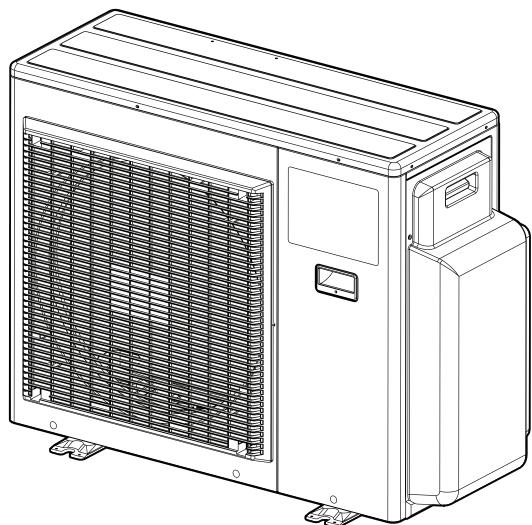


**SHARP®****SERVICE MANUAL****S1401AEX2M20RU/T****MULTI SPLIT TYPE  
ROOM AIR CONDITIONERS****OUTDOOR UNIT****MODEL AE-X2M20RU**

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.

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## SPECIFICATION

ITEMS	MODEL		INDOOR UNIT AY-XPC07PU/09PU/12PU	OUTDOOR UNIT AE-X2M20RU							
Rated cooling capacity (Min. – Max.) ☆	9K & 9K		Btu/h	19000 (7500 ~ 20000)							
Rated heating capacity (Min. –Max.) ☆	9K & 9K		Btu/h	22000 (8000 ~ 24000)							
Moisture removal (at cooling) ☆			pints/h	2.1×2							
<b>Electrical data</b>											
Phase	Single										
Rated frequency	Hz		60								
Rated voltage	V		208/230								
Rated current ☆ (Min - Max.)	Cooling	A	7.4*								
	Heating	A	8.6*								
Rated input ☆ (Min - Max.)	Cooling	W	1580 (420 ~ 1780)								
	Heating	W	1820 (510 ~ 2100)								
Power factor ☆	Cooling	%	92*								
	Heating	%	92*								
Compressor	Type	Twin rotary									
	Model	SNB172FEKMT									
	Oil Charge	type	FV50S								
		cc	700								
Refrigerant system	Evaporator	Louver Fin and Grooved tube type									
	Condenser	Corrugate Fin and Grooved tube type									
	Control	Expansion valve									
	Refrigerant	type	R410A								
		oz. (g)	64.6 (1830)								
Noise level (at cooling)	High / Soft										
	07PU	dB(A)	38/26	52							
	09PU		39/26								
	12PU		44/27								
Noise level (at heating)	07PU	dB(A)	39/28	53							
	09PU		40/28								
	12PU		43/29								
<b>Fan system</b>											
Drive	Direct drive										
Air flow quantity (at cooling)	High / Soft										
	07PU	CFM (m <sup>3</sup> /min)	332 / 198 (9.4 / 5.6)	1625 (46)							
	09PU		343 / 198 (9.7 / 5.6)								
	12PU		381 / 214 (10.8 / 6.1)								
Air flow quantity (at heating)	07PU	CFM (m <sup>3</sup> /min)	332 / 230 (9.4 / 6.5)	1555 (44)							
	09PU		343 / 230 (9.7 / 6.5)								
	12PU		408 / 244 (11.6 / 6.9)								
Fan	Cross flow fan		Propeller fan								
<b>Connections</b>											
Refrigerant coupling	Flare type										
Refrigerant tube size (Gas line)	inch (mm)		3/8 (9.52)								
Refrigerant tube size (Liquid line)	inch (mm)		1/4 (6.35)								
Minimum - Maximum length (per unit)	ft (m)		10 - 82 (3 - 25)								
Maximum length	2 units	ft (m)	164 (50)								
Maximum charge-less length		ft (m)	98 (30)								
Maximum height difference		ft (m)	49(15)								
Additional charge	oz./ft (g/m)		0.16 (15)								
Drain piping O.D.	inch (mm)		5/8 (16)								
<b>Others</b>											
Safety device	Compressor: Thermal protector										
	Fan motors: Thermal fuse										
Fuse, Micro computer control											
Air filters	Polypropylene net (Washable)										
Net dimensions (Width × Height × Depth)	07PU, 09PU, 12PU	inch (mm)	36-7/32 × 11-13/32 × 9-7/16 (920 × 290 × 240)	33-15/32 × 27-15/16 × 13 (850 × 710 × 330)							
Net weight	07PU, 09PU, 12PU	lb. (kg)	22 (10)	119 (54)							

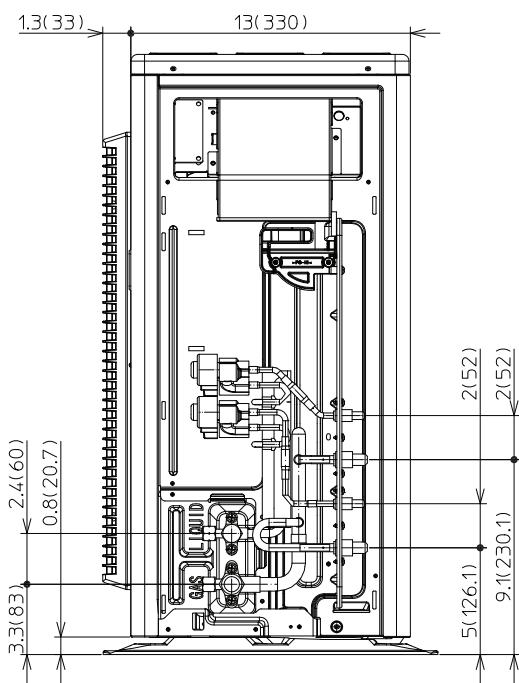
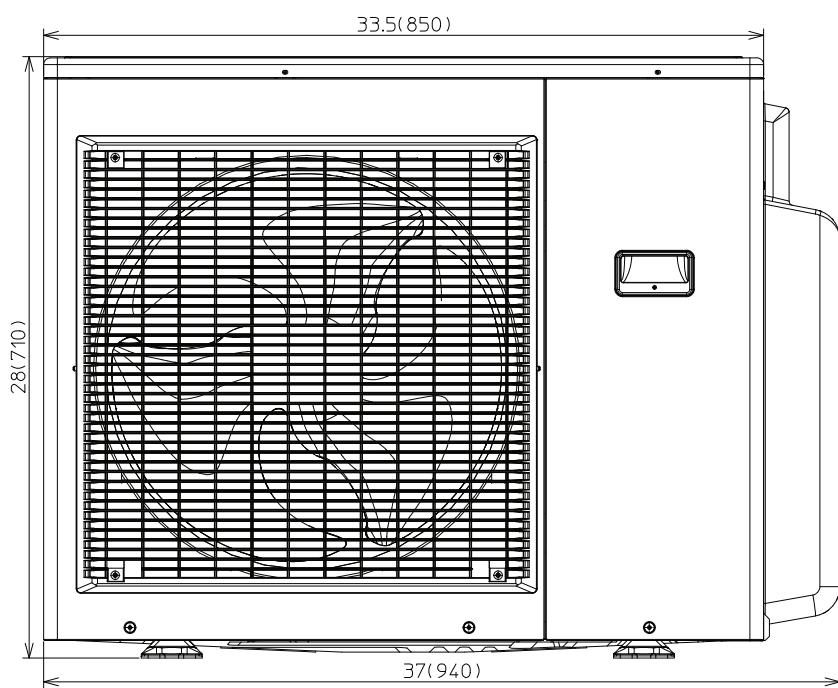
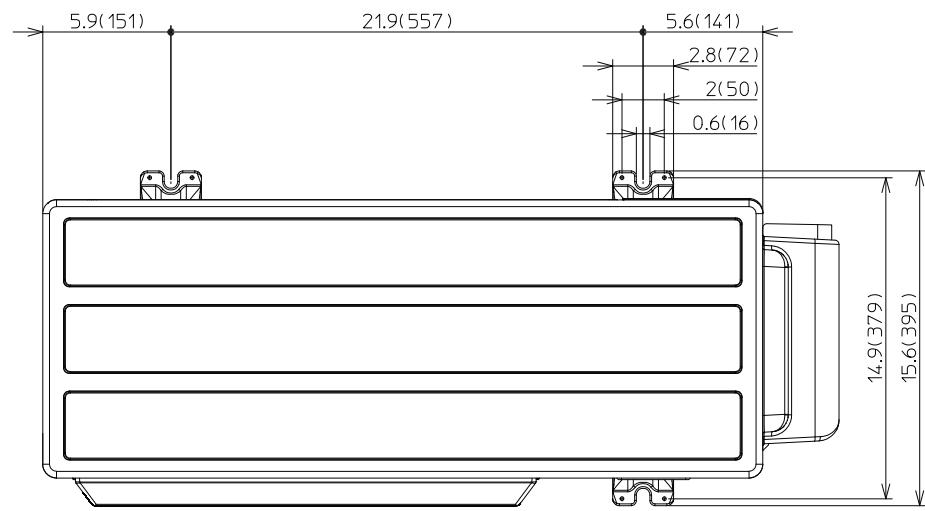
NOTE: Test conditions are based on AHRI 210/240. (Refrigerant piping length [per unit]: 25ft [7.6m]) \*: Voltage is 230V ☆ : Representative connection



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## EXTERNAL DIMENSION

Length unit: inch (mm)





## CAPACITY TABLE

### COOLING CAPACITY TABLE

Operating Status	Indoor unit combination		Cooling capacity (Btu/h)			Power input (W) Rating (Min. - Max.)	Running current (A) Rating (Min. - Max.)	
	A	B	A	B	Rating ( Min - Max )		208V	230V
2-indoor unit operation	12	12	10,000	10,000	20,000 (7,500 - 23,000 )	1,660 (420 - 2,220 )	8.6 (2.7 - 11.8 )	7.8 (2.5 - 10.7 )
	12	9	11,086	8,314	19,400 (7,500 - 22,000 )	1,610 (420 - 2,140 )	8.4 (2.7 - 11.4 )	7.6 (2.5 - 10.3 )
	12	7	12,126	7,074	19,200 (7,500 - 21,000 )	1,600 (420 - 1,820 )	8.3 (2.7 - 9.7 )	7.5 (2.5 - 8.7 )
	9	9	9,500	9,500	19,000 (7,500 - 20,000 )	1,580 (420 - 1,780 )	8.2 (2.7 - 9.5 )	7.4 (2.5 - 8.6 )
	9	7	9,563	7,438	17,000 (7,500 - 18,000 )	1,360 (420 - 1,500 )	7.1 (2.7 - 8.0 )	6.4 (2.5 - 7.2 )
	7	7	7,000	7,000	14,000 (7,500 - 16,000 )	1,040 (420 - 1,300 )	5.4 (2.7 - 6.9 )	4.9 (2.5 - 6.3 )
1-indoor unit operation	12	*	12,000	*	12,000 (5,400 - 13,000 )	1,000 (400 - 1,160 )	5.2 (2.6 - 6.2 )	4.7 (2.3 - 5.6 )
	9	*	9,000	*	9,000 (5,400 - 11,000 )	740 (400 - 840 )	3.8 (2.6 - 4.5 )	3.4 (2.3 - 4.1 )
	7	*	7,000	*	7,000 (5,400 - 9,000 )	500 ( 400 - 640 )	2.6 (2.6 - 3.4 )	2.3 (2.3 - 3.1 )

\* When connected indoor unit is not in operation.

### HEATING CAPACITY TABLE

Operating Status	Indoor unit combination		Heating capacity (Btu/h)			Power input (W) Rating (Min. - Max.)	Running current (A) Rating (Min. - Max.)	
	A	B	A	B	Rating ( Min - Max )		208V	230V
2-indoor unit operation	12	12	11,000	11,000	22,000 (8,000 - 25,500 )	1,820 (510 - 2,240 )	9.6 (3.3 - 11.5 )	8.6 (3.0 - 10.4 )
	12	9	12,571	9,429	22,000 (8,000 - 25,500 )	1,820 (510 - 2,240 )	9.6 (3.3 - 11.5 )	8.6 (3.0 - 10.4 )
	12	7	13,895	8,105	22,000 (8,000 - 24,500 )	1,820 (510 - 2,240 )	9.6 (3.3 - 11.5 )	8.6 (3.0 - 10.4 )
	9	9	11,000	11,000	22,000 (8,000 - 24,000 )	1,820 (510 - 2,100 )	9.6 (3.3 - 10.8 )	8.6 (3.0 - 9.8 )
	9	7	10,688	8,313	19,000 (8,000 - 21,000 )	1,500 (510 - 1,740 )	7.9 (3.3 - 8.9 )	7.0 (3.0 - 8.1 )
	7	7	8,500	8,500	17,000 (8,000 - 18,600 )	1,260 (510 - 1,440 )	6.6 (3.3 - 8.9 )	5.9 (3.0 - 8.1 )
1-indoor unit operation	12	*	15,400	*	15,400 (5,600 - 17,000 )	1,580 (480 - 1,820 )	8.3 (3.1 - 9.4 )	7.4 (2.8 - 8.5 )
	9	*	11,000	*	11,000 (5,600 - 13,000 )	1060 (480 - 1,320 )	5.6 (3.1 - 6.8 )	5.0 (2.8 - 6.2 )
	7	*	9,000	*	9,000 (5,600 - 10,000 )	780 ( 480 - 900 )	4.1 (3.1 - 4.7 )	3.6 (2.8 - 4.2 )

\* When connected indoor unit is not in operation.



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## ELECTRICAL PARTS

Fuse 1	-	QFS-GA091JBZZ (25A, 250V)
Fuse 2	-	QFS-GA078JBZZ (3.15A, 250V)
Fuse 3	-	QFS-GA077JBZZ (2A, 250V)
Fuse 5	-	QFS-GA090JBZZ (20A, 250V)

## CYCLE PARTS

PARTS	MODEL	TYPE	PARTS CODE
Compressor	SNB172EFKMT	17.2cc DC TWIN ROTARY 1200W	PCMPRA718JBEZ
Fan motor	RDN-280-60-8C-1	DC MOTOR 8 Poles 41W	CMOTLB560JBEZ
Refrigerant control	Expansion valve (Body)	Φ1.8	PVLVRA047JBEZ
	Expansion valve (Coil)	DC12V	RMOTSA037JBZZ
Reverse Valve	(Body)	SHF-7H-34U-P	PVLVXA081JBEZ
	(Coil)	50/60Hz 220-240V	CCIL-A185JBKZ

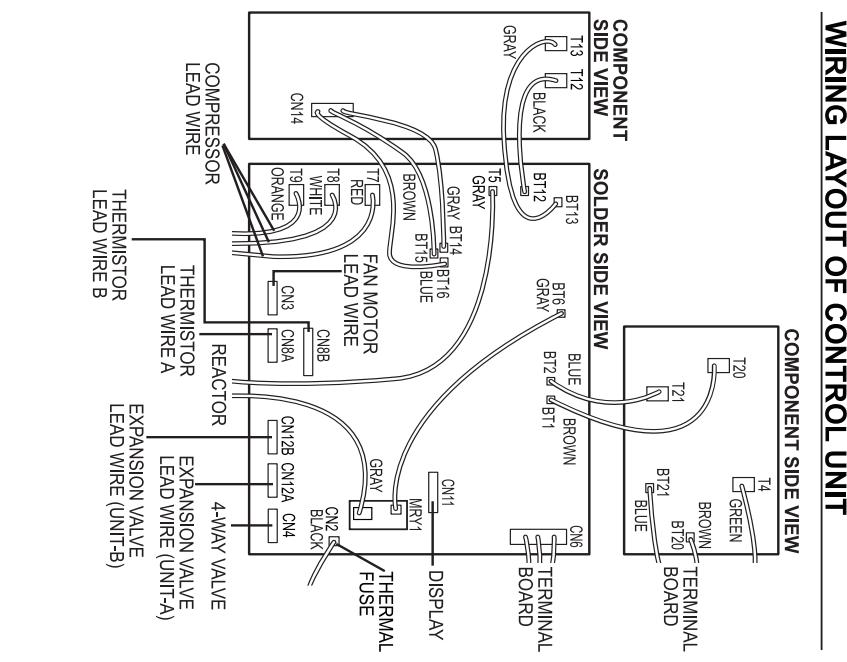
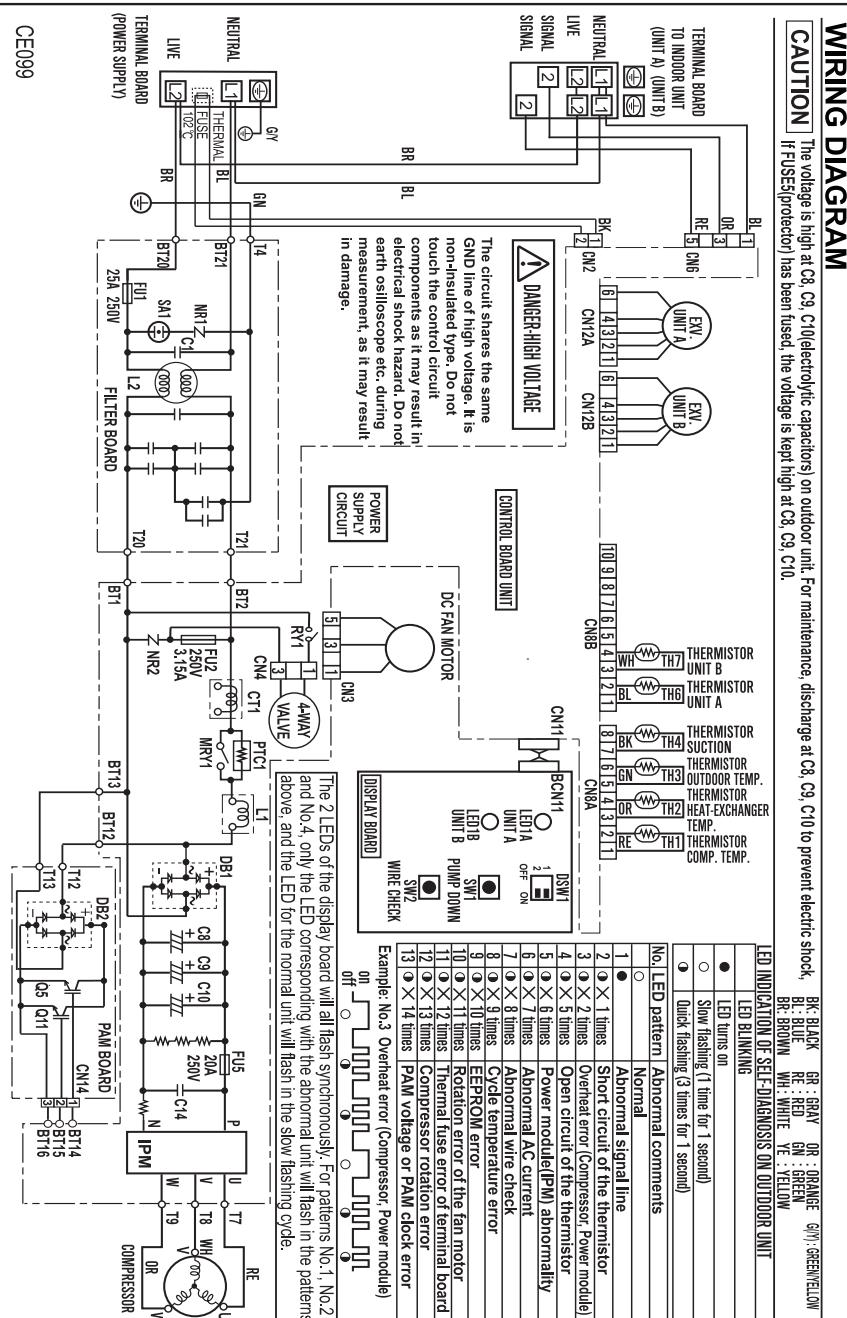


## WIRING DIAGRAM

### WIRING DIAGRAM

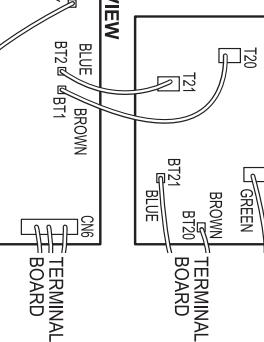
**CAUTION** The voltage is high at C8, C9, C10 (electrolytic capacitors) on outdoor unit. For maintenance, discharge at C8, C9, C10 to prevent electric shock.

If FUSE5 (protector) has been fused, the voltage is kept high at C8, C9, C10.



