# HITACHI

# **SERVICE MANUAL**

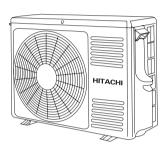
**TECHNICAL INFORMATION** 

FOR SERVICE PERSONNEL ONLY

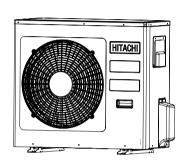
# RAC-25WXEN RAC-35WXEN RAC-50WXEN

JCH-WH NO.0123E

#### **OUTDOOR UNIT**







RAC-50WXEN

### REFER TO THE FOUNDATION MANUAL

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#### **SPECIFICATIONS**

TYPE				DC INVERTER				
TIPE			OUTDOOR UNIT OUTDOOR UNIT OUTDOOR UNIT					
MODEL			RAC-25WXEN	RAC-25WXEN RAC-50WXEN RAC-50WXEN				
POWER SO	URCE		1 PHASE,50Hz,220-230V	0-230V 1 PHASE,50Hz,220-230V 1 PHASE,50Hz,220-230V				
	TOTAL INP	UT (W)	481 (250~1,000)	814 (250~1,400)	1,397 (500~2,100)			
COOLING	TOTAL AMP	PERES (A)	2.92-2.79	3.74-3.57	6.36-6.09			
COOLING	CAPACITY (KW)		2.50 (0.90~3.10)	3.50 (0.90~4.00)	5.00 (1.90~5.20)			
	OAI AOITT	(B.T.U./h)	8,530 (3,070~10,580)	11,940 (3,070 ~13,650)	17,060 (6,480~17,740)			
	TOTAL INPUT (W) TOTAL AMPERES (A) CAPACITY (KW) (B.T.U./h)		593 (250~1,200)	800 (250~1,600)	1,415 (500~2,700)			
LIEATING			2.73-2.61	3.67-3.51	6.44-6.16			
HEATING			3.20 (0.90~4.20)	4.00 (0.90~4.80)	5.80 (2.20~7.00)			
			10,920 (3,070~14,330)	13,650 (3,070~16,380)	19,790 (7,510~23,880)			
		W	792(+65)**	792(+65) <sup>*</sup>	800(+63)**			
DIMENSION (mm)	IS	Н	600	600	736			
, ,		D	299(+27.5) <sup>**</sup>	299(+27.5)**	350(+35.5) <sup>*</sup> *			
NET WEIGH	IT	(Kg)	38.2	38.2	51.7			

\* After installation

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

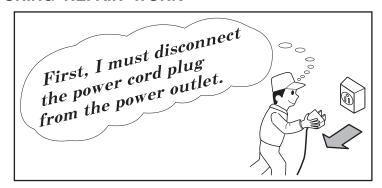
# ROOM AIR CONDITIONER

**OUTDOOR UNIT** 

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

#### SAFETY DURING REPAIR WORK

 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.
- 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.
- 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
- 10. Any inflammable object must not be placed about the location of installation.

at a new location.

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.

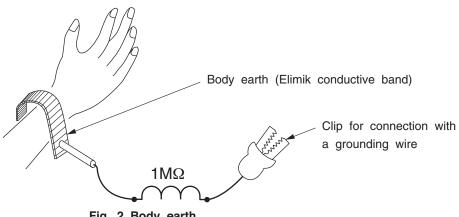


Fig. 2 Body earth

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

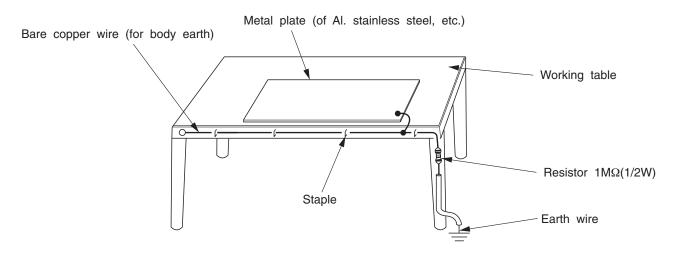


Fig.3 Grounding of the working table

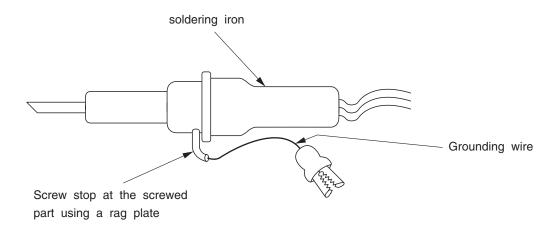


Fig.4 Grounding a solder iron

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

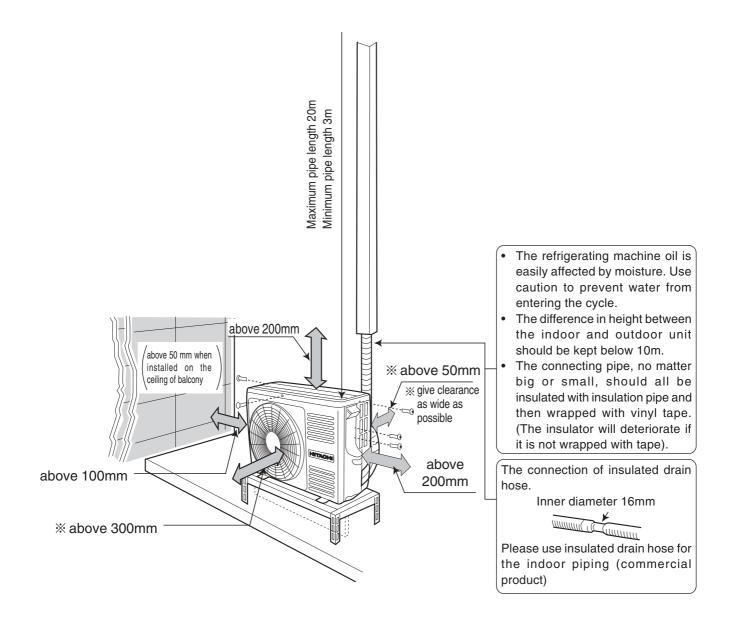
(7) In checking circuits for maintenance, inspection, or some others, be careful not to have the test probes of the measuring instrument short circuit a load circuit or the like.

## **A** CAUTION

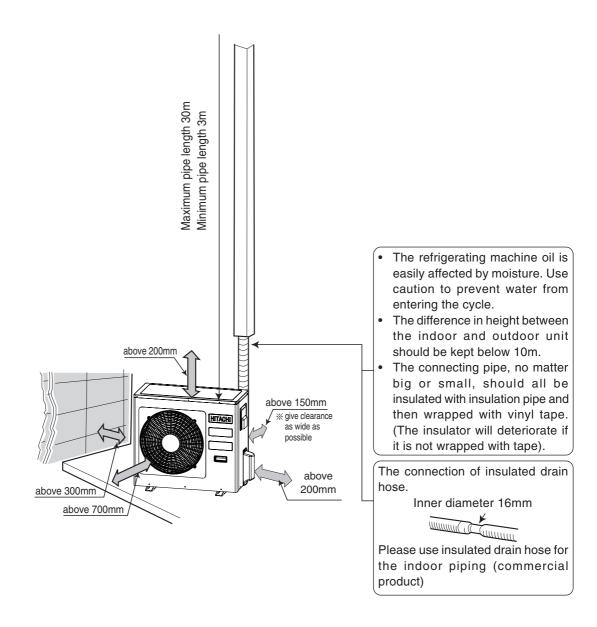
- 1. In quiet or stop operation, slight flowing noise of refrigerant in the refrigerating cycle is heard occasionally, but this noise is not abnormal for the operation.
- 2. When it thunders near by, it is recommend to stop the operation and turn off the circuit breaker for safety.
- 3. In the event 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°C (14°F).
- This room air conditioner (the reverse cycle) should not be used when the outside temperature is below -20°C (5°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**

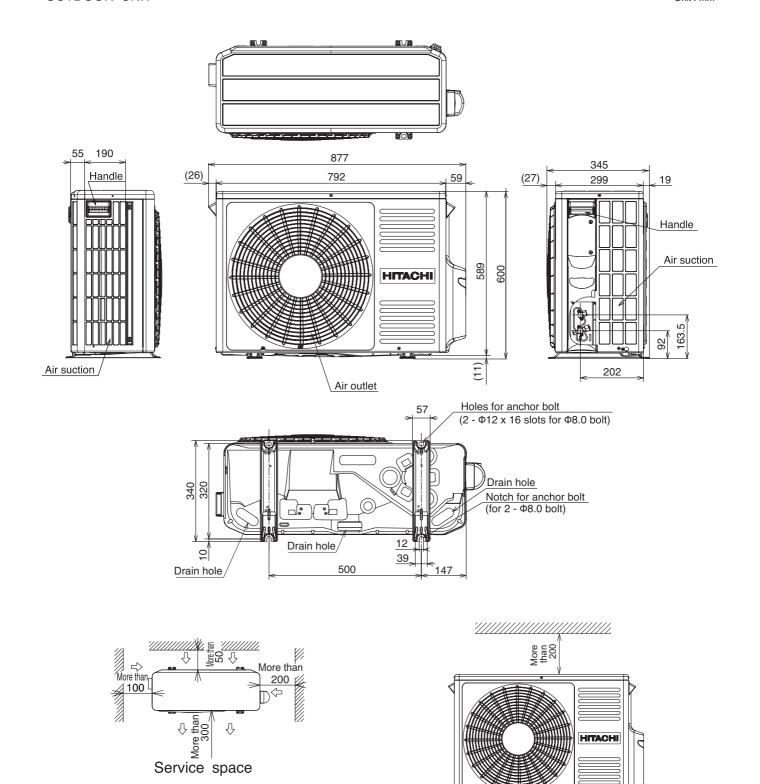
			Т			
MODEL		RAC-	25/35WXEN	RAC-50WXEN		
FAN MOTOR		47W (DC120~380V)				
FAN MOTOR CAPACITOR			NO			
FAN MOTOR PROTECTOR			NO			
COMPRESSOR		GSD	102UKQA6JT6A	GTD1	41UKQA8JT6	
COMPRESSOR MOTOR CAP	ACITOR		NO			
OVERLOAD PROTECTOR			YES(INTEF	RNAL)		
OVERHEAT PROTECTOR			YES			
FUSE (for MICROPROCESSC	PR)		25A, 2A, 3A	A, 3.15A		
POWER RELAY			HF16	61F		
POWER SWITCH		NO				
TEMPORARY SWITCH		NO				
SERVICE SWITCH		YES				
TRANSFORMER		YES				
VARISTOR		TVR10471,ERZVA9V431				
NOISE SUPPRESSOR		YES				
THERMOSTAT		YES(IC)				
REMOTE CONTROL SWITCH CRYSTAL)	(LIQUID	NO				
SHEATHED HEATER		200W(AC 230V)				
REFRIGERANT CHARGING			980g	1300g		
VOLUME (Refrigerant R32)	UNIT	PIPES (MAX. 20m) (MIN. 3m)	WITHOUT REFRIGERANT BECAUSE COUPLING IS FLARE TYPE.	PIPES (MAX. 30m) (MIN. 3m)	WITHOUT REFRIGERANT BECAUSE COUPLING IS FLARE TYPE.	



