

5. Troubleshooting

5-1-1 Items to be checked first

- 1) **The input voltage should be rating voltage $\pm 10\%$ range.**
The air conditioner may not operate properly if the voltage is out of this range.
- 2) **Is the link cable linking the indoor unit and the outdoor unit linked properly?**
The indoor unit and the outdoor unit shall be linked by 5 cables.
Check the terminals if the indoor unit and outdoor unit are properly linked by the same number of cables.
Otherwise the air conditioner may not operate properly.
- 3) **When a problem occurs due to the contents illustrated in the table below it is a symptom not related to the malfunction of the air conditioner.**

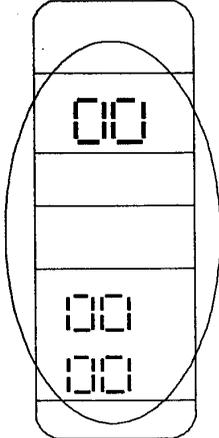
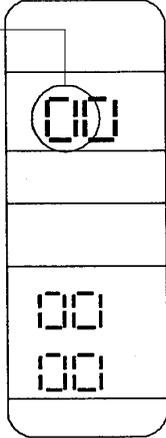
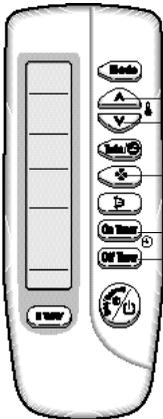
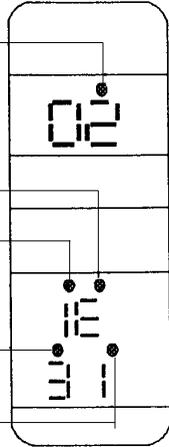
NO	Operation of air conditioner	Explanation
1	The STD operation indication LED blinks when a power plug of the indoor unit is plugged in for the first time.	It indicates power is on. The LED stops blinking if the operation ON/OFF button on the remote control unit is pushed.
2	In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the IN DOOR FAN should operate. In a HEAT operation mode, the compressor does not operate at a room temperature lower than the setting temperature that indoor fan should operate.	In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on. As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew
3	Fan speed setting is not allowed in AUTO or DRY mode.  	The speed of the indoor fan is set to LL in DRY mode. Fan speed is 5 steps is selected automatically in AUTO mode.
4	Compressor stops operation intermittently in DRY mode. 	Compressor operation is controlled automatically in DRY mode depending on the room temperature and humidity.
5	Compressor of the outdoor unit is operating although it is turned off in a HEAT mode.	When the unit is turned off while de-ice is activated, the compressor continues operation for up to 9 minutes (maximum) until the deice is completed.
6	Timer LED only of the indoor unit lights up and the air conditioner does not operate.	Timer is being activated and the unit is in ready mode. The unit operates normally if the timer operation is cancelled.
7	The compressor and indoor fan stop intermittently in HEAT mode.	The compressor and indoor fan stop intermittently if room temperature exceeds a setting temperature in order to protect the compressor from overheated air in a HEAT mode.
8	Indoor fan and outdoor fan stop operation intermittently in a HEAT mode.	The compressor operates in a reverse cycle to remove exterior ice in a HEAT mode, and indoor fan and outdoor fan do not operate intermittently for within 20% of the total heater operation
9	The compressor stops intermittently in a COOL mode or DRY mode, and fan speed of the indoor unit decreases.	The compressor stops intermittently or the fan speed of the indoor unit decreases to prevent inside/outside air frozen depending on the inside/outside air temperature.

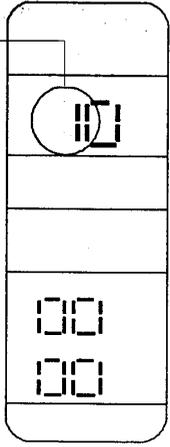
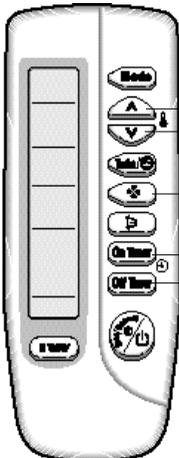
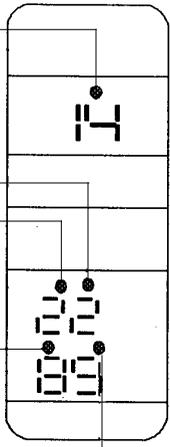
- 4) **Indoor unit observes operation condition of the air conditioner, and displays self diagnosis details on the display panel.**

NO	Display				Self Diagnosis
	Standard	Timer	Nature	Power	
1	 (GREEN)	X	X	X	Restore from power failure (input initial power)
2	X		X	X	Indoor unit Room sensor Error (open or short)
3	 (GREEN)		X	X	Indoor unit heat exchanger temperature sensor Error (open or short)
4	X	X		X	Indoor fan malfunctioning (for speed is below 450rpm)
5	X			X	In case that the communication between the indoor unit and outdoor unit is not made for 60 seconds
6	 (GREEN)	X		X	Outdoor sensor Error (open or short) - Outdoor sensor - Pipe sensor A, B
7	 (GREEN)	X			The malfunction of 4way valve in heat mode operation.

5-1-2 Set up the Model option

✳ If you make the replacement of the ASS'Y CONTROL-IN or MAIN PCB ,
Be sure to be set up the model option as follow the steps

Remote controller operation method as per the step	Applicable key	Display status
<p>1st step Method) ① Remove the battery of remote controller ② Press the temperature raise/down key simultaneously ③ Insert the battery again</p> <p>(Result) If the screen of remote displays as shown in the right, go to the second step</p>		
<p>2nd step Method) If the first digit of LCD is 0 on the remote screen, go to the 3rd step.</p> <p>✳ If it is 1, press the mode key once to change to 0 and go to the 3rd step.</p>		
<p>3rd step Method) Press the marked key to input the option number. example) 021E31</p> <p>Result) Go to 4th step if it displays as shown in the right (The number increases from 1-9, and A, b, C, d, E, F whenever pressing the key.)</p>		

Remote controller operation method as per the step	Applicable key	Display status
<p>4th step Method) After completion of 3rd step, and if the MODE KEY is pressed once, 1. 1-3 steps are saved internally 2. If the first number at the time is "1", it is correct and so go to 5th step</p> <p>* If pressing mode key and the first digit becomes 0, the screen of 1-3 steps can be seen.</p>		
<p>5th step Method) Pressing the marked key to input the option number. example) 142285</p> <p>Result) If it displays as shown in the right go to the 6th step</p>		
<p>6th step Method) When pressing the operation ON/OFF key with the direction of remote controller for set, the sound "Ding, or Diriring is heard and then the input of option is completed.</p> <p>* Refer to the right side if the error appears.</p>	<p>ERROR MODE</p> <p>1. When the lamp(STANDARD(☀️), NATURE(🌿), TIMER(🕒)) is flickering → failute of option input After removing the set power cord and insert it again, pressing the operation on/off key to retry and if the condition is same, EPROM is deffective or misinsertted. So replace the PCB.</p>	<p>2. When all lamps (☀️🌿🕒) are flickering with the sound of Dididiring, → The current option input is different from that of already input one: Check the option number correctly and if it is correct, press the key once more to input the option. (check correctly) → If the option is not input at the time and the all lamps are continuously flickering ; since it is the case that the option number is out of the input range, check the option number again and do again the steps from 1 - 6steps</p>