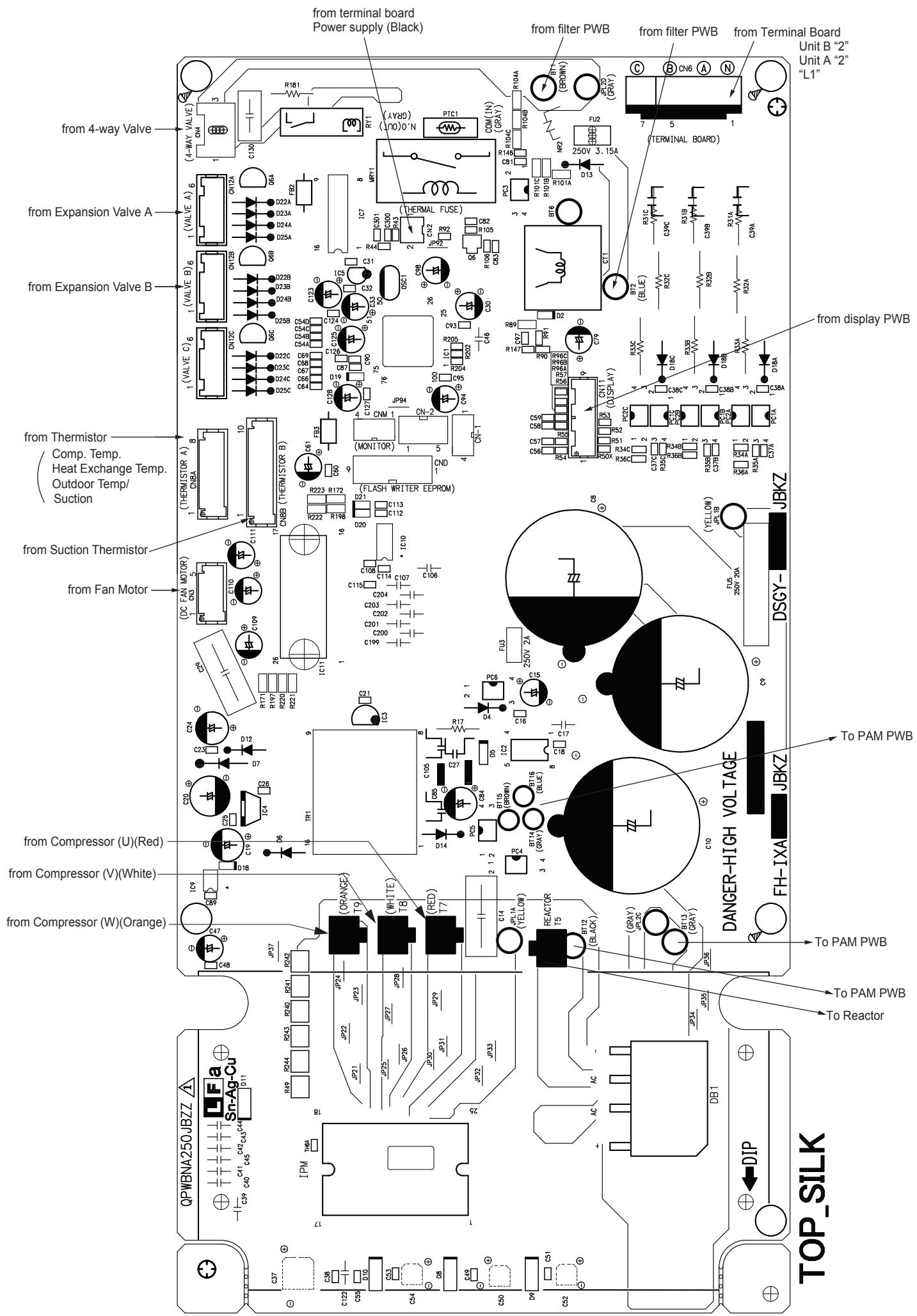
### WIRING LAYOUT OF CONTROL UNIT

#### COMPONENT SIDE VIEW





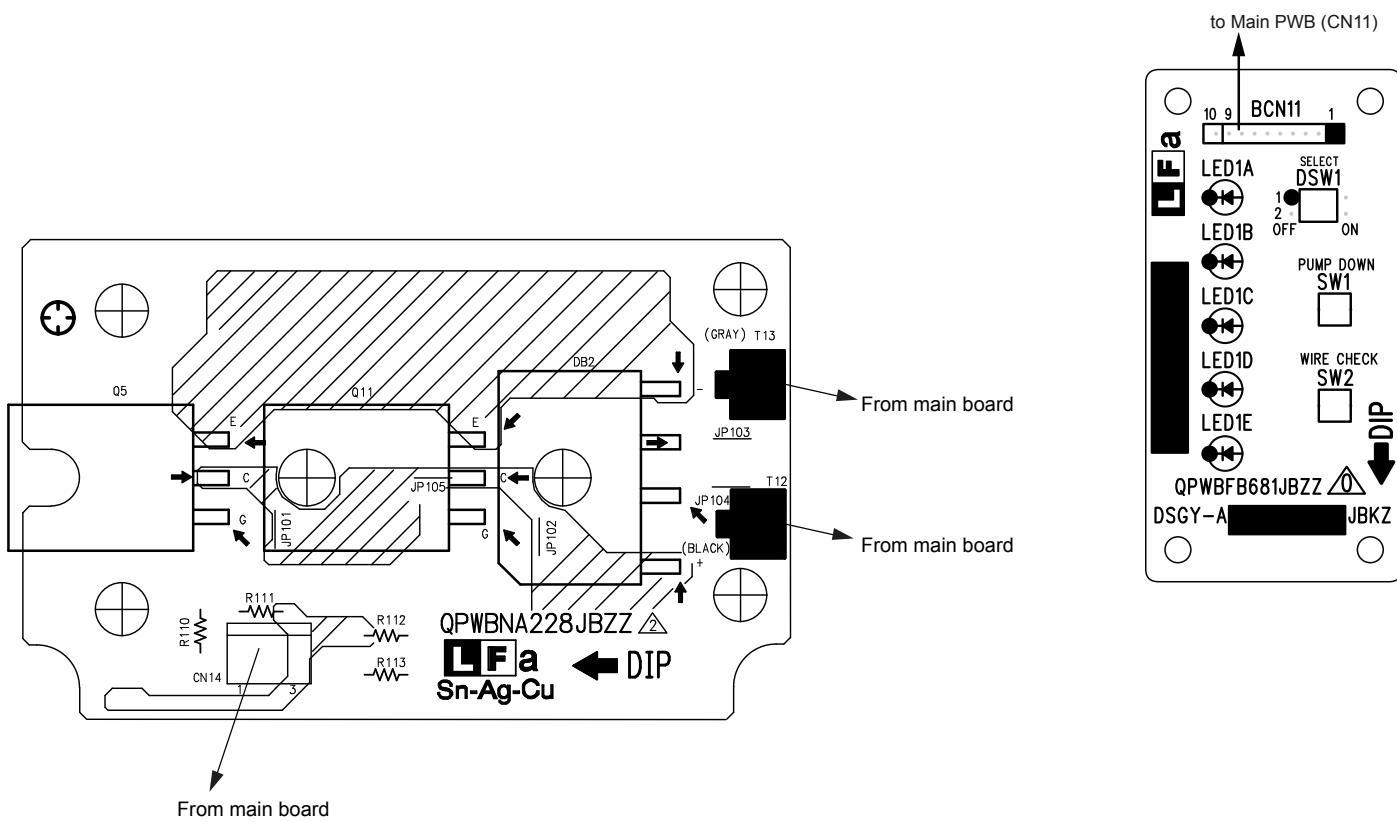
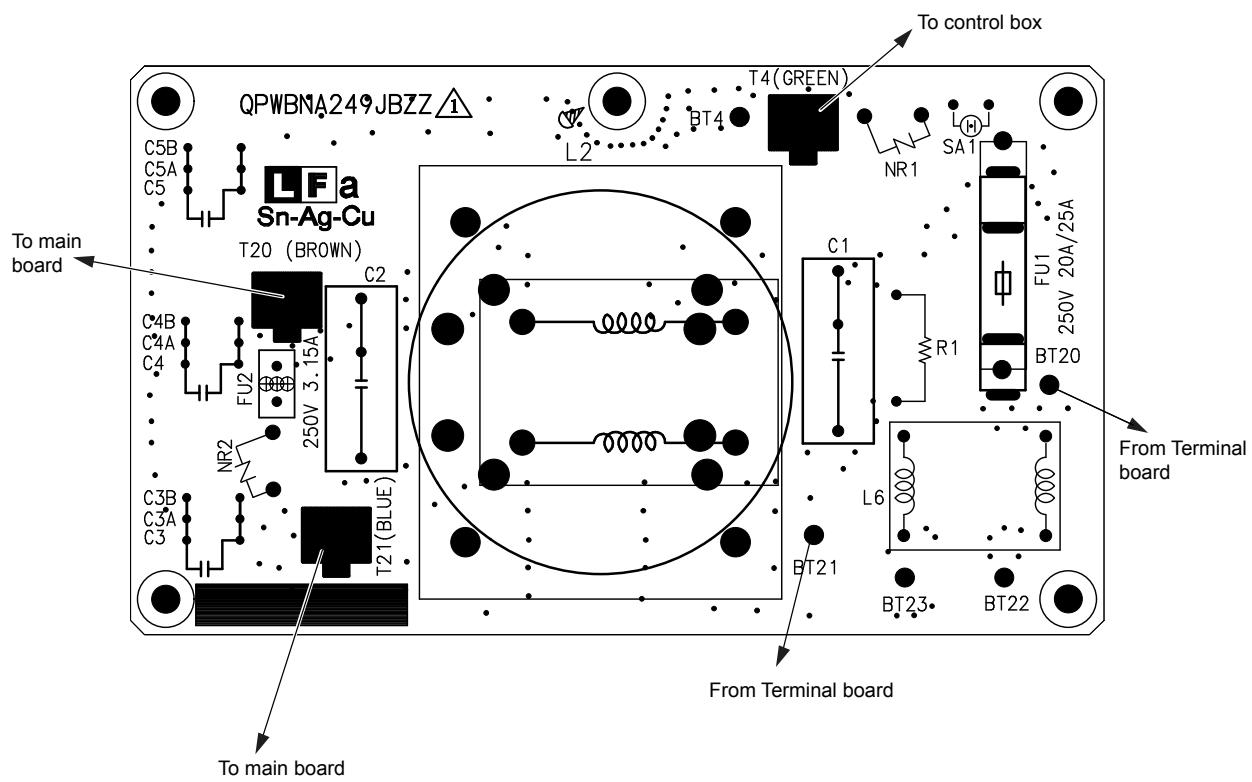
AE-X2M20RU



TOP\_SILK

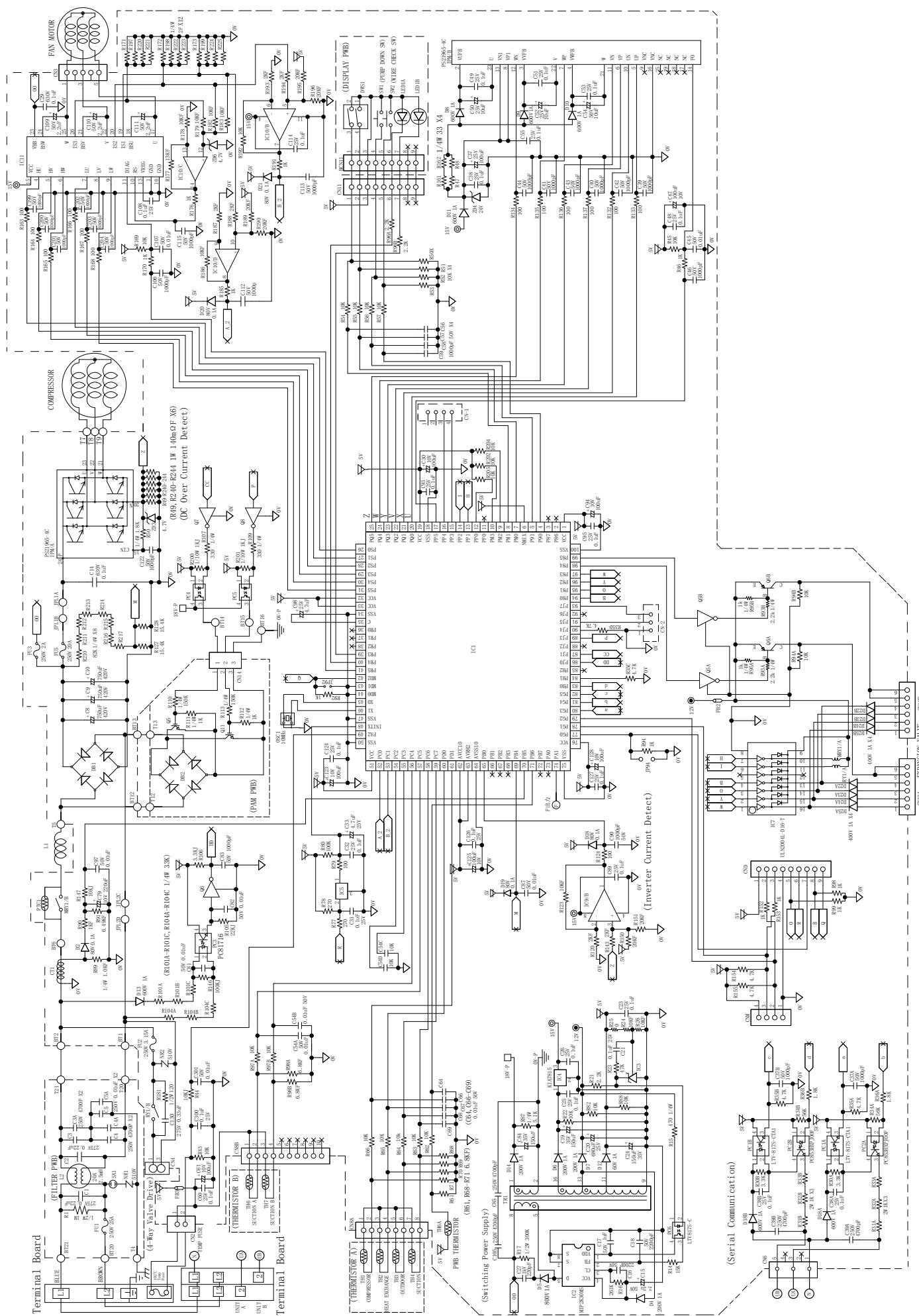


AE-X2M20RU





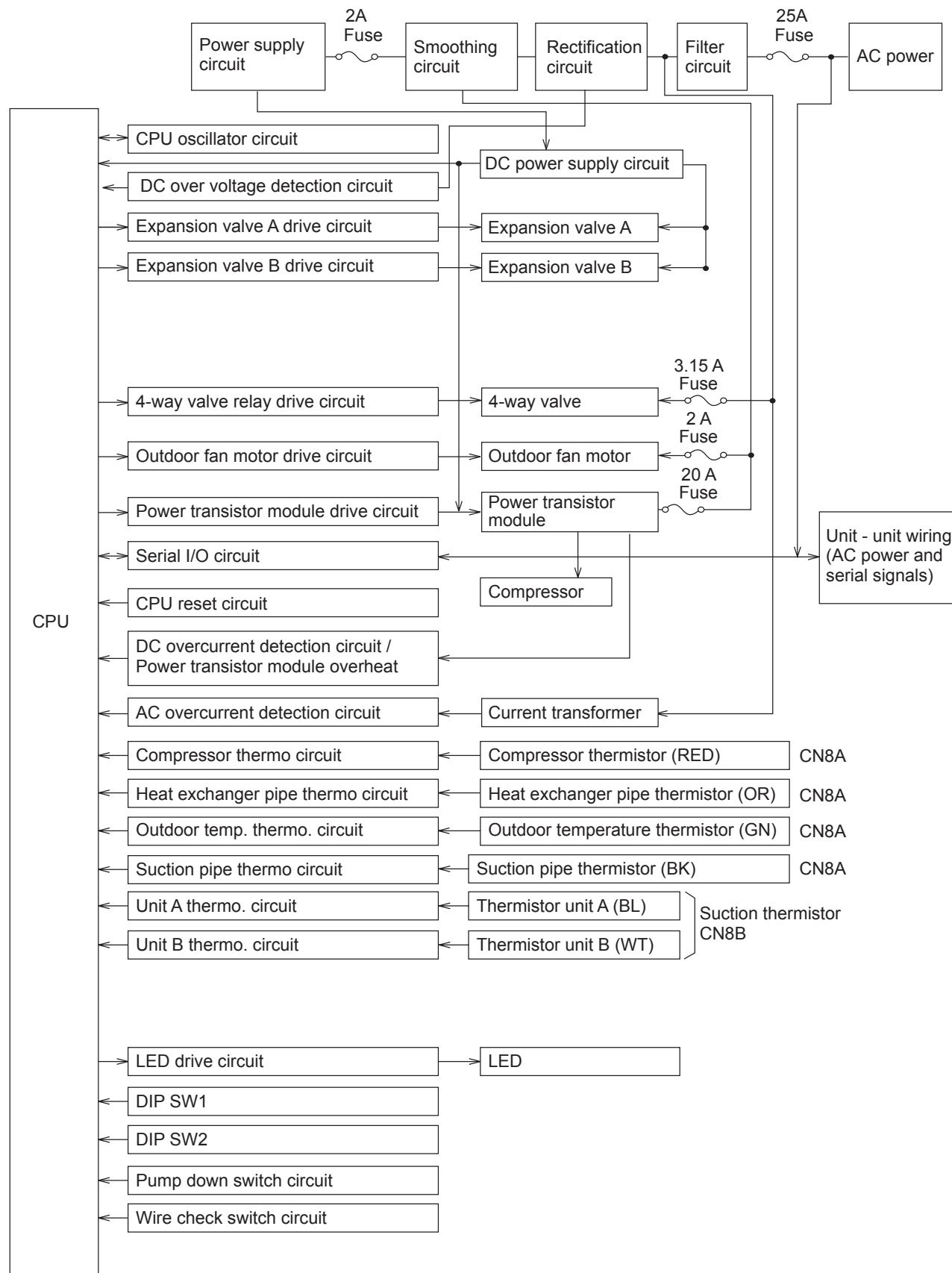
AE-X2M20RU





# EXPLANATION OF CIRCUIT AND OPERATION

## BLOCK DIAGRAM





AE-X2M20RU

## FUNCTIONS

### 1. FREQUENCY CONTROL

- 1) AC current peak control

Cooling mode	Heating mode
13.5A	13.8A

- 2) Prevention control of outdoor heat exchanger overheating

If the temperature of the outdoor heat exchanger exceeds the overheating prevention line 1 or 2 during cooling, the operating frequency is lowered by approximately 5 to 15Hz. After that, the frequency is lowered approximately 5Hz once every 60 seconds or approximately 15Hz once every 120 seconds. If the frequency is lowered to minimum frequency without the temperature of the outdoor heat exchanger decreasing and this condition lasts for 1 minute, the compressor will be stopped.

Overheating Prevention line 1	129.2°F (54°C)	Lower 5Hz once every 60 seconds
Overheating Prevention line 2	134.6°F (57°C)	Lower 15Hz once every 120 seconds

- 3) Prevention control of compressor overheating

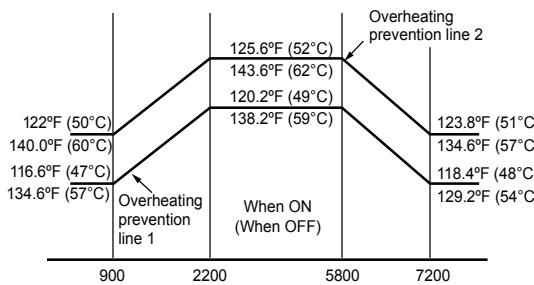
If the temperature of the compressor exceeds approximately 226.4°F (108°C), the operating frequency is lowered approximately 5Hz. After that, the frequency is lowered approximately 5Hz once every 60 seconds. When the compressor temperature drops below approximately 226.4°F (108°C), the frequency is raised approximately 5Hz once every 60 seconds, and normal operation is restored. If the frequency is lowered to minimum frequency without the temperature of the compressor decreasing, and this condition lasts for 1 minute, the compressor will be stopped.

- 4) Prevention control of indoor heat exchanger overheating

Two minutes after room several decrease If the temperature of any of indoor heat exchangers exceeds the overheating prevention line 1 or 2 during heating, the operating frequency is lowered to minimum frequency. When the temperature of all of indoor heat exchangers go below [the overheating prevention line 1 -45.5°F(-7.5°C)], the frequency is raised by approximately 5Hz once every 60 seconds, and normal operation is restored. If the condition that the frequency is minimum lasts for 2 minutes, the compressor will be stopped.

#### <When normal >

If the temperature of any of indoor heat exchangers exceeds the overheating prevention line 1 or 2 during heating, the operating frequency is lowered by approximately 5 to 15Hz. After that, the frequency is lowered approximately 5Hz once every 60 seconds or approximately 15Hz once every 90 seconds. When the temperature of all of indoor heat exchangers go below [the overheating prevention line 1 -45.5°F(-7.5°C)], the frequency is raised by approximately 5Hz once every 60 seconds, and normal operation is restored. If the condition that the frequency is minimum lasts for 2 minutes, the compressor will be stopped.



### 2. OVER CURRENT PROTECTION

DC over current detection, AC over current detection To protect against over current due to sudden change in load, the compressor is stopped if 25A DC is exceeded in the DC section. If the set value of AC current is exceeded in the AC section, the compressor is stopped. 90 seconds after the compressor has been stopped, another starting try will be made. Three retries are allowed. On the fourth retry, a complete stop request signal is sent to the indoor unit, and the outdoor unit will remain stopped until the indoor operation is stopped. DC over current is detected by the power module. AC over current is detected by CT1, on the outdoor PWB.

Cooling mode	Heating mode
18A	18A

### 3. COMPRESSOR PROTECTION CONTROL

If the temperature of the compressor exceeds 235.4°F (113°C), the compressor is stopped. In this case, the outdoor fan is not stopped until the temperature of compressor drops below 210.2°F (99°C). In 90 seconds after the compressor is stopped, if the temperature is below 194°F (90°C), another starting try will be made. Three retries are allowed. On the fourth retry, a complete stop request signal is sent to the indoor unit, and the outdoor unit will remain stopped until the indoor operation is stopped.

