

# WOYG---LCT WOYK---LCT

## Outdoor unit (air to water split heat pump)

single phase outdoor unit    3- phase outdoor unit

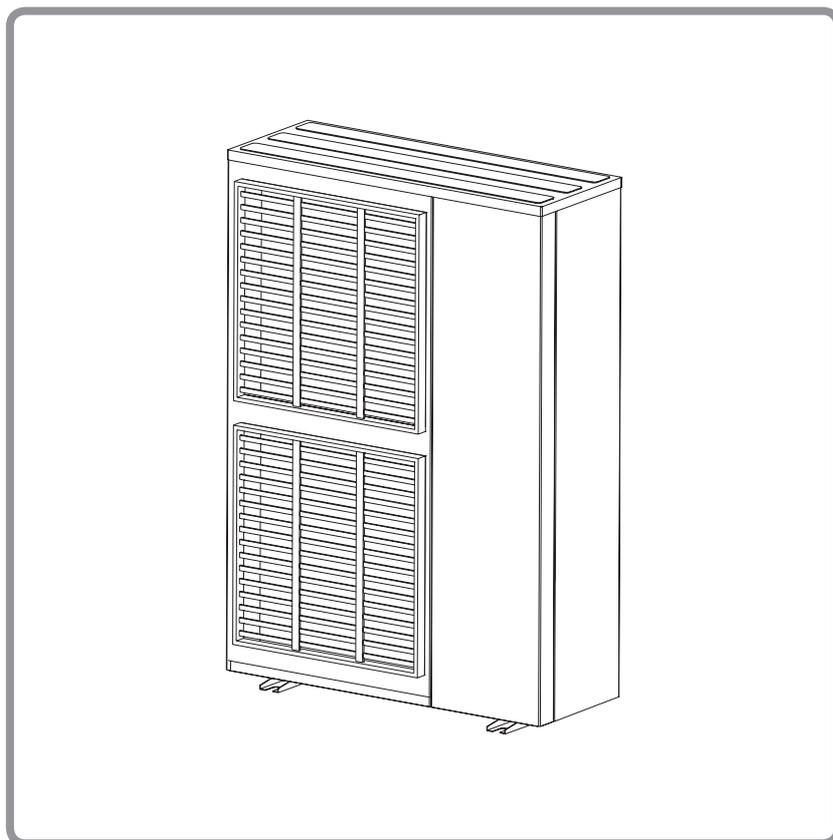
WOYG112LCT

WOYK112LCT

WOYG140LCT

WOYK140LCT

WOYK160LCT



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FR

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### Maintenance Document

intended for professionals

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Non contractual document.

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# 1 Faults

## 1.1 Fault List

When the system is switched back on after a power outage, the Hydraulic Unit may display fault 370 for a few tens of seconds. This is not a serious problem. It simply means that the outdoor unit is running its tests. Once the tests have been completed, the fault should disappear.

If it doesn't, if a fault has occurred on the outdoor unit as indicated by the Hydraulic Unit, you must remove the front (right-hand) facing from the outdoor unit.

Faults are coded by LED flashes. Error messages are listed in the table below:

### On the outdoor unit

When an error occurs:

- The diode "ERROR" (2) blinks

Press once on the switch "ENTER" (SW4)