<Table of the option code>

MODEL	OPTION CODE
AD18B1(B2)E09 MH18ZA1(A2)-09	016223-1000EA
AD19B1(B2)E07 MH19ZA1(A2)-09	015553-1000B7
AD19B1(B2)E12 MH19ZA1(A2)-12	015553-10023F
AD24B1(B2)E12 MH24ZA1(A2)-12	017553-10021d
AD26B1(B2)E12 MH26ZA1(A2)-12	-
AD26B1(B2)E07 MH26ZA1(A2)-07	-

5-2 Checking and Testing Operations (Outdoor Unit)

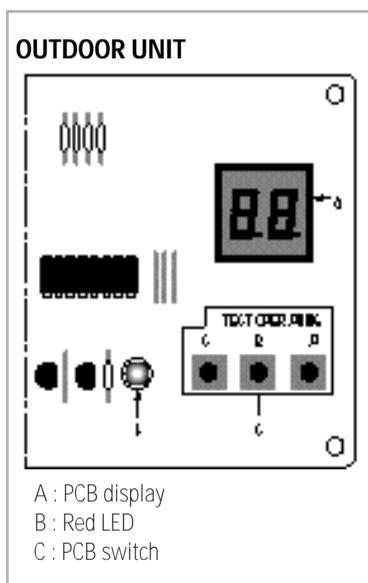
To complete the installation, perform the following checks and tests to ensure that the air conditioner is operating correctly.

1. Review all the following elements in the installation:

- Installation site strength
- Piping connection tightness to detect any gas leakages
- Connection wiring
- Heat-resistant insulation of the piping
- Drainage
- Earthing wire connection
- Correct operations (follow the steps below)
- Room select switch in the indoor unit

2. Apply the power to the outdoor unit.

- Check the fuse (250V~, 5A) : The fuse is open when the power line (L, N) is short.



3. Check the connection of PCB communication of outdoor unit. (Check whether the red LED of outdoor unit PCB is flickering.)

- The communication lamp is flickering after the display of each unit on the outdoor PCB display part. (every one second).
LED is not flickering, if the connection is bad or the room select switch is located in the wrong position.
 - LED lamp (red) flickering after display of A (0.5 sec)
 - LED lamp (red) flickering after display of b (0.5 sec)
 - LED lamp (red) flickering after display of C (0.5 sec)

Note : PCB switch "C" is used for triple split multi air conditioner.

Result : If all of three units display lamps are flickering, the connection wires and the room option connections are good.

If the lamp is not flickering, check as follows:

A. Check the display part of indoor unit of each unit (A,B) after outdoor unit PCB switch S/W-A is on.

Check the status of each unit indoor room select switch.

(Adjust the select switch suitable to the unit A, B.)

- A unit : STANDARD LED on, TIMER LED flickering
- B unit : STANDARD LED on, TIMER and NATURE LED flickering
- C unit : STANDARD LED on, TIMER and NATURE, POWER LED flickering (In case of triple split multi air conditioner)

UNIT	STANDARD	TIMER	NATURE	POWER
A	○	◐	●	●
B	○	◐	◐	●
C	○	◐	◐	◐

○ Lamp ON

● Lamp OFF

◐ Lamp Flasher

B. Check the communication connection of outdoor unit PCB

(Check whether the red LED of outdoor unit PCB is flickering).

The communication lamp is flickering after the display of each unit on the outdoor unit PCB. (every one second)

- LED lamp (red) is flickering after display of A (0.5 sec)
- LED lamp (red) is flickering after display of b (0.5 sec)
- LED lamp (red) is flickering after display of C (0.5 sec)

Result: If all of three units display lamps are flickering, the connection wires and the room option connections are good.

4. Check the test operation status by pressing the PCB switch S/W-A and S/W-B of outdoor unit.

- Check the operation status by pushing the switch one at time.
- Perform the test operation only for the unit selected last.
- Check the pipe pressure and the other operation status during the test operation.
- Check items when the error occurs during the test operation (each unit)
 - Check there is enough refrigerant.
 - Check pipe connections.

DISPLAY	EXPLANATION	REMARK
Er-t0	Outdoor sensor error (Short/Open)	Be sure to check after applying the power to the outdoor unit.
Er-tA	Outdoor A cond pipe sensor error (Short/Open)	
Er-tb	Outdoor B cond pipe sensor error (Short/Open)	
Er-tC	Outdoor C cond pipe sensor error (Short/Open)	
Er- A	A unit test operation error	Display when the test operation finishes. • When the pipe temperature difference of indoor unit (pipe temperature 4 minutes before - Actual pipe temperature) is less than 5°C.
Er- b	B unit test operation error	
Er- C	C unit test operation error	
Er-CA	A unit test communication error	Be sure to check during the test operation.
Er-Cb	B unit test communication error	
Er-CC	C unit test communication error	
Er-C0	A,B,C unit all communication error	Display of power application.
Gd- A	A room test operation OK	Display 4 minutes after the COMP is on.
Gd- b	B room test operation OK	
Gd- C	C room test operation OK	
A	Communication unit number display : A unit	<ul style="list-style-type: none"> Normal operation Unit A,B and C are changed every one second.  The communication lamp is flickering after display of each unit. (possibility to check the communication status)
b	Communication unit number display : B unit	
C	Communication unit number display : C unit (In case of triple split multi air conditioner)	
Er- 6	Refrigerant leaks	
Er-AC	High temperature of the A cond	
Er-BC	High temperature of the B cond	