### 4. POWER TRANSISTOR MODULE PROTECTION

If the temperature of the chips in the power transistor module exceeds 212°F (100°C), the compressor is stopped. In this case, the outdoor fan is not stopped until the temperature of power module drops below 185°F (85°C). In 90 seconds after the compressor is stopped, if the temperature is below 185°F (85°C), another starting try will be made. Three retries are allowed. On the fourth retry, a complete stop request signal is sent to the indoor unit, and the outdoor unit will remain stopped until the indoor operation is stopped.



## 5. SERIAL SIGNALS

Serial signals consist of all 96-bit signals. If the condition as outdoor unit unable to receive a serial signal from the indoor unit continues for 30 seconds, it closes the expansion valve which corresponds to the room which can not be communicated. If all indoor units can not communicate with the outdoor unit, the compressor is stopped.

## 6. THERMISTOR OPEN OR SHORT

When compressor, heat exchanger, outdoor thermistor, suction thermistor (CN8A) are in OPEN or SHORT condition, even if they are in the condition which an operation signal is transmitted from indoors, the compressor will not start. If any suction thermistors (CN8B) become OPEN or SHORT resistance, the protective procedure will work only for the cycle corresponding to the malfunctioning suction thermistor.

## 7. MISWIRING CHECK

"Mis-wiring check" is conducted by detecting the indoor heat exchanger temp. For example, when the expansion valve for only room A is open, and the wiring is correct, the indoor heat exchanger temp for room A will reduce. If the wiring is incorrect, the indoor heat exchanger temp for a different room will reduce.

## 8. SAFETY TIME

When the unit is operated by the remote control after the breaker is turned on, the safety device of the compressor will work and the compressor will not operate for 90 seconds.

## 9. PUMP DOWN SWITCH

When the PUMP DOWN SWITCH (SW1) is pressed for 5 seconds or more, the total A/C system will start its PUMP DOWN automatically and the compressor frequency will be 40 Hz.

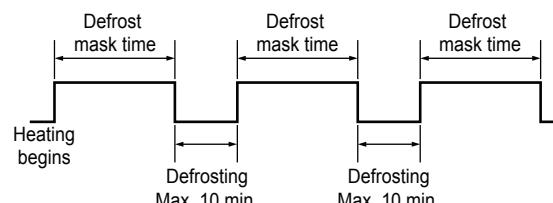
## 10. CONTROL OF COMPRESSOR AND EXPANSION VALVE

For 90 seconds after turning on the AC power, the compressor will not be activated even if indoor units request the compressor to do so. If the compressor receives a request from one or more indoor units after 90 seconds have passed, it will be turned on and the expansion valve corresponding to the requesting indoor unit will be opened. When the indoor unit of a room requests for the cooling operation to the outdoor unit and it runs responding to the request, requests for the heating can't be accepted if the indoor units in other rooms send individual requests. If the indoor unit in another room sends a request for the heating operation, the operation lamp and timer lamp of the indoor unit in that room start flashing in turn to inform that the unit is in the standby mode. If the operation in one room is stopped while the indoor unit in another room is in the stand-by mode, the operation mode requested by the indoor unit which is now in the stand-by mode will be accepted. At this time, the compressor will be temporarily stopped to switch the four-way valve and restart after 90 seconds. During the cooling or dry operation, the expansion valve corresponding to the indoor unit that is not running is closed. Therefore, the refrigerant will not flow into those units. However, if the heating operation is in progress, it is possible that it flows into indoor units which are out of operation depending on the cycle conditions. As a result, the indoor exchanger may be heated up even if it is not activated. This is not abnormal. When the operations in all rooms are stopped, the compressor is off and the expansion valves in all rooms are fully opened.

## 11. DEFROST OPERATION

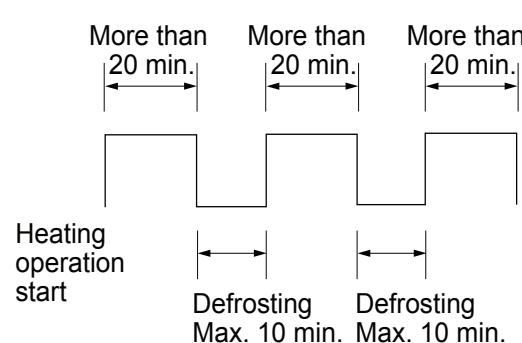
### 1) Overview

Defrosting begins during heating if the conditions for compressor operation time and outdoor heat exchanger temperature are met. When defrosting begins, the indoor and outdoor fans stop. Defrosting stops when the temperature of the outdoor heat exchanger goes above approximately 73.4°F (23°C) or defrosting time exceeds 10 minutes.



### 2) Defrosting

If the compressor operation time is more than 20 minutes in the heating mode and the outdoor air temperature and outdoor heat exchange temperature satisfy the defrosting conditions, the defrosting operation is started. When the defrosting operation is started, the indoor fan starts to run intermittently. When the outdoor heat exchanger temperature reaches approx. 73.4°F (23°C) or above or when the defrosting time exceeds 10 minutes, the defrosting operation is quit.





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### 3) During defrosting

When defrosting begins, the compressor stops. Approximately 1 minutes later, the compressor reactivates in the refrigeration cycle, and the outdoor heat exchanger is defrosted. Each mode is as follows:

The outdoor fan is stopped.

The operating frequency is as shown in the table below.

The indoor fan is stopped.

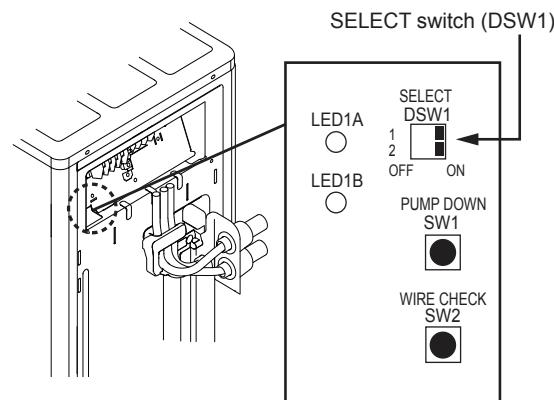
All expansion valve are open.      for 5 minutes 3600 rpm  
    after that 3000 rpm

### 4) Defrost stop

When defrosting time exceeds 10 minutes When the temperature of the outdoor heat exchanger rises above approximately 73.4°F (23°C) Defrost stop is determined by either of the above conditions, and the compressor is stopped. At the same time, the outdoor fan go ON. The compressor is reactivated in the heating cycle 1 minutes after it was stopped, and normal control resumes.

## 12.5°F(-15°C) AUTO STOP FUNCTION

- During the heating operation, the unit will automatically stop when the outdoor temperature drops below 5°F(-15°C) to prevent the outdoor unit from the damage caused by the freezing of the drained water. The unit will stop its operation for 5 hour and then resume the operation when the outdoor temperature rises above 7°F(-13.9°C).
- To inactivate this function, slide the SELECT switch(DSW1) #1 to OFF side.

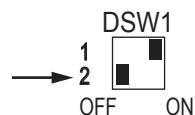


## 13. Preheat

When heating is stopped, applying a small amount of voltage to the compressor to make heating start more quickly.

The preheat function will active according to outdoor temperature and compressor temperature.

To inactivate this function, slide the SELECT switch (DSW1) #2 to OFF side.





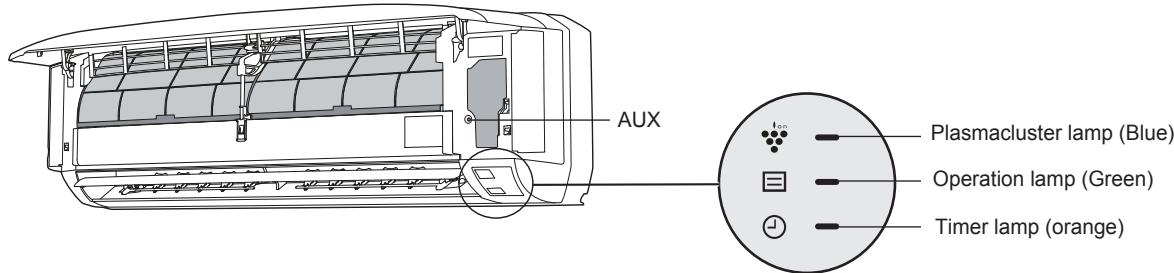
# TROUBLE SHOOTING GUIDE

## SELF-DIAGNOSIS FUNCTION

**NOTE: WHEN TURN ON THE POWER SUPPLY AGAIN, WAIT MORE THAN 10 MINUTES AFTER TURN OFF TO PREVENT ELECTRIC SHOCK.**

### Indoor unit

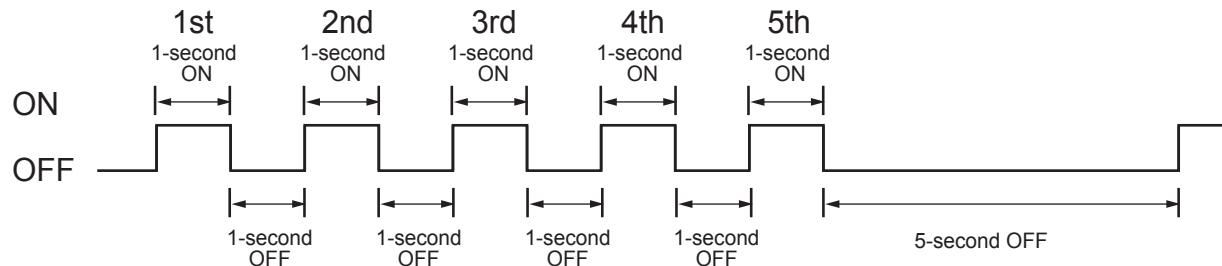
- To display the self-diagnosis, hold down the AUX button for over 5 seconds on the indoor unit when the indoor unit is not operating.
- The operation lamp (green), timer lamp (orange) and Plasmacluster lamp (blue) flash to indicate the information of malfunction.
- If the power cord is unplugged or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



### <Display of self-diagnosis result>

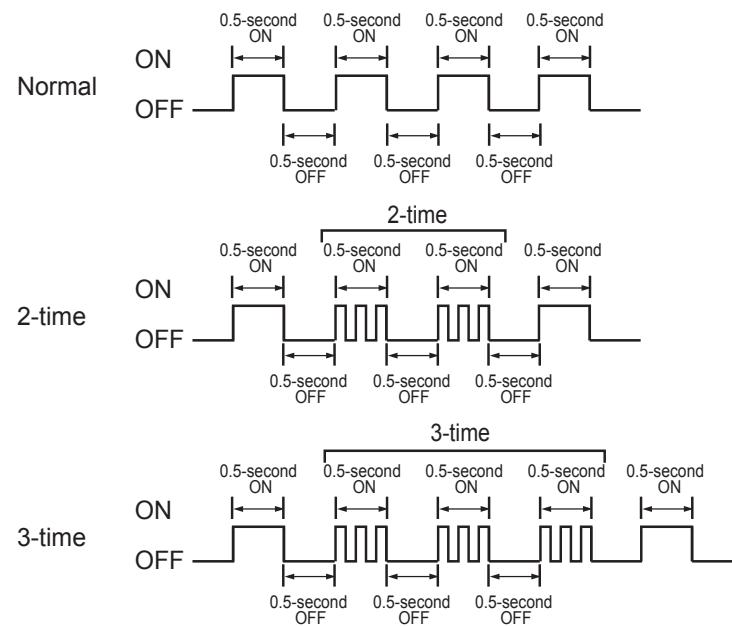
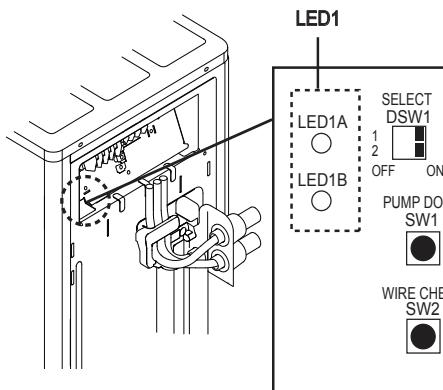
The operation lamp (green) and the Plasmacluster lamp (blue) flash in synchronization with the timer lamp (orange).

Timer lamp (1 cycle)



### Outdoor unit

- The self-diagnosis is indicated the error information by flashing LED1 on the outdoor unit.
- The self-diagnosis of outdoor unit is displayed for about 3-10 minutes. Then, the LED1 returns to normal display.





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&lt;INDOOR UNIT&gt; ○:1-second ON / 1-second OFF

Problem symptom	Outdoor unit indication (LED1)	Indoor unit		Malfunction No.*		Content of diagnosis		Check point	Action
		→	Lamp	Main	Sub	Main	Sub		
Normal condition	Normal blinking	O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)	0	0	Normal			
Indoor and outdoor units do not operate.	1 time	O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)	1 1 2 3	0	Outdoor unit thermistor short-circuit Outdoor temperature thermistor short circuit error Suction thermistor short circuit error Suction thermistor (for unit A, B) short circuit error	1) Measure the resistance of the outdoor unit thermistors. (TH2-4, 6-7: Approx. 4.4kΩ at 77°F(25°C)) 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.	
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
Indoor and outdoor units do not operate.	2 time	O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)	2 1 2 3 4 5 7	0	Cycle temperature	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. (TH1:Approx.50kΩ at 77°F(25°C)) 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 O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
Indoor unit operates. Outdoor unit does not operate temporarily	3 time	O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)	3	0	Temporary stop	Temporary stop due to low temperature of out door	(Temporary stop for cycle protection)	If the temperature of outdoor is not lower than 5°F(-15°C), check the outdoor temp. thermistor.
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
Indoor and outdoor units do not operate.	5-time	O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)	5 1 2 3 4 5	0	Outdoor unit thermistor open-circuit	1) Check connector CN8A and CN8B of the outdoor unit thermistor for secure installation. 2) Measure resistance of outdoor thermistors TH1- 4, 6-7. 3) Check the lead wires of thermistors TH1- 4, 6-7 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 O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						
		O O O O O	Timer (Orange) Operation (green) Plasmacluster (blue)						



Problem symptom	Outdoor unit indication (LED1)	Indoor unit		Malfunction No.*	Content of diagnosis		Check point	Action	
		→	Lamp		Main	Sub			
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 O	Operation (green)				IPM pin level error		
Indoor and outdoor units do not operate.	7-time	Plasmacluster (blue)		7	0	Outdoor unit AC Current		Check the IPM is attached correctly to the outdoor unit IPM PWB.	
		O O O O O	Timer (Orange)						
		O O O	Operation (green)					Replace the outdoor unit IPM PWB assembly.	
		Plasmacluster (blue)							
		O O O O O	Timer (Orange)		1			1) Ensure unobstructed air flow from the outdoor unit air outlet.	
		O O O	Operation (green)						
		Plasmacluster (blue)						2) Check the outdoor unit fan motor.	
		O O O O O	Timer (Orange)		2				
		O O O	Operation (green)					1) Replace the outdoor unit IPM PWB	
		Plasmacluster (blue)							
		O O O O O	Timer (Orange)	3	3	AC maximum current error		1) Ensure unobstructed air flow from the outdoor unit air outlet.	
		O O O	Operation (green)						
		Plasmacluster (blue)						2) Check the outdoor unit fan motor.	
Indoor and outdoor units do not operate.	8-time	O O O O O	Timer (Orange)	8	0	Abnormal wire check	AC current deficiency error	1) Replace the outdoor unit control PCB assembly.	
		O	Operation (green)						
		Plasmacluster (blue)							
Indoor and outdoor units do not operate.	9-time	O O O O O	Timer (Orange)	9	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.	
		O	Operation (green)						
		Plasmacluster (blue)							
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	Operation (green)						
		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 assembly.	
		O	Operation (green)						
		Plasmacluster (blue)							
		O O O O O	Timer (Orange)		1	Outdoor unit DC fan drive IC error		1) Replace the outdoor unit control PWB assembly. 2) Replace the outdoor unit fan.	
		O	Operation (green)						
		Plasmacluster (blue)							
					2	Outdoor unit DC fan lock error		1) Replace the outdoor unit control PWB assembly. 2) Replace the outdoor unit fan.	
		O O O O O	Timer (Orange)						
		O	Operation (green)		3	Detection error of DC fan negative rotation before compressor is driven		(Temporary stop for DC fan circuit protection) - Replace the outdoor unit control PWB assembly.	
		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)						
		Plasmacluster (blue)			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).	



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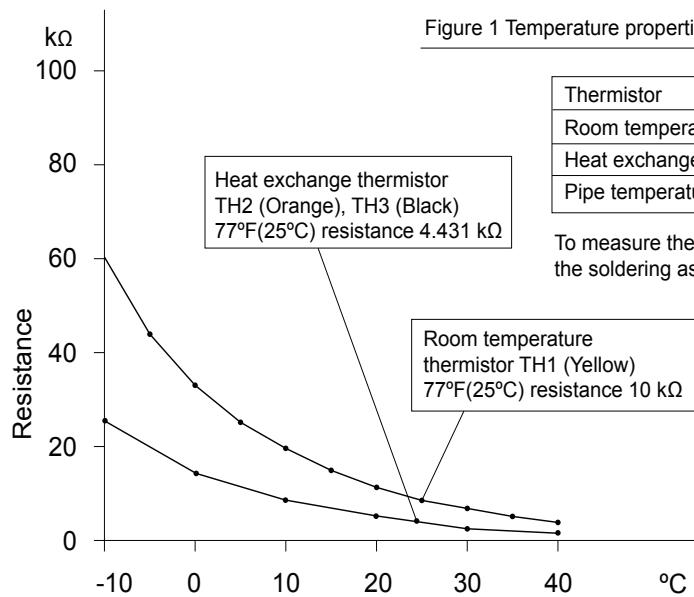
Problem symptom	Outdoor unit indication (LED1)	Indoor unit				Malfunction No.*	Content of diagnosis		Check point	Action	
		→		Lamp			Main	Sub	Main	Sub	
Indoor and outdoor units do not operate.	12-time	O   O   O   O   O	Timer (Orange)			12	0	Thermal fuse in terminal board	Thermal fuse error in terminal board (for power supply)	1) Check the thermal fuse in terminal board (for Power supply). 2) Check connector CN2 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   O   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)	1) Correct the installation. (U: Red, V: White, W: Orange)
		O   O   O   O   O	Operation (green)				1		Compressor rotation error. (at120C energizing)	2) Check if the IPM terminal resistance values are uniform.	2) Replace the outdoor unit control PWB assembly.
				Plasmacluster (blue)			2		Compressor rotation error (at 180C energizing)	3) Check if outdoor main relay (MY1) turns on and voltage of both end of the condenser (C10) has become DC290-330V. 4) 1) 2) 3) : Normal	3) Replace the outdoor unit control PWB assembly. 4) Replace the compressor.
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   O   O   O	Operation (green)			Plasmacluster (blue)							
Indoor and outdoor units do not operate.	14-time	O   O   O   O   O	Timer (Orange)			14	0	Outdoor unit Active filter	PFC Module over voltage error	1) Check the connector of PFCM for secure installation. 2) Check the AC power supply voltage for fluctuation. 3) 1),2) Normal	1) Correct the installation. 2) Connect stable power supply. 3) Replace the outdoor unit PFCM PWB or control PCB assembly.
		O   O   O   O   O	Operation (green)				1		PFC Module clock error		
				Plasmacluster (blue)			2		PFC Module low voltage error		
		O   O   O   O   O	Timer (Orange)				4		PFC Module error		
O   O   O   O   O	Operation (green)			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 L1 and L2 the indoor/outdoor unit terminal boards. 3) Check the outdoor unit fuse. 4) Check 15-V,12-V and 5-V voltages on the PCB. Check resistance between IPM terminals. 5) Check pins No.1 and 3 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   O   O   O   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 short circuit	Check the wiring between units.	Correct the wiring.
Indoor and outdoor units do not operate.		O   O   O   O   O	Operation (green)				1		Serial erroneous wiring	Check the wiring between units.	Correct the wiring.
O   O   O   O   O	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 of the indoor unit fanmotor for secure installation. 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   O   O   O   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   O   O   O   O	Operation (green)								
				Plasmacluster (blue)							

**\*Remark**

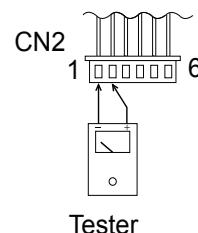
The malfunction No. is calculated using the following way.

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



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

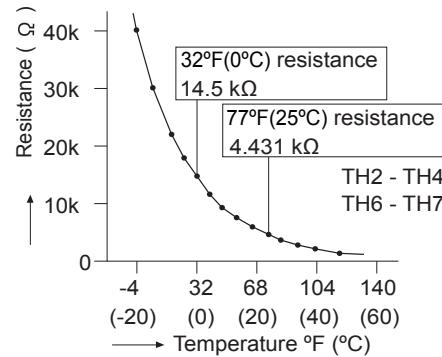
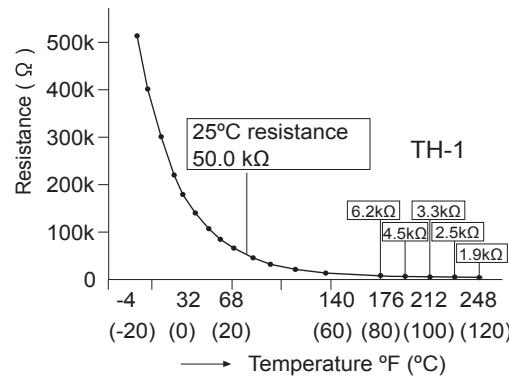
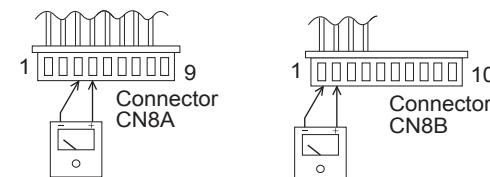
**CAUTION: When attaching or removing the board**

When operating only the outdoor unit (cooling 40 Hz fixed mode) To make only the outdoor unit run in cooling mode, and apply a voltage of 230V AC to L1 and L2 on the terminal board and push the pump down switch (SW1). (Avoid operating the outdoor unit alone for long periods of time.)