- The "ERROR" (2) diode blinks several times depending on the error's type

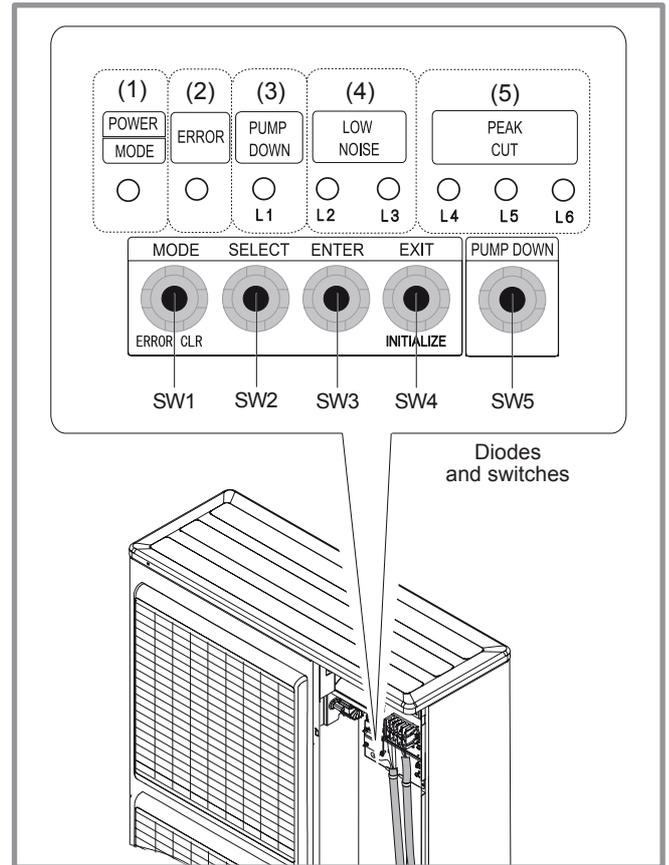


figure 1 - Location of switches and diodes on single phase outdoor unit

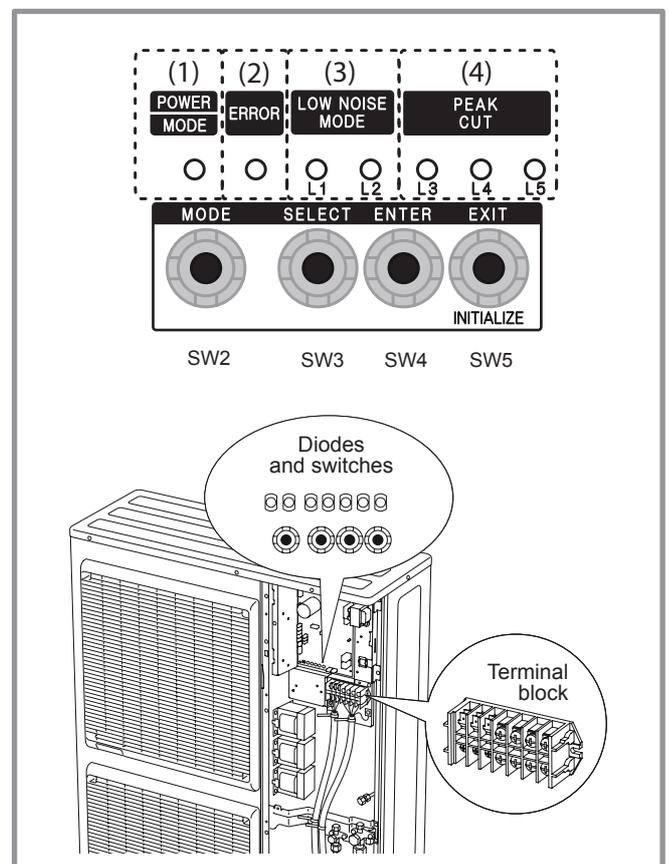


figure 2 - Location of switches and diodes on 3-phase outdoor unit

LED display		Outdoor unit	Diagnosis	Clear
Hydraulic Unit Green	Red			
1 flash	1 flash	Off	Serial reverse transfer error.	1
		1 flash	Serial forward transfer error.	2
4 flashes	1 flash	22 flashes	Heat pump capacity signal error	4
4 flashes	2 flashes	22 flashes	Hydraulic Unit Heat ex. Sensor error	5
6 flashes	3 flashes	18 flashes	Inverter error.	20
6 flashes	4 flashes	19 flashes	Active filter error (single phase)	21
			P.F.C. error (3-phase)	27
7 flashes	1 flash	2 flashes	Discharge thermistor error.	7
7 flashes	2 flashes	8 flashes	Compressor thermistor error.	11
7 flashes	3 flashes	5 flashes	Heat-exchange thermistor (intermediate) error.	12
		4 flashes	Heat-exchange thermistor (outlet) error.	8
7 flashes	4 flashes	7 flashes	Outdoor temperature thermistor error.	9
7 flashes	7 flashes	9 flashes	Heat sink thermistor error.	10
7 flashes	8 flashes	6 flashes	Expansion valve thermistor error.	14
8 flashes	6 flashes	3 flashes	Pressure sensor error.	24
9 flashes	4 flashes	13 flashes	Current trip (permanent stoppage).	15
9 flashes	5 flashes	14 flashes	Detection of compressor position error (permanent stoppage).	33
		15 flashes	Compressor start up error (permanent stoppage).	17
9 flashes	7 flashes	16 flashes	Outdoor unit fan 1 motor error.	18
		17 flashes	Outdoor unit fan 2 motor error.	
10 flashes	1 flash	11 flashes	Discharge temperature protection (permanent stoppage).	22
10 flashes	3 flashes	12 flashes	Compressor temperature protection (permanent stoppage).	25
10 flashes	5 flashes	20 flashes	Low pressure abnormal.	26
Continuous flashing			Pump down operation.	
Continuous lighting	Off		Defrosting.	