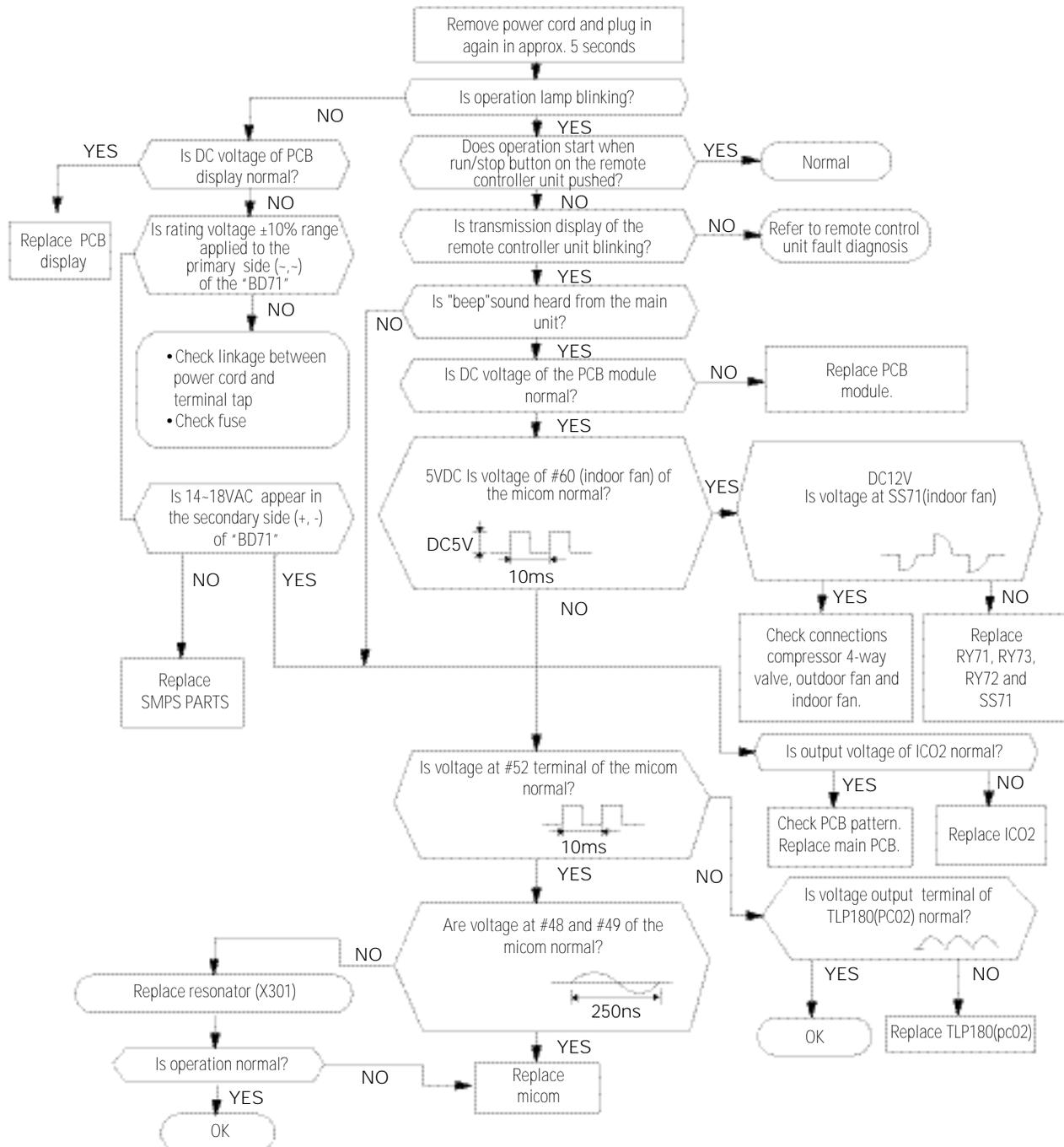
5-3 Fault Diagnosis by Symptom

5-3-1 No Power (completely dead)-Initial diagnosis

1) Checklist :

- (1) Is input voltage normal?
- (2) Is AC power linked correctly?
- (3) Is output voltage of DC regulator IC KA7805 (IC02) normal? (4.5VDC-5.5VDC)

2) Troubleshooting procedure

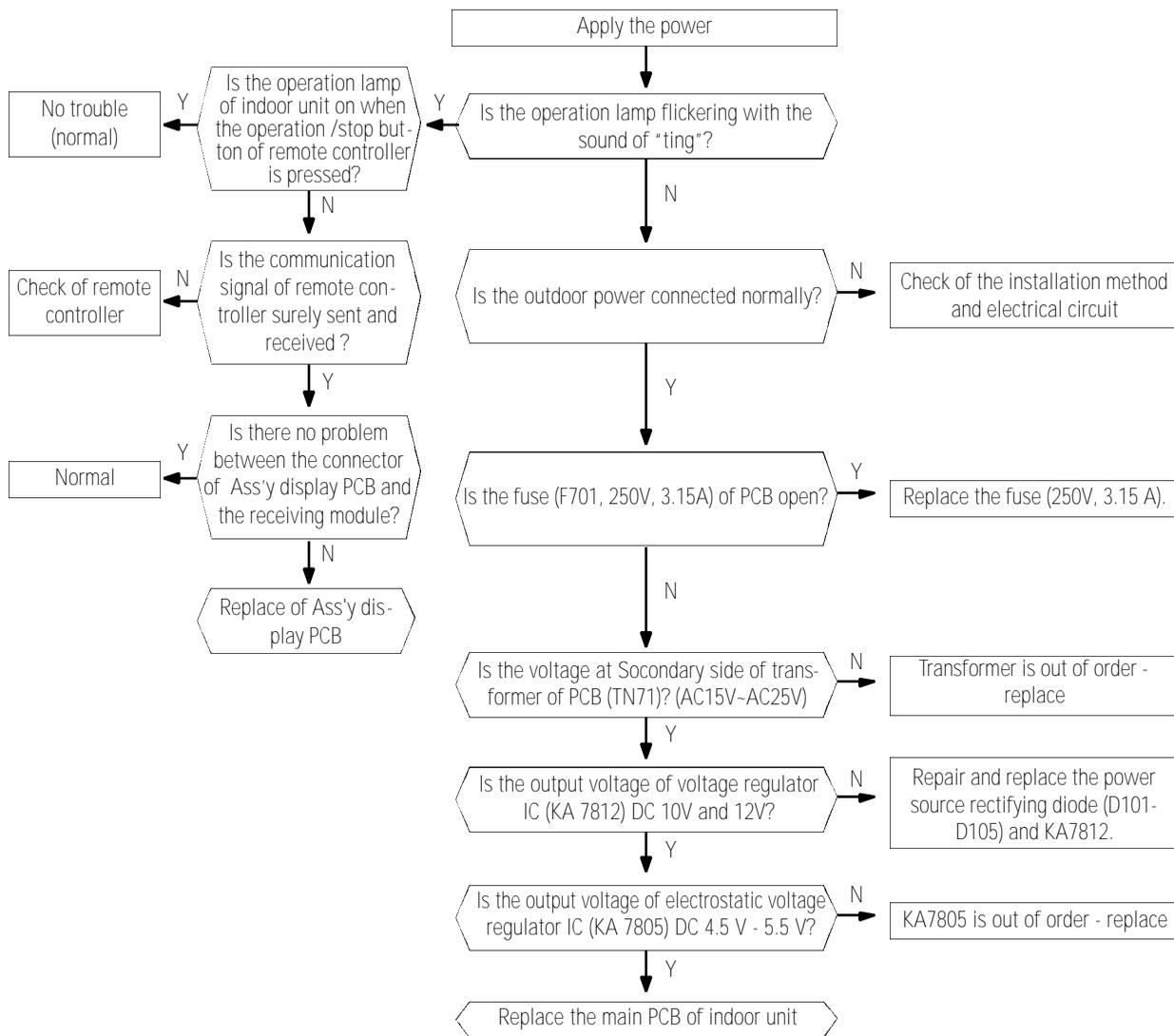


5-3-2 When the power voltage is not available

1) Inspection items

- (1) Is the power voltage is normal? (The rating voltage $\pm 10\%$ range)
- (2) Is the power cord is correctly connected and is the contact good?
- (3) Does the sound “ting” come out with the operation lamp (green) flickering when the power is applied?
If it is not flickering, do inspect and repair in accordance with the following inspection sequence.

