

# HITACHI

## SERVICE MANUAL

TECHNICAL INFORMATION

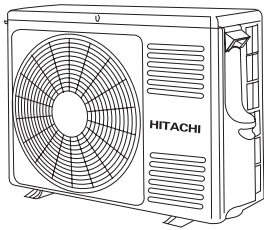
FOR SERVICE PERSONNEL ONLY

JCH-WH

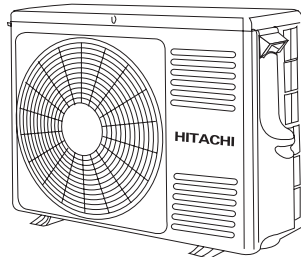
NO.0109E

RAC-18WPD  
RAC-25WPD  
RAC-35WPD  
RAC-42WPD  
RAC-50WPD

### OUTDOOR UNIT



RAC-18WPD  
RAC-25WPD  
RAC-35WPD



RAC-42WPD  
RAC-50WPD

### REFER TO THE FOUNDATION MANUAL

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### SPECIFICATIONS

TYPE		DC INVERTER				
		OUTDOOR UNIT	OUTDOOR UNIT	OUTDOOR UNIT	OUTDOOR UNIT	OUTDOOR UNIT
MODEL		RAC-18WPD	RAC-25WPD	RAC-35WPD	RAC-42WPD	RAC-50WPD
POWER SOURCE		1 PHASE,50Hz,220-230V	1 PHASE,50Hz,220-230V	1 PHASE,50Hz,220-230V	1 PHASE,50Hz,220-230V	1 PHASE,50Hz,220-230V
COOLING	TOTAL INPUT (W)	419 (250~1,010)	549 (250~1,290)	941 (250~1,460)	1,120 (300~1,700)	1,471 (300~2,100)
	TOTAL AMPERES (A)	2.46-2.35	3.08-2.95	4.81-4.60	5.10-4.88	6.69-6.40
	CAPACITY	(KW)	2.00 (0.90~2.5)	2.50 (0.90~3.10)	3.50 (0.90~4.00)	4.20 (1.70~5.00)
(B.T.U./h)		6,820 (3,070~8,530)	8,530 (3,070~10,580)	11,940 (3,070~13,650)	14,330 (5,800~17,060)	17,060 (6,480~17,740)
HEATING	TOTAL INPUT (W)	519 (250~970)	733 (250~1500)	1,000 (250~1,700)	1,317 (500~2,100)	1,558 (500~2,750)
	TOTAL AMPERES (A)	2.93-2.81	3.87-3.71	5.11-4.89	5.99-5.73	7.09-6.78
	CAPACITY	(KW)	2.50 (0.90~3.20)	3.40 (0.90~4.40)	4.20 (0.90~5.00)	5.40 (1.70~6.00)
(B.T.U./h)		8,530 (3,070~10,920)	11,600 (3,070~15,010)	14,330 (3,070~17,060)	18,430 (5,800~20,470)	20,470 (7,510~24,910)
DIMENSIONS (mm)	W	750(+65)*	750(+65)*	750(+65)*	792(+85)*	792(+85)*
	H	548	548	548	600	600
	D	288(+27.5)*	288(+27.5)*	288(+27.5)*	299(+47)*	299(+47)*
NET WEIGHT		32.5	32.5	32.5	39	39

\* After installation

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

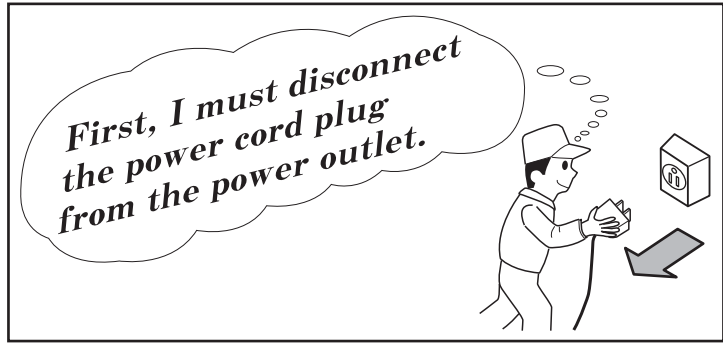
## ROOM AIR CONDITIONER

OUTDOOR UNIT

Johnson Controls-Hitachi Air Conditioning Wuhu Co., Ltd.

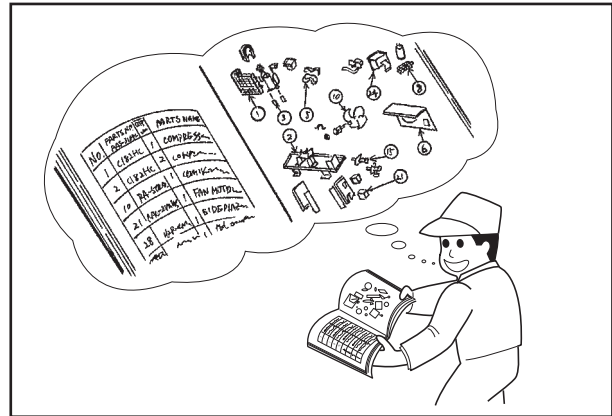
## SAFETY DURING REPAIR WORK

1. In order to disassemble and repair the unit in question, be sure to disconnect the power cord plug from the power outlet before starting the work.



2. If it is necessary to replace any parts, they should be replaced with respective genuine parts for the unit, and the replacement must be effected in correct manner according to the instructions in the Service Manual of the unit.

If the contacts of electrical parts are defective, replace the electrical parts without trying to repair them



3. After completion of repairs, the initial state should be restored.
4. Lead wires should be connected and laid as in the initial state.
5. Modification of the unit by the user himself should absolutely be prohibited.
6. Tools and measuring instruments for use in repairs or inspection should be accurately calibrated in advance.
7. In installing the unit having been repaired, be careful to prevent the occurrence of any accident such as electrical shock, leak of current, or bodily injury due to the drop of any part.
8. To check the insulation of the unit, measure the insulation resistance between the power cord plug and grounding terminal of the unit.  
The insulation resistance should be  $1M\Omega$  or more as measured by a 500V DC megger.
9. The initial location of installation such as window, floor or the other should be checked for being safe enough to support the repaired unit again.  
If it is found not so strong and safe, the unit should be installed at the initial location after reinforced or at a new location.
10. Any inflammable object must not be placed about the location of installation.
11. Check the grounding to see whether it is proper or not, and if it is found improper, connect the grounding terminal to the earth.





# WORKING STANDARDS FOR PREVENTING BREAKAGE OF SEMICONDUCTORS

## 1. Scope

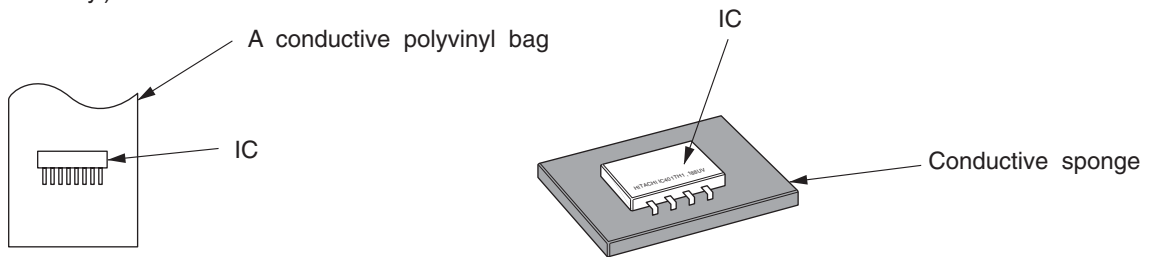
The standards provide for items to be generally observed in carrying and handling semiconductors in relative manufactures during maintenance and handling thereof. (They apply the same to handling of abnormal goods such as rejected goods being returned.)

## 2. Object parts

- (1) Microcomputer
- (2) Integrated circuits (I.C.)
- (3) Field effective transistor (F.E.T.)
- (4) P.C. boards or the like to which the parts mentioned in (1) and (2) of this paragraph are equipped.

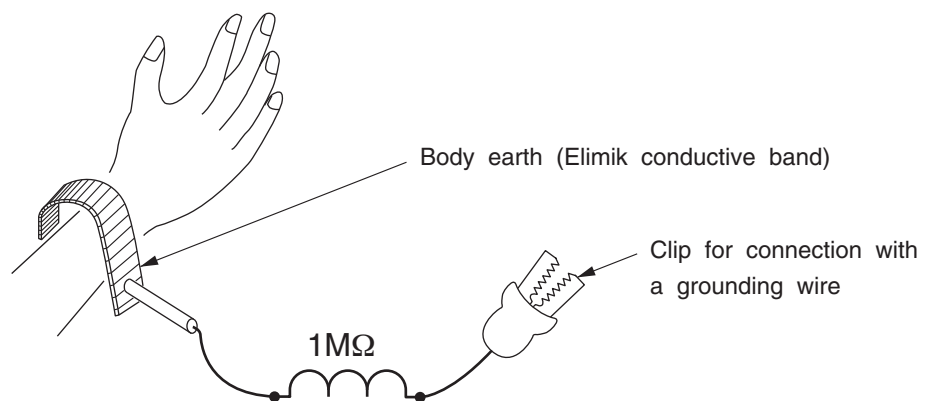
## 3. Items to be observed in handling

- (1) Use a conductive container for carrying and storing of parts. (Even rejected goods should be handled in the same way.)



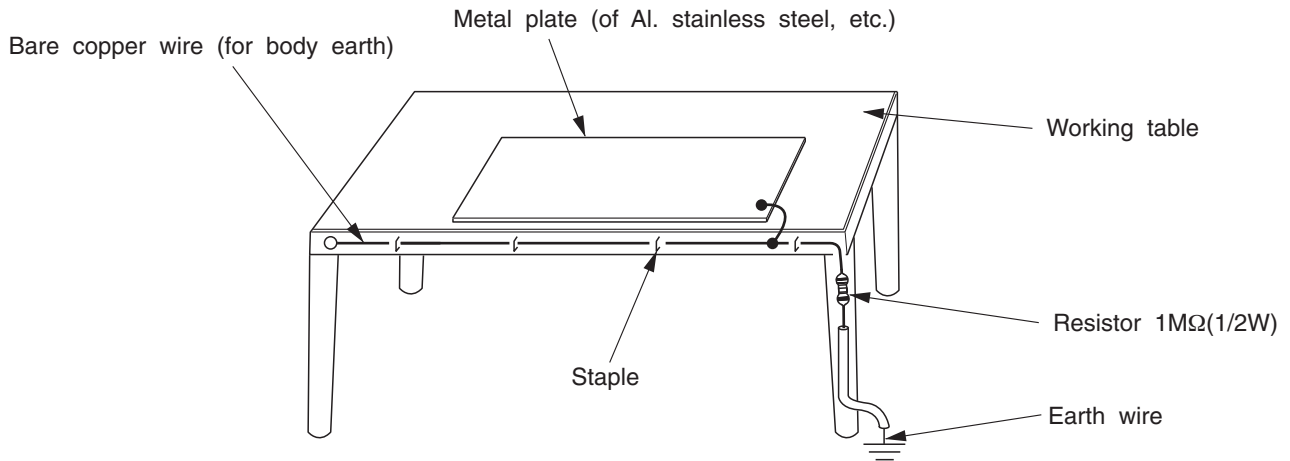
**Fig. 1 Conductive container**

- (2) When any part is handled uncovered (in counting, packing and the like), the handling person must always use himself as a body earth. (Make yourself a body earth by passing one M ohm earth resistance through a ring or bracelet.)
- (3) Be careful not to touch the parts with your clothing when you hold a part even if a body earth is being taken.
- (4) Be sure to place a part on a metal plate with grounding.
- (5) Be careful not to fail to turn off power when you repair the printed circuit board. At the same time, try to repair the printed circuit board on a grounded metal plate.

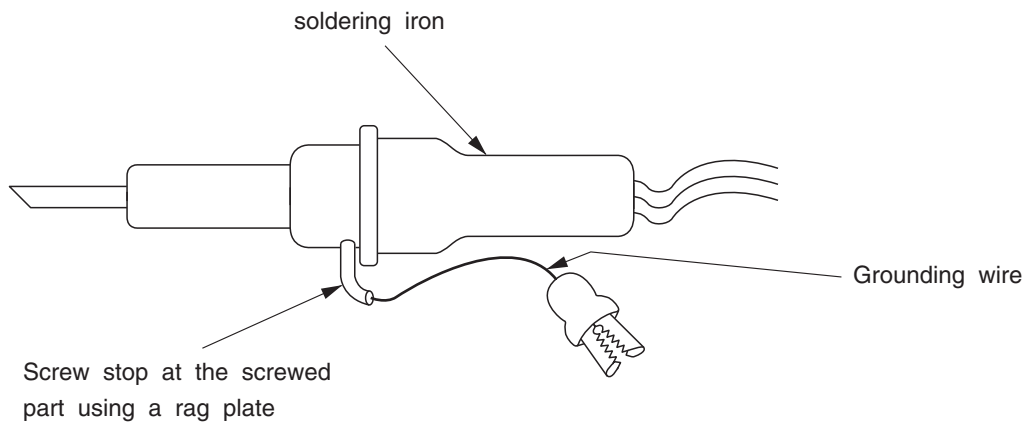


**Fig. 2 Body earth**

(6) Use a three wire type soldering iron including a grounding wire.



**Fig.3 Grounding of the working table**



**Fig.4 Grounding a solder iron**

Use a high insulation mode (100V, 10MΩ or higher) when ordinary iron is to be used.

(7) In checking circuits for maintenance, inspection, or some others, be careful not to have the test probes of the measuring instrument short circuit a load circuit or the like.

 **CAUTION**

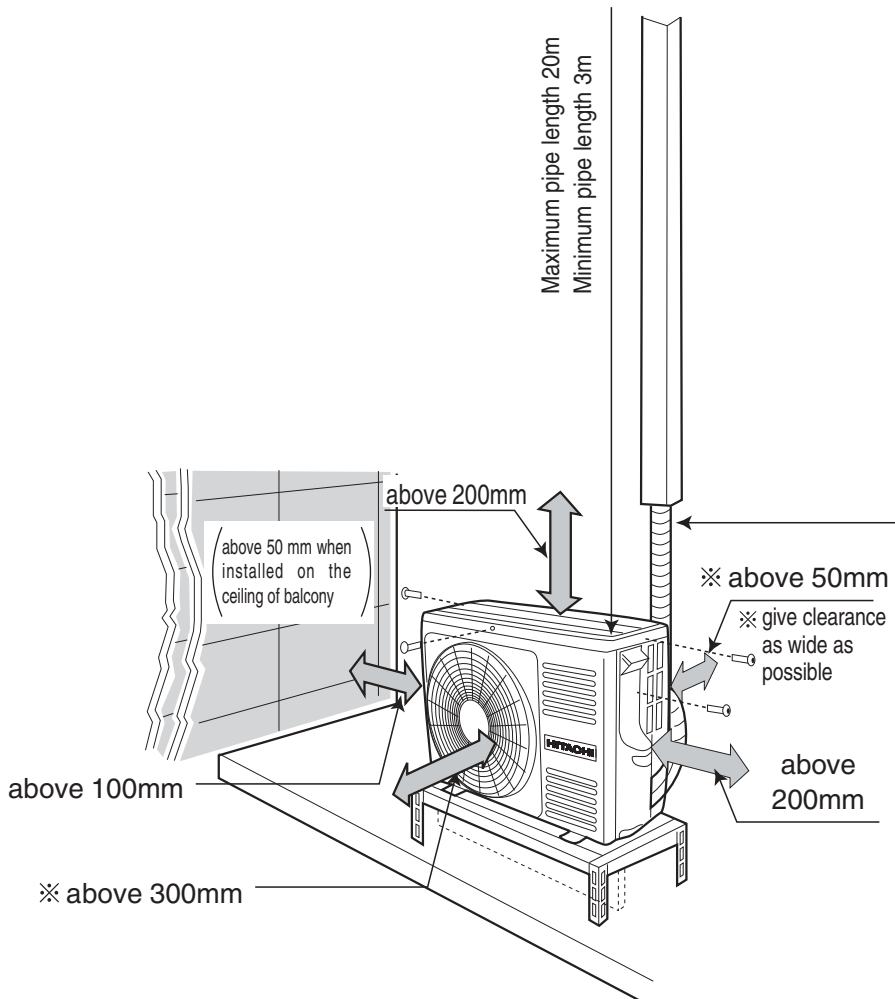
1. In quiet or stop operation, slight flowing noise of refrigerant in the refrigerating cycle is heard occasionally, but this noise is not abnormal for the operation.
2. When it thunders near by, it is recommend to stop the operation and turn off the circuit breaker for safety.
3. In the event of power failure,the room air conditioner will restare automatically in the previously selected mode once the power is restored. In the event of power failure during TIMER operation, the room air comditioner will not start automatically. Re-press ON/OFF button after 3 minutes from when the unit off or power recovery.
4. If the room air conditioner is stopped by adjusting thermostat, or missoperation, and re-start in a moment, there is occasion that the cooling and heating operation does not start for 3 minutes, it is not abnormal and this is the result of the operation of IC delay circuit. This IC delay circuit ensures that there is no danger of blowing fuse or damaging parts even if operation is restarted accidentally.
5. This room air conditioner should not be used at the cooling operation when the outside temperature is below  $-10^{\circ}\text{C}$  ( $14^{\circ}\text{F}$ ).
6. This room air conditioner (the reverse cycle) should not be used when the outside temperature is below  $-15^{\circ}\text{C}$  ( $5^{\circ}\text{F}$ ).  
If the reverse cycle is used under this condition, the outside heat exchanger is frosted and efficiency falls.
7. When the outside heat exchanger is frosted, the frost is melted by operating the hot gas system, it is not trouble that at this time fan stops and the vapour may rise from the outside heat exchanger.

## SPECIFICATIONS

MODEL		RAC-18/25/35WPD	RAC-42/50WPD
FAN MOTOR		47W (DC120~380V)	
FAN MOTOR CAPACITOR		NO	
FAN MOTOR PROTECTOR		NO	
COMPRESSOR		GSD088SKQA6JK6	GTD130UKQA8JT6
COMPRESSOR MOTOR CAPACITOR		NO	
OVERLOAD PROTECTOR		YES(INTERNAL)	
OVERHEAT PROTECTOR		YES	
FUSE (for MICROPROCESSOR)		15A, 2A, 3A, 3.15A	25A, 2A, 3A, 3.15A
POWER RELAY		HF161F	
POWER SWITCH		NO	
TEMPORARY SWITCH		NO	
SERVICE SWITCH		YES	
TRANSFORMER		YES	
VARISTOR		TVR10471,ERZVA9V431	
NOISE SUPPRESSOR		YES	
THERMOSTAT		YES(IC)	
REMOTE CONTROL SWITCH (LIQUID CRYSTAL)		NO	
REFRIGERANT CHARGING VOLUME (Refrigerant R32)	UNIT	870g	1050g
	PIPES (MAX. 20m) (MIN. 3m)	WITHOUT REFRIGERANT BECAUSE COUPLING IS FLARE TYPE.	

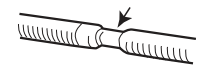
Figure showing the installation of Outdoor unit

MODEL RAC-18WPD  
 RAC-25WPD  
 RAC-35WPD



- The refrigerating machine oil is easily affected by moisture. Use caution to prevent water from entering the cycle.
- The difference in height between the indoor and outdoor unit should be kept below 10m.
- The connecting pipe, no matter big or small, should all be insulated with insulation pipe and then wrapped with vinyl tape. (The insulator will deteriorate if it is not wrapped with tape).

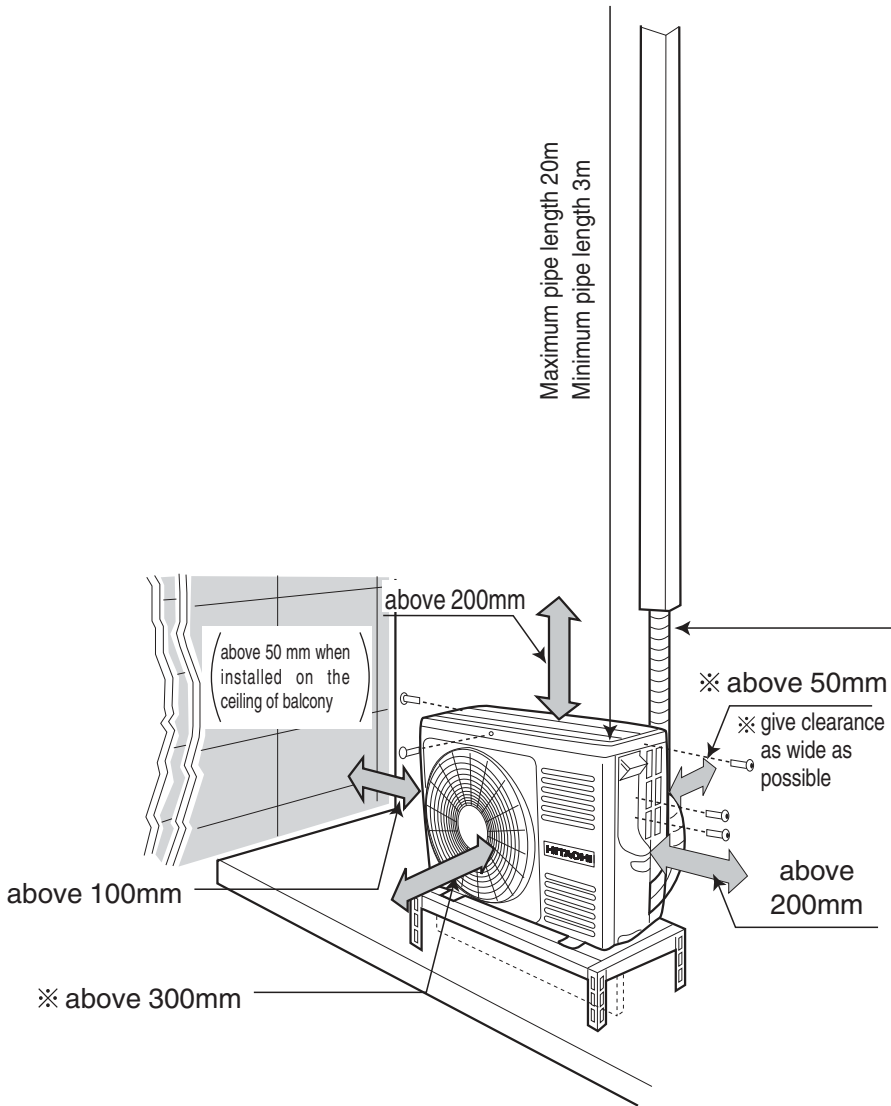
The connection of insulated drain hose.  
 Inner diameter 16mm



Please use insulated drain hose for the indoor piping (commercial product)


Figure showing the installation of Outdoor unit

MODEL RAC-42WPD  
RAC-50WPD



- The refrigerating machine oil is easily affected by moisture. Use caution to prevent water from entering the cycle.
- The difference in height between the indoor and outdoor unit should be kept below 10m.
- The connecting pipe, no matter big or small, should all be insulated with insulation pipe and then wrapped with vinyl tape. (The insulator will deteriorate if it is not wrapped with tape).

