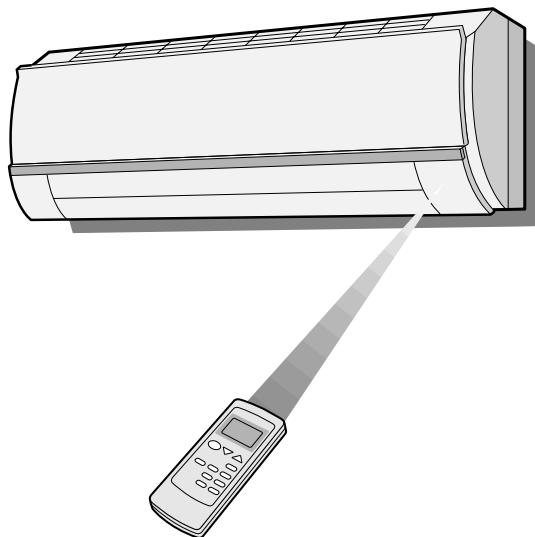


# SHARP SERVICE MANUAL



## SPLIT SYSTEM ROOM AIR CONDITIONER

INDOOR UNIT

**AH-129**

**AH-MP14**

OUTDOOR UNIT

**AU-129**

**AU-MP14**

### CONTENTS

	Page
SPECIFICATIONS.....	2
EXTERNAL DIMENSIONS.....	4
WIRING DIAGRAMS.....	5
ELECTRICAL PARTS.....	6
MICROCOMPUTER CONTROL SYSTEM.....	7
PRINTED WIRING DIAGRAM.....	8
FUNTIONS.....	10
TROUBLESHOOTING.....	14
REFRIGERATION CYCLE AND PERFORMANCE CURVES.....	16
DISASSEMBLING PROCEDURE.....	17
REPLACEMENT PARTS LIST.....	25

SHARP CORPORATION

## CHAPTER 1. PRODUCT SPECIFICATION

### [1] SPECIFICATION

#### 1. AH-129 / AU-129

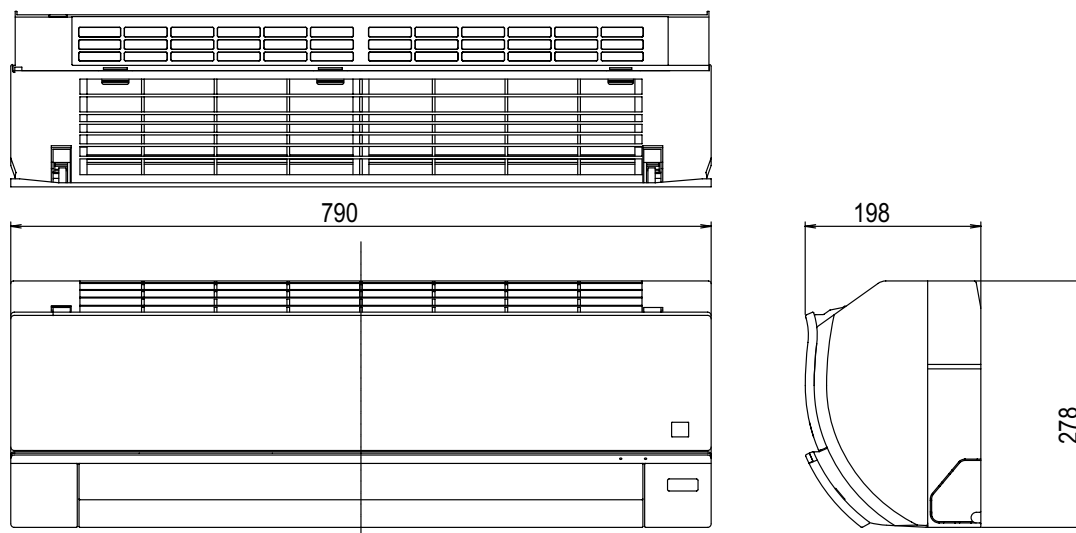
ITEMS			INDOOR UNIT	OUTDOOR UNIT
			AH-129	AU-129
Cooling capacity		kW	3.50	
Moisture removal		Liters/h	—	
Electrical data				
Phase			Single	
Rated frequency		Hz	50	
Rated voltage		V	220	
Rated current		A	5.1	
Rated input *		W	1090	
Power factor		%	97 - 99	
Compressor	Type	Hermetically sealed rotary type		
	Model	RH207VXGT		
	Oil charge	520cc (DIAMOND MS56)		
Refrigerant system	Evaporator	Slit fin and Grooved tube type		
	Condenser	Slit fin and Grooved tube type		
	Control	Capillary tube		
	Refrigerant volume	960g		
Noise level	High	dB(A)	39	48
	Mid.	dB(A)	33	—
	Low	dB(A)	29	—
Fan system				
Drive			Direct drive	
Air flow quantity	High	m <sup>3</sup> /min.	10.2	27
	Mid.	m <sup>3</sup> /min.	9.6	—
	Low	m <sup>3</sup> /min.	8.7	—
Fan			Cross flow fan	Propeller fan
Connections				
Refrigerant coupling			Flare type	
Refrigerant tube size Gas, Liquid			3/8" , 1/4"	
Drain piping mm			O.D.Ø 18	
Others				
Safety device			Compressor : Internal protector	
			Fan motor : Thermal fuse / Protector	
			Fuse, Micro computer control	
Air filters			Polypropylene net (Washable)	
Net dimensions	Width	mm	790	730
	Height	mm	278	540
	Depth	mm	198	250
Net weight		kg	10	34