# Figure showing the installation of Indoor and Outdoor unit MODEL RAC-50WXEN



Unit: mm



#### NOTE:

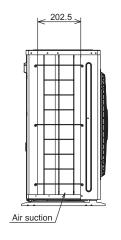
- 1. For outdoor unit installation, allow at least 2 sides of space around the unit ensure ventilation flue.
- 2. The connecting pipe, should all the insulated with insulation pipe.
- 3. Piping length is within 20m.
- 4. Height different of the piping between the indoor unit and outdoor unit should be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

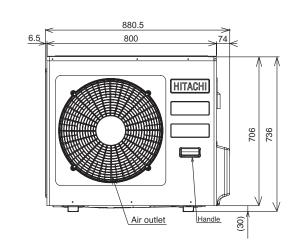
#### CONSTRUCTION AND DIMENSIONAL DIAGRAM

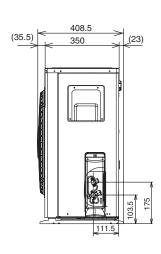
MODEL RAC-50WXEN OUTDOOR UNIT

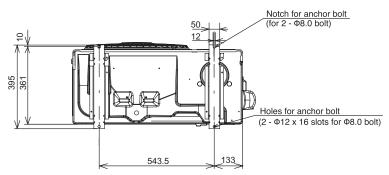
Unit: mm

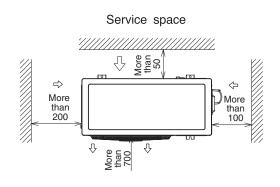


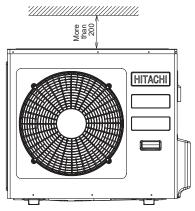












#### NOTE:

- 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-25/35/50WXEN
POWER SOURCE	DC : 120 - 380V
OUTPUT	47W
CONNECTION	WHT(V)  M  RED(U)  BLK(W)

BLU : BLUE YEL : YELLOW BRN : BROWN WHT : WHITE GRY : GRAY ORN : ORANGE GRN : GREEN RED : RED

BLK : BLACK PNK : PINK VIO : VIOLET

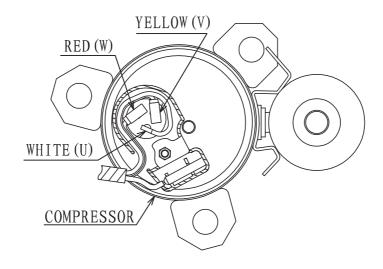
#### MAIN ELECTRIC COMPONENTS FOR OUTDOOR UNIT

PARTS NAME	RESISTANCE VALUE( $\Omega$ )	APPLICABLE MODELS
COIL(REVERSING VALVE)	2780 Ω ( 0 )°C	RAC-25/35/50WXEN
COIL(EXPANSION VALVE)	46 Ω/PHASE (AT 20 °C )	RAC-25/35/50WXEN
REACTOR	5.3 (mH) 67 m Ω MAX (20 °C)	RAC-25/35/50WXEN
SHEATHED HEATER	266 Ω (20 °C)	RAC-25/35/50WXEN

#### **COMPRESSOR MOTOR**

#### Compressor Motor Specifications

MODEL		RAC-25/35WXEN	RAC-50WXEN	
COMPRESSOR TYPE		GSD102UKQA6JT6A	GTD141UKQA8JT6	
POWER SOURCE		220 - 350 V	220 - 350 V	
OUTPUT		790W	1400W	
CONNECTION		(U) O WHITE  M M M (W) (V) O YELLOW O RE	D	
20°C		2M= 1.354	2M= 1.354	
RESISTANCE VALUE (Ω)	75°C			



RAC-25/35/50WXEN

### **ACAUTION**

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.

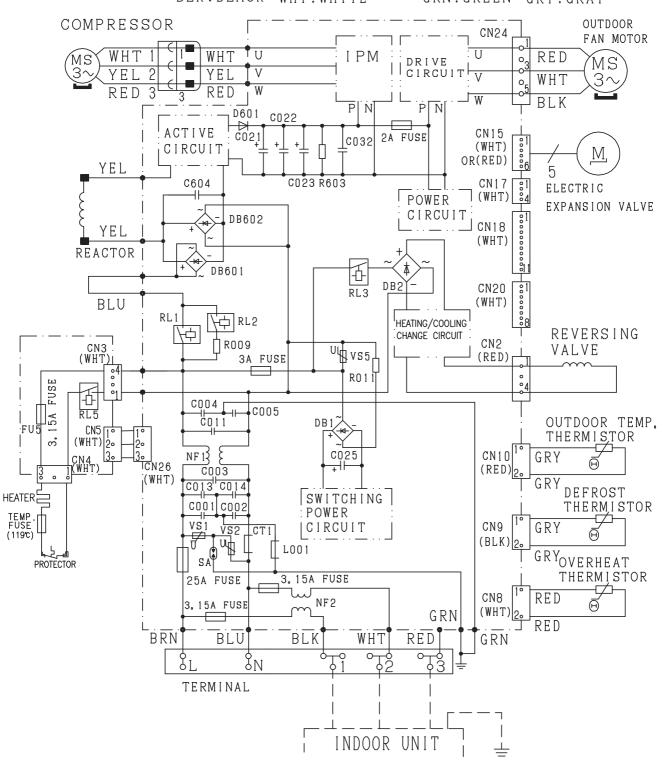
#### **WIRING DIAGRAM**

OUTDOOR UNIT

MODEL RAC-25/35/50WXEN

# WIRING DIAGRAM

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



MODEL RAC-25/35/50WXEN Revision

Output

Description

Revision

JP01

Description

JP02

JP02 The parts inside the dashed line should be closer with each other on the PWB. The parts inside the dashed line should be closer with each other on the PWB. HIC-OV R441 R441 Cool/Heat changing relay  $\vdash$ X 1 用辺(破線部)は A 面実装 RL3 4 way valve relay R-PCB Electrical expansion valve A CN15 XA-6P(RED) RL1 power relay coil RL3 4 way valve relay coil RL2 inrush current relay coil RL4 Cool/Heat changing relay coil OH Thermistor XA-2P (WHT) CN9

DEF Thermistor XA-2P (BLK) CN10

Out Temperature 1 2

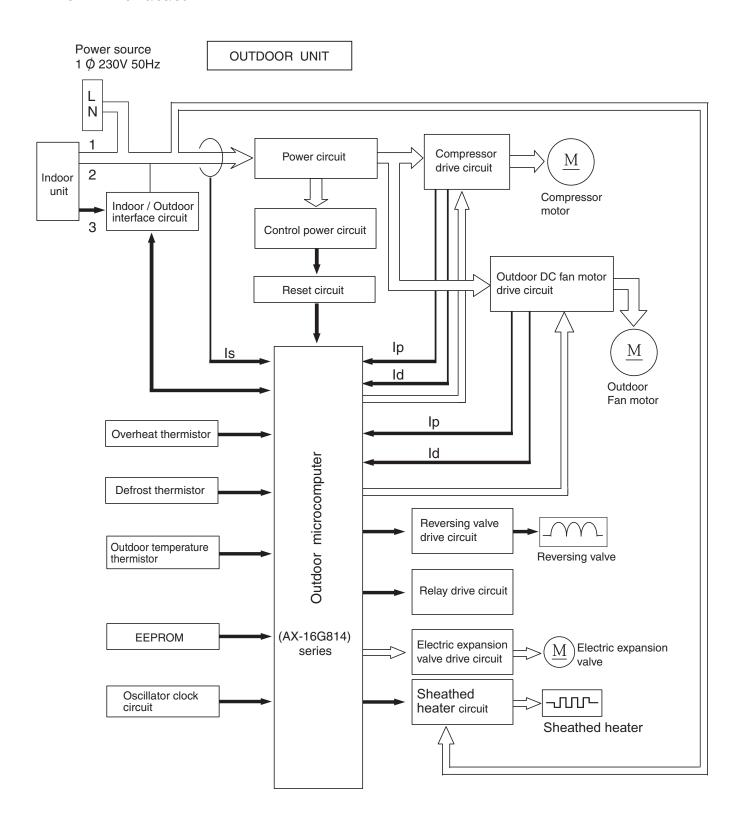
Thermistor XA-2P (RED)

M基板与R基板				加区全似			
R	The color   The	Part	E1一ズ Fuse   Image	Resistance	Fig.   Resistance   Resistanc	Symbol   September   Symbol   September   Symbol   September   S	Section   Sect

HIC基板

M基板与R基板

#### MODEL RAC-25/35/50WXEN



#### SHEATHED HEATER

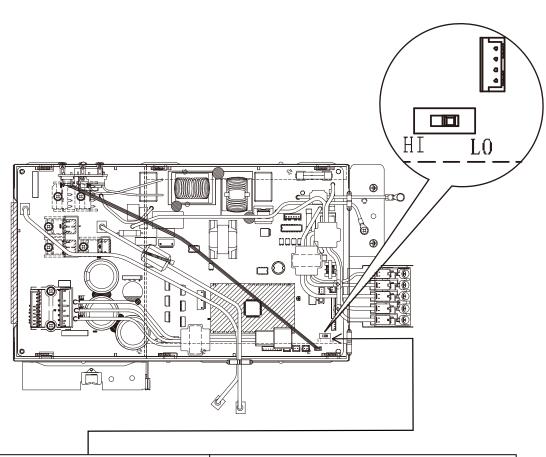
MODEL RAC-25/35/50WXEN

# **SHEATHED HEATER TO SELECT SWITCH LO OR HI**



# **!** CAUTION

Before setting the switch, make sure to turn OFF power supply and then set the position of the switch otherwise will cause damage to the Main PCB.