Figure 2 Temperature properties of outdoor thermistors

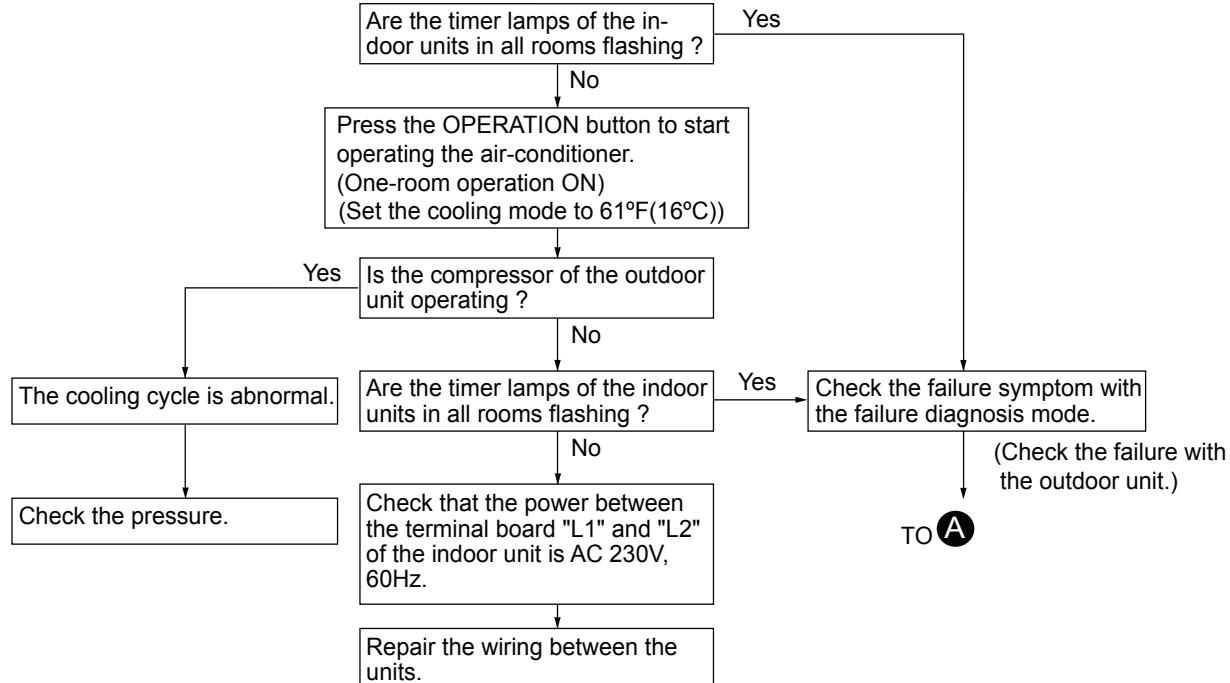
TH1 : Compressor thermistor (CN8A ① - ②)  
 TH2 : Heat exchanger pipe thermistor (CN8A ③ - ④)  
 TH3 : Outdoor temp. thermistor (CN8A ⑤ - ⑥)  
 TH4 : Suction thermistor (CN8A ⑦ - ⑧)  
 TH6 : Thermistor unit A (CN8B ① - ②)  
 TH7 : Thermistor unit B (CN8B ③ - ④)

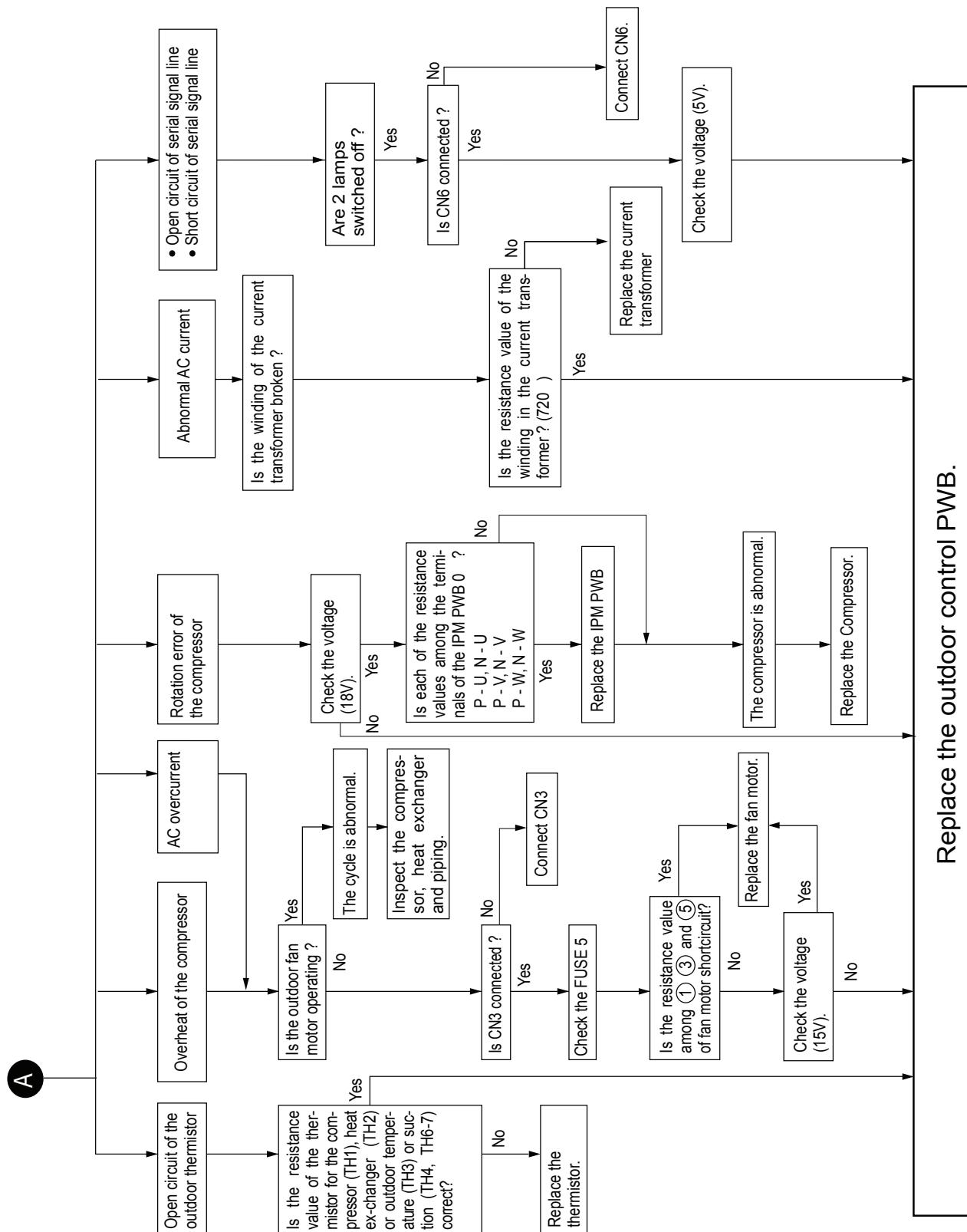


Thermistor	No.	Connector	Color	Connector pin
Compressor thermistor	TH1	CN8A	Red	No. 1 to 2
Heat exchanger pipe thermistor	TH2	CN8A	Orange	No. 3 to 4
Outdoor temp. thermistor	TH3	CN8A	Green	No. 5 to 6
Suction thermistor	TH4	CN8A	Black	No. 7 to 8
Thermistor unit A (suction)	TH6	CN8B	Blue	No. 1 to 2
Thermistor unit B (suction)	TH7	CN8B	White	No. 3 to 4

## 1. How to distinguish the defective parts

- 1) When all rooms are not cooled

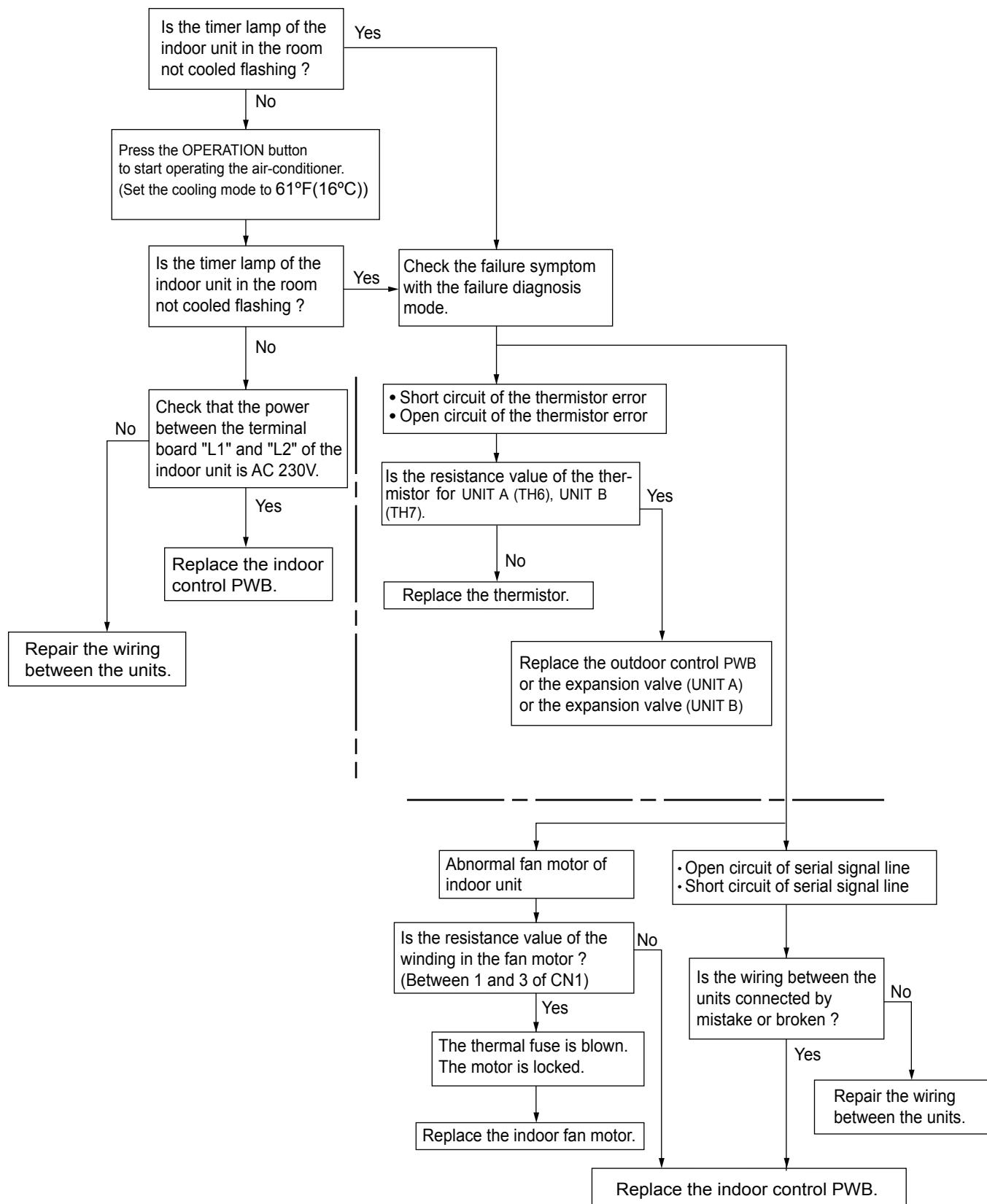






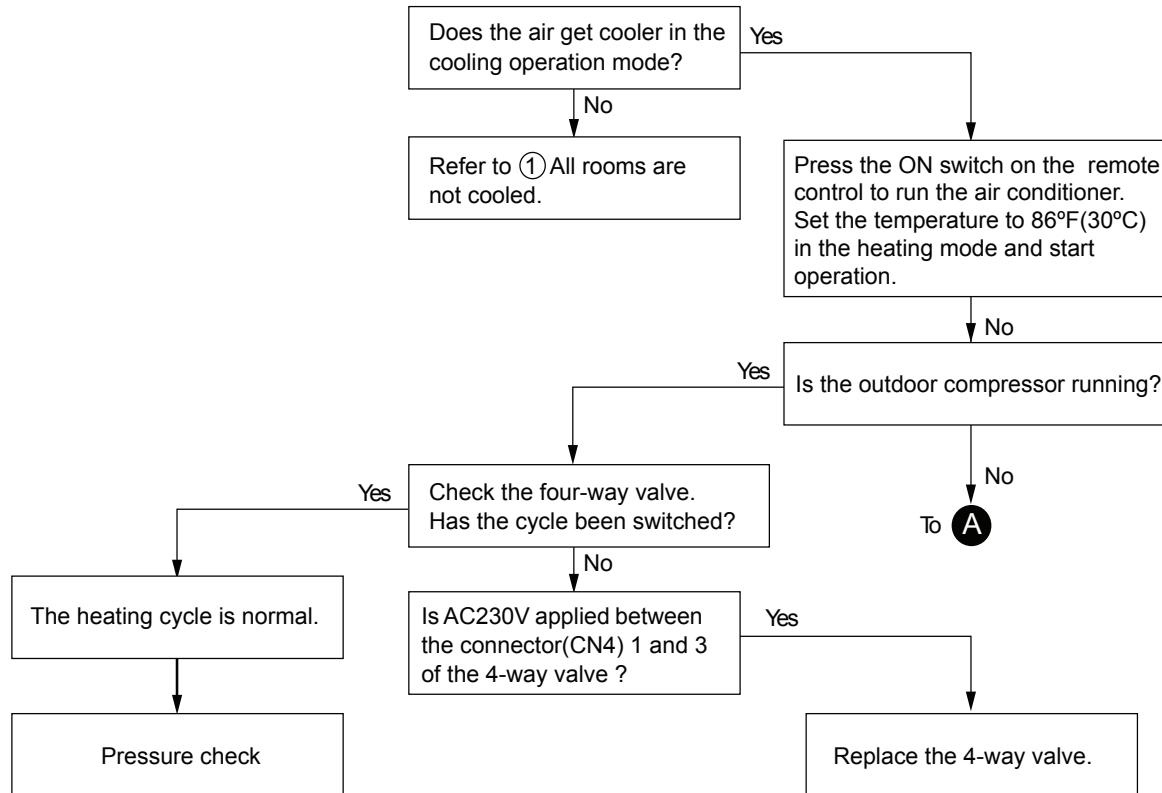
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2) When one room is not cooled (other rooms are cooled)





## 3) When all rooms are not heated





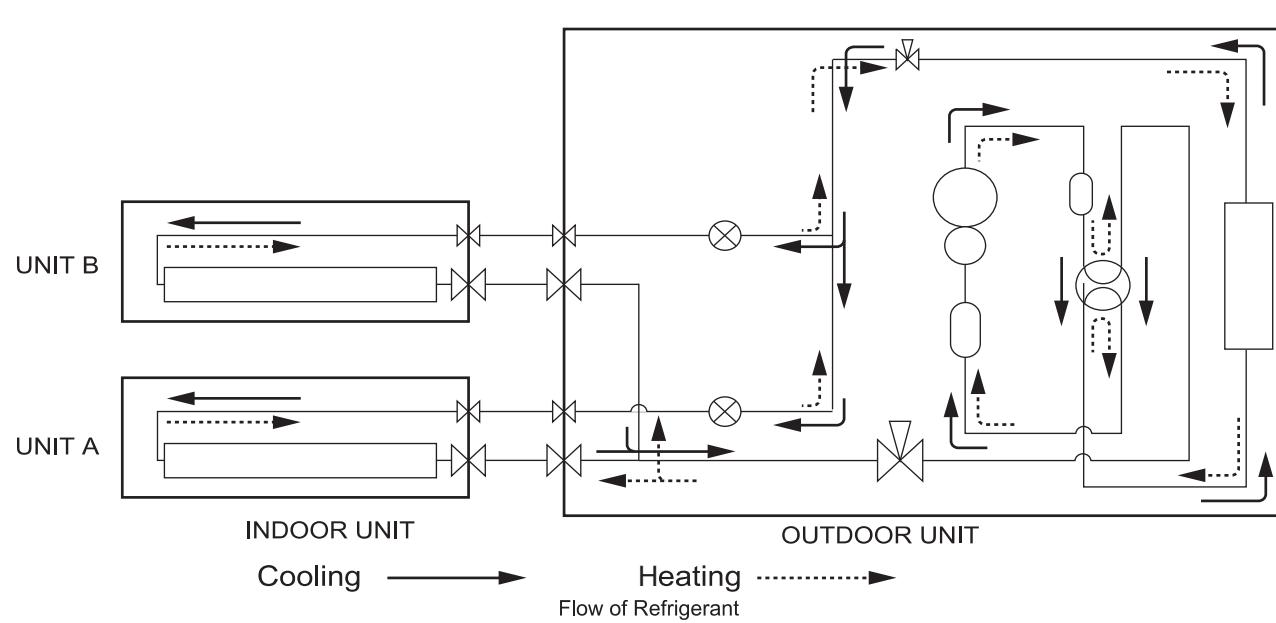
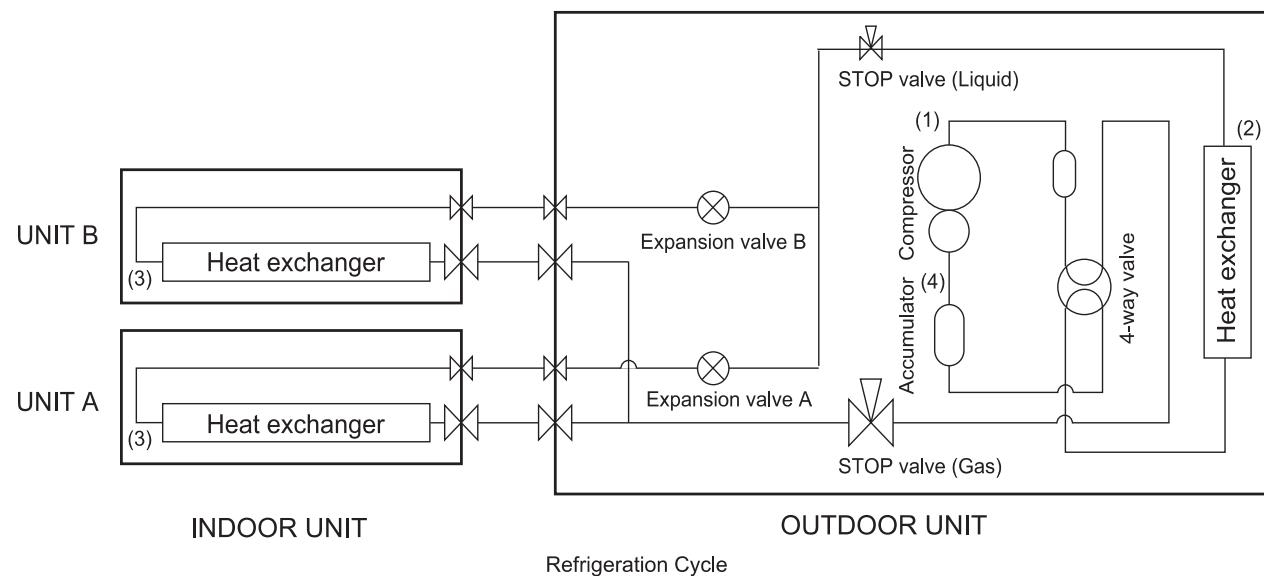
## PROTECTIVE FUNCTIONS AND OPERATIONS

