



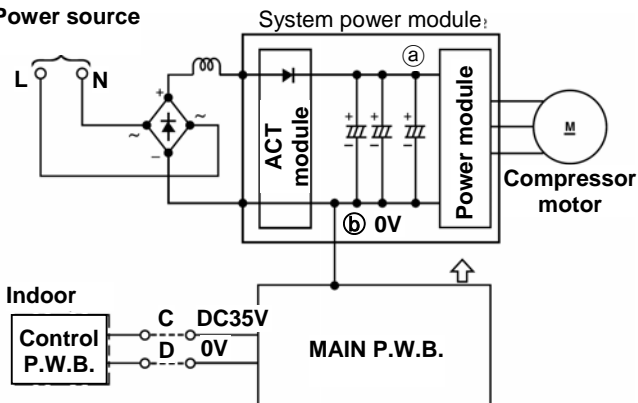
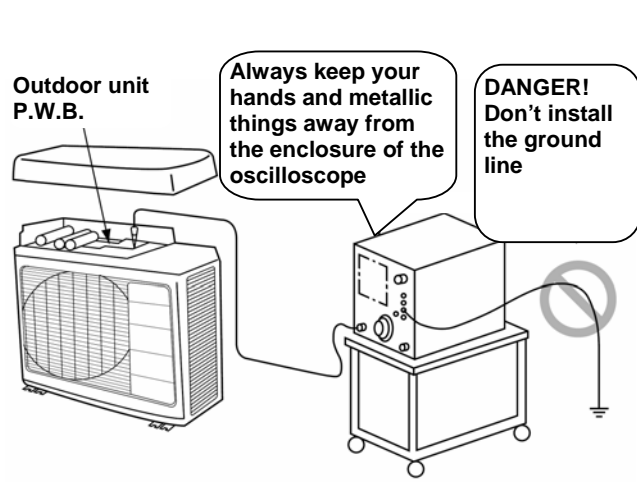
14 TROUBLESHOOTING

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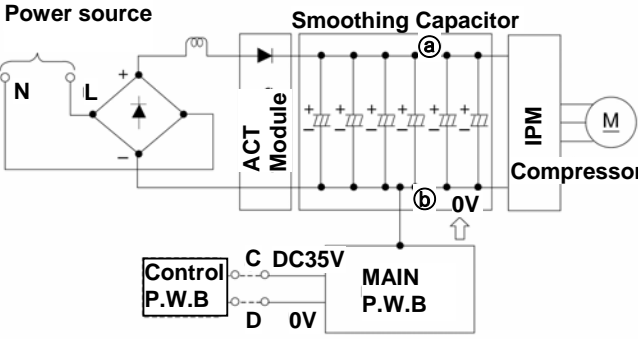
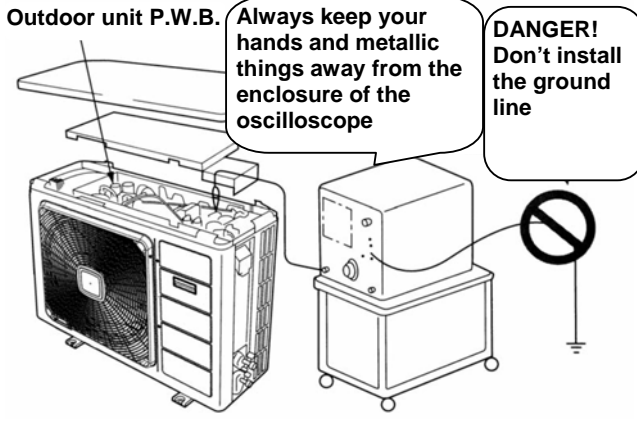
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14.1 PRECAUTIONS FOR TROUBLE SHOOTING

14.1.1 MONOZONE RAC-25NH5 / 35NH5 / 50NH5 / 65NH5 & MULTIZONE RAM-40QH5 / 55QH5 / 65QH5 / 72QH5 / 130QH5

<p style="text-align: center;">⚠ Warning</p> <p>Remember that voltage of 175V is applied to the 0V line on the P.W.B. or the like as shown in the diagram below</p> <p style="text-align: center;"></p>	<p style="text-align: center;">⚠ Warning</p> <p>When using an oscilloscope, never ground it. Don't forget that high voltage as noted in the left figure may apply to the oscilloscope.</p> <p style="text-align: center;"></p>
<p>Power source</p>  <p style="text-align: center;">Indoor</p> <p style="text-align: center;">Control P.W.B.</p> <p style="text-align: center;">MAIN P.W.B.</p> <p style="text-align: center;">Across (a)-(b) (0V line) approx 260~360V Across (a)-ground approx 155~170V Across (b) (0V line)-ground approx 155~170V</p>	<p>Outdoor unit P.W.B.</p>  <p style="text-align: center;">Always keep your hands and metallic things away from the enclosure of the oscilloscope</p> <p style="text-align: center;">DANGER! Don't install the ground line</p>

14.1.2 MULTIZONE RAM-90QH5

<p style="text-align: center;">⚠ Warning</p> <p>Remember that the 0V line is biased of 162V in reference to the ground level. Also note that it takes about 10 minutes until the voltage fall after the power switch is turned OFF.</p> <p style="text-align: center;"></p>	<p style="text-align: center;">⚠ Warning</p> <p>When using an oscilloscope, never ground it. Don't forget that high voltage as noted in the left figure may apply to the oscilloscope.</p> <p style="text-align: center;"></p>
<p>Power source</p>  <p style="text-align: center;">Indoor</p> <p style="text-align: center;">Control P.W.B.</p> <p style="text-align: center;">MAIN P.W.B.</p> <p style="text-align: center;">Across (a)-(b) (0V line) approx 260~360V Across (a)-ground approx 155~170V Across (b) (0V line)-ground approx 155~170V</p>	<p>Outdoor unit P.W.B.</p>  <p style="text-align: center;">Always keep your hands and metallic things away from the enclosure of the oscilloscope</p> <p style="text-align: center;">DANGER! Don't install the ground line</p>

14.1.3 SUMMIT INVERTER RAS/RAC-18YH6 / 25YH6 / 35YH6 / 25YH5 / 35YH5

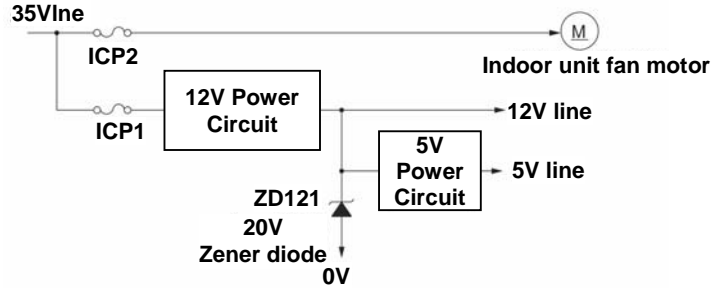
<p>Warning Remember that voltage of 175V is applied to the 0V line on the P.W.B. or the like as shown in the diagram below</p>	<p>Warning When using an oscilloscope, never ground it. Don't forget that high voltage as noted in the left figure may apply to the oscilloscope.</p>

14.1.4 SUMMIT INVERTER RAS/RAC-50YH5 / 60YH5 / 70YH5 / 80YH5 & SUMMIT INVERTER RAD/RAC-50DH7 / 60DH7 / 70DH7

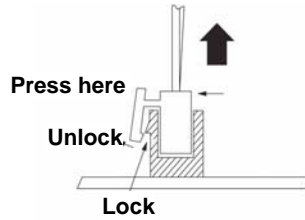
<p>Warning Remember that voltage of 175V is applied to the 0V line on the P.W.B. or the like as shown in the diagram below</p>	<p>Warning When using an oscilloscope, never ground it. Don't forget that high voltage as noted in the left figure may apply to the oscilloscope.</p>						
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Across a-b (0V line)</td> <td>approx 260~360V</td> </tr> <tr> <td>Across a-ground</td> <td>approx 155~170V</td> </tr> <tr> <td>Across b (0V line)-ground</td> <td>approx 155~170V</td> </tr> </table>	Across a-b (0V line)	approx 260~360V	Across a-ground	approx 155~170V	Across b (0V line)-ground	approx 155~170V	
Across a-b (0V line)	approx 260~360V						
Across a-ground	approx 155~170V						
Across b (0V line)-ground	approx 155~170V						

Other Cautions

- 1) Cautions concerning for short circuit in servicing.
 - a) Use due caution to prevent short circuit in servicing. Short circuit will immediately open the ICP.
 - b) If the ICP is open, remove the causes and replace the ICP. If the remedy is improper, the ICP maybe blown again.



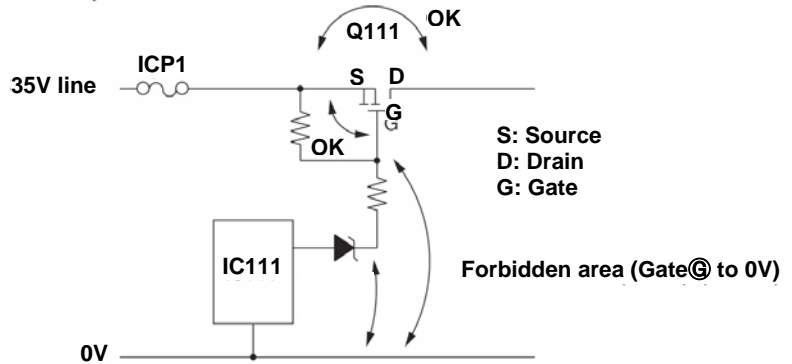
- 2) The CN3 (power supply) and CN10 (fan motor) are the connectors with lock mechanism. Press the lock with your fingers to unlock and remove the connector.



- 3) When checking the voltage and waveform, do not connect the probes to the forbidden areas shown below. Touching them may cause the ICP1 blowout and Q11 failure.

The Q11 is a MOS-FET and its gate terminal is high impedance. When a probe such as multimeter is contacted with gate (G), the Q11 may have continuous ON state to supply overcurrent in the circuit causing the ICP1 blow out and Q111 failure.

When checking the switching waveform of Q111, set the source (S) to the base and measure the gate (G) and drain (D).



- 4) During power feeding to the P.W.B. , do not remove and insert the CN10 (fan motor connector). Failure to do so may cause overcurrent to the fan motor and P.W.B.s (microcomputer, IC and the like) and a failure may occur. To remove or insert the CN10, be sure to shut off the power.

14.2 DISCHARGE PROCEDURE AND POWER SHUT OFF METHOD FOR POWER CIRCUIT



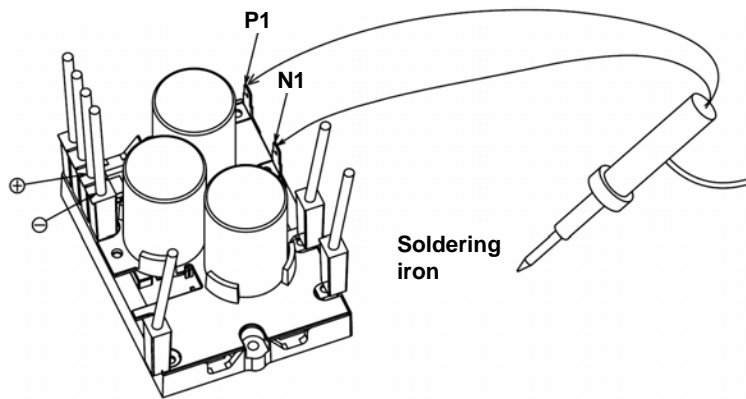
Caution

- Voltage of about 350V is charged between the terminals of smoothing capacitors.
- High voltage (DC360V) is also charged at terminals of ACT module and power module
- During continuity check for each circuit part of the outdoor unit, be sure to discharge the smoothing capacitors

14.2.1 MONOZONE RAC-25NH5 / 35NH5 / 50NH5 / 65NH5 & MULTIZONE RAM-40QH5 / 55QH5 / 65QH5 / 72QH5 / 130QH5

Discharge Procedure

1. Turn off the power supply to the outdoor unit.
2. After power is turned off, wait for 10 minutes or more. Then remove the electrical parts cover and apply soldering iron of 30 to 75W for 15 seconds or more to P1 and N1 terminals on system power module, in order to discharge voltage in smoothing capacitor
3. Remove receptacle of red/gray lead wire connected to system power module from diode stack before performing operation check of each circuit.



System Power module

As shown above, apply soldering iron to metal parts (receptacle) inside the sleeve corresponding to P1 and N1 terminals of system power module. Do this with smoothing capacitors kept connected. By removing red/gray lead wire from diode stack, power supply can be shut off (corresponding to (+) and (-).

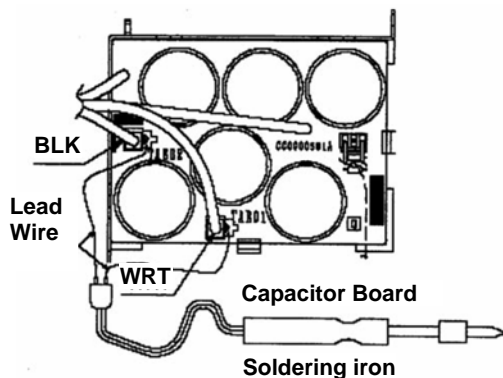
Do not use a soldering iron with transformer: If one is used, thermal fuse inside transformer will be blown.

14.2.2 MULTIZONE RAM-90QH5

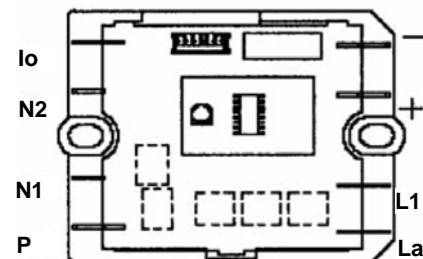
Discharge Procedure

1. Turn off the power supply to the outdoor unit and disconnect the power plug.
2. Wait for 10 minutes or more after power is turned off and then remove electrical parts box lid as shown below. Apply soldering iron of 30~75W for 15 seconds or more at P1 and N1 black/white lead receptacles on Capa board to discharge voltage from smoothing capacitor. Do not loosen or remove screws of intelligent power module : If screw is loose, voltage will not be discharged.
3. Before operation check on each part of circuit, remove receptacle of red/gray lead connected to ACT module from diode stack.
- 4.

As shown left, apply soldering iron to metal parts TAB 01 P and TAB 02 terminals of Capa board.



Do not use a soldering iron with transformer: If one is used, thermal fuse inside transformer will be blown.