2) Inspection sequence

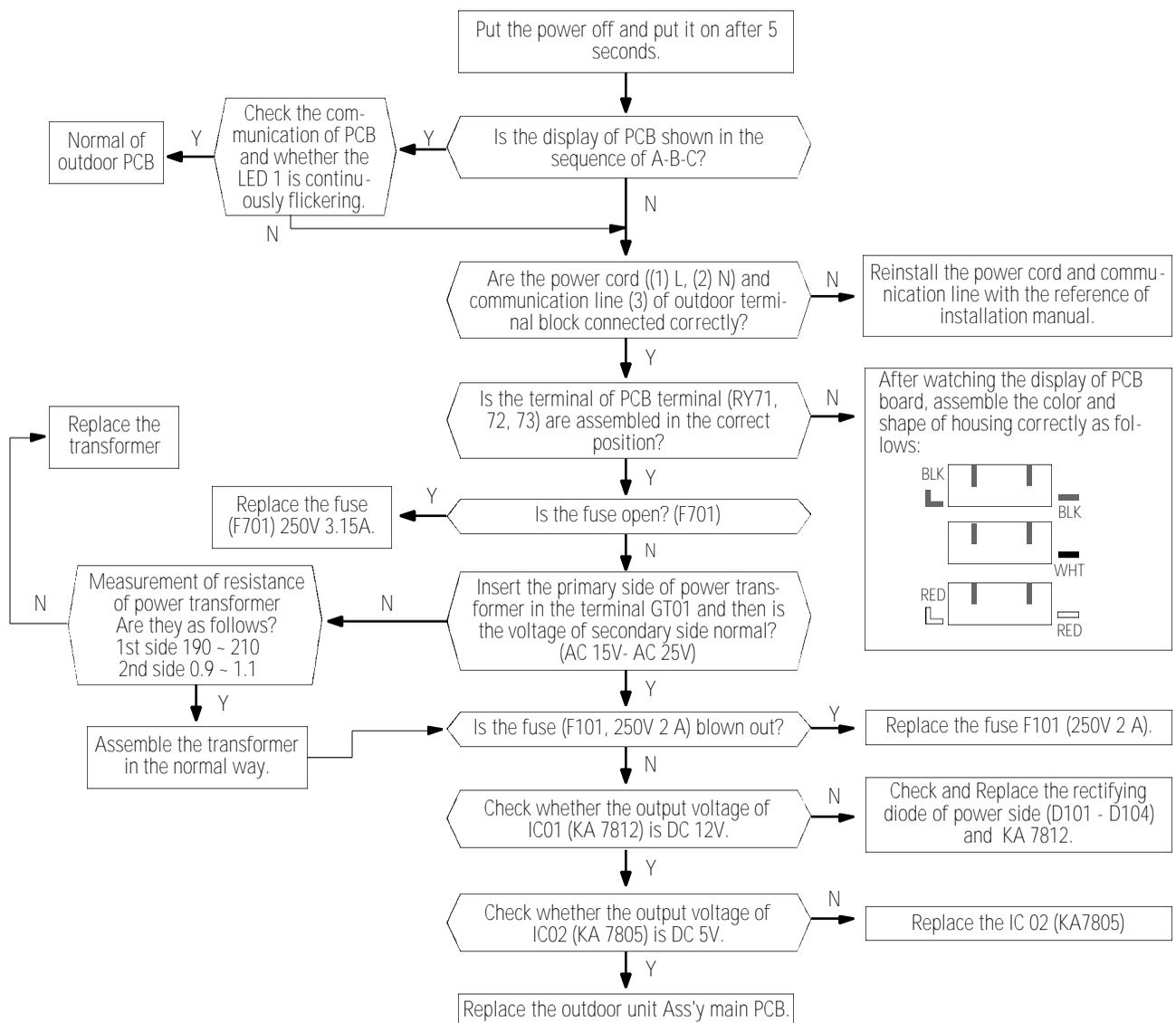


5-3-3 No Power (Outdoor unit)

1) Inspection items

- (1) Is the power source normal (The rating Voltage $\pm 10\%$ range)?
- (2) Is the outdoor power connected normally? ((1) of terminal : L, (2) of terminal : N, (3) of terminal : communication) ?
- (3) Check whether the display of outdoor PCB(SEG1) is shown in the order of A- B - C when the power is applied.
If the display (SEG 1) is not shown the inspection and repair shall be performed in the sequence of the following:

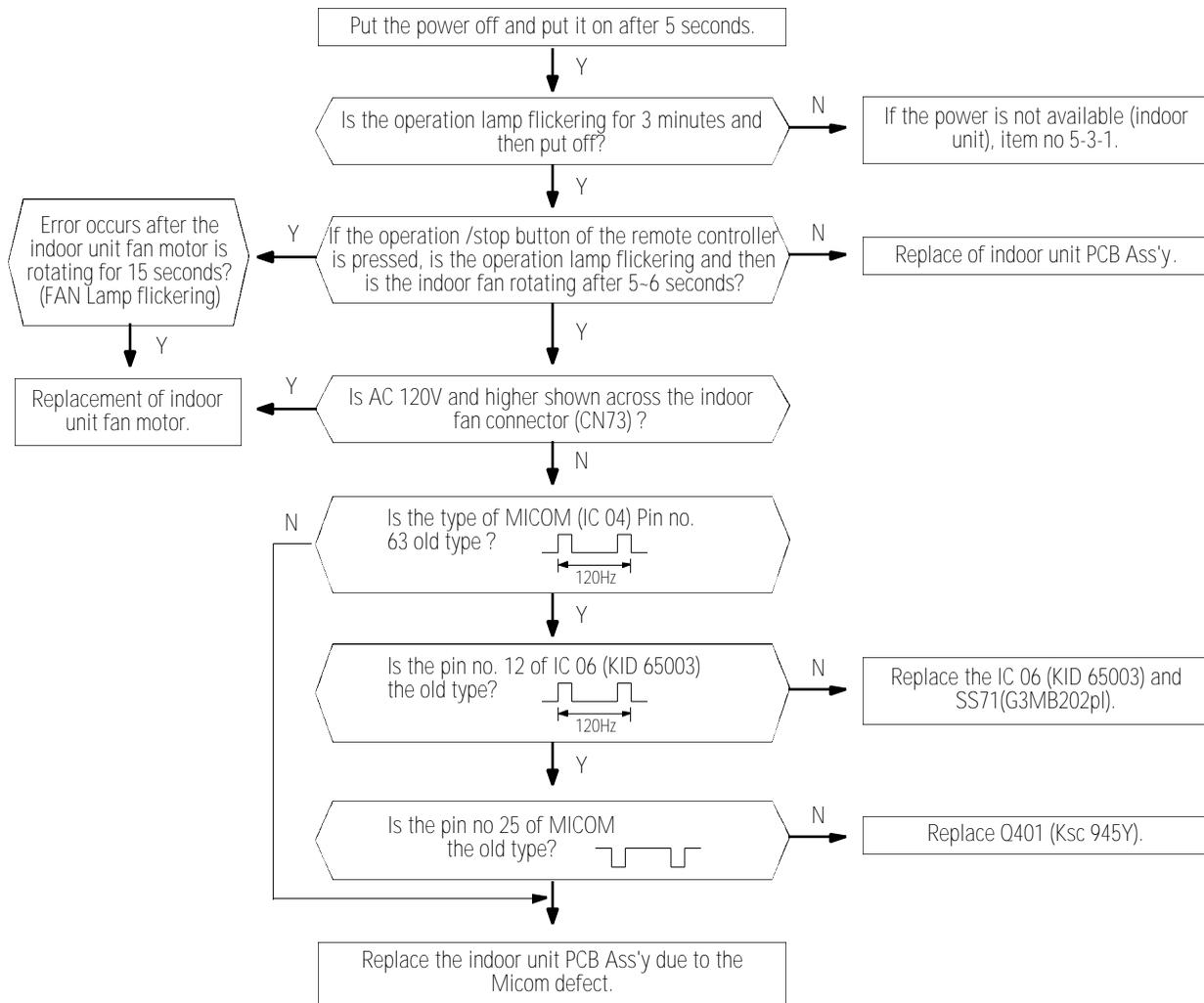
2) Inspection sequence



5-3-4 When the fan of indoor unit does not operate

1) Inspection items

- (1) Is the power voltage normal?
- (2) Is the connector of indoor fan with the good contact? (CN73)
- (3) Is the soldering status of running condenser (CR71) with the good contact?
- (4) Is connector of the Hall IC with the good contact (CN 43) ?
- (5) Is the indoor fan rotating when it is under operation mode?
- (6) Is the FAN LED (green) flickering when the indoor fan stalled (for more than 15 seconds) and the trouble condition of speed detecting part?

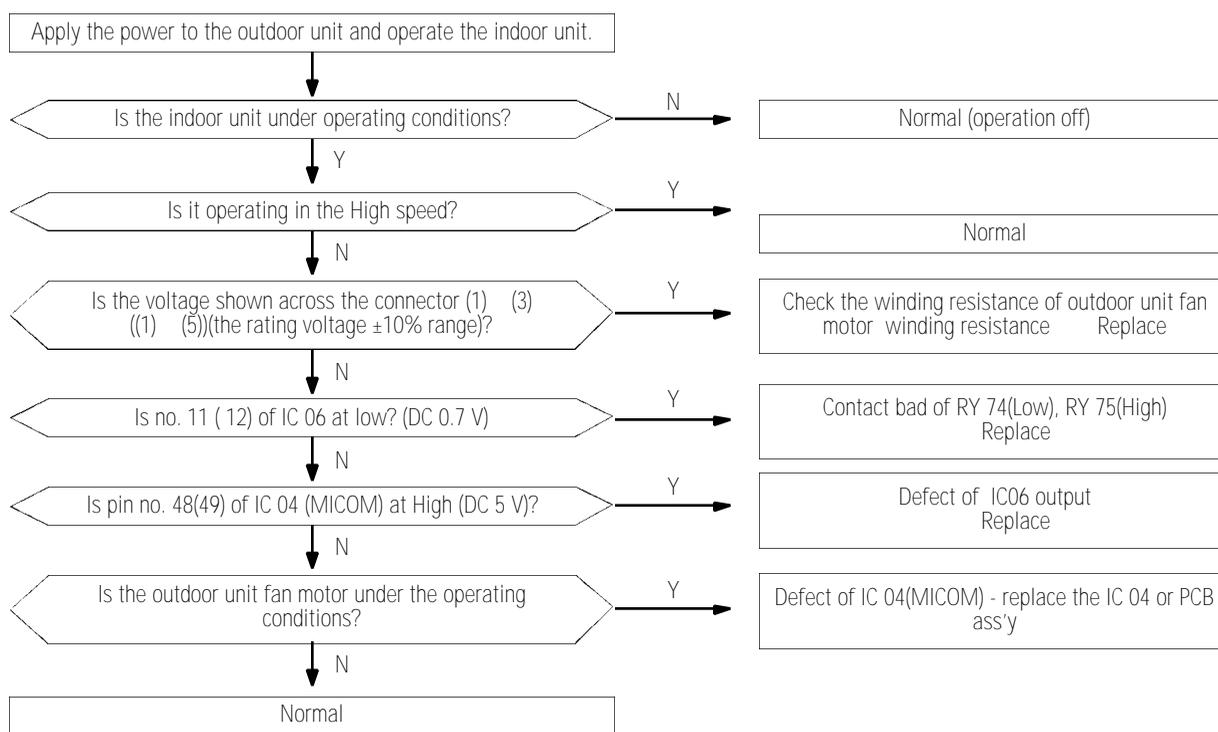


5-3-5 When the outdoor unit fan does not operate

1) Inspection items

- (1) The outdoor unit fan motor operates only when the operating conditions are satisfied and is selected by the RY74(LOW) and PY75(HI) to rotate.
- (2) Is the power voltage normal?
- (3) Is the contact of outdoor unit fan motor (CN 73) good?
- (4) Is the winding resistance of outdoor unit fan motor 58 at Hi side and 143 at low side?
- (5) The outdoor unit fan motor operates with Hi at over 28°C and low at below 26°C during the cooling operation, and operates with Hi at below 14°C and low at over 15°C during the heating operation.

2) Inspection sequence



* Operating specification of the FAN of outdoor unit

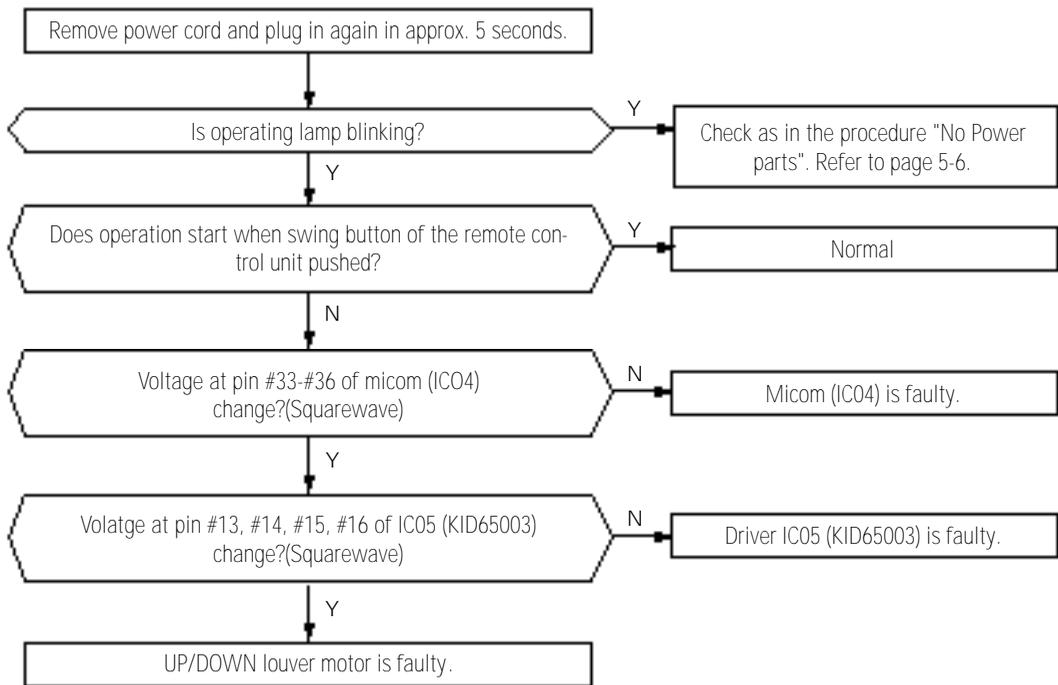
- (1) When the COMP is under the COMP ON condition during the cooling and heating operation, Hi or LOW operation is selected according to the temperature condition of outdoor room.
- (2) When A room and B room are mixed to operate, it is always under low operation.
- (3) Perform the comp ON/OFF control in the dry mode.
- (4) When it is under the operation of anti-freezing, overload protection, defrost operation, it may be Low, high or Off.
- (5) Hi = High speed, Low = Low speed