No.	Function	Operation					
		Description	Detection time	Restart condition			
1	DC over current	Compressor is stopped if a current approximately 25A or more flows in the power transistor module.	During compressor operation	Automatically restarts after safety time (180 seconds)	4 times	Yes	Yes
2	AC over current	Lowers the operating frequency if the compressor AC current exceeds set value(19.3). Stops the compressor if the current exceeds at minimum frequency.	During compressor operation	Automatically restarts after safety time (180 seconds)	4 times	Yes	Yes
3	Compressor overheat prevention control	Lowers the operating frequency if the temperature of the compressor thermistor (TH1) rises above 226.4°F (108°C). Compressor is stopped if the thermistor stays above 226.4°F (108°C) for 2 minutes at minimum frequency.	During compressor operation	Automatically restarts after safety time (180 seconds)	No limit	No	No
4	Compressor high temperature error	Compressor is stopped if the compressor thermistor is above 235.4°F (113°C) (Or when TH1 shorts)	During compressor operation	Automatically restarts when thermistor (TH1) temperature falls below 210.2°F (99°C) (approximately 30 minutes)	4 times	Yes	Yes
5	Outdoor heat exchanger overheat prevention control	Lowers the operating frequency if the temperature of the outdoor heat exchanger rises above 134.6°F(57°C) during cooling. Stops the compressor if the temperature stays above 134.6°F (57°C) for 2 minutes at minimum frequency	During compressor operation	Automatically restarts after safety time (180 seconds)	No limit	No	No
6	Thermistor short	Compressor is stopped, if heat exchanger or outdoor thermistor shorts. Close the expansion valve of the corresponding room, if some suction thermistor shorts.	When the room is activated turns ON and the compressor starts.	Operation OFF	1 time	Yes	Yes
7	Thermistor open	Compressor is stopped, if compressor or heat exchanger or outdoor thermistor opens. Close the expansion valve of the corresponding room, if some suction thermistor shorts or opens.	When the room turns ON and the compressor starts.	Operation OFF	1 time	Yes	Yes
8	AC abnormal current	Compressor is stopped, if the operating frequency is above 70Hz and the compressor current is below 0.8A.	During compressor operation	Automatically re-starts after safety time.(180 sec.)	4 times	Yes	Yes
9	Serial signal error	INDOOR If open, while timer LED blinks, operation is continued. If short, operation is continued. OUTDOOR Loses the expansion valve of the corresponding room if the outdoor unit does not receive a serial signal from one or more indoor unit for 30 seconds. Compressor is stopped, if the out-door unit does not receive a serial signal from all indoor units.	During operation	Automatically re-starts as soon as the serial communication becomes possible.	No limit	Yes	Yes
10	Miswiring check error	Compressor is stopped, and miswiring check operation ends.	During miswiring operation	Miswiring check operation will not re-start automatically.	4 times	Yes	Yes
11	Indoor heat exchanger overheat prevention control	Lowers the operating frequency if the temperature of any of indoor heat exchanger rises high temperature during heating. Stops the compressor if the temperatures rays high for 2 minutes at minimum frequency.	During compressor operation	Automatically re-starts after safety time.(180 sec.)	No limit	No	No
12	Power factor module error	When a power factor module error input is detected.	During compressor operation	Automatically re-starts after safety time.(180 sec.)	4 times	Yes	Yes
13	DC Compressor rotation error	In the case that the feed back signal from the compressor is not input or abnormal.	During compressor operation	Automatically re-starts after safety time.(180 sec.)	8 times	Yes	Yes
14	IPM overheat prevention control. IPM high temperature error	Lowers the operating frequency if the temperature of IPM rises high temperature. Stops the compressor if the temperatures rays high for 2 minutes at minimum frequency.	During compressor operation	Automatically restarts after safety time.(180 sec.)	No limit	No	No



## REFRIGERATION CYCLE

### REFRIGERATION CYCLE





AE-X2M20RU

**Cycle temperature and pressure in stop valve**

Running unit	No.	Operation Mode			
		Cool (Max)	Cool (Test run)	Heat (Max)	Heat (Test run)
AY-XPC12PU & AY-XPC12PU	(1)	174 °F (79°C )	152 °F (67°C )	168 °F (76°C )	130 °F (55°C )
	(2)	99 °F (37°C )	99 °F (37°C )	42 °F (6°C )	38 °F (4°C )
	(3)	52 °F (11°C )	55 °F (13°C )	86 °F (30°C )	78 °F (25°C )
	(4)	50 °F (10°C )	60 °F (15°C )	36 °F (2°C )	40 °F (5°C )
	Stop valve pressure (gas side)	119 psig	145 psig	381 psig	289 psig
	Frequency	78Hz	48Hz	80Hz	42Hz
	(1)	164 °F (73°C )	148 °F (65°C )	172 °F (78°C )	127 °F (53°C )
AY-XPC09PU & AY-XPC09PU	(2)	99 °F (37°C )	99 °F (37°C )	42 °F (5°C )	38 °F (3°C )
	(3)	52 °F (11°C )	57 °F (14°C )	88 °F (31°C )	77 °F (25°C )
	(4)	53 °F (12°C )	64 °F (18°C )	36 °F (2°C )	43 °F (6°C )
	Stop valve pressure (gas side)	129 psig	155 psig	397 psig	274 psig
	Frequency	65Hz	36Hz	76Hz	32Hz
	(1)	162 °F (72°C )	149 °F (65°C )	184 °F (84°C )	132 °F (56°C )
	(2)	97 °F (36°C )	98 °F (37°C )	43 °F (6°C )	37 °F (3°C )
AY-XPC12PU (1 unit only on operation)	(3)	50 °F (10°C )	54 °F (12°C )	107 °F (42°C )	80 °F (27°C )
	(4)	48 °F (9°C )	61 °F (16°C )	40 °F (5°C )	43 °F (6°C )
	Stop valve pressure (gas side)	113 psig	146 psig	483 psig	313 psig
	Frequency	49Hz	27Hz	63Hz	27Hz
	(1)	156 °F (69°C )	144 °F (62°C )	166 °F (74°C )	130 °F (54°C )
	(2)	98 °F (36°C )	98 °F (37°C )	41 °F (5°C )	36 °F (2°C )
	(3)	51 °F (10°C )	63 °F (17°C )	102 °F (39°C )	79 °F (26°C )
AY-XPC09PU (1 unit only on operation)	(4)	54 °F (12°C )	66 °F (19°C )	41 °F (5°C )	45 °F (7°C )
	Stop valve pressure (gas side)	128 psig	155 psig	438 psig	305 psig
	Frequency	36Hz	20Hz	49Hz	22Hz
	(1)	150 °F (66°C )	140 °F (60°C )	149 °F (65°C )	128 °F (53°C )
	(2)	98 °F (37°C )	99 °F (37°C )	38 °F (3°C )	37 °F (3°C )
	(3)	53 °F (11°C )	58 °F (15°C )	93 °F (34°C )	80 °F (27°C )
	(4)	60 °F (15°C )	70 °F (21°C )	41 °F (5°C )	44 °F (7°C )
AY-XPC07PU (1 unit only on operation)	Stop valve pressure (gas side)	141 psig	164 psig	384 psig	305 psig
	Frequency	28Hz	16Hz	38Hz	22Hz

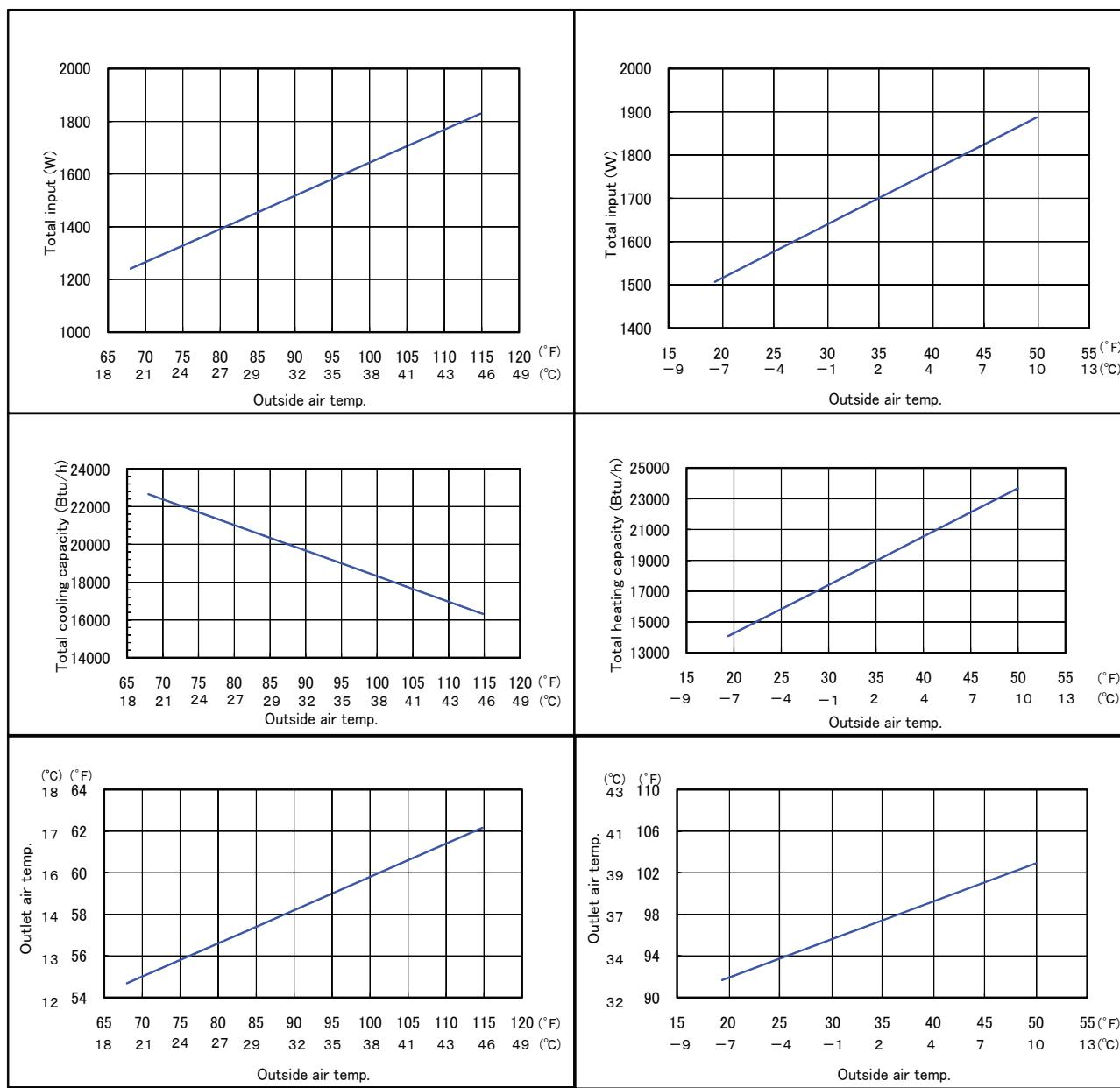


## Performance curves

Note: Total Capacity and total input with 2 units (9k+9k) running.

At Cooling  
(Running frequency: 61Hz)

At Heating  
(Running frequency: 70Hz)



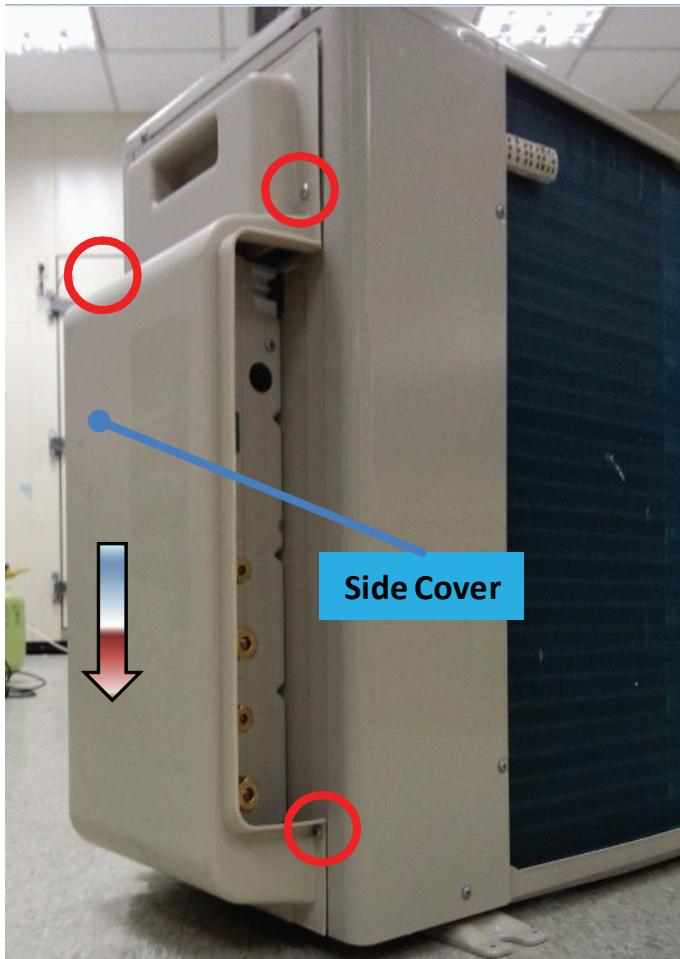


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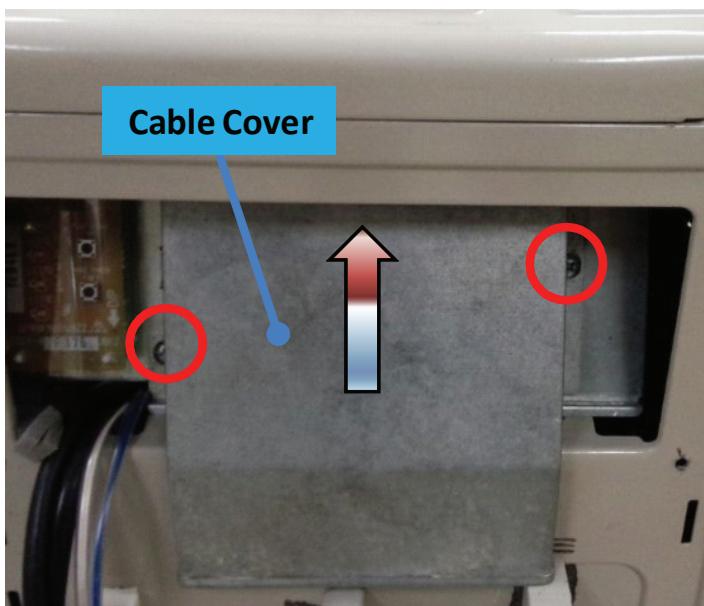
## DISASSEMBLING PROCEDURE

### PROCEDURE

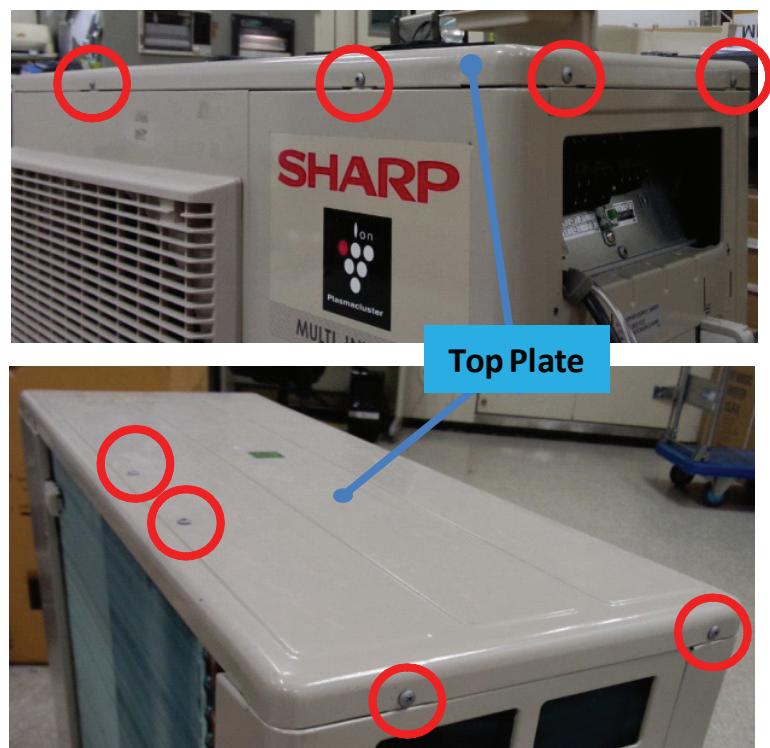
1. Remove the 3 screws fixing on the Side Cover, then slide it downward to take it out.



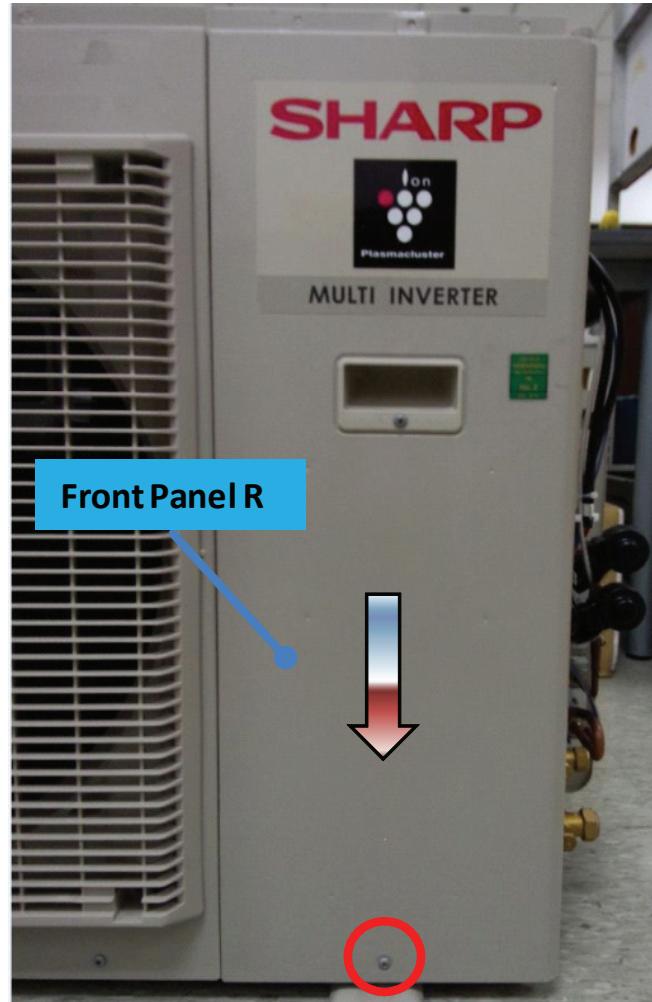
2. Remove the 2 screws fixing on the Cable Cover, then slide it upward and take it out.



3. Remove the 8 screws fixing on the Top Plate, Then take it out.



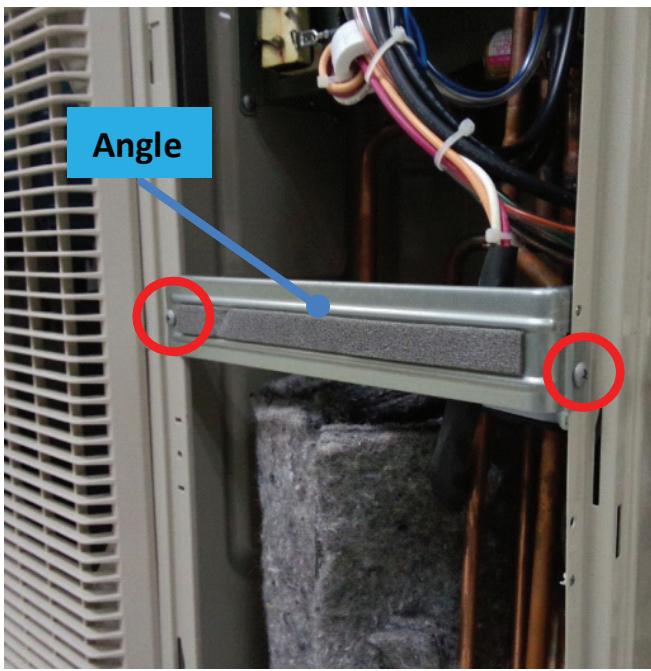
4. Remove the 1 screw fixing on the Front Panel R, then slide it downward to take it out.



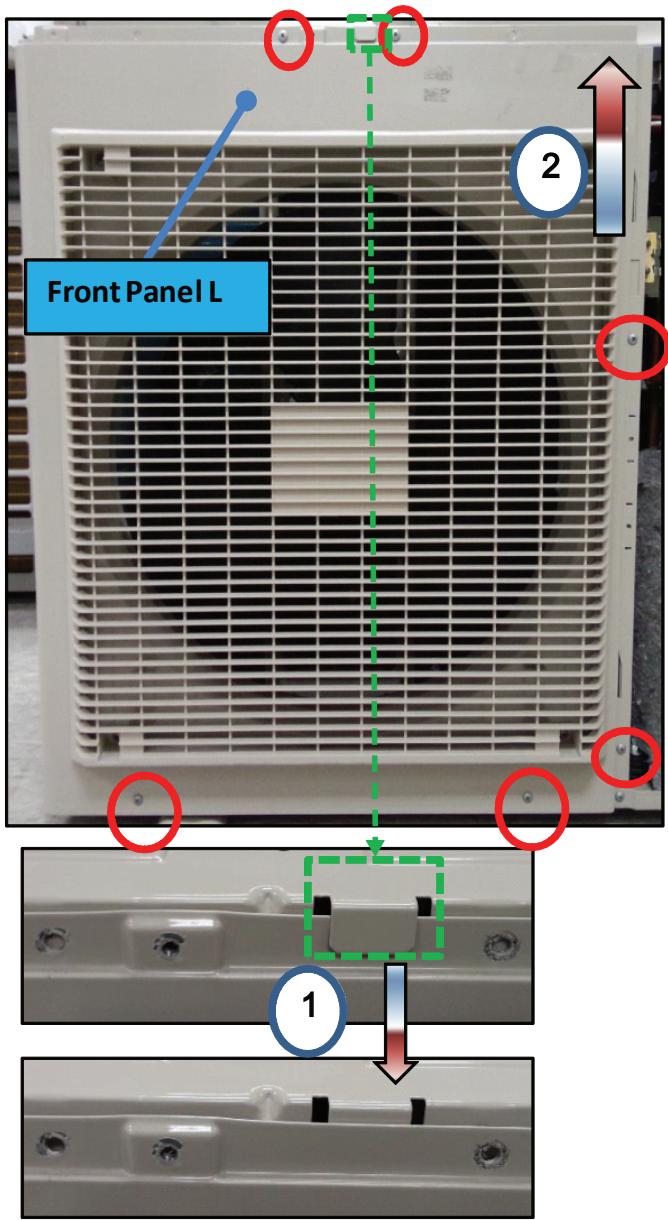


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5. Remove the 2 screws fixing on the Angle then take it out.