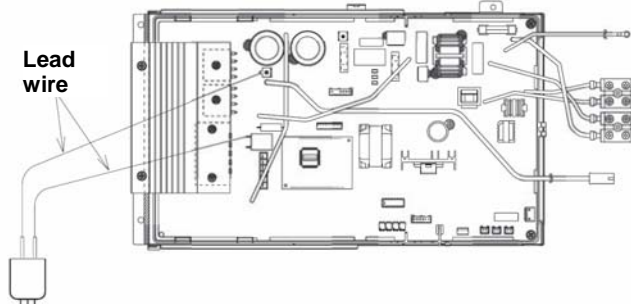


14.2.3 SUMMIT INVERTER RAS/RAC-18YH6 / 25YH6 / 35YH6 / 25YH5 / 35YH5

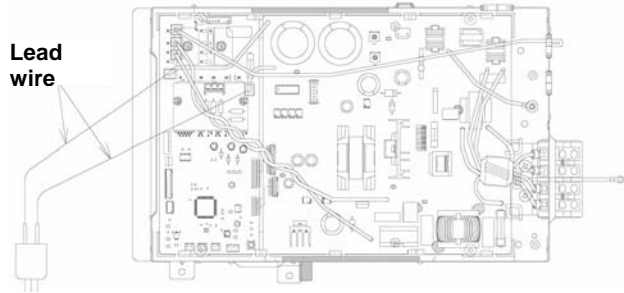
Discharge Procedure

1. Turn off the power of the indoor/outdoor unit and pull out the power supply plug.
2. After power is turned off, wait for 10 minutes or more. Then remove the electrical parts cover and apply soldering iron of 30 to 75W for 15 seconds or more to TAB05 and R001 terminals on the main P.W.B. as shown in the figure below. In order to discharge voltage in smoothing capacitor

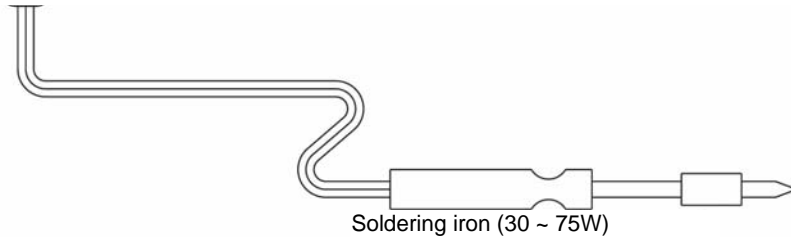
- Applicable models : RAS/RAC-18YH6 / 25YH6



- Applicable models : RAS/RAC-25YH5 / 35YH5 / 35YH6



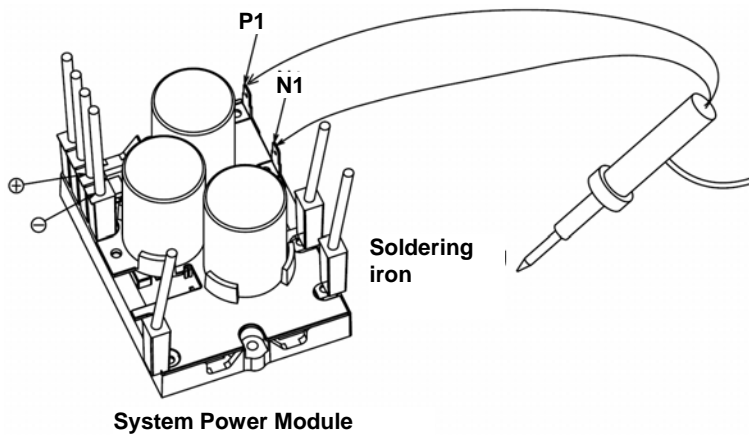
Do not use a soldering iron with transformer: Otherwise, thermal fuse inside transformer will be blown



14.2.4 SUMMIT INVERTER RAS/RAC-50YH5 / 60YH5 / 70YH5 / 80YH5 & RAS/RAC-50DH7 / 60DH7 / 70DH7

Discharge Procedure

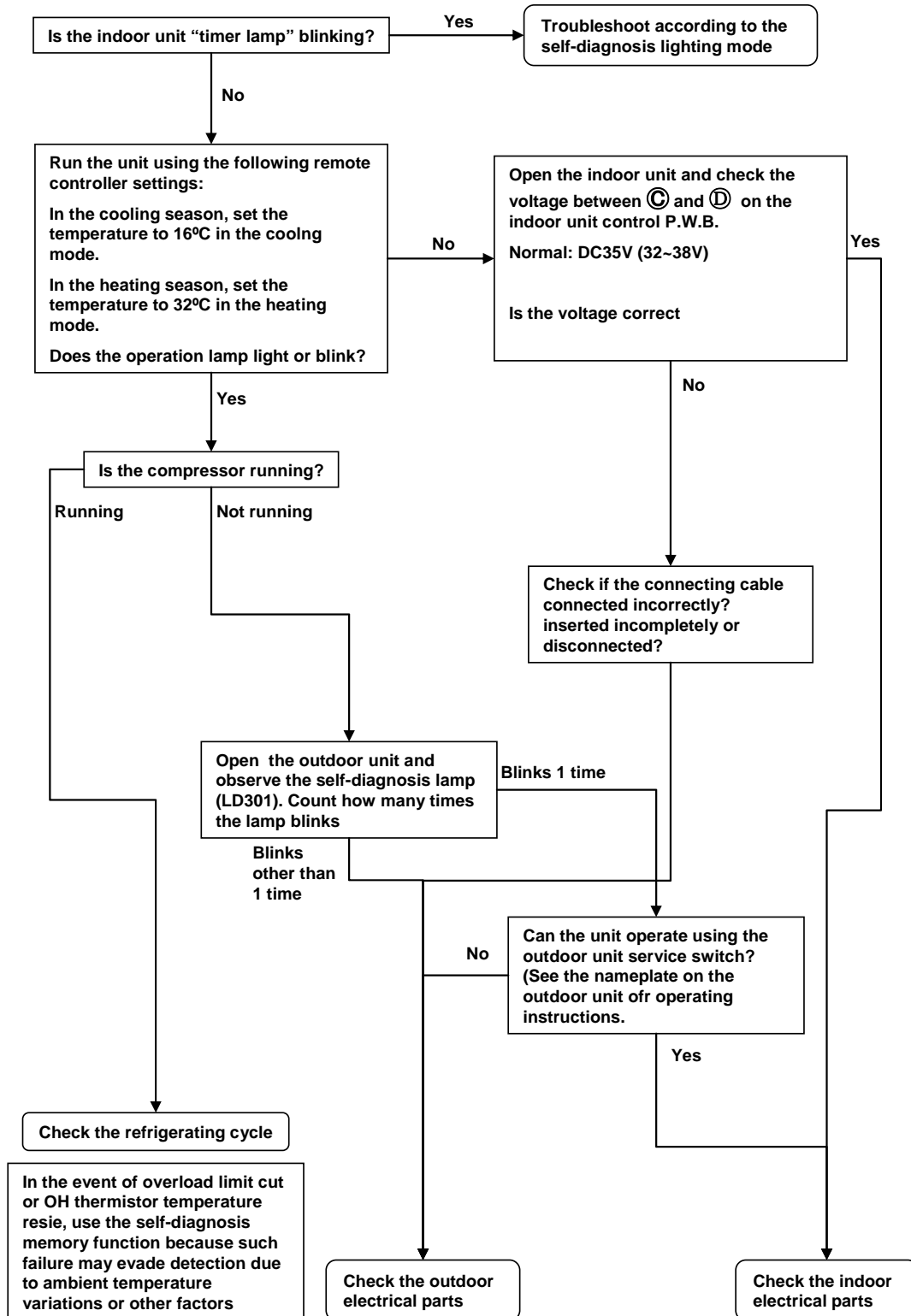
1. Turn off the power supply to the outdoor unit.
2. After power is turned off, wait for 10 minutes or more. Then remove the electrical parts cover and apply soldering iron of 30 to 75W for 15 seconds or more to P1 and N1 terminals on system power module, in order to discharge voltage in smoothing capacitor
3. Remove receptacle of red/gray lead wire connected to system power module from diode stack before performing operation check of each circuit.



As shown above, apply soldering iron to metal parts (receptacle) inside the sleeve corresponding to P1 and N1 terminals of system power module. Do this with smoothing capacitors kept connected. By removing red/gray lead wire from diode stack, power supply can be shut off (corresponding to (+) and (-).

Do not use a soldering iron with transformer: If one is used, thermal fuse inside transformer will be blown.

14.3 PRELIMINARY CHECK ON INDOOR/OUTDOOR UNIT ELECTRICAL PARTS AND REFRIGERATING



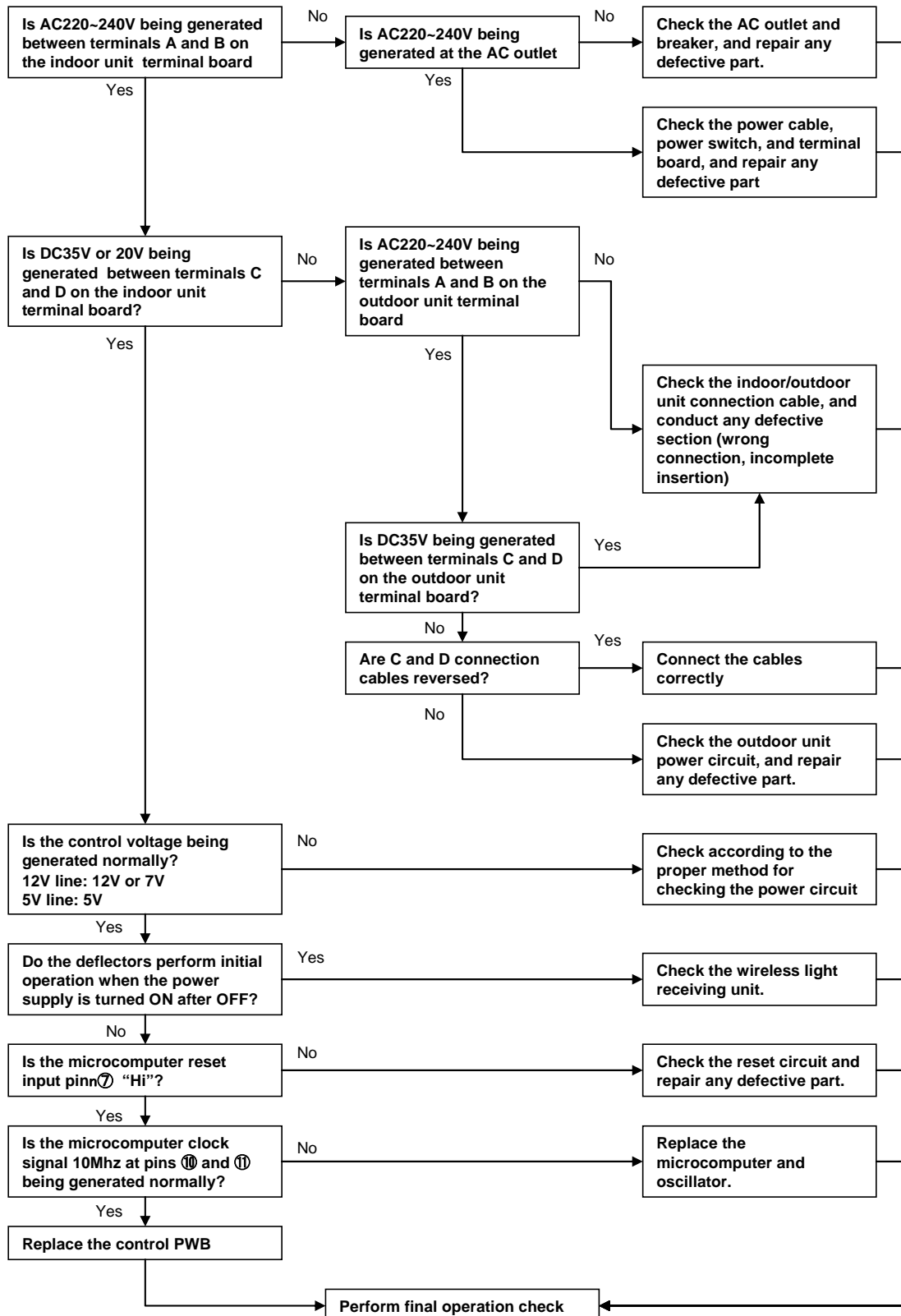
14.3.1 SUPPORT FUNCTION OF FAILURE DIAGNOSIS

No.	Function Name	Description
1	Self-diagnosis function <indicating a failure on the indoor unit>	<ul style="list-style-type: none"> • The “timer lamp indicates a mode of failure detected on the indoor or outdoor unit side by blinking frequency. • A failure detected on the outdoor unit side will be indicated by the “timer lamp” blinking 4 times after a retry operation has been performed several times. <p>Note: In some failure modes, only the retry operation is repeated without lamp indication.</p> <p><Failure modes that will repeat a retry operation without the indoor unit lamp indication are as follow :></p> <ul style="list-style-type: none"> OH thermistor temperature rise Outdoor unit communication error. Power voltage abnormal Less frequent defects.
	<Indicating a failure on the outdoor unit>	<ul style="list-style-type: none"> • The “LD301” indicates a mode of failure detected on the outdoor unit side by the blinking frequency. <p>Upon failure detection, the outdoor unit will shut down and the LD301 continues to blink until the unit is reset. (In the event of communication errors, the LD301 continues to blink until communication is restored)</p>

14.4 CHECKING THE INDOOR UNIT ELECTRICAL PARTS

14.4.1 NO POWER IS DETECTED (NO OPERATION)

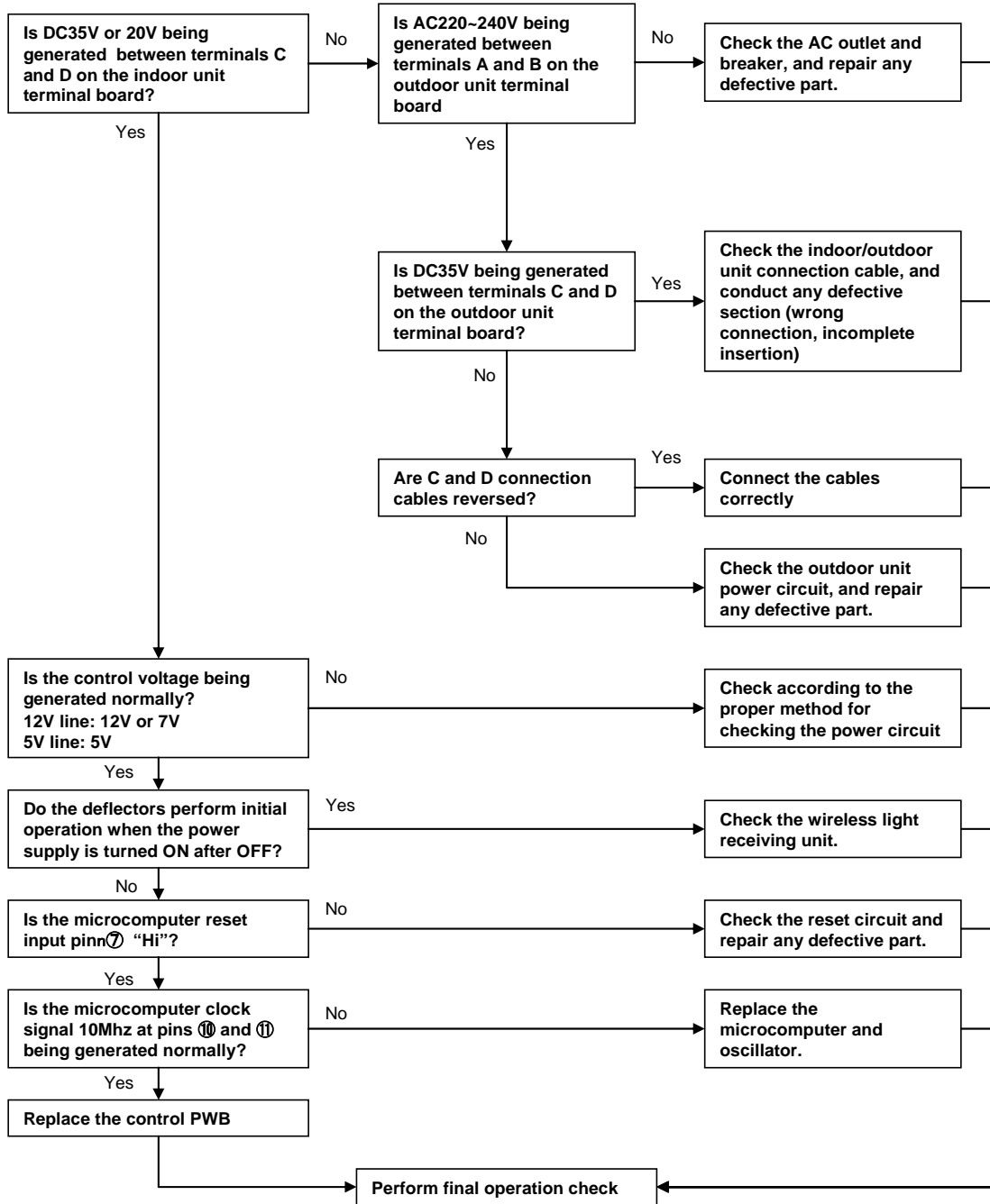
14.4.1.1 SUMMIT INVERTER RAS/RAC-18YH6 / 25YH6 / 35YH6 / 25YH5 / 35YH5



※1: When not in operation, the unit will enter into a low power standby state, possibly causing a voltage drop to the 12V and 35V lines as shown