## 1.2 Outdoor Unit Clearing

This section describes the techniques which can be used to identify the failure.

### 1.2.1 Failures with Error Code

#### Clear 1: Serial reverse transfer error

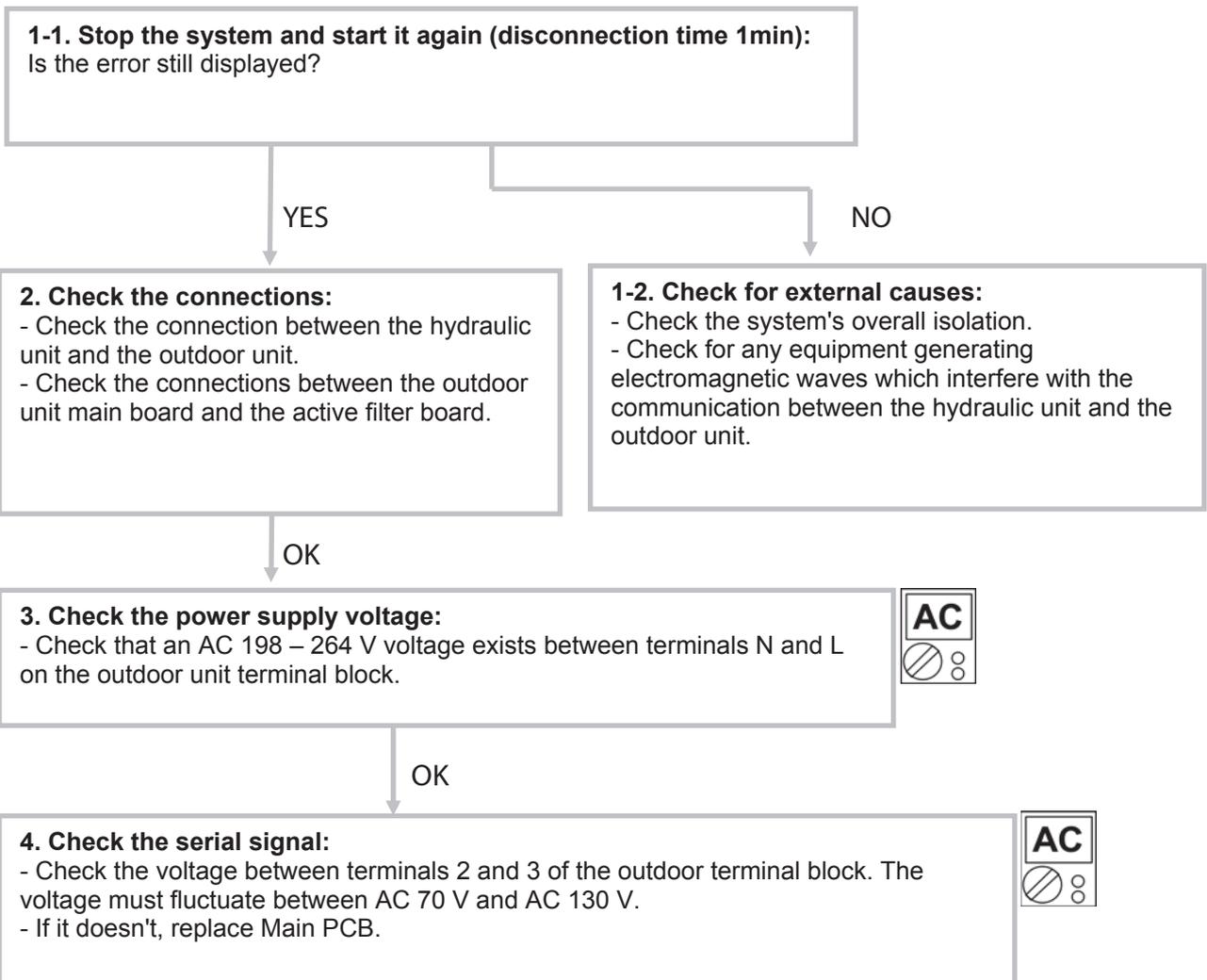
LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	1 flash	1 flash	Off

**Probable causes:**

- Misconnection.
- External cause.
- Main PCB failure.