6.1 Remove the 6 screws fixing on the Front Panel L. Firstly take the hook of Motor Angle T out, then slide and take it out.



6.2 Firstly open it, secondly slide left side upward and take it out.



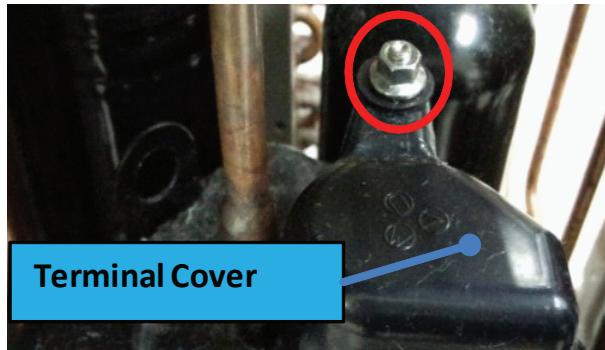
7. Remove the Compressor Cover Top and the Compressor Cover.





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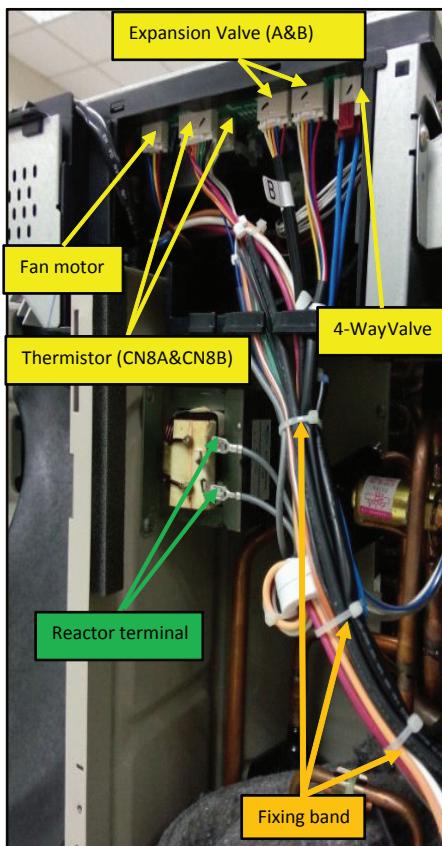
8. Remove the nut, then take Terminal Cover out.



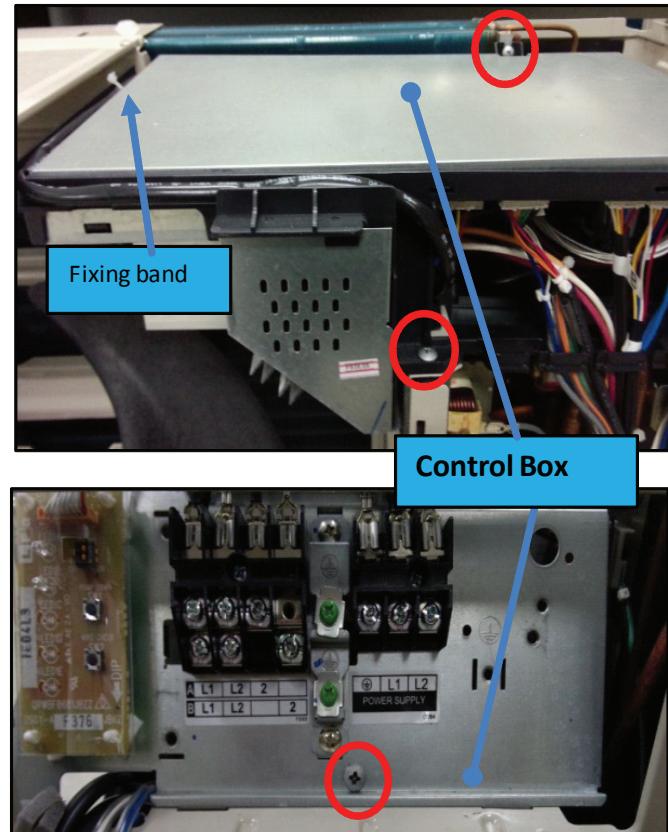
9. Take off 3 pcs compressor terminals.  
(Orange, white, red)



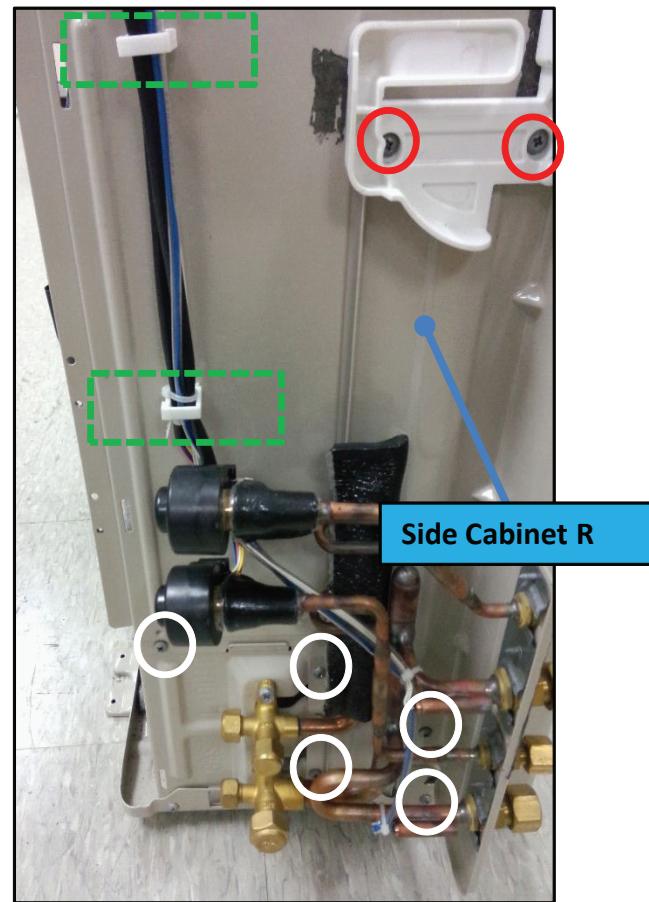
10.1 Take off 6 connectors, 2 Reactor terminals and cut 3 fixing bands.



10.2 Cut the fixing band and remove the 3 screws fixing on the Control Box. Then take the Control Box out.

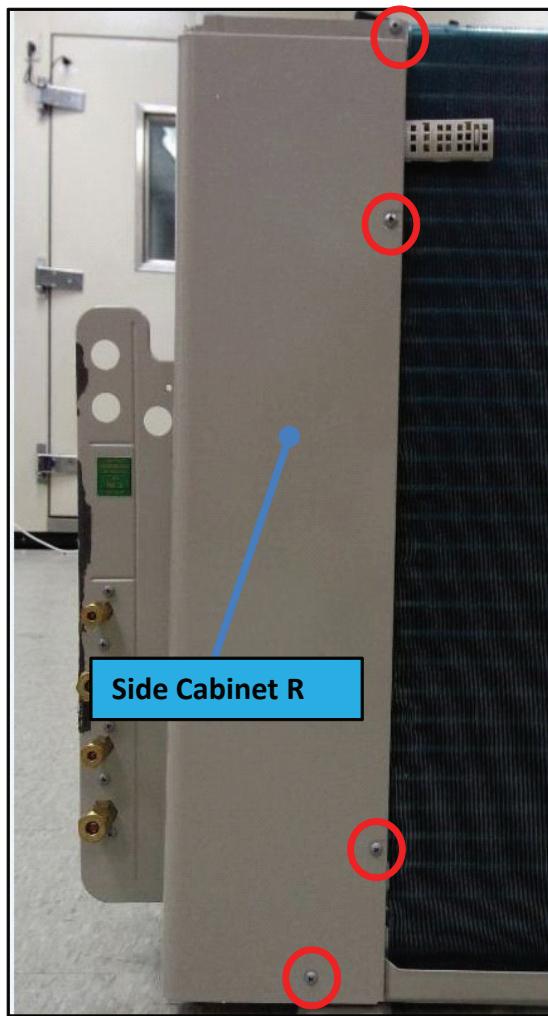


11. Remove the 11 screws fixing on the Side Cabinet R. Open the 2 hooks. Take the wires out of 2 hooks.

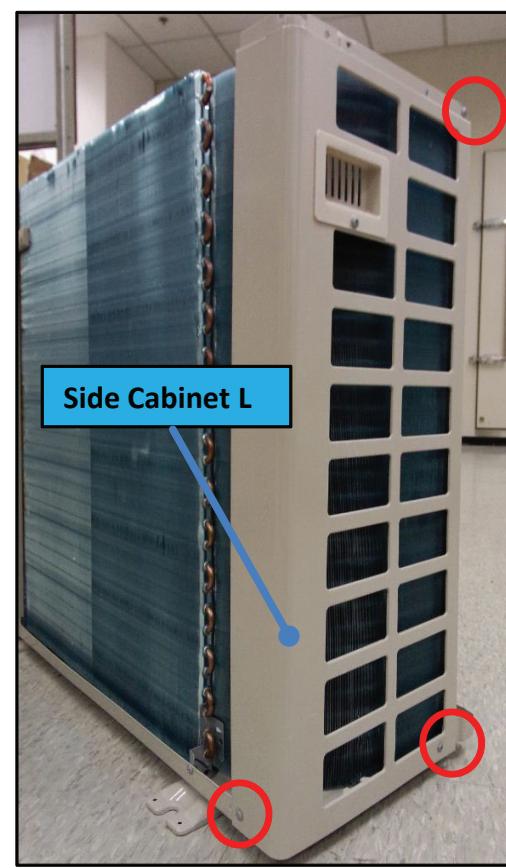




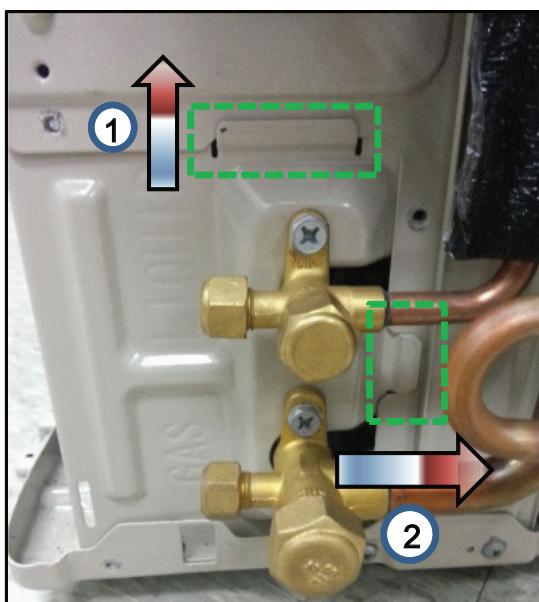
(11.1 Remove the 11 screws fixing on the Side Cabinet R. Open the 2 hooks. Take the wire out of 2 hooks.)



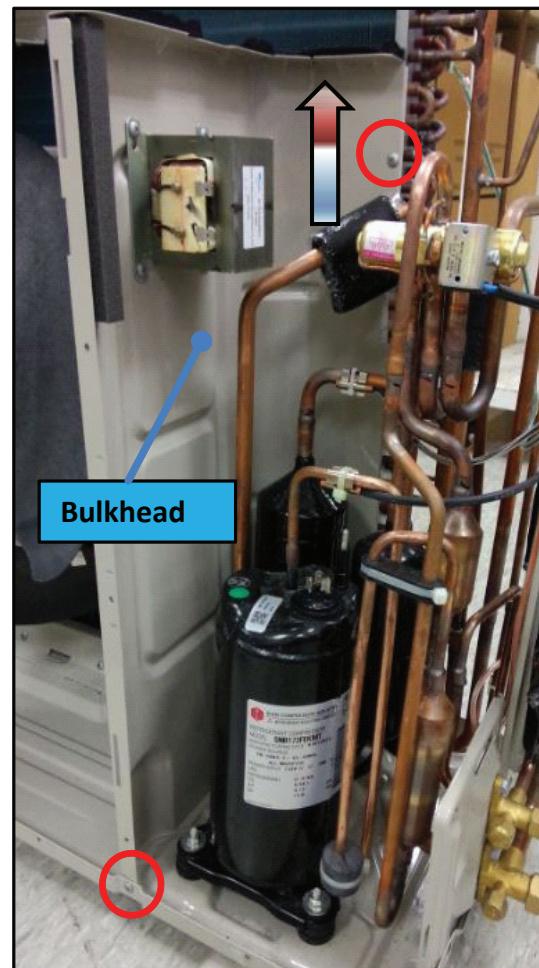
12. Remove the 3 screws fixing on the Side Cabinet L then take it out.



11.2 Firstly slide Side Cabinet R upward, secondly slide it rightward and take it out.



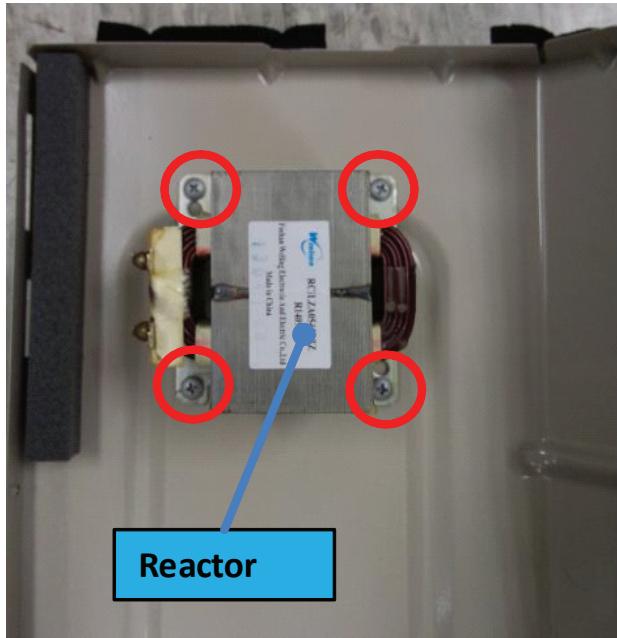
13. Remove the 2 screws fixing on the Bulkhead then slide it upward to take it out.



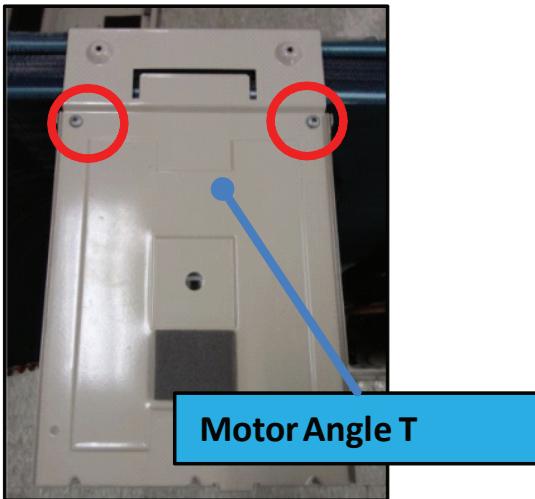


AE-X2M20RU

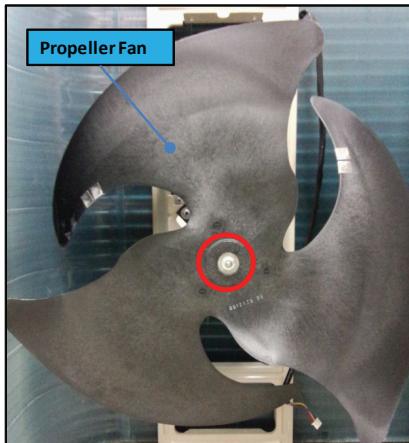
15. Remove the 4 screws fixing on the Reactor, then take it out.



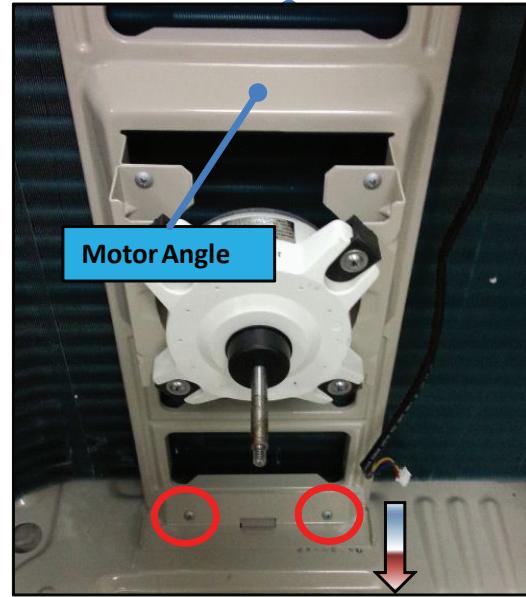
15. Remove the 2 screws fixing on the Motor Angle T, then take it out.



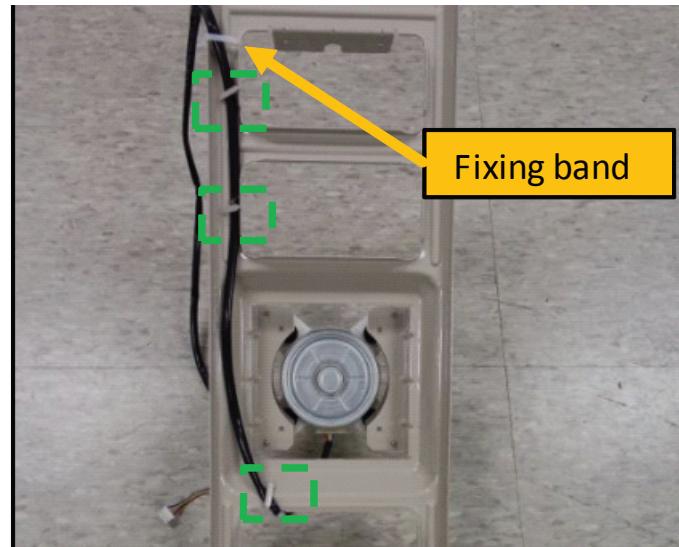
16. Remove the 1 nut fixing on the Propeller Fan then take it out.



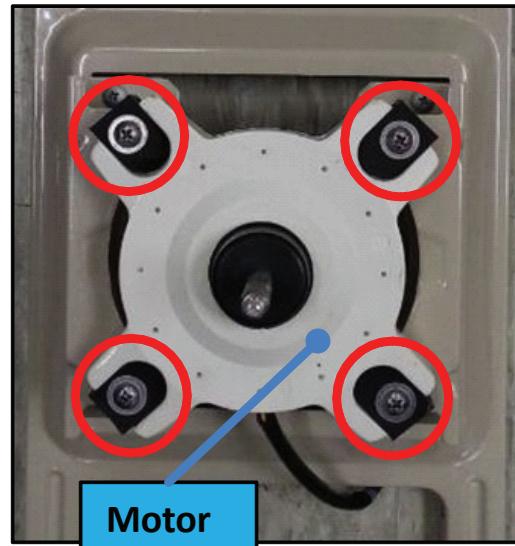
17. Remove the 2 screws fixing on the Motor Angle then slide it forward to take it out.



18.1 Cut the Fixing band and open the 3 hook to take wire out.



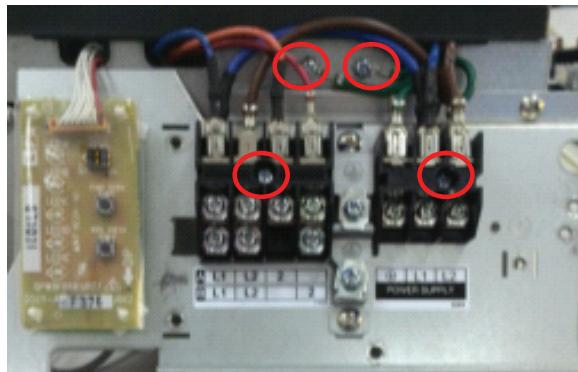
18.2 Remove the 4 screws fixing on the Motor, then take it out.





## DISASSEMBLY OF CONTROL UNIT

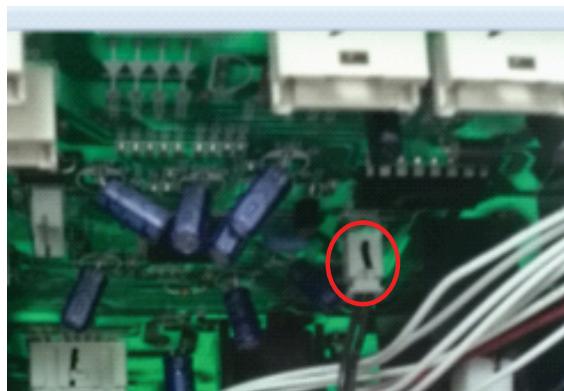
1. Unscrew the 4 screws and remove the terminal board.