25V~20V
12V~7V

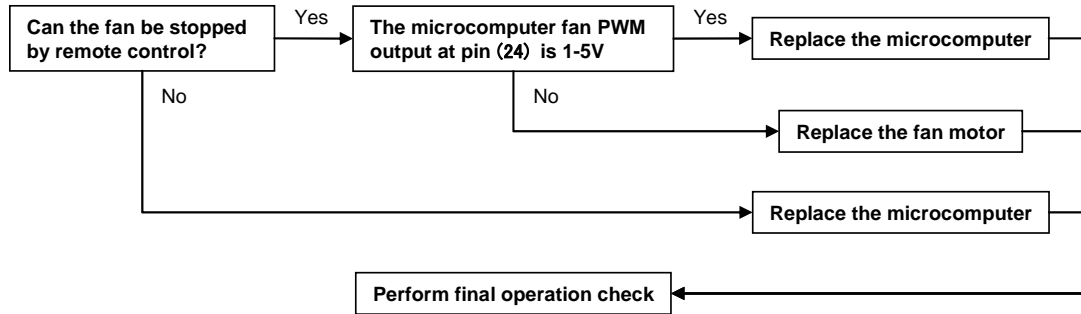
14.4.1.2 MONOZONE / MULTIZONE / SUMMIT INVERTER



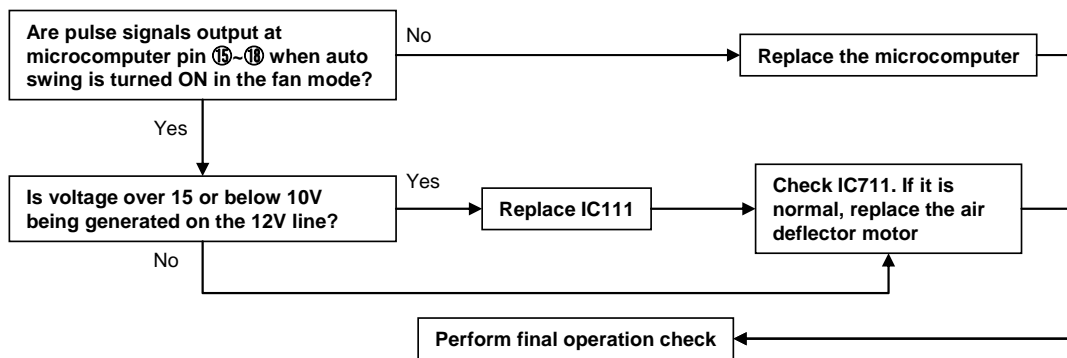
※1: When not in operation, the unit will enter into a low power standby state, possibly causing a voltage drop to the 12V and 35V lines as shown

25V~20V
12V~7V

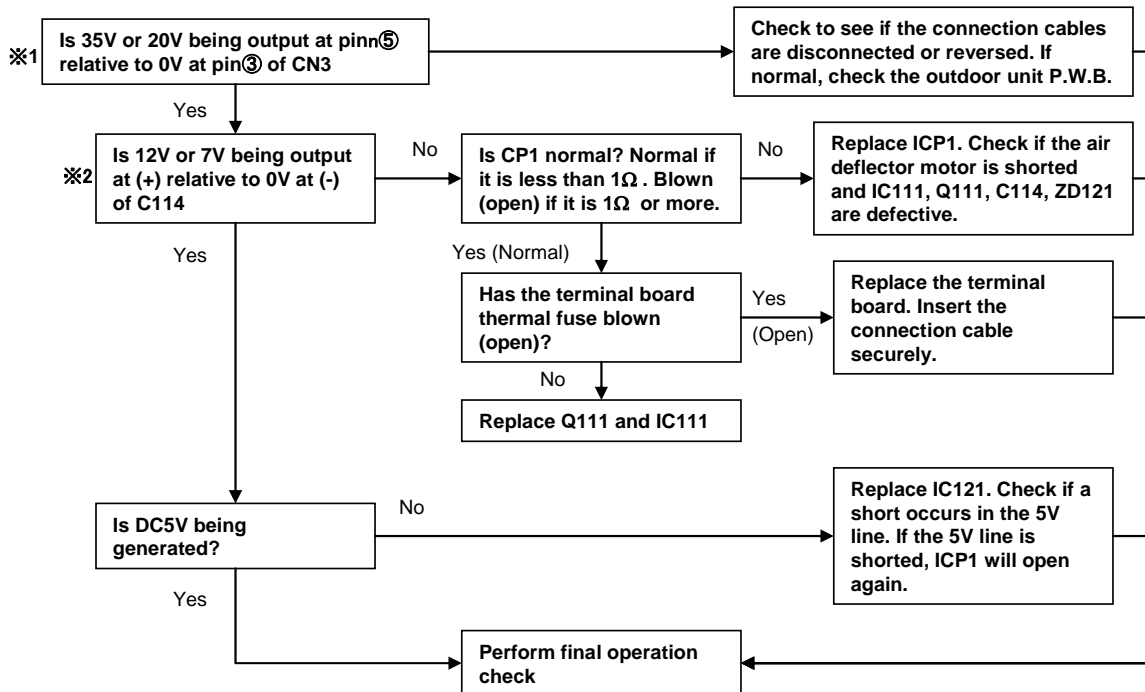
14.4.2 INDOOR FAN DOES NOT OPERATE (OTHERS ARE NORMAL)



14.4.3 AIR DEFLECTOR DOES NOT MOVE (OTHERS ARE NORMAL)



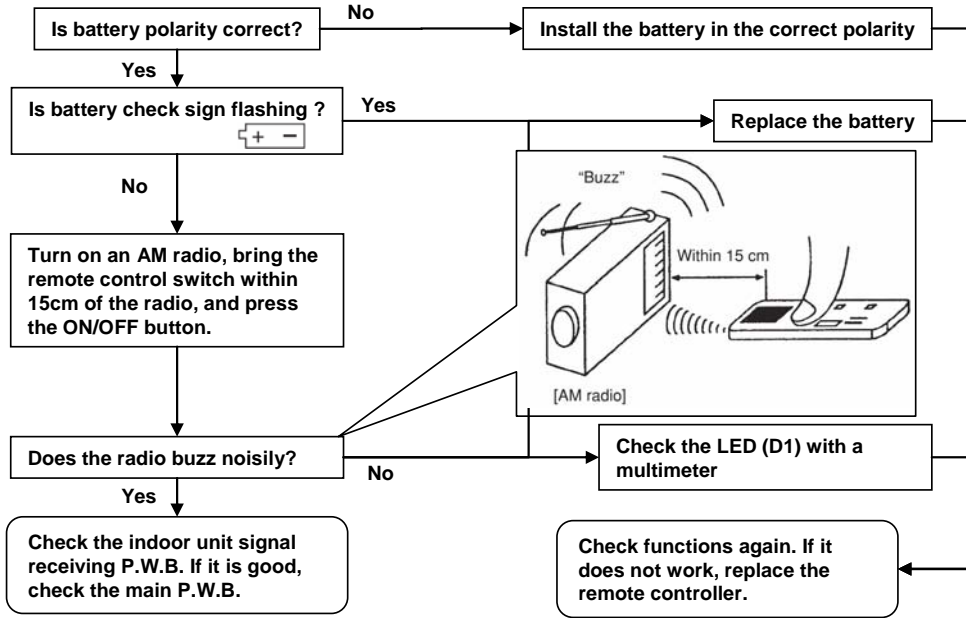
14.4.4 CHECK THE CONTROL P.W.B. (POWER CIRCUIT)



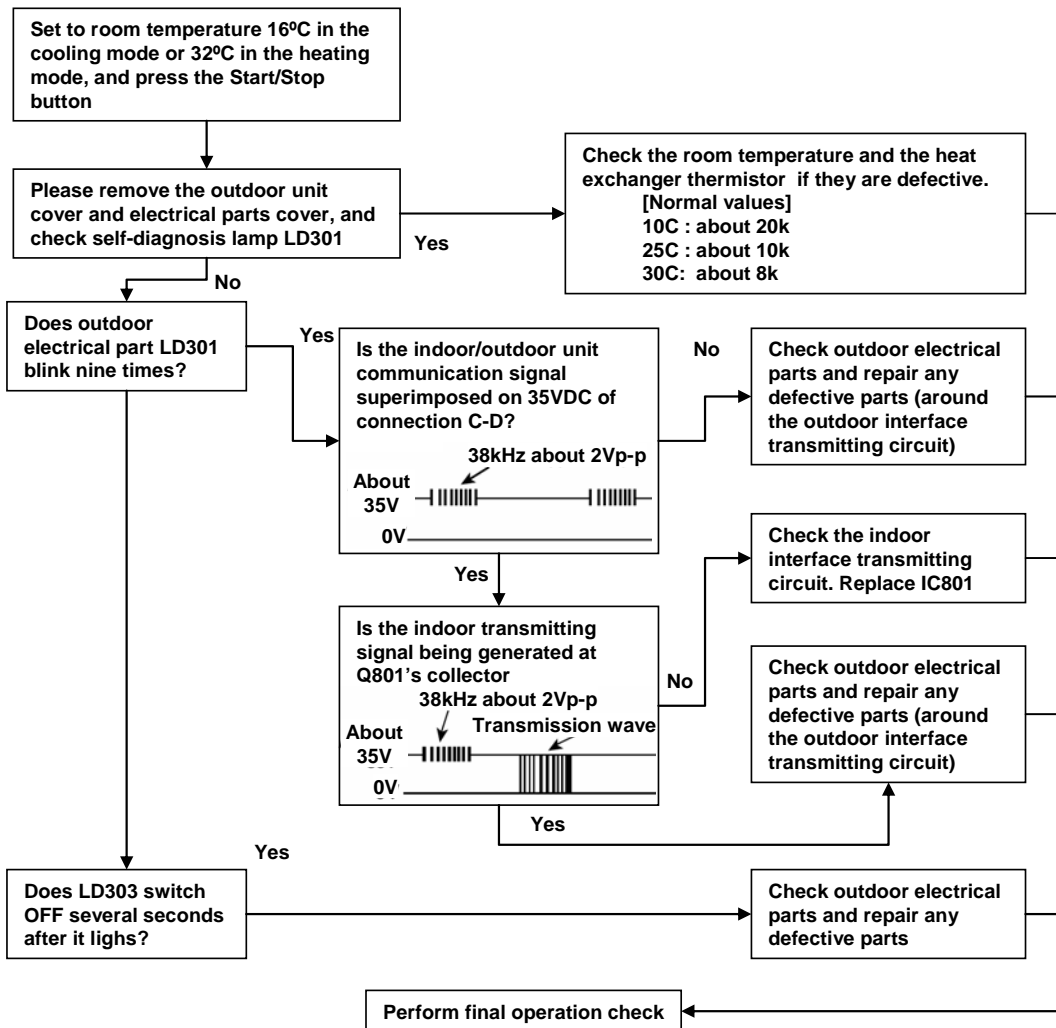
※1: When the unit is not in operation, the voltage across the 35V line may drop to 20V

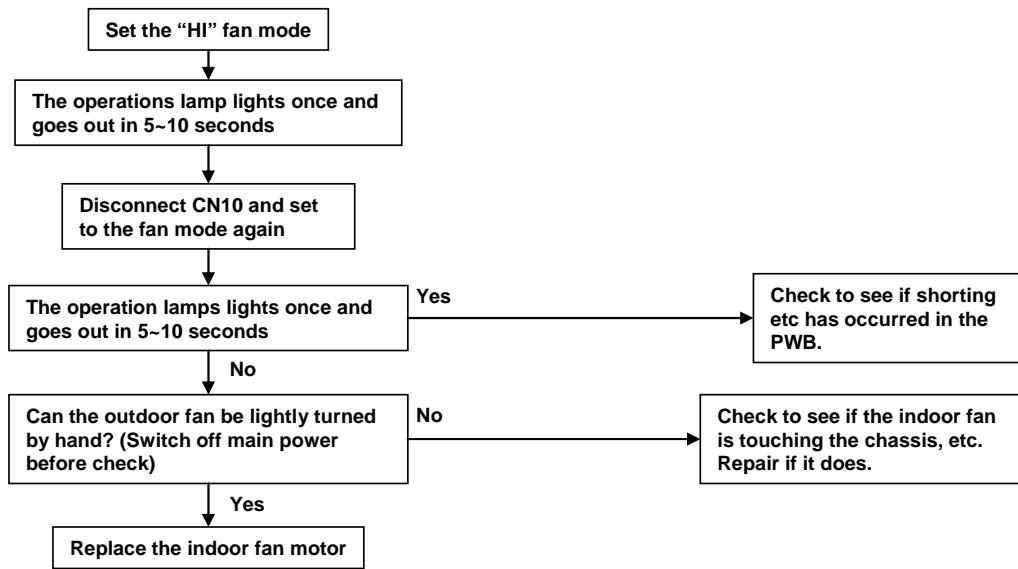
※2: When the unit is not in operation, the voltage across the 12V line may drop to 7V

14.4.5 CHECKING THE REMOTE CONTROLLER



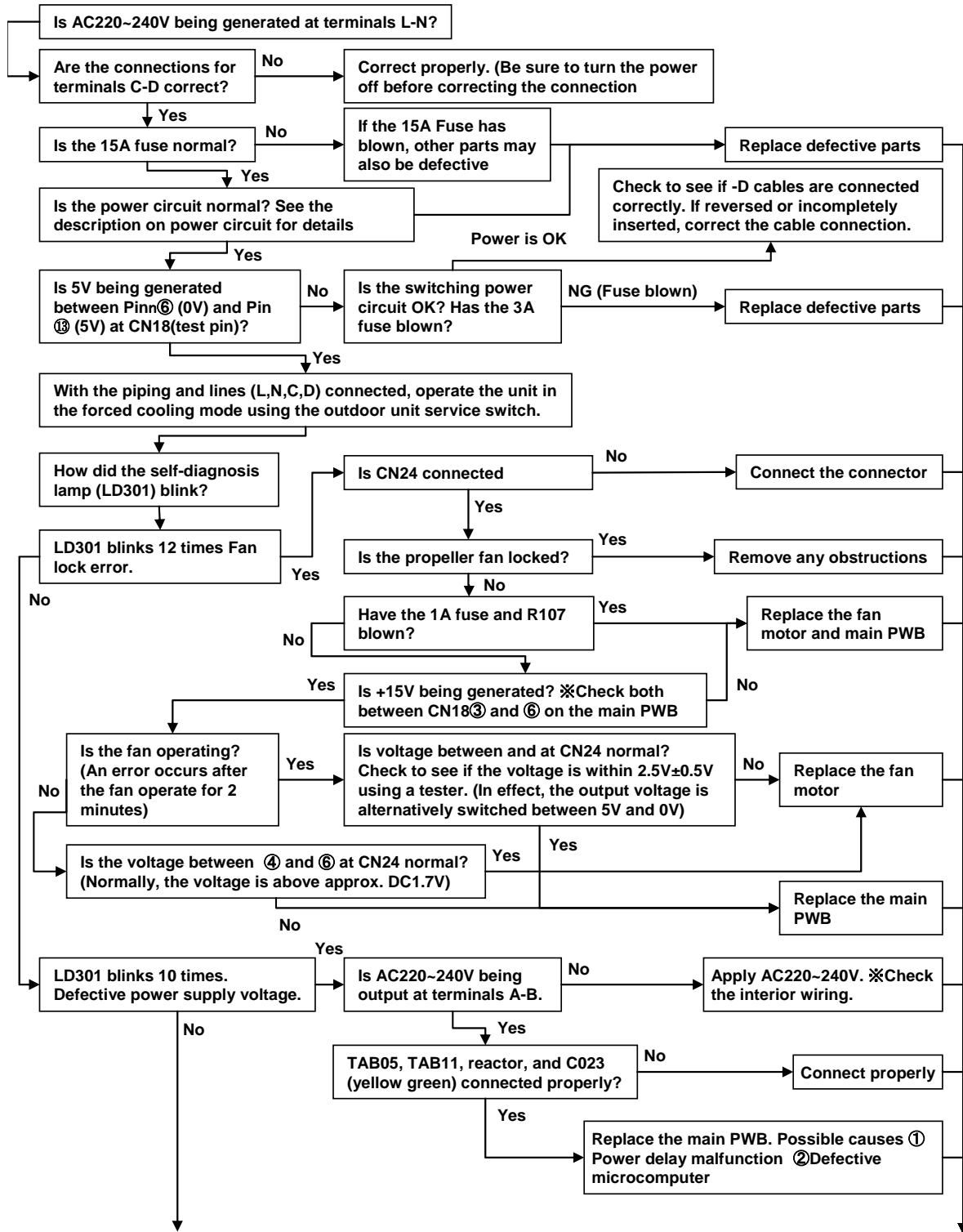
14.4.6 OUTDOOR UNIT DOES NOT OPERATE (BUT RECEIVES REMOTE INFRARED SIGNAL)