**Check:**

**Clear 1**



**Clear 2: Serial forward transfer error**

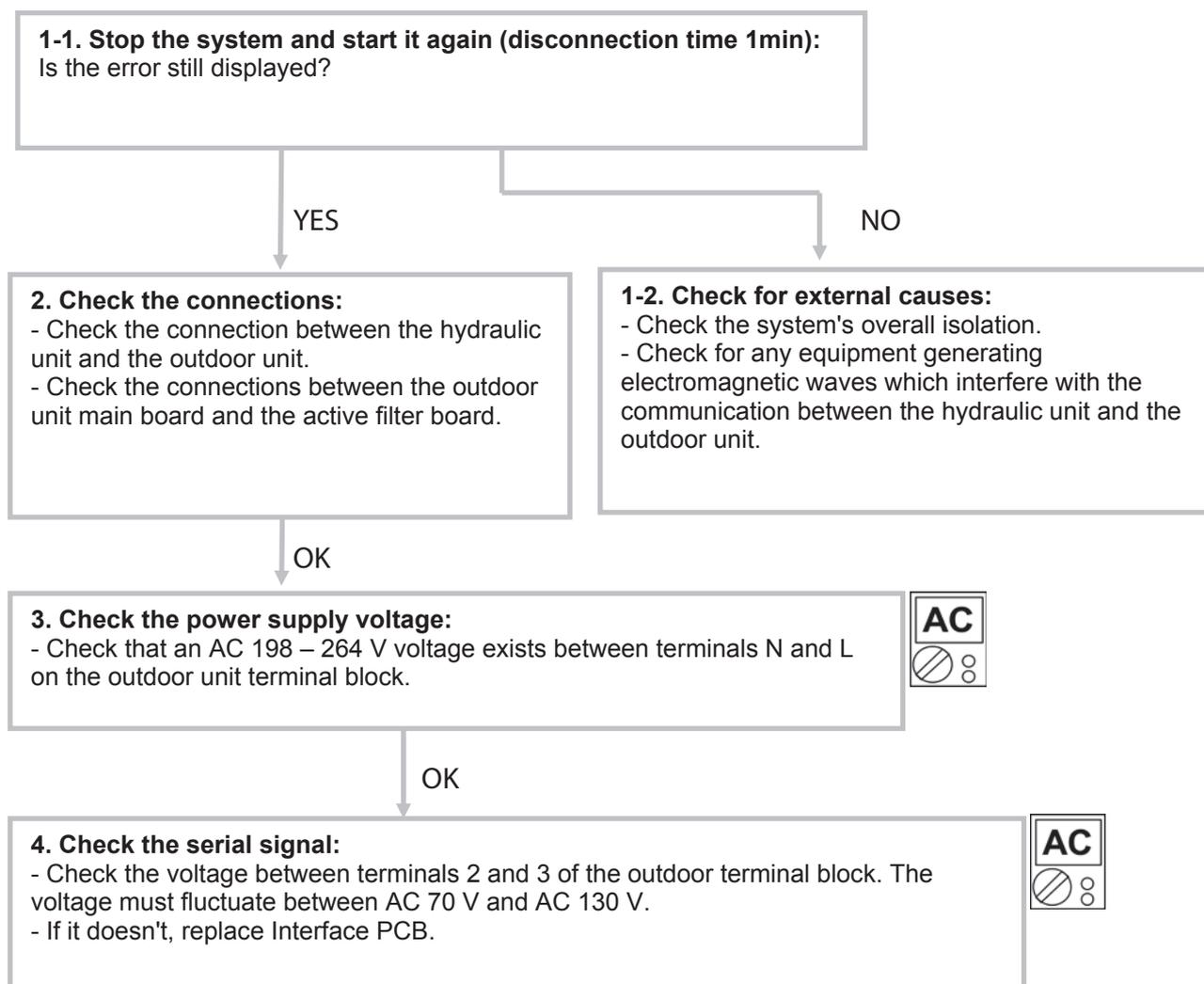
LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	1 flash	1 flash	1 flash

**Probable causes:**

- Misconnection.
- External cause.
- Interface PCB failure.

