H/M/L)		CFM	247/224/188	247/224/188
Dehumidifying Volume		L/h	1.7	1.7
EER		(Btu/h)/W	9.2	9.2
COP		(Btu/h)/W	/	8.8
SEER		W/W	/	/
Application Area		yd2	16-24	16-24
Climate Type			T1	T1
Isolation			I	I
Moisture Protection			IPX0	IPX0
Permissible Excessive Operating				
Permissible Excessive Operating				
Throttling Method			Capillary	Capillary
Fuse		A	3.15	3.15
Operation Temp		ºF	61~86	61~86
Ambient Temp (Cooling)		ºF	61~95	61~95
Sound Pressure Level (H/M/L)		dB (A)	55/53/51	55/53/51
Sound Power Level (H/M/L)		dB (A)	65/63/61	65/63/61
Dimension (WXHXD)		inch	14 3/4 X 30 1/2 X 17 2/5	14 3/4 X 30 1/2 X 17 2/5
Dimension of Carton Box		inch	21 3/4X17X33 6/7	21 3/4X17X33 6/7
Dimension of Package		inch	21 6/7X17 1/5X34 4/9	21 6/7X17 1/5X34 4/9
Net Weight		lb	78.3	78.3
Gross Weight		lb	89.3	89.3
Refrigerant			R410A	R410A
Refrigerant Charge		oz	29.6	29.6

Model			AP13500G	AP13500HG
	Compressor Model		QXA-B117xA030	QXA-B117xA030
	Compressor Oil		RB68EP/EQUIVALENT	RB68EP/EQUIVALENT
	Compressor Type		Rotary	Rotary
	L.R.A.	A	54.00	54.00
	Compressor RLA	A	10.50	10.50
	Compressor Power Input	W	1152	1152
	Overload Protector		UP3-49	UP3-49
	Fan Type		Centrifugal	Centrifugal
	Diameter	inch	Φ7 2/5X4 1/4	Φ7 2/5X4 1/4
	Fan Motor Speed	r/min	1080/980/900	1080/980/900
	Output of Fan	W	85	85
	Fan Motor RLA	A	1.9	1.9
	Fan Motor	μF	12	12
	Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Pipe Diameter	inch	Φ2/7	Φ2/7
	Row-fin Gap	inch	3-1/18	3-1/18
	Coil Length	inch	18 1/2X1 1/2X9	18 1/2X1 1/2X9
Condenser	Fan Type		Centrifugal	Centrifugal
	Fan Diameter	inch	Φ9X3 3/4	Φ9X3 3/4
	Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Pipe Diameter	inch	Φ2/7	Φ2/7
	Rows-fin Gap	inch	3-2/39	3-2/39
	Coil Length	inch	18 5/7X1/2X10 1/2+23X1X12	18 5/7X1/2X10 1/2+23X1X12
	Fan Motor Speed	rpm	1080/980/900	1080/980/900
	Output of Fan	W	85	85
	Fan Motor RLA	A	1.9	1.9
	Fan Motor	μF	12	12

The above data is subject to change without notice. Please refer to the rating label on the unit.