## 2. AH-MP14 / AU-MP14

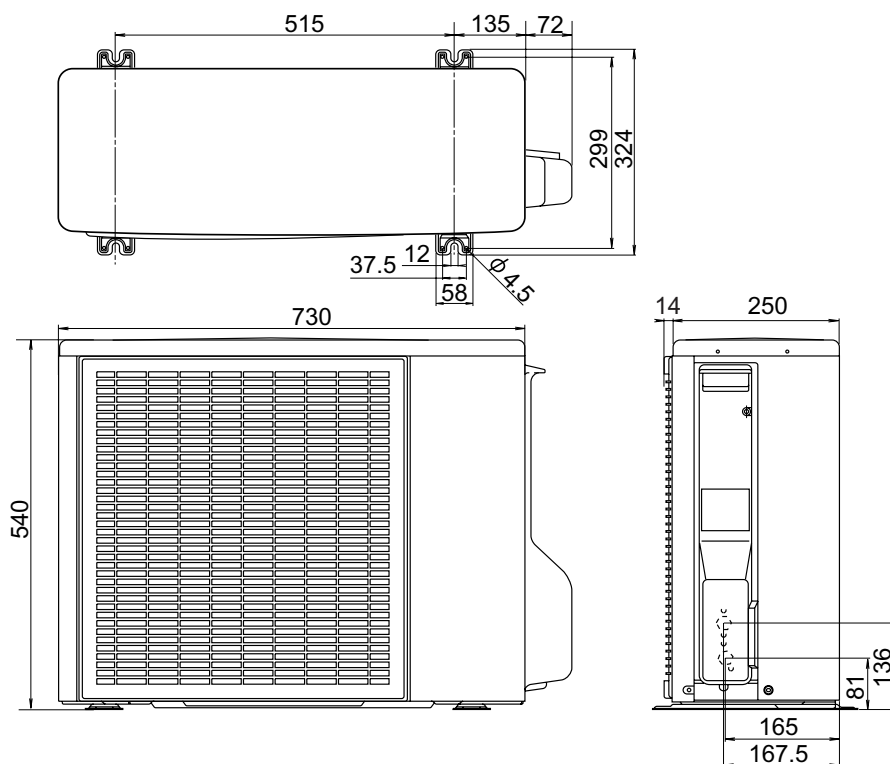
ITEMS			INDOOR UNIT		OUTDOOR UNIT	
			AH-MP14		AU-MP14	
Cooling capacity		kW	3.50			
Moisture removal		Liters/h	—			
Electrical data						
Phase			Single			
Rated frequency		Hz	50			
Rated voltage		V	220			
Rated current		A	5.1			
Rated input *		W	1090			
Power factor		%	97 - 99			
Compressor	Type		Hermetically sealed rotary type			
	Model		RH207VXGT			
	Oil charge		520cc (DIAMOND MS56)			
Refrigerant system	Evaporator		Slit fin and Grooved tube type			
	Condenser		Slit fin and Grooved tube type			
	Control		Capillary tube			
	Refrigerant volume		960g			
Noise level	High	dB(A)	39	48		
	Mid.	dB(A)	33	—		
	Low	dB(A)	29	—		
Fan system						
Drive			Direct drive			
Air flow quantity	High	m <sup>3</sup> /min.	10.2	27		
	Mid.	m <sup>3</sup> /min.	9.6	—		
	Low	m <sup>3</sup> /min.	8.7	—		
Fan			Cross flow fan		Propeller fan	
Connections						
Refrigerant coupling			Flare type			
Refrigerant tube size Gas, Liquid			3/8"φ 1/4"			
Drain piping			mm	O.D.φ 18		
Others						
Safety device			Compressor : Internal protector			
			Fan motor : Thermal fuse / Protector			
			Fuse, Micro computer control			
Air filters			Polypropylene net (Washable)			
Net dimensions	Width	mm	790	730		
	Height	mm	278	540		
	Depth	mm	198	250		
Net weight		kg	10	34		

## [2] EXTERNAL DIMENSION

### 1. Indoor unit (AH-129 / AH-MP14)

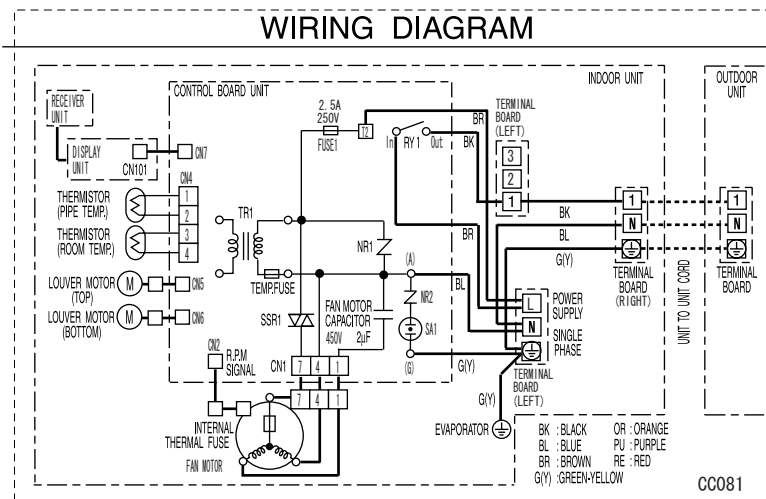


### 2. Outdoor unit (AU-129 / AU-MP14)

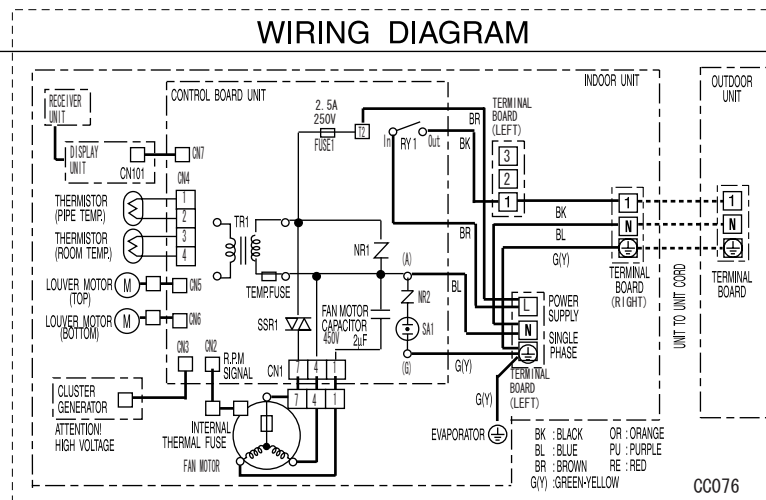


### [3] WIRING DIAGRAM

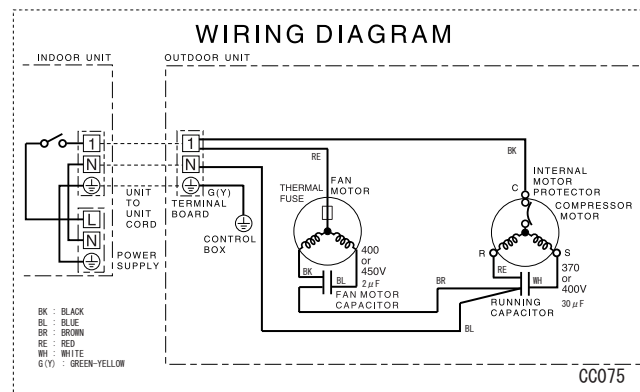
#### Indoor Unit (AH-129)



#### Indoor Unit (AH-MP14)



#### Outdoor (AU-129 / AU-MP14)



## CHAPTER 2. ELECTRIC CIRCUIT

### [1] ELECTRIC PARTS

#### 1. AH-129 / AU-129

DESCRIPTION	MODEL	REMARKS	SITE
Compressor	RH207VXGT	220V, 50Hz, 1120W	OUTDOOR
Indoor fan motor	CMOT-A448JBKZ	220 - 240V , 50Hz	INDOOR
Outdoor fan motor	CMOTLB182JBEZ	220 - 240V , 50/60Hz	OUTDOOR
Indoor fan motor capacitor	—	450V, 2 $\mu$ F	INDOOR
Outdoor fan motor capacitor	—	400V, 2 $\mu$ F	OUTDOOR
Running capacitor	—	400V, 30 $\mu$ F	OUTDOOR
Transformer	—	Primary ; AC 220 / 240V 50Hz	INDOOR
	—	Secondary ; AC15.3V , 50Hz	
Fuse	—	250V, 2.5A	INDOOR