**Check:**

**Clear 2:**



**Clear 4: Hydraulic Unit Heat exchanger thermistor error**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	4 flashes	1 flash	22 flashes

**Probable causes:**

- Misconnection.
- Sensor failure.
- Interface PCB failure.

**Check:****Clear 4:****1. Check connection interface PCB and Heat pump regulator PCB:**

- See if the connector has been disconnected.
- See if the connection is correct.
- Check for any damage on the sensor cable.

After solving the misconnection problem, switch the heat pump back on.

OK

**2. Check resistance value:**

3 pin of CN22 – M < 10Ω



OK

**3. Replace interface PCB:**

If check point 1 and 2 do not improve the symptom, replace Interface PCB.

**Clear 5: Hydraulic Unit Heat exchanger thermistor error**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	4 flashes	2 flashes	22 flashes

**Probable causes:**

- Misconnection.
- Sensor failure.
- Interface PCB failure.

**Check:**

**Clear 5:**

**1. Check the sensor connection:**

- See if the connector has been removed
- See if the connection is correct
- Check for any damage on the sensor cable.

After solving the misconnection problem, switch the heat pump back on.

OK

**2. Remove the sensor and check its resistance value :**

- Check the resistance value.

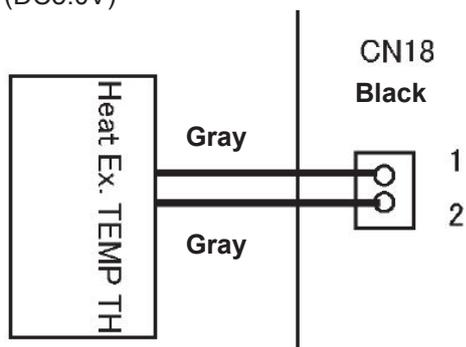
Temperature (°C)	0	5	10	15	20	25	30	35	40	45	50
Resistance (kΩ)	176	134	103	80,3	62,9	49,7	39,6	31,7	25,6	20,8	17,1

- If the thermistor is faulty, replace it.

OK

**3. Check the electronic board voltage:**

- Make sure circuit diagram of hydraulic unit and check terminal voltage at thermistor (DC5.0V)



- If there is no voltage, replace Interface PCB.



**Clear 7: Discharge thermistor error**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	7 flashes	1 flash	2 flashes

**Probable causes:**

- Misconnection.
- Sensor failure.
- Main PCB failure.

**Check:**

**Clear 7:**

**1. Check the sensor connection:**

- See if the connector has been disconnected.
- See if the connection is correct.
- Check for any damage on the sensor cable.

After solving the misconnection problem, switch the heat pump back on.

OK

**2. Remove the sensor and check its resistance value:**

- Check the resistance value

Temperature (°C)	0	5	10	15	20	30	40	50
Resistance (kΩ)	168	130	101	79	63	40	26,3	17,8

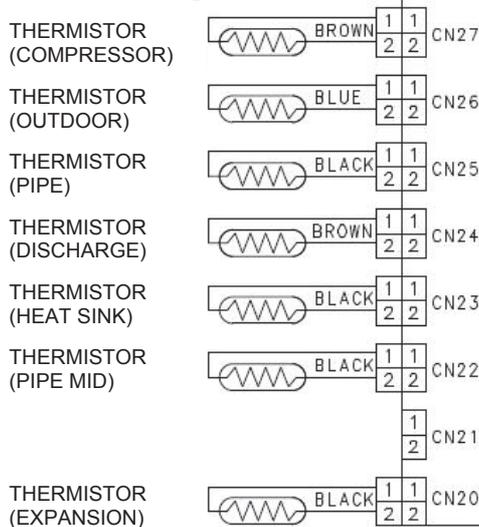
Temperature (°C)	60	70	80	90	100	120
Resistance (kΩ)	12,3	8,7	6,3	4,6	3,4	2

- If the thermistor is faulty, replace it.

OK

**3. Check the electronic board voltage:**

Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC5.0V)



- If there is no voltage, replace Main PCB.