SWITCH POSITION	OPEN THE TEMPERATURE
HI 💷 LO	-16.1 ℃
HI 🛄 LO	-0.1 ℃

### NOTE:

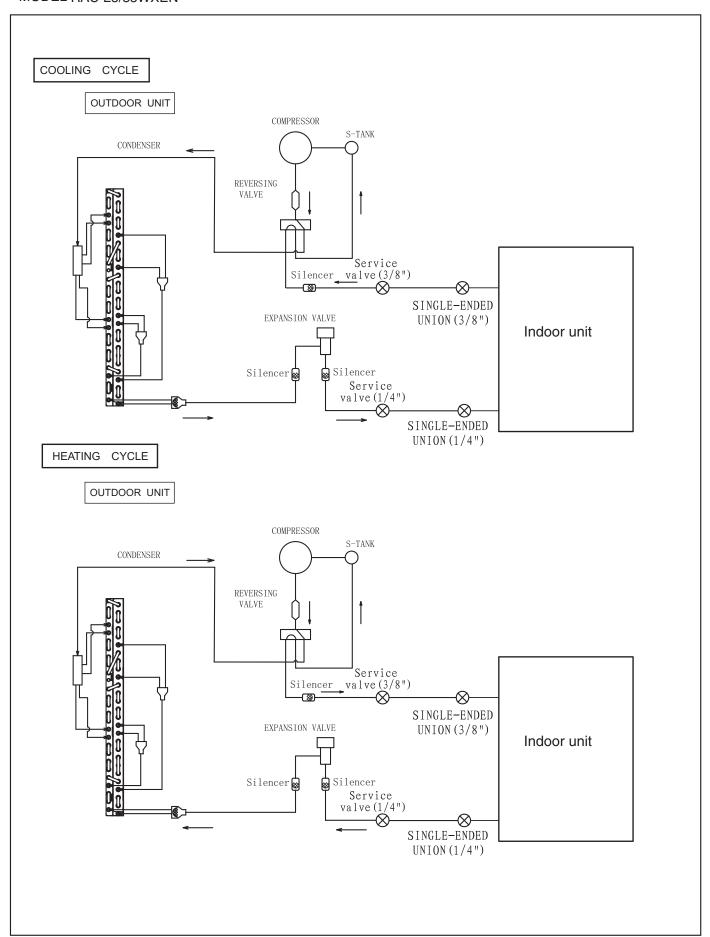
- 1. Factory default setting is at LO.
- 2. See page 17 for a detailed description of the sheathed heater.

# **Basic Sheathed Heater Operation**

Select Switch	Lo				Hi				
	Heating Op		Defrost	Thermo	Heating Op		Defrost	Thermo	
	Normal mo	de		Off	Normal mo	de		Off	
	Power ON	-16.1°C	1		Power ON	-0.1°C			
	Power OFF				Power OFF				
	1 GWGI GI I	10.10			1 OWEI OIT	2.0 0			
	Power ON	Power OFF			Power ON	Power OFF	-		
Outdoor Temp.									
10℃	-	-	-	-	-	-	ON	-	
9℃	-	-	-	-	-	-	ON	-	
8℃	-	-	-	-	-	-	ON	-	
7℃	-	-	-	-	-	-	ON	-	
6℃	-	-	-	-	-	-	ON	-	
5℃	-	-	-	-	-	-	ON	-	
4℃	-	-	-	-	-	-	ON	-	
3℃	-	-	-	-	-	-	ON	-	
2℃	-	-	-	-	_	ON	ON	-	
1℃	-	-	_	-	-	ON	ON	_	
0℃	_	_	_	_	_	ON	ON	_	
-1℃	_	_	_	_	ON	ON	ON	_	
-2℃	_	_	_	_	ON	ON	ON	_	
-3℃	_	_	_	_	ON	ON	ON	_	
<b>-4</b> ℃	_	_	_	_	ON	ON	ON	_	
-5℃		_		_	ON	ON	ON		
<u>-6℃</u>				<u> </u>	ON	ON	ON		
-7℃		_		<del>-  </del> -	ON	ON	ON		
-8°C		_			ON	ON	ON		
		_	_	<u> </u>	ON	ON	ON		
-10°C		_	_	<u> </u>	ON	ON	ON		
-10℃ -11℃	-	-		-	ON	ON	ON	-	
-11℃ -12℃	-	-	-	-	ON	ON	ON	-	
-12℃ -13℃	-	-	-	-				-	
-13℃ -14℃	-	ON	-	-	ON	ON	ON	-	
	-	ON	-	-	ON	ON	ON	-	
-15℃	-	ON	-	-	ON	ON	ON	-	
-16℃	ON	ON	ON	-	ON	ON	ON	-	
-17℃	ON	ON	ON	-	ON	ON	ON	-	
-18℃	ON	ON	ON	-	ON	ON	ON	-	
-19℃	ON	ON	ON	-	ON	ON	ON	-	
-20℃	ON	ON	ON	-	ON	ON	ON	-	
-21℃	ON	ON	ON	-	ON	ON	ON	-	
-22℃	ON	ON	ON	-	ON	ON	ON	-	
-23℃	ON	ON	ON	-	ON	ON	ON	-	
<b>-24</b> ℃	ON	ON	ON	-	ON	ON	ON	-	
<b>-25</b> ℃	ON	ON	ON	-	ON	ON	ON	-	
<b>-26</b> ℃	ON	ON	ON	-	ON	ON	ON	-	
<b>-27</b> ℃	ON	ON	ON		ON	ON	ON	-	
-28℃	ON	ON	ON	-	ON	ON	ON		
<b>-29</b> ℃	ON	ON	ON	-	ON	ON	ON	-	
-30℃	ON	ON	ON	_	ON	ON	ON	_	

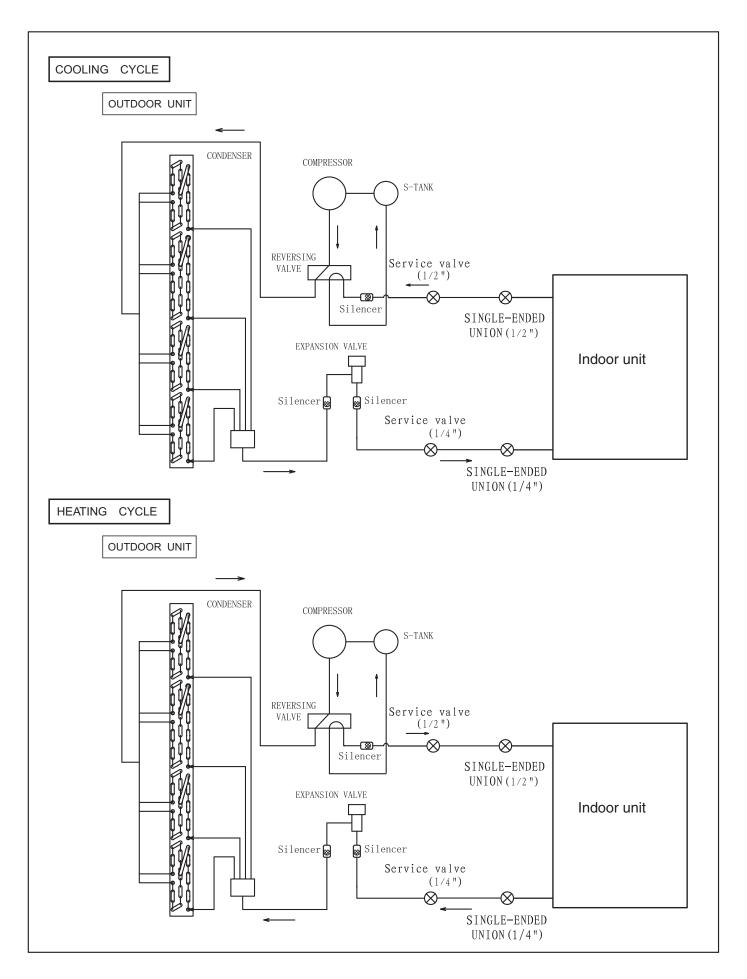
### REFRIGERATING CYCLE DIAGRAM

MODEL RAC-25/35WXEN



## REFRIGERATING CYCLE DIAGRAM

MODEL RAC-50WXEN



### **Procedure for Disassembly and Reassembly**

#### **OUTDOOR UNIT MODEL RAC-25/35WXEN**

#### 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.

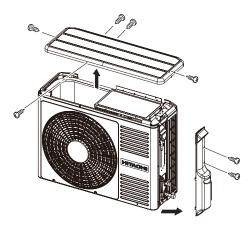


Fig. 1

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

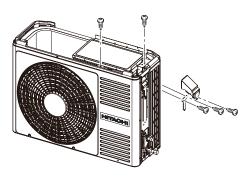


Fig. 2

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

#### **OUTDOOR UNIT MODEL RAC-50WXEN**

#### 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.

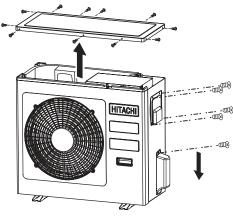
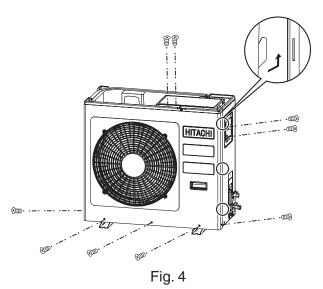


Fig. 3

- (3) Remove the front cover lock screw.
- (4) Lower the right side of the front cover and pull it forward. Then, remove the cover from the hook.
- (5) Pull the right side of the front cover a little and pull up the left side to remove it from the hook.