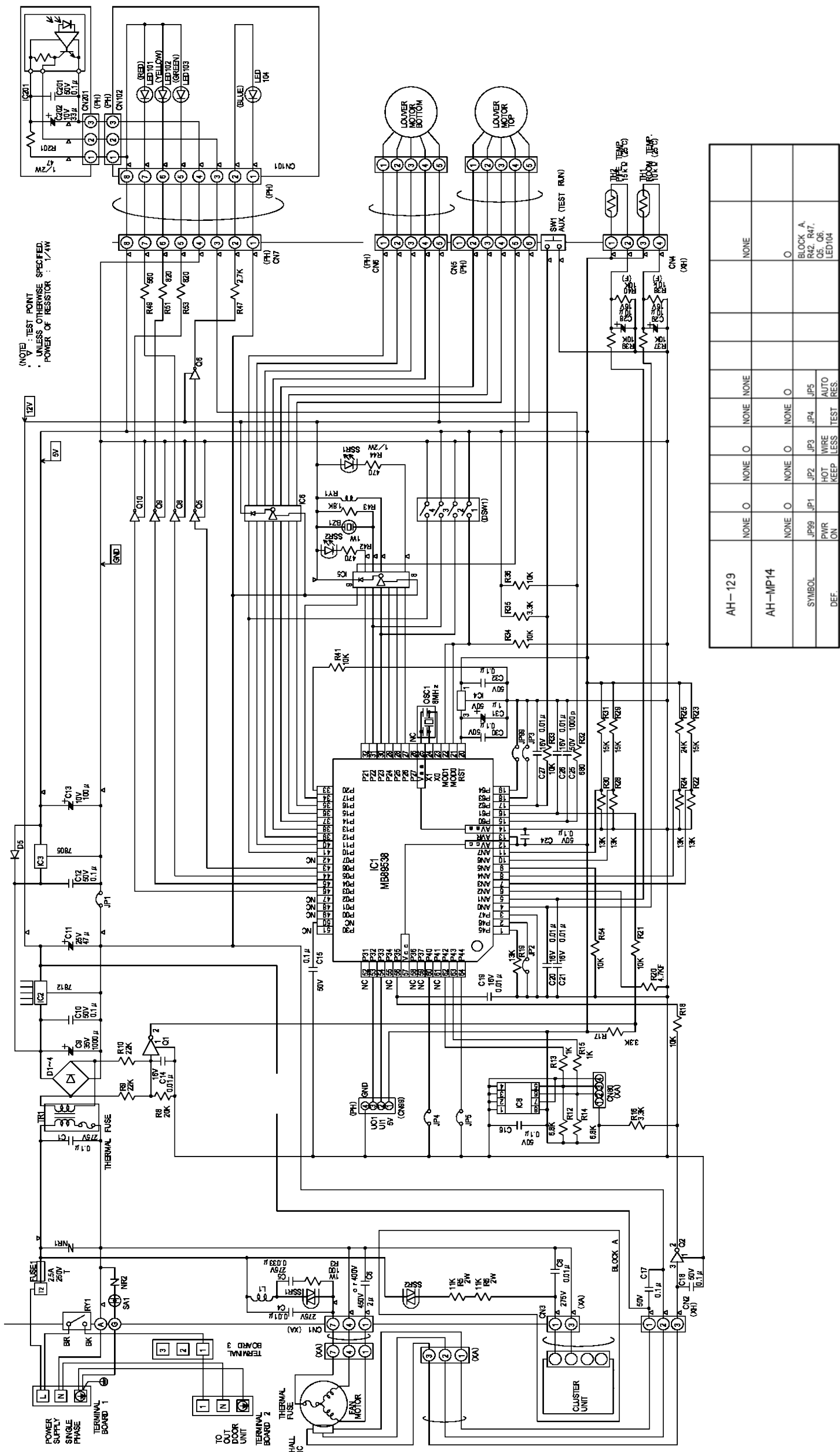
#### 2. AH-MP14 / AU-MP14

DESCRIPTION	MODEL	REMARKS	SITE
Compressor	RH207VXGT	220V, 50Hz, 1120W	OUTDOOR
Indoor fan motor	CMOT-A448JBKZ	220 - 240V , 50Hz	INDOOR
Outdoor fan motor	CMOTLB182JBEZ	220 - 240V , 50/60Hz	OUTDOOR
Indoor fan motor capacitor	—	450V, 2 $\mu$ F	INDOOR
Outdoor fan motor capacitor	—	400V, 2 $\mu$ F	OUTDOOR
Running capacitor	—	400V, 30 $\mu$ F	OUTDOOR
Transformer	—	Primary ; AC 220 / 240V 50Hz	INDOOR
	—	Secondary ; AC15.3V , 50Hz	
Fuse	—	250V, 2.5A	INDOOR

[2] MICRO-COMPUTER CONTROL SYSTEM

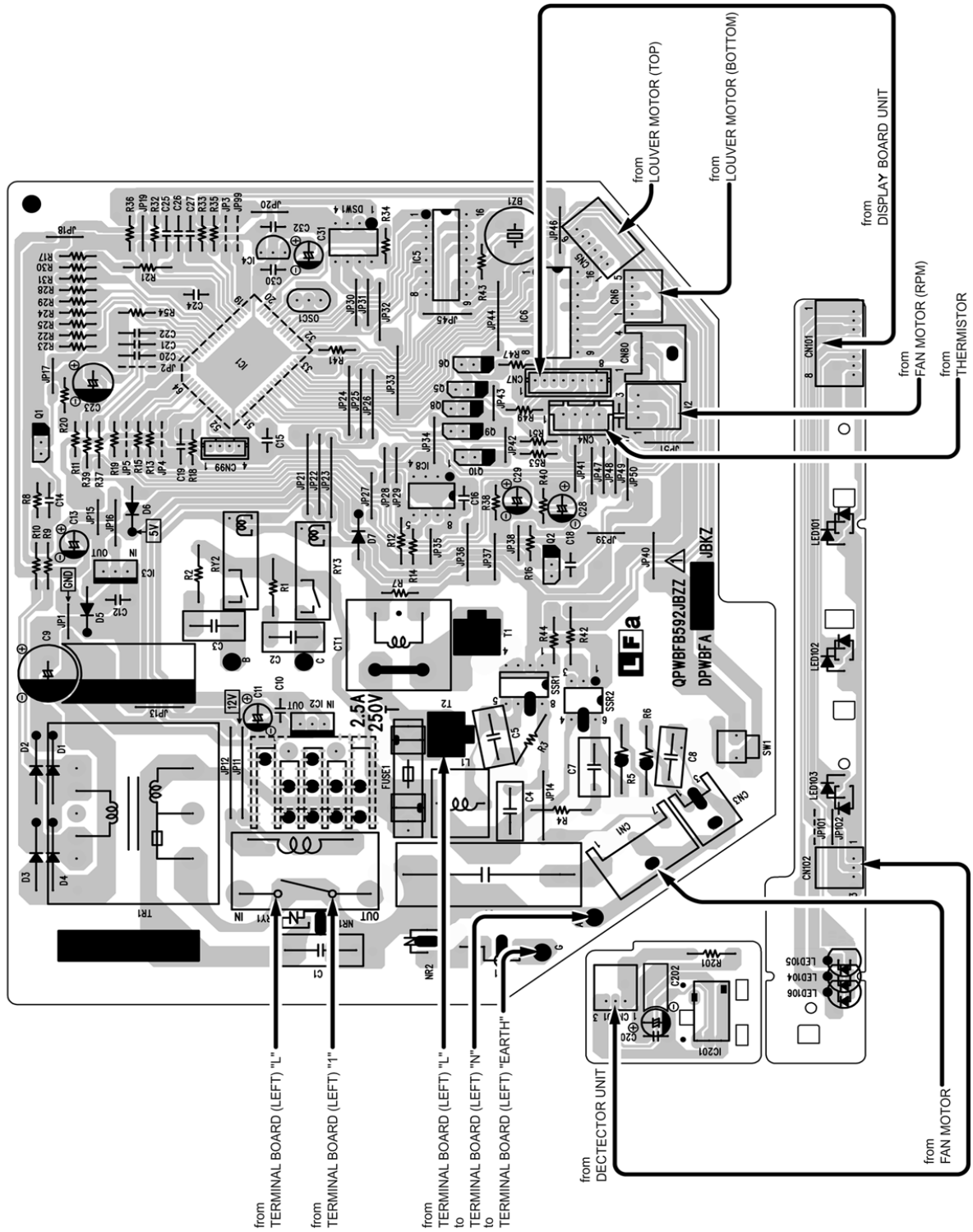
1. Electronic Control Diagram

Indoor unit (AH-129 / AH-MP14)