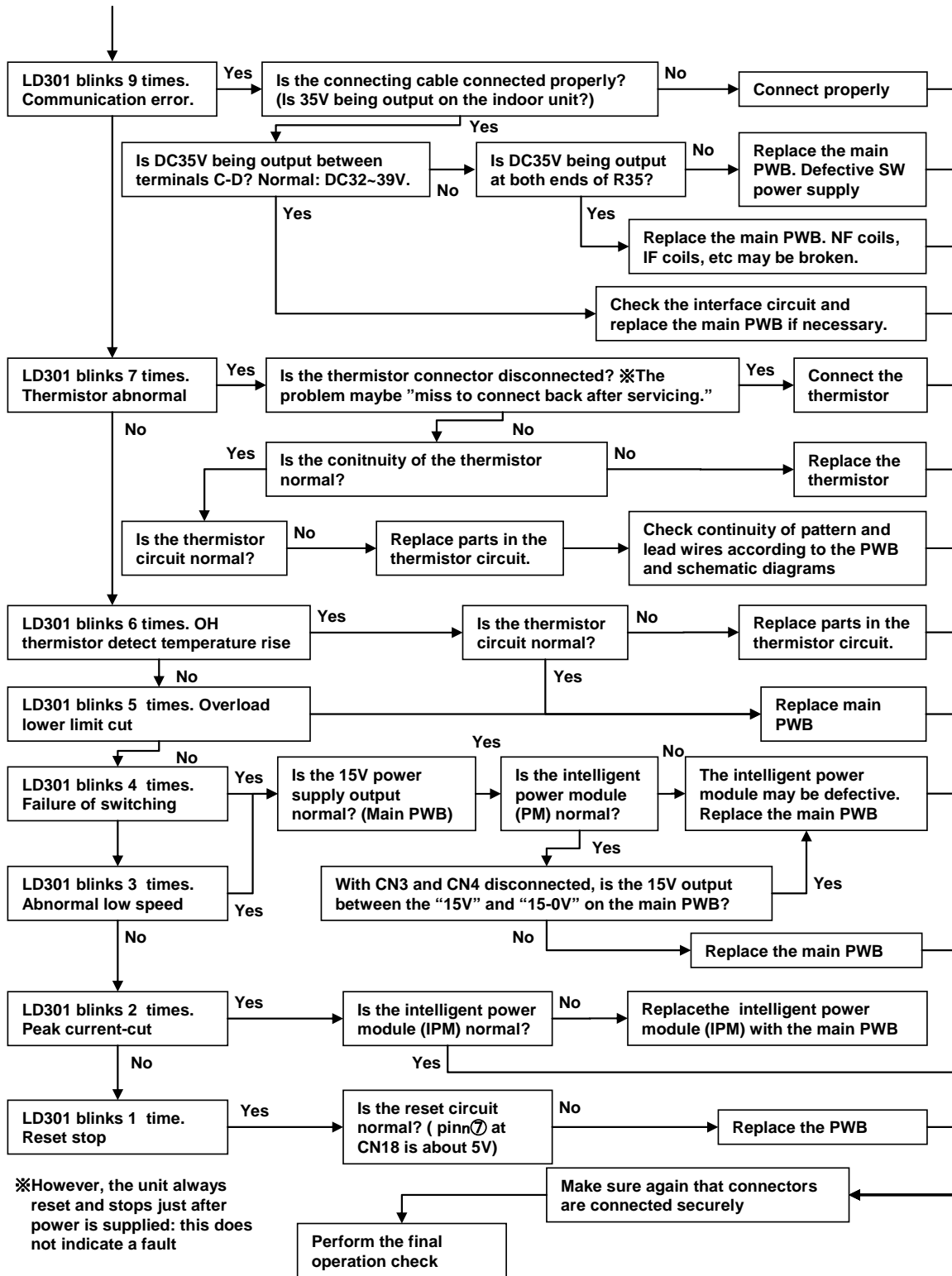


14.4.7 ALL SYSTEMS STOP FROM SEVERAL SECONDS TO SEVERAL MINUTES AFTER OPERATION IS STARTED (ALL INDICATORS ARE ALSO OFF)

14.5 CHECKING OUTDOOR UNIT ELECTRICAL PARTS

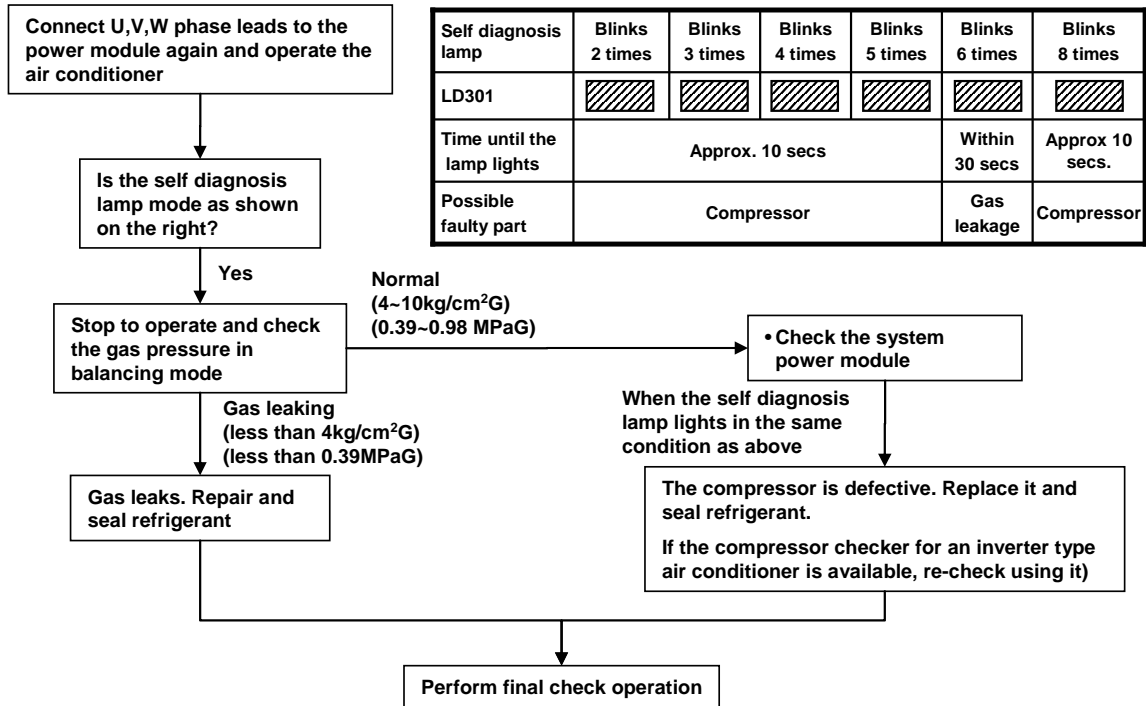
No operation or abnormal operation.





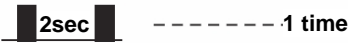










14.6 CHECKING BETWEEN GAS LEAKAGE AND COMPRESSOR FAULTY

14.6.1 TROUBLESHOOTING PROCEDURE (NO OPERATION, NO HEATING OR NO COOLING)

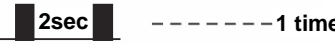











14.7 TROUBLESHOOTING WHEN INDOOR TIMER LAMP BLINKS

14.7.1 MONOZONE / MULTIZONE INDOOR

No	Blinking of TIMER lamp	Reason for indication	Possible causes	RAK	RAF	RAI	RAD
1	 1 time	<u>Reversing valve defective</u> 1) When the indoor heat exchanger temperature is too low in the heating mode or it is too high in the cooling mode.	2) Reversing valve defective 3) Heat exchanger thermistor disconnected (only in heating mode) The malfunction mode is displayed only after the abnormal condition occurs 3 rd time (read every 3 minutes)	★	★	★	★
2	 2 times	<u>Outdoor unit is under forced operation.</u> When the outdoor unit is in forced operation or balancing operation after forced operation	Electrical parts in the outdoor unit.	★	★	★	★
3	 3 times	<u>Indoor/outdoor interface defective</u> When the interface signal from the outdoor unit is interrupted.	1) Indoor interface circuit. 2) Outdoor interface circuit	★	★	★	★
4	 4 times	<u>Outdoor unit electrical components defective</u> When the error mode is detected times within 30 minutes from outdoor unit electrical components. (However, when error is detected 8 times within two hours only for outdoor thermistor	Outdoor unit electrical components. (For details, operate again using remote controller and check from self-diagnosis display of outdoor unit)	★	★	★	★
5	 5 times	Abnormal rotating values of fan motor	When lower DC fan motor is not running. 1) DC fan motor		★		
6	 6 times	Abnormal water level detection	Float switch activated 1) Drain pump 2) Float switch			★	★
7	 7 times	Drain pump forced operation	Drain pump test slide switch is set to "Test" position on the indoor PWB 1) Indoor PWB (Main)			★	★
8	 8 times	Damper defective	1) Fan motor damper		★		
9	 9 times	<u>Room thermistor or heat exchanger thermistor is faulty</u> When room thermistor or heat exchanger thermistor is opened circuit or short circuit.	1) Room thermistor 2) Heat exchanger thermistor	★	★	★	★
10	 10 times	<u>Over-current detection at the DC fan motor</u> When over-current is detected at the DC fan motor of the indoor unit.	1) Indoor fan locked 2) Indoor fan motor 3) Indoor control P.W.B.	★	★	★	★
11	 13 times	<u>IC401 or IC402 data reading error</u> When data read from IC401 or IC402 is incorrect.	IC401 or IC402 abnormal error	★	★	★	★

14.7.2 SUMMIT INVERTER INDOOR


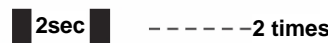


No	Blinking of TIMER lamp	Reason for indication	Possible causes	RAS	RAD
1	 2sec 1 time	<u>Reversing valve defective</u> When the indoor heat exchanger temperature is too low in the heating mode or it is too high in the cooling mode. 1 times	1) Reversing valve defective 2) Heat exchanger thermistor disconnected (only in heating mode) (Note) The malfunction mode is displayed only after the abnormal condition occurs 3 rd time (read every 3 minutes)	★	★
2	 2sec 2 times	<u>Outdoor unit is under forced operation.</u> When the outdoor unit is in forced operation or balancing operation after forced operation	Electrical parts in the outdoor unit.	★	★
3	 2sec 3 times	<u>Indoor/outdoor interface defective</u> When the interface signal from the outdoor unit is interrupted.	1) Indoor interface circuit. 2) Outdoor interface circuit	★	★
4	 2sec 4 times	<u>Outdoor unit electrical components defective</u> When the error mode is detected times within 30 minutes from outdoor unit electrical components. (However, when error is detected 8 times within two hours only for outdoor thermistor)	Outdoor unit electrical components. (For details, operate again using remote controller and check from self-diagnosis display of outdoor unit)	★	★
5	 2sec 6times	Abnormal water level detection	Float switch activated 1) Drain pump 2) Float switch		★
6	 2sec 7 times	Drain pump forced operation	Drain pump test slide switch is set to "Test" position on the indoor PWB 1) Indoor PWB (Main)		★
7	 2sec 9 times	<u>Room thermistor or heat exchanger thermistor is faulty</u> When room thermistor or heat exchanger thermistor is opened circuit or short circuit.	1) Room thermistor 2) Heat exchanger thermistor	★	★
8	 2sec 10times	<u>Over-current detection at the DC fan motor</u> When over-current is detected at the DC fan motor of the indoor unit. 10times	1) Indoor fan locked 2) Indoor fan motor 3) Indoor control P.W.B.	★	★
9	 2sec 13times	<u>IC401 or IC402 data reading error</u> When data read from IC401 or IC402 is incorrect.	IC401 or IC402 abnormal	★	★


( --- Lights for 0.35 sec. at interval of 0.35 sec.)

<Cautions>

- 1) If the interface circuit is faulty when power is supplied, the self diagnosis display will not be displayed
- 2) If the indoor unit does not operate at all, check if the connecting cable is connected to the outdoor unit.
- 3) To check operation again when the timer lamp is blinking, you can use the remote control for eoperation (except for mode mark ※1)

14.7.3 BIGFLOW INDOOR

No	Blinking of TIMER lamp	Reason for indication	Possible causes	Heatpump GH4	Cooling G4
1	 2sec ---1 time	<u>Reversing valve defective</u> When the indoor heat exchanger temperature is too low in the heating mode or it is too high in the cooling mode.	1) Reversing valve defective 2) Heat exchanger thermistor disconnected (only in heating mode) (Note) The malfunction mode is displayed only after the abnormal condition occurs 3 rd time (read every 3 minutes)	★	
2	 2sec ---2 times	<u>Outdoor unit is under forced operation.</u> When the outdoor unit is in forced operation or balancing operation after forced operation	Electrical parts in the outdoor unit.	★	★
3	 2sec 10 times	<u>Over-current detection at the DC fan motor</u> When over-current is detected at the DC fan motor of the indoor unit.	1) Indoor fan locked 2) Indoor fan motor 3) Indoor control P.W.B.	★	★
4 ※	 2sec 13 times	<u>IC401 or IC402 data reading error</u> When data read from IC401 or IC402 is incorrect.	4) IC401 or IC402 abnormal	★	★

( --- Lights for 0.35 sec. at interval of 0.35 sec.)

<Cautions>

- 1) If the interface circuit is faulty when power is supplied, the self diagnosis display will not be displayed
- 2) If the indoor unit does not operate at all, check if the connecting cable is connected to the outdoor unit.
- 3) To check operation again when the timer lamp is blinking, you can use the remote control for operation (except for mode mark ※1)

14.8 TROUBLESHOOTING WHEN OUTDOOR LED LAMP BLINKS

14.8.1 MONOZONE RAC-25NH5 / 35NH5 / 50NH5 / 65NH5

SELF-DIAGNOSIS LIGHTING MODE		■ : LIGHT	▨ : BLINK	□ : OFF
LD301	LD302	SELF DIAGNOSIS NAME	DETAIL	MAIN CHECK POINT
		1. DURING OPERATION		
		LD303 (RED) LIGHTS. ■		
□	□	Normal operation	Compressor operation	Not malfunction
■	□	Overload (1)		The rotation speed is automatically controlled to protect the compressor in the overload condition. This shows an overload but not malfunction.
□	■	Overload (2)		
■	■	Overload (3)		
		2. DURING STOP		
		LD303 (RED) GOES OFF. □		
□	□	Normal stop	Stopped by Thermostat or Controller	NOT MALFUNCTION
▨	□	Reset stop	Microprocessor was re-booted. (It is NORMAL when power SW has been turned ON)	①Main P.W.B.
1 time				
▨	□	Peak current cut	Compressor Peak Current was beyond the maximum limit	①Main P.W.B. ②Compressor
2 times				
▨	□	Abnormal low speed rotation	Compressor Rotor position could not be detected.	①Main P.W.B. ②Compressor
3 times				
▨	□	Switching failure	Switching from low frequency sync start to position detection operation failure	①Main P.W.B. ②Compressor
4 times				
▨	□	Overload lower limit cut	Overload protection mechanism is requesting compressor to run at a speed lower than the minimum speed limit	①Outdoor unit is exposed to direct sunlight or its airflow is blocked. ②Fan motor ③Main PWB ④The Voltage is extremely LOW
5 times				
▨	□	OH thermistor temperature rise	OH thermistor detected compressor overheat	①Leak of refrigerant. ②Compressor ③OH thermistor circuit.
6 times				
▨	□	Thermistor abnormal	Abnormal thermistor value was detected (Open or Short)	①Thermistor. ②Connection of thermistor defective. ③Thermistor circuit.
7 times				
▨	□	Acceleration failure	Compressor acceleration was not more than the minimum speed setting.	①Leak of refrigerant. ②Compressor.
8 times				
▨	□	Communication error	Communication between indoor and outdoor is interrupted	①C-D cable wrongly connected ②Open connection on the C-D cable. ③Interface circuit of indoor/outdoor unit.
9 times				
▨	□	Abnormal power voltage	Abnormal power source is detected.	①Abnormal power source ②Cable is wrongly connected ③Main P.W.B.
10 times				
▨	□	Fan lock error	Outdoor fan actual rpm could not reach as per instructed.	①Outdoor fan motor ②Fan motor circuit.
12 times				
▨	□	EEPROM read error	Microcomputer cannot read the data in EEPROM.	①Main P.W.B.
13 times				
▨	□	ACTIVE CONVERTER defective	Over Voltage is detected by System Power Module	①System Power Module.
14 times				
Example of blinking (5 times)				Lights for 0.25 sec at interval of 0.25 sec