5-3-6 When the UP/DOWN Louver Moter Does Not Operate. (Initial Diagnosis)

1) Checklist :

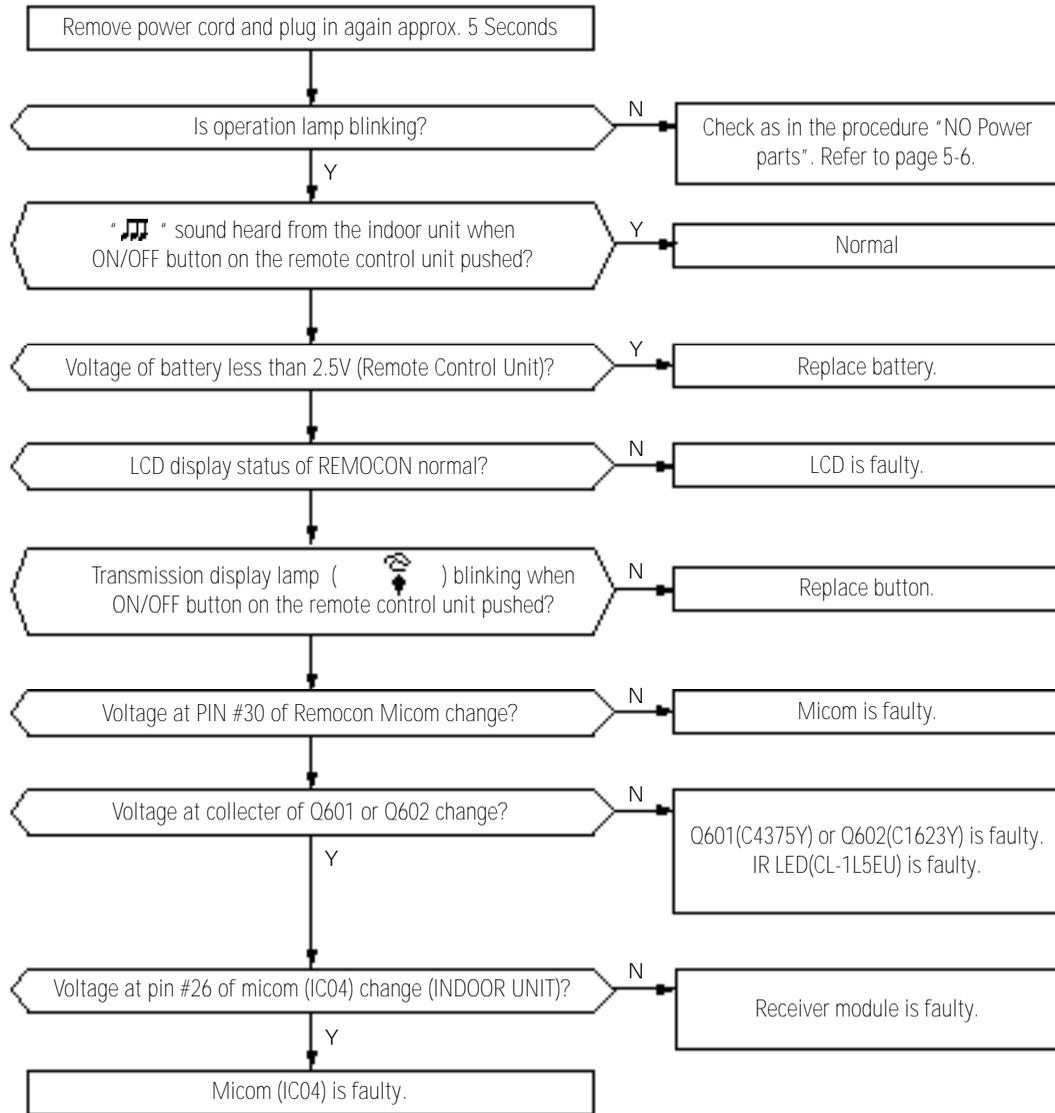
- (1) Is input voltage normal?
- (2) Is the UP/DOWN louver motor properly connected with the connector (CN61)?

2) Troubleshooting procedure



5-3-7 If Operation By Remote Control Unit Is Impossible. (Initial Diagnosis)