The connection of insulated drain hose.  
Inner diameter 16mm

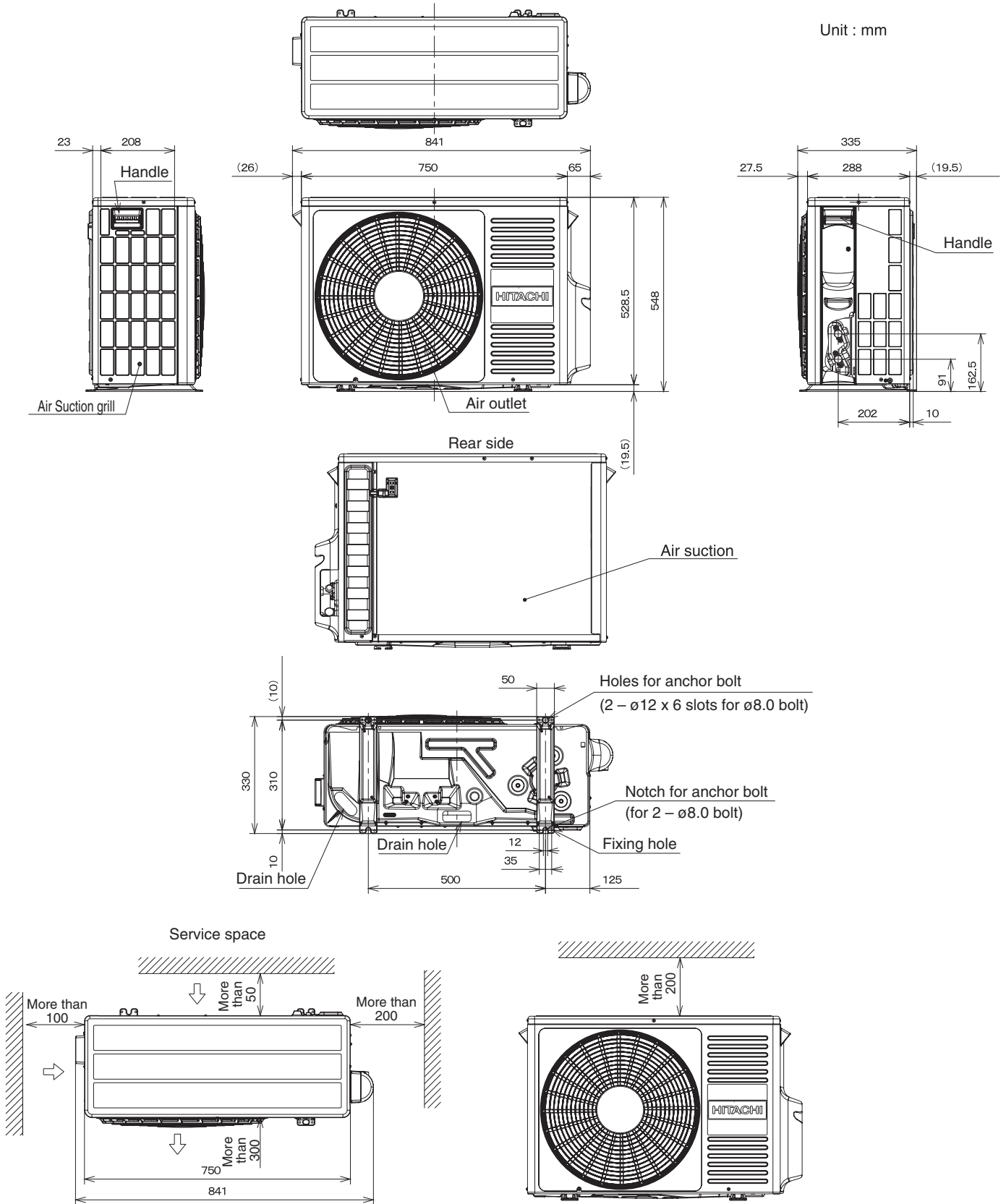


Please use insulated drain hose for the indoor piping (commercial product)

# CONSTRUCTION AND DIMENSIONAL DIAGRAM

MODEL RAC-18/25/35WPD  
OUTDOOR UNIT

Unit : mm



## NOTE:

1. For outdoor unit installation, allow at least 2 sides of space around the unit ensure ventilation flue.
2. The connecting pipe, should all the insulated with insulation pipe.
3. Piping length is within 20m.
4. Height different of the piping between the indoor unit and outdoor unit should be within 10m.

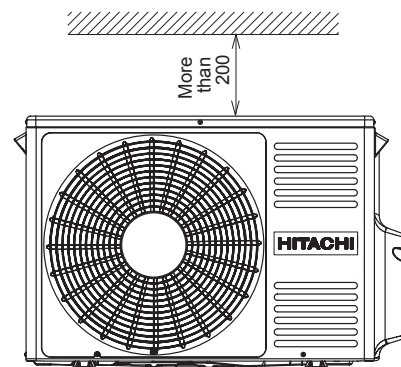
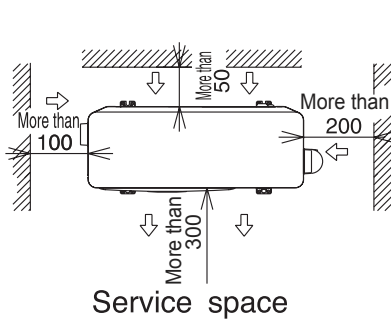
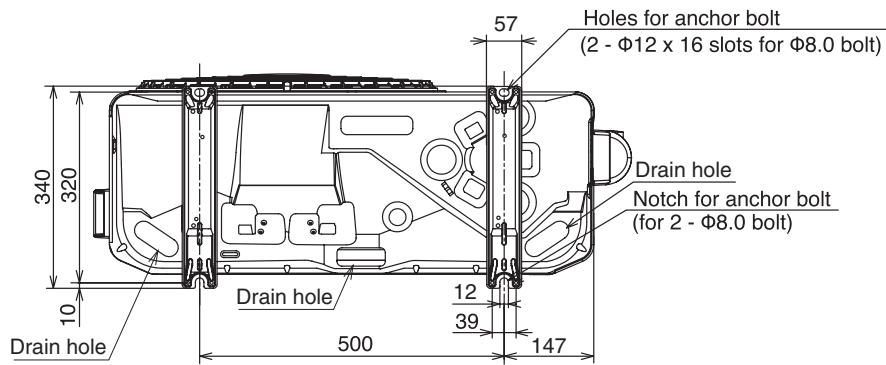
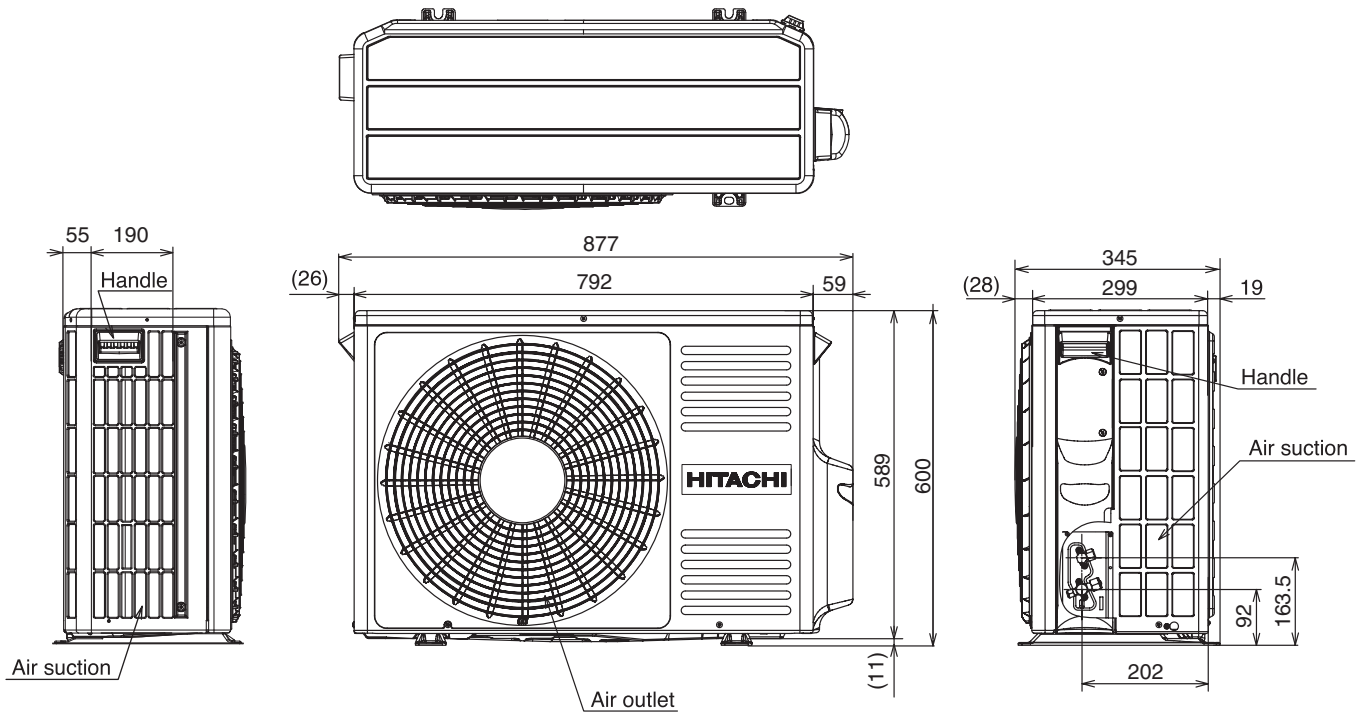


# CONSTRUCTION AND DIMENSIONAL DIAGRAM

MODEL RAC-42/50WPD

OUTDOOR UNIT

Unit : mm



## NOTE:

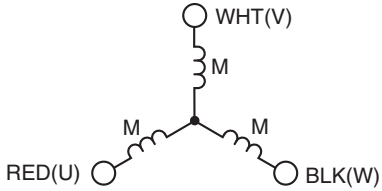
1. For outdoor unit installation, allow at least 2 sides of space around the unit ensure ventilation flue.
2. The connecting pipe, should all the insulated with insulation pipe.
3. Piping length is within 20m.
4. Height different of the piping between the indoor unit and outdoor unit should be within 10m.

## MAIN PARTS COMPONENT

THERMOSTAT (Room temperature Thermistor)

## FAN MOTOR

Fan Motor Specifications

MODEL	RAC-18/25/35/42/50WPD
POWER SOURCE	DC : 120 - 380V
OUTPUT	47W
CONNECTION	

BLU : BLUE  
 GRY : GRAY  
 BLK : BLACK

YEL : YELLOW  
 ORN : ORANGE  
 PNK : PINK

BRN : BROWN  
 GRN : GREEN  
 VIO : VIOLET

WHT : WHITE  
 RED : RED

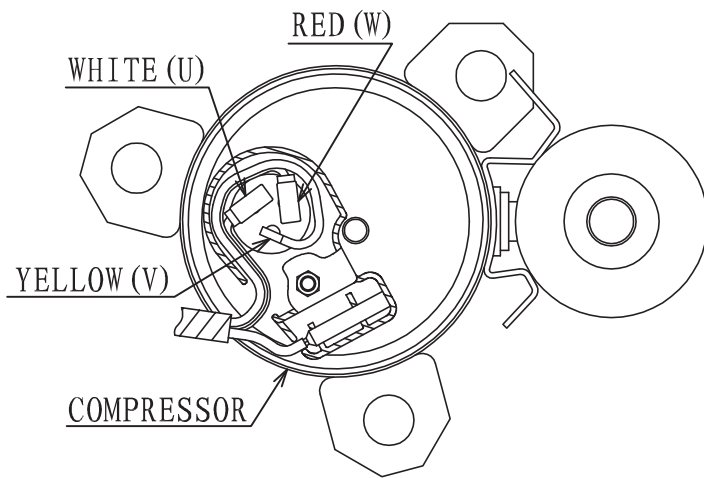
## MAIN ELECTRIC COMPONENTS FOR OUTDOOR UNIT

PARTS NAME	RESISTANCE VALUE( $\Omega$ )	APPLICABLE MODELS
COIL(REVERSING VALVE)	2780 $\Omega$ ( 0 ) $^{\circ}$ C	RAC-18/25/35/42/50WPD
COIL(EXPANSION VALVE)	46 $\Omega$ /PHASE ( AT 20 $^{\circ}$ C )	RAC-18/25/35/42/50WPD
REACTOR	15 (mH) 226 m $\Omega$ MAX (20 $^{\circ}$ C)	RAC-18/25/35WPD
	5.3 (mH) 67 m $\Omega$ MAX (20 $^{\circ}$ C)	RAC-42/50WPD

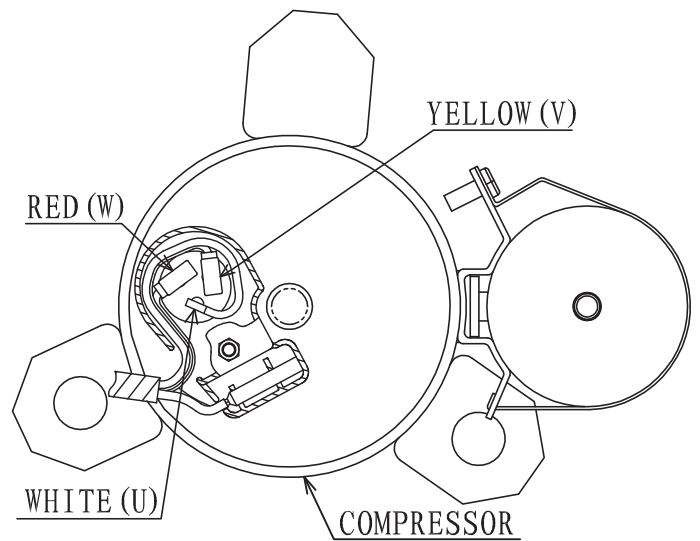
# COMPRESSOR MOTOR

## Compressor Motor Specifications

MODEL		RAC-18/25/35WPD	RAC-42/50WPD
COMPRESSOR TYPE		GSD088SKQA6JK6	GTD130UKQA8JT6
POWER SOURCE		220 - 350 V	220 - 350 V
OUTPUT		840W	1350W
CONNECTION			
RESISTANCE VALUE ( $\Omega$ )	20°C	2M= 2.167	2M= 1.354
	75°C	—	—



RAC-18/25/35WPD



RAC-42/50WPD

### ⚠ CAUTION

When the refrigerating cycle has been operated for a long time with the capillary tubes clogged or crushed or with too little refrigerant, check the color of the refrigerating machine oil inside the compressor. If the color has been changed conspicuously, replace the compressor.