2 Exploded View and Parts List

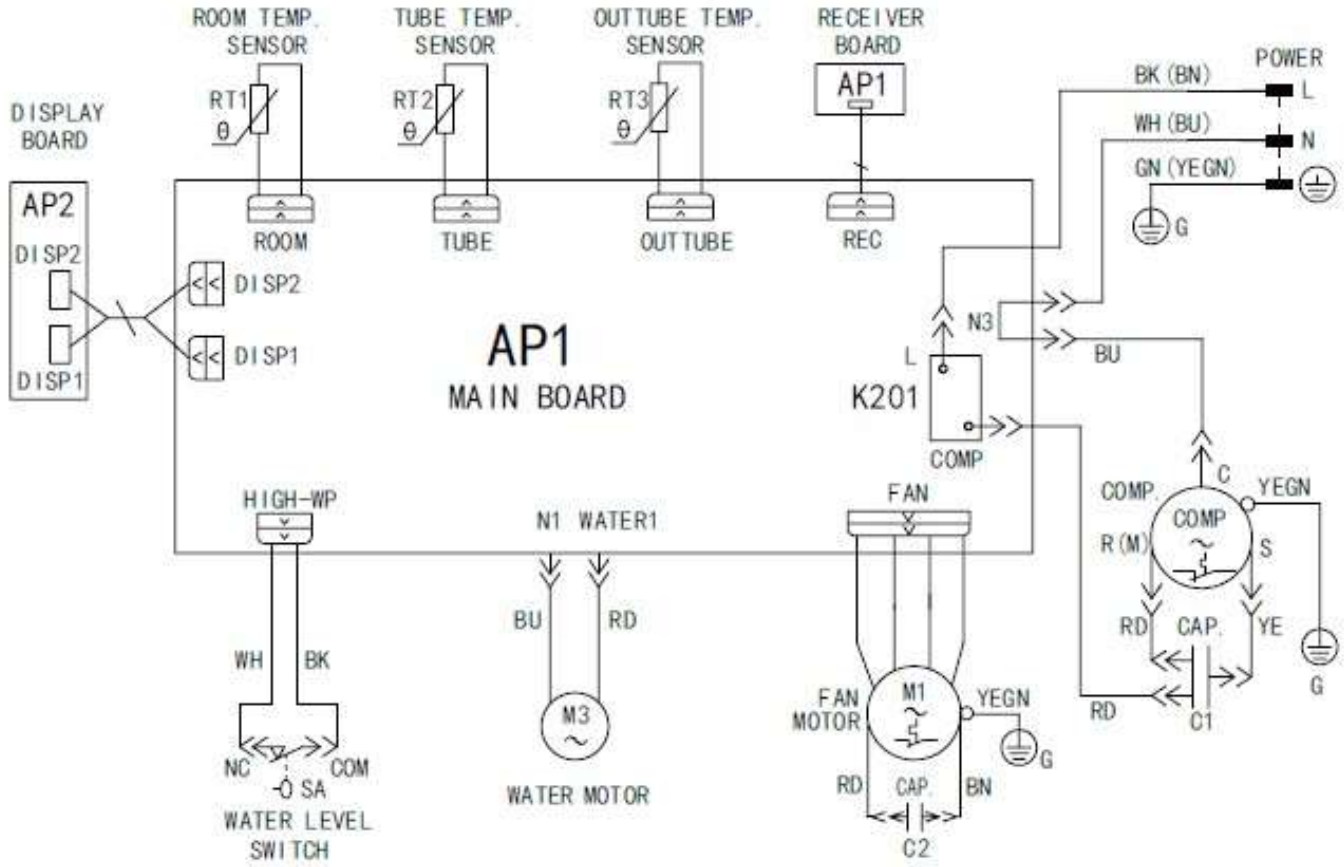


No.	Part Name	No.	Part Name
1	Top Cover Assembly	41	Water Level Switch Base
2	Membrane	42	Inching Switch
3	Coping	43	Water Level Switch Sub-assembly
4	Display Box	44	Supporting Board 1
5	Display Cover	45	Diversion Circle
6	Display Board	46	Centrifugal Fan
7	Foam (Baffle)	47	Condenser Assembly
8	Baffle Plate	48	Temperature Sensor
9	Propeller Housing 2 (Upper)	49	Capillary Sub-assembly
10	Swing Lever	50	Ambient Temperature Sensor
11	Air Louver	51	Left Side Plate
12	Rear Grill	52	Remote controller Box
13	Right Side Plate	53	Filter Sub-assembly 2
14	Capacitor Box	54	Guide Strip(Filter 2)
15	Capacitor CBB61	55	Rear Plate
16	Capacitor CBB65	56	Thread Rolling Hook
17	Capacitor Box Sub-Assembly	57	Filter Sub-assembly 1
18	Guide Blade Lever	58	Evaporator Assembly
19	Guide Louver 2	59	Foam (Water Tray)
20	Guide Louver 1	60	Temperature Sensor
21	Remote Control Display Window	61	Motor Holder
22	Front Panel	62	Fan Motor
23	Front Panel Assembly	63	Propeller Housing 1 (Upper)
24	4-Way Valve Assembly	64	Supporting Board 2
25	Magnet Coil	65	Supporting Board 4
26	Compressor and Fittings	66	Centrifugal Fan
27	Compressor Gasket	67	Remote Controller
28	Electric Box Cover	68	Power cord (LCDI)
29	Shield Cover of Electric Box 2	69	Window Locking Bracket
30	Electric Box	70	Back Plate 2
31	Main Board	71	Adjusting plate
32	Shield Cover of Electric Box 1	72	Baffle Plate
33	Electric Box Assembly	73	Back Plate1
34	Supporting Board 3	74	Rear Grill
35	Motor holder (Shaded Pole Motor)	75	Rear Clip (nether)
36	Water Flinger Flywheel	76	Rear Clip (upper)
37	Water Flinger Motor	77	Pipe
38	Chassis Sub-assembly	78	Tie-in 1
39	Chassis Assembly	79	Drainage Hose
40	Castor		

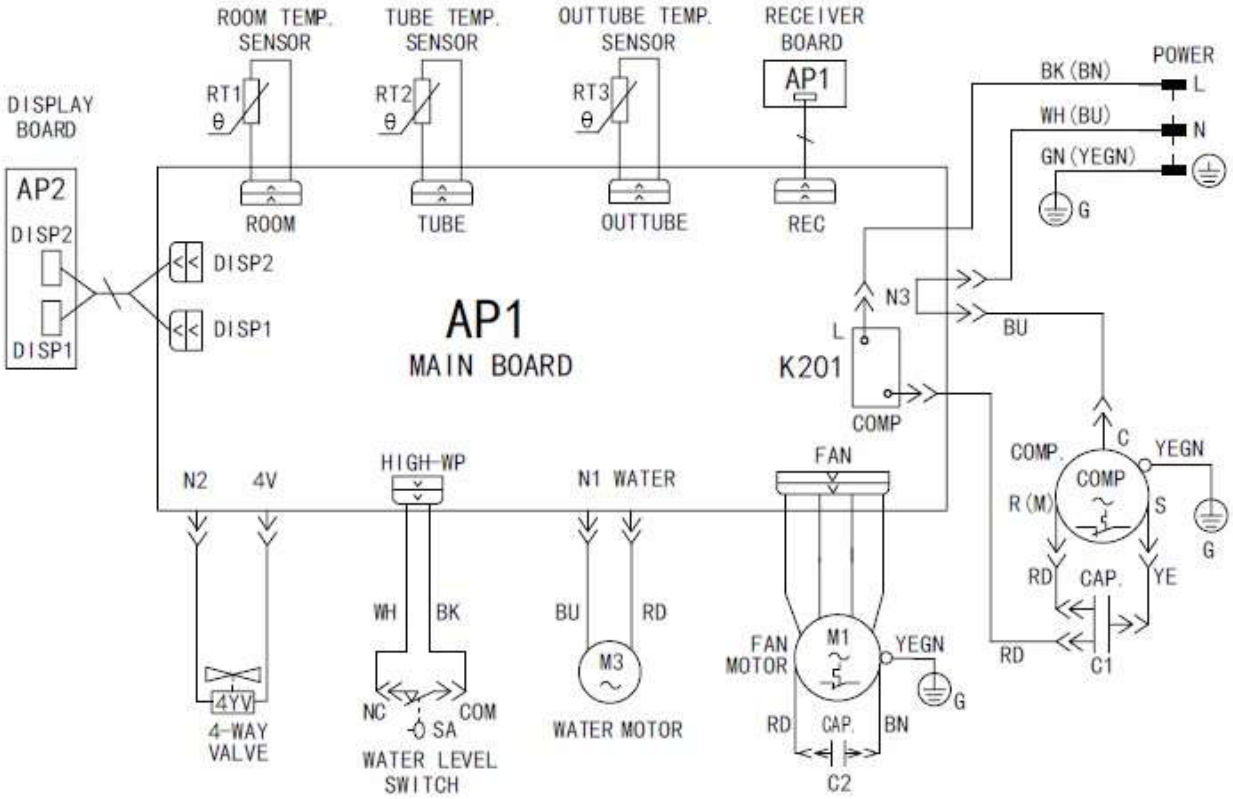
3 Wiring Diagrams

Symbol	Symbol Color	Symbol	Symbol Color	Symbol	Name
WH	White	GN	Green	COMP	Compressor
YE	Yellow	BN	Brown	⏚	Grounding wire
RD	Red	BU	Blue	/	/
YEGN	Yellow/Green	BK	Black	/	/
VT	Violet	OG	Orange	/	/