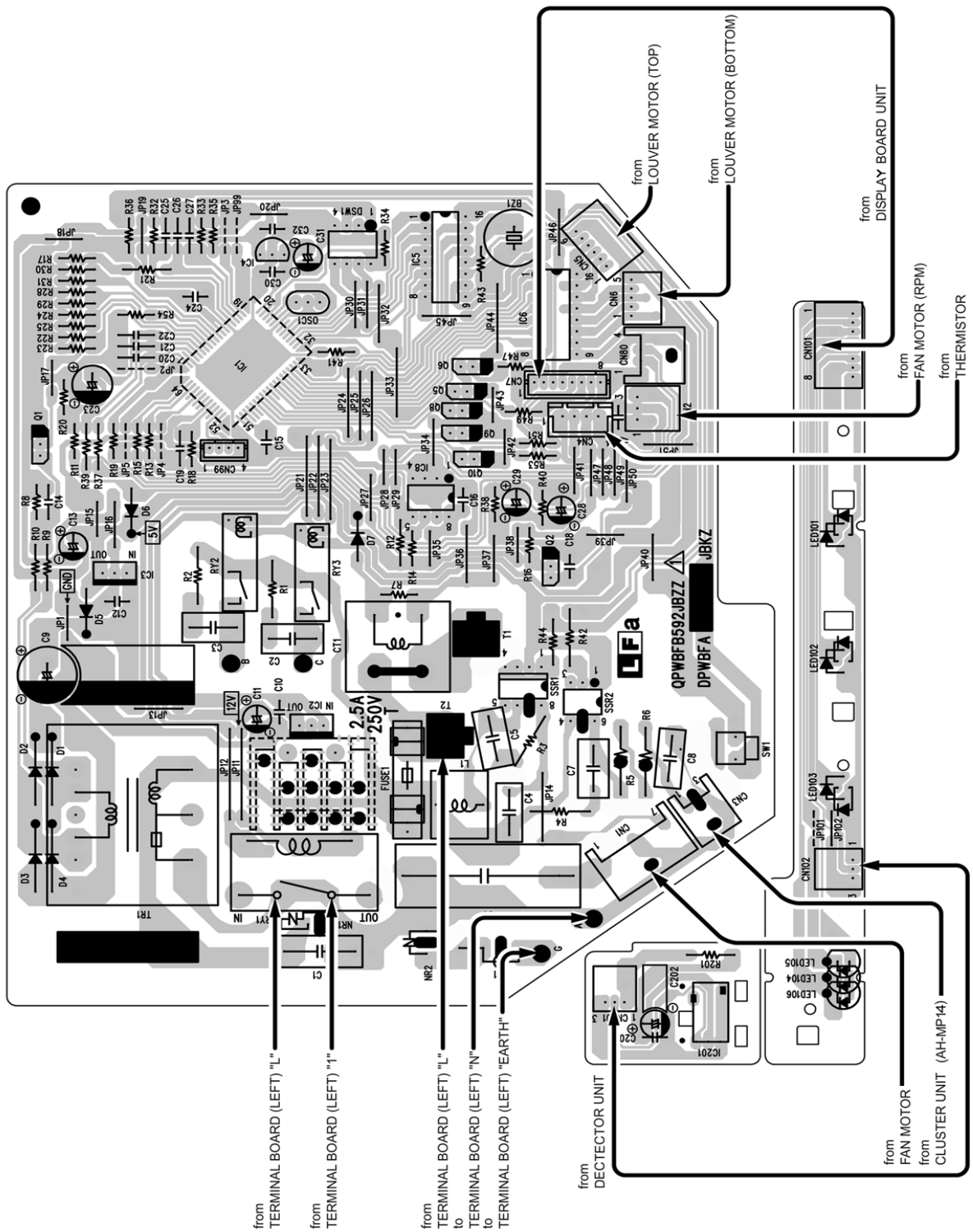
## 2. PRINTED WIRING DIAGRAM

### 2.1 Indoor (AH-129)





## 2.2 Indoor (AH-MP14)



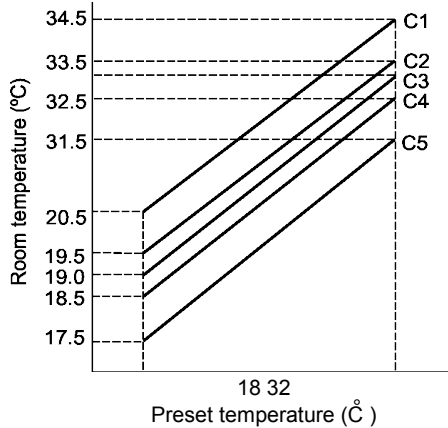
## CHAPTER 3. FUNCTIONS

### [1] FUNCTION

#### TEMPERATURE CONTROL

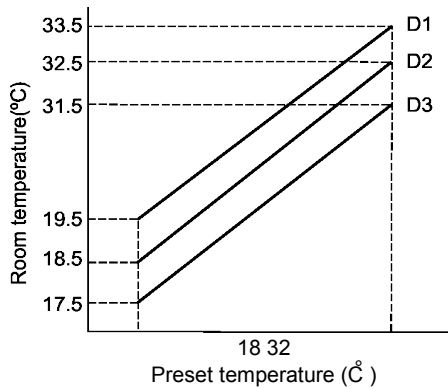
##### CHARACTERISTIC 1.1. COOL operation

In the "COOL" mode, the thermostat circuit is controlled by five thermostat lines (C1 thru C5).



##### 1.2. DRY

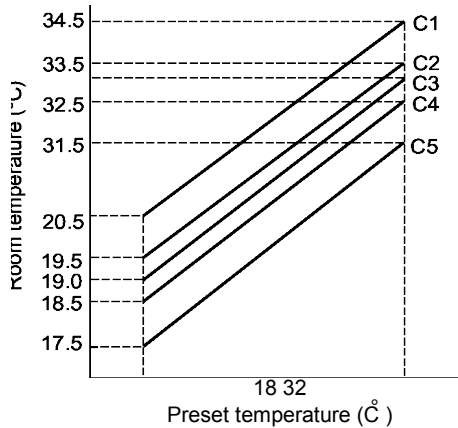
In the "DRY" mode, the thermostat circuit is controlled by three thermostat lines (D1 thru D3).



#### OPERATION MODES

##### 2.1. COOL operation

The compressor turns on or off, at the thermostat lines C3 and C4. The outdoor fan motor is also controlled with the compressor.