1) Troubleshooting procedure

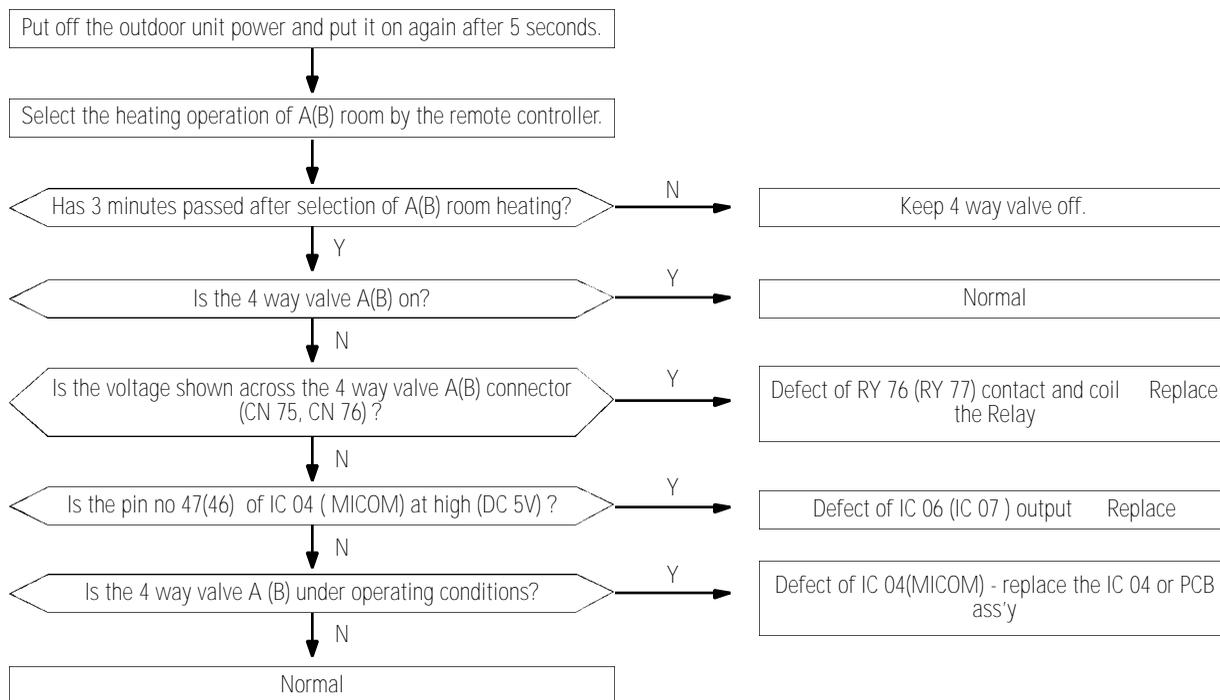


5-3-8 When the 4 way valve (A,B) is not operating

1. Inspection items

- (1) Are the 4 way valve A and B under the operating conditions?
(When the COMP A (4 way valve A) and COMP B (4 way valve B) are on during the heating operating)
- (2) Is the power voltage normal?
- (3) Is the connecting of 4 way valve A (CN 75) and B (CN 76) good?

2) Inspection sequence



*4 way valve operating conditions

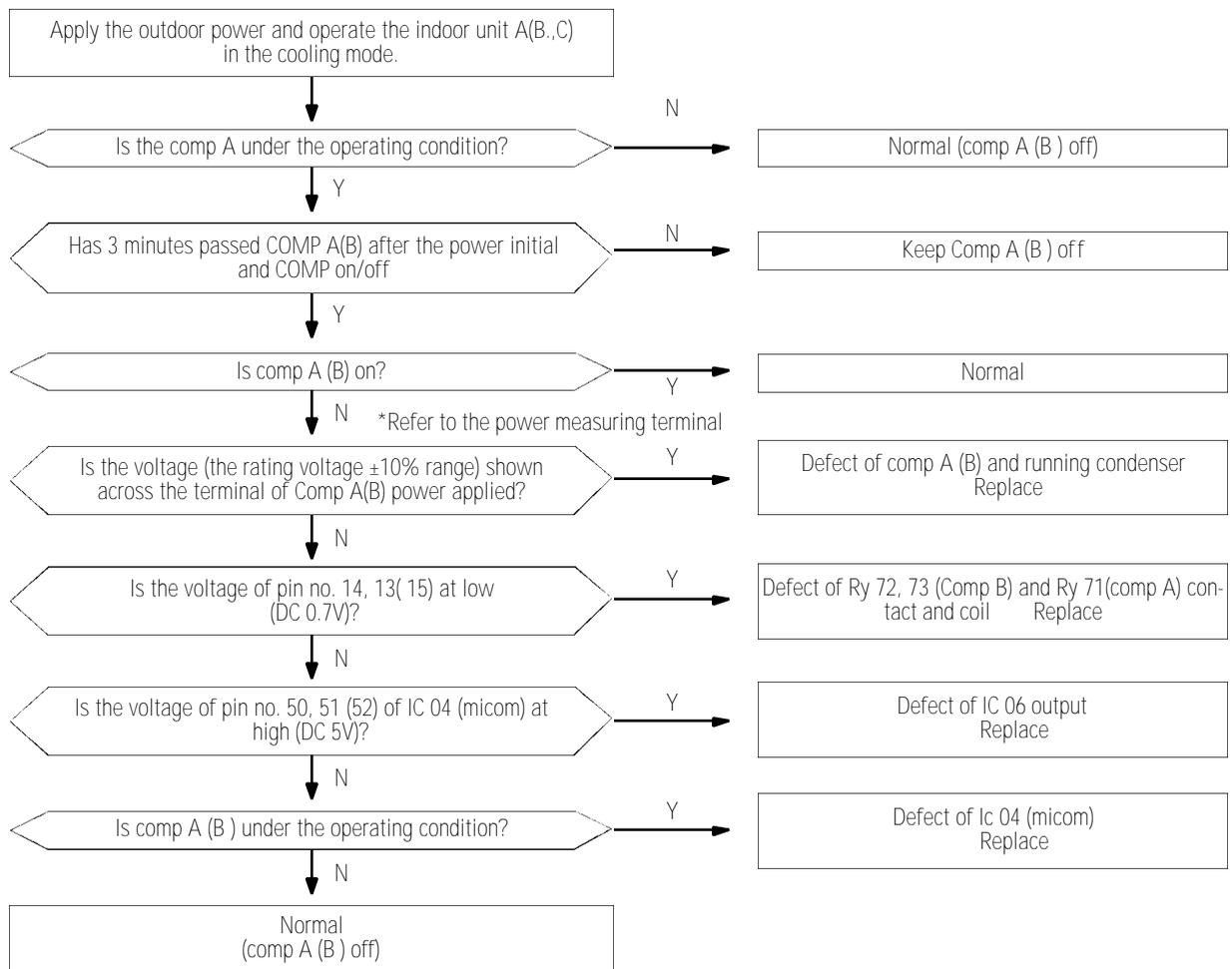
- (1) During the defrost control, put the 4 way valve A(B) off.
- (2) During the heating operation put the 4 way valve A(B) on.
- (3) The changeover of heating to cooling : put the 4 way valve off immediately (in case of B and C room).
- (4) The changeover of cooling to heating : it is on after 170 seconds delay.

5-3-9 When the compressor does not operate

1) Inspection items

- (1) Is the COMP A under the operating conditions? (cooling operating of A, B(C) room)
- (2) Is the power voltage normal? (the rating voltage $\pm 10\%$ range)
- (3) Are the connector connection of COMP A(RY 72, 73) and B(RY 71) good?
- (4) The COMP A(B) is operated on and off in accordance with the operating conditions of indoor unit of A (B. C) room.