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

#### **DESCRIPTION OF MAIN CIRCUIT OPERATION**

#### 1. Power Circuit

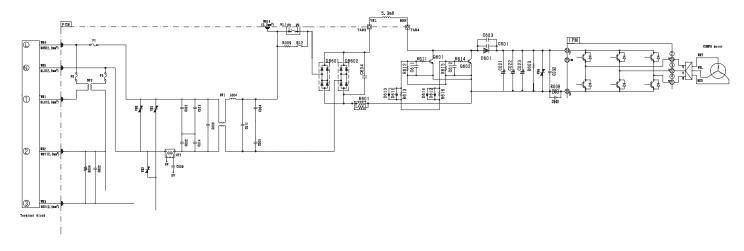


Fig 1-1

\* 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.

- **X** 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>

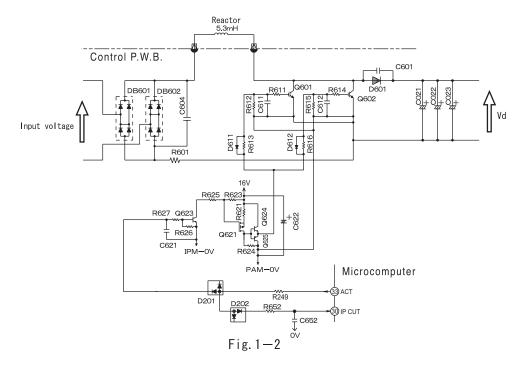
In case of Intelligence Power Module malfunction or connection failure immediately after compressor starts, its may stop due to error of [abnormal low speed], [switching failure],[Ip stop] and others.

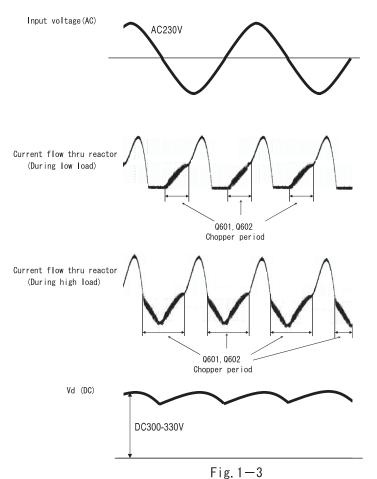
#### <Reference>

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 (CO21-CO23,500 $\mu$ F,450V)

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

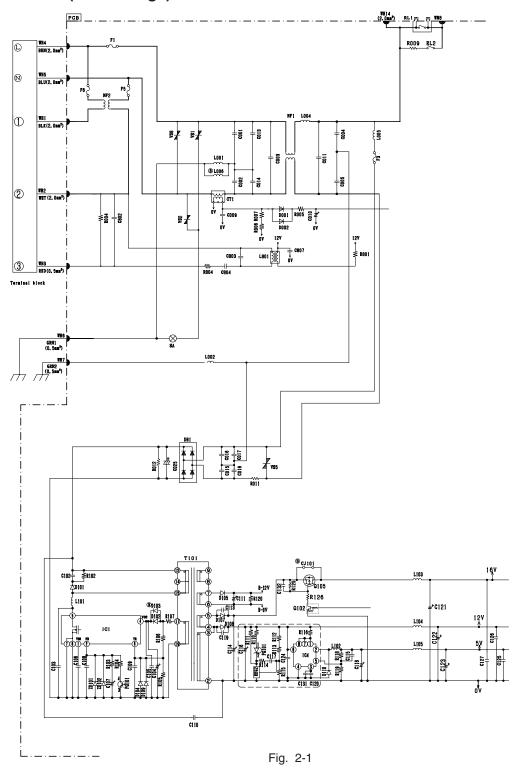




(4) IGBT to improve efficiency (Q601,Q602)

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)



- The 230V AC voltage is rectified to DC voltage (B-12V,16V,12V,5V) pass through switching control IC (ICI), 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

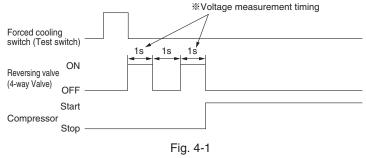
Voltage specification of power circuit as shown in below table. <Checking point>

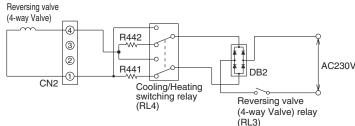
Output	Spec	Main Ioad	Measuring point	Example of possible failure mode.
5V 0/P	5 ±0.4V	Micon, Thermistor	Tester⊕ : L105 (JUMPER) Tester⊖ : D110 (EARTH)	Outdoor not operate, no blinking indication
12V 0/P	12 ±0.5V	Micon, IC2,3,4 Relay circuit	Tester⊕ : L104 (JUMPER) Tester⊖ : D110 (EARTH)	Outdoor not operate, no blinking indication
16V 0/P	15.5 <sup>+</sup> 1.5V - 1.0V	IPM for Comp IPM for DC fan	Tester⊕ : L103 (JUMPER) Tester⊝ : D110 (EARTH)	Stop: LD301 3,4 or 12 times blinking
B-12V O/P	13 + 2.5V - 1.0V	Expansion valve	Tester⊕ : R418(B-12V) Tester⊖ : C401("-")	Stop: LD301 5 times blinking

<sup>\*</sup> 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.





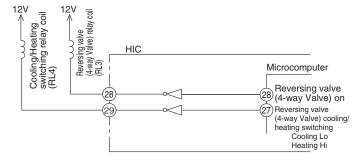


Fig. 4-2

- 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 [2500Ω±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		<ul><li>⊕ terminal of tester to CN2 pin 4</li><li>⊝ terminal of tester to CN2 pin 1</li></ul>	⊕ terminal of tester to CN2 pin ① ⊖ terminal of tester to CN2 pin ④
f 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.
Types of	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

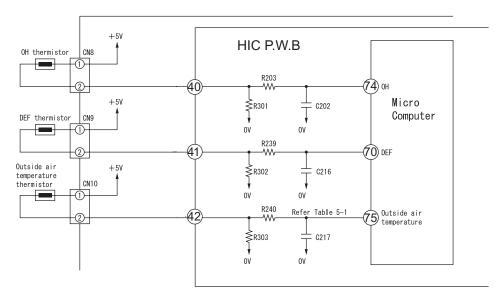


Fig. 5-1

- 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 (4) 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 70 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 condition or disconnect, microcomputer pin(70)(74)(75) 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

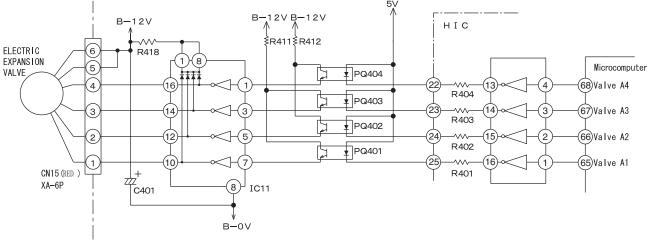


Fig. 6-1

- 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	0FF	0FF	0FF	0FF	0FF	ON
2	YEL	0FF	ON	ON	ON	0FF	0FF	0FF	0FF
3	ORG	0FF	0FF	0FF	ON	ON	ON	0FF	0FF
4	BLU	0FF	0FF	0FF	0FF	0FF	ON	ON	ON
Operation mode $1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8$ VALVE CLOSE									
$8 \rightarrow 7 \rightarrow 6 \rightarrow 5 \rightarrow 4 \rightarrow 3 \rightarrow 2 \rightarrow 1$ VALVE OPEN									

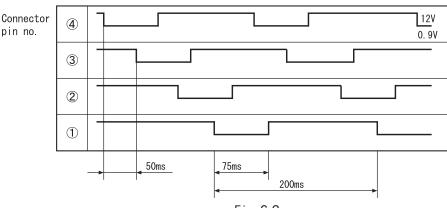


Fig. 6-2

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.

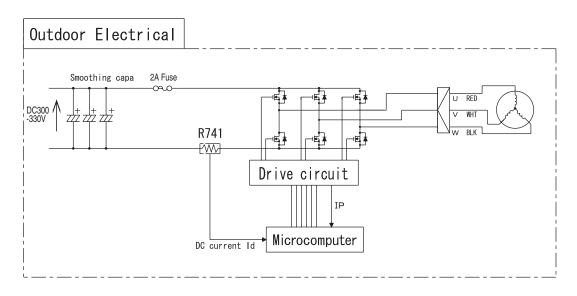


Fig 7-1

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

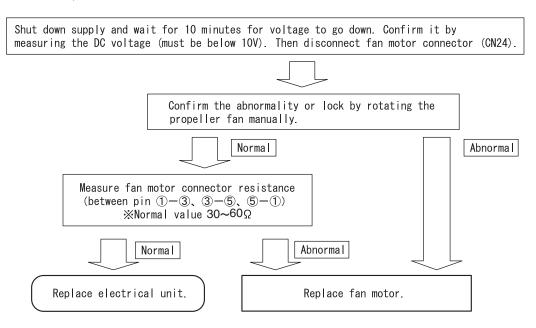
There is a case where fan rpm is reducing during rotating caused by interference of strong wind If this condition continue in long period, fan will stop rotating. (LD301 : 11 times blinking) The unit will restart according to control as per during start (1).