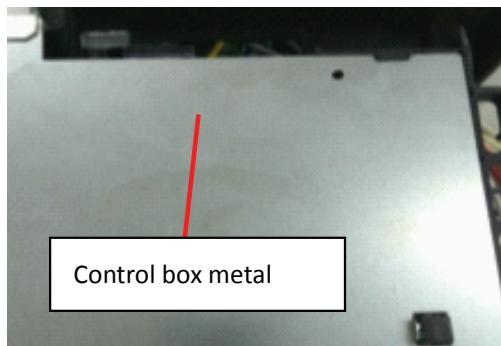
2. Unscrew 2 screws and take off the display board from the hooks. Then take off the terminal board holder.



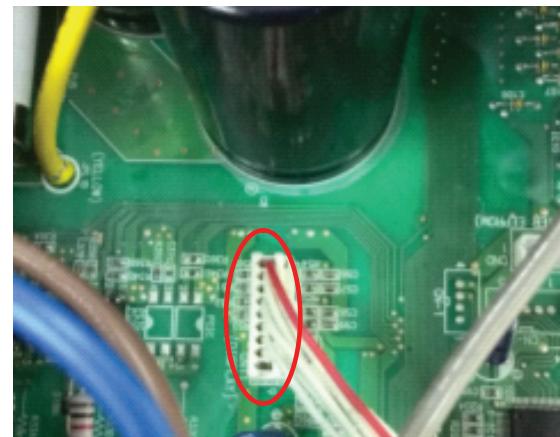
3. Take off terminal board thermal fuse from CN2. And take off the 2 terminal boards.



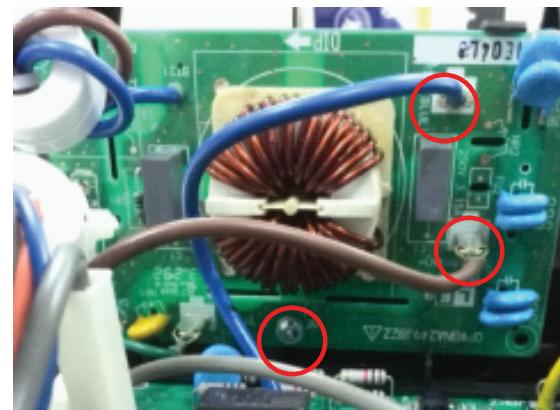
4. Take off the control box metal from the hook.



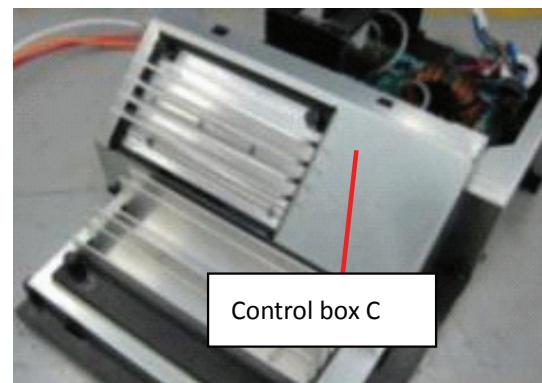
5. Take off display board terminal from CN11 and take off terminal board.



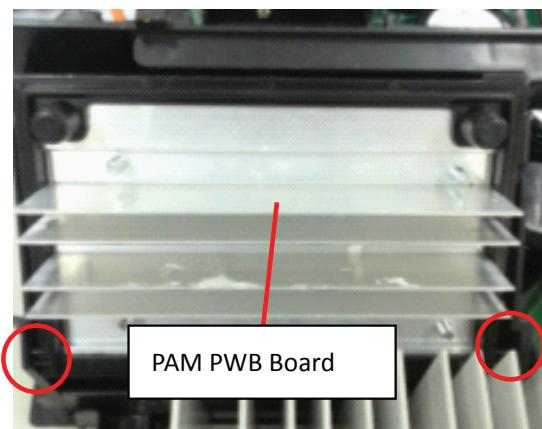
6. Take off T20 and T21, unscrew 1 screw to take off the filter board.



7. Take off control box C from the hook.



8. Take off the PAM PWB board from the hook.





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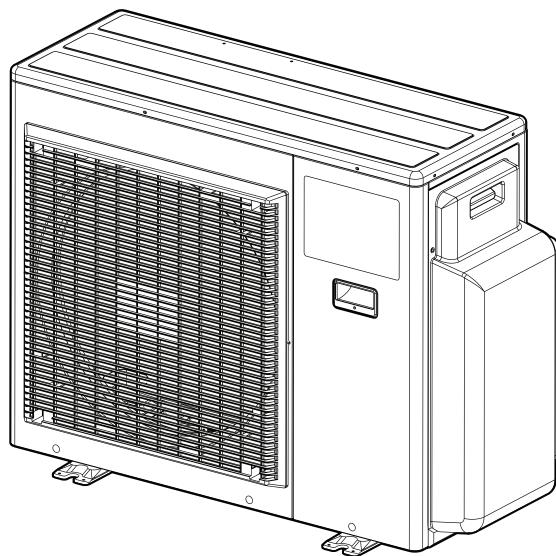
9. Unscrew 6 screws and take off the control unit board.





# SHARP®

# PARTS GUIDE



## MULTI SPLIT TYPE ROOM AIR CONDITIONERS

OUTDOOR UNIT  
**MODEL AE-X2M20RU**

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

- [1] CABINET AND UNIT PARTS
- [2] CYCLE PARTS
- [3] CONTROL BOX PARTS
- [4] ACCESSORY AND PACKING PARTS
- INDEX

#### "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

#### MARK:SPARE PARTS-DELIVERY SECTION

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.

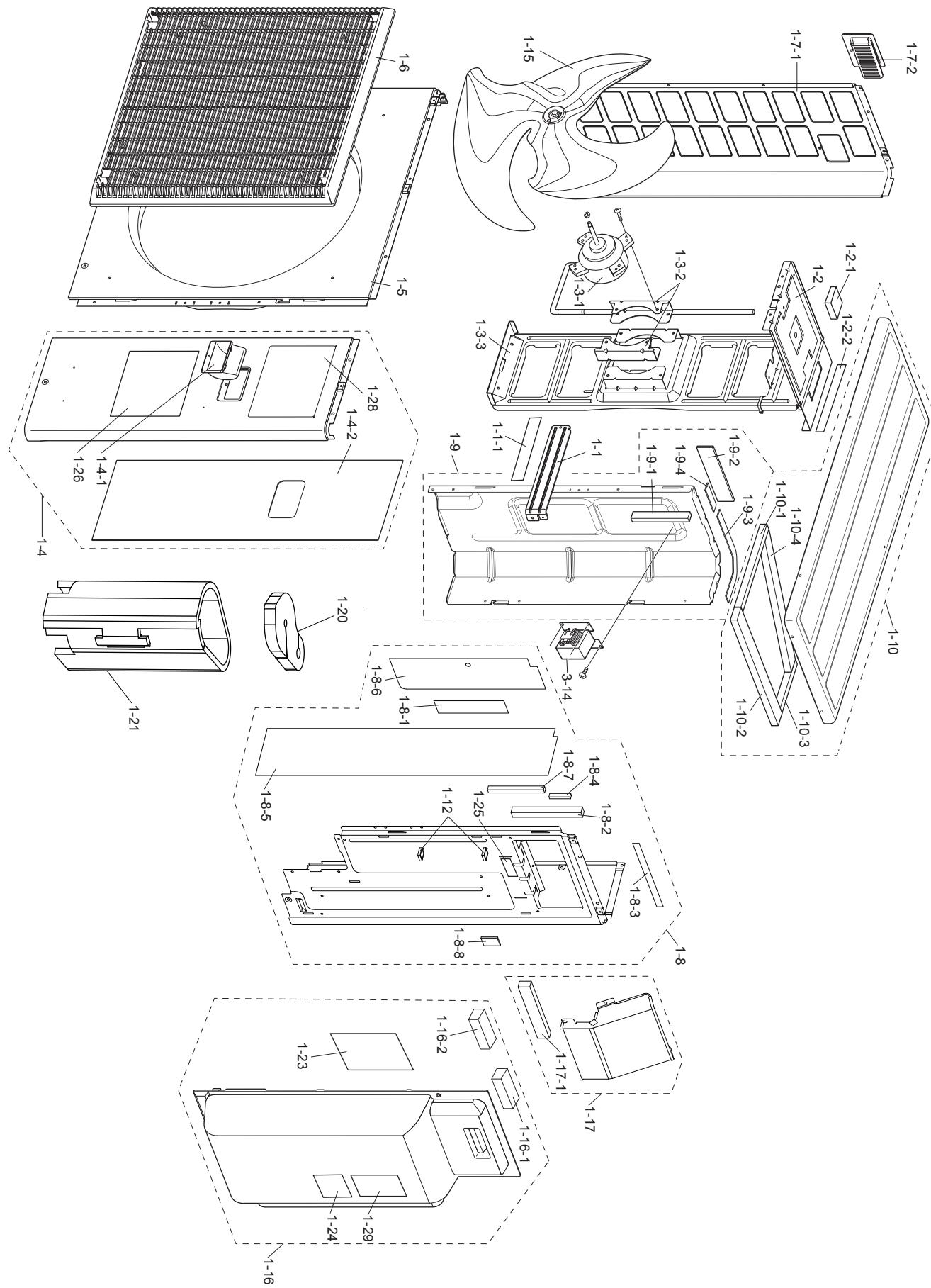
SHARP CORPORATION

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after sales service only.  
The contents are subject to change without notice.



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## [1] CABINET AND UNIT PARTS



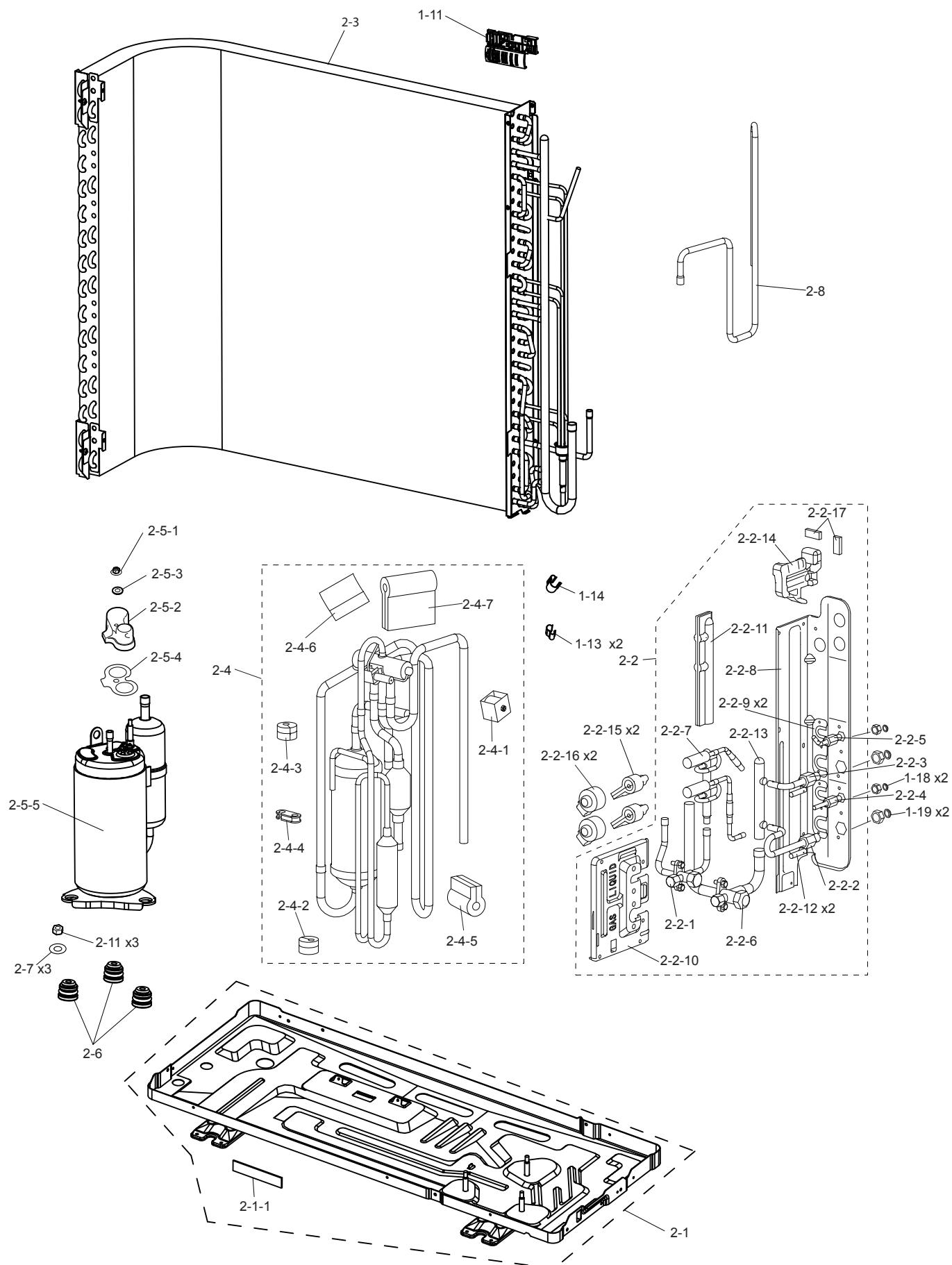


NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
<b>[1] CABINET AND UNIT PARTS</b>					
1-1	CANG-A358JBKZ	AK			ANGLE ASS'Y
1-1-1	PFPFPE478JBEZ	AC			ANGLE INSULATOR
1-2	CANG-A393JBKZ	AL			MOTOR ANGLE T ASS'Y
1-2-1	PSEL-E406JBEZ	AC			MOTOR ANGLE T SEAL
1-2-2	PSEL-E498JBEZ	AC			SEAL
1-3-1	CMOTLB560JBEZ	BD	N		FAN MOTOR
1-3-2	LANGKA324JBTA	AH			FAN MOTOR ANGLE SUB
1-3-3	LANGKA325JBTA	AY			MOTOR ANGLE
1-4	CCAB-A586JBKZ	AZ			FRONT PANEL R ASS'Y
1-4-1	JHNDPA030JBFA	AG			HANDLE
1-4-2	PSPF-B182JBEZ	AY			BASE PAN SUB ASS'Y
1-5	GCAB-A469JBTA	BB			FRONT PANEL L
1-6	GGADFA049JBFA	BC			FAN GUARD
1-7-1	GPLTMA081JBTA	AX			SIDE CABINET L
1-7-2	JHNDPA032JBFA	AG			HANDLE
1-8	CPLT-A249JBKZ	AZ	N		SIDE CABINET R ASS'Y
1-8-1	PGUMSA451JBEZ	AD	N		DAMPER RUBBER
1-8-2	PSEL-E593JBEZ	AD	N		SIDE CABINET R SEAL
1-8-3	PSEL-E388JBEZ	AC			SIDE CABINET R SEAL B
1-8-4	PSEL-E454JBEZ	AC			SEAL
1-8-5	PSPF-B185JBEZ	AX			IIR SHEET B
1-8-6	PSPF-B438JBEZ	AG	N		IIR SHEET
1-8-7	PSEL-E594JBEZ	AD	N		SIDE CABINET R SEAL
1-8-8	PFPFPF005JBEZ	AD	N		SIDE CABINET R SEAL
1-9	CSKR-A569JBKZ	AW			BULKHEAD ASS'Y
1-9-1	PFPFPE480JBEZ	AC			BULKHEAD SEAL B
1-9-2	PFPFPE481JBEZ	AC			BULKHEAD SEAL C
1-9-3	PSEL-E285JBEZ	AE			BULKHEAD SEAL
1-9-4	PSEL-E286JBEZ	AD			BULKHEAD SEAL A
1-10	DCAB-A185JBKZ	BC			TOP PLATE ASS'Y
1-10-1	PSEL-E129JBEZ	AK			TOP PLATE SEAL A
1-10-2	PSEL-E130JBEZ	AN			TOP PLATE SEAL B
1-10-3	PSEL-E131JBEZ	AK			TOP PLATE SEAL C
1-10-4	PSEL-E284JBEZ	AL			TOP PLATE SEAL E
1-12	LHLDWA054JBEZ	AK			WIRE HOLDER
1-15	NFANPA152JBEZ	AY			PROPELLER FAN
1-16	DCOV-A417JBKZ	BA	N		SIDE COVER ASS'Y
1-16-1	PFPFPF003JBEZ	AD	N		SEAL
1-16-2	PSEL-E591JBEZ	AD	N		SEAL
1-17	DCOV-A418JBKZ	AM	N		CABLE COVER ASS'Y
1-17-1	PSEL-E592JBEZ	AD			SEAL
1-20	PSPF-B239JBEZ	AK			COMPRESSOR COVER TOP
1-21	PSPF-B457JBEZ	AP	N		COMPRESSOR COVER
1-23	TLAB-G136JBRZ	AL	N		LABEL
1-24	TLAB-F696JBRZ	AF			CAUTION LABEL UL
1-25	TLAB-F748JBRZ	AF			UL COPPER WIRE LABEL
1-26	TLAB-G071JBRA	AK	N		ENERGY LABEL
1-28	TLABMA819JBRA	AV			INVERTER LABEL
1-29	TSPC-J367JBRZ	AG	N		NAME LABEL



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## [2] CYCLE PARTS



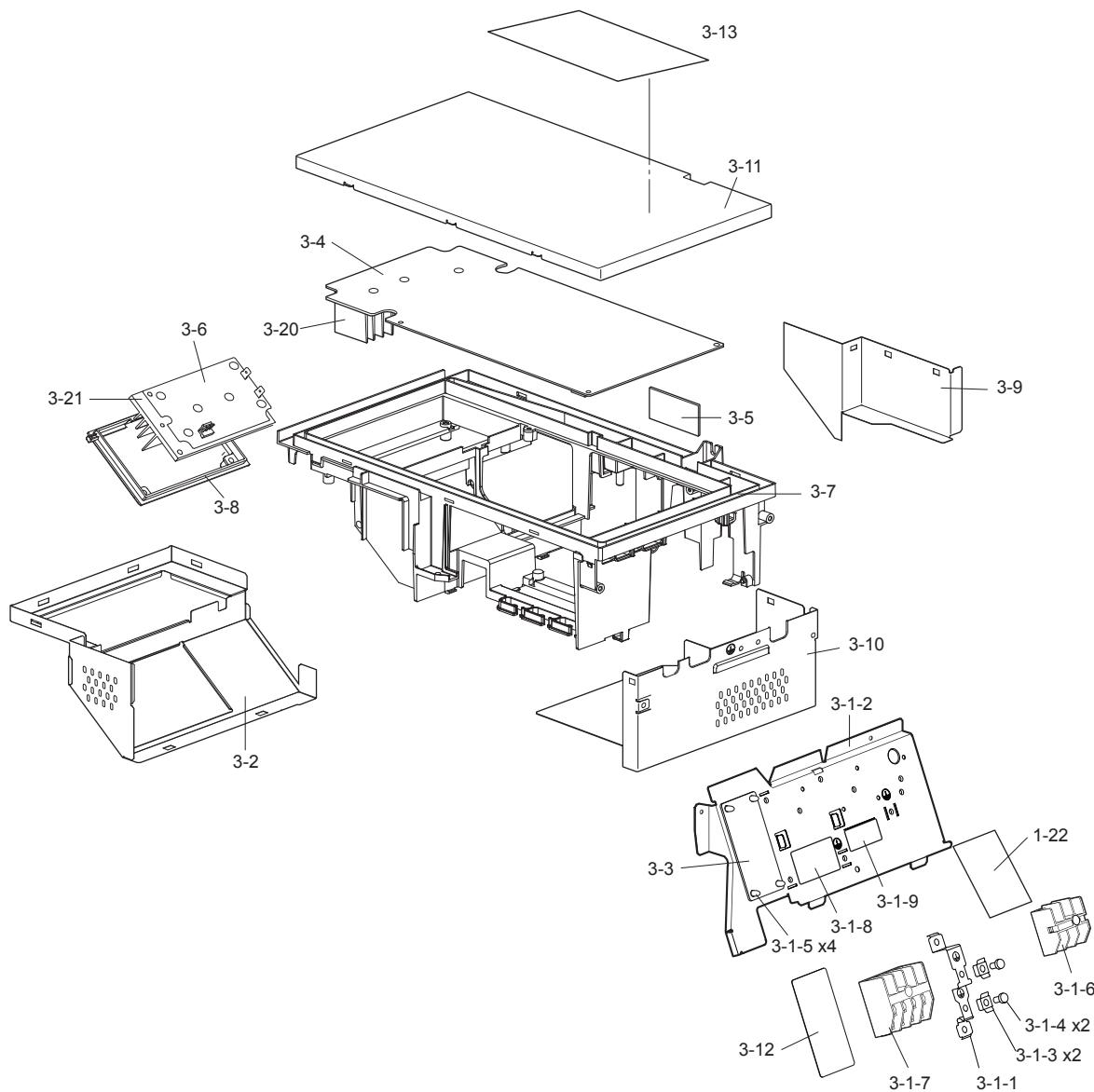


NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
<b>[2] CYCLE PARTS</b>					
1-11	LHLD-B217JBFA	AE			THERMISTOR HOLDER
1-13	MSPR-A026JBE0	AB			SPRING
1-14	MSPR-A036JBE0	AB			THERMISTOR SPRING
1-18	PSEN-A050JBKZ	AK			FLARE NUT ASS'Y
1-19	PSEN-A051JBKZ	AL			FLARE NUT ASS'Y
2-1	CCHS-B375JBTA	BC			BASE PAN SUB ASS'Y
2-1-1	PFPPPE477JBEZ	AC			BASE PAN SEAL C
2-2	DDAI-A225JBKZ	BU	N		FLARE COU.BASE ASS'Y
2-2-1	DVLV-B053JBKZ	AZ			3WAY VALVE UNIT L
2-2-2	DVLV-B054JBKZ	BG			FLARE UNION UNIT 3S-A
2-2-3	DVLV-B055JBKZ	BG			FLARE UNION UNIT 3S-B
2-2-4	DVLV-B056JBKZ	AX			FLARE UNION UNIT 2S-A
2-2-5	DVLV-B057JBKZ	AX			FLARE UNION UNIT 2S-B
2-2-6	DVLV-B195JBKZ	BC			3WAY VALVE UNIT G
2-2-7	DVLV-B479JBKZ	BG	N		EXPAN.VALVE ASS'Y
2-2-8	LANG-A783JBWZ	AQ	N		EXPANSION VALVE ANGLE
2-2-9	LSUB-A020JBWZ	AE			FLARE CUP.SUB-S
2-2-10	PDAI-A292JBTA	AM			FLARE COUPLING BASE
2-2-11	PGUMSA093JBE0	AL			DAMPER RUBBER
2-2-12	PPIPCE511JB10	AK			THERMISTOR HOLDER
2-2-13	PPIPCM254JB1Z	AR	N		HEADER PIPE-L
2-2-14	LHLD-B312JBFA	AE	N		CABLE HOLDER
2-2-15	PGUMSA047JBE0	AF			DAMPER RUBBER
2-2-16	RMOTSA037JBZZ	BC			COIL
2-2-17	PFPPFP004JBEZ	AD	N		SEAL
2-3	DCON-A754JBKZ	CP			CONDENSER
2-4	DVLV-B478JBKZ	BN	N		REVERSE VALVE ASS'Y
2-4-1	CCIL-A185JBKZ	AU			COIL ASS'Y
2-4-2	PGUM-0034JBE0	AF			DAMPER RUBBER
2-4-3	PGUM-0035JBE0	AG			DUMPER RUBBER
2-4-4	PGUM-A121JBEZ	AE			DAMPER RUBBER
2-4-5	PGUMS0170JBE0	AE			DAMPER RUBBER
2-4-6	PGUMSA068JBE0	AD			DAMPER RUBBER
2-4-7	PGUMSA445JBE0	AK			DAMPER RUBBER
2-5-1	LX-NZA411JBEZ	AH			FRANGE NUT
2-5-2	PCOV-B887JBEZ	AR			TERMINAL COVER
2-5-3	PSEL-E239JBEZ	AH			GASKET WASHER
2-5-4	PSEL-E240JBEZ	AK			TERMINAL GASKET
2-5-5	PCMPRA718JBEZ	CU			COMPRESSOR
2-6	GLEG-A162JBEZ	AF			COMPRESSOR CUSHION
2-7	LX-WZA057JBEZ	AC			WASHER 22
2-8	PPIPCM252JB1Z	AQ	N		LEAD TUBE
2-9	TLAB-C251JBRZ	AC			LABEL
2-10	TLAB-C258JBRZ	AC			LABEL
2-11	XNFS760-50000	AB			NUT