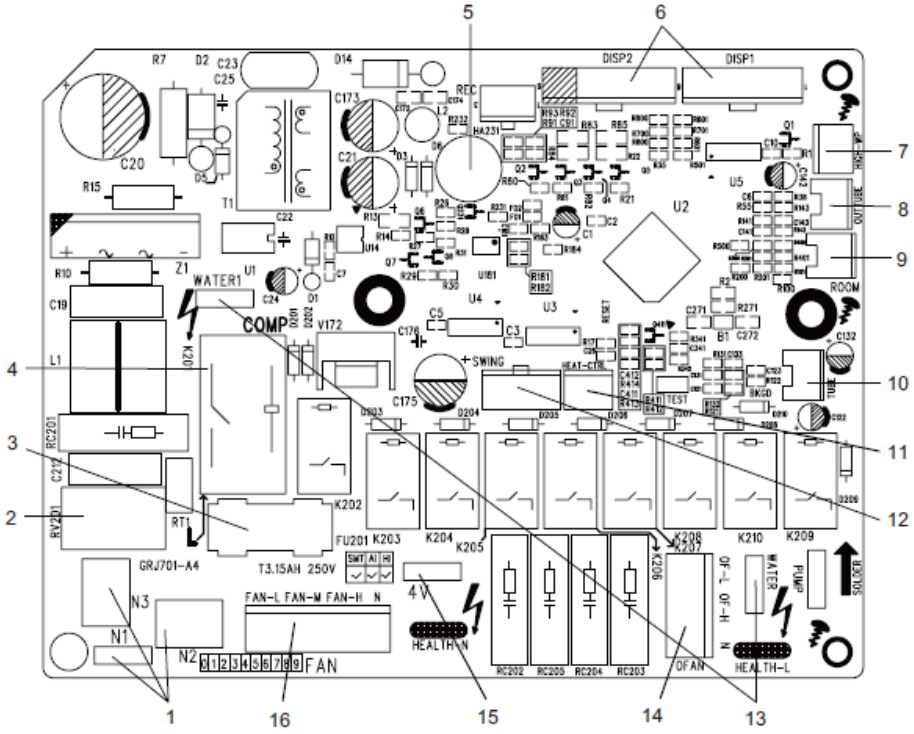
3.1 AP13500G



3.2 AP13500HG



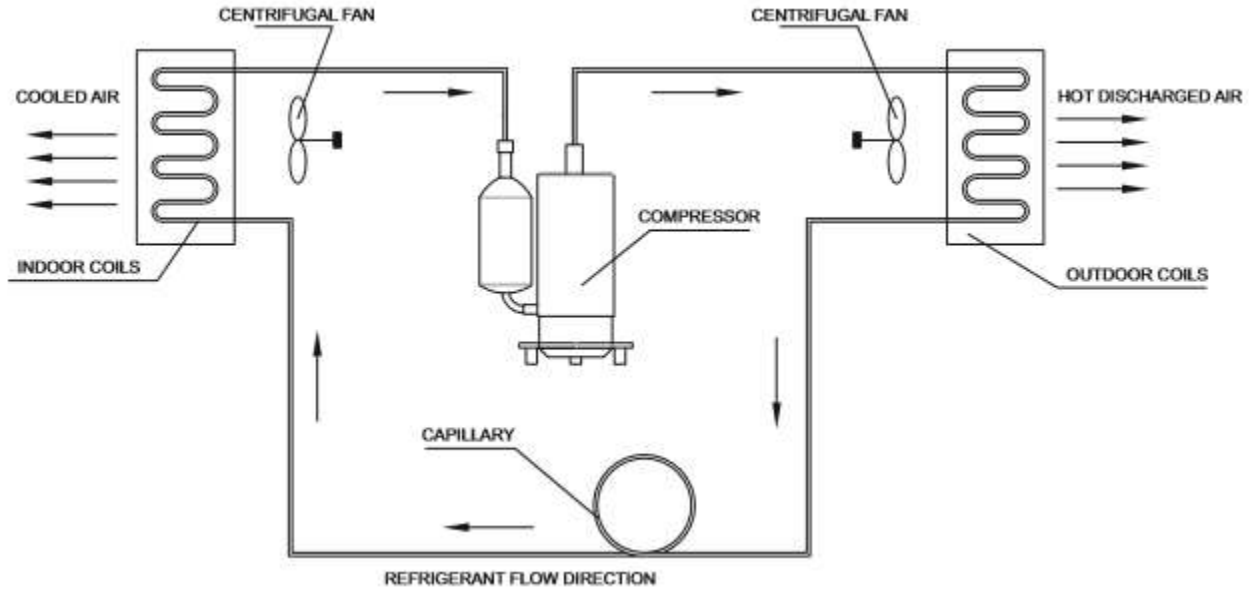
4 PCB Diagram



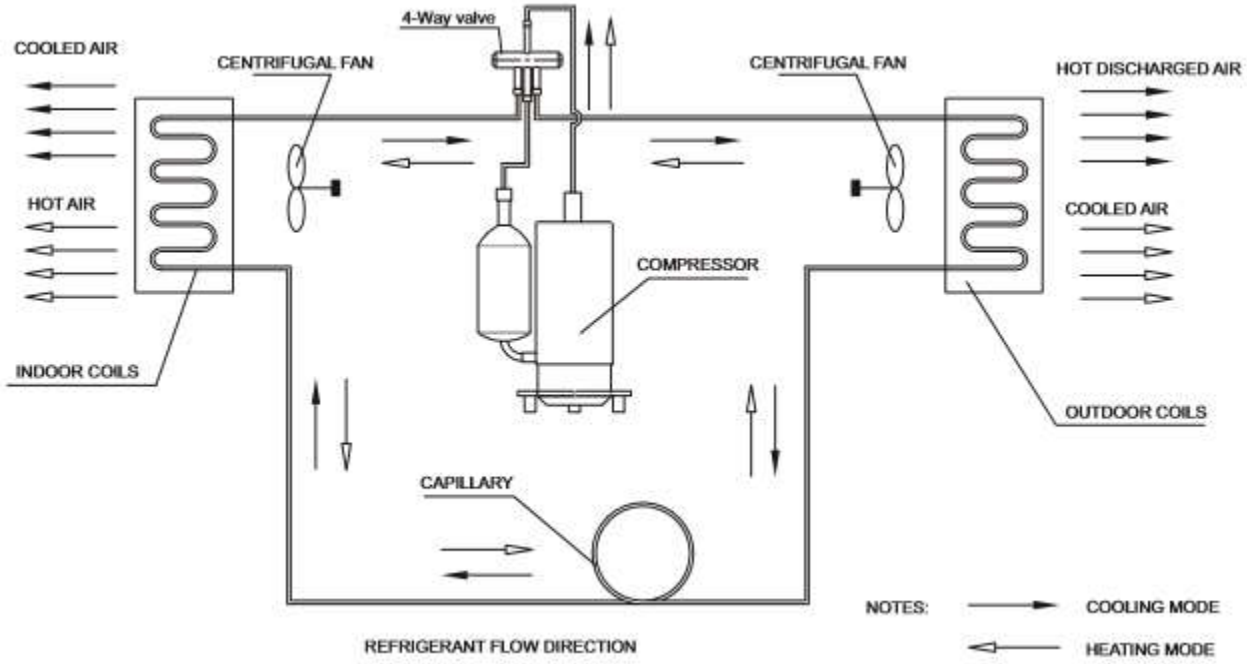
No.	Item
1	Neutral wire connectors
2	Varistor
3	Fuse
4	Compressor relay
5	Buzzer
6	Display board connectors
7	Water level switch connector
8	Condenser temperature sensor connector
9	Room/ambient temperature sensor connector
10	Frost sensor connector
11	Heater sensor connector
12	Louver/Stepping motor connector
13	Flinger/Draw water motor
14	Condenser fan connector
15	4 way valve connector
16	Evaporator fan connector

5 Refrigerant System Diagrams

5.1 AP13500G



5.2 AP13500HG



6 Modes and Operating Conditions

6.1 Cooling mode

When Tambient ≥ Tpreset +1ºC(2ºF) the unit operates in cooling mode. The compressor runs and the indoor fan operates at the set fan speed. If the indoor fan operates at high or medium speed, the outdoor fan operates at high speed. If the indoor fan operates at low fan speed, the outdoor fan operates at low speed.

When Tambient ≤ Tpreset -1ºC(2ºF) the compressor and outdoor fan stop, while the indoor fan operates at the set fan speed.

When Tpreset-1ºC(2ºF) < Tambient < Tpreset+1ºC(2ºF) the unit stays in the original operation mode.

Under cooling mode the 4-way valve is de-energized. The temperature can be set between 61 and 86ºF (16-30ºC).

6.2 Dry mode

Under this mode the set temperature and ambient temperature won't be displayed. The indoor fan operates at low fan speed. The compressor and outdoor fan operate continuously.

6.3 Heating mode (AP13500HG only)

When Tambient ≤ Tpreset+3ºC(6ºF) the unit operates in heating mode. The 4-way valve energizes, the compressor runs, and the indoor fan operates at the set fan speed. If the indoor fan operates at high or medium speed, the outdoor fan operates at high speed. If the indoor fan operates at low speed, the outdoor fan operates at low fan speed.