- (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



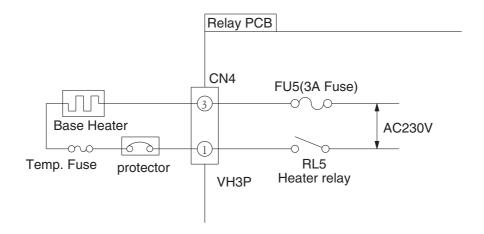
- 5. Reconnect again fan motor connector (CN24).
  - \*\*Please confirm above checking procedure if found 2A fuse blown.

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).

#### 8. Base Heater Circuit



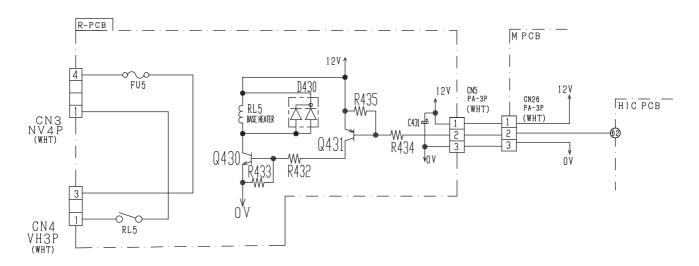


Fig 8-1

- When the outdoor temperature is lower than a certain temperature, the base heater begins to work and the defrosting ability is enhanced.
- When the outdoor temperature is higher than a certain temperature (7±3°C), the protector will work arel. The power supply of base heater will be cut off.
- When the base heater exceeds 119°C, the temp. fuse will act and cut off the power supply.

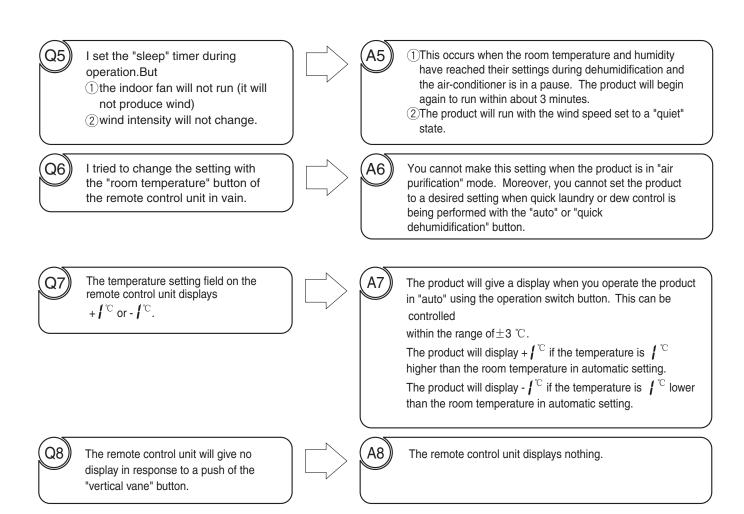
#### SERVICE CALL Q&A

#### Cooling operation Q1 The compressor sometimes Α1 Cooling when the room Check if the heat stops during cooling. temperature is low may exchanger of the indoor cause the heat exchanger unit is covered with dew. of the indoor unit to gather Wait for 3 to 4 minutes until the dew disappears. Dehumidification The indoor unit produces a noise that Q1 That is a noise produced by refrigerant flowing through goes "shaaahhh" during dehumidification. Cold air comes out during a To improve the dehumidification efficiency performs dehumidifying operation. quiet fan operation. Therefore the air is cold and it is not a malfunction. Q3 The operation does not stop even by It sets to perform dehumidifying operation by setting setting the temperature higher than the temperature slightly lower than remote controller room temperature on the remote setting. controller. Heating operation Q1 The product sometimes fails to Defrosting is in progress. Wait 5 to 10 minutes until the dew on the outdoor unit disappears. produce a wind during heating. Q2 At the first of the heating, the product will run for 30 seconds The product begins with a slight wind with a slight wind. When set to strong wind, the product will during heating even though set to begin with a slight wind operation, producing a weak wind for "strong wind" or "weak wind." 30 seconds, and then switch to strong wind. Q3 А3 When heating is conducted despite the high outdoor The product stops during heating temperature, the product may stop to protect its even though it is set to "30°C." equipment. Auto-fresh defrost Q1 During heating, I turned off the The "auto-fresh defrost" should be working. When product by using the START/STOP stopped, the product will check its outdoor unit for dew button. But the "operation lamp" is and, if there is any dew, conduct defrosting and then blinking and the outdoor unit is stop operating. running. Automatic operation Q1 During an automatic run, switching The product will switch automatically to automatic wind the wind speed selector will not speed. You cannot select strong or weak wind by change the wind speed. remote control but you can select wind and quiet. According to the room temperature, heating or How is the automatic operation mode determined? cooling operation is automatically selected. Refer to the basic operation section.

Common, etc.	
In "automatic wind speed" mode, the indoor fan changes from strong wind to weak wind to slight wind.	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.
At operation startup, the outdoor unit becomes noisy.	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.	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.
There is a difference between the temperature setting and room temperature in room temperature control.	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.
The product will not produce wind right after startup.	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.
I performed internal cleaning, but didn't succeed in controlling the mold in the room.	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.	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.	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.
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.
I tried to set the "sleep" timer while the ON timer is reserved. But it will not set itself to a desired time.	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.



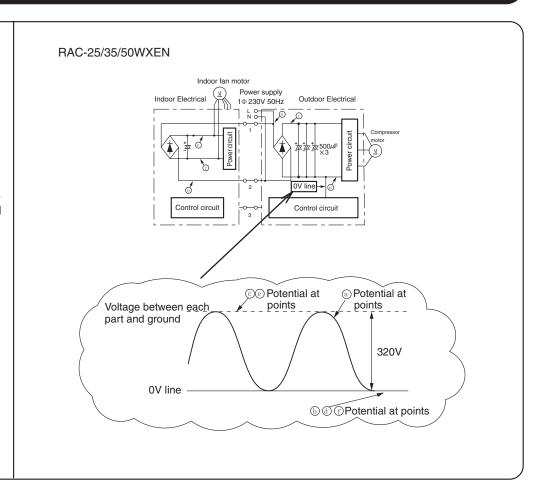
#### Inspection instructions



#### 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.



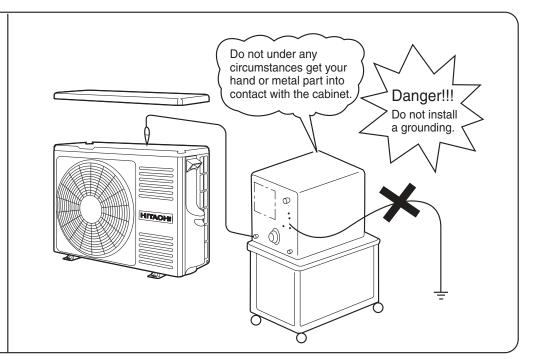




#### Warning

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





#### Caution

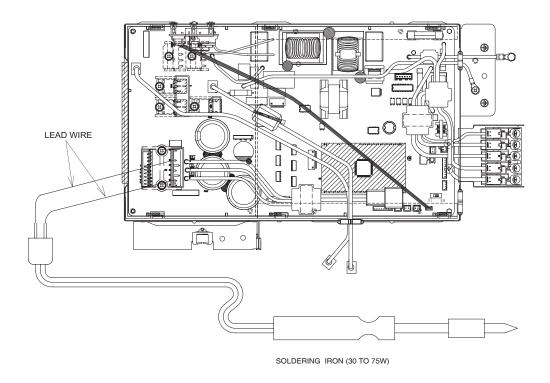
- Voltage of about 350 V is charged between the terminal of smoothing capacitors.
- During continuity check for each circuit part of the outdoor unit, be sure to discharge the smoothing capacitors.

#### **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-25/35/50WXEN



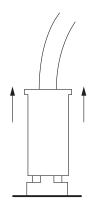
#### Other instructions

#### (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.

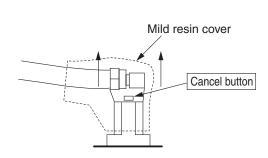
When reconnecting it, insert it securely all the way home.

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



Vertical (with a resin case)

Hold the resin case and pull it out.



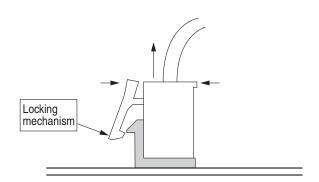
Horizontal (with a mild resin cover)

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.