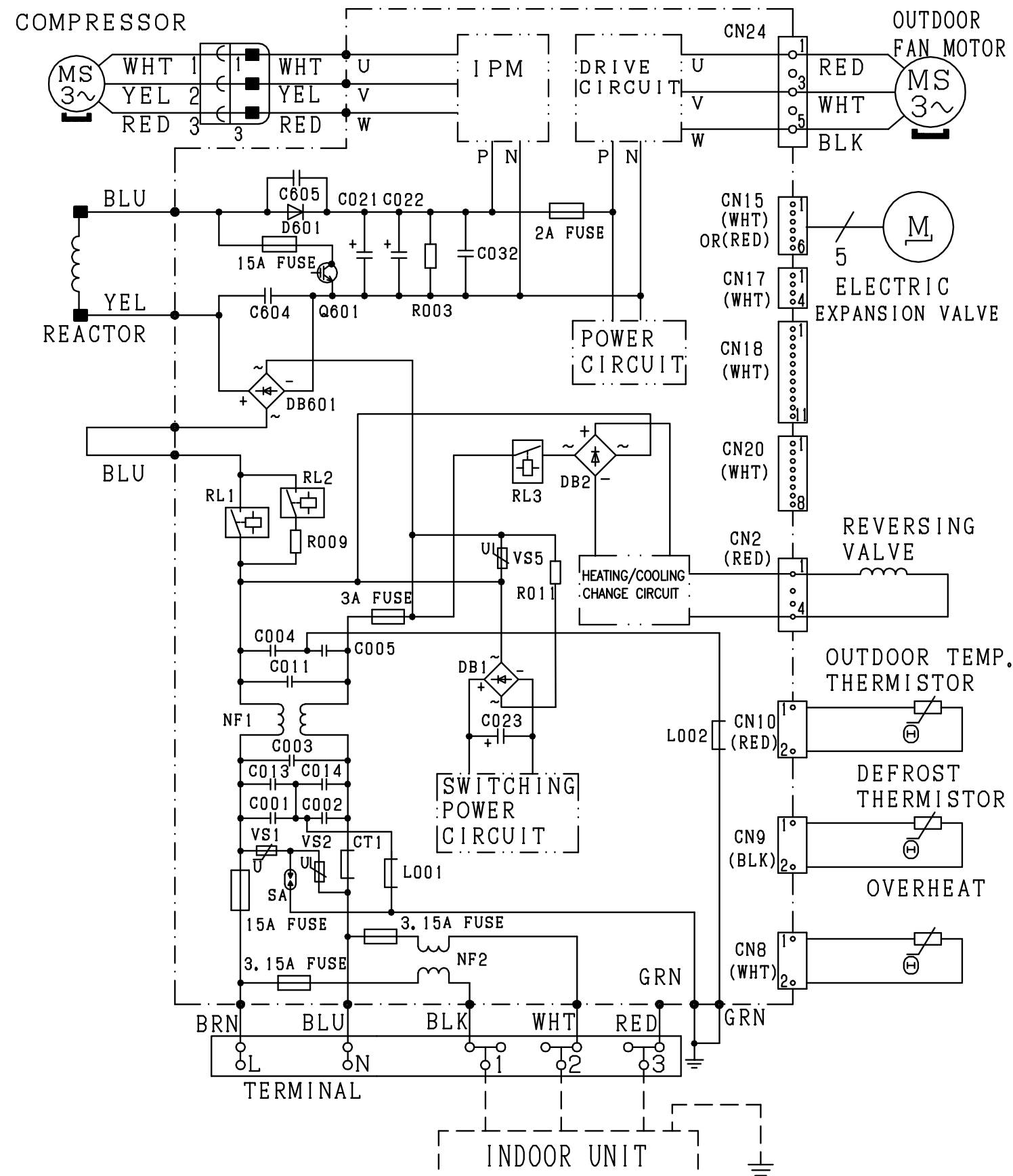
WIRING DIAGRAM

OUTDOOR UNIT

MODEL RAC-18/25/35WPD

WIRING DIAGRAM

BLU:BLUE RED:RED  
 BLK:BLACK WHT:WHITE  
 BRN:BROWN YEL:YELLOW  
 GRN:GREEN GRY:GRAY

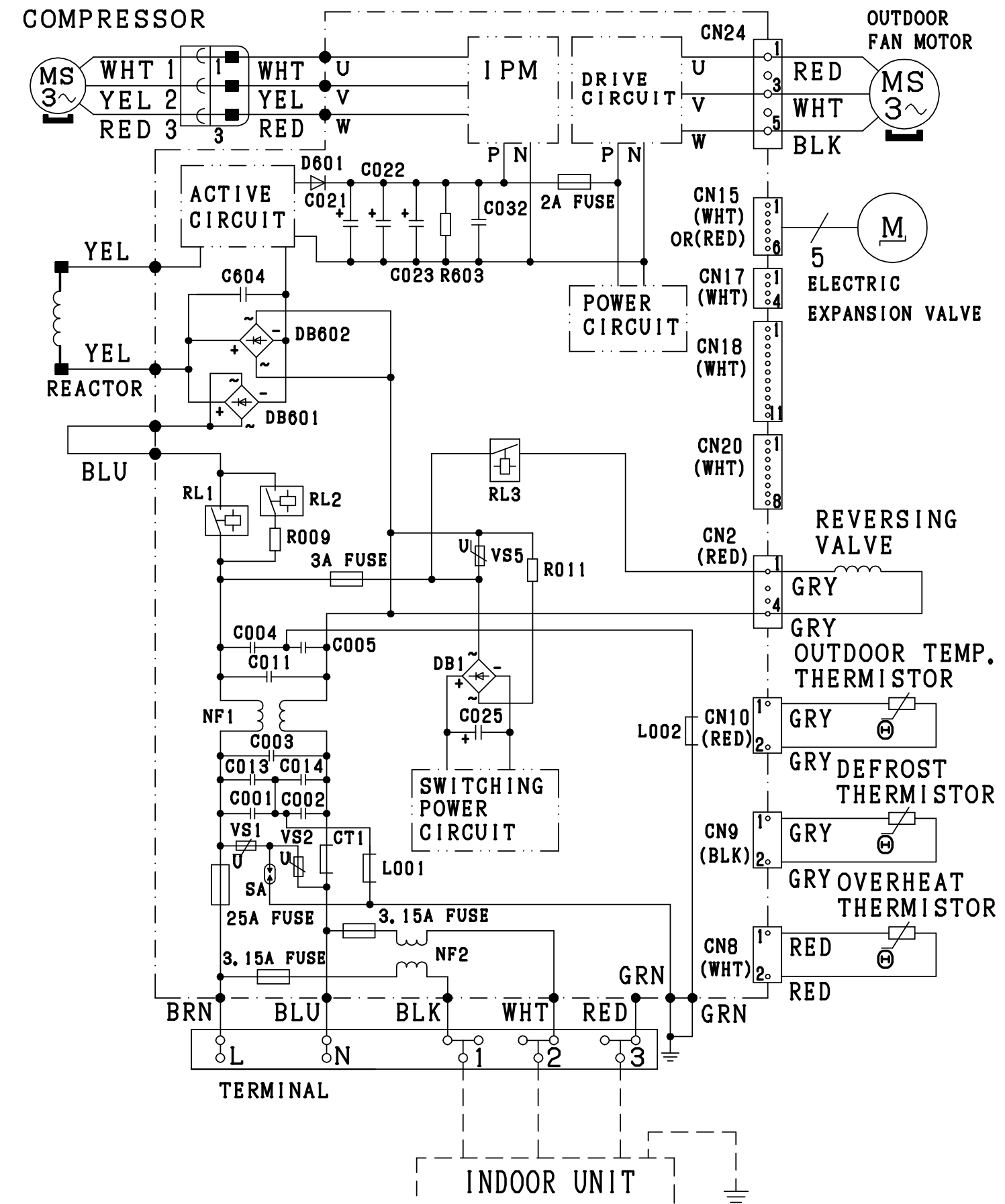


OUTDOOR UNIT

MODEL RAC-42/50WPD

WIRING DIAGRAM

BLU:BLUE RED:RED  
 BLK:BLACK WHT:WHITE  
 BRN:BROWN YEL:YELLOW  
 GRN:GREEN GRY:GRAY

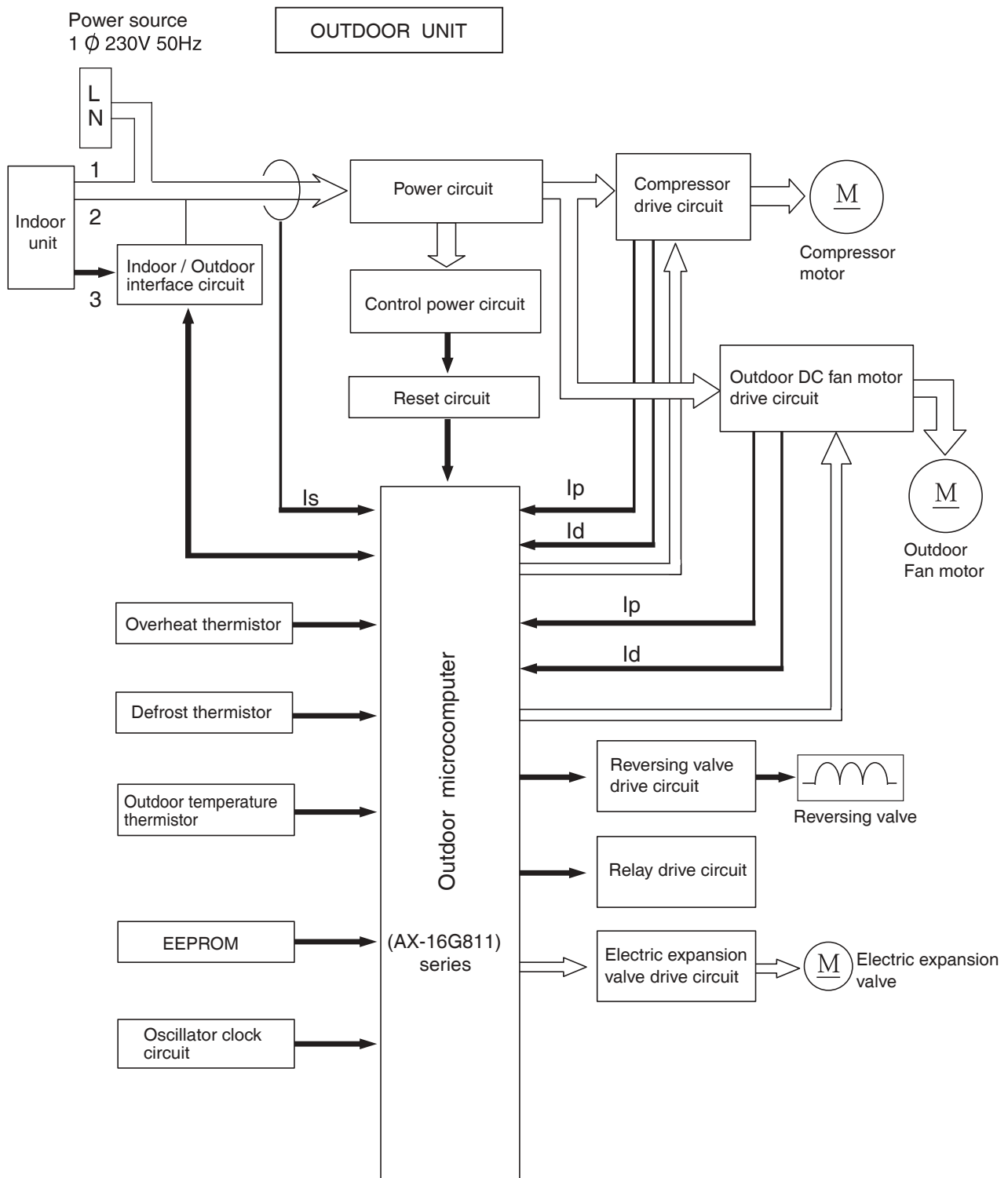








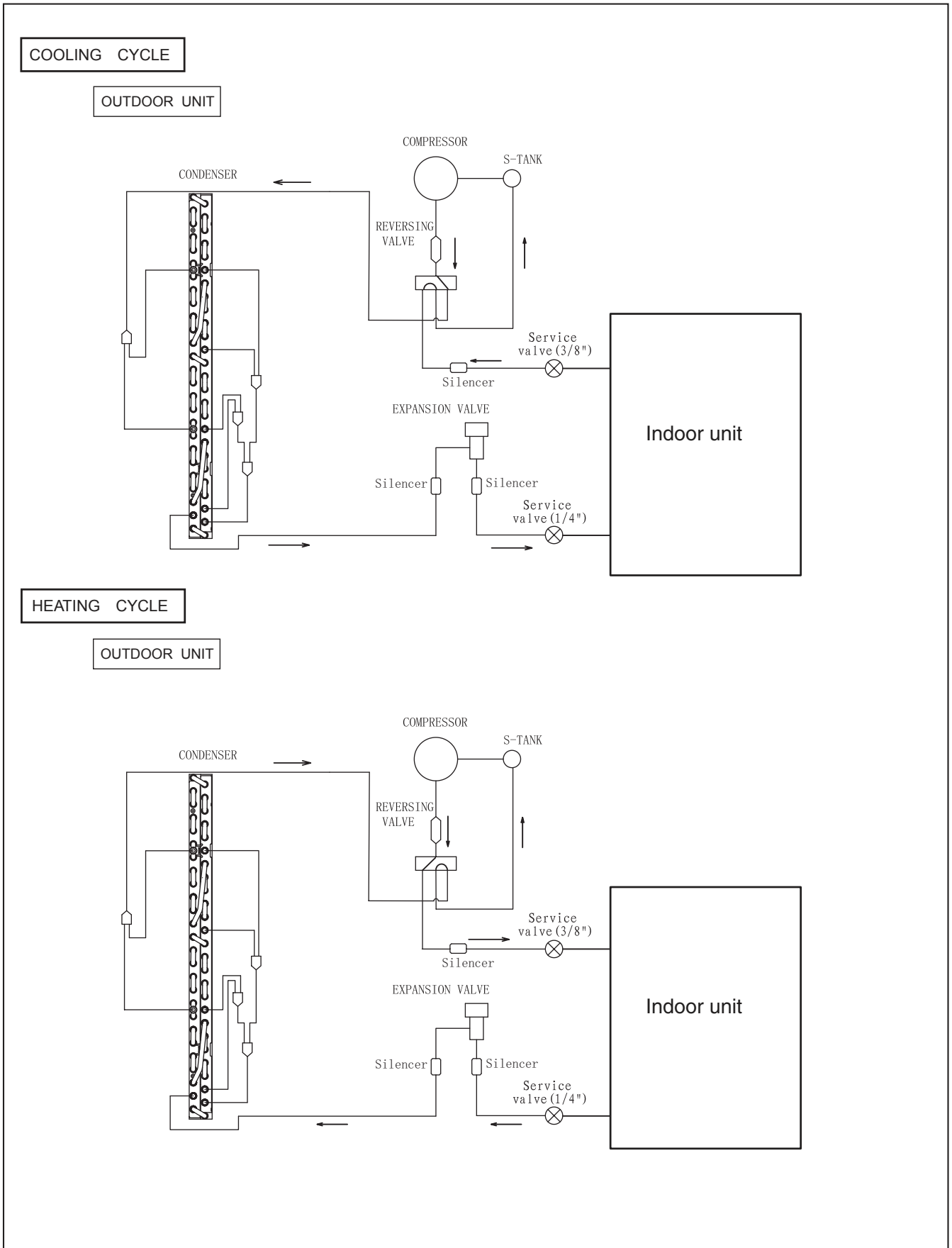






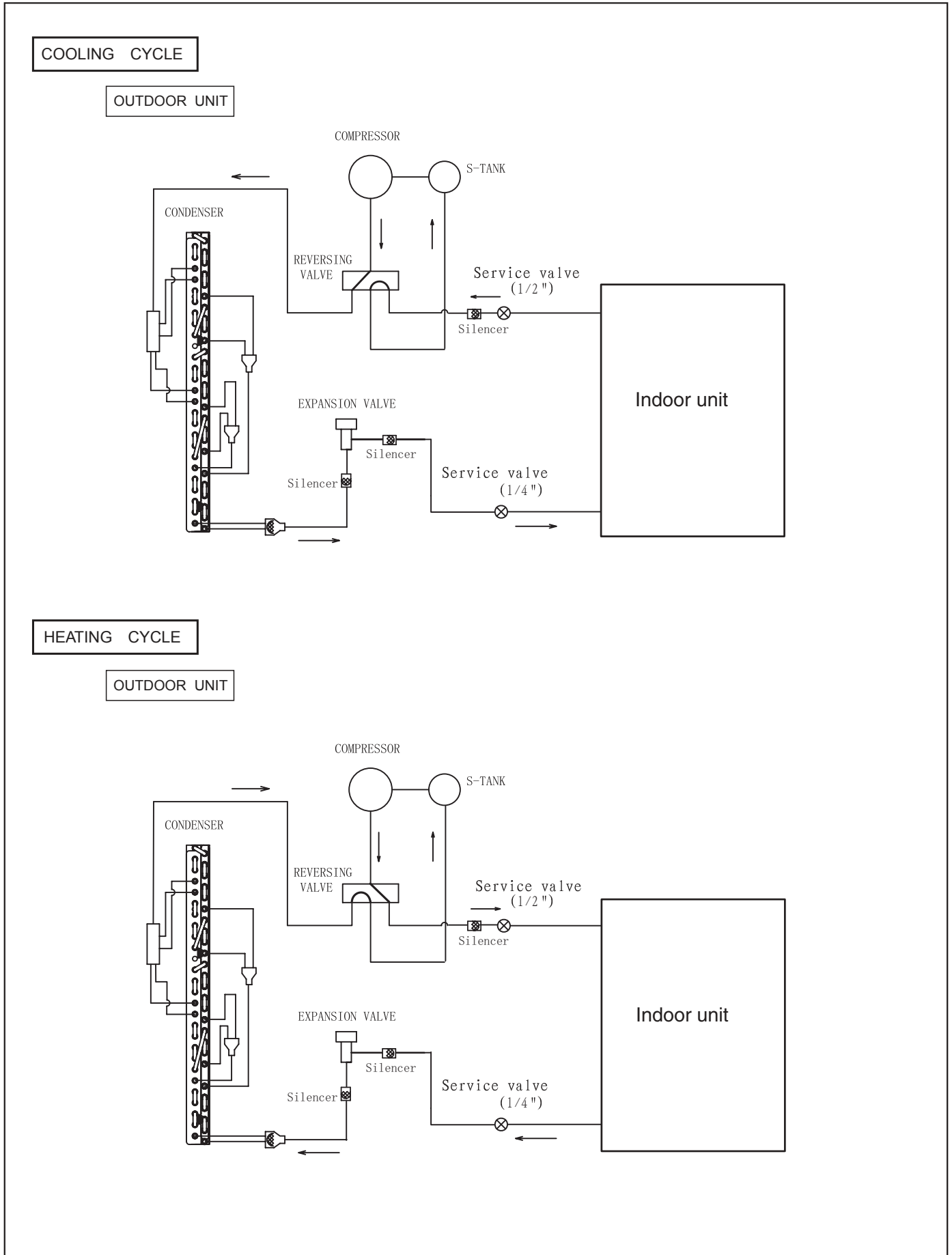
# REFRIGERATING CYCLE DIAGRAM

MODEL RAC-18/25/35WPD



# REFRIGERATING CYCLE DIAGRAM

MODEL RAC-42/50WPD



# Procedure for Disassembly and Reassembly

## OUTDOOR UNIT MODEL RAC-18/25/35WPD

### 1. Electrical parts

- (1) Remove the service value cover lock screws and lower the cover to remove it.
- (2) Remove the top cover lock screw and raise the cover to remove it.

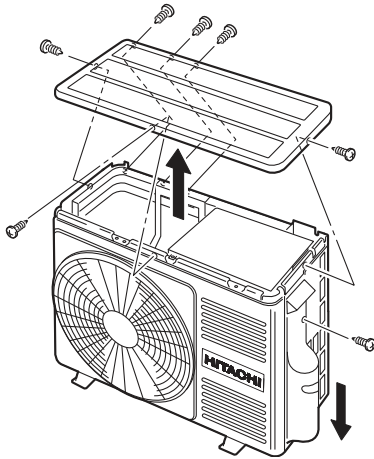


Fig. 1

- (3) Remove the electrical box lock screw.
- (4) Remove the terminal cover lock screw.

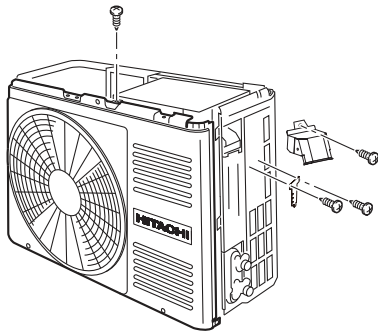


Fig. 2

- (5) Remove each connector and earth cable from the lead wire. Then, remove the electrical box.

## OUTDOOR UNIT MODEL RAC-42/50WPD

### 1. Electrical parts

- (1) Remove the service value cover lock screws and lower the cover to remove it.
- (2) Remove the top cover lock screw and raise the cover to remove it.

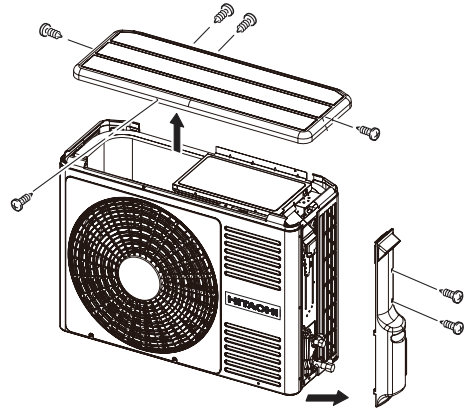


Fig. 3

- (3) Remove the electrical box lock screw.
- (4) Remove the terminal cover lock screw.

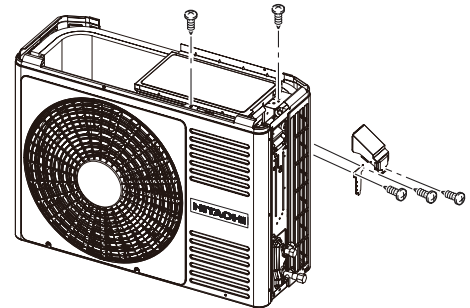


Fig. 4

- (5) Remove each connector and earth cable from the lead wire. Then, remove the electrical box.

# DESCRIPTION OF MAIN CIRCUIT OPERATION

## MODEL RAC-18/25/35WPD

### 1. Power Circuit

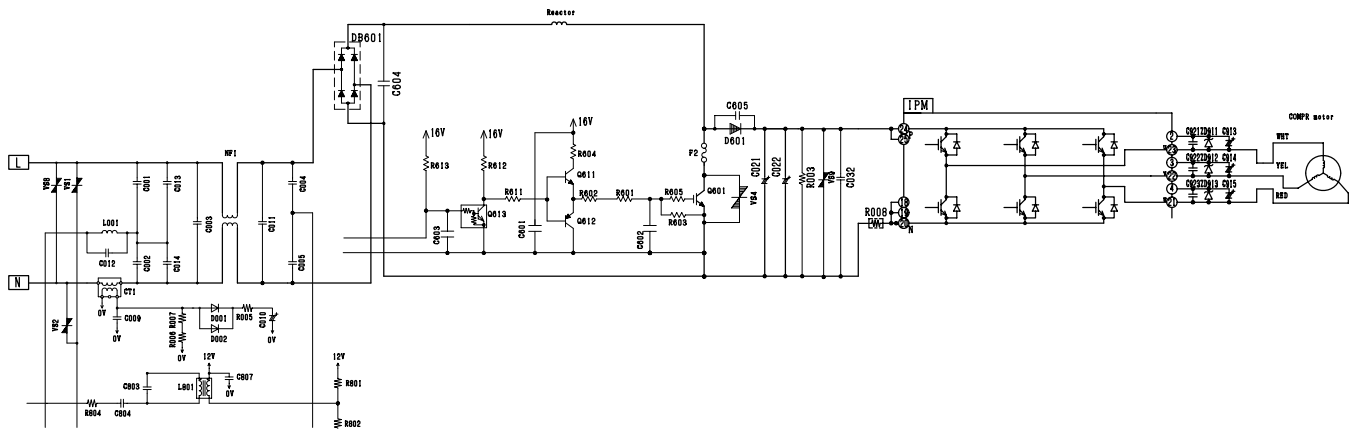


Fig 1-1

※ This circuit full-wave rectifies 230VAC applied between terminals L and N and boosts it to a required voltage with the IPM to create a DC voltage.

The voltage become 300-330V when the compressor is operated.

※ Main parts

- (1) Intelligence Power Module (IPM)  
A module that constitute by an inverter part.
- (2) Diode Stack (DB601)  
These rectify the 230VAC from terminal L and N to a DC power supply.
- (3) Smoothing capacitors (C021-C022, 375 $\mu$ F ,420V)
- (4) IGBT to improve efficiency (Q601)

<Reference>

※ In case of Intelligence Power Module malfunction or connection failure immediately after compressor starts, its may stop due to error of [abnormal low speed], [switching failure],[Ip stop] and others.

<Reference>

※ If diode stack (DB601) are faulty, DC voltage may not be generated and the compressor may not operate at all. Also be aware that the 15A fuse might have blown.

※ This smoothes (averages) the voltage rectified by the diode stack.

※ It will improve the efficiency during compressor load become heavy when current flow thru the chopper period of Q601.

## 2. Power circuit (Low voltage)

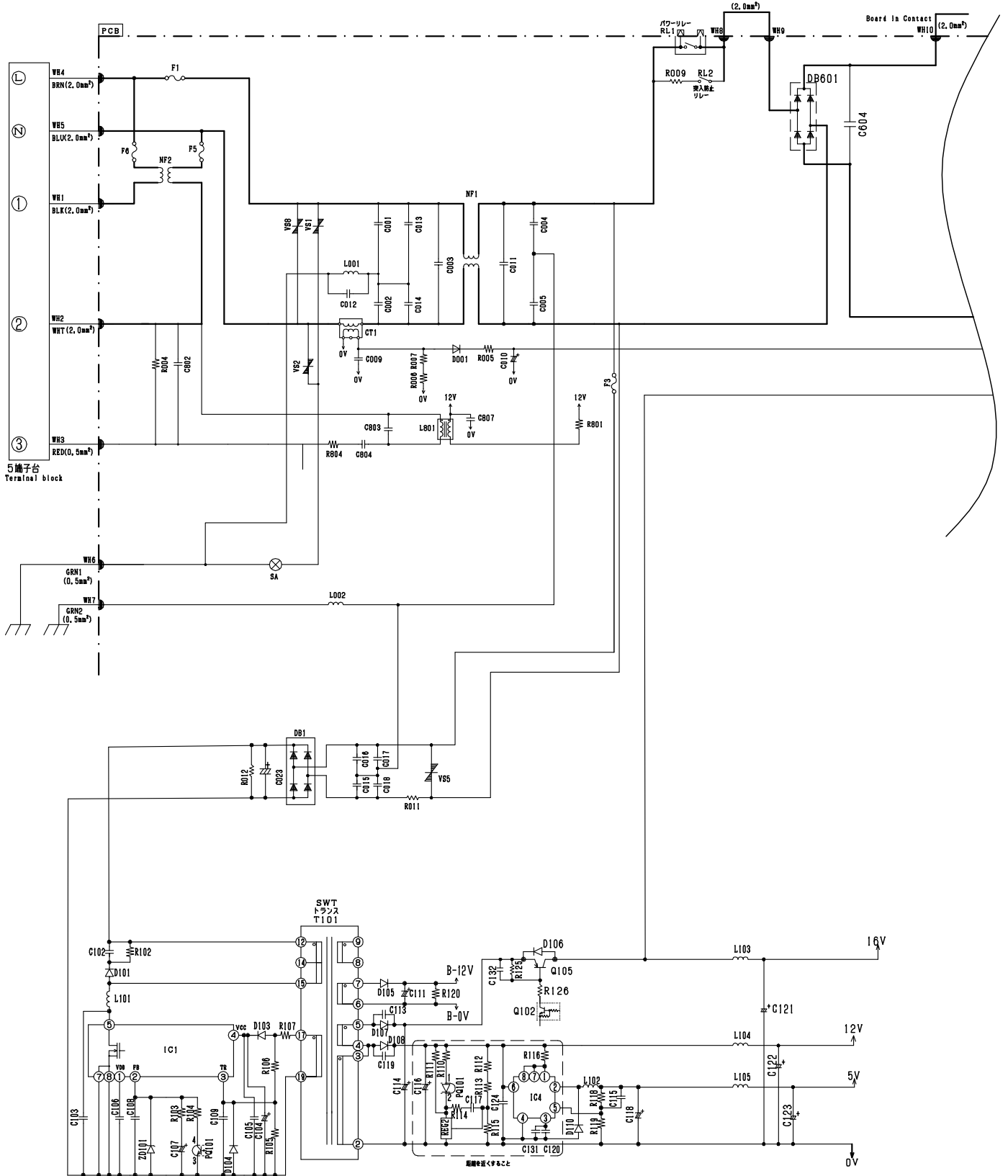


Fig. 2-1

- The 230V AC voltage is rectified to DC voltage (B-12V,16V,12V,5V) pass through switching control IC (IC1), switching transformer.
  - (1) B-12V Power supply for electrical expansion valve.
  - (2) 16V Power supply for IPM driver circuit of compressor and fan motor, IGBT action.
  - (3) 12V Power supply for 4 way valve relay, power relay, inrush current relay, motor current amplification,
  - (4) 5V Power supply for microcomputer, peripheral circuits.

## Main parts

- (1) C001,C002,C003,C004,C005,C011,C013,C014, NF1

These absorb electrical noise generated during operation of compressor and also absorb external noise entering from power line to protect electronic parts.

- (2) Surge Absorber, Varistor1,2,5,8.

These absorb external power surge.

- (2) IC4

DC/DC convertor IC (DC12V → DC5V).

### 3. P.W.B. for power circuit

Voltage specification of power circuit as shown in below table.

<Checking point>

Output	Spec	Main load	Measuring point	Example of possible failure mode.
5V O/P	$5 \pm 0.4V$	Micon, Thermistor	Tester $\oplus$ : L105 (JUMPER) Tester $\ominus$ : D110 (EARTH)	Outdoor not operate, no blinking indication
12V O/P	$12 \pm 0.5V$	Micon, IC2, 3, 4 Relay circuit	Tester $\oplus$ : L104 (JUMPER) Tester $\ominus$ : D110 (EARTH)	Outdoor not operate, no blinking indication
16V O/P	$15.5^{+1.5V}_{-1.0V}$	IPM for Comp IPM for DC fan	Tester $\oplus$ : L103 (JUMPER) Tester $\ominus$ : D110 (EARTH)	Stop : LD301 3, 4 or 12 times blinking
B-12V O/P	$13^{+2.5V}_{-1.0V}$	Expansion valve	Tester $\oplus$ : R120 (B-12V) Tester $\ominus$ : R120 (B-0V)	Stop : LD301 5 times blinking

※ Power circuit for P.W.B. can consider normal if the result is satisfied with above specification.

#### 4. Reversing valve (4-way valve) control circuit

- This model is equipped with a reversing valve (4-way Valve).
- The reversing valve (4-way Valve) "slides" the valve in the specified direction for each operating mode and switches the route of refrigerant and holds the route with a built-in permanent magnet.
- According to an operation command from the indoor unit microcomputer, the reversing valve (4-way Valve) control circuit applies current to the reversing valve (4-way Valve) coil in the specified direction, for each operating mode and slides the valve.
- Just before the compressor starts operation, the current is applied twice at the interval of 1 sec as shown in Fig. 4-1.
- During forced cooling operation, just after the forced cooling switch turns on, the current is applied twice at the interval of 1 sec as shown in Fig. 4-1.
- When the operation stops, the position of the valve before the stop is held.

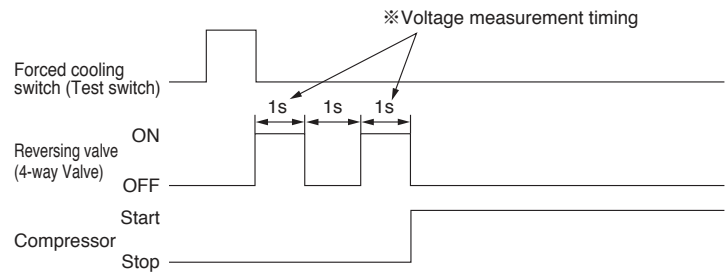


Fig. 4-1

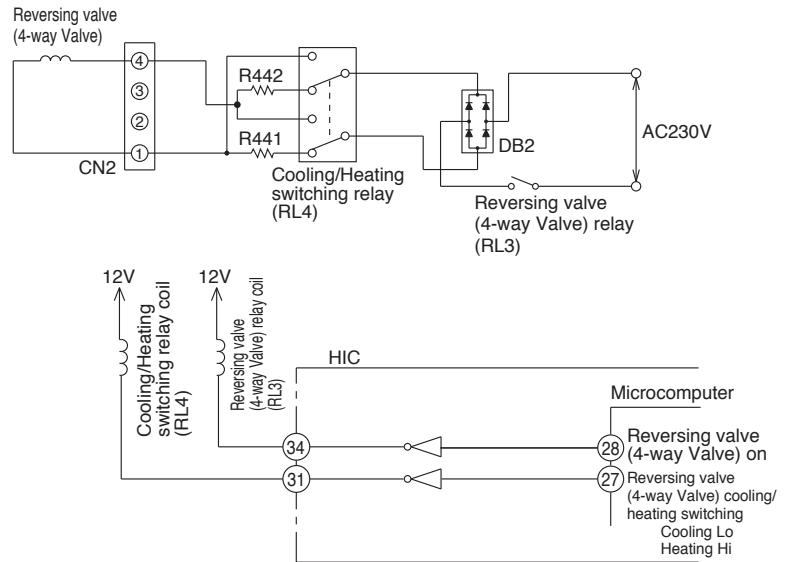


Fig. 4-2

- Before checking the application of current to the reversing valve (4-way Valve), disconnect the connector (CN2) and measure the resistance of both ends of the connector, to see if it is  $[2500\Omega \pm 10\%]$ . Only when the resistance is normal, check the application of current using the following procedures.  
If the resistance is abnormal, it is caused by either; breakage of a lead wire, or failure of the reversing valve (4-way Valve).
- The voltage, when measured by a tester during the application of current to the reversing valve (4-way Valve) (when the voltage is measured)  
  - ※ Switches the indoor unit to the "Ion Mist operation and air cleaning operation", and keep pressing the "Test switch" of the outdoor unit electrical part from 1 sec to below 5 sec (while the self-diagnosis lamp LED301 is on).
  - Afterwards, when the "Test switch" is released, the application of current starts after 1 sec elapses. (Forced cooling operation)

Operating mode		Cooling operation (including forced cooling operation)	(Reference) Heating operation
Tester and CN2 terminal connection point		⊕ terminal of tester to CN2 pin ④ ⊖ terminal of tester to CN2 pin ①	⊕ terminal of tester to CN2 pin ① ⊖ terminal of tester to CN2 pin ④
Types of testers	Analog tester	The tester indicates about 80 VDC and returns to 0 V, and indicates about 80 VDC again.	The tester indicates about 160 VDC and returns to 0 V, and indicates about 160 VDC again.
	Digital tester	The tester indicates a large value for an instant and returns to 0 V, and indicates a large value again.	The tester indicates a large value for an instant and returns to 0 V, and indicates a large value again.

※ In each operating mode, if the tester is reverse-connected to the CN2 terminal, the tester indicates a value on the – (negative) side.

- At the voltage measurement timing, when the voltage is measured with a tester, if the tester indicates the values as shown in the table above, the circuit is functioning normally. (Each tester indicates values differently. Since it is often difficult to read the values of a digital tester, it is recommended to measure voltage with an analog tester.)
- ※ Since the current is applied only twice in 1 sec, if the timing is missed, correct operations cannot be measured.
- ※ If the main body of the reversing valve (4-way Valve) is functioning normally, it clicks twice synchronously with the voltage measurement timing.  
If this sound is heard, the reversing valve (4-way Valve) is functioning normally.
- ※ If the checking of the application of current becomes abnormal, it is a failure of an electrical part.