##### 2.2. DRY

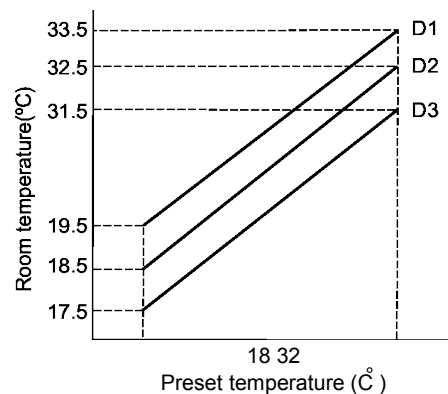
On the switch on, the compressor always starts to operate for 2 minutes with fan speed "DL".

The microcomputer reads the room temperature 2 minutes after this first compressor operation.

This room temperature is set as the preset temperature

The preset temperature ranges from 18°C to 32°C. When the room temperature is below 18°C, the preset temperature is set to 18°C, and when the room temperature is over 32°C, the preset temperature is set to 32°C.

Dry operation is divided into three zones (Cooling zone, Dehumidifying zone and Circulating zone) by thermostat lines (D1 to D3), and the compressor and the fan motor are controlled in each zone as shown in Table.



	Compressor	Fan speed
Cooling zone (1) & (5)	ON	"DH"
Dehumidifying zone (2) & (4)	ON	"DL"
Circulating zone (3)	OFF	"DL" or OFF

##### FAN SPEED

Fan speeds are given by the indoor fan motor, "DL"~"CH" which are available in the following operation mode.

NOTE: Fan speed may be changed, without warning.

Fan speed	Fan switch	Fan switch (AUTO)	AH-129 / AH-MP14 (r.p.m)
DL	—	DRY	800
DH	—		890
CL	COOL LOW	COOL	800
CAL	—		840
CM	COOL MID		980
CAH	—		1020
CH	COOL HIGH	—	1170

##### FREEZE PREVENTIVE

When the indoor pipe temperature falls below 3°C cool or dry operation for 3 minutes or more, the compressor is turned off. When the indoor pipe temperature rises above 7°C in cool or dry operation for 3 minutes or more, the compressor is turned on.

## TEST RUN

If the "AUX" button on the unit is pressed for 5 seconds or more during operation, cool test operation starts. The operation LED (red) flickers during test run.

In cool mode continuous compressor on operation is performed. In dry mode the operation is in dehumidifying zone.

## TIMER

### 6.1. ON/OFF Timer

When the unit operates during one hour after the OFF-time is set, tem-

perature setting is automatically shifted  $+0.33^{\circ}\text{C}$  (After 1H)  $+0.66^{\circ}\text{C}$  (After 1.5H)  $+1^{\circ}\text{C}$  (After 2H) in operation and dry operation). When the ON-timer is set in cool operation, operation starts before 0 to 30 minutes(depends on the room temperature) so that preset temperature is obtained at set time.

### 6.2. 1 hour timer

When ONE-HOUR timer is set, the unit turns off automatically after one hour. The one hour timer operation has priority over other time operation, such as the TIMER ON and TIMER OFF. If the ONE-HOUR TIMER button is pressed again during operation, the unit

## AUTOMATIC AIR CONDITIONING

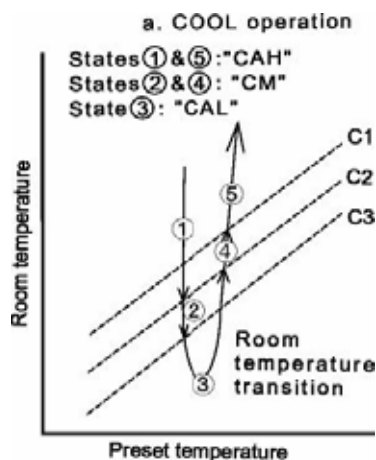
When automatic air conditioning is selected, the operation mode and preset temperature are set automatically according to the room temperature on starting operation.

Room temperature at operation start	Operation Mode	Preset Temperature
Above $28^{\circ}\text{C}$	COOL	$26^{\circ}\text{C}$
$26^{\circ}\text{C} > 28^{\circ}\text{C}$		$25^{\circ}\text{C}$
$24^{\circ}\text{C} > 26^{\circ}\text{C}$		$24^{\circ}\text{C}$
Below $24^{\circ}\text{C}$	DRY	Room temperature at operation start

When DRY mode is selected by the micro computer with AUTO operation, the fan speed lamps on the indoor unit panel will indicate identically with the fan speed symbols on the remote control display, as the FAN speed setting is changed accordingly. Despite,

## AUTOMATIC FAN SPEED

When the automatic fan speed is selected in cool operation, the fan speed is automatically changed by the thermostat lines C1 to C3 in cool operation.



## OUTPUTS IN EACH OPERATION MODE

Mode	Compressor	Outdoor Fan Motor	Indoor Fan Motor	Valve Coil
0 Cooling	ON	ON	ON	OFF
0 Circulating	OFF	OFF	ON	OFF
0 Cooling	ON	ON	L/UL	OFF
} Dehumidifying	ON	ON	UL/D	OFF
0 Circulating	OFF	OFF	D/OFF	OFF

## POWER ON START

If the connecting wire "POWER ON" (JP99) is cut on the PWB ass'y, when the power is supplied by turning on a circuit breaker, the air conditioner automatically starts of operation in "AUTO".

(Refer to Printed Wiring Board.)

## AUTO RESTART

### 11.1. When JP5 is ON

Power failuer occurs during operation, the unit will restart in the same operation mode as before recovery.

### 11.2. When JP5 is OFF

Auto restart function is not available.

## [2] TEST MODE

### 1. AH-129

Keep pushing the "AUX." buttons and supply the power, the system will go to the test mode. In this mode, the output of operation is switched by pushing the ""AUX." button in the unit or the "OI" button in the remote controller. Normal outputs are shown in Table.

STEP No.	OUTPUT "-" : NO CHECK, "O" : ON, "X" : OFF								
	BUZZER					FAN MOTOR	LOUVER	OUTDOOR	
		LED 101	LED 102	LED 103	LED 104				
		RED	YELLOW	GREEN	BLUE				
STEP0	BEEP2	O *1	O*2	O	X	X	X	X	*1 : 7°C<(ROOM TEMP.)<42°C *2 : -2°C<(PIPE TEMP.)<45°C
STEP1	BEEP1	X	X	O	X	O	OPEN	O	
STEP2	BEEP1	O RPM	X	O	X	O	X	X	
STEP3	BEEP1	O	*4	X	X	O	X	O	*4 : O --- POWER ON INVALIDITY
STEP4	BEEP1	O IC8	O	O	X	O	X	X	*4 : X --- POWER ON VALIDITY
STEP5	BEEP1	O	O	O	X	O	X	O	
STEP6	BEEP1	X R.C.	X	O	X	O	X	X	
STEP7	BEEP1	X	X	X	X	O	X	O	
STEP8	BEEP1	X	X	O	X	O	X	X	
STEP9	BEEP1	O	X	O	X	O	X	O	
STEP10	BEEP1	O	O	O	X	X	CLOSE	O	