# **Troubleshooting support**

Nº	Function	Description
1	[Display on the outdoor unit side]	<ul> <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> <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.</li> <li>(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.</li> <li>(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>

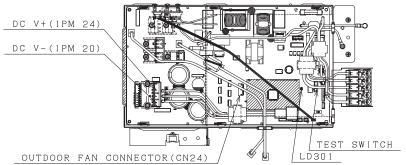
<sup>\*\*</sup>The "self-diagnosis function of the communication circuit" available in our conventional models is now incorporated as part of the normal self-diagnosis function. In the case of a failure in the communication circuit, you do not have to conduct a special operation and the operations can 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**

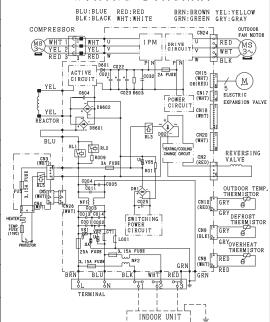
MODEL RAC-25/35/50WXEN



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



		5.1.5.1.1.2					
	DURING STOP						
S	SELF-DIAGNOSIS BLINKING MODE ☐:BLINK ☐:OFF						
LD301 (RED)	SELF DIAGNOSIS CONTENTS	MAIN CHECK POINT HOW TO REPAIR					
OFF	NORMAL STOP (STOPPED BY INDOOR THERMO- STAT OR MAIN OPERATION OFF)	1. NO NEED TO CHECK					
ONCE	RESET STOP	1. MICROPROCESSOR WAS					
2 TIMES	PEAK CURRENT CUT	1. ODU CONTOROLLER 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   I. REMOVE THE OBSTRUCTION THE ODU MAY CAUSE   2. CHECK CYCLE PIPE					
6 TIMES	OH THERMISTOR TEMPERATURE RISE	1. DUE TO OPEN 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	I. CONNECTOR INSERT MISS  2. OPEN CIRCUIT/SHORT CIR-  CUIT OF THERMISTOR WIRE  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	I.REACTOR IS UNCONNECTED					
11 TIMES	ODU FAN STOP BY STRONG REVERSE WIND	1.OUTDOOR FAN STOP BY STRONG REVERSE WIND THE WIND BECOME WEAK					
12 TIMES	OUTDOOR FAN LOCK ERROR	1. OUTDOOR FAN STOP BY \$\ightharpoonup 1. AUTOMATICALLY RE-START STRONG REVERSE WIND \$\ightharpoonup 1. AUTOMATICALLY RE-START AFTER WIND BECOME WEAK 2. PROPELLER FAN LOCK \$\ightharpoonup 2. REMOVE THE OBSTRUCTION 3. OUTDOOR FAN MOTOR OK \$\ightharpoonup 3. CHANGE THE FAN MOTOR A. OUTDOOR FAN MOTOR OK \$\ightharpoonup 4. CHANGE OUD CONTROLLER					
13 TIMES	EEPROM READ ERROR	·CHANGE OUTDOOR UNIT CONTROLLER					
14 TIMES	ACTIVE VOLTAGE ABNORMAL	1. ABNORMAL OUTDOOR ☐ 1. CHANGE ODU CONTROLLER CONTROLLER 2. ABNORMAL COMPRESSOR LOAD → 2. CHECK THE COMPRESSOR					
15 TIMES	CIRCUIT ABNORMAL	·CHANGE OUTDOOR UNIT CONTROLLER					
16 TIMES	-	1. SERVICE VALVE CLOSE  2. OBSTACLE SURROUND  THE ODU MAY CAUSE 3. CLOGGED FILTER IN INDOOR  UNIT CAUSE.					



WIRING DIAGRAM

\*\*ODU=OUTDOOR UNIT, IDU=INDOOR UNIT

[OUTDOOR FAN MOTOR CHECK]DIAGNOSIS METHOD

], 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
REFER TO THE SERVICE MANUAL,
\*\*INSERT THE FAN MOTOR'S CONNECTOR
AFTER FINE FAN MOTOR'S CONNECTOR
AFTER THIS HAND STEPS 1 TO 4,

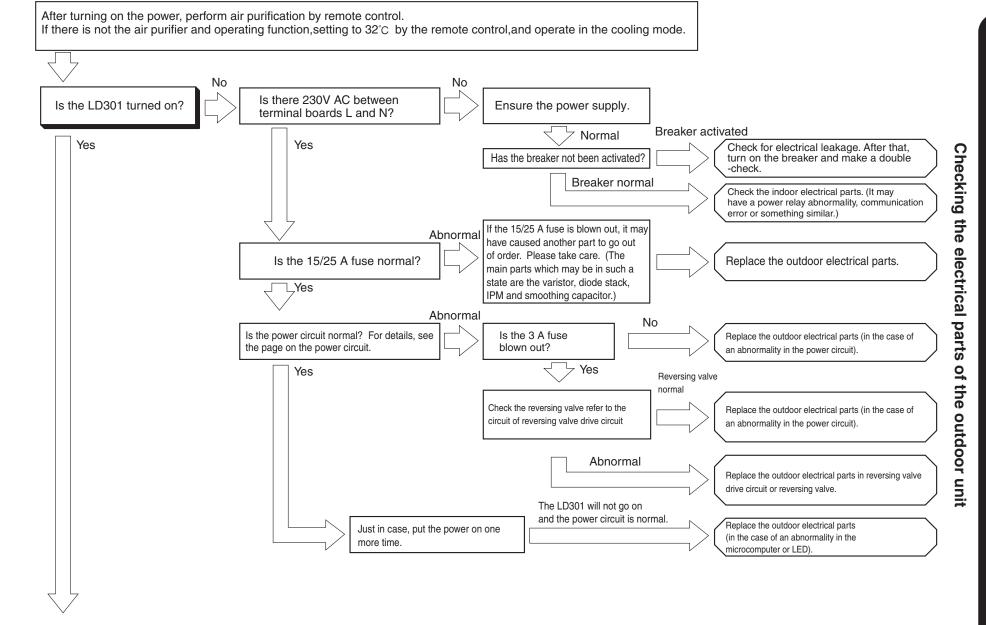
#### \*OTHERS CHECK POINTS

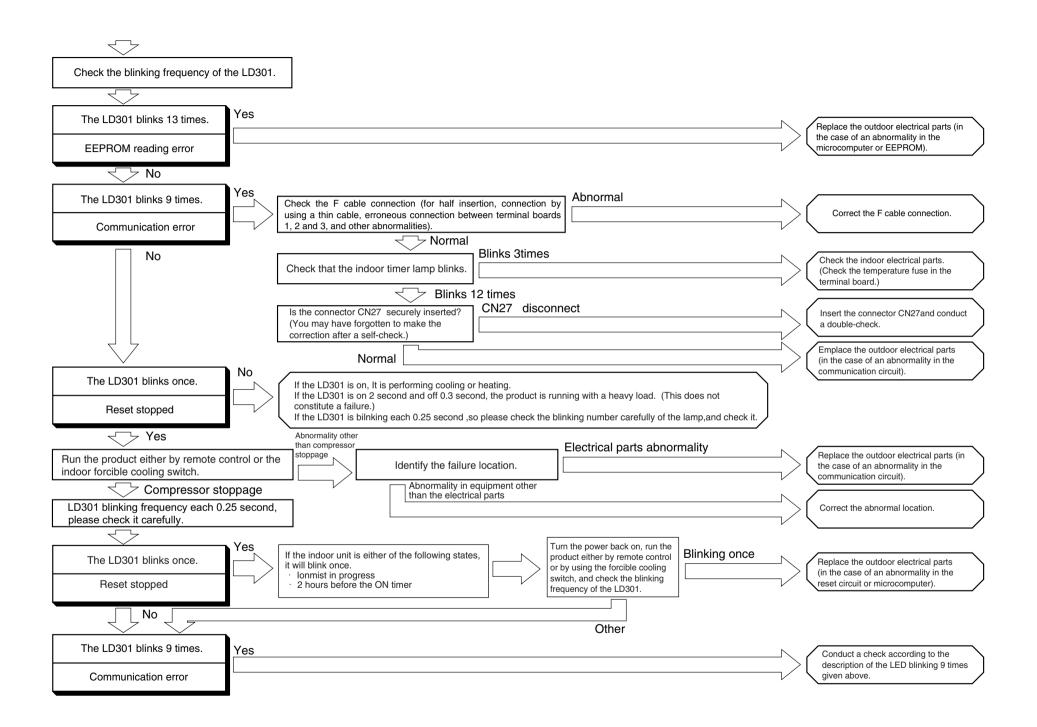
- 1. DIAGNOSIS FOR [REVERSING VALVE OPERATION ERROR]; ⇒CHECK REVERSING VALVE WIRE CONNECTION EITHER WIRE BROKEN OR NOT, IF OK CHECK 3,15A FUSE, IF BROKEN REPLACE FUSE OR ODU CONTROLLER,
- OR ODU CONTROLLER,
  2. [WHEN DISPLAY THE COMMUNICATION ERROR OR THE OUTDOOR DO NOT RUN AT ALL].
- THE OUTDOOR DO NOT RUN AT ALL].

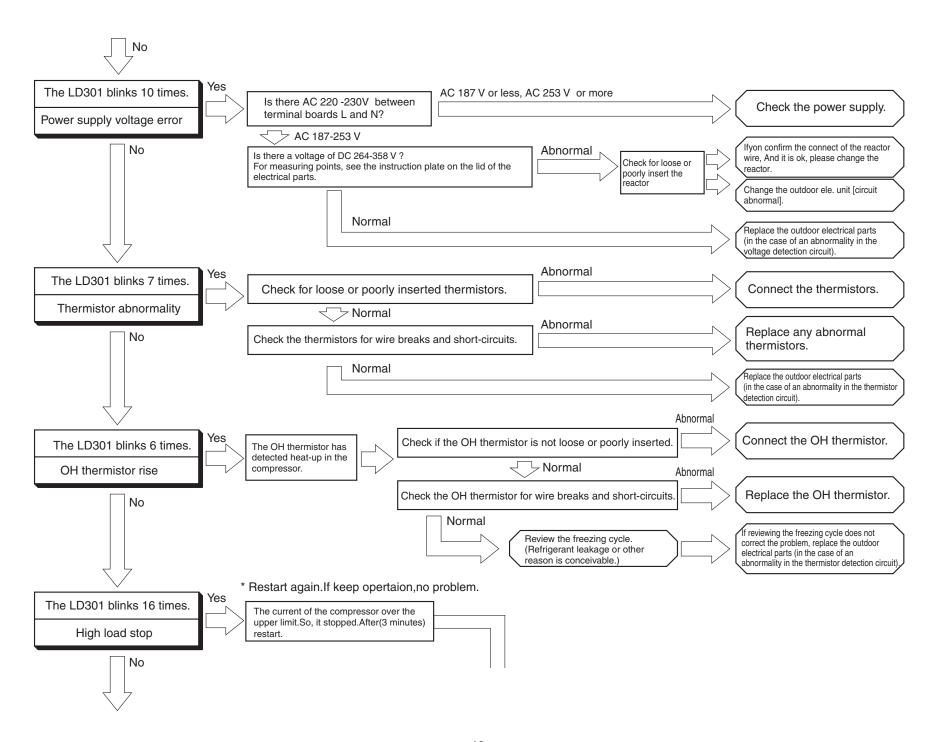
  ⇒PLEASE CHECK THE CONTINUITY OF THE INDOOR ⇔ OUTDOOR CONNECTING CORD(F CABLE).