14.8.2 MULTIZONE





























SELF-DIAGNOSIS LIGHTING MODE				■ : LIGHT	▨ : BLINK	□ : OFF
L D 3 0 1	L D 3 0 2	L D 3 0 3	L D 3 0 4	SELF DIAGNOSIS NAME	DETAIL	MAIN CHECK POINT
RED	RED	RED	GRN			
1. DURING OPERATION						
□	□	■	□	Normal Operation	Compressor Operation	Not Malfunction
■	□	■	□	Overload (1)	<p>ROTATION SPEED vs TIME</p> <p>(1) (2) SET VALUE (3)</p>	<p>The rotation speed is automatically controlled to protect the compressor in the overload condition. This shows an overload but not malfunction.</p>
□	■	■	Overload (2)			
■	■	■	Overload (3)			
Example of blinking (5 times)				<p>2SEC</p>	Lights for 0.25 sec at interval of 0.25 sec	
2. DURING STOP						
□	□	■	□	Abnormal Thermistor	Thermistor is opened or shorted. Refer to the table below	①Thermistor ②Connection of Thermistor is faulty ③Thermistor Circuit
Lit	1~11 Times					
Blinking times				Reference Table for Abnormal Thermistor		
1 Times		Overheat Thermistor		8 Times		Narrow Pipe Thermistor (Indoor 3)
2 Times		Defrost Thermistor		9 Times		Wide Pipe Thermistor (Indoor 3)
3 Times		Outdoor Temperature Thermistor		10 Times		Narrow Pipe Thermistor (Indoor 4)
4 Times		Narrow Pipe Thermistor (Indoor 1)		11 Times		Wide Pipe Thermistor (Indoor 4)
5 Times		Wide Pipe Thermistor (Indoor 1)		12 Times		Narrow Pipe Thermistor (Indoor 5)
6 Times		Narrow Pipe Thermistor (Indoor 2)		13 Times		Wide Pipe Thermistor (Indoor 5)
7 Times		Wide Pipe Thermistor (Indoor 2)				
L D 3 0 1	L D 3 0 2	L D 3 0 3	L D 3 0 4	SELF DIAGNOSIS NAME	DETAIL	MAIN CHECK POINT
RED	RED	RED	GRN			
□	□	□	□	Normal Stop	Indoor Thermostat OFF. Main Operation OFF	Not Malfunction
▨	□	□	□	Reset STOP	When stop with Power RESET (Normal when power has been Switched ON)	①P.W.B. (Power Circuit, HIC, ETC)
1 Time						
▨	□	□	□	Peak Current Cut	Over Current is Detected	①Compressor ②P.W.B.
▨	▨	□	□			
2 Times						
▨	□	□	□	Abnormal Low Speed Rotation	Position Detection Signal is not input during operation	①System Power Module ②Compressor ③ P.W.B
3 Times						
▨	□	□	□	Switching Failure	Fail to Switch from Initial Low Frequency Sync to Position Detection Signal	①System Power Module ②Compressor ③ P.W.B
4 Times						
▨	□	□	□	Overload Lower Limit Cut	Overload protection mechanism is requesting compressor to run at a speed lower than the minimum speed limit	①Outdoor unit is exposed to direct sunlight or its airflow is blocked. ②Fan motor ③Main PWB ④The Voltage is extremely LOW
5 Times						

SELF-DIAGNOSIS LIGHTING MODE				■ : LIGHT	▨ : BLINK	□ : OFF
L D 3 0 1	L D 3 0 2	L D 3 0 3	L D 3 0 4	SELF DIAGNOSIS NAME	DETAIL	MAIN CHECK POINT
RED	RED	RED	GRN			
▨	□	□	□	OH thermistor temperature rise 6 Times	OH thermistor detected compressor overheat	①Leak of refrigerant. ②Compressor ③OH thermistor circuit.
▨	□	□	□	Thermistor abnormal 7 Times	Abnormal thermistor value was detected (Open or Short)	①Thermistor. ②Connection of thermistor defective. ③Thermistor circuit.
▨	□	□	□	Acceleration failure 8 Times	Compressor acceleration was not more that the minimum speed setting.	①Leak of refrigerant. ②Compressor.
▨	□	□	□	Communication error 9 Times	Communication between indoor and outdoor is interrupted	①C-D cable wrongly connected ②Open connection on the C-D cable. ③Interface circuit of indoor/outdoor unit.
▨	□	□	□	Abnormal power voltage 10 Times	Abnormal power source is detected.	①Abnormal power source ②Cable is wrongly connected ③Main P.W.B.
▨	□	□	□	Fan lock error 12 Times	Outdoor fan actual rpm could not reach as per instructed.	①Outdoor fan motor ②Fan motor circuit.
▨	□	□	□	EEPROM read error 13 Times	Microcomputer cannot read the data in EEPROM.	①Main P.W.B.
▨	□	□	□	ACTIVE CONVERTER defective 14 Times	Over Voltage is detected by System Power Module	①System Power Module.
Example of blinking (5 times)						

14.8.3 COMMUNICATION ERROR DIAGNOSIS MULTIZONE RAM-40QH5 / 55QH5 / 65QH5 / 72QH5 / 130QH5

SELF-DIAGNOSIS LIGHTING MODE				■ : LIGHT	▨ : BLINK	□ : OFF
L D 3 0 1	L D 3 0 2	L D 3 0 3	L D 3 0 4	SELF DIAGNOSIS NAME	DETAIL	MAIN CHECK POINT
RED	RED	RED	GRN			
1. DURING OPERATION						
□	□	□	▨	Communication Error between Indoor and Outdoor	Communication Error of Indoor 1	When Indoor unit is not connected, It blinks similarly. Not Malfunction. ①Cable is wrongly connected ②Cable is open ③Interface Circuit between Indoor and Outdoor Unit
1 Time					Communication Error of Indoor 2	
2 Times					Communication Error of Indoor 3	
3 Times					Communication Error of Indoor 4	
4 Times						

14.8.4 COMMUNICATION ERROR DIAGNOSIS MULTIZONE RAM-90QH5

SELF-DIAGNOSIS LIGHTING MODE					 : LIGHT	 : BLINK	 : OFF	
L D 3 0 4	L D 3 0 5	L D 3 0 6	L D 3 0 7	L D 3 0 8	SELF DIAGNOSIS NAME	DETAIL	MAIN CHECK POINT	
GRN	GRN	GRN	GRN	GRN	2. DURING OPERATION			
					Communication Error between Indoor and Outdoor	Communication Error of Indoor 1	When Indoor unit is not connected, It blinks similarly. Not Malfunction.	①Cable is wrongly connected ②Cable is open ③Interface Circuit between Indoor and Outdoor Unit
						Communication Error of Indoor 2		
						Communication Error of Indoor 3		
						Communication Error of Indoor 4		
						Communication Error of Indoor 5		

14.8.5 SUMMIT INVERTER (RAC-18YH6 / 25YH6 / 35YH6 / 25YH5 / 35YH5 / 25WX8 / 25FX8 / 35WX8 / 35FX8)




SELF-DIAGNOSIS LIGHTING MODE		■ : LIGHT	▨ : BLINK	□ : OFF
LD301	LD302	SELF DIAGNOSIS NAME	DETAIL	MAIN CHECK POINT
1. DURING OPERATION			LD303 (RED) LIGHTS. ■	
□	□	Normal operation	Compressor operation	Not malfunction
■	□	Overload (1)		The rotation speed is automatically controlled to protect the compressor in the overload condition. This shows an overload but not malfunction.
□	■	Overload (2)		
■	■	Overload (3)		
2. DURING STOP			LD303 (RED) GOES OFF. □	
□	□	Normal stop	Stopped by Thermostat or Controller	NOT MALFUNCTION
▨	□	Reset stop	Microprocessor was re-booted. (It is NORMAL when power SW has been turned ON)	①Main P.W.B.
1 time				
▨	□	Peak current cut	Compressor Peak Current was beyond the maximum limit	①Main P.W.B. ②Compressor
2 times				
▨	□	Abnormal low speed rotation	Compressor Rotor position could not be detected.	①Main P.W.B. ②Compressor
3 times				
▨	□	Switching failure	Switching from low frequency sync start to position detection operation failure	①Main P.W.B. ②Compressor
4 times				
▨	□	Overload lower limit cut	Overload protection mechanism is requesting compressor to run at a speed lower than the minimum speed limit	①Outdoor unit is exposed to direct sunlight or its airflow is blocked. ②Fan motor ③Main PWB ④The Voltage is extremely LOW
5 times				
▨	□	OH thermistor temperature rise	OH thermistor detected compressor overheat	①Leak of refrigerant. ②Compressor ③OH thermistor circuit.
6 times				
▨	□	Thermistor abnormal	Abnormal thermistor value was detected (Open or Short)	①Thermistor. ②Connection of thermistor defective. ③Thermistor circuit.
7 times				
▨	□	Acceleration failure	Compressor acceleration was not more that the minimum speed setting.	①Leak of refrigerant. ②Compressor.
8 times				
▨	□	Communication error	Communication between indoor and outdoor is interrupted	①C-D cable wrongly connected ②Open connection on the C-D cable. ③Interface circuit of indoor/outdoor unit.
9 times				
▨	□	Abnormal power voltage	Abnormal power source is detected.	①Abnormal power source ②Cable is wrongly connected ③Main P.W.B.
10 times				
▨	□	Fan lock error	Outdoor fan actual rpm could not reach as per instructed.	①Outdoor fan motor ②Fan motor circuit.
12 times				
▨	□	EEPROM read error	Microcomputer cannot read the data in EEPROM.	①Main P.W.B.
13 times				
Example of blinking (5 times)				Lights for 0.25 sec at interval of 0.25 sec

14.8.6 SUMMIT INVERTER (RAC-50YH5 / 60YH5 / 50WX8 / 50FX8)

SELF-DIAGNOSIS LIGHTING MODE		■ : LIGHT	▨ : BLINK	□ : OFF
LD301	LD302	SELF DIAGNOSIS NAME	DETAIL	MAIN CHECK POINT
1. DURING OPERATION		LD303 (RED) LIGHTS. ■		
□	□	Normal operation	Compressor operation	Not malfunction
■	□	Overload (1)		The rotation speed is automatically controlled to protect the compressor in the overload condition. This shows an overload but not malfunction.
□	■	Overload (2)		
■	■	Overload (3)		
2. DURING STOP		LD303 (RED) GOES OFF. □		
□	□	Normal stop	Stopped by Thermostat or Controller	NOT MALFUNCTION
▨	□	Reset stop	Microprocessor was re-booted. (It is NORMAL when power SW has been turned ON)	①Main P.W.B.
1 time				
▨	□	Peak current cut	Compressor Peak Current was beyond the maximum limit	①Main P.W.B. ②Compressor
2 times				
▨	□	Abnormal low speed rotation	Compressor Rotor position could not be detected.	①Main P.W.B. ②Compressor
3 times				
▨	□	Switching failure	Switching from low frequency sync start to position detection operation failure	①Main P.W.B. ②Compressor
4 times				
▨	□	Overload lower limit cut	Overload protection mechanism is requesting compressor to run at a speed lower than the minimum speed limit	①Outdoor unit is exposed to direct sunlight or its airflow is blocked. ②Fan motor ③Main PWB ④The Voltage is extremely LOW
5 times				
▨	□	OH thermistor temperature rise	OH thermistor detected compressor overheat	①Leak of refrigerant. ②Compressor ③OH thermistor circuit.
6 times				
▨	□	Thermistor abnormal	Abnormal thermistor value was detected (Open or Short)	①Thermistor. ②Connection of thermistor defective. ③Thermistor circuit.
7 times				
▨	□	Acceleration failure	Compressor acceleration was not more that the minimum speed setting.	①Leak of refrigerant. ②Compressor.
8 times				
▨	□	Communication error	Communication between indoor and outdoor is interrupted	①C-D cable wrongly connected ②Open connection on the C-D cable. ③Interface circuit of indoor/outdoor unit.
9 times				
▨	□	Abnormal power voltage	Abnormal power source is detected.	①Abnormal power source ②Cable is wrongly connected ③Main P.W.B.
10 times				
▨	□	Fan lock error	Outdoor fan actual rpm could not reach as per instructed.	①Outdoor fan motor ②Fan motor circuit.
12 times				
▨	□	EEPROM read error	Microcomputer cannot read the data in EEPROM.	①Main P.W.B.
13 times				
▨	□	ACTIVE CONVERTER defective	Over Voltage is detected by System Power Module	①System Power Module.
14 times				
Example of blinking (5 times)				Lights for 0.25 sec at interval of 0.25 sec

14.8.7 SUMMIT INVERTER (RAC-70YH5 / 80YH5 / 50DH7 / 60DH7 / 70DH7)

SELF-DIAGNOSIS LIGHTING MODE				<input checked="" type="checkbox"/> : LIGHT	<input checked="" type="checkbox"/> : BLINK	<input type="checkbox"/> : OFF
L D 3 0 1	L D 3 0 2	L D 3 0 3	L D 3 0 4	SELF DIAGNOSIS NAME	DETAIL	MAIN CHECK POINT
RED	RED	RED	GRN			
1. DURING OPERATION						
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Normal Operation	Compressor Operation	Not Malfunction
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Overload (1)	<p>ROTATION SPEED vs TIME</p> <p>(1) (2) SET VALUE (3)</p>	The rotation speed is automatically controlled to protect the compressor in the overload condition. This shows an overload but not malfunction.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Overload (2)			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Overload (3)			
Example of blinking (5 times)				<p>Lights for 0.25 sec at interval of 0.25 sec</p>		
2. DURING STOP						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Normal Stop	Indoor Thermostat OFF. Main Operation OFF	Not Malfunction
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Reset STOP	When stop with Power RESET (Normal when power has been Switched ON)	①P.W.B. (Power Circuit, HIC, ETC)
1 Time						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Peak Current Cut	Over Current is Detected	①Compressor ②P.W.B.
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
2 Times						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Abnormal Low Speed Rotation	Position Detection Signal is not input during operation	①System Power Module ②Compressor ③ P.W.B
3 Times						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Switching Failure	Fail to Switch from Initial Low Frequency Sync to Position Detection Signal	①System Power Module ②Compressor ③ P.W.B
4 Times						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Overload Lower Limit Cut	Overload protection mechanism is requesting compressor to run at a speed lower than the minimum speed limit	①Outdoor unit is exposed to direct sunlight or its airflow is blocked. ②Fan motor ③Main PWB ④The Voltage is extremely LOW
5 Times						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	OH thermistor temperature rise	OH thermistor detected compressor overheat	①Leak of refrigerant. ②Compressor ③OH thermistor circuit.
6 Times						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Thermistor abnormal	Abnormal thermistor value was detected (Open or Short)	①Thermistor. ②Connection of thermistor defective. ③Thermistor circuit.
7 Times						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Acceleration failure	Compressor acceleration was not more that the minimum speed setting.	①Leak of refrigerant. ②Compressor.
8 Times						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Communication error	Communication between indoor and outdoor is interrupted	①C-D cable wrongly connected ②Open connection on the C-D cable. ③Interface circuit of indoor/outdoor unit.
9 Times						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Abnormal power voltage	Abnormal power source is detected.	①Abnormal power source ②Cable is wrongly connected ③Main P.W.B.
10 Times						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fan lock error	Outdoor fan actual rpm could not reach as per instructed.	①Outdoor fan motor ②Fan motor circuit.
12 Times						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EEPROM read error	Microcomputer cannot read the data in EEPROM.	①Main P.W.B.
13 Times						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ACTIVE CONVERTER	Over Voltage is detected by System	①System Power Module.