### 1. AH-MP14

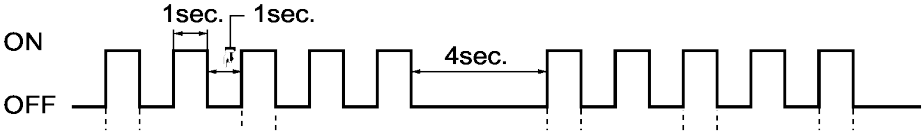
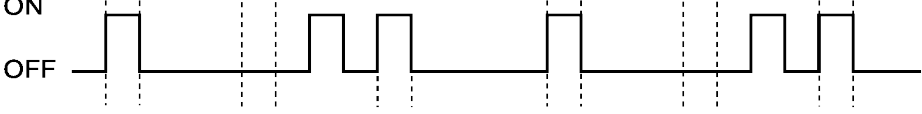
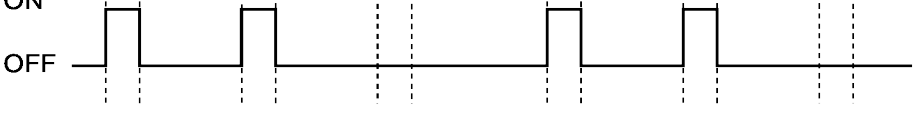
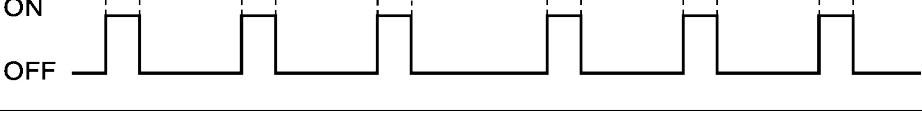
STEP No.	OUTPUT "-" : NO CHECK, "O" : ON, "X" : OFF									
	BUZZER					FAN MOTOR	LOUVER	OUTDOOR	PLASMA CLUSTER	
		LED 101	LED 102	LED 103	LED 104					
		RED	YELLOW	GREEN	BLUE					
STEP0	BEEP2	O *1	O*2	O	O	X	X	X	X	*1 : 7°C<(ROOM TEMP.)<42°C *2 : -2°C<(PIPE TEMP.)<45°C
STEP1	BEEP1	X	X	O	X	O	OPEN	O	X	
STEP2	BEEP1	O RPM	O	O	O	O	X	X	O	
STEP3	BEEP1	O	*4	X	X	O	X	O	O	*4 : O --- POWER ON INVALIDITY
STEP4	BEEP1	O IC8	O	O	X	O	X	X	X	*4 : X --- POWER ON VALIDITY
STEP5	BEEP1	X	O	O	X	O	X	O	X	
STEP6	BEEP1	X R.C.	X	O	X	O	X	X	X	
STEP7	BEEP1	X	X	X	X	O	X	O	X	
STEP8	BEEP1	X	X	O	X	O	X	X	X	
STEP9	BEEP1	O	X	O	X	O	X	O	X	
STEP10	BEEP1	O	O	O	X	X	CLOSE	O	X	

[3] DIAGNOSIS PROCEDURE

1. AH-129 / AH-MP14

When indoor fan motor is out of order occurs, indoor fan motor and louver are all stopped and the operation LED(red) turns on or off synchronously with the timing of the timer LED.

When the thermistor for room temperature or pipe temperature is open or short state, the operation LED turns on or off synchrnoously with the timing of the timer LED by pushing continously for more than 5 seconds "AUX." button during suspension of operati

	Timer LED	
Indoor fan motor	Operation LED	
Thermistor short state	Operation LED	
Thermistor open state	Operation LED	

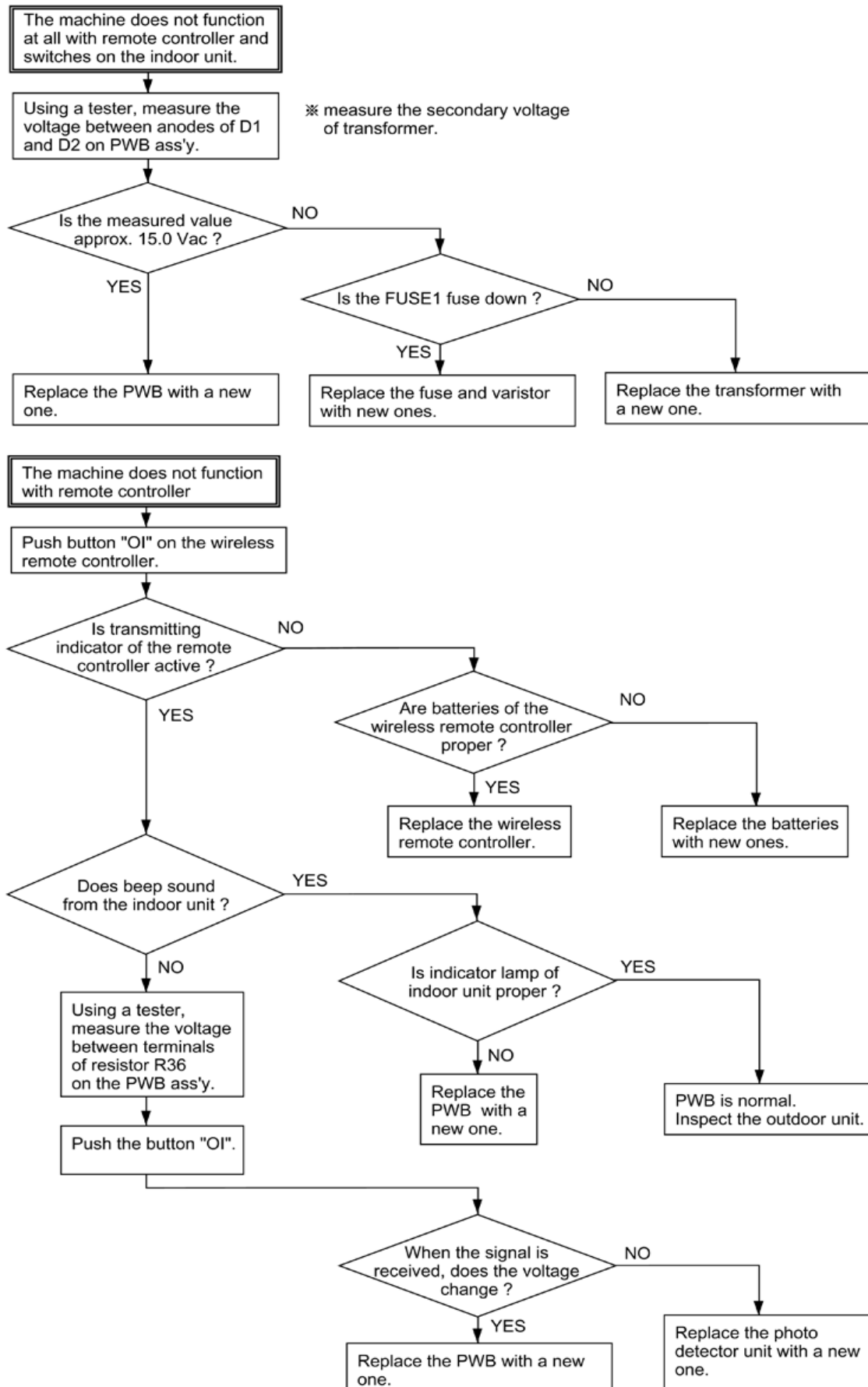
Timing chart of Timer LED and Operation LED of DIAGNOSIS PROCEDURE.