**Clear 8: Heat-exchange thermistor (outlet) error**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	7 flashes	3 flashes	4 flashes

**Probable causes:**

- Misconnection.
- Sensor fault.
- Main PCB failure

**Check:**

**Clear 8:**

**1. Check the sensor connection:**

- See if the connector has been disconnected.
- See if the connection is correct.
- Check for any damage on the sensor cable.

After solving the misconnection problem, switch the heat pump back on.

OK

**2. Remove the sensor and check its resistance value :**

- Check the resistancer value

Temperature (°C)	-10	-5	0	10	15	20	25	30
Resistance (kΩ)	27,5	20,9	16,1	12,4	9,73	7,67	6,1	3,95

- If the thermistor is faulty, replace it.



OK

**3. Check the electronic board voltage:**

- Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC5.0V)

THERMISTOR (COMPRESSOR)		1 1 2 2	CN27
THERMISTOR (OUTDOOR)		1 1 2 2	CN26
THERMISTOR (PIPE)		1 1 2 2	CN25
THERMISTOR (DISCHARGE)		1 1 2 2	CN24
THERMISTOR (HEAT SINK)		1 1 2 2	CN23
THERMISTOR (PIPE MID)		1 1 2 2	CN22
		1 2	CN21
THERMISTOR (EXPANSION)		1 1 2 2	CN20

- If there is no voltage, replace Main PCB.



**Clear 9: Outdoor temperature thermistor error**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	7 flashes	4 flashes	7 flashes

**Probable causes:**

- Misconnection.
- Sensor failure.
- Main PCB failure.

**Check:**

**Clear 9:**

**1. Check the sensor connection :**

- See if the connector has been disconnected.
- See if the connection is correct.
- Check for any damage on the sensor cable.

After solving the misconnection problem, switch the heat pump back on.

OK

**2. Remove the sensor and check its resistance value :**

- Check the resistance value.

Temperature (°C)	-20	-10	-5	0	5	10	15	20	30	40	50	60	70
Resistance (kΩ)	115	62,3	46,6	35,2	26,9	20,7	16,1	12,6	7,97	5,18	3,45	2,36	1,65

- If the thermistor is faulty, replace it.



OK

**3. Check the electronic board voltage:**

- Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC5.0V)

THERMISTOR (COMPRESSOR)		<table border="1"><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr></table>	1	1	2	2	CN27
1	1						
2	2						
THERMISTOR (OUTDOOR)		<table border="1"><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr></table>	1	1	2	2	CN26
1	1						
2	2						
THERMISTOR (PIPE)		<table border="1"><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr></table>	1	1	2	2	CN25
1	1						
2	2						
THERMISTOR (DISCHARGE)		<table border="1"><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr></table>	1	1	2	2	CN24
1	1						
2	2						
THERMISTOR (HEAT SINK)		<table border="1"><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr></table>	1	1	2	2	CN23
1	1						
2	2						
THERMISTOR (PIPE MID)		<table border="1"><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr></table>	1	1	2	2	CN22
1	1						
2	2						
		<table border="1"><tr><td>1</td></tr><tr><td>2</td></tr></table>	1	2	CN21		
1							
2							
THERMISTOR (EXPANSION)		<table border="1"><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr></table>	1	1	2	2	CN20
1	1						
2	2						

- If there is no voltage, replace Main PCB.



**Clear 10: Heat Sink Thermistor error**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	7 flashes	7 flashes	9 flashes

**Probable causes:**

- Misconnection.
- Sensor failure.
- Main PCB failure

**Check:**

**Clear 10:**

**1. Check the sensor connection :**

- See if the connector has been disconnected.
- See if the connection is correct.
- Check for any damage on the sensor cable.

After solving the misconnection problem, switch the heat pump back on.

OK

**2. Remove the sensor and check its resistance value :**

- Check the resistance value.

Temperature (°C)	0	5	10	15	20	30	40	50
Resistance (kΩ)	15,8	12,2	9,5	7,5	5,9	3,78	2,50	1,69

Temperature (°C)	60	70	80	90	100	120
Resistance (kΩ)	1,17	0,83	0,6	0,44	0,33	0,19

- If the thermistor is faulty, replace it.



OK

**3. Check the electronic board voltage:**

- Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC5.0V)

THERMISTOR (COMPRESSOR)		BROWN	1 1 2 2	CN27
THERMISTOR (OUTDOOR)		BLUE	1 1 2 2	CN26
THERMISTOR (