14 Times	defective	Power Module	
Example of blinking (5 times)			
	Abnormal Thermistor	Thermistor is opened or shorted. Refer to the table below	①Thermistor ②Connection of Thermistor is faulty ③Thermistor Circuit
Lit 1~11 Times			
Blinking time	Abnormal Thermistor		
1 Time	Overheat Thermistor		
2 Times	Defrost Thermistor		
3 Times	Outdoor Temperature Thermistor		
	Communication error	Communication between indoor and outdoor is interrupted	①C-D cable wrongly connected ②Open connection on the C-D cable. ③Interface circuit of indoor/outdoor unit.
1 Time			

14.9 CHECKING POWER MODULE

■ Checking power module using tester

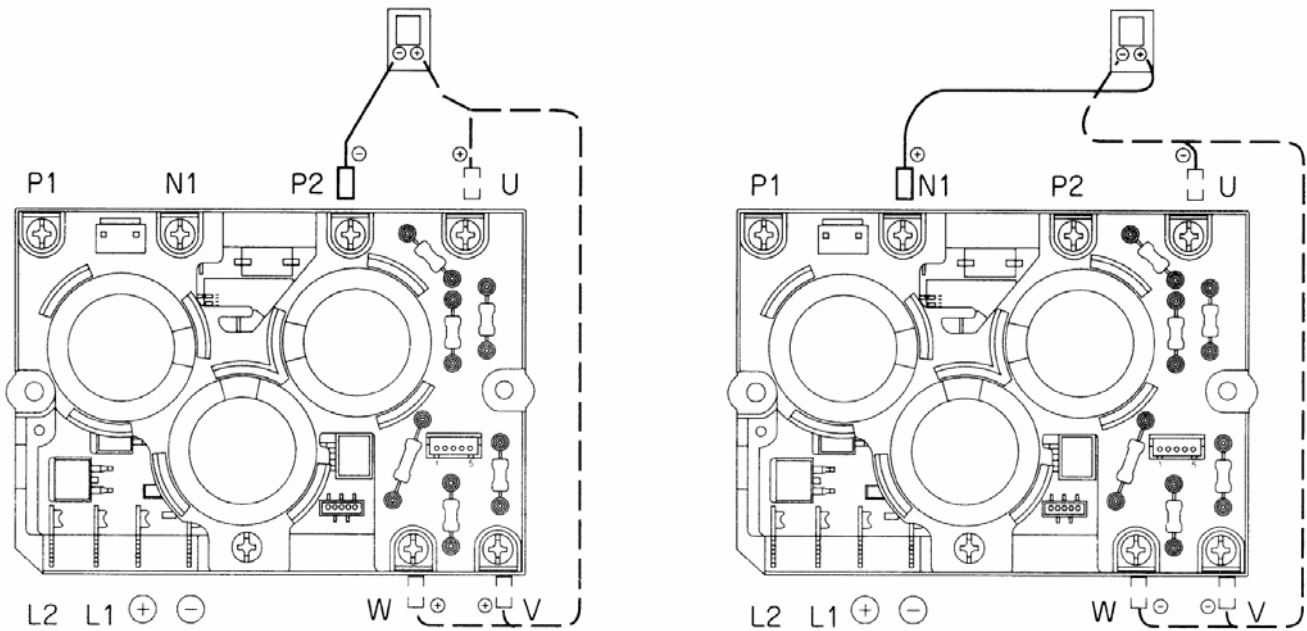
Set tester to resistance range (x 100)

If indicator shows high resistance in the following conductivity check, the power module is considered normal. (In case of the digital tester, since built-in battery is set in reverse direction, ⊕ and ⊖ terminals are reversed).

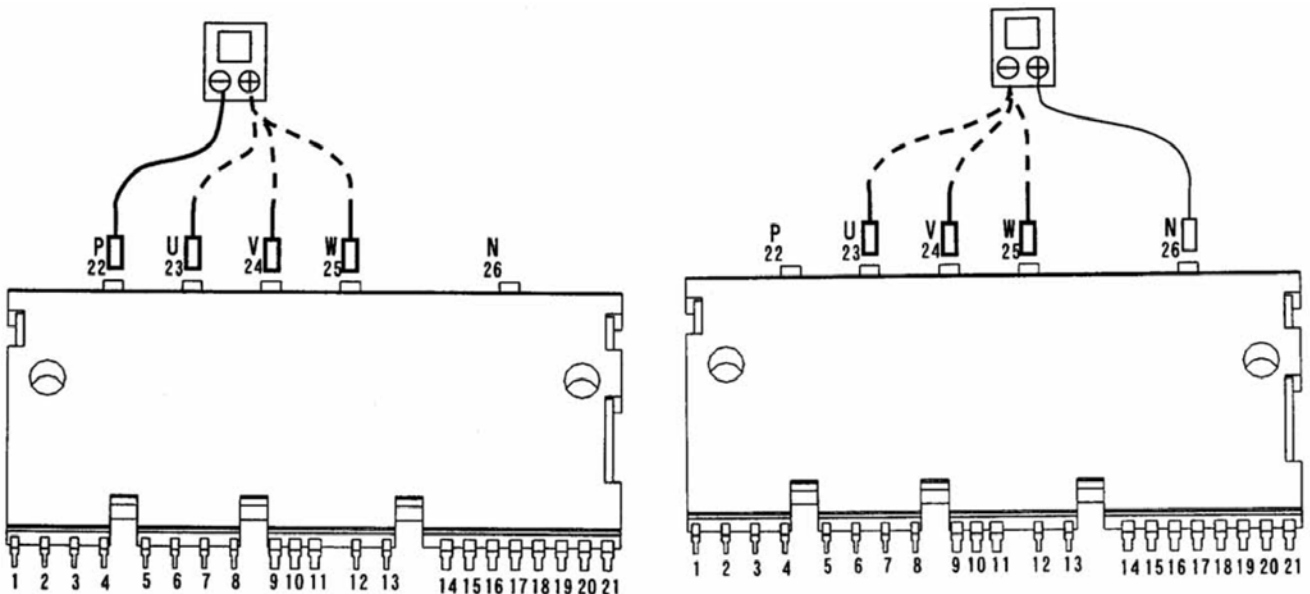
Caution

However, if the inner circuit of power module is already disconnected (open), the HIGH resistance shown may be misjudged as normal. In this case, please check the resistance by the reversing ⊕ and ⊖ probe polarity against what is shown in the diagram below and measure again. If it is considered normal if the tester shows LOW resistance. Furthermore, compare how the indicator swings at each U, V and W phases. If indicator swings the same way at each terminal, the power module is judged normal.

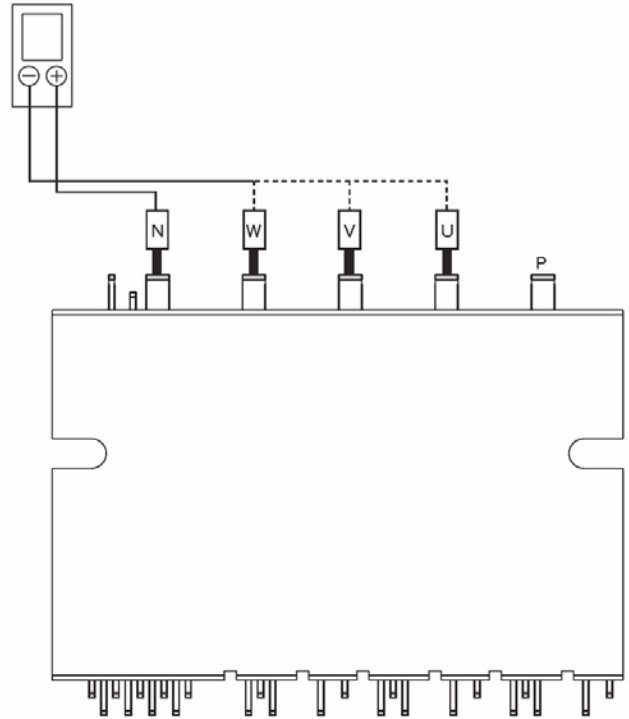
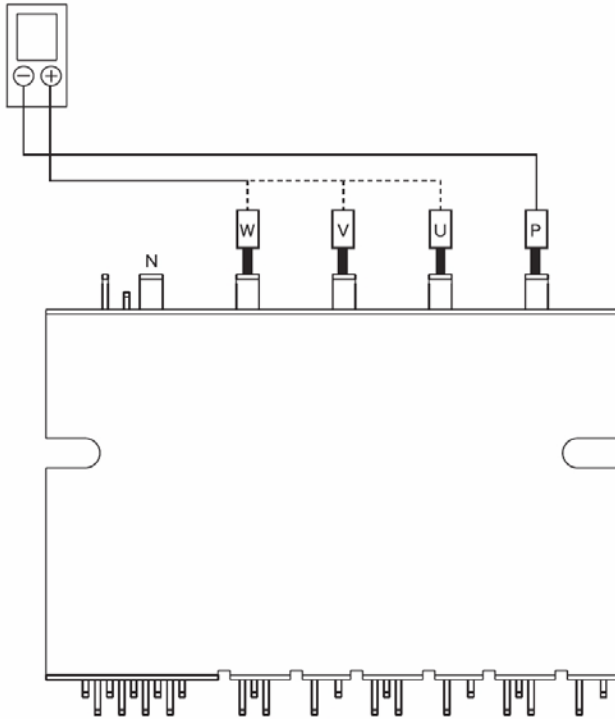
14.9.1 RAC-25NH5, 35NH5, 50NH5, 65NH5 & RAM-40QH5, 55QH5, 65QH5, 72QH5, 130QH5



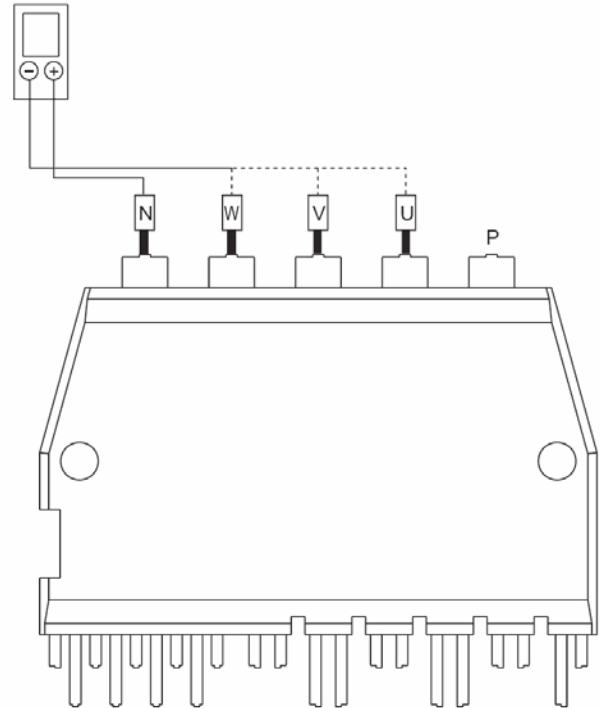
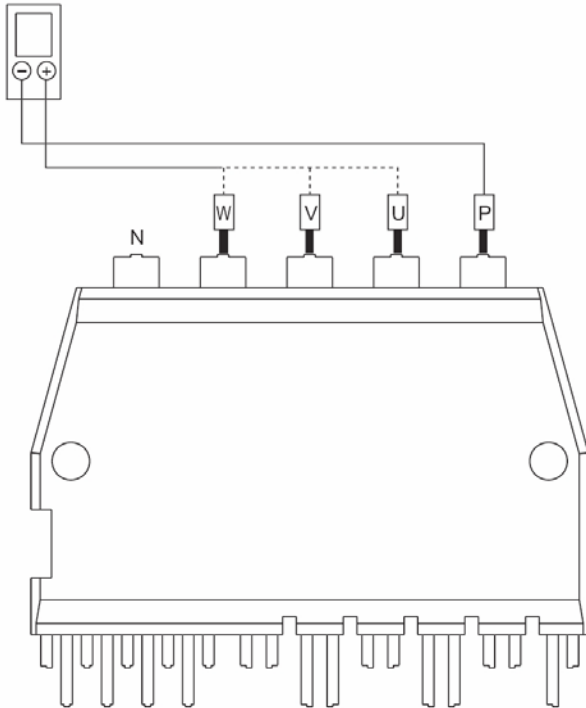
14.9.2 RAM-90QH5



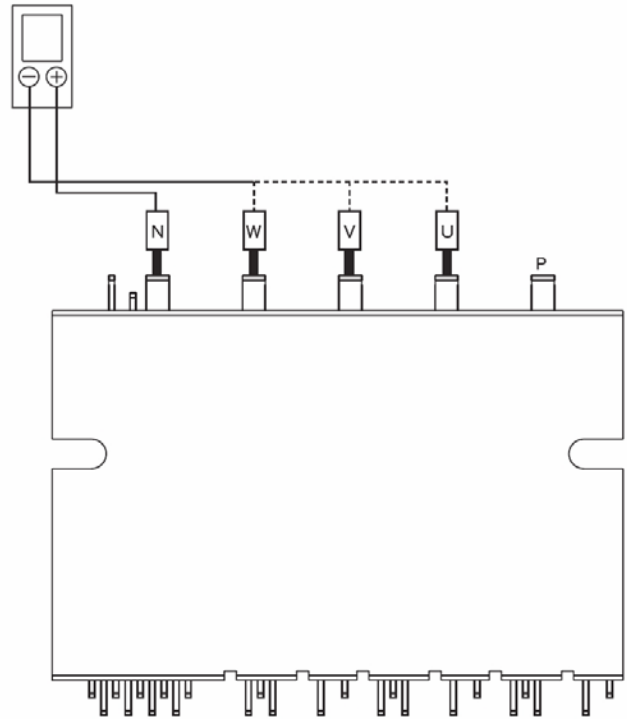
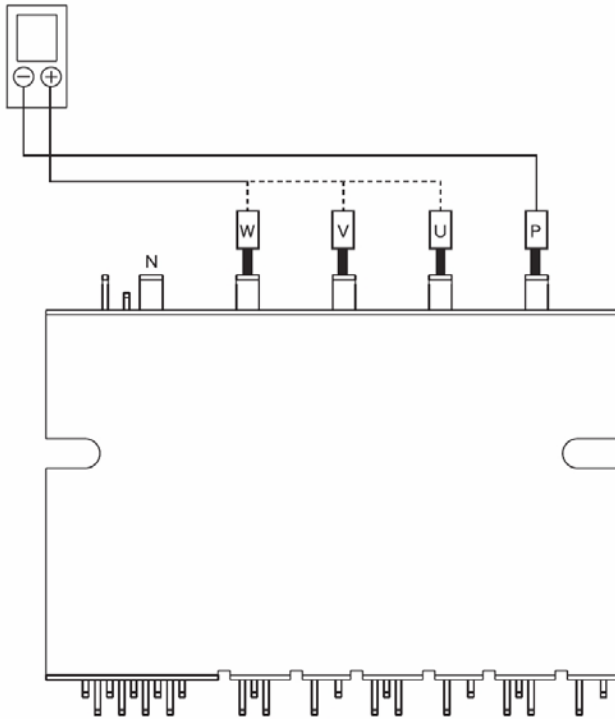
14.9.3 RAC-25YH5, 35YH5