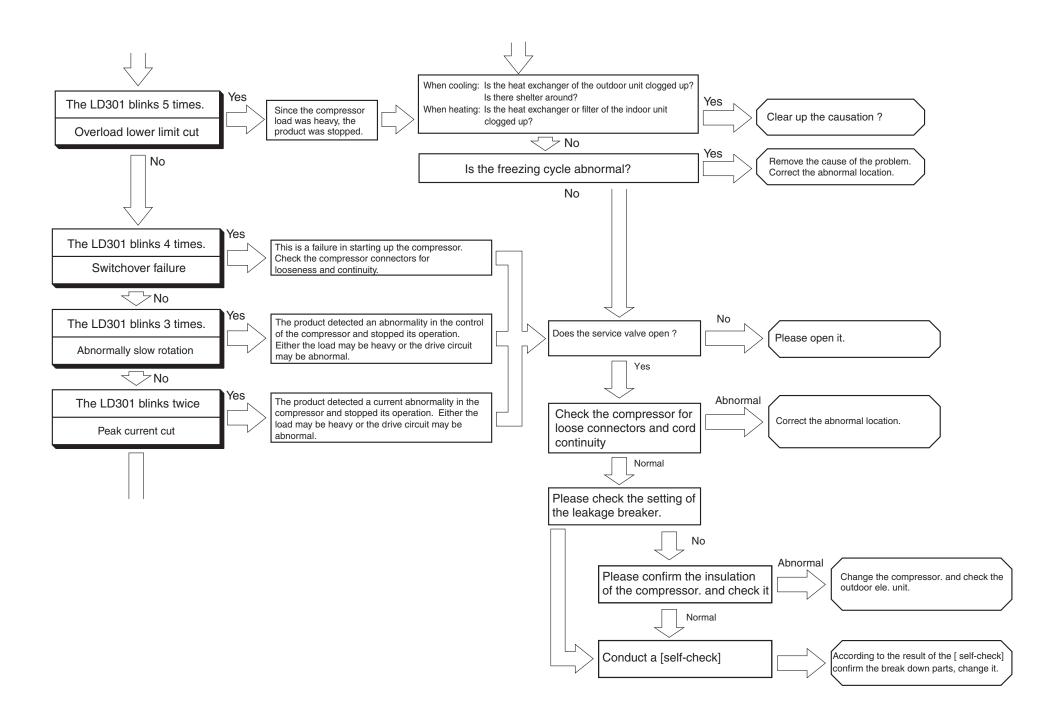
\*\*OTHERS SELF-DIAGNOSIS CONTENTS REFER TO THE SERVICE MANUAL.

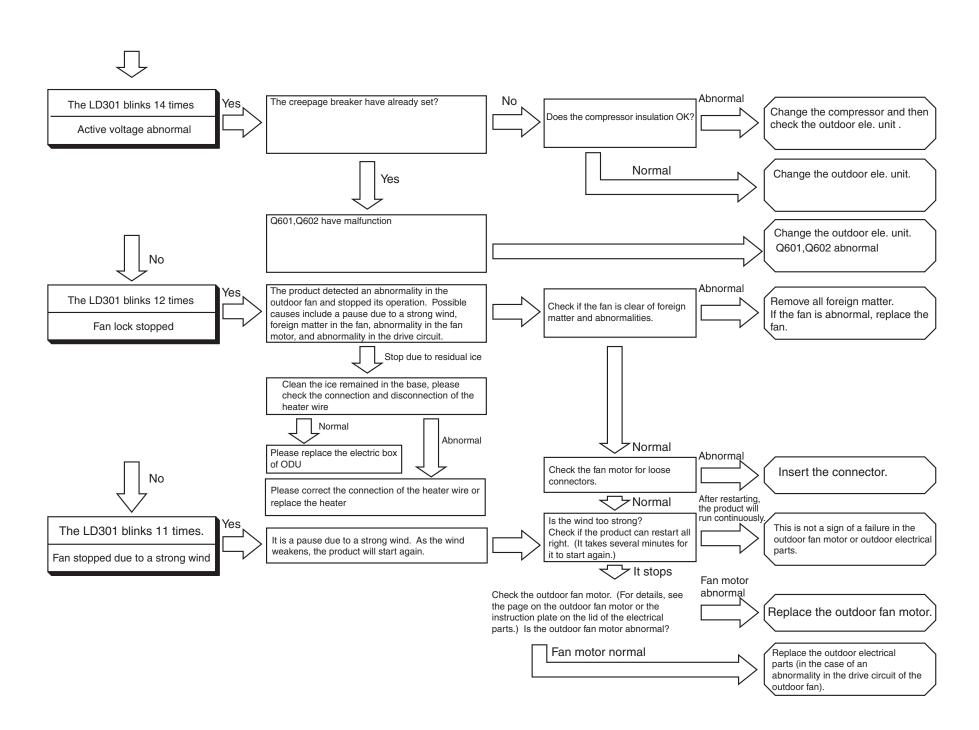
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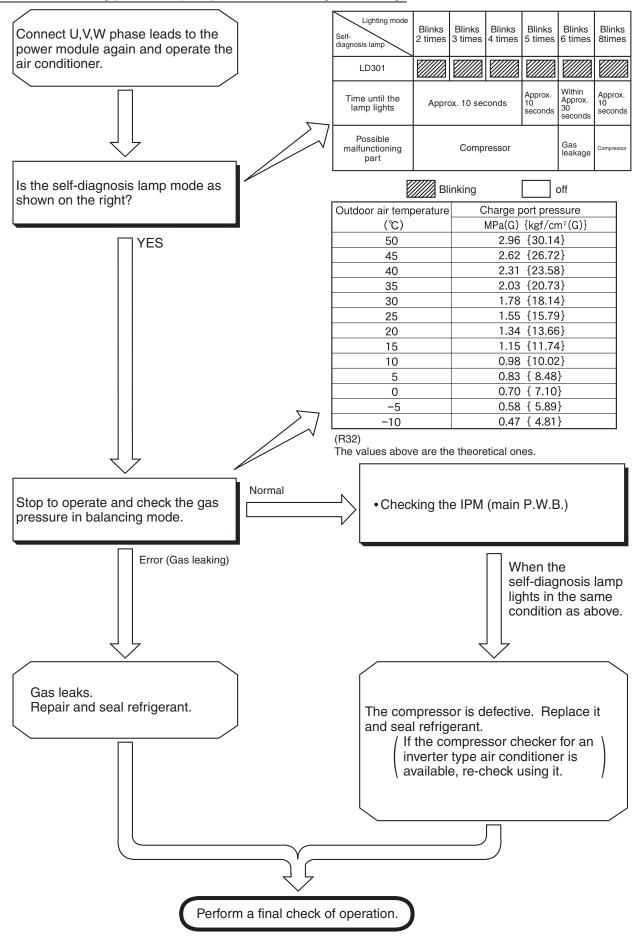








1. Troubleshooting procedure (No operation, No heating, No cooling)



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

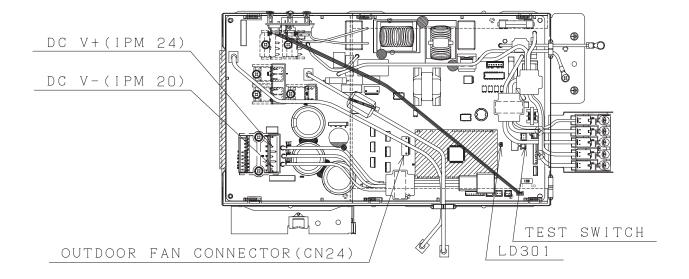
## If the indoor electrical parts is out of order and if you wish to run the outdoor unit

- 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-25/35/50WXEN



#### **%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 descried 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.

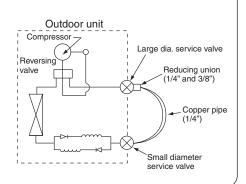
### HOW TO OPERATE THE OUTDOOR UNIT INDEPENDENTLY

#### RAC-25/35WXEN

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 (x1)



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

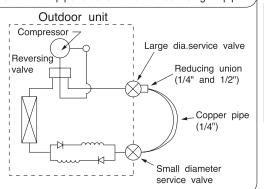
The operation method is the same as "How to operate using the connector to servicing the outdoor unit". %1 The charging amount of 300g is equivalent to the load in normal operation.

#### **RAC-50WXEN**

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

Connect the small diameter service value 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)



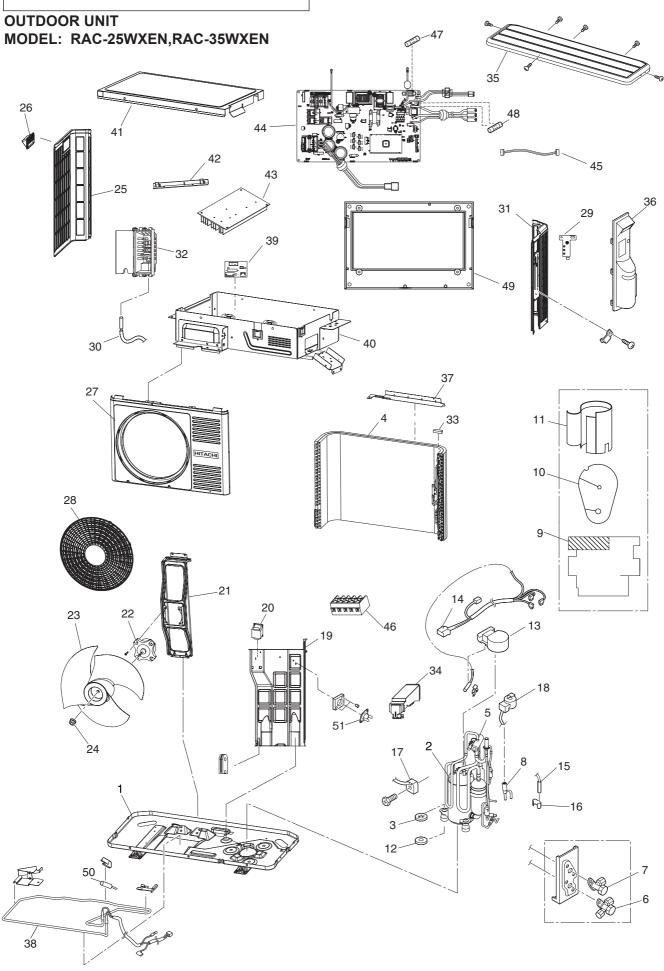
Parts to be prepared

- (1) Reducing union 1/4" (6.35mm) 1/2" (12.7mm)
- (2) Copper pipe (1/4" and 1/2")
- (3) Shorting leads2 leads approx. 10 cm long with alligator clip or IC clip

Do not operate for 5 minutes or more.