## 5. Temperature Detection Circuit

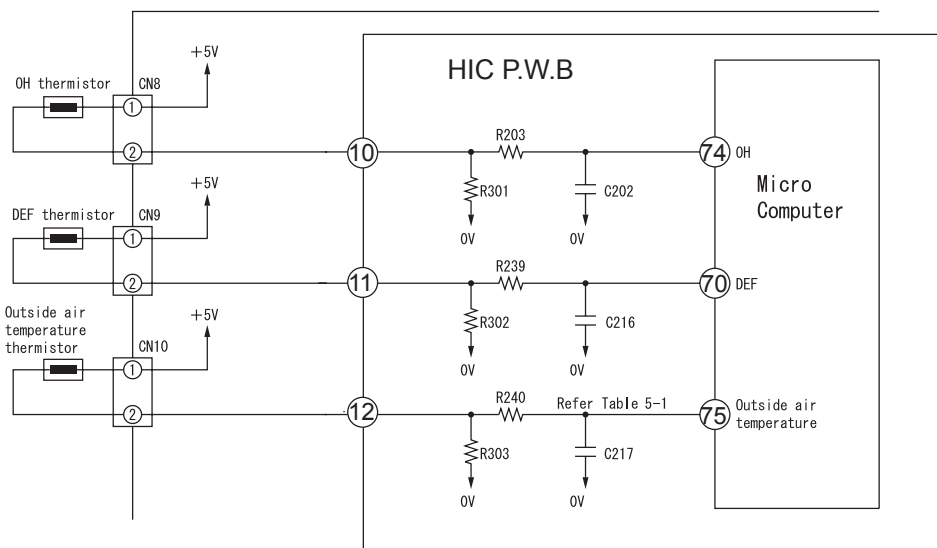


Fig. 5-1

- OH thermistor circuit detect the temperature at the surface of compressor head, DEF thermistor circuit detect the defrosting operation temperature.
  - A thermistor is a negative resistor element which has characteristics that the higher(lower) the temperature, the lower(higher) the resistance.
  - When the compressor is heated, the resistance of the OH thermistor becomes low and  $\oplus 5V$  is divided by OH thermistor and R301 and the voltage at pin ⑦④ of microcomputer.
  - Compare the voltage at microcomputer pin ⑦④ and setting value stored inside. If the value exceed the set value, microcomputer will judge that the compressor is overheated and stop the operation.
  - When frost is formed on the outdoor heat exchanger, the temperature at the exchanger drops abruptly. Therefore the resistance of the DEF thermistor becomes high and the voltage at pin ⑦① of micro computer drops. If this voltage becomes lower than the set value stored inside, microcomputer will enter the defrost control.
  - During defrost operation, the microcomputer will transfer the defrosting condition command to indoor unit via SDO pin of interface of IF transmission output.
  - The microcomputer read the outdoor temperature by Outside Air thermistor and transfer it to the indoor unit, thus controlling the compressor rotation speed according to the set value in the EEPROM of indoor unit and switching the operation mode (outdoor fan on/off etc.) to DRY mode.
- Below table show the typical values of outdoor temperature in relation to the voltage.

Table 5-1

Outside Air Temperature (°C)	-10	0	10	20	30	40
Voltage at both side of R303 (V)	1.19	1.69	2.23	2.75	3.22	3.62

<Reference>

When the thermistor is open, open condition or disconnect, microcomputer pin ⑦①⑦④⑦⑤ are approx. 0V;

When thermistor is shorted, they are approx. 5V and LD301 will blink 7 times.

However, an error is detected when only the OH thermistor is shorted and will enter blinking mode after 12 minutes start the compressor operation.

## 6. Electric expansion valve circuit

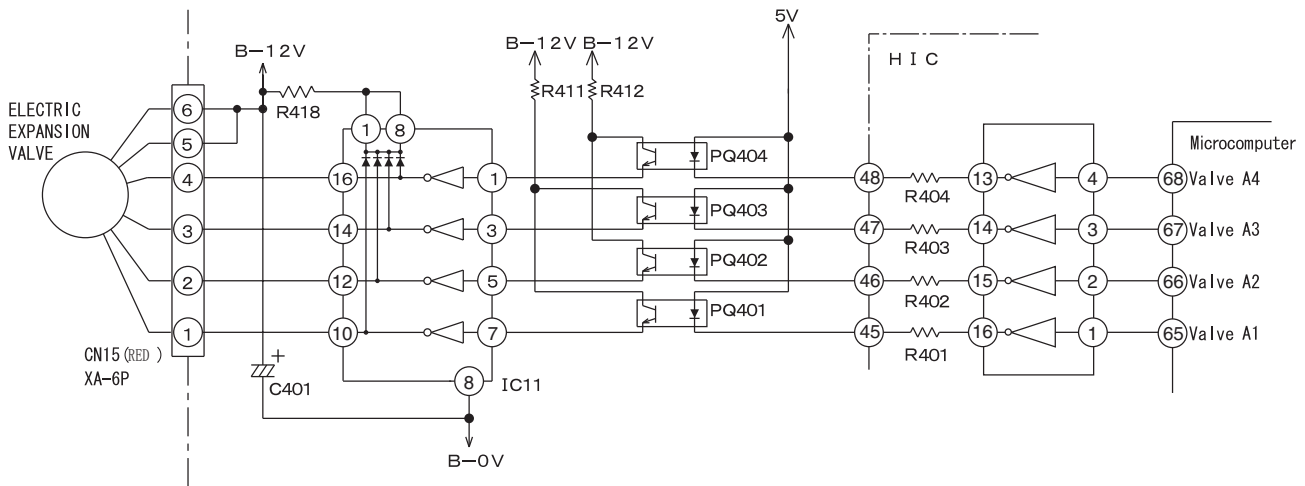


Fig. 6-1

- The electric expansion valve is driven by DC12V. Power is supplied to 1 or 2 phases of 4-phase winding to switch magnetic pole of winding in order to control the opening degree.
- Relationship between power switching direction of phase and open/close direction is shown below. When power is supplied, voltages at pins ④ to ① of CN15 are about 0.9V and 12V when no power is supplied. When power is reset, initial operation is performed for 10 or 20 seconds. During initial operation, measure all voltages at pin ④ to ① of CN15 by using a multimeter. If there is any pin with voltage that has not changed from 0.9V or 12V, expansion valve or microcomputer is broken.
- Fig. 6-2 shows logic waveform when expansion valve is operating.

Table 6-1

CN15 pin no.	Wire	Drive status							
		1	2	3	4	5	6	7	8
①	WHT	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
②	YEL	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
③	ORG	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
④	BLU	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

Operation mode  
 1→2→3→4→5→6→7→8 VALVE CLOSE  
 8→7→6→5→4→3→2→1 VALVE OPEN

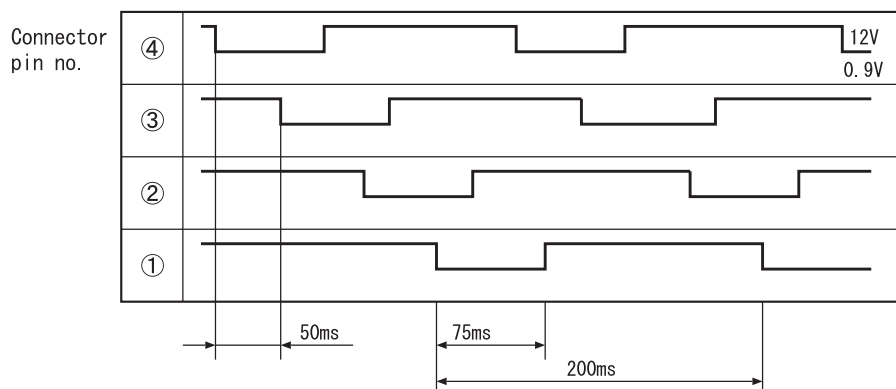


Fig. 6-2

With expansion valve control, opening degree is adjusted to stabilize target temperature by detecting compressor head temperature. The period of control is about once per 20 seconds and output a few pulse.

## 7. Outdoor DC fan motor control circuit

- This model is built with DC fan motor control circuit inside outdoor electrical unit.

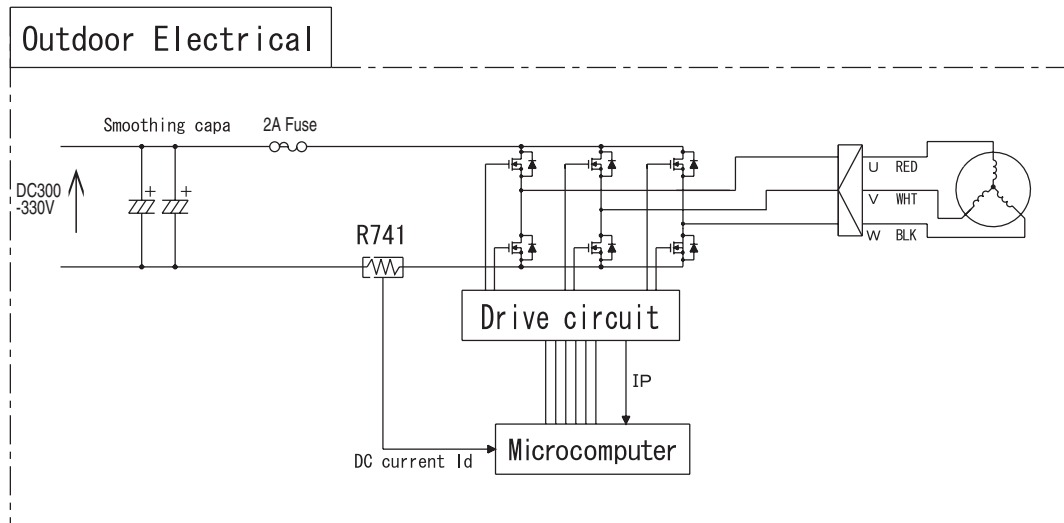


Fig 7-1

This DC fan motor is control by outdoor microcomputer that follow the operating instruction received from indoor microcomputer. The DC current that flow from R741 will presume actual operation speed and control the rotation to follow the operating instruction. Based on this DC current it will detect a over current and other fan motor failure.

### (1) Fan motor speed controller during starting

Due to the interference of strong wind etc., operation movement is changed based on fan direction and rotation speed as shown below during starting of operation.

In addition, the fair wind is define as wind that blow to outside direction using Mouth Ring part. At strong and contrary wind ... The rotational speed is not controlled as to protect the equipment and fan will rotate reversely depend on the wind. Automatically start when wind condition become weak.

At contrary wind ... The rotational speed is controlled in fair wind direction after it slowly reduce the speed and finally stop.

At fair wind ... The rotational speed is controlled as it is.

At strong fair wind ... The rotational speed is not controlled as to protect the equipment and fan will rotate reversely depend on the wind. Automatically start when wind condition become weak.

### (2) Fan motor speed controller during unit operating

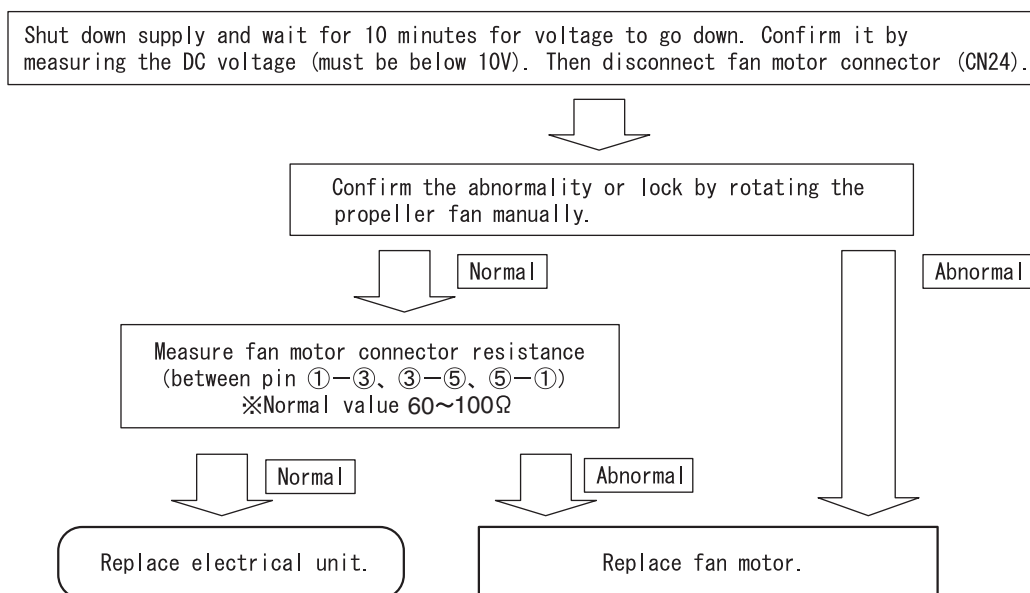
There is a case where fan rpm is reducing during rotating caused by interference of strong wind. If this condition continue in long period, fan will stop rotating. (LD301 : 11 times blinking)  
The unit will restart according to control as per during start (1).

(3) Method of confirming self diagnosis LD301 lamp : 12 times blinking

If the unit stop and LD301 on the pwb blinking 12 times [fan lock stop is detected], follow below steps to confirm it.

1. Fan lock stop is detected when something has disturb the fan rotation by inserting material into propeller fan or ice has growing inside outdoor unit caused by snow.  
Remove it if found something is bloking the fan.
2. Confirmed that CN24 connector is securely inserted. Fan lock stop is detected also when connector is not properly inserted. Please securely insert if found any disconnection.
3. Fan lock stop also can be detected where strong wind blown surrounding the unit.  
Please confirm after restart the unit. (It may take few minutes to operate the compressor)  
It is not a malfunction of electrical unit or fan motor if the unit run continuously after restart the unit.
4. Check fan motor condition as below procedure.

[Checking Fan Motor] procedure



5. Reconnect again fan motor connector (CN24).

※Please confirm above checking procedure if found 2A fuse blown.

If fan motor is broken, replace both electrical unit and fan motor.

Caution

※Beware of electric shock due to high voltage when conducting an operation check.

Power supply for DC fan motor and compressor is common (DC300-330V).

# MODEL RAC-42/50WPD

## 1. Power Circuit

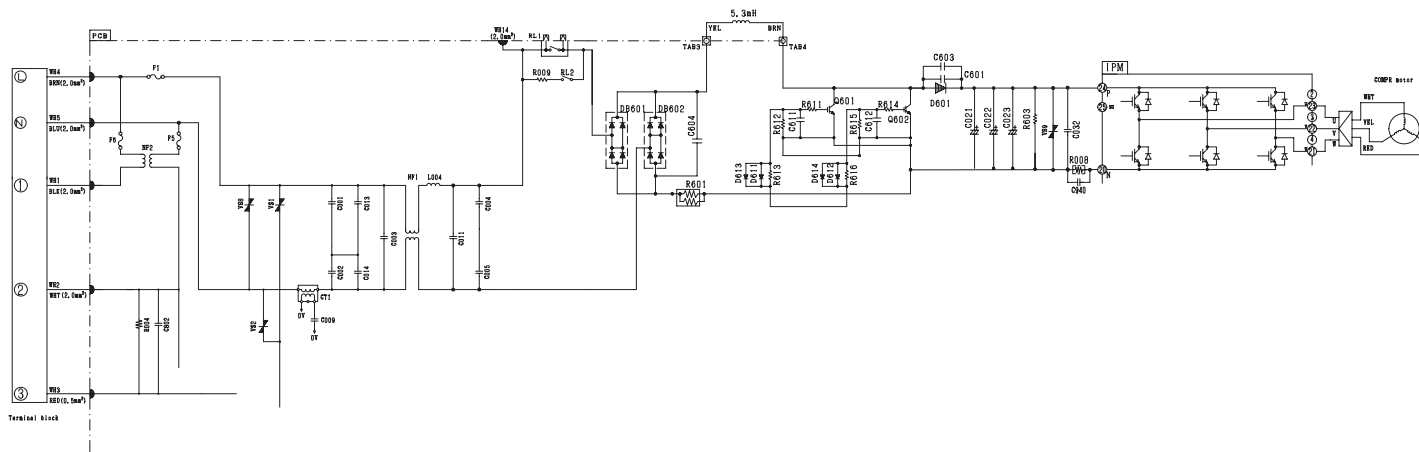


Fig 1-1

※ This circuit full-wave rectifies 230VAC applied between terminals L and N and boosts it to a required voltage with the IPM to create a DC voltage.

The voltage become 300-330V when the compressor is operated.

※ Importance component

( 1 ) Intelligence Power Module (IPM)

A module that constitute by an inverter part.

( 2 ) Diode Stack (DB601, DB602)

These rectify the 230VAC from terminal L and N to a DC power supply.

<Reference>

※ In case of Intelligence Power Module malfunction or connection failure immediately after compressor starts, its may stop due to error of [abnormal low speed], [switching failure],[Ip stop] and others.

<Reference>

※ If diode stack (DB601, DB602) are faulty, DC voltage may not be generated and the compressor may not operate at all. Also be aware that the 25A fuse might have blown.

(3) Smoothing capacitors (C021-C023, 500 $\mu$ F, 450V)

This smoothes (averages) the voltage rectified by the diode stack.

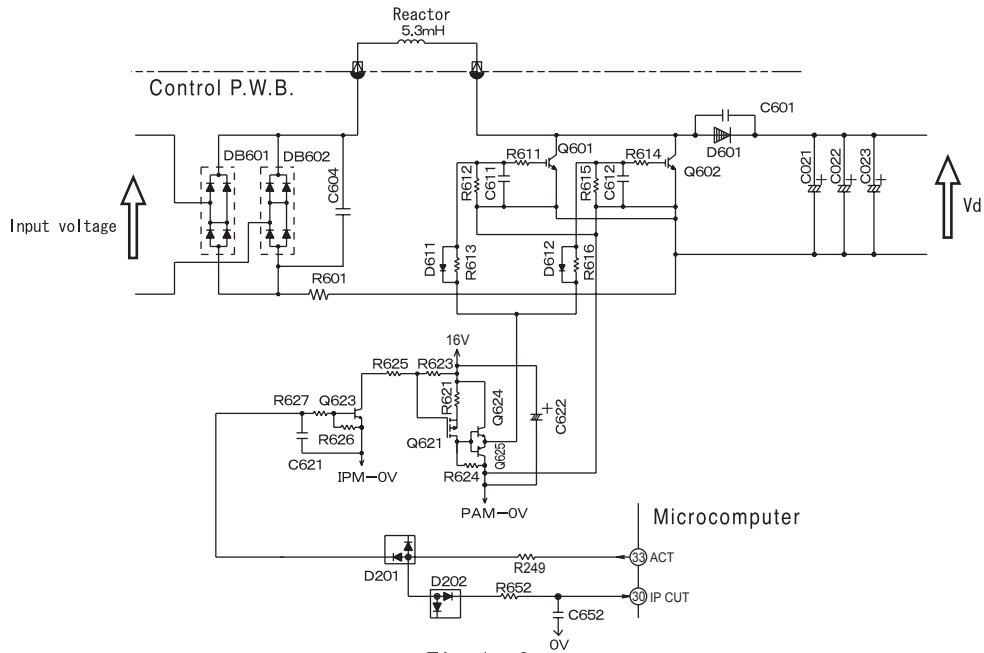


Fig. 1-2

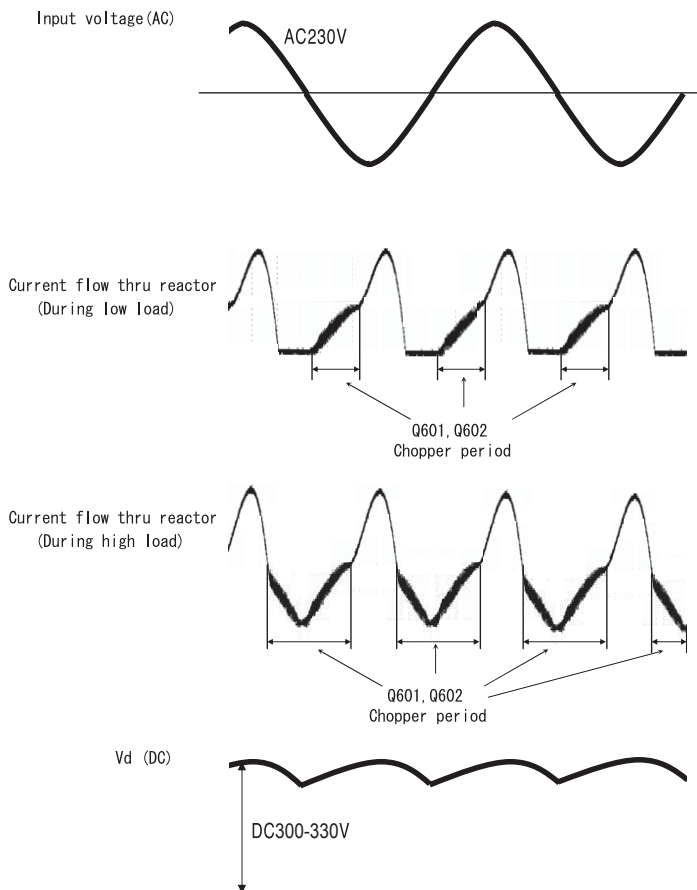


Fig. 1-3

(4) IGBT to improve efficiency (Q601, Q602)

It will improve the efficiency during compressor load become heavy when current flow thru the chopper period of Q601, Q602.

## 2. Power circuit (Low voltage)

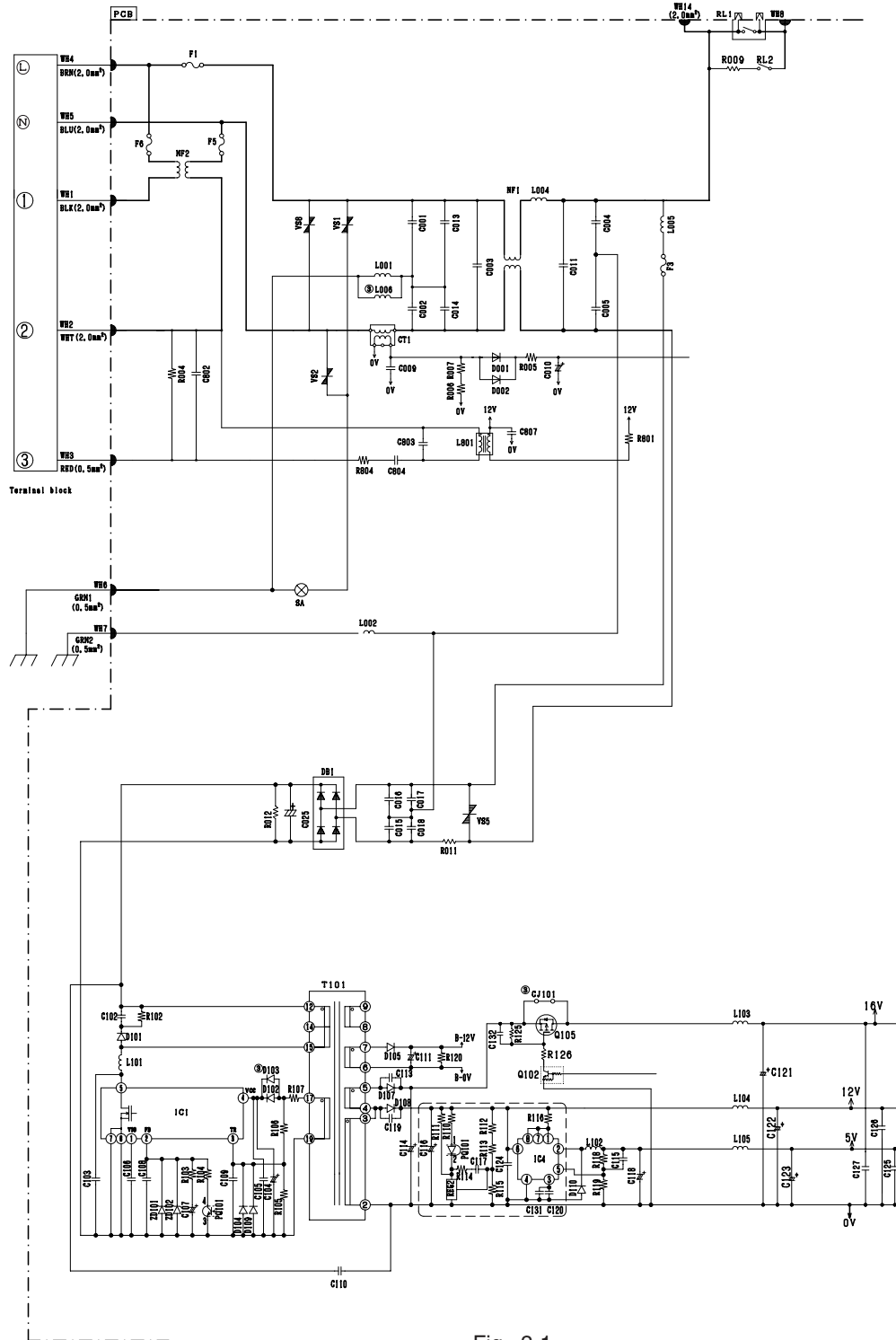


Fig. 2-1

- The 230V AC voltage is rectified to DC voltage (B-12V,16V,12V,5V) pass through switching control IC (IC1), switching transformer.
  - (1) B-12V Power supply for electrical expansion valve.
  - (2) 16V Power supply for IPM driver circuit of compressor and fan motor, IGBT action.
  - (3) 12V Power supply for 4 way valve relay, power relay, inrush current relay, motor current amplification,
  - (4) 5V Power supply for microcomputer, peripheral circuits.