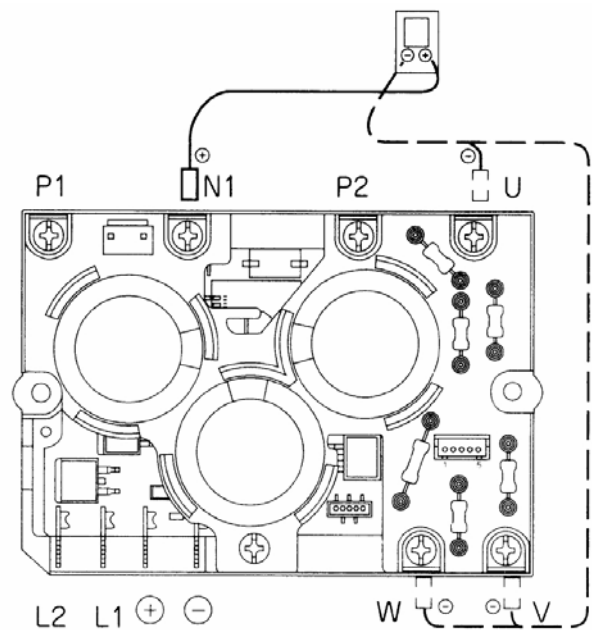
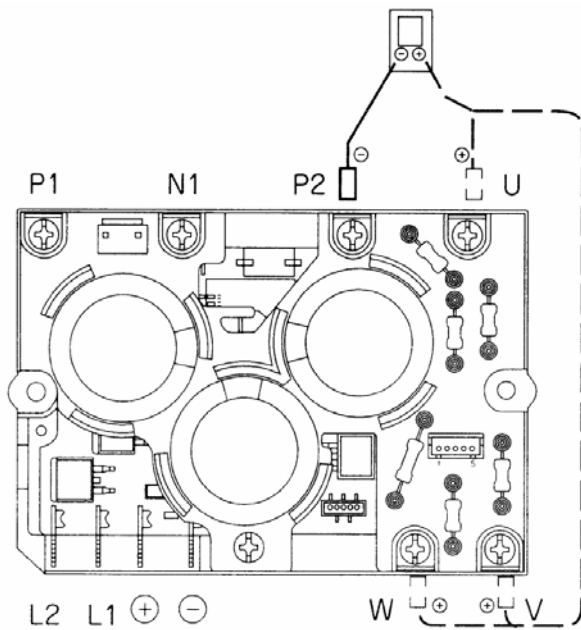
14.9.4 RAC-18YH6, RAC-25YH6, RAC-25WX8, RAC-25FX8, RAC-35WX8, RAC-35FX8, RAC-50WX8, RAC-50FX8



14.9.5 RAC-35YH6



14.9.6 RAC-50YH5, 60YH5, 70YH5, 80YH5 & RAC-50DH7, 60DH7, 70DH7



THERMISTOR

14.9.7 NAME AND ROLE OF EACH THERMISTOR

Name	Connector no.	Measuring point	role
OH thermistor	CN5	Compressor head	If the temperature of the compressor rises abnormally (118°C), the compressor will be stopped. The temperature is used to decide the operation of the valve
DEF thermistor	CN6	Heat exchanger	The thermistor decide the defrost operation during heating combine the data of the outside temperature and its data
Outdoor temperature thermistor	CN7	Outside temperature	Outdoor temperature is used to decide the various operation of the air conditioner
Electrical Expansion valve thermistor (narrow pipe 1)	CN8	Indoor unit (narrow pipe 1)	The thermistors detect the temperature of the piping to the indoor units. The temperature are used to decide how much the expansion valve is opened
Electrical Expansion valve thermistor (narrow pipe 2)		Indoor unit (narrow pipe 2)	
Electrical Expansion valve thermistor (narrow pipe 3) *		Indoor unit (narrow pipe 3)	
Electrical Expansion valve thermistor (narrow pipe 4) *		Indoor unit (narrow pipe 4)	
Electrical Expansion valve thermistor (wide pipe 1)	CN9	Indoor unit (wide pipe 1)	
Electrical Expansion valve thermistor (wide pipe 2)		Indoor unit (wide pipe 2)	
Electrical Expansion valve thermistor (wide pipe 3) *		Indoor unit (wide pipe 3)	
Electrical Expansion valve thermistor (wide pipe 4) *		Indoor unit (wide pipe 4)	

*** Starmark is applicable to respective models only

14.9.8 REFERENCE VALUE FOR THERMISTOR'S RESISTANCE AND TEMPERATURE

Electrical expansion valve thermistor	Temperature	Resistance	Microcomputer pin potential
DEF thermistor	-15°C	12.6kΩ	1.0V
	0°C	6.1 kΩ	1.7V
	25°C	2.2 kΩ	3.0V
	50°C	860 Ω	3.9V
	75°C	400 Ω	4.4V
Outdoor temperature thermistor	-15°C	12.6kΩ	1.0V
	0°C	6.1 kΩ	1.7V
	15°C	3.2 kΩ	2.4V
	30°C	2 kΩ	3.1V
OH thermistor	25°C	33.9 kΩ	0.5V
	50°C	10.8 kΩ	1.3V
	75°C	4.1 kΩ	2.4V
	100°C	1.7 kΩ	3.4V
	105°C	1.5 kΩ	3.6V
	118°C	1 kΩ	3.9V

NOTE:

The table shows the corresponding reference value between thermistor's resistance and the temperature. The value stated in the table might be slightly differ from measured value, depending on the measuring instrument.

When measuring the resistance, pull out the connector after turning off the power supply to avoid voltage leak.

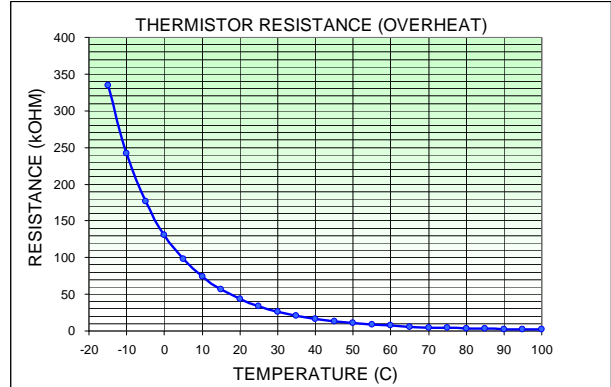
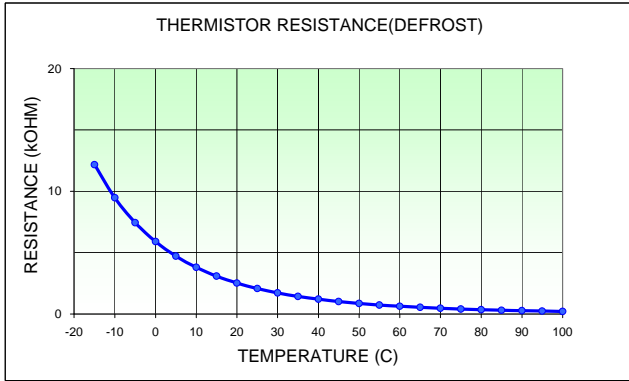
WARNING:

Pulling out the connector while the power supply is turn on will cause electrical shock, leak of current or burn of measuring instrument.

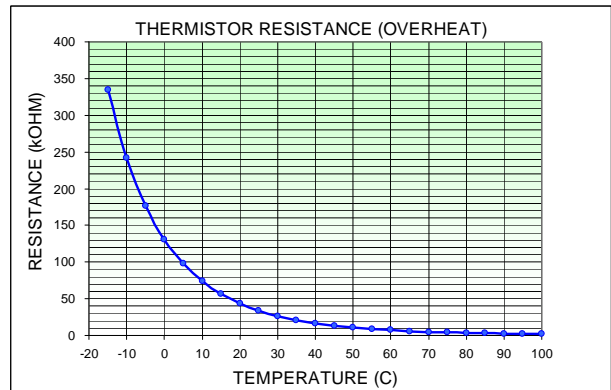
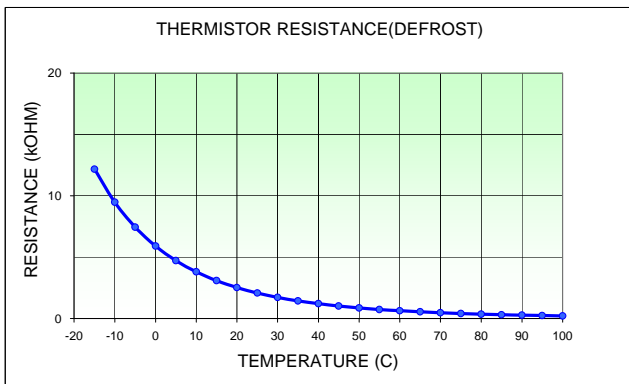
14.9.9 THERMISTOR RESISTANCE-TEMPERATURE GRAPH

Mono/Multi Outdoor

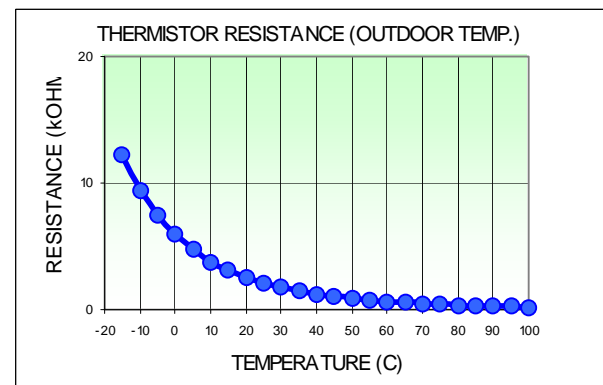
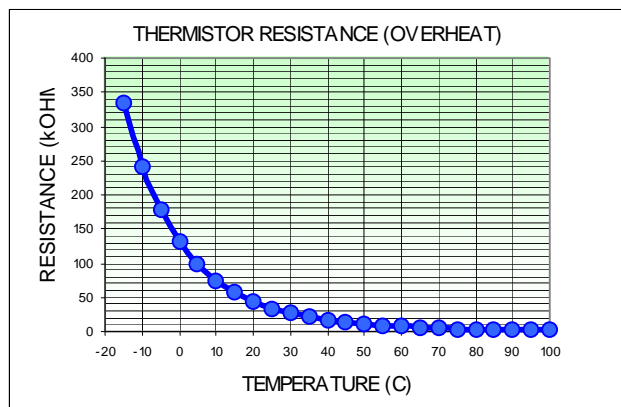
RAC-25NH5, RAC-35NH5, RAC-50NH5, RAC-65NH5



RAM-40QH5, RAM-55QH5, RAM-65QH5, RAM-72QH5, RAM-90QH5, RAM-130QH5



RAM-80QH5



- When the connectors of the thermistors are disconnected or the thermistors are open or short, LD301 (red) will lights and LD302 (red) blinks so that they indicate troubled parts (please refer to section 12.1).

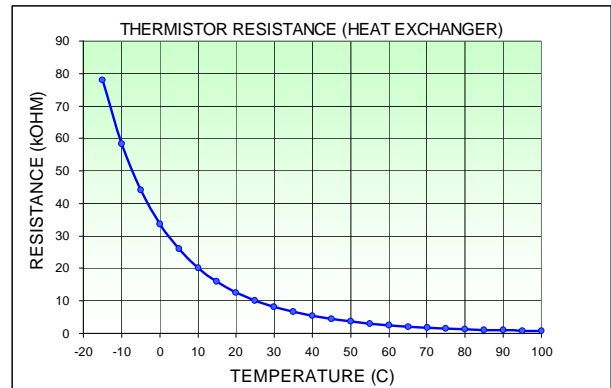
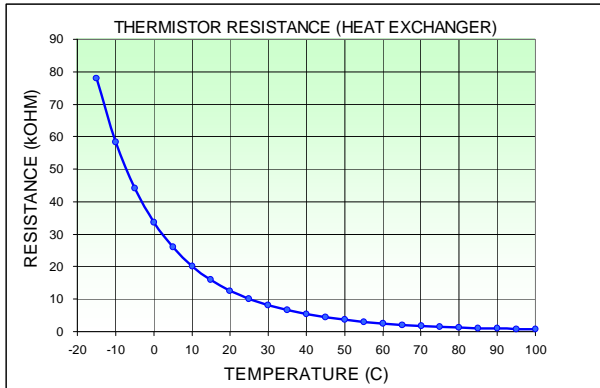
WARNING:

Beware that an open-circuit for OH thermistor has to be checked in 5 minutes after the compressor starts.

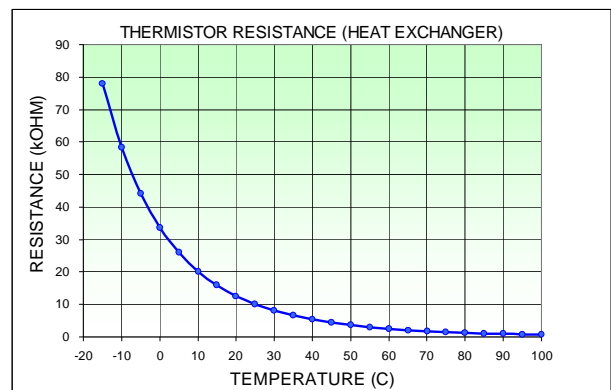
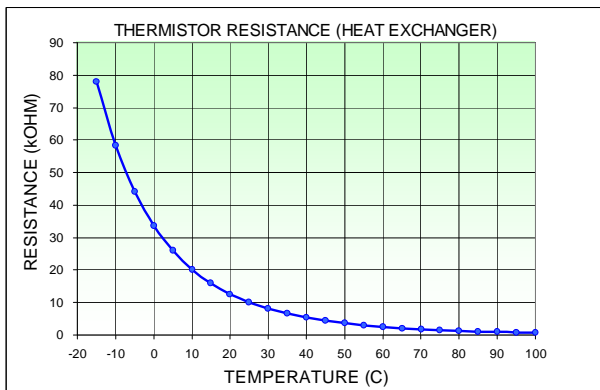
- If the unit operates abnormally after replacing the thermistor, the control P.W.B. must be replace.

Mono/Multi Indoor

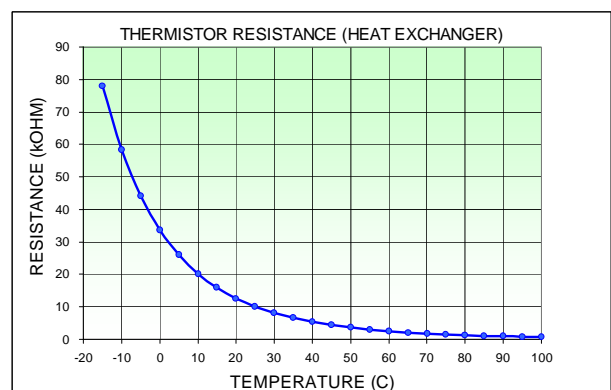
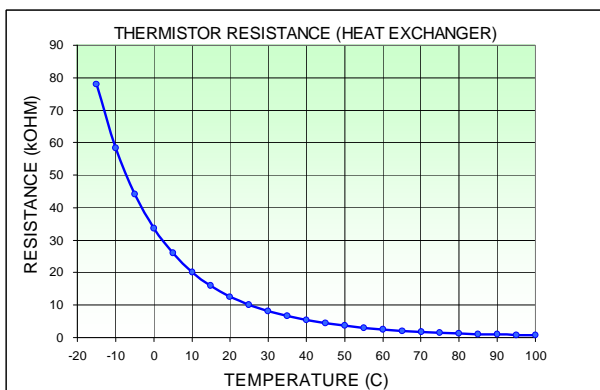
RAK-18NH6A , RAK-25NH6A, RAK-35NH6A, RAK-50NH6A , RAK-65NH5A, RAK-25QH8 , RAK-35QH8 , RAK-50QH8



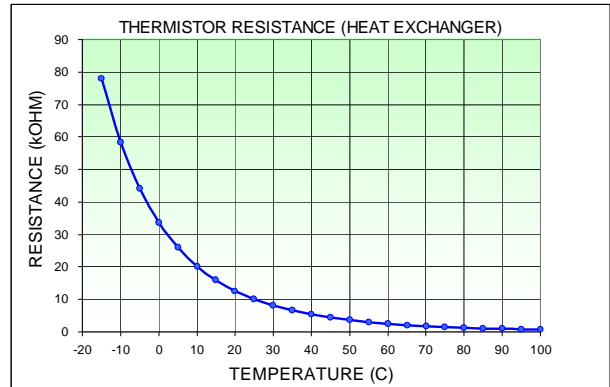
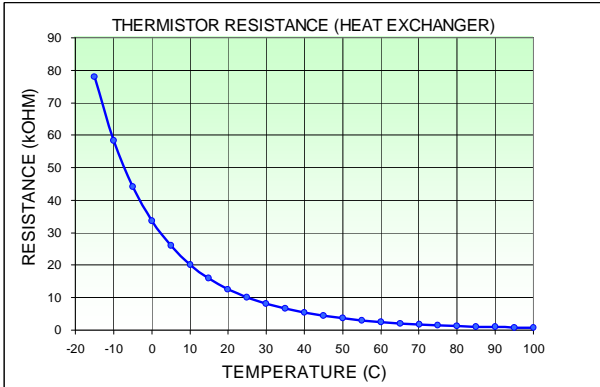
RAI-25NH5A ,RAI-35NH5A ,RAI-50NH5A