When "OI" button the remote controller or "AUX." button in the unit is pushed, the unit is free from DIAGNOSIS

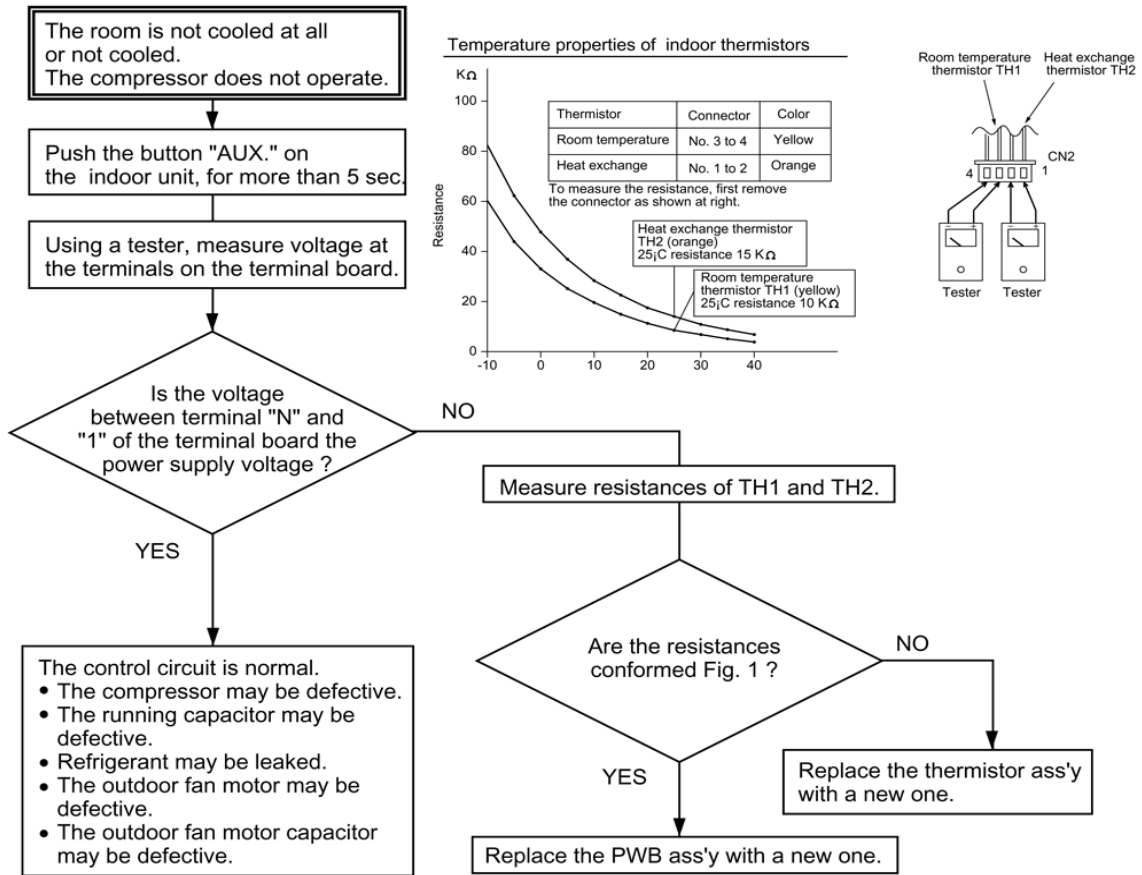
PROCEDURE

When the louver unit is not properly installed, all lamps on the indicator panel will blink operation are all stop and Remote signal is not accept.

## CHAPTER 4. TROUBLESHOOTING



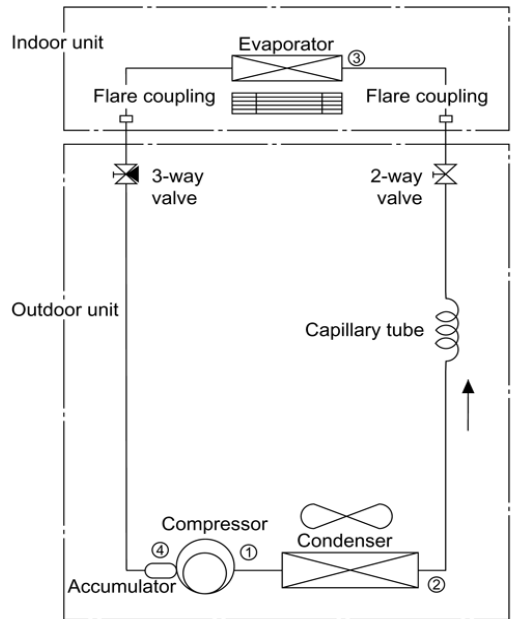
# CHAPTER 4. TROUBLESHOOTING



# CHAPTER 5. REFRIGERATION CYCLE AND PERFORMANCE CURVES

## [1] REFRIGERATION CYCLE

### 1. Refrigeration cycle



### 2. Standard conditions

		Cooling
Indoor side	Dry-bulb Temp.	27°C
	Relative Humidity	47%
Outdoor side	Dry-bulb Temp.	35°C
	Relative Humidity	40%

\* REFRIGERANT PIPE LENGTH 5m

### 3. Temperature at each part and pressure in 3-way valve

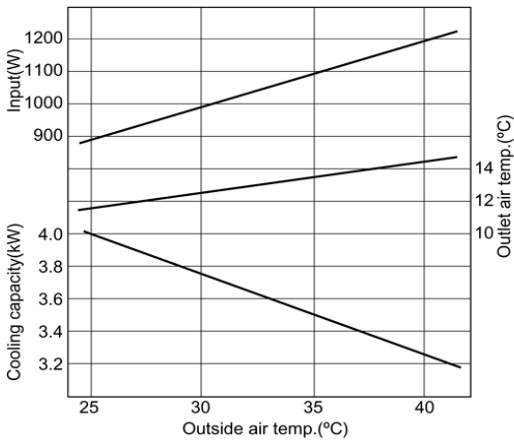
(1)	86°C
(2)	38°C
(3)	13°C
(4)	13°C
3-way valve pressure (MPaG)	0.50

### 4. Dimension of Capillary tube

Capillary tube	O.D	I.D	L
	2.7	1.6	700

## [2] PERFORMANCE CURVES

- NOTE: 1) Indoor fan speed : Hi  
2) Vertical adjustment louver "45°", Horizontal adjustment louver "Front"  
3) Indoor air temp. : Cooling 27°C  
4) Power source : 220V, 50Hz





## DISASSEMBLING PROCEDURE

MODEL: AH-129 ,AH-MP14

### [1] INDOOR UNIT

Be sure to disconnect the power supply cord from the AC power outlet before starting the disassembly procedure. When reassembling the unit after repairing, be sure to install screws to their original positions.

The screws used are not the same in specifications such as corrosion-resistant treatment, tip shape and length.

After the air conditioner is repaired or parts are replaced, measure insulation resistance of the equipment using an insulation resistance meter. If the measured resistance is lower than 1M  $\Omega$ , inspect parts and repair or replace defective parts.

1) Open the open panel.



5) Pushing the 2 hooks, disconnect the louver base(2)



2) Remove screw fixing the cord clamp.



6) Remove 2 air filters.



3) Remove the cord clamp.



7) Remove the Screw cover (use the (-) driver).



4) Remove the unit-to-unit wiring from the terminal board(4).