## Main parts

- (1) C001,C002,C003,C004,C005,C011,C013,C014, NF1

These absorb electrical noise generated during operation of compressor and also absorb external noise entering from power line to protect electronic parts.

- (2) Surge Absorber, Varistor1,2,5,8.

These absorbs external power surge.

- (2) IC4

DC/DC convertor IC (DC12V → DC5V).

### 3. P.W.B. for power circuit

Voltage specification of power circuit as shown in below table.

〈Checking point〉

Output	Spec	Main load	Measuring point	Example of possible failure mode.
5V O/P	$5 \pm 0.4V$	Micon, Thermistor	Tester $\oplus$ : L105 (JUMPER) Tester $\ominus$ : D110 (EARTH)	Outdoor not operate, no blinking indication
12V O/P	$12 \pm 0.5V$	Micon, IC2, 3, 4 Relay circuit	Tester $\oplus$ : L104 (JUMPER) Tester $\ominus$ : D110 (EARTH)	Outdoor not operate, no blinking indication
16V O/P	$15.5^{+1.5V}_{-1.0V}$	IPM for Comp IPM for DC fan	Tester $\oplus$ : L103 (JUMPER) Tester $\ominus$ : D110 (EARTH)	Stop : LD301 3,4 or 12 times blinking
B-12V O/P	$13^{+2.5V}_{-1.0V}$	Expansion valve	Tester $\oplus$ : R418 (B-12V) Tester $\ominus$ : C401 (" - ")	Stop : LD301 5 times blinking

※ Power circuit for P.W.B can consider normal if the result is satisfied with above specification.

#### 4. Reversing valve (4-way valve) control circuit

- This model is equipped with a reversing valve (4-way Valve).
- The reversing valve (4-way Valve) "slides" the valve in the specified direction for each operating mode and switches the route of refrigerant and holds the route with a built-in permanent magnet.
- According to an operation command from the indoor unit microcomputer, the reversing valve (4-way Valve) control circuit applies current to the reversing valve (4-way Valve) coil in the specified direction, for each operating mode and slides the valve.
- Just before the compressor starts operation, the current is applied twice at the interval of 1 sec as shown in Fig. 4-1.
- During forced cooling operation, just after the forced cooling switch turns on, the current is applied twice at the interval of 1 sec as shown in Fig. 4-1.
- When the operation stops, the position of the valve before the stop is held.

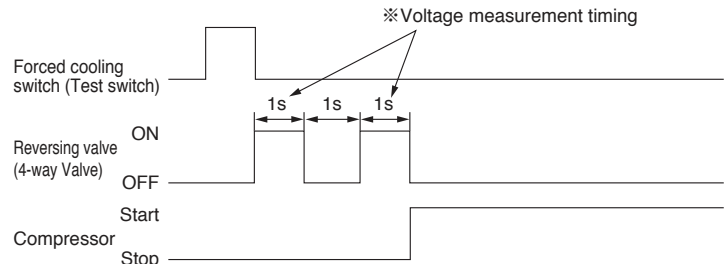


Fig. 4-1

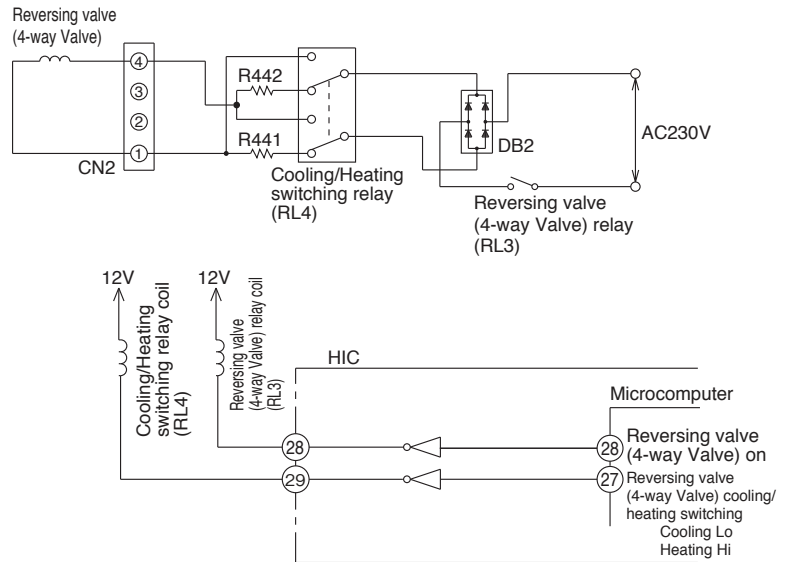


Fig. 4-2

- Before checking the application of current to the reversing valve (4-way Valve), disconnect the connector (CN2) and measure the resistance of both ends of the connector, to see if it is  $[2500\Omega \pm 10\%]$ . Only when the resistance is normal, check the application of current using the following procedures.  
If the resistance is abnormal, it is caused by either; breakage of a lead wire, or failure of the reversing valve (4-way Valve).
- The voltage, when measured by a tester during the application of current to the reversing valve (4-way Valve) (when the voltage is measured)  
  - ※ Switches the indoor unit to the "Ion Mist operation and air cleaning operation", and keep pressing the "Test switch" of the outdoor unit electrical part from 1 sec to below 5 sec (while the self-diagnosis lamp LED301 is on).
  - Afterwards, when the "Test switch" is released, the application of current starts after 1 sec elapses. (Forced cooling operation)

Operating mode		Cooling operation (including forced cooling operation)	(Reference) Heating operation
Tester and CN2 terminal connection point		⊕ terminal of tester to CN2 pin ④ ⊖ terminal of tester to CN2 pin ①	⊕ terminal of tester to CN2 pin ① ⊖ terminal of tester to CN2 pin ④
Types of testers	Analog tester	The tester indicates about 80 VDC and returns to 0 V, and indicates about 80 VDC again.	The tester indicates about 160 VDC and returns to 0 V, and indicates about 160 VDC again.
	Digital tester	The tester indicates a large value for an instant and returns to 0 V, and indicates a large value again.	The tester indicates a large value for an instant and returns to 0 V, and indicates a large value again.

※ In each operating mode, if the tester is reverse-connected to the CN2 terminal, the tester indicates a value on the - (negative) side.

- At the voltage measurement timing, when the voltage is measured with a tester, if the tester indicates the values as shown in the table above, the circuit is functioning normally. (Each tester indicates values differently. Since it is often difficult to read the values of a digital tester, it is recommended to measure voltage with an analog tester.)
- ※ Since the current is applied only twice in 1 sec, if the timing is missed, correct operations cannot be measured.
- ※ If the main body of the reversing valve (4-way Valve) is functioning normally, it clicks twice synchronously with the voltage measurement timing.  
If this sound is heard, the reversing valve (4-way Valve) is functioning normally.
- ※ If the checking of the application of current becomes abnormal, it is a failure of an electrical part.

## 5. Temperature Detection Circuit

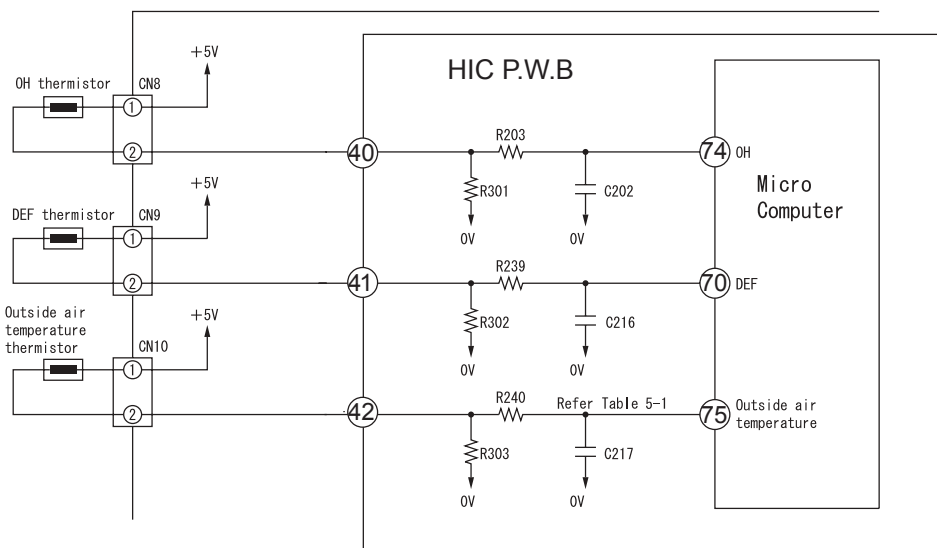


Fig. 5-1

- OH thermistor circuit detect the temperature at the surface of compressor head, DEF thermistor circuit detect the defrosting operation temperature.
  - A thermistor is a negative resistor element which has characteristics that the higher(lower) the temperature, the lower(higher) the resistance.
  - When the compressor is heated, the resistance of the OH thermistor becomes low and  $\oplus 5V$  is divided by OH thermistor and R301 and the voltage at pin ⑦④ of microcomputer.
  - Compare the voltage at microcomputer pin ⑦④ and setting value stored inside. If the value exceed the set value, microcomputer will judge that the compressor is overheated and stop the operation.
  - When frost is formed on the outdoor heat exchanger, the temperature at the exchanger drops abruptly. Therefore the resistance of the DEF thermistor becomes high and the voltage at pin ⑦① of micro computer drops. If this voltage becomes lower than the set value stored inside, microcomputer will enter the defrost control.
  - During defrost operation, the microcomputer will transfer the defrosting condition command to indoor unit via SDO pin of interface of IF transmission output.
  - The microcomputer read the outdoor temperature by Outside Air thermistor and transfer it to the indoor unit, thus controlling the compressor rotation speed according to the set value in the EEPROM of indoor unit and switching the operation mode (outdoor fan on/off etc.) to DRY mode.
- Below table show the typical values of outdoor temperature in relation to the voltage.

Table 5-1

Outside Air Temperature (°C)	-10	0	10	20	30	40
Voltage at both side of R303 (V)	1.19	1.69	2.23	2.75	3.22	3.62

<Reference>

When the thermistor is open, open condition or disconnect, microcomputer pin ⑦①⑦④⑦⑤ are approx. 0V;

When thermistor is shorted, they are approx. 5V and LD301 will blink 7 times.

However, an error is detected when only the OH thermistor is shorted and will enter blinking mode after 12 minutes start the compressor operation.

## 6. Electric expansion valve circuit

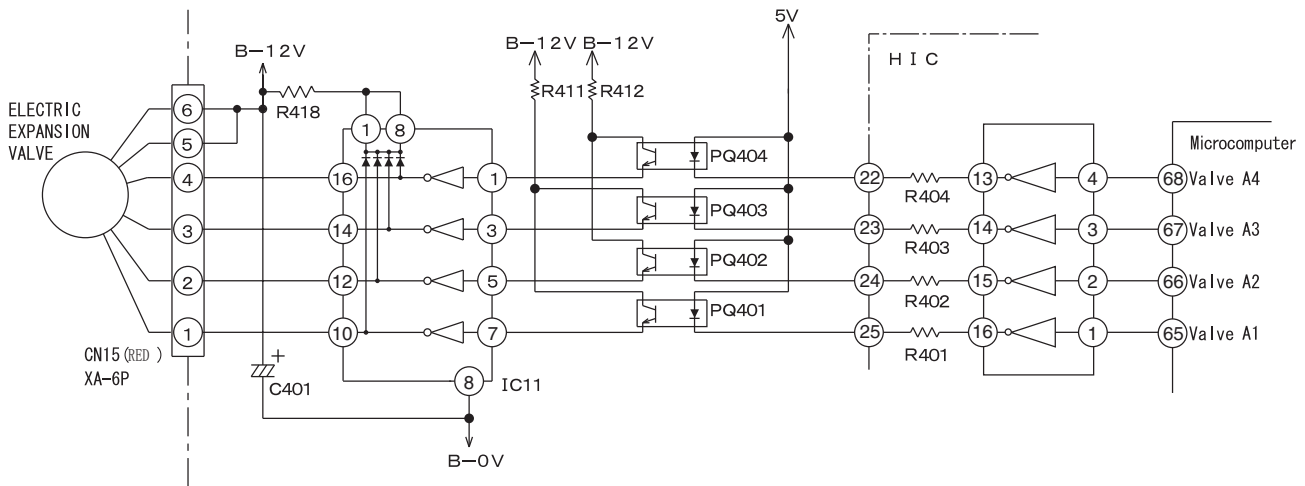


Fig. 6-1

- The electric expansion valve is driven by DC12V. Power is supplied to 1 or 2 phases of 4-phase winding to switch magnetic pole of winding in order to control the opening degree.
- Relationship between power switching direction of phase and open/close direction is shown below. When power is supplied, voltages at pins ④ to ① of CN15 are about 0.9V and 12V when no power is supplied. When power is reset, initial operation is performed for 10 or 20 seconds. During initial operation, measure all voltages at pin ④ to ① of CN15 by using a multimeter. If there is any pin with voltage that has not changed from 0.9V or 12V, expansion valve or microcomputer is broken.
- Fig. 5-2 shows logic waveform when expansion valve is operating.

Table 6-1

CN15 pin no.	Wire	Drive status							
		1	2	3	4	5	6	7	8
①	WHT	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
②	YEL	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
③	ORG	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
④	BLU	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

Operation mode  
 1→2→3→4→5→6→7→8 VALVE CLOSE  
 8→7→6→5→4→3→2→1 VALVE OPEN

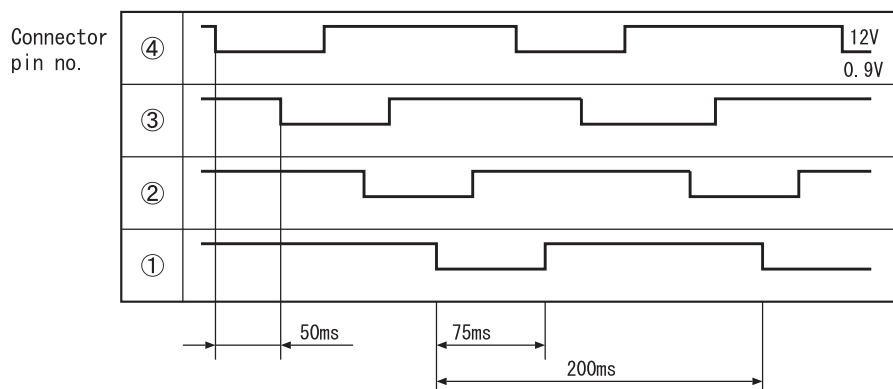


Fig. 6-2

With expansion valve control, opening degree is adjusted to stabilize target temperature by detecting compressor head temperature. The period of control is about once per 20 seconds and output a few pulse.

## 7. Outdoor DC fan motor control circuit

- This model is built with DC fan motor control circuit inside outdoor electrical unit.

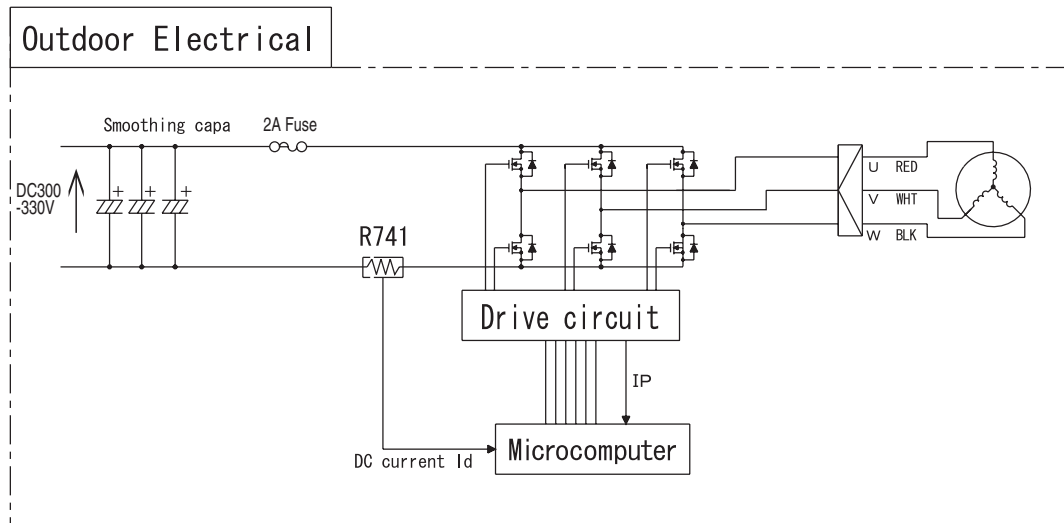


Fig 7-1

This DC fan motor is control by outdoor microcomputer that follow the operating instruction received from indoor microcomputer. The DC current that flow from R741 will presume actual operation speed and control the rotation to follow the operating instruction. Based on this DC current it will detect a over current and other fan motor failure.

### (1) Fan motor speed controller during starting

Due to the interference of strong wind etc., operation movement is changed based on fan direction and rotation speed as shown below during starting of operation.

In addition, the fair wind is define as wind that blow to outside direction using Mouth Ring part. At strong and contrary wind ...The rotational speed is not controlled as to protect the equipment and fan will rotate reversely depend on the wind. Automatically start when wind condition become weak.

At contrary wind ...The rotational speed is controlled in fair wind direction after it slowly reduce the speed and finally stop.

At fair wind ...The rotational speed is controlled as it is.

At strong fair wind ...The rotational speed is not controlled as to protect the equipment and fan will rotate reversely depend on the wind. Automatically start when wind condition become weak.

### (2) Fan motor speed controller during unit operating

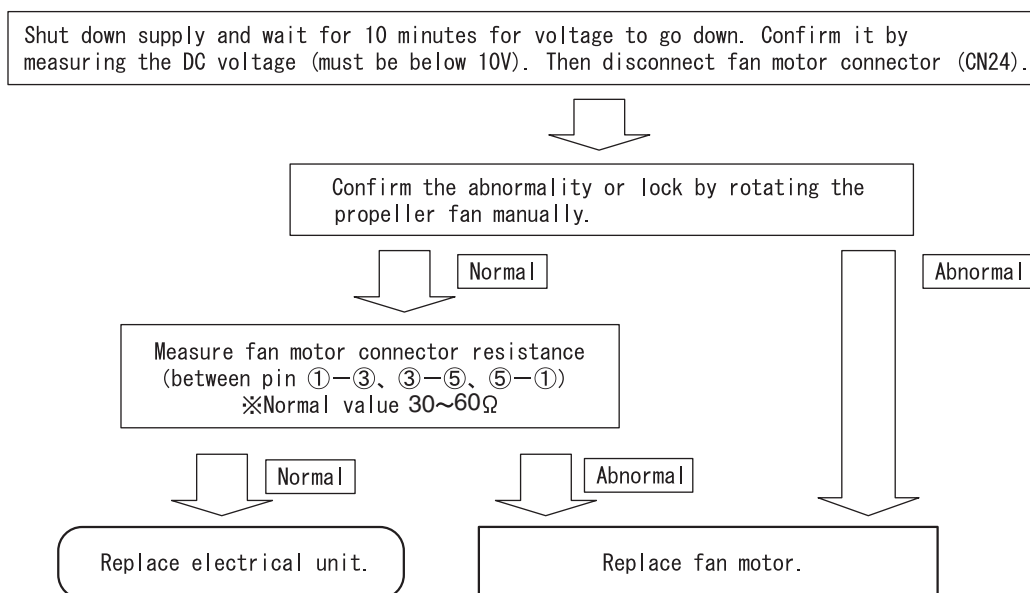
There is a case where fan rpm is reducing during rotating caused by interference of strong wind. If this condition continue in long period, fan will stop rotating. (LD301 : 11 times blinking)  
The unit will restart according to control as per during start (1).

(3) Method of confirming self diagnosis LD301 lamp : 12 times blinking

If the unit stop and LD301 on the pwb blinking 12 times [fan lock stop is detected], follow below steps to confirm it.

1. Fan lock stop is detected when something has disturb the fan rotation by inserting material into propeller fan or ice has growing inside outdoor unit caused by snow.  
Remove it if found something is bloking the fan.
2. Confirmed that CN24 connector is securely inserted. Fan lock stop is detected also when connector is not properly inserted. Please securely insert if found any disconnection.
3. Fan lock stop also can be detected where strong wind blown surrounding the unit.  
Please confirm after restart the unit. (It may take few minutes to operate the compressor)  
It is not a malfunction of electrical unit or fan motor if the unit run continuesly after restart the unit.
4. Check fan motor condition as below procedure.

[Checking Fan Motor] procedure



5. Reconnect again fan motor connector (CN24).

※Please confirm above checking procedure if found 2A fuse blown.

If fan motor is broken, replace both electrical unit and fan motor.

Caution

※Beware of electric shock due to high voltage when conducting an operation check.

Power supply for DC fan motor and compressor is common (DC300-330V).

## SERVICE CALL Q&A

### Cooling operation

**Q1** The compressor sometimes stops during cooling.



**A1** Check if the heat exchanger of the indoor unit is covered with dew. Wait for 3 to 4 minutes until the dew disappears.

Cooling when the room temperature is low may cause the heat exchanger of the indoor unit to gather dew.

### Dehumidification

**Q1** The indoor unit produces a noise that goes "shaaahhh" during dehumidification.



**A1** That is a noise produced by refrigerant flowing through the pipe.

**Q2** Cold air comes out during a dehumidifying operation.



**A2** To improve the dehumidification efficiency performs quiet fan operation. Therefore the air is cold and it is not a malfunction.

**Q3** The operation does not stop even by setting the temperature higher than room temperature on the remote controller.



**A3** It sets to perform dehumidifying operation by setting the temperature slightly lower than remote controller setting.

### Heating operation

**Q1** The product sometimes fails to produce a wind during heating.



**A1** Defrosting is in progress. Wait 5 to 10 minutes until the dew on the outdoor unit disappears.

**Q2** The product begins with a slight wind during heating even though set to "strong wind" or "weak wind."



**A2** At the first of the heating, the product will run for 30 seconds with a slight wind. When set to strong wind, the product will begin with a slight wind operation, producing a weak wind for 30 seconds, and then switch to strong wind.

**Q3** The product stops during heating even though it is set to "30°C."



**A3** When heating is conducted despite the high outdoor temperature, the product may stop to protect its equipment.

### Auto-fresh defrost

**Q1** During heating, I turned off the product by using the START/STOP button. But the "operation lamp" is blinking and the outdoor unit is running.



**A1** The "auto-fresh defrost" should be working. When stopped, the product will check its outdoor unit for dew and, if there is any dew, conduct defrosting and then stop operating.

### Automatic operation

**Q1** During an automatic run, switching the wind speed selector will not change the wind speed.



**A1** The product will switch automatically to automatic wind speed. You cannot select strong or weak wind by remote control but you can select wind and quiet.

**Q2** How is the automatic operation mode determined?



**A2** According to the room temperature, heating or cooling operation is automatically selected. Refer to the basic operation section.

Common, etc.

**Q1** In "automatic wind speed" mode, the indoor fan changes from strong wind to weak wind to slight wind.



**A1** This does not abnormal. It is because the cold wind prevention is working.

In wind speed "automatic" mode, the product will sense the heat exchange temperature and, when the temperature goes down, the product will automatically switch to strong wind to weak wind to slight wind.

**Q2** At operation startup, the outdoor unit becomes noisy.



**A2** At operation startup, the product will set the rotation speed of the compressor to full power and increase its heating and cooling capacity, resulting in a slightly higher noise level. This is not a sign of a breakdown.

**Q3** The outdoor unit sometimes changes in its noise.



**A3** The difference between the thermometer temperature setting and room temperature will change the rotation speed of the compressor. This is not a sign of a breakdown.

**Q4** There is a difference between the temperature setting and room temperature in room temperature control.



**A4** The room structure, air stream, or other factor may cause a gap between the room temperature setting and actual room temperature. If there is any difference between the setting and the room temperature, adjust the temperature setting to match the living space to a comfortable temperature.

**Q5** The product will not produce wind right after startup.



**A5** After turning ON the power switch or breaker, setting the product to heating or dehumidification will activate a preliminary operation for 1 minute. At that time, heating will cause the operation lamp to blink. This is not a sign of a breakdown.

**Q6** I performed internal cleaning, but didn't succeed in controlling the mold in the room.



**A6** Internal cleaning will clean the inside of the indoor unit of the air-conditioner, thereby controlling mold generation. This will not control the mold in the room.



## Wireless remote control

**Q1** The timer will not become set.



**A1** Have you set the product to the current time? The timer cannot be set unless it is set to the current time.

**Q2** The current time display will disappear at once.



**A2** The current time disappears 10 seconds later. The timer set display is given priority.

When set to the current time setting, the reading blinks for about 3 minutes.

**Q3** I made a timer "reservation". But the time setting has disappeared.



**A3** Is the time not past the reserved time? The set time disappears when the current time reaches the reserved time.

**Q4** I tried to set the "sleep" timer while the ON timer is reserved. But it will not set itself to a desired time.



**A4** The time set in the "sleep" timer can be set with a time up to the time set with the ON timer. If the end time of the "sleep" timer is past the time set with the ON timer, you cannot make that setting.