When Tpreset+3ºC(6ºF) < Tambient < Tpreset+5ºC(10ºF) the unit stays in the original operation mode.

When Tambient ≥ Tpreset+5ºC(10ºF) the compressor and outdoor fan stop. The 4-way valve will de-energize after the compressor has stopped for 2 minutes. The indoor fan operates to disperse any residual heat.

In heating mode the temperature can be set between 61 and 86ºF (16-30ºC).

6.4 Fan mode

In this mode the set temperature and ambient temperature won't be displayed. The indoor fan operates at the set fan speed.

6.5 Auto mode

Under auto mode standard cooling Tpreset=77ºF(25ºC); standard heating Tpreset=68ºF(20ºC)

6.5.1 AP13500G

When Tambient > 79ºF(26ºC) the unit runs in cooling mode. When Tambient < 68ºF(20ºC) the unit runs in fan mode.

If the unit is operating in fan mode and 68ºF(20ºC) ≥ Tambient ≥ 73ºF(23ºC), the unit will stay in fan mode. If the is not running in fan mode it will change to dry mode.

6.5.2 AP13500HG

When Tambient > 79ºF(26ºC) the unit runs in cooling mode. When Tambient < 68ºF(20ºC) the unit runs in heating mode.

If the unit is operating in heating mode and 73ºF(23ºC) ≥ Tambient ≥ 68ºF(20ºC), the unit will stay in heating mode. If the unit is not operating in heating mode the unit will change to dry mode.

6.6 Timer Mode

Timer ON is set with the unit OFF. The unit will turn ON when the set time is reached. The timer set range is 0.5-24hr in 30-minute increments.

Timer OFF is set with the unit ON. The unit will turn OFF when the set time is reached. The timer set range is 0.5-24hr in 30-minute increments.

6.7 Sleep Mode

Press the Sleep Button to enter sleep mode. The Sleep Mode can be activated when in Cool Mode or Heat Mode and will not operate when in Fan Mode. When operating in Cool Mode, the Sleep function will slowly raise the Temp Control by 4° Fahrenheit over the initial 2 hour Sleep Mode period. When operating in Heat Mode (AP13500HG only), the Sleep function will slowly lower the Temp Control by 4° Fahrenheit over the initial 2 hour Sleep Mode period. When the Sleep Mode is active, the LCD will continue to display the Sleep Mode status.

6.8 Freeze Prevention Mode

Under freeze prevention mode the compressor stops running and the indoor fan operates at set fan speed. After the evaporator thaws the unit will return to normal operation.

6.9 Compressor Protection Mode

If power is interrupted, the compressor will only restart after a 3 minute delay.

7 Troubleshooting

7.1 Troubleshooting Guide

Problem	Possible Cause	Solution
Unit does not turn on.	Wall plug is disconnected.	Insert plug firmly into proper wall outlet.
	House fuse blown or circuit breaker tripped.	Replace fuse with time delay type or reset circuit breaker.
	Power cord is tripped.	Press the RESET button on the power cord. If power cord is damaged replace power cord.
	Unit is turned OFF.	Turn unit ON and set to desired setting.
	Ribbon cable to control panel is disconnected.	Remove outer shell and reconnect cable.
	Loose or disconnected wiring on main PCB.	Remove outer shell. Check all connections to the PCB and reconnect any loose or disconnected leads.
	Condensate water tray is full and/or display shows H8 error code.	Drain condensate water. Make sure water level switch is operating correctly and not stuck in “full” position or being interfered with.
	Ambient temperature sensor has malfunctioned and/or display shows F1 error code.	Check sensor wiring connection on PCB. Replace sensor if defective.
Poor cooling (or heating) performance.	Room temperature is below 61ºF(16ºC) or above 86ºF(30ºC).	Cooling will not occur until room temperature rises above 61ºF(16ºC.) Heating will not occur until room temperature falls below 86ºF(30ºC).
	Fan speed is set too low.	Increase fan speed to improve air flow.
	Set temperature is too high (or too low.)	Set to a Lower (or higher) temperature.
	Filter is dirty.	Clean filter.
	Refrigerant leak. Display shows F0 error.	Find leak and repair. Recharge with refrigerant.
	Evaporator is frosted.	The unit needs to defrost and will resume normal operation after defrost mode is finished.
Unit continues to operate after water tray is full or water full protection (H8 error) occurs frequently.	Water level switch is open or short circuited.	Check water level switch connections or replace water level switch if defective.
	Water level switch is stuck in “empty” position.	Make sure water level switch is operating correctly and not stuck or being interfered with.
	Water flinger motor is defective.	Replace water flinger motor.

Fan louvers do not swing.	Wire connections faulty.	Check wire connections. Repair or tighten any broken or loose connections.
	Fan swing motor damaged.	Replace motor.
Sounds or vibration.	When unit is turned on or off the outer shell “pops” or “clicks.”	Normal sound. Outer shell is contracting or expanding and will stop after a few minutes.
	When unit is turned on or off “boiling” or “running water” is heard.	Normal sound. The cause is refrigerant flowing inside the system and will stop after a few minutes.
	Foreign objects inside the unit are interfering with fans or other moving parts.	Remove foreign objects.
	Compressor vibration.	Tighten bolts holding compressor to chassis.
Room too cold (or too hot.)	Set temperature is too low (or high.)	Adjust the set temperature.

7.2 Error Codes

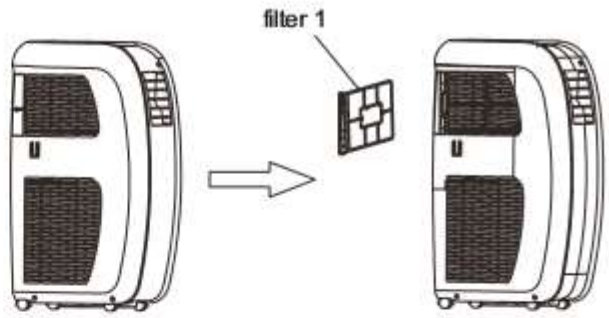
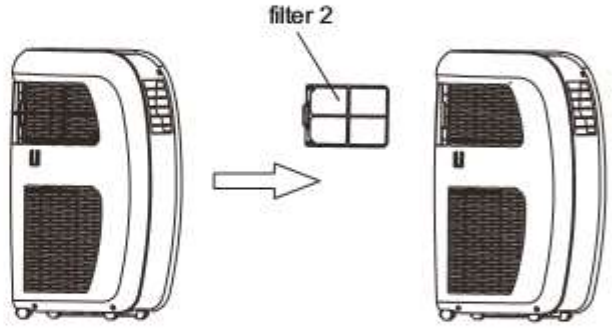
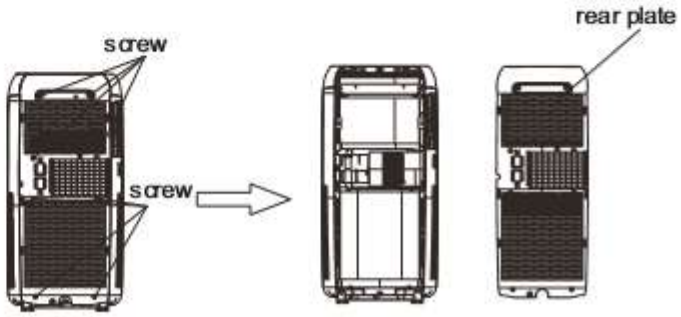
Code	LED Indication	Malfunction	Possible Causes and Solutions
F1	LED blinks once then off for 3 seconds.	Indoor ambient temperature sensor is open/short circuited.	• Sensor connection is loose or disconnected. Reconnect any loose or disconnected wires. • Sensor wire is damaged. Repair wire or replace sensor. • Sensor is defective. Replace sensor. • Main PCB is defective. Replace PCB.
F2	LED blinks twice then off for 3 seconds.	Evaporator temperature sensor is open/short circuited.	• Sensor connection is loose or disconnected. Reconnect any loose or disconnected wires. • Sensor wire is damaged. Repair wire or replace sensor. • Sensor is defective. Replace sensor. • Main PCB is defective. Replace PCB.
F4	LED blinks four times then off for 3 seconds.	Condenser temperature sensor is open/short circuited.	• Sensor connection is loose or disconnected. Reconnect any loose or disconnected wires. • Sensor wire is damaged. Repair wire or replace sensor. • Sensor is defective. Replace sensor. • Main PCB is defective. Replace PCB.