2) Inspection sequence

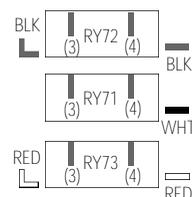


* Comp A (B) operating conditions

- (1) Comp A : Comp on /off control in accordance with the A room during the heating and cooling indoor unit operation
- (2) Comp B : Comp on /off control in accordance with the B(C) room during the heating and cooling indoor unit operation

* Comp A(B) power measuring terminal

- (1) Comp A measuring ; RY 73 (4) RY 72 (4)
- (2) Comp B measuring ; RY 71 (4) RY 72 (4)
- (3) Power input ; RY 72 (3) RY 73(3)



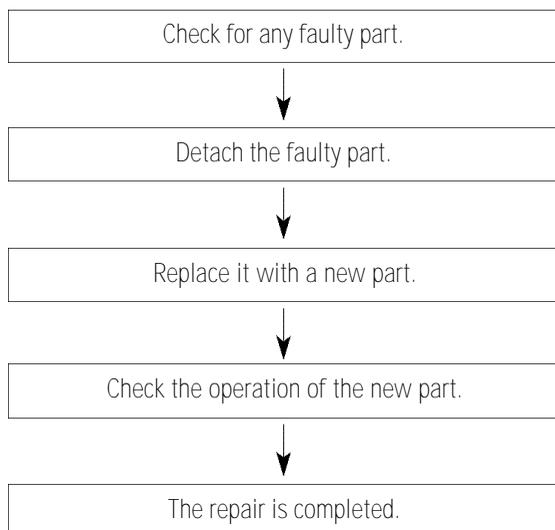
5-4 PCB Inspection

5-4-1 Cautions for Part Replacement

1. The human body carries much static electricity. Before touching a part for repair, replacement or the similar purpose, be sure to touch a grounded metallic portion by hand to let the static electricity go through the metallic portion to the earth. Especially when handling any micro computer or IC, carefully remove such static electricity before touching them.
2. When repairing any part on a work bench, be sure to place an insulative sheet on the bench and always keep the sheet surface neat without any metal fragments. If any such fragment touches a part, a secondary trouble will possibly be caused in the part.
3. Before replacing any parts, be sure to turn off the power supply. If such replacement is done with the power supply kept on, an electric shock, short circuit or destruction of a part may result.
4. During replacement or repair of a part, carefully handle it : The printed circuit board has fine lead wires (jumper wires) and glass-made parts (diode) on its substrate. So if a circuit board is roughly handled, such lead wires and parts will be easily broken or damaged by bending or shock.
5. When soldering the lead wires of any new part, be sure to polish them using an emery paper or the like before soldering them. Since the lead wires of any new part are covered with an oxide film, solder cannot adhere to the lead wires if not polished.
6. When soldering any part, care should be exercised not to apply any high-wattage soldering iron to the part for a long time. Some parts are of so low a heat resistance that they may be broken or have the properties changed if a soldering iron is so applied (Otherwise, the pattern may possibly be separated and raised).
7. The heat of the soldering iron should be transferred to the entire object to be soldered. If the solder pieces are not well fused due to insufficient transfer of the heat from the soldering iron, no satisfactory electrical continuity can be assured even if the soldered objects appear well connected to each other.
8. The solder used should be limited to a minimum. If excessive solder is used, it will cause inter-pattern contact, which may cause malfunction of the circuit.

5-4-2 Procedure

The parts should be replaced in the following procedure.



5-4-3 Detailed Procedure

No.	Malfunction	Checking point (symptoms)	Causes
1	Pull out the power plug from the AC terminal and confirm the fuse on the PCB assembly	1. Is the broken?	1. Voltage over 2. Indoor unit fan motor short-circuit.
2	Turn the power on. If lamp blinks trouble is not related to the items 1 through 4 on the right.	Voltage check	
		1. AC voltage at both end of transformer Primary? the rating voltage $\pm 10\%$ range	1. Irregular power code or power fuse, or poor wiring.
		2. AC voltage at both end of transformer secondary? 14- 18Vac	2. Transformer is faulty.
		3. DC voltage at OUT and GND of IC01 (KA7812)? 12VDC	3. Power circuit is faulty.
		4. DC voltage at OUT and GND of IC02? 5VDC	4. Power circuit is faulty.
3	Set TURBO operating mode when RMC switch pushed after a delay of 3 minutes. (A-unit and B-unit)	Voltage check	
		1. Voltage of relay (RY71, 72, 73) coil Voltage at pin#13, 14, 15 of IC07 : 12VDC	1. Relay(RY 71) coil is open. IC6(KID65003A) is faulty.
4	Set operating mode when RMC switch pushed. 1. TURBO mode	2. Voltage at RY72 No ③ and RY71 No ③ , RY72 No ③ and RY73 No ③ , the rating voltage $\pm 10\%$ range	2. Relay contactor is faulty or Relay is faulty
		1. Compressor does not operate.	1. Temperature of Heat exchange is lower. 2. PCB is faulty. 3. Room sensor or Heat exchanger temperature sensor is faulty
5	Set operating mode when RMC switch pushed. 1. [FAN] mode 2. Fan speed [Hi] 3. Continuously operation	1. Voltage at ③⑤ both ends of CN73 : above 180V~ 2. Indoor unit fan motor does not operate.	1. Indoor unit fan motor is faulty. 2. Poor connection of indoor fan motor and connector of RPM sensing (CN43)

5-5 Fault Diagnosis of Major Parts

Parts	Diagnosis										
Temp.Sensor	Measure resistance with a tester.										
Heat ex. Sensor	Normal	8K ~27K at ambient temperature (+0°C ~ +30°C)									
	Abnormal	, 0 ... open or short									
Indoor Fan Motor	Measure resistance between terminals (CN73) with a tester										
	Normal	At ambient temperature (10°C ~ 30°C)									
		<table border="1"> <thead> <tr> <th>between</th> <th>Resistance</th> </tr> </thead> <tbody> <tr> <td>Red, Yellow</td> <td>190±10</td> </tr> <tr> <td>Red, Blue</td> <td>170±10</td> </tr> </tbody> </table>	between	Resistance	Red, Yellow	190±10	Red, Blue	170±10			
		between	Resistance								
	Red, Yellow	190±10									
	Red, Blue	170±10									
Abnormal											
Measure the voltage between ground and signal wire of the fan motor (CN43)											
Normal	<table border="1"> <thead> <tr> <th>between</th> <th>Voltage</th> </tr> </thead> <tbody> <tr> <td>Gray, Orange</td> <td>0.5V~4.5V</td> </tr> <tr> <td>Yellow, Orange</td> <td>5V</td> </tr> </tbody> </table>	between	Voltage	Gray, Orange	0.5V~4.5V	Yellow, Orange	5V				
	between	Voltage									
	Gray, Orange	0.5V~4.5V									
Yellow, Orange	5V										
Abnormal	Abnormal if voltage does not change from 0V to 5V.										
Outdoor Fan Motor	Normal	At ambient temperature (10°C ~ 30°C)									
		<table border="1"> <thead> <tr> <th>between</th> <th>Resistance</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>Red, Yellow</td> <td>143±10</td> <td>Low</td> </tr> <tr> <td>Blue, Red</td> <td>58±10</td> <td>High</td> </tr> </tbody> </table>	between	Resistance	Remark	Red, Yellow	143±10	Low	Blue, Red	58±10	High
		between	Resistance	Remark							
Red, Yellow	143±10	Low									
Blue, Red	58±10	High									
Abnormal	, 0 ... open or short										
Stepping Motor (UP/DOWN swing motor)	Measure resistance between red wire and each terminal.										
	Normal	Approx. 380 at ambient temperature (20°C ~30°C)									
	Abnormal	, 0 ... open or short									

MEMO