**Q5** I set the "sleep" timer during operation. But  
① the indoor fan will not run (it will not produce wind)  
② wind intensity will not change.



**A5** ① This occurs when the room temperature and humidity have reached their settings during dehumidification and the air-conditioner is in a pause. The product will begin again to run within about 3 minutes.  
② The product will run with the wind speed set to a "quiet" state.

**Q6** I tried to change the setting with the "room temperature" button of the remote control unit in vain.



**A6** You cannot make this setting when the product is in "air purification" mode. Moreover, you cannot set the product to a desired setting when quick laundry or dew control is being performed with the "auto" or "quick dehumidification" button.

**Q7** The temperature setting field on the remote control unit displays  $+f^{\circ}\text{C}$  or  $-f^{\circ}\text{C}$ .



**A7** The product will give a display when you operate the product in "auto" using the operation switch button. This can be controlled within the range of  $\pm 3^{\circ}\text{C}$ .  
The product will display  $+f^{\circ}\text{C}$  if the temperature is  $f^{\circ}\text{C}$  higher than the room temperature in automatic setting.  
The product will display  $-f^{\circ}\text{C}$  if the temperature is  $f^{\circ}\text{C}$  lower than the room temperature in automatic setting.

**Q8** The remote control unit will give no display in response to a push of the "vertical vane" button.



**A8** The remote control unit displays nothing.

# TROUBLE SHOOTING

MODEL RAC-18/25/35/42/50WPD

## Inspection instructions

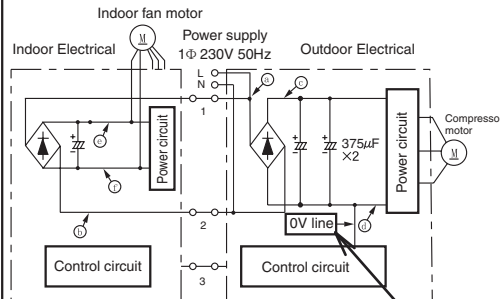


### Warning

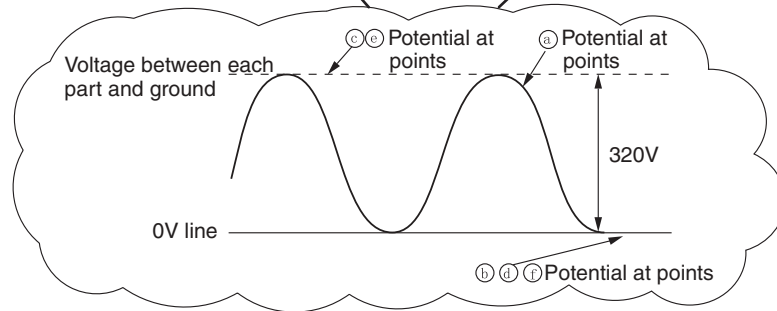
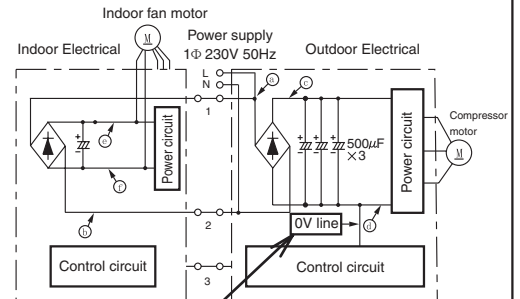
Note that the 0 V line of the outdoor electrical parts and the primary power circuit of the indoor electrical parts have voltages to ground as illustrated in the right-hand figure.



RAC-18/25/35WPD

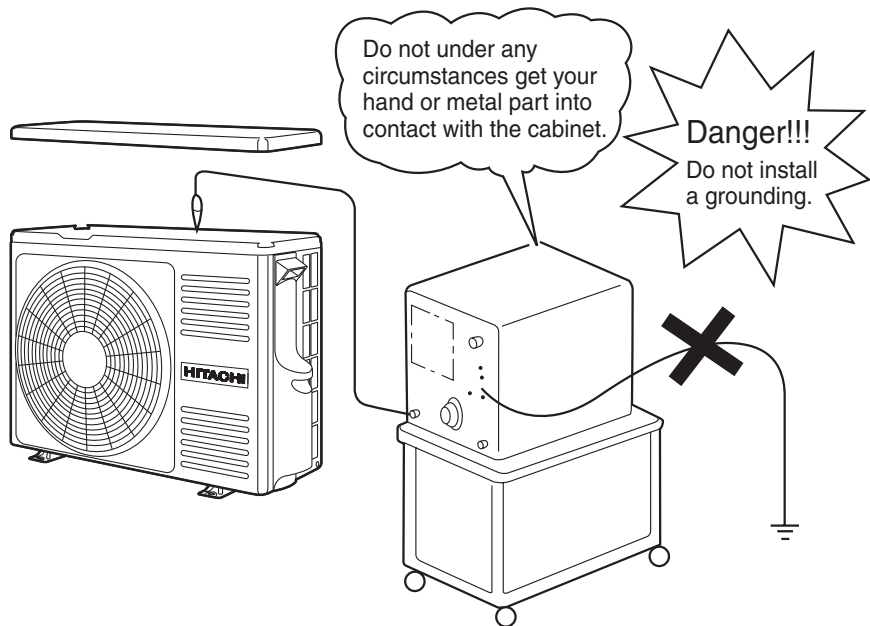


RAC-4 2/50WPD



### Warning

When conducting a check with an oscilloscope or something similar, do not ground the oscilloscope. Note that the oscilloscope will be subjected to voltages as illustrated in the figure above.



# DISCHARGE, PROCEDURE AND POWER SHUT OFF METHOD FOR POWER CIRCUIT



**WARNING**



## Caution

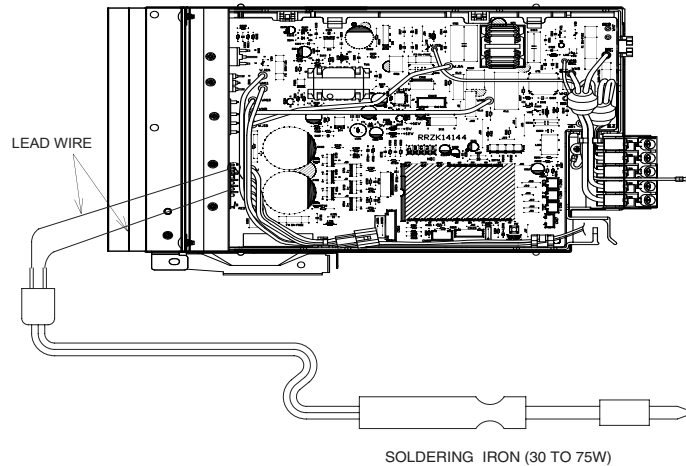
- Voltage of about 350 V is charged between the terminal of smoothing capacitors.
- During continuity check for each circuit part of the outdoor unit, be sure to discharge the smoothing capacitors.

## Discharge Procedure

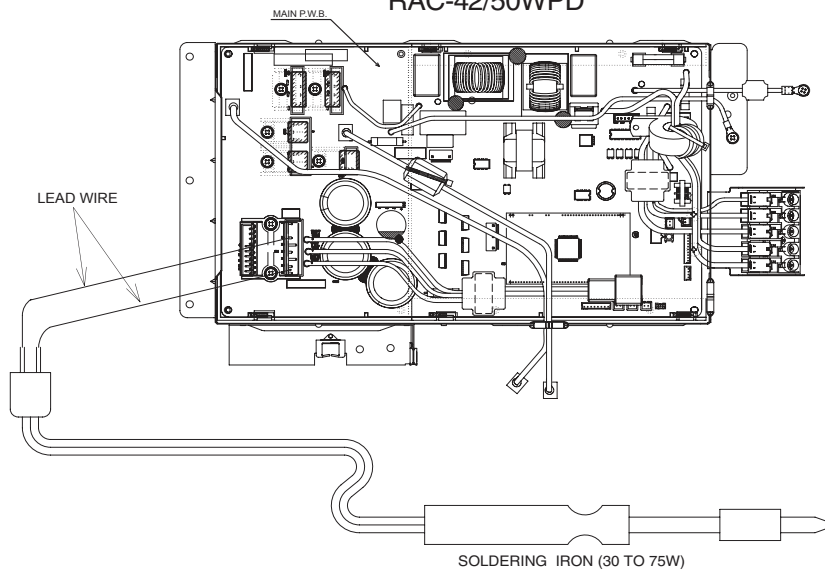
1. Turn off the power.
2. After power is turned off, wait for 10 minutes or more. Then, remove electrical parts cover and apply soldering iron of 30 to 75 W for 15 seconds or more to IPM(24) and IPM(20) terminals on the main P.W.B. as shown in the figure below, in order to discharge voltage in smoothing capacitor.

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

RAC-18/25/35WPD



RAC-42/50WPD



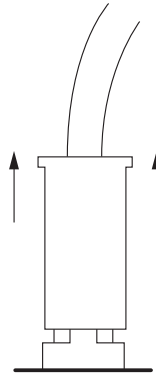
## Other instructions

### (1) Detaching and reattaching the receptacles for tab terminal

All the receptacles for connecting tab terminals are with a locking mechanism. Forcibly pulling any such receptacle without unlocking it will destroy it. Be on guard.

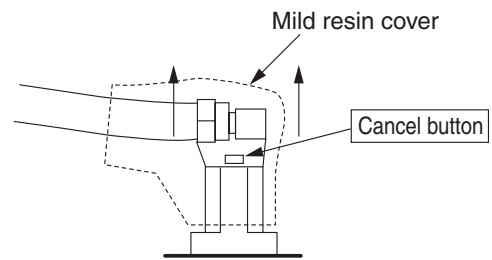
When reconnecting it, insert it securely all the way home.

#### · Receptacle types and how to unlock them



Vertical (with a resin case)

Hold the resin case and pull it out.



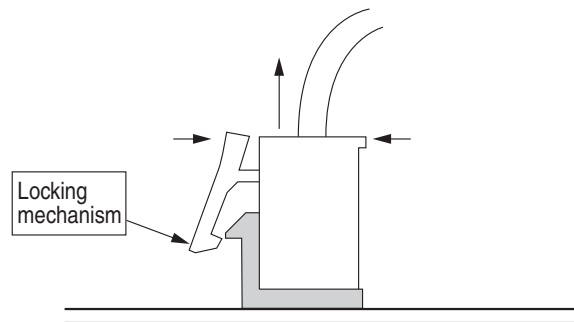
Horizontal (with a mild resin cover)

Hold the cancel button down on the mild resin cover while pulling it out.

### (2) Detaching and reattaching the board connector

The product comes equipped with many board connectors provided with lock mechanism. Forcibly pulling any such part without unlocking it will destroy it. Be on guard. When reconnecting it, insert it securely all the way home.

Pinch the locking mechanism with your fingers and pull it out unlocked.



### (3) Do not detach or reattach the connectors while energized

Do not under any circumstances detach or reattach the connectors while energized. That would destroy the board components and fan motor. For both the indoor and outdoor boards, ensure that the smoothing capacitor has discharged its electricity fully before you do your work.

No	Function	Description
1	[Display on the outdoor unit side]	<ul style="list-style-type: none"> <li>· The failure mode detected on the outdoor unit side is displayed by blinking the "LD301". Detecting a failure will stop the outdoor unit and keep blinking the LD301 until it is restarted. (The communication error will persist until the communication is reestablished.)</li> </ul>
2	Self-diagnosis memory	<ul style="list-style-type: none"> <li>· The failure modes detected on the indoor and outdoor unit sides are stored in the nonvolatile memory of the indoor unit and can be read later on. (The memory will remain even after power-off.)</li> <li>· The failure modes detected on the outdoor unit side are written in memory every time any such mode occurs. The failure mode can therefore be detected on the indoor unit side without waiting for the retry frequency to reach the display of the indoor unit lamp. Moreover, the normal self-diagnosis display function which rarely occurs will store and display failure modes that do not end up displaying the indoor unit lamp. (Any such mode may be unable to be stored if indoor or outdoor communications is in a failure.)</li> <li>· The product stores 5 last-stored failure modes.</li> <li>· There is a function for deleting memory. Once you clear the memory and run the product for several days, you can read the failure modes and check them, thereby detecting the less frequent failure phenomena.</li> <li>· Failure modes can be checked by both the blinking of the lamp of the indoor unit and the display of the remote control liquid crystal display.</li> </ul>

※The "self-diagnosis function of the communication circuit" available in our conventional models is now incorporated as part of the normal self-diagnosis function. In the case of a failure in the communication circuit, you do not have to conduct a special operation and the operations can be automatically divided into 3 blinking operations and 12 blinking operations of the timer lamp. However, a strong external noise may have resulted in 12 times of blinking.

# SELF-DIAGNOSIS LIGHTING MODE

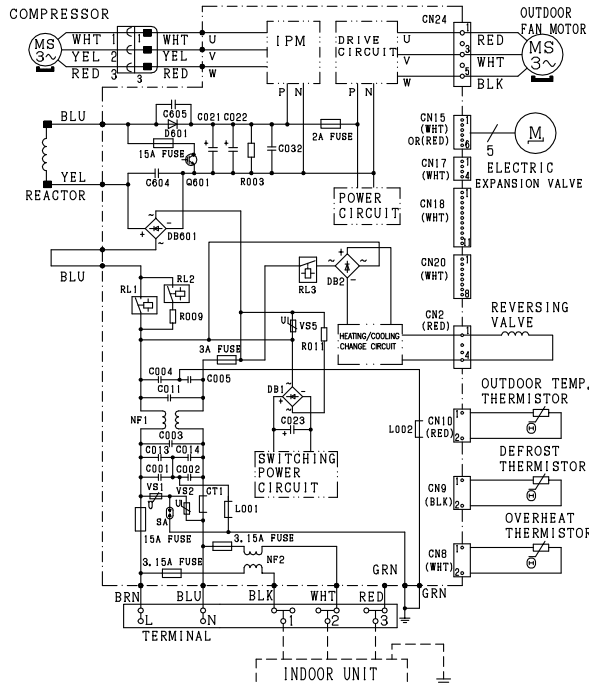
MODEL RAC-18/25/35WPD

**⚠ ⚡ DANGER (DC350V)**

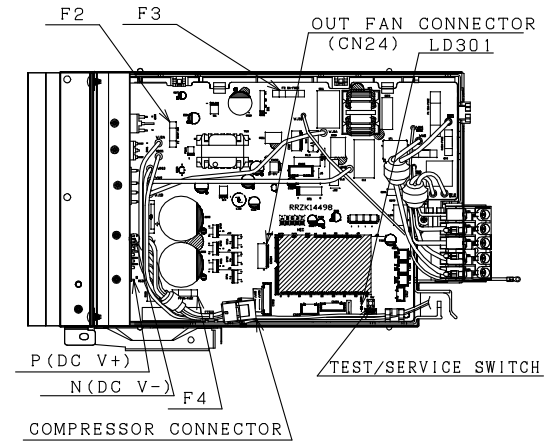
- CUT THE POWER SOURCE AND WAIT MORE THAN 10 MINUTES BEFORE SERVICE WORK.
- CONFIRM THE DC VOLTAGE AT THE MEASURING POINT SHOWN IN BELOW FIGURE MUST BE LESS THAN 10V.

## WIRING DIAGRAM

BLU:BLUE RED:RED  
 BLK:BLACK WHT:WHITE  
 BRN:BROWN YEL:YELLOW  
 GRN:GREEN GRY:GRAY



DURING STOP			
SELF-DIAGNOSIS BLINKING MODE			
		▣:BLINK	□:OFF
LD301 (RED)	SELF DIAGNOSIS CONTENTS	MAIN CHECK POINT	HOW TO REPAIR
□ OFF	NORMAL STOP (STOPPED BY INDOOR THERMOS-STAT OR MAIN OPERATION OFF)	1. NO NEED TO CHECK	1. NOT ANY MALFUNCTION
▣ ONCE	RESET STOP	1. MICROPROCESSOR WAS REBOOTED	1. CHANGE ODU CONTROLLER
▣ 2 TIMES	PEAK CURRENT CUT	1. ODU CONTROLLER DEFECTIVE 2. COMPRESSOR ABNORMAL LOAD	1. CHANGE ODU CONTROLLER 2. CHECK THE COMPRESSOR
▣ 3 TIMES	ABNORMAL LOW SPEED ROTATION	1. ODU CONTROLLER DEFECTIVE 2. COMPRESSOR ABNORMAL LOAD	1. CHANGE ODU CONTROLLER 2. CHECK THE COMPRESSOR
▣ 4 TIMES	SWITCHING FAILURE	1. COMPRESSOR CONNECTOR OPEN 2. COMPRESSOR ABNORMAL LOAD 3. ODU CONTROLLER DEFECTIVE	1. INSERT THE CONNECTOR 2. CHECK THE COMPRESSOR 3. CHANGE ODU CONTROLLER
▣ 5 TIMES	OVERLOAD LOWER LIMIT CUT	1. OBSTACLE SURROUND THE ODU MAY CAUSE 2. OTHER CAUSE	1. REMOVE THE OBSTRUCTION 2. CHECK CYCLE PIPE
▣ 6 TIMES	OH THERMISTOR TEMPERATURE RISE	1. DUE TO OPEN CONNECTOR 2. LEAKAGE OF REFRIGERANT 3. OTHER CAUSE	1. INSERT THE CONNECTOR 2. CHECK THE CYCLE PIPE AND RECHARGE THE REFRIGERANT 3. CHANGE ODU CONTROLLER
▣ 7 TIMES	THERMISTOR ABNORMAL	1. CONNECTOR INSERT MISS 2. OPEN CIRCUIT/SHORT CIRCUIT OF THERMISTOR WIRE 3. ODU CONTROLLER DEFECTIVE	1. INSERT PROPERLY 2. CHANGE THE THERMISTOR 3. CHANGE ODU CONTROLLER
▣ 9 TIMES	COMMUNICATIONS ERROR	1. F CABLE MISS CONNECTION 2. F CABLE DISCONNECTION 3. ODU CONTROLLER DEFECTIVE 4. IDU CONTROLLER DEFECTIVE	1. F CABLE CONNECT PROPERLY 2. CHANGE THE F CABLE 3. CHANGE ODU CONTROLLER 4. CHANGE IDU CONTROLLER
▣ 10 TIMES	ABNORMAL POWER SOURCE	1. REACTOR IS UNCONNECTED 2. ABNORMAL AC INPUT: OUT OF THE RANGE (230±10%) 3. AC INPUT IS NORMAL	1. CONNECT REACTOR PROPERLY 2. CONNECT TO NORMAL AC POWER SOURCE 3. CHANGE ODU CONTROLLER
▣ 11 TIMES	ODU FAN STOP BY STRONG REVERSE WIND	1. OUTDOOR FAN STOP BY STRONG REVERSE WIND	1. IT WILL RE-START AFTER THE WIND BECOME WEAK
▣ 12 TIMES	OUTDOOR FAN LOCK ERROR	1. OUTDOOR FAN STOP BY STRONG REVERSE WIND 2. PROPELLER FAN LOCK 3. OUTDOOR FAN MOTOR LOCK 4. OUTDOOR FAN MOTOR OK	1. AUTOMATICALLY RE-START AFTER WIND BECOME WEAK 2. REMOVE THE OBSTRUCTION 3. CHANGE THE FAN MOTOR 4. CHANGE ODU CONTROLLER
▣ 13 TIMES	EEPROM READ ERROR	· CHANGE OUTDOOR UNIT CONTROLLER	
▣ 14 TIMES	ACTIVE VOLTAGE ABNORMAL	1. ABNORMAL OUTDOOR 2. ABNORMAL COMPRESSOR LOAD	1. CHANGE ODU CONTROLLER 2. CHECK THE COMPRESSOR
▣ 15 TIMES	CIRCUIT ABNORMAL	· CHANGE OUTDOOR UNIT CONTROLLER	
▣ 16 TIMES	HIGH LORD STOP	1. SERVICE VALVE CLOSE 2. OBSTACLE SURROUND THE ODU MAY CAUSE 3. CLOGGED FILTER IN INDOOR	1. CHECK SERVICE VALVE 2. REMOVE THE OBSTRUCTION 3. CHECK FILTER UNIT CAUSE.



## ※OTHERS CHECK POINTS

1. DIAGNOSIS FOR [REVERSING VALVE OPERATION ERROR] ;  
 ⇒ CHECK REVERSING VALVE WIRE CONNECTION EITHER WIRE BROKEN OR NOT, IF OK CHECK 3.15A FUSE, IF BROKEN REPLACE FUSE OR ODU CONTROLLER.
2. [WHEN DISPLAY THE COMMUNICATION ERROR OR THE OUTDOOR DO NOT RUN AT ALL],  
 ⇒ PLEASE CHECK THE CONTINUITY OF THE INDOOR ↔ OUTDOOR CONNECTING CORD (F CABLE).

## [OUTDOOR FAN MOTOR CHECK] DIAGNOSIS METHOD

1. PUT THE POWER OFF.
2. REMOVE THE OUTDOOR FAN MOTOR'S CONNECTOR FROM "CN24"
3. ROTATE THE FAN MOTOR BY HAND AND CHECK WHETHER THE FAN MOTOR IS LOCKED OR NOT.
4. MEASURE THE RESISTANCE BETWEEN EACH TERMINAL OF THE FAN MOTOR CONNECTOR.  
 NORMAL RESISTANCE BETWEEN EACH TERMINAL: 60~100Ω  
 ※ INSERT THE FAN MOTOR'S CONNECTOR AFTER FINISHING STEPS 1 TO 4.

※OTHERS SELF-DIAGNOSIS CONTENTS REFER TO THE SERVICE MANUAL.

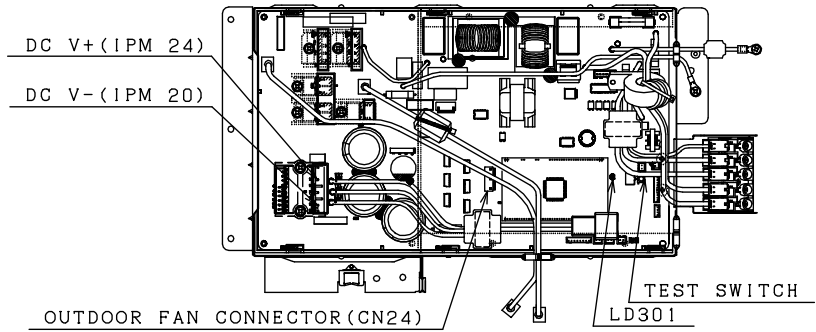
# SELF-DIAGNOSIS LIGHTING MODE

MODEL RAC-42/50WPD

## ⚠ DANGER (DC350V)

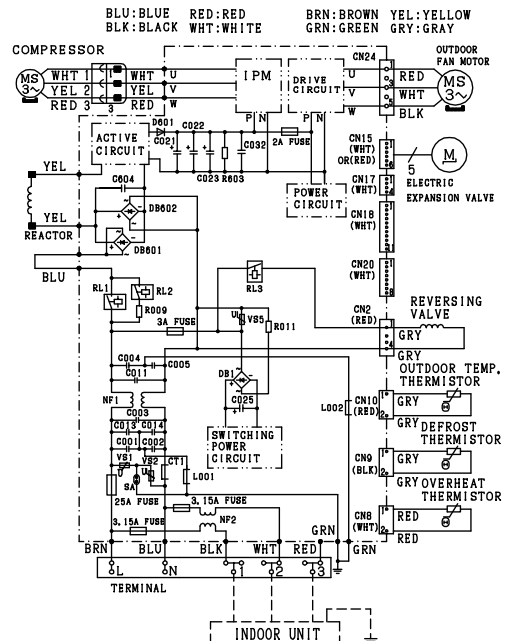
- CUT THE POWER SOURCE AND WAIT MORE THAN 10 MINUTES BEFORE SERVICE WORK.
- CONFIRM THE DC VOLTAGE AT THE MEASURING POINT SHOWN IN BELOW FIGURE MUST BE LESS THAN 10V.