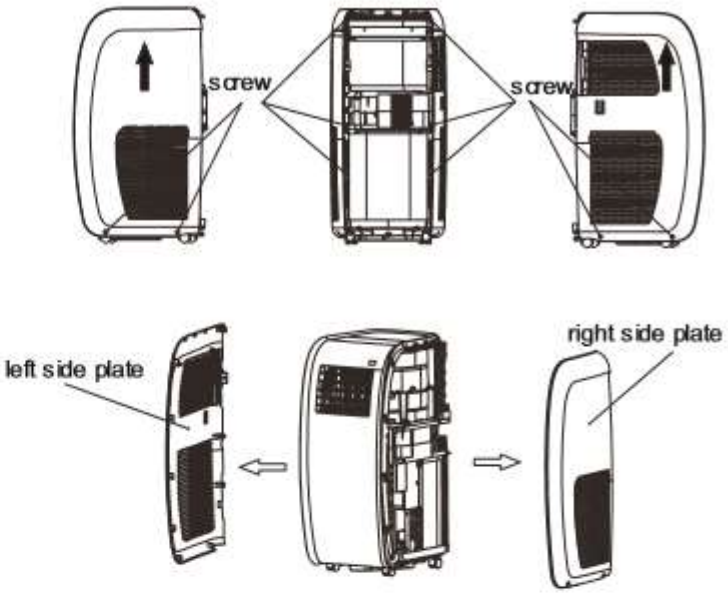
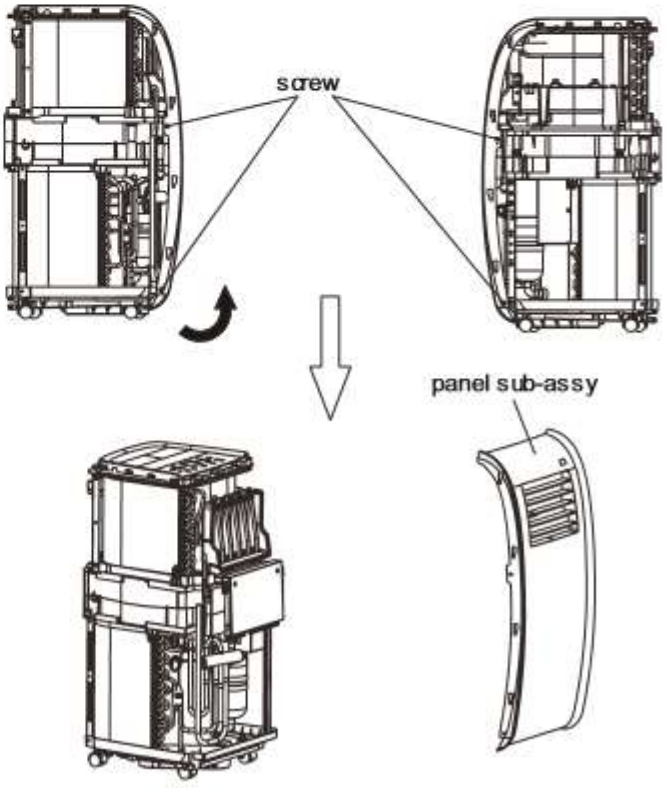
F0	NA	Low refrigerant charge due to leak or defect.	• Find leak and repair. • Recharge refrigerant.
H3	NA	Compressor overload protection.	• The coils are dirty or the air inlet or outlet is blocked. Clean coils and/or move/remove obstructions. • Fan is not running or set too low. Increase fan speed or replace fan if defective. • Compressor is defective. Replace compressor. • Refrigerant leak. Repair leak and recharge system. • Restriction in refrigeration system. Locate and clear restriction, then recharge refrigerant. • Water flinger motor defective or fly wheel obstructed. Clear obstructions, repair alignment of motor or replace if defective.
H8	LED blinks eight times then off for 3 seconds.	Condensate water overflow protection. Water reservoir is full.	• Water reservoir full. Drain water from unit. • Level switch stuck or being interfered with. Remove any obstructions from water tray and/or unstick switch. Make sure switch is free to move as water level changes. • Loose or disconnected switch wiring. Repair connections. • Level switch is defective. Replace switch. • Main PCB is defective. Replace PCB.
E5	LED blinks five times then off for 3 seconds.	Overload malfunction.	• Unstable power supply voltage or supply voltage too low. Requires certified electrician to adjust supply voltage to within proper operating parameters. • The coils are dirty or the air inlet or outlet is blocked. Clean coils and/or move/remove obstructions. • Fan is not running or set too low. Increase fan speed or replace fan if defective. • Compressor is defective. Replace compressor. • Restriction in refrigeration system. Locate and clear restriction, then recharge refrigerant.
E8	NA	Overload protection.	• The coils are dirty or the air inlet or outlet is blocked. Clean coils and/or move/remove obstructions.