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### [3] CONTROL BOX PARTS



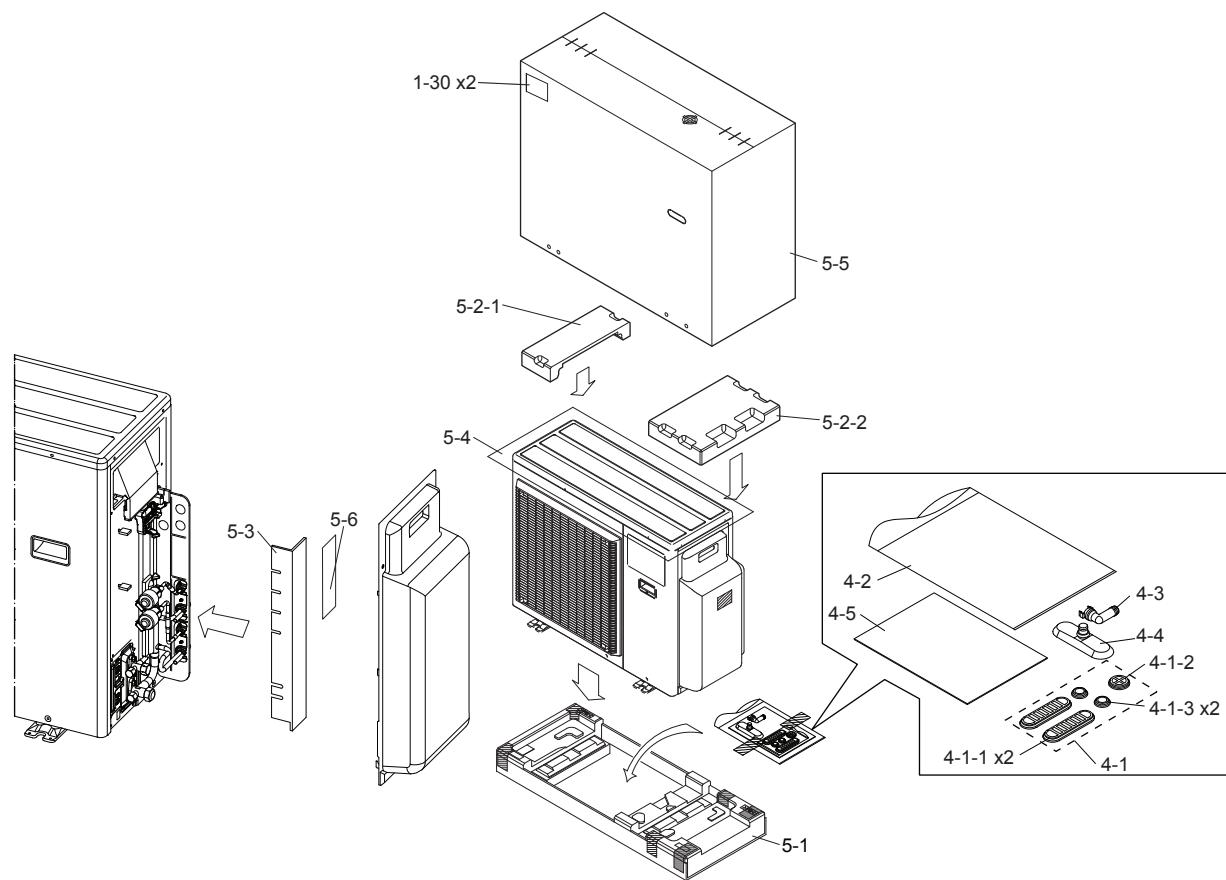


NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
<b>[3] CONTROL BOX PARTS</b>					
1-22	TLAB-B777JBRZ	AC			CAUTION LABEL IN
3-1-1	LANG-A734JBWZ	AK			EARTH ANGLE
3-1-2	LANG-A771JBWZ	AN			TERMINAL ANGLE
3-1-3	LHLD-B067JBEZ	AN			WASHER
3-1-4	LX-BZA536JBTA	AC	N		EARTH SCREW
3-1-5	PSPA-A146JBE0	AC			SPACER
3-1-6	QTANZA093JBZZ	AQ			TERMINAL BOARD
3-1-7	QTANZA096JBZZ	AV			TERMINAL BOARD
3-1-8	TLAB-F685JBRZ	AH			LABEL
3-1-9	TLAB-G084JBRZ	AD	N		LABEL
3-2	CBOX-A081JBKZ	AR			CONTROL BOX C ASS'Y
3-2-2	PFPFPE482JBEZ	AC			CONTROL BOX SEAL A
3-2-3	PFPFPE483JBEZ	AC			CONTROL BOX SEAL B
3-2-4	PFPFPE484JBEZ	AC			CONTROL BOX SEAL C
3-2-5	PFPFPE485JBEZ	AC			CONTROL BOX SEAL D
3-2-6	PFPFPE486JBEZ	AC			CONTROL BOX SEAL E
3-3	DSGY-F376JBKZ	AU	N		DISPLAY BOARD UNIT
3-4	DSGY-F377JBKZ	CC	N		CONTROL BOARD UNIT
3-5	DSGY-F378JBKZ	BH	N		FLTER BOARD UNIT
3-6	FSGY-B642JBKZ	AY			PAM PWB
3-7	LHLD-B240JBFZ	AT			HOLDER
3-8	LHLD-B279JBFZ	AE			HOLDER B
3-9	PBOX-A570JBWZ	AK			CONTROL BOX B
3-10	PBOX-A576JBWZ	AM			CONTROL BOX
3-11	PCOV-B888JBWZ	AL			COVER
3-12	PSHE-A314JBEZ	AK			PROTECT SHEET
3-13	TLABCE099JBRZ	AG	N		WIRING DIAGRAM
3-14	RCILZA054JBZZ	BC			REACTOR
3-17	RNF--A001VBE0	AF			FERRITE CORE
3-18	RH-HXA187JBZZ	AY			Thermistor A
3-19	RH-HXA204JBZZ	BB	N		Thermistor B
3-20	PRDAFA253JBEZ	AW			HEAT SINK (IPM)
3-21	PRDAFA249JBEZ	AE			HEAT SINK (IC11)
3-22	FW-VZA121JBKZ	AQ	N		COMPRESSOR CORD
3-23	QW-VZG643JBZZ	AE			Lead Wire (T4 ~ Control Box)
3-24	QW-VZG640JBZZ	AG			Lead Wire (REACTOR1 ~ MRY)
3-25	QW-VZG641JBZZ	AG			Lead Wire (REACTOR1 ~ T5)
3-26	QW-VZG951JBZZ	AG	N		Lead Wire (TB ~ CN6)
3-27	QW-VZG633JBZZ	AG			Lead Wire (MRY1 ~ BT6)
3-28	QW-VZG634JBZZ	AF			Lead Wire (T20 ~ BT1)
3-29	QW-VZG635JBZZ	AF			Lead Wire (T21 ~ BT2)
3-30	QW-VZG613JBZZ	AG			Lead Wire (PAM ~ DB2)
3-31	QW-VZG614JBZZ	AG			Lead Wire (PAM ~ DB2)
3-32	QW-VZG615JBZZ	AG			Lead Wire (PAM ~ GATE)
3-33	QW-VZG685JBZZ	AG			Lead Wire (TB L2 ~ TB L2)
3-34	QW-VZG686JBZZ	AG			Lead Wire (TB L1 ~ TB L1)
3-35	QW-VZG632JBZZ	AE			Lead Wire (TB ~ BOX)



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#### [4] ACCESSORY AND PACKING PARTS



NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
<b>[4] ACCESSORY AND PACKING PARTS</b>					
1-30	TLAB-F722JBRZ	AE			NO CLAMP LABEL
4-1	DFKS-A203JBKZ	AU			BESE PAN CAP KIT
4-1-1	PCAP-A140JBEZ	AH			BESE PAN CAP 1
4-1-2	PCAP-A141JBEZ	AE			BESE PAN CAP 2
4-1-3	PCAP-A142JBEZ	AD			BESE PAN CAP 3
4-2	DFKS-A205JBKZ	AF			BAG ASSEMBLY
4-3	LPFT-A134JBFZ	AF			DRAIN JOINT
4-4	LPFT-A135JBFZ	AH			DRAIN TRAY
4-5	TINS-B498JBRZ	AG	N		INSTALLATION MANUAL
5-1	CPADBA161JBKZ	AZ			BOTTOM PAD ASS'Y
5-2-1	SPADBA532JBEZ	AK			TOP PAD L
5-2-2	SPADBA533JBEZ	AK			TOP PAD R
5-3	SPADBA546JBEZ	AK			PACKING PAD
5-4	SPADP0300YDE0	AB			BAG
5-5	SPAKCE501JBEZ	AX	N		PACKING CASE
5-6	TLAB-G167JBEZ	AG	N		STICKER



## ■ INDEX

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
<b>[C]</b>				
CANG-A358JBKZ	1-1-1	AK		
CANG-A393JBKZ	1-1-2	AL		
CBOX-A081JBKZ	3-3-2	AR		
CCAB-A586JBKZ	1-1-4	AZ		
CCHS-B375JBTA	2-2-1	BC		
CCIL-A185JBKZ	2-2-4-1	AU		
CMOTLB560JBEZ	1-1-3-1	BD	N	
CPADBA161JBKZ	4-5-1	AZ		
CPLT-A249JBKZ	1-1-8	AZ	N	
CSKR-A569JBKZ	1-1-9	AW		
<b>[D]</b>				
DCAB-A185JBKZ	1-1-10	BC		
DCON-A754JBKZ	2-2-3	CP		
DCOV-A417JBKZ	1-1-16	BA	N	
DCOV-A418JBKZ	1-1-17	AM	N	
DDAI-A225JBKZ	2-2-2	BU	N	
DFKS-A203JBKZ	4-4-1	AU		
DFKS-A205JBKZ	4-4-2	AF		
DSGY-F376JBKZ	3-3-3	AU	N	
DSGY-F377JBKZ	3-3-4	CC	N	
DSGY-F378JBKZ	3-3-5	BH	N	
DVLV-B053JBKZ	2-2-2-1	AZ		
DVLV-B054JBKZ	2-2-2-2	BG		
DVLV-B055JBKZ	2-2-2-3	BG		
DVLV-B056JBKZ	2-2-2-4	AX		
DVLV-B057JBKZ	2-2-2-5	AX		
DVLV-B195JBKZ	2-2-2-6	BC		
DVLV-B478JBKZ	2-2-4	BN	N	
DVLV-B479JBKZ	2-2-2-7	BG	N	
<b>[F]</b>				
FSGY-B642JBKZ	3-3-6	AY		
FW-VZA121JBKZ	3-3-22	AQ	N	
<b>[G]</b>				
GCAB-A469JBTA	1-1-5	BB		
GGADFA049JBFA	1-1-6	BC		
GLEG-A162JBEZ	2-2-6	AF		
GPLTMA081JBTA	1-1-7-1	AX		
<b>[J]</b>				
JHNDPA030JBFA	1-1-4-1	AG		
JHNDPA032JBFA	1-1-7-2	AG		
<b>[L]</b>				
LANG-A734JBWZ	3-3-1-1	AK		
LANG-A771JBWZ	3-3-1-2	AN		
LANG-A783JBWZ	2-2-2-8	AQ	N	
LANGKA324JBTA	1-1-3-2	AH		

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
LANGKA325JBTA	1-1-3-3	AY		
LHLD-B067JBEZ	3-3-1-3	AN		
LHLD-B217JBFA	2-1-11	AE		
LHLD-B240JBFZ	3-3-7	AT		
LHLD-B279JBFZ	3-3-8	AE		
LHLD-B312JBFA	2-2-2-14	AE	N	
LHLDWA054JBEZ	1-1-12	AK		
LPFT-A134JBFZ	4-4-3	AF		
LPFT-A135JBFZ	4-4-4	AH		
LSUB-A020JBWZ	2-2-2-9	AE		
LX-BZA536JBTA	3-3-1-4	AC	N	
LX-NZA411JBEZ	2-2-5-1	AH		
LX-WZA057JBEZ	2-2-7	AC		
<b>[M]</b>				
MSPR-A026JBE0	2-1-13	AB		
MSPR-A036JBE0	2-1-14	AB		
<b>[N]</b>				
NFANPA152JBEZ	1-1-15	AY		
<b>[P]</b>				
PBOX-A570JBWZ	3-3-9	AK		
PBOX-A576JBWZ	3-3-10	AM		
PCAP-A140JBEZ	4-4-1-1	AH		
PCAP-A141JBEZ	4-4-1-2	AE		
PCAP-A142JBEZ	4-4-1-3	AD		
PCMPRA718JBEZ	2-2-5-5	CU		
PCOV-B887JBEZ	2-2-5-2	AR		
PCOV-B888JBWZ	3-3-11	AL		
PDAI-A292JBTA	2-2-2-10	AM		
PFPFPE477JBEZ	2-2-1-1	AC		
PFPFPE478JBEZ	1-1-1-1	AC		
PFPFPE480JBEZ	1-1-9-1	AC		
PFPFPE481JBEZ	1-1-9-2	AC		
PFPFPE482JBEZ	3-3-2-2	AC		
PFPFPE483JBEZ	3-3-2-3	AC		
PFPFPE484JBEZ	3-3-2-4	AC		
PFPFPE485JBEZ	3-3-2-5	AC		
PFPFPE486JBEZ	3-3-2-6	AC		
PFPFPF003JBEZ	1-1-16-1	AD	N	
PFPFPF004JBEZ	2-2-2-17	AD	N	
PFPFPF005JBEZ	1-1-8-8	AD	N	
PGUM-0034JBE0	2-2-4-2	AF		
PGUM-0035JBE0	2-2-4-3	AG		
PGUM-A121JBEZ	2-2-4-4	AE		
PGUMS0170JBE0	2-2-4-5	AE		
PGUMSA047JBE0	2-2-2-15	AF		
PGUMSA068JBE0	2-2-4-6	AD		



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PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
PGUMSA093JBE0	2-2-2-11	AL		
PGUMSA445JBE0	2-2-4-7	AK		
PGUMSA451JBEZ	1-1-8-1	AD	N	
PPIPCE511JB10	2-2-2-12	AK		
PPIPCM252JB1Z	2-2-8	AQ	N	
PPIPCM254JB1Z	2-2-2-13	AR	N	
PRDAFA249JBEZ	3-3-21	AE		
PRDAFA253JBEZ	3-3-20	AW		
PSEL-E129JBEZ	1-1-10-1	AK		
PSEL-E130JBEZ	1-1-10-2	AN		
PSEL-E131JBEZ	1-1-10-3	AK		
PSEL-E239JBEZ	2-2-5-3	AH		
PSEL-E240JBEZ	2-2-5-4	AK		
PSEL-E284JBEZ	1-1-10-4	AL		
PSEL-E285JBEZ	1-1-9-3	AE		
PSEL-E286JBEZ	1-1-9-4	AD		
PSEL-E388JBEZ	1-1-8-3	AC		
PSEL-E406JBEZ	1-1-2-1	AC		
PSEL-E454JBEZ	1-1-8-4	AC		
PSEL-E498JBEZ	1-1-2-2	AC		
PSEL-E591JBEZ	1-1-16-2	AD	N	
PSEL-E592JBEZ	1-1-17-1	AD	N	
PSEL-E593JBEZ	1-1-8-2	AD	N	
PSEL-E594JBEZ	1-1-8-7	AD	N	
PSEN-A050JBKZ	2-1-18	AK		
PSEN-A051JBKZ	2-1-19	AL		
PSHE-A314JBEZ	3-3-12	AK		
PSPA-A146JBE0	3-3-1-5	AC		
PSPF-B182JBEZ	1-1-4-2	AY		
PSPF-B185JBEZ	1-1-8-5	AX		
PSPF-B239JBEZ	1-1-20	AK		
PSPF-B457JBEZ	1-1-21	AP	N	
PSPF-B438JBEZ	1-1-8-6	AG	N	

**[Q]**

QTANZA093JBZZ	3-3-1-6	AQ		
QTANZA096JBZZ	3-3-1-7	AV		
QW-VZG613JBZZ	3-3-30	AG		
QW-VZG614JBZZ	3-3-31	AG		
QW-VZG615JBZZ	3-3-32	AG		
QW-VZG632JBZZ	3-3-35	AE		
QW-VZG633JBZZ	3-3-27	AG		
QW-VZG634JBZZ	3-3-28	AF		
QW-VZG635JBZZ	3-3-29	AF		
QW-VZG640JBZZ	3-3-24	AG		
QW-VZG641JBZZ	3-3-25	AG		
QW-VZG643JBZZ	3-3-23	AE		
QW-VZG685JBZZ	3-3-33	AG		

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
QW-VZG686JBZZ	3-3-34	AG		
QW-VZG951JBZZ	3-3-26	AG	N	
<b>[R]</b>				
RCILZA054JBZZ	3-3-14	BC		
RH-HXA187JBZZ	3-3-18	AY		
RH-HXA204JBZZ	3-3-19	BB	N	
RMOTSA037JBZZ	2-2-2-16	BC		
RNF--A001VBE0	3-3-17	AF		
<b>[S]</b>				
SPADBA532JBEZ	4-5-2-1	AK		
SPADBA533JBEZ	4-5-2-2	AK		
SPADBA546JBEZ	4-5-3	AK		
SPADP0300YDE0	4-5-4	AB		
SPAKCE501JBEZ	4-5-5	AX	N	
<b>[T]</b>				
TINS-B498JBRZ	4-4-5	AG	N	
TLAB-B777JBRZ	3-1-22	AC		
TLAB-C251JBRZ	2-2-9	AC		
TLAB-C258JBRZ	2-2-10	AC		
TLABCE099JBRZ	3-3-13	AG	N	
TLAB-F685JBRZ	3-3-1-8	AH		
TLAB-F696JBRZ	1-1-24	AF		
TLAB-F722JBRZ	4-1-30	AE		
TLAB-F748JBRZ	1-1-25	AF		
TLAB-G071JBRA	1-1-26	AK	N	
TLAB-G084JBRZ	3-3-1-9	AD	N	
TLAB-G136JBRZ	1-1-23	AL	N	
TLAB-G167JBEZ	4-5-6	AG	N	
TLABMA819JBRA	1-1-28	AV		
TSPC-J367JBRZ	1-1-29	AG	N	
<b>[X]</b>				
XNFS760-50000	2-2-11	AB		