DURING STOP	
LD301	CONTENTS
LIGHT	NORMAL OPERATION
2 SEC LIGHTING AND 0.3 SEC LIGHTS OUT REPETITION	OVERLOAD OPERATION(NORMAL OPERATION)



DURING STOP			
SELF-DIAGNOSIS BLINKING MODE		☒:BLINK ☐:OFF	
LD301 (RED)	SELF DIAGNOSIS CONTENTS	MAIN CHECK POINT	HOW TO REPAIR
☐	OFF	NORMAL STOP (STOPPED BY INDOOR THERMOSTAT OR MAIN OPERATION OFF)	1. NO NEED TO CHECK → 1. NOT ANY MALFUNCTION
☒	ONCE	RESET STOP	1. MICROPROCESSOR WAS REBOOTED → 1. CHANGE ODU CONTROLLER
☒	2 TIMES	PEAK CURRENT CUT	1. ODU CONTROLLER DEFECTIVE → 1. CHANGE ODU CONTROLLER 2. COMPRESSOR ABNORMAL LOAD → 2. CHECK THE COMPRESSOR
☒	3 TIMES	ABNORMAL LOW SPEED ROTATION	1. ODU CONTROLLER DEFECTIVE → 1. CHANGE ODU CONTROLLER 2. COMPRESSOR ABNORMAL LOAD → 2. CHECK THE COMPRESSOR
☒	4 TIMES	SWITCHING FAILURE	1. COMPRESSOR CONNECTOR OPEN → 1. INSERT THE CONNECTOR 2. COMPRESSOR ABNORMAL LOAD → 2. CHECK THE COMPRESSOR 3. ODU CONTROLLER DEFECTIVE → 3. CHANGE ODU CONTROLLER
☒	5 TIMES	OVERLOAD LOWER LIMIT CUT	1. OBSTACLE SURROUND THE ODU MAY CAUSE → 1. REMOVE THE OBSTRUCTION 2. OTHER CAUSE → 2. CHECK CYCLE PIPE
☒	6 TIMES	OH THERMISTOR TEMPERATURE RISE	1. DUE TO OPEN CONNECTOR → 1. INSERT THE CONNECTOR 2. LEAKAGE OF REFRIGERANT → 2. CHECK THE CYCLE PIPE AND RECHARGE THE REFRIGERANT 3. OTHER CAUSE → 3. CHANGE ODU CONTROLLER
☒	7 TIMES	THERMISTOR ABNORMAL	1. CONNECTOR INSERT MISS → 1. INSERT PROPERLY 2. OPEN CIRCUIT/SHORT CIRCUIT OF THERMISTOR WIRE → 2. CHANGE THE THERMISTOR 3. ODU CONTROLLER DEFECTIVE → 3. CHANGE ODU CONTROLLER
☒	9 TIMES	COMMUNICATIONS ERROR	1. F CABLE MISS CONNECTION → 1. F CABLE CONNECT PROPERLY 2. F CABLE DISCONNECTION → 2. CHANGE THE F CABLE 3. ODU CONTROLLER DEFECTIVE → 3. CHANGE ODU CONTROLLER 4. IDU CONTROLLER DEFECTIVE → 4. CHANGE IDU CONTROLLER
☒	10 TIMES	ABNORMAL POWER SOURCE	1. REACTOR IS UNCONNECTED → 1. CONNECT REACTOR PROPERLY 2. ABNORMAL AC INPUT: OUT OF THE RANGE (230±10%) → 2. CONNECT TO NORMAL AC POWER SOURCE 3. AC INPUT IS NORMAL → 3. CHANGE ODU CONTROLLER
☒	11 TIMES	ODU FAN STOP BY STRONG REVERSE WIND	1. OUTDOOR FAN STOP BY STRONG REVERSE WIND → 1. IT WILL RE-START AFTER THE WIND BECOME WEAK
☒	12 TIMES	OUTDOOR FAN LOCK ERROR	1. OUTDOOR FAN STOP BY STRONG REVERSE WIND → 1. AUTOMATICALLY RE-START AFTER WIND BECOME WEAK 2. PROPELLER FAN LOCK → 2. REMOVE THE OBSTRUCTION 3. OUTDOOR FAN MOTOR LOCK → 3. CHANGE THE FAN MOTOR 4. OUTDOOR FAN MOTOR OK → 4. CHANGE ODU CONTROLLER
☒	13 TIMES	EEPROM READ ERROR	• CHANGE OUTDOOR UNIT CONTROLLER
☒	14 TIMES	ACTIVE VOLTAGE ABNORMAL	1. ABNORMAL OUTDOOR CONTROLLER → 1. CHANGE ODU CONTROLLER 2. ABNORMAL COMPRESSOR LOAD → 2. CHECK THE COMPRESSOR
☒	15 TIMES	CIRCUIT ABNORMAL	• CHANGE OUTDOOR UNIT CONTROLLER
☒	16 TIMES	HIGH LOAD STOP	1. SERVICE VALVE CLOSE → 1. CHECK SERVICE VALVE 2. OBSTACLE SURROUND THE ODU MAY CAUSE → 2. REMOVE THE OBSTRUCTION 3. CLOGGED FILTER IN INDOOR UNIT CAUSE. → 3. CHECK FILTER

## WIRING DIAGRAM



\*ODU=OUTDOOR UNIT, IDU=INDOOR UNIT

### [OUTDOOR FAN MOTOR CHECK]DIAGNOSIS METHOD

1. PUT THE POWER OFF.
2. REMOVE THE OUTDOOR FAN MOTOR'S CONNECTOR FROM 'CN24'.
3. ROTATE THE FAN MOTOR BY HAND AND CHECK WHETHER THE FAN MOTOR IS LOCKED OR NOT.
4. MEASURE THE RESISTANCE BETWEEN EACH TERMINAL OF THE FAN MOTOR CONNECTOR. NORMAL RESISTANCE BETWEEN EACH TERMINAL:30-60Ω

\*INSERT THE FAN MOTOR'S CONNECTOR AFTER FINISHING STEPS 1 TO 4.

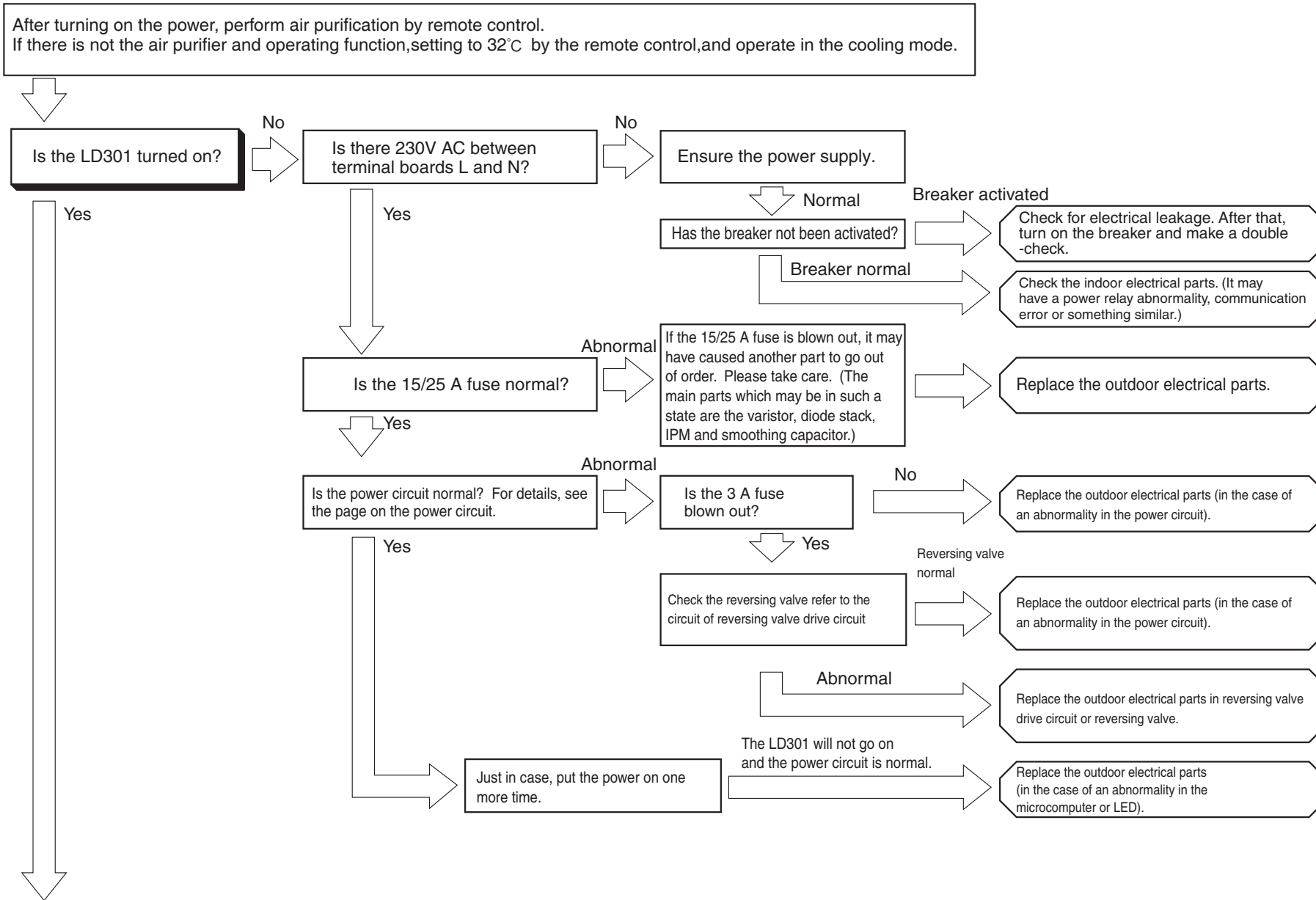
### \*OTHERS CHECK POINTS

1. DIAGNOSIS FOR [REVERSING VALVE OPERATION ERROR] ;  
→ CHECK REVERSING VALVE WIRE CONNECTION EITHER WIRE BROKEN OR NOT. IF OK CHECK 3.15A FUSE. IF BROKEN REPLACE FUSE OR ODU CONTROLLER.
2. [WHEN DISPLAY THE COMMUNICATION ERROR OR THE OUTDOOR DO NOT RUN AT ALL].  
→ PLEASE CHECK THE CONTINUITY OF THE INDOOR ↔ OUTDOOR CONNECTING CORD(F CABLE).

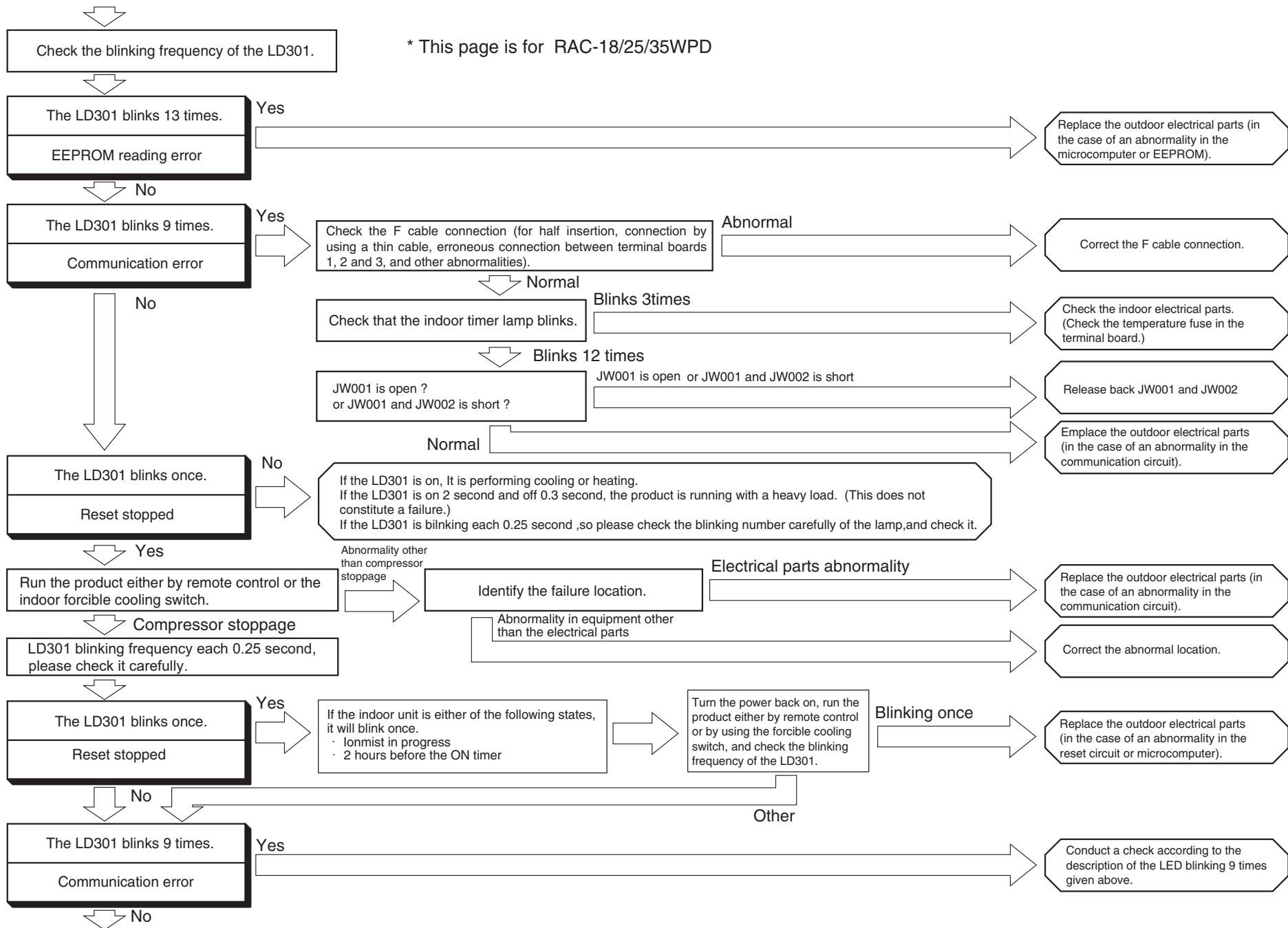
\*OTHERS SELF-DIAGNOSIS CONTENTS REFER TO THE SERVICE MANUAL.



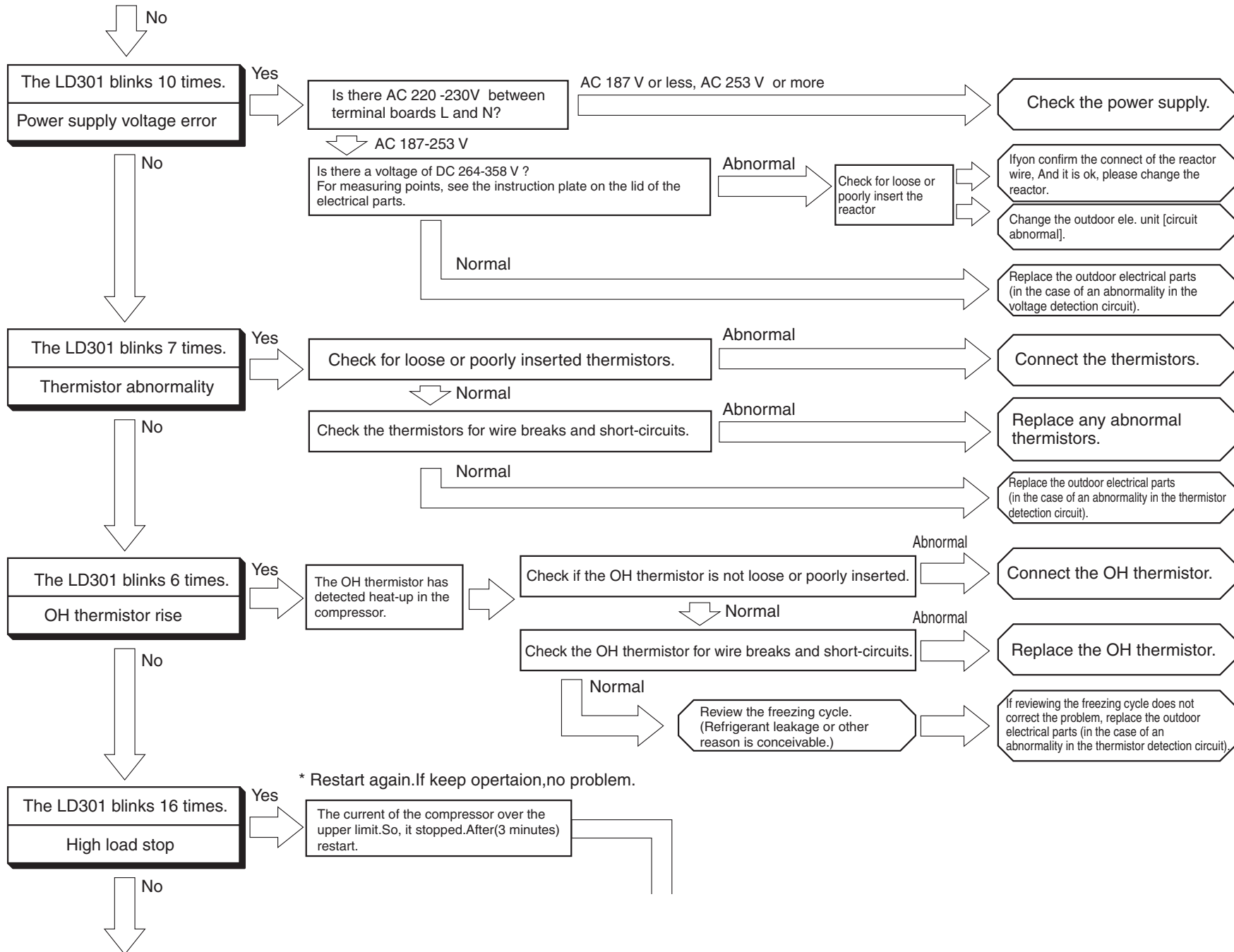
Checking the electrical parts of the outdoor unit

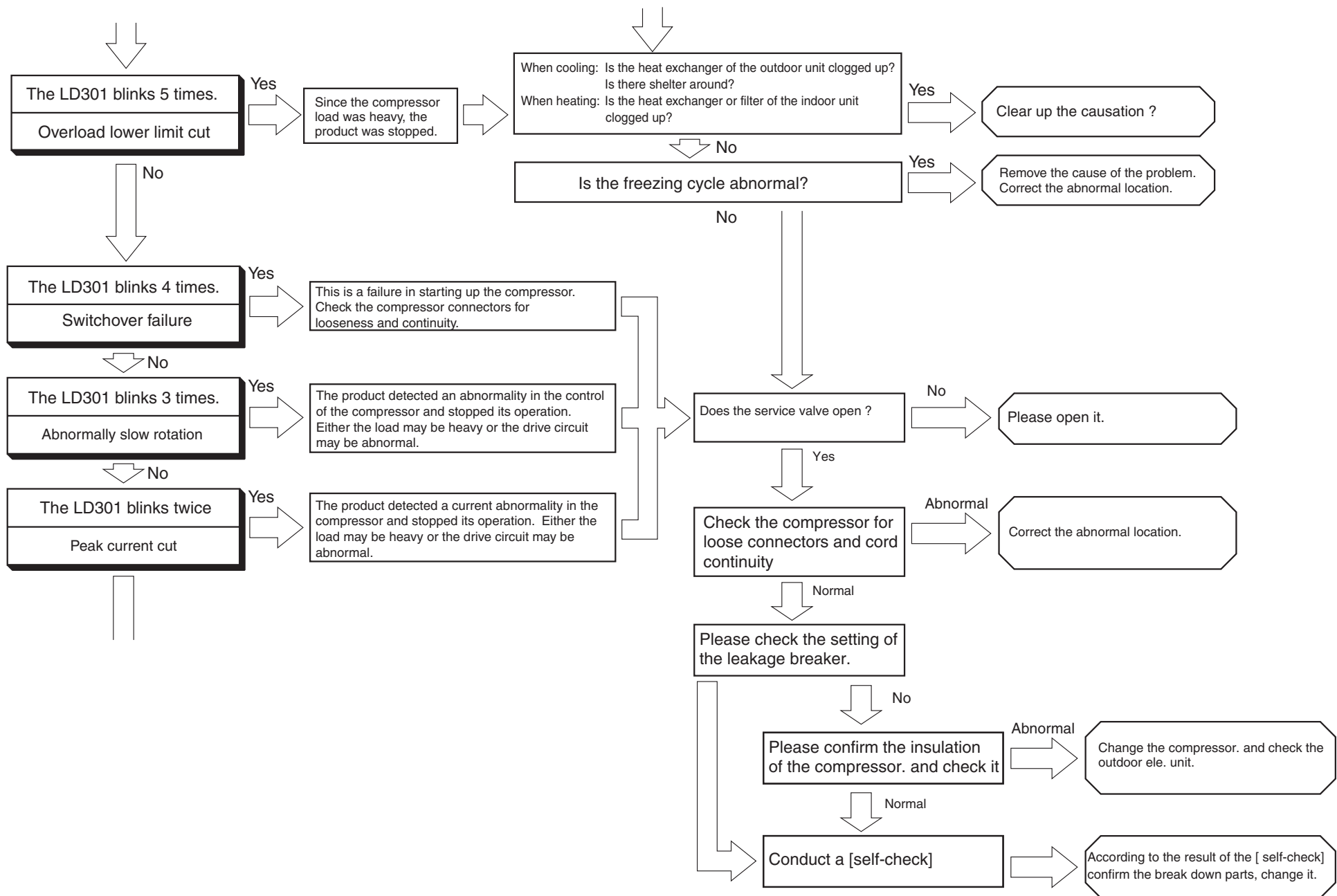


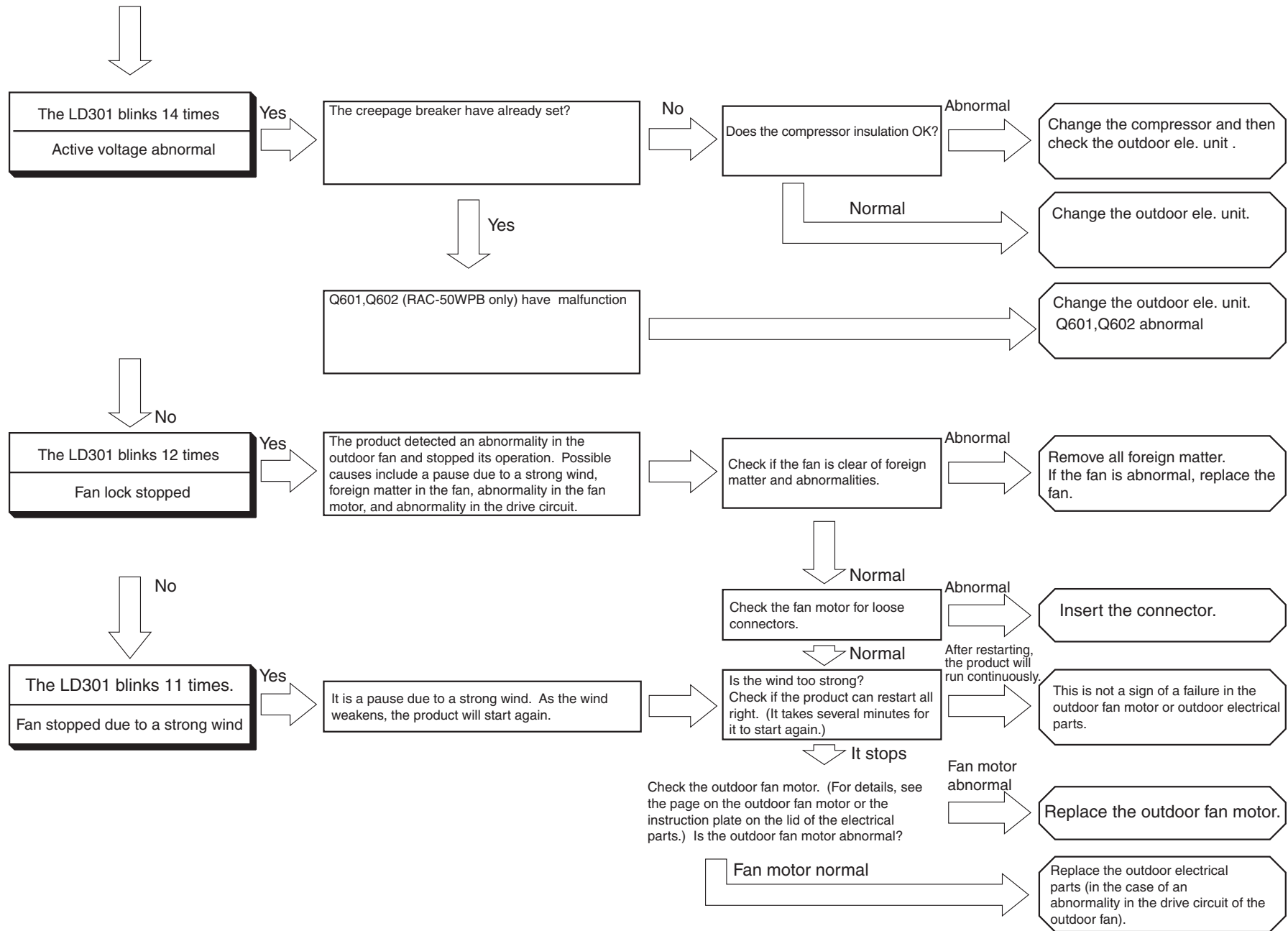
\* This page is for RAC-18/25/35WPD









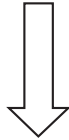


# CHECKING THE REFRIGERATING CYCLE

## (JUDGING BETWEEN GAS LEAKAGE AND COMPRESSOR DEFECTIVE)

### 1. Troubleshooting procedure (No operation, No heating, No cooling)

Connect U,V,W phase leads to the power module again and operate the air conditioner.



Is the self-diagnosis lamp mode as shown on the right?