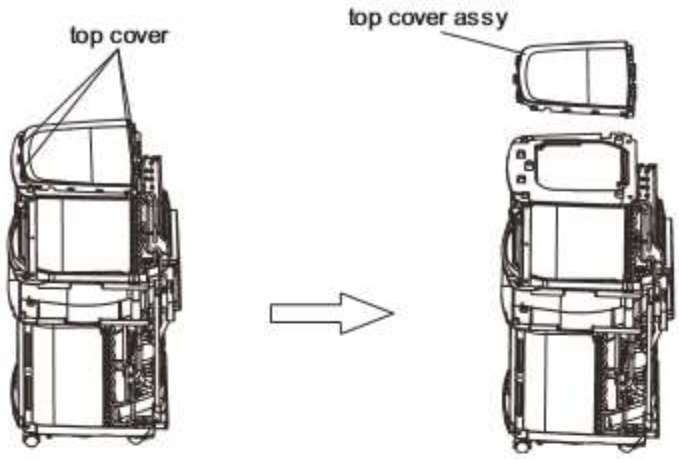
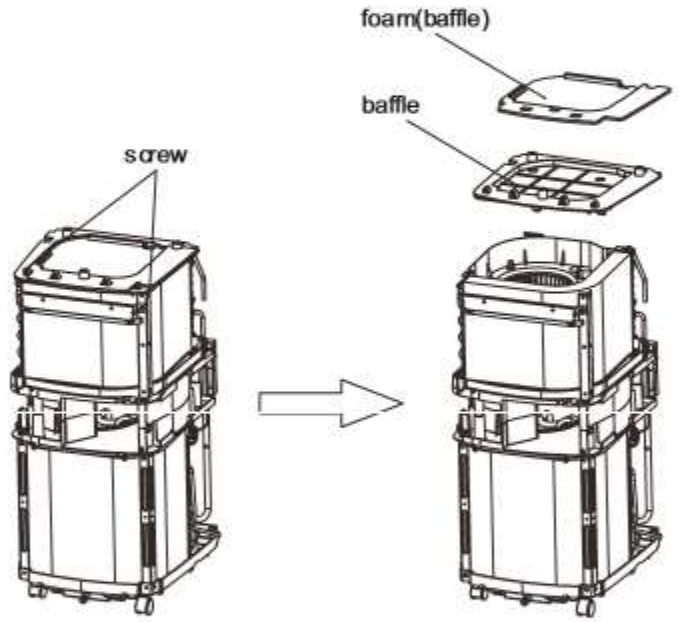
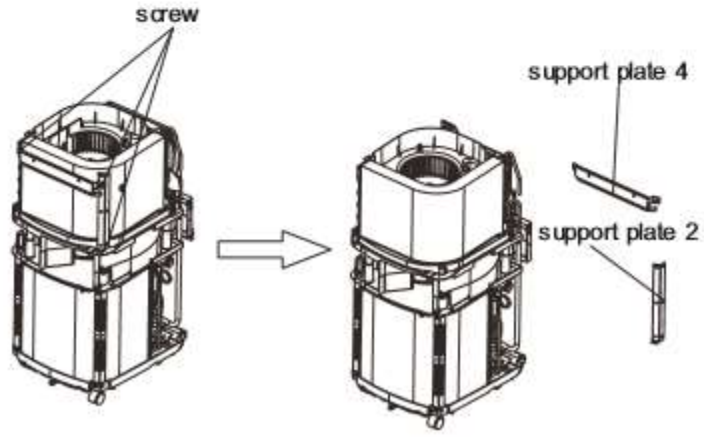
			• Fan is not running or set too low. Increase fan speed or replace fan if defective. • Compressor is defective. Replace compressor. • Restriction in refrigeration system. Locate and clear restriction, then recharge refrigerant. • Ambient temperature is extreme.

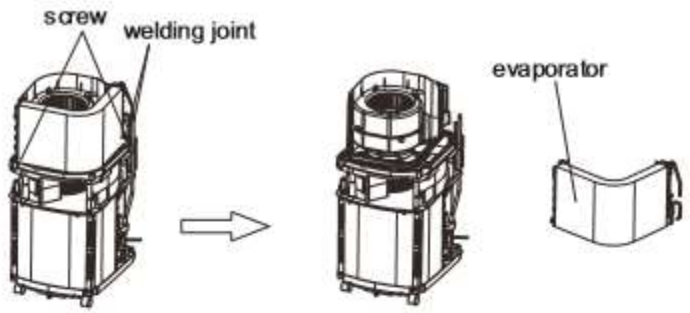
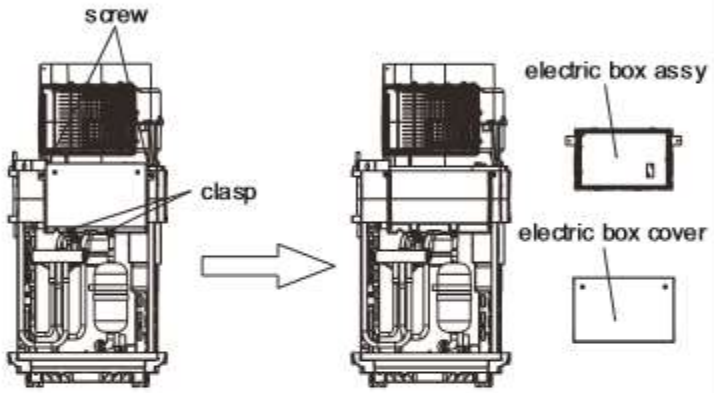
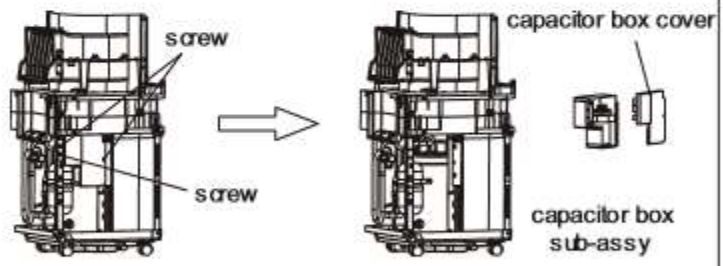
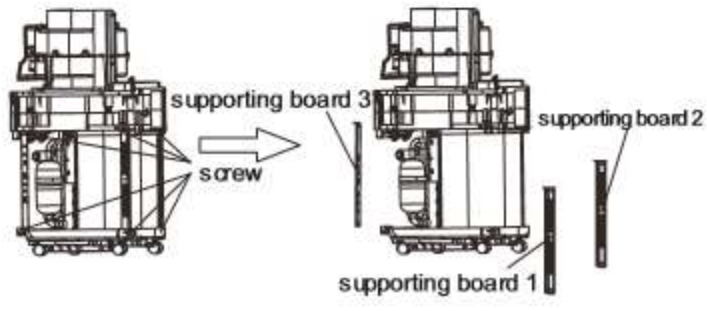
8 Unit Disassembly