RAD-18NH7A ,RAD-25NH7A ,RAD-35NH7A ,RAD-50NH7A

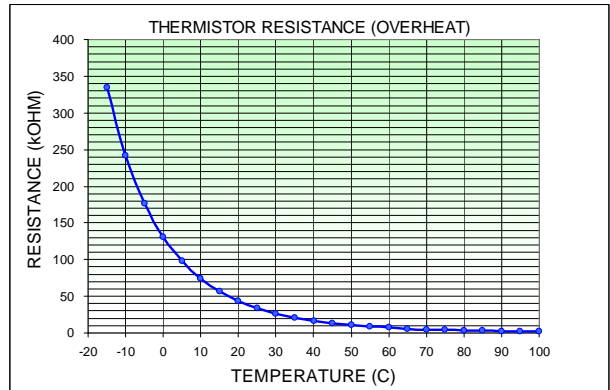
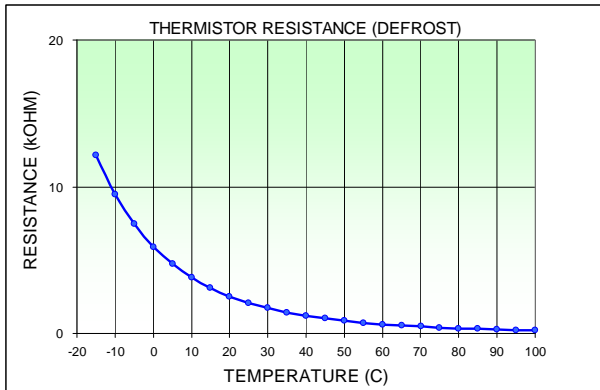


RAF-25QH8 , RAF-35QH8 , RAF-50QH8 , RAF-25NH5 , RAF-35NH5 , RAF-50NH5

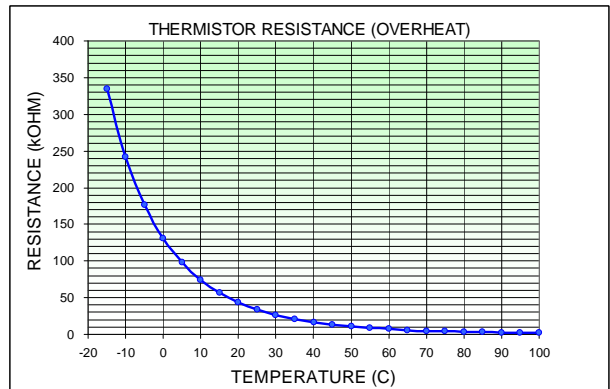
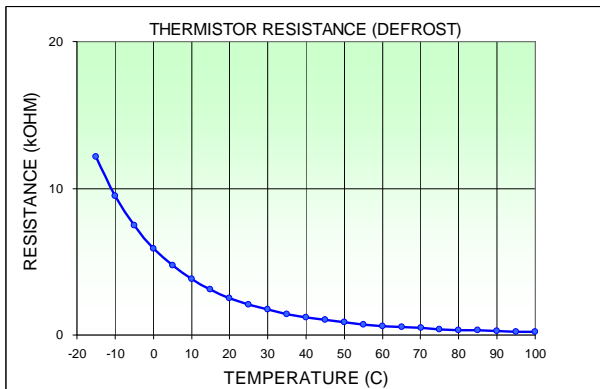


Summit Outdoor

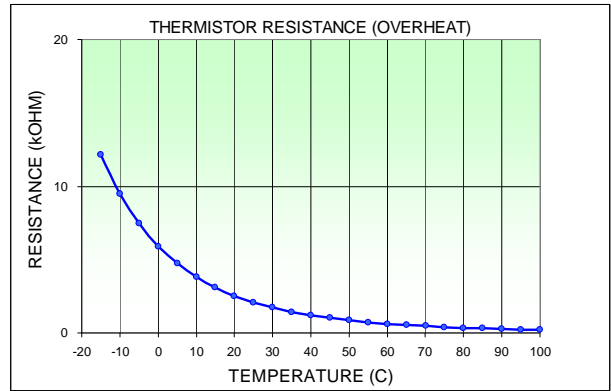
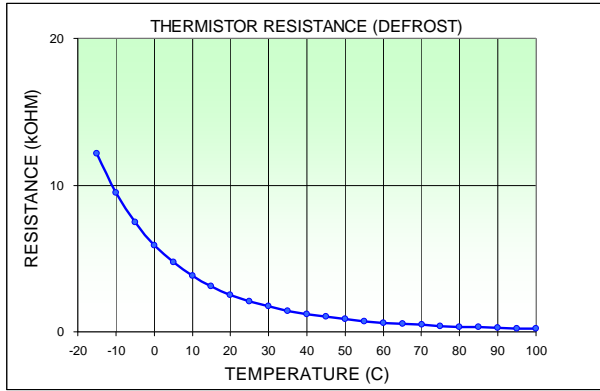
RAC-25YH5 , RAC-35YH5 , RAC-18YH6 , RAC-25YH6 , RAC-35YH6



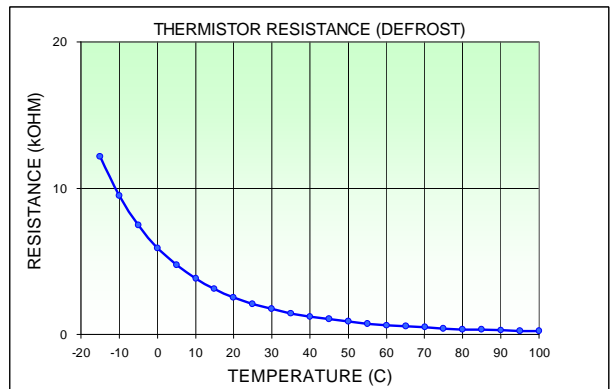
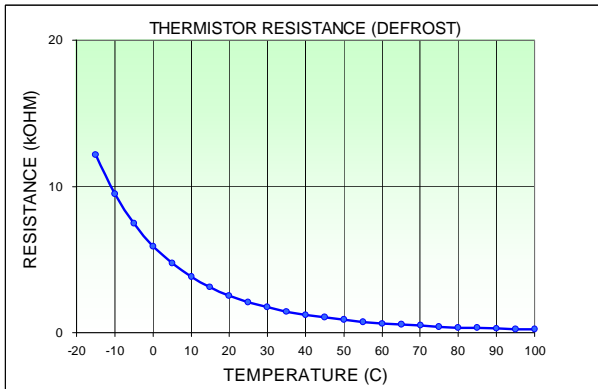
RAC-25WX8 , RAC-35YWX8 , RAC-50WX8 , RAC-25FX8 , RAC-35FX8 , RAC-50FX8



RAC-50YH6 , RAC-60YH5 , RAC-70YH5 , RAC-80YH5

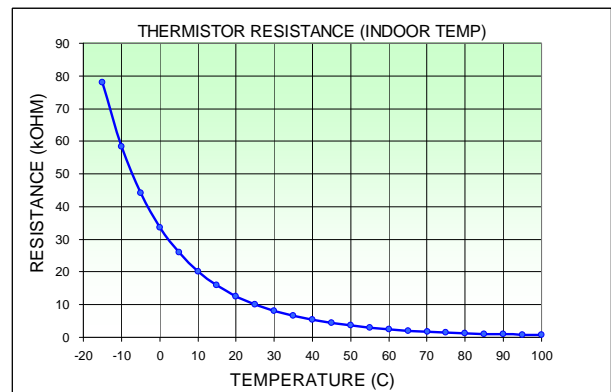
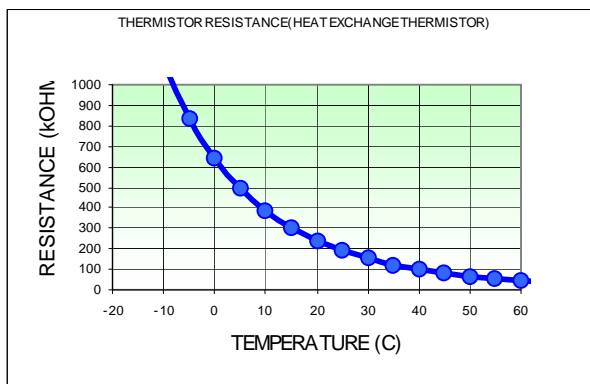


RAC-50DH7 , RAC-60DH7 , RAC-70DH7

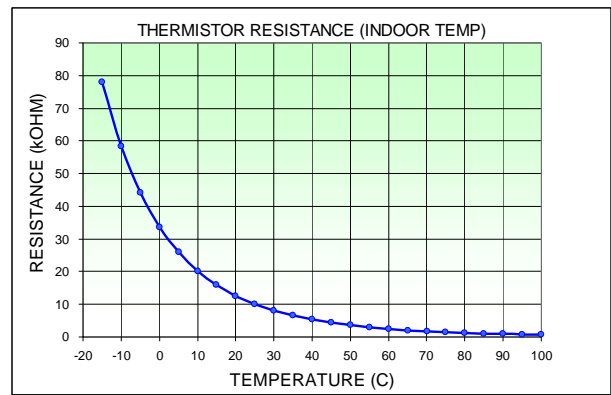
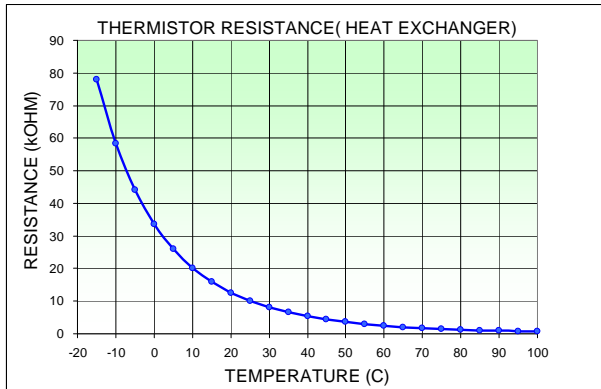


Summit Indoor

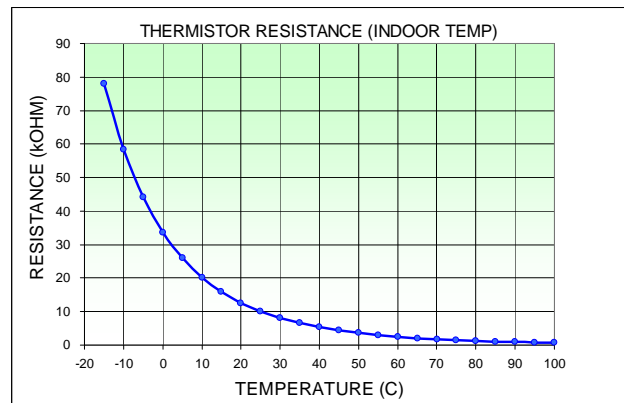
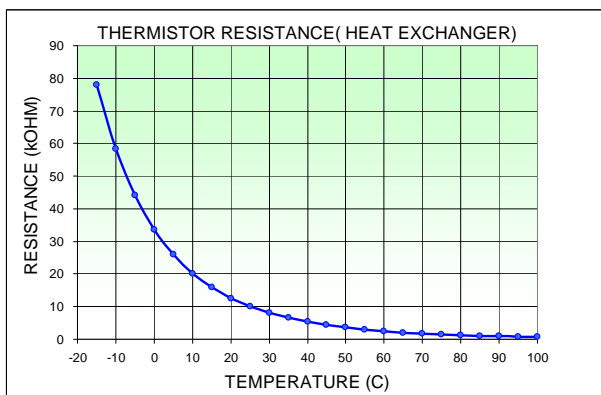
RAS-18YH6 , RAS-25YH6 , RAS-35YH6



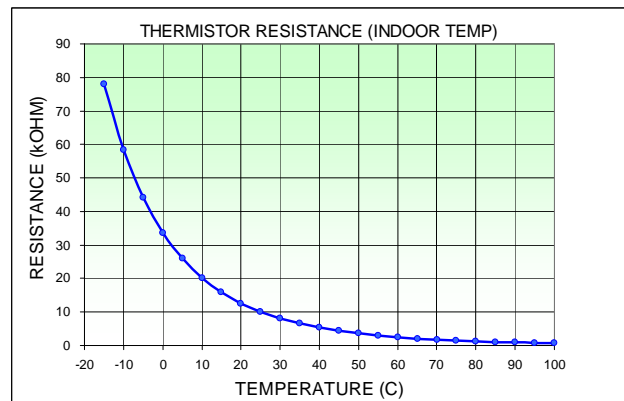
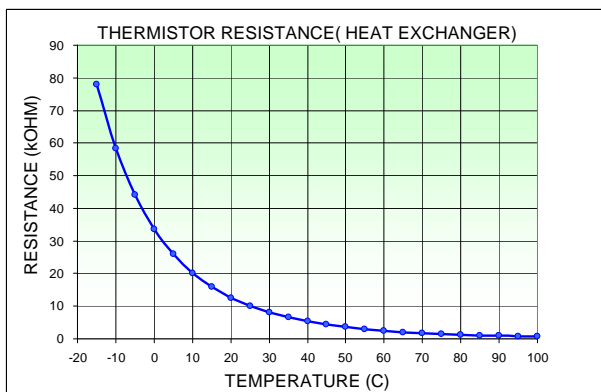
RAS-18FH6 , RAS-25FH6 , RAS-35FH6 , RAS-50FH6 , RAS-25FH5 , RAS-35FH5 , RAS-50YH5 , RAS-60YH5 , RAS-70YH5 , RAS-80YH5 , RAS-25WX8 , RAS-35WX8 , RAS-50WX8



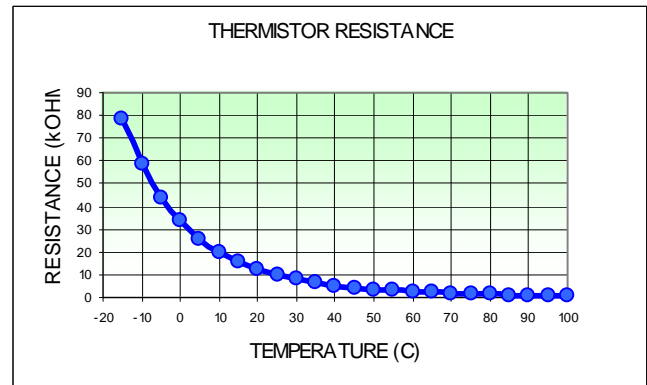
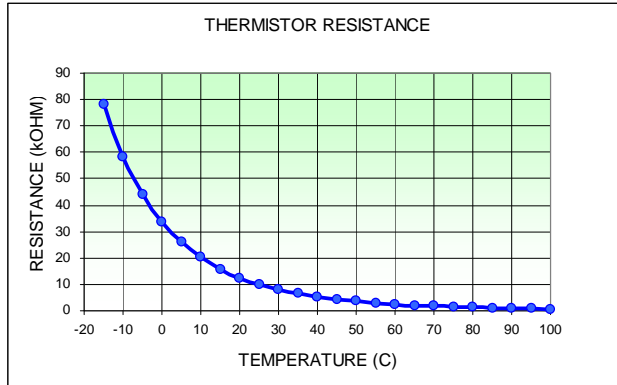
RAD-50DH7A , RAD-60DH7A , RAD-70H7A



RAF-25FX8 , RAF-35FX8 , RAF-50FX8



Bigflow Indoor



LED lighting mode		Troubled thermistor	Judgement	
LD301	LD302		Open	Short
light	1 blink	OH thermistor	0.04V or less	4.96V or more
Light	2 blinks	DEF thermistor	0.04V or less	4.94V or more
Light	3 blinks	Outdoor temperature thermistor		
Light	4 blinks	Electrical expansion valve thermistor (thin pipe 1)		
Light	5 blinks	Electrical expansion valve thermistor (thick pipe 1)		
Light	6 blinks	Electrical expansion valve thermistor (thin pipe 2)	0.04 or less	4.94 or more
Light	7 blinks	Electrical expansion valve thermistor (thick pipe 2)		
Light	8 blinks	Electrical expansion valve thermistor (thin pipe 3)		
Light	9 blinks	Electrical expansion valve thermistor (thick pipe 3)		