Lighting mode Self-diagnosis lamp	Blinks 2 times	Blinks 3 times	Blinks 4 times	Blinks 5 times	Blinks 6 times	Blinks 8 times
LD301						
Time until the lamp lights	Approx. 10 seconds		Approx. 10 seconds	Within Approx. 30 seconds	Approx. 10 seconds	
Possible malfunctioning part	Compressor			Gas leakage	Compressor	

Blinking off

Outdoor air temperature (°C)	Charge port pressure MPa(G) {kgf/cm <sup>2</sup> (G)}
50	2.96 {30.14}
45	2.62 {26.72}
40	2.31 {23.58}
35	2.03 {20.73}
30	1.78 {18.14}
25	1.55 {15.79}
20	1.34 {13.66}
15	1.15 {11.74}
10	0.98 {10.02}
5	0.83 {8.48}
0	0.70 {7.10}
-5	0.58 {5.89}
-10	0.47 {4.81}

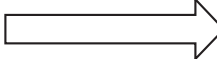
(R32)  
The values above are the theoretical ones.

YES



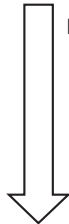
Stop to operate and check the gas pressure in balancing mode.

Normal



• Checking the IPM (main P.W.B.)

Error (Gas leaking)

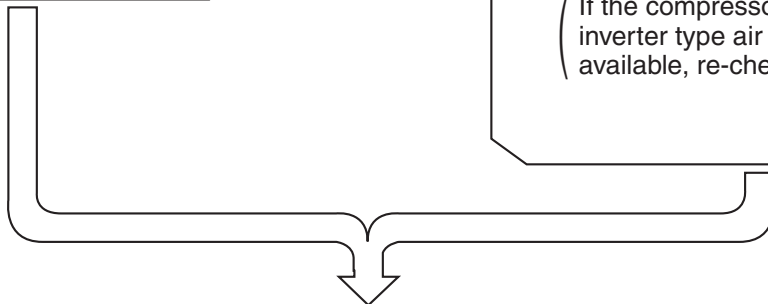


Gas leaks.  
Repair and seal refrigerant.

When the self-diagnosis lamp lights in the same condition as above.



The compressor is defective. Replace it and seal refrigerant.  
( If the compressor checker for an inverter type air conditioner is available, re-check using it. )



Perform a final check of operation.

## How to run the product with the outdoor unit test switch

If the indoor electrical parts is out of order and if you wish to run the outdoor unit

1. Turn on the outdoor terminal boards L and N (220-230 V AC).
2. Confirm that the "LD301" blinks once from the terminal side of the outdoor unit. Afterwards (when about 30 sec elapses after the power turns on), confirm that the "LD301" changes to blinking 9 times (communication error).
3. When the "LD301" is blinks 9 times, if you press the test switch, the "LD301" lights up.

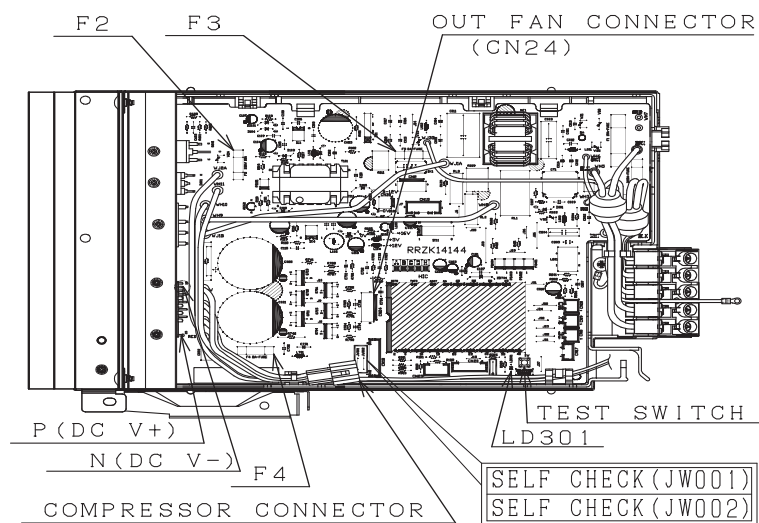
If you release your finger from the test switch within 1 sec to 5 sec after pressing the switch, the forced cooling operation starts.

※(If you press the test switch for 5 sec or longer, the self-check diagnosis starts. In this case, turn the power off and start the procedure from 1 again.)

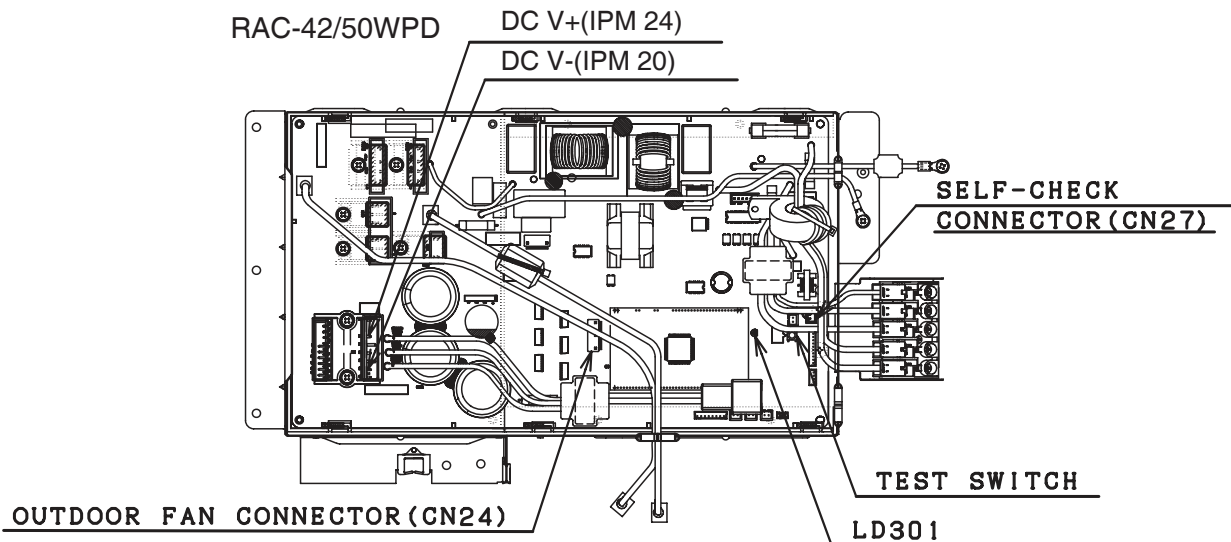
※(For the initialization of the expansion valve, it may take 1 min until the operation starts.)

4. When you press the test switch again for 1 sec or longer, the unit stops the operation.

RAC-12/25/35WPD



RAC-42/50WPD





※Cautions

1. Applying power directly to the outdoor unit will cause a rush current to stress the outdoor unit. Therefore, if the indoor unit is not out of order, do not use the method described in 2).
2. Before making the connections, be sure to turn off the breaker.
3. Do not under any circumstances run the product for more than 5 minutes.
4. Doing work with the compressor connector removed will cause the LD301 to blink 4 times. It will not start.
5. For another test run, turn off the breaker and turn it back on. (The test switch is accepted only once after power-on. After operation by remote control, it is not accepted.)
6. When the operation with the test switch is over, turn off the breaker and set the connectors back.

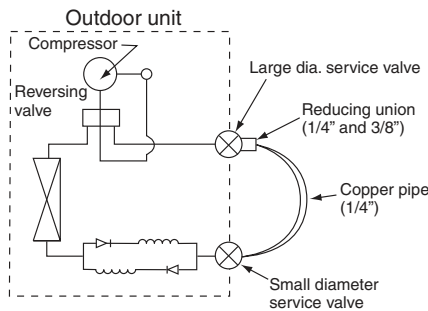
## HOW TO OPERATE THE OUTDOOR UNIT INDEPENDENTLY

### RAC-18/25/35WPD

1. Connect the large dia. pipe side and small dia. pipe side service valve using a pipe.

Connect the small diameter service valve and the large diameter service valve using the reducing union and copper pipe as shown on the right.

Charge refrigerant of 300g after vacuuming (※1)



#### Parts to be prepared

- (1) Reducing union  
1/4" (6.35 mm)  
3/8" (9.52 mm)
- (2) Copper pipe (1/4" and 3/8")

Do not operate for more than 5 minutes

The operation method is the same as "How to operate using the connector to servicing the outdoor unit".

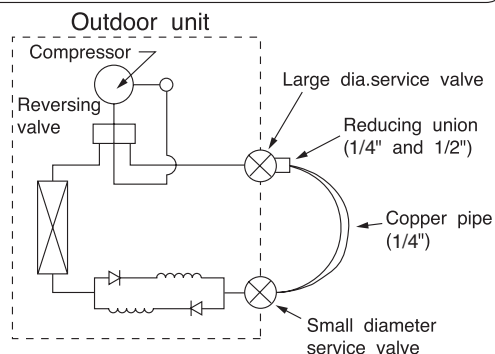
※1 The charging amount of 300g is equivalent to the load in normal operation.

### RAC-42/50WPD

1. Connect the large dia. pipe side and small dia. pipe side service valves using a pipe.

Connect the small diameter service valve and the large diameter service valve using the reducing union and copper pipe as shown on the right.

Charge refrigerant of 300g after vacuuming (※1)



#### Parts to be prepared

- (1) Reducing union  
1/4" (6.35mm)  
1/2" (12.7mm)
- (2) Copper pipe (1/4" and 1/2")
- (3) Shorting leads  
2 leads approx. 10 cm long  
with alligator clip or IC clip

Do not operate for 5 minutes or more.

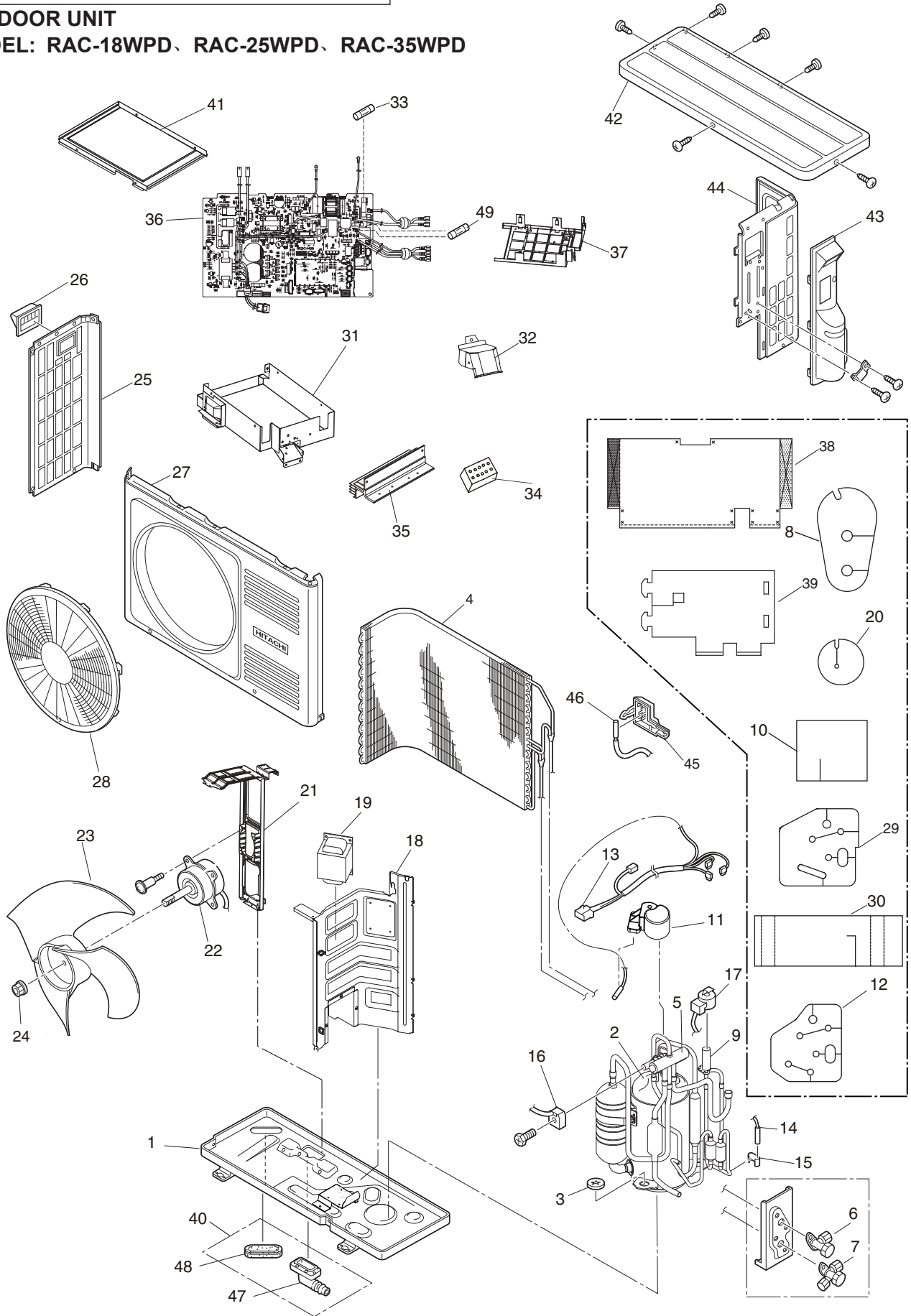
The operation method is the same as "How to operate using the connector to servicing the outdoor unit".

※1 The charging amount of 300g is equivalent to the load in normal operation.

# PARTS LIST AND DIAGRAM

## OUTDOOR UNIT

MODEL: RAC-18WPD、RAC-25WPD、RAC-35WPD



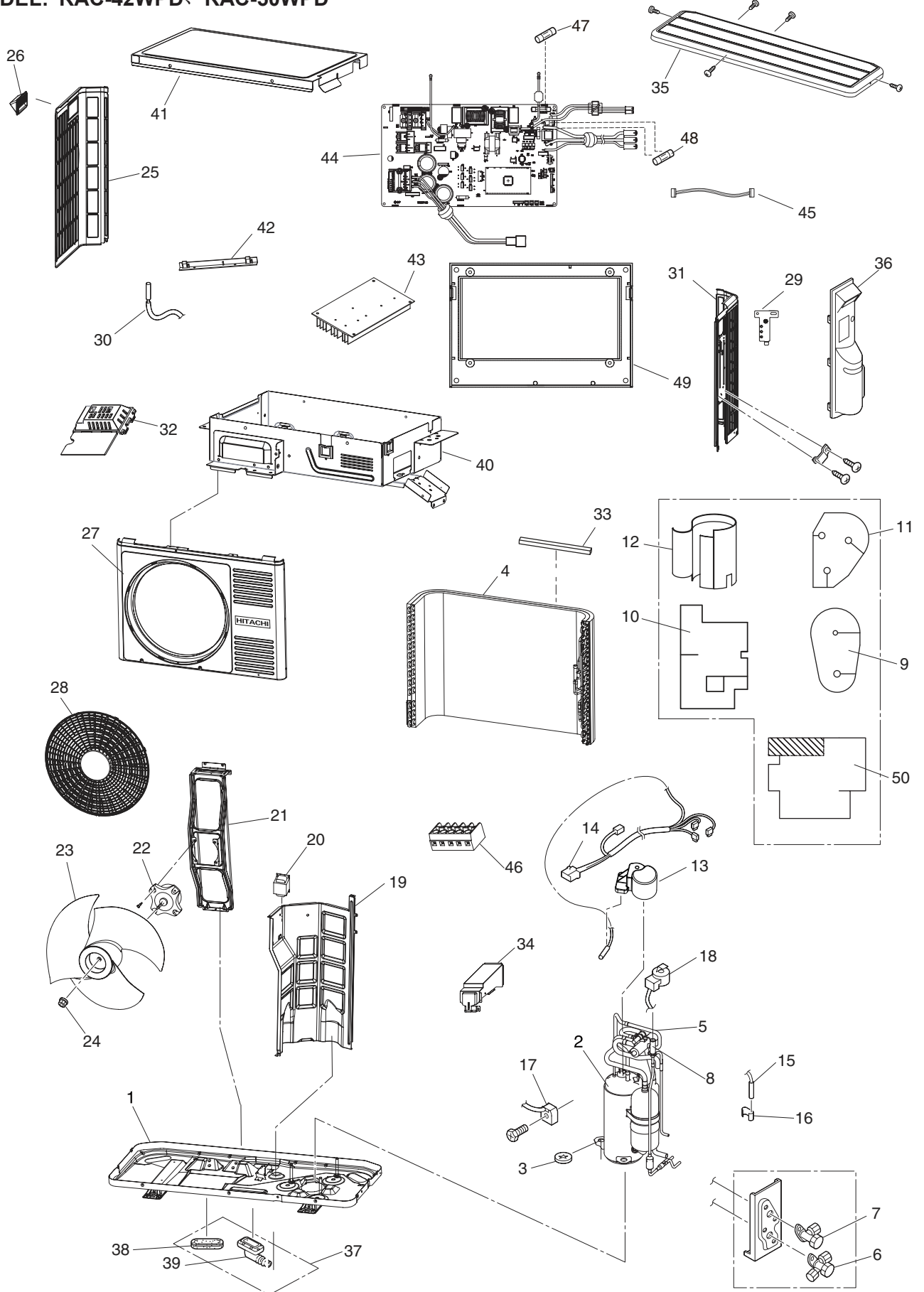
## OUTDOOR UNIT

NO	JCH-WH PARTS NO	Q' TY/UNIT	PARTS NAME
1	HWRAC-35WPC A01	1	BASE
2	HWRAC-18WED A02	1	COMPRESSOR
3	HWRAC-25YH4 A04	3	PUSH NUT
4	HWRAC-18WPD A01	1	CONDENSER
5	HWRAC-18WPD A02	1	REVERSING VALVE
6	HWRAC-50WEA A06	1	2S-VALVE
7	HWRAC-10GH5 A03	1	3S-VALVE
8	HWRAC-SX10HAK A09	1	SOUND PROOF COVER ASSEMBLY
9	HWRAC-18WPD A03	1	ELECTRIC EXPANSION VALVE
10	HWRAC-25WXA A04	1	SOUND PROOF COVER ASSEMBLY
11	HWRAC-18WEB A07	1	O. L. R COVER
12	HWRAC-18WPD A04	1	SOUND PROOF COVER ASSEMBLY
13	HWRAC-18WED A06	1	CONNECTING CORD (COMP)
14	HWRAC-E10H2 A09	1	THERMISTOR (DEFROST)
15	HWRAC-25WX8 A02	1	THERMISTOR SUPPORT
16	HWRAC-25WXD A09	1	COIL (REVERSING VALVE)
17	HWRAC-50WED A07	1	COIL (EXPANSION VALVE)
18	HWRAC-18WPD A05	1	PARTITION
19	HWRAC-18WED A07	1	REACTOR 1
20	HWRAC-35WPB A05	1	SOUND PROOF COVER ASS' Y
21	HWRAC-14EH4 A08	1	FAN MOTOR SUPPORT
22	HWRAC-50WED A10	1	FAN MOTOR
23	HWRAC-18WED A09	1	PROPELLER FAN
24	HWRAC-50NX2 A25	1	NUT (PROPELLER. FAN)
25	HWRAC-25YH4 A25	1	SIDE COVER (L)
26	HWRAC-25YH4 A26	1	HANDLE
27	HWRAC-35WPC A08	1	FRONT COVER
28	HWRAC-E14H3 909	1	DISCHARGE GRILL
29	HWRAC-18WPD A06	1	SOUND PROOF COVER ASS' Y
30	HWRAC-18WPD A07	1	SOUND PROOF COVER ASS' Y
31	HWRAC-35WPC A09	1	ELECTRIC PARTS PLATE
32	HWRAC-18WPD A08	1	TERMINAL COVER
33	HWRAC-18WPD A09	1	FUSE (15A)
34	HWRAC-50WED A16	1	TERMINAL BOARD (5P)
35	HWRAC-25YHA5 A21	1	HEAT SINK (REGURATOR1)
36	HWRAC-18WPD A10	1	P. W. B (CONTROL)
	HWRAC-25WPD A01	1	P. W. B (CONTROL)
	HWRAC-35WPD A01	1	P. W. B (CONTROL)
37	HWRAC-35WPC A11	1	SUPPORT (P. W. B CONTROL)
38	HWRAC-18WPD A11	1	SOUND PROOF COVER ASS' Y
39	HWRAC-18WPD A12	1	SOUND PROOF COVER ASS' Y
40	HWRAC-25YH4 A48	1	BUSH ASSEMBLY
41	HWRAC-18WPD A13	1	ELECTRIC PARTS COVER
42	HWRAC-14EH4 A16	1	TOP COVER
43	HWRAC-18WPD A14	1	SERVICE VALVE COVER
44	HWRAC-E14H3 915	1	SIDE COVER (R)
45	HWRAC-14EH4 A15	1	COVER (OUT DOOR THERMISTOR)
46	HWRAC-E14H3 914	1	THERMISTOR (OUTDOOR TEMPERATURE)
47	HWRAC-25YH4 A50	1	DRAIN PIPE
48	HWRAC-25YH4 A49	1	BUSH
49	HWRAC-25WXD A11	2	FUSE (3. 15A)

# PARTS LIST AND DIAGRAM

## OUTDOOR UNIT

MODEL: RAC-42WPD, RAC-50WPD



## OUTDOOR UNIT

NO	JCH-WH PARTS NO	Q' TY/UNIT	PARTS NAME
1	HWRAC-50WPC A01	1	BASE
2	HWRAC-50WED A01	1	COMPRESSOR
3	HWRAC-50NX2 A04	3	PUSH NUT
4	HWRAC-50WEC A01	1	CONDENSER
5	HWRAC-42WPD A01	1	REVERSING VALVE
6	HWRAC-50WEA A05	1	SERVICE VALVE
7	HWRAC-50WEA A06	1	SERVICE VALVE
8	HWRAC-50WED A03	1	ELECTRIC EXPANSION VALVE
9	HWRAC-50WED A04	1	SOUND PROOF
10	HWRAC-50WPC A04	1	SOUND PROOF
11	HWRAC-50WEC A07	2	SOUND PROOF
12	HWRAC-42WPD A02	1	SOUND PROOF
13	HWRAC-25WXD A08	1	O. L. R COVER
14	HWRAC-50WEA A12	1	CONNECTING CORD (COMP)
15	HWRAC-50NX2 A16	1	THERMISTOR (DEFROST)
16	HWRAC-50NX2 A17	1	THERMISTOR SUPPORT
17	HWRAC-25WXD A09	1	COIL (REVERSING VALVE)
18	HWRAC-50WED A07	1	COIL (EXPANSION VALVE)
19	HWRAC-50WED A08	1	PARTITION
20	HWRAC-50WED A09	1	REACTOR
21	HWRAC-50WEB A02	1	FAN MOTOR SUPPORT
22	HWRAC-42WPD A03	1	FAN MOTOR
23	HWRAC-50WEC A12	1	PROPELLER FAN
24	HWRAC-50NX2 A25	1	NUT (PROPELLER FAN)
25	HWRAC-50NX2 A26	1	SIDE COVER (L)
26	HWRAC-50NX2 A27	1	HANDLE
27	HWRAC-50WED A11	1	FRONT COVER
28	HWRAC-50WEC A14	1	DISCHARGE GRILL
29	HWRAC-50WEA A14	1	EARTH-PLATE
30	HWRAC-E14H3 914	1	THERMISTOR (OUTDOOR TEMPERATURE)
31	HWRAC-50WED A12	1	SIDE COVER (R)
32	HWRAC-18WSPA A24	1	TC-COVER
33	HWRAC-50WEC A15	1	H-SHEET
34	HWRAC-50WEC A16	1	TERMINAL COVER
35	HWRAC-SX18HAK A28	1	TOP COVER
36	HWRAC-50WED A13	1	SERVICE VALVE COVER
37	HWRAC-50NX2 A36	1	BUSH ASSEMBLY
38	HWRAC-50NX2 A37	2	BUSH
39	HWRAC-50NX2 A38	1	DRAIN PIPE
40	HWRAC-50WEC A17	1	ELECTRIC PARTS PLATE
41	HWRAC-50WED A14	1	ELECTRIC PARTS COVER
42	HWRAC-50WEB A07	2	SUPPORT2 (P. W. B. )
43	RAC-1F50KVY014	1	HEAT SINK
44	HWRAC-42WPD A04	1	P. W. B. (MAIN)
	HWRAC-50WPD A01	1	P. W. B. (MAIN)
45	HWRAC-50WEB A11	2	CORD (REACTOR)
46	HWRAC-50WED A16	1	TERMINAL BOARD (5P)
47	HWRAC-50WED A17	1	FUSE (25A)
48	HWRAC-25WXD A11	2	FUSE (3. 15A)
49	HWRAC-50WEB A13	1	SUPPORT1 (P. W. B. )
50	HWRAC-25WXD A04	1	SOUND PROOF

# HITACHI

**RAC-18WPD  
RAC-25WPD  
RAC-35WPD  
RAC-42WPD  
RAC-50WPD**

**JCH-WH NO.0109E**