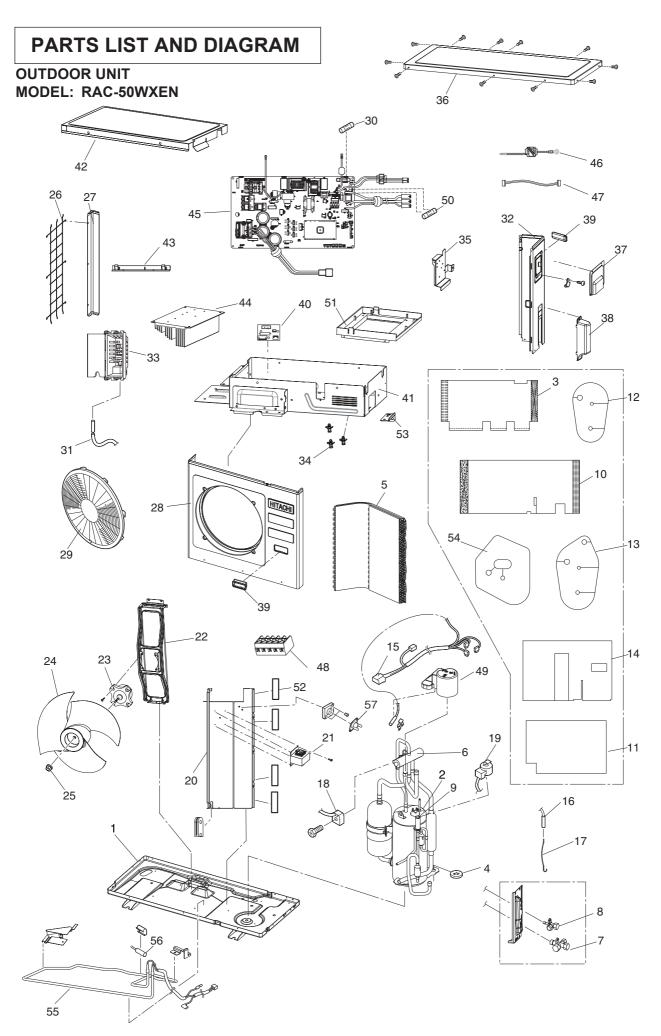
The operation method is the same as "How to operate using the connector to servicing the outdoor unit". %1 The charging amount of 300g is equivalent to the load in normal operation.

# **PARTS LIST AND DIAGRAM**



# OUTDOOR UNIT

NO	JCH-WH PARTS NO		PARTS NAME	
	RAC-25WXEN RAC-35WXEN	UNIT		
1	HWRAC-25WXDN A01	1	BASE	
2	HWRAC-25WXD A01		COMPRESSOR	
3	HWRAC-50NX2 A04	3	PUSH NUT	
4	HWRAC-25WXD A02	1	CONDENSER	
5	HWRAC-25WXD A03	1	REVERSING VALVE	
6	HWRAC-10GH5 A03	1	SERVICE VALVE	
7	HWRAC-50WEA A06	1	SERVICE VALVE	
8	HWRAC-50WED A03	1	ELECTRIC EXPANSION VALVE	
9	HWRAC-25WXDN A02	1	SOUND PROOF	
10	HWRAC-25WXD A05	2	SOUND PROOF	
11	HWRAC-25WXD A06	1	SOUND PROOF	
12	HWRAC-25WXD A07	3	RUBBER RING	
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-25WXDN A03	1	PARTITION	
20	HWRAC-50WED A09	1	REACTOR	
21	HWRAC-50WEB A02	1	FAN MOTOR SUPPORT	
22	HWRAC-50WED A10	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		1		
	HWRAC-E14H3 914	1	THERMISTOR (OUTDOOR TEMPERATURE) SIDE COVER (R)	
31	HWRAC-50WED A12	1	· /	
32	HWRAC-18WSPA A24		TC-COVER	
33	HWRAC-25WXDN A04	1	H-SHEET	
34	HWRAC-25WXDN A05	1	TERMINAL COVER	
35	HWRAC-18WSPA A10	1	TOP COVER	
36	HWRAC-50WED A13	1	SERVICE VALVE COVER	
37	HWRAC-18WSPA A09	1	COVER (FOR OUTDOOR TEMPERATURE THERMISTOR)	
38	HWRAC-25WXDN A06	1	SHEATHED HEATER	
39	HWRAC-25WXDN A07	1	HEATER RELAY PWB	
40	HWRAC-25WXDN A08	1	ELECTRIC PARTS PLATE	
41	HWRAC-25WXDN A09	1	ELECTRIC PARTS COVER	
42	HWRAC-50WEB A07	2	SUPPORT2 (P. W. B.)	
43	RAC-1F50KVY 014	1	HEAT SINK	
44	HWRAC-25WXEN A01 HWRAC-35WXEN 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-25WXDN A11	1	ONDO-FUSE	
51	HWRAC-25WXDN A12	1	B-THERMO	



# OUTDOOR UNIT

NO	JCH-WH PARTS NO	Q'TY/ UNIT	PARTS NAME
	RAC-50WXEN		
1	HWRAC-50WXDN A01	1	BASE
2	HWRAC-50WXD A02	1	COMPRESSOR
3	HWRAC-50WEC A08	1	SOUND PROOF
4	HWRAC-50NX2 A04	3	PUSH NUT
5	HWRAC-50WXD A03	1	CONDENSER
6 7	HWRAC-50WXD A04 HWRAC-50WEA A05	1 1	REVERSING VALVE SERVICE VALVE
8	HWRAC-50WEA A06	1	SERVICE VALVE SERVICE VALVE
9	HWRAC-50WED A03	1	ELECTRIC EXPANSION VALVE
10	HWRAC-50WXD A05	1	SOUND PROOF
11	HWRAC-50WXDN A02	1	SOUND PROOF
12	HWRAC-50WXD A07	1	SOUND PROOF
13	HWRAC-50WXD A08	1	SOUND PROOF
14	HWRAC-50WXD A09	1	SOUND PROOF
15	HWRAC-50WEA A12	1	CONNECTING CORD (COMP)
16	HWRAC-50WXB A28	1	THERMISTOR (DEFROST)
17	HWRAC-50WXD A10	1	THERMISTOR SUPPORT
18	HWRAC-25WXD A09	1	COIL (REVERSING VALVE)
19	HWRAC-50WED A07	1	COIL (EXPANSION VALVE)
20	HWRAC-50WXDN A03	1	PARTITION
21	HWRAC-50WED A09	1	REACTOR
22	HWRAC-50WXD A12	1	FAN MOTOR SUPPORT
23	HWRAC-50WED A10	1	FAN MOTOR
24	HWRAC-50WXB A07	1	PROPELLER FAN
25	HWRAC-50NX2 A25	1	NUT (PROPELLER FAN)
26	HWRAC-50WXB A09	1	NET LEFT
27	HWRAC-50WXB A10	1	LEFT PLATE
28	HWRAC-50WXDN A04	1	FRONT COVER
29	HWRAC-50WXB A12	1	DISCHARGE GRILL
30	HWRAC-50WED A17	1	FUSE (25A)
31	HWRAC-50WXB A14	1	THERMI-C
32	HWRAC-50WXDN A05	1	SIDE COVER (R)
33	HWRAC-50WXDN A06	1	COVER (OUT DOOR THERMISTOR)
34	HWRAC-50WXB A27	3	PC-SUP
35	HWRAC-50WXB A18	1	TER-PLATE
36	HWRAC-50WXB A19	1	TOP COVER
37	HWRAC-50WXD A15	1	TERMINAL-COVERAS
38	HWRAC-50WXD A16	1	EV-COVER
39	HWRAC-50WXB A22	2	HANDLE
40	HWRAC-25WXDN A07	1	HEATER RELAY PWB
41	HWRAC-50WXDN A07	1	ELECTRIC PARTS PLATE
42	HWRAC-50WXDN A08	1	ELECTRIC PARTS COVER
43	HWRAC-50WEB A07	2	SUPPORT (P. W. B.)
44	HWRAC-50WEB A08	1	HEAT SINK
45	HWRAC-50WXEN A01	1	P. W. B. (MAIN)
46	HWRAC-50WEB A10	1	12 CORD ASSEMBLY
47	HWRAC-50WEB A11	2	CORD ASSEMBLY
48	HWRAC-50WED A16	1	TERMINAL BOARD (5P)
49 50	HWRAC-25WXD A08 HWRAC-25WXD A11	1 2	O. L. R COVER FUSE (3. 15A)
51 52	HWRAC-50WEB A13 HWRAC-50WXB A32	1	SUPPORT (P. W. B.)
53	HWRAC-50WXB A26	1	MIRROR MAT FIX-PLATE
54	HWRAC-50WXD A19	1 1	SOUND PROOF
55	HWRAC-50WXDN A10	1	SHEATHED HEATER
56	HWRAC-25WXDN A11	1	ONDO-FUSE
57	HWRAC-25WXDN A12	1	B-THERMO
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