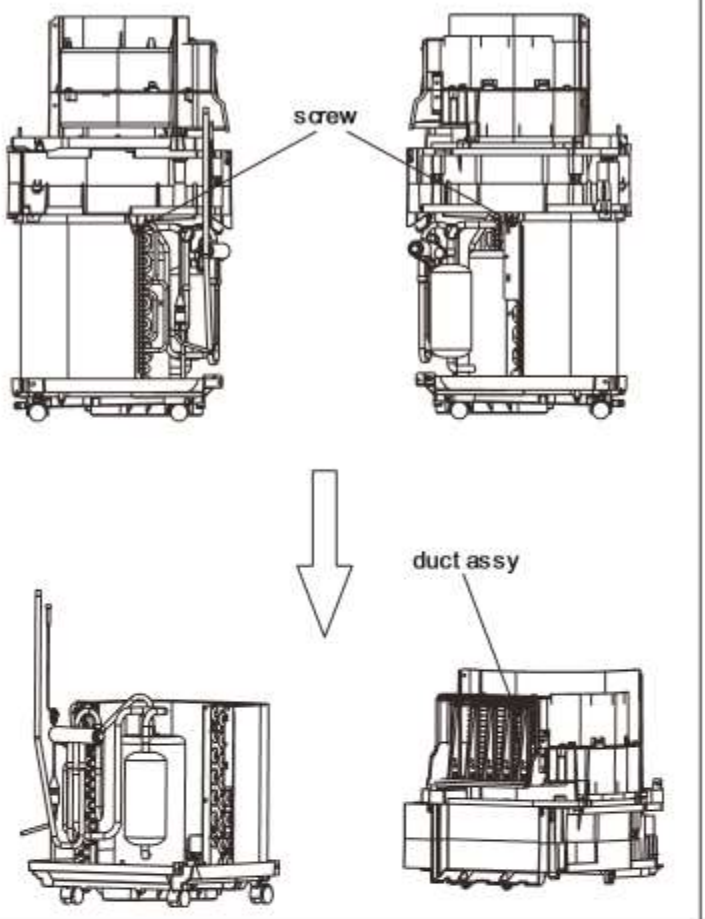
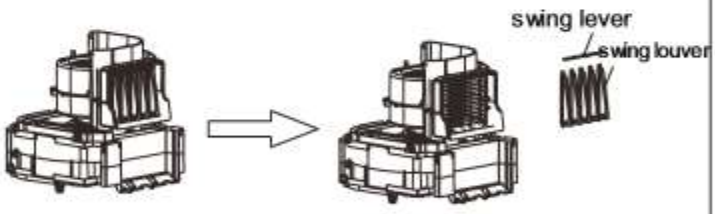
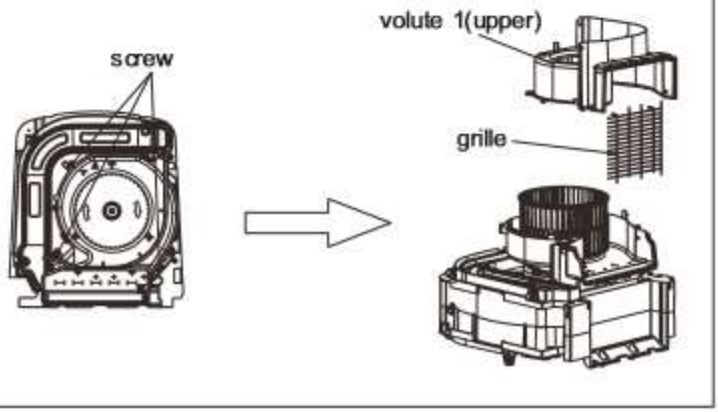
Warning: disconnect power supply before removal; discharge the refrigerant completely before unsoldering the pipes.

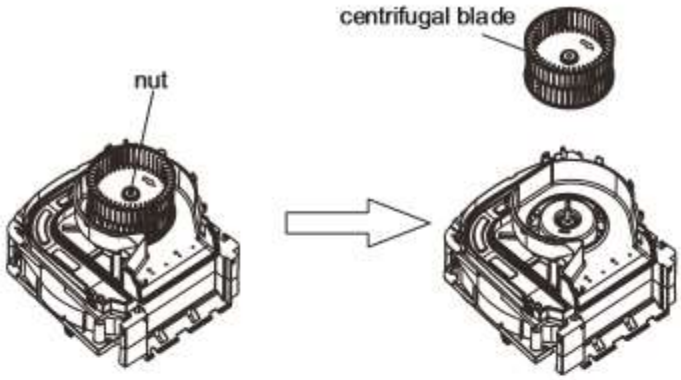
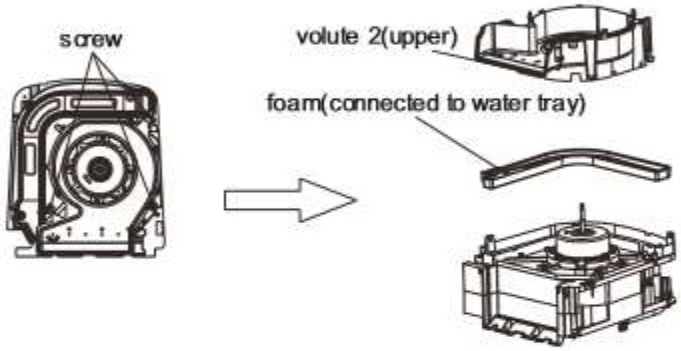
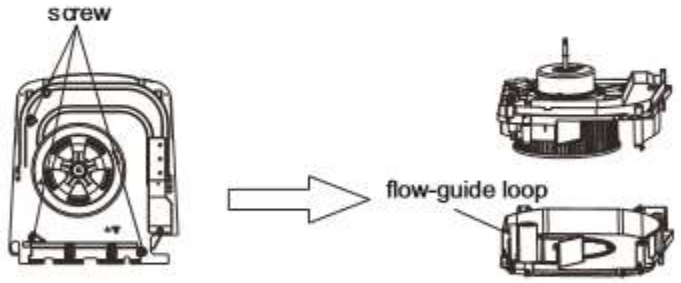
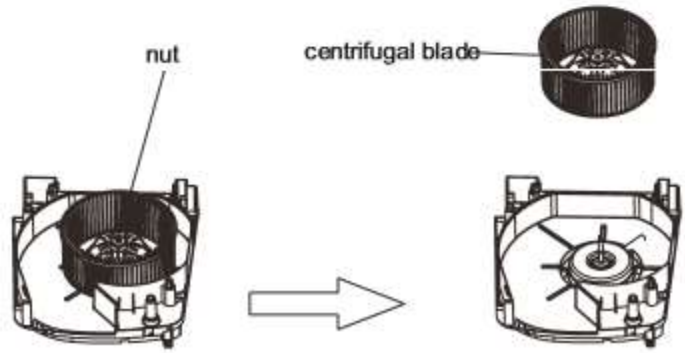
Steps	Procedure	
1. Remove filter 1		
	Pull the clasp outwards, open filter 1 and then pull it outwards to remove it.	
2. Remove filter 2		
	Hold the clasp of filter 2 and then pull it outwards to remove it.	
3. Remove rear plate		
	Remove the 8 fixing screws, push the rear plate upwards and then remove it after the clasp is separated.	

Steps	Procedure
4. Remove left side plate and right side plate	
Remove the 10 fixing screws (5 at the left side and 5 at the right side); push the side plate upwards and then remove it after the clasp is separated.	
5. Remove panel assy	
Remove the 4 fixing screws, rotate the panel upwards slightly and then remove it.	

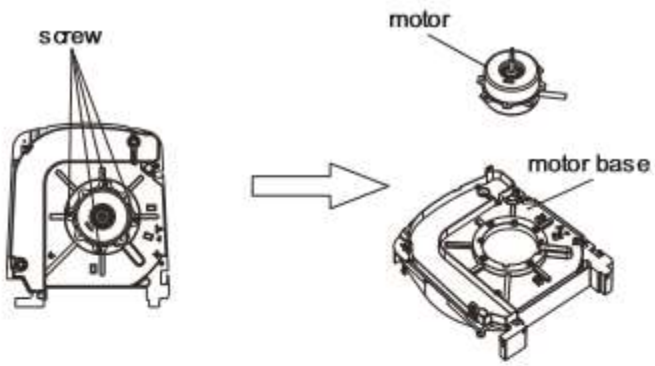
Steps	Procedure
6. Remove top cover assy Remove the 4 fixing screws and then remove the top cover assy.	
7. Remove baffle Remove the foam, remove the 5 fixing screws (3 screws are under the foam) and then remove the baffle.	
8. Remove support plate 2 and 4 Remove the 3 fixing screws and then remove supporting plate 2 and 4.	