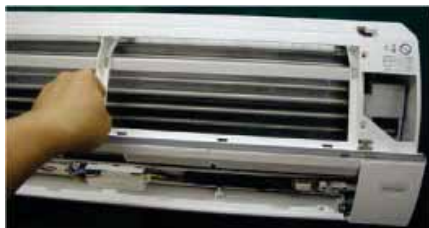
8) Remove the cover.



9) Remove 5 screws fixing the front panel.



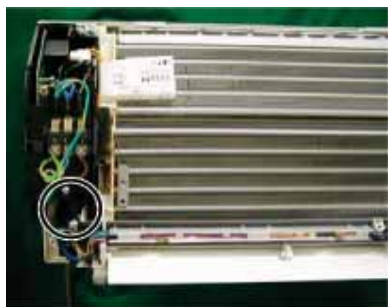
10) Pull the front panel up.



11) Remove a screw fixing the Control box cover,  
and remove it



12) Remove the 2 screws fixing the control box.



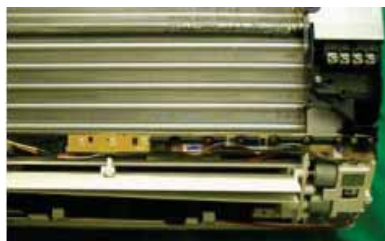
13) Disconnect the thermistor.



14) Remove the control box.



15) Remove the LED guide.



16) Pushing the 2 hooks of the holder, remove the display  
board



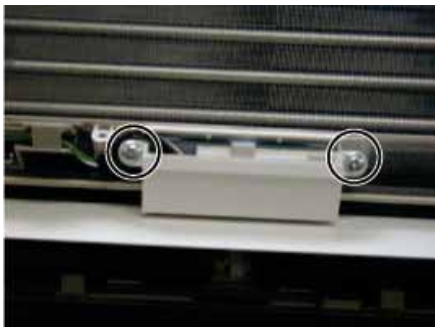
17) Remove a screw fixing the holder.



18) Remove the holder.



19) Remove 2 screws fixing the holder. (AH-MP14)



20) Remove 2 screws fixing the PC cover. (AH-MP14)



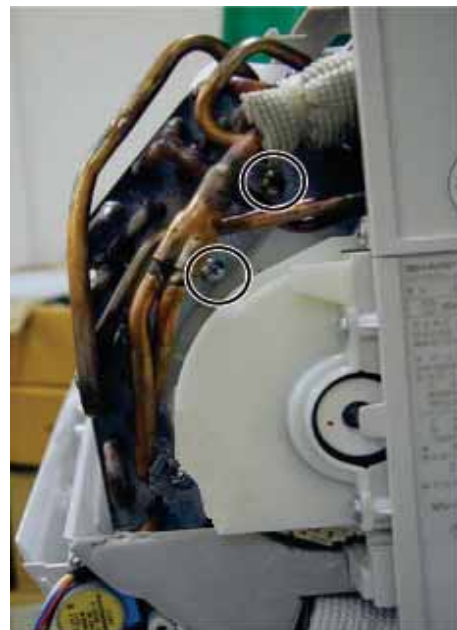
21) Remove the screw fixing the evaporator ass'y and -  
evaporator.



22) Remove the drain guide.



23) Remove 2 screws fixing the evaporator.



24) Remove 2 screw fixing the evaporator and bushing holder.



25) Pull the evaporator ass'y up.



26) Take out the left side of the drain pan.



Attention: In case of assembly.

Part A is inserted into the drain part of the drain pan.

27) Take out the right side of the drain pan leaving drain-hose in cabinet.



28) Remove the screw fixing cross flow fan.



29) Hold up the left side of evaporator, pull out cross flow fan





## [2] OUTDOOR UNIT

1) Loose a screw fixing the side cover



3) Loose the unit-to-unit cord.



2) Loose 2 screws fixing the terminal cover and 1 screw-  
fixing the cord clamp.



4) Loose 6 screws fixing the top panel.  
( Right side view )



( Left side view )



5) Loose 5 screws fixing the front panel. (Right side view)



( Left side view )

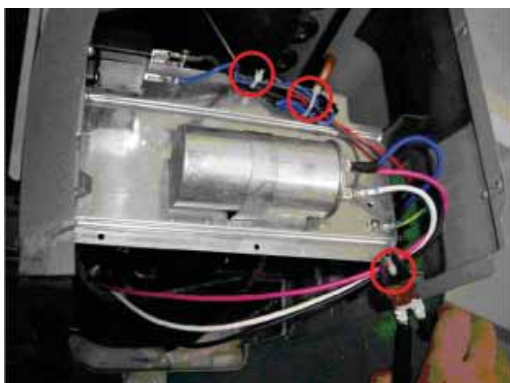
( Front view )



( Front view )



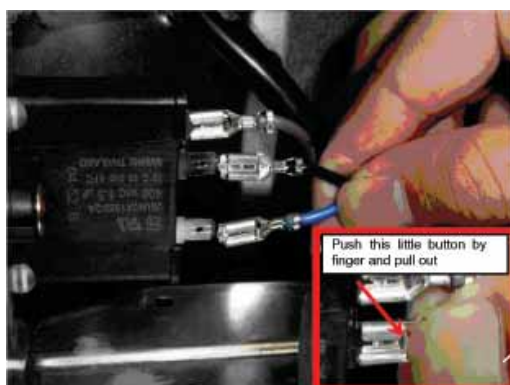
6) Cut 3 plastic bands.



9) Remove 3 terminals of compressor.



7) Remove 2 terminals. (connecting with fan condenser)



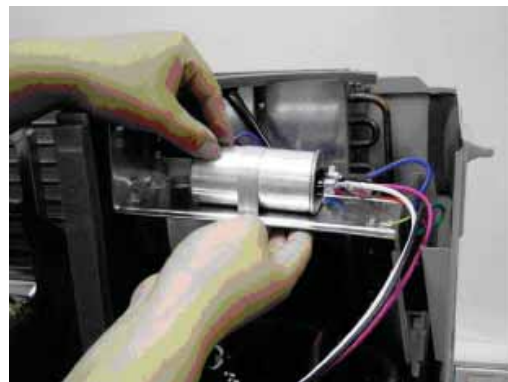
10) Loose 4 screw fixing the control box.



8) Remove the terminal cover.

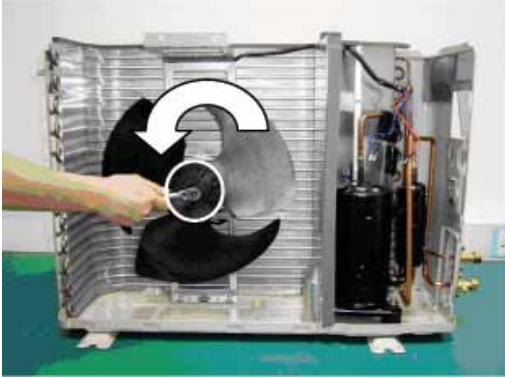


11) Take out the control box



## 1. DISASSEMBLING PROCEDURE OF THE FAN

1) Loose the fan nut and take out fan.



2) Loose 4 screws fixing fan motor.



## 2. ASSEMBLING PROCEDURE OF COMPRESSOR COVER

1) Remove: Unlace the fastenner and pull the compressor cover out from left side. [a]→ b)]

2) Assembly: Insert the compressor cover from left side, cover the tube and fasten. [b]→ a)]