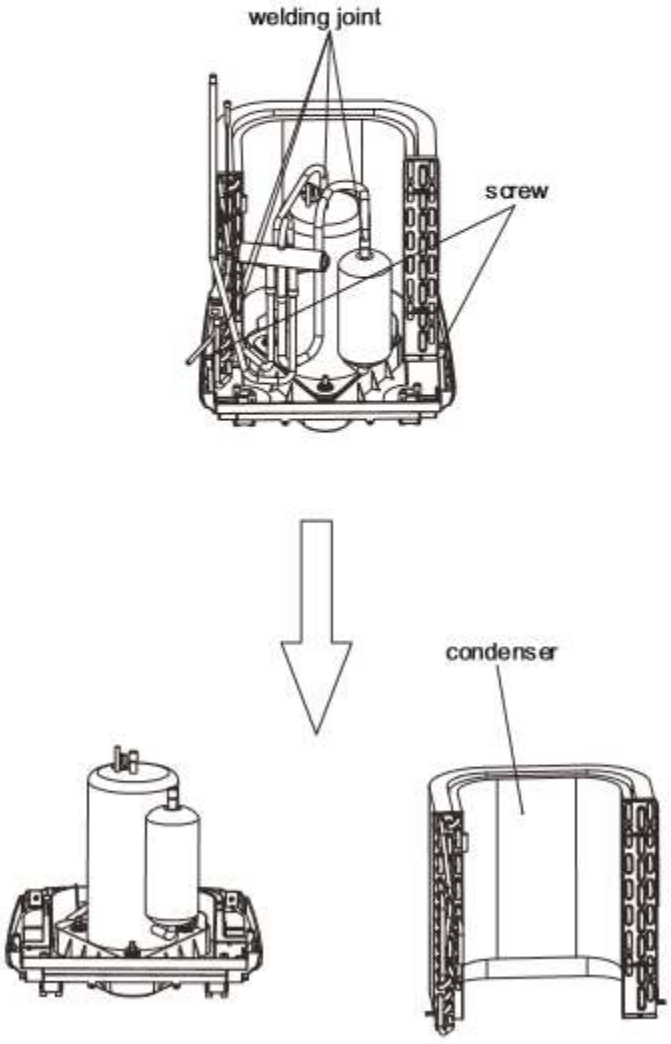
Steps	Procedure
9. Remove evaporator assy	
Unsolder the welding joint connected with the pipeline, remove the 2 fixing screws and then remove the evaporator assy.	
10. Remove electric box assy	
Pull the clasp of electric box cover outwards; remove the electric box cover; remove the connection wire on the PCB board; remove the 2 fixing screws and then remove the electric box assy.	
11. Remove capacitor box sub-assy	
Remove the 2 screws fixing the cover of capacitor box, remove the connection wire on the capacitor and then remove the cover of capacitor box; remove the 1 screw fixing the capacitor box and then remove the capacitor box sub-assy.	
12. Remove supporting board 1, 2 and 3	
Remove the 6 fixing screws to remove the supporting board 1, 2 and 3.	

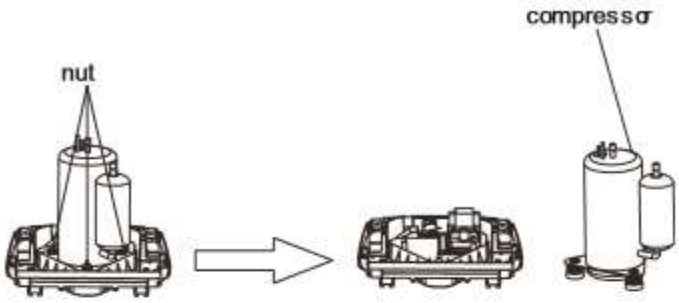
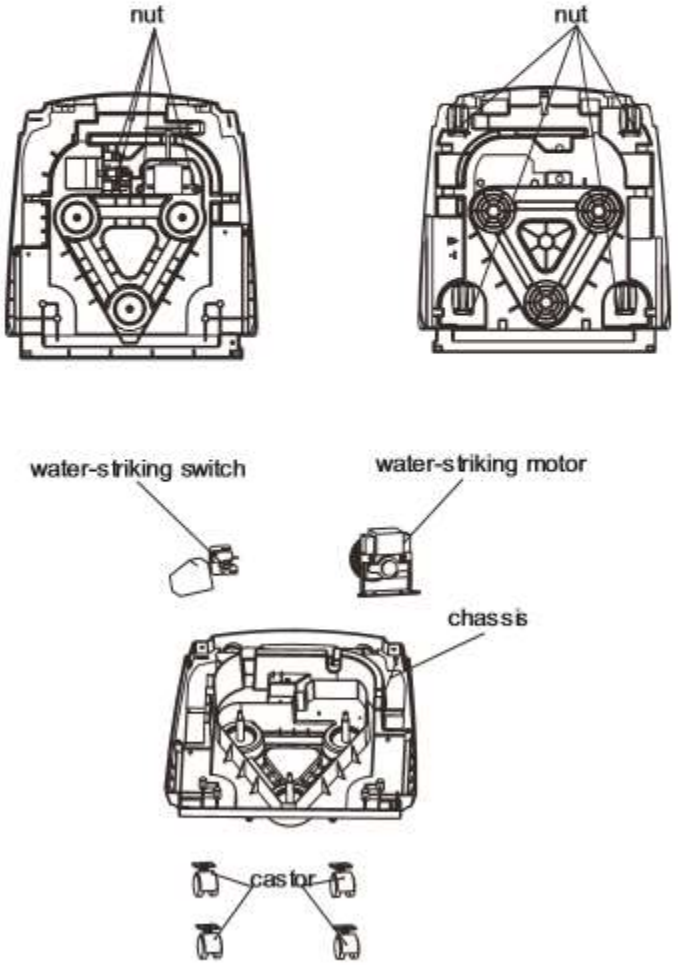
Steps	Procedure
13. Remove duct assy Remove the 2 fixing screws and then remove the duct assy.	
14. Remove swing louver and swing lever Lift the swing louver upwards; bend the swing louver to separate it from the fixing hole; remove the swing louver; pull the swing lever outwards to remove the swing lever.	
15. Remove volute 1（upper） and grille Remove the 3 fixing screws to take out the volute 1(upper); remove the 2 screws fixing the grille to remove the grille.	

Steps	Procedure
16. Remove centrifugal blade Remove the fixing nut and washer to remove the centrifugal blade.	
17. Remove volute 2(upper) Remove the 3 fixing screws to remove the volute 2(upper) and then remove the foam(connected to water tray).	
18. Remove flow-guide loop Turn the duct assy upside down and then remove the 3 fixing screws to remove the flow-guide loop.	
19. Remove centrifugal blade Remove the fixing nut and washer to remove the centrifugal blade.	

Steps	Procedure
20. Remove motor	
	Remove the 4 fixing screws to remove the motor.
21. Remove condenser assy	
	Unsolder the welding joint connected to the pipeline; remove the 2 fixing screws to remove the condenser assy and pipeline.





Steps	Procedure
22. Remove compressor	
Remove the 3 nuts fixing the compressor and lift the compressor upwards to remove it.	
23. Remove water-striking motor	
Remove the 4 screws fixing the water-striking motor and water level switch to remove the water-striking motor and water level switch; turn the chassis upside down and remove the fixing screws(two for each castors) to remove the cators.	

DATE	REVISION NOTES
04/11/2018	INITIAL DOCUMENT

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**Warranty service should be performed by an authorized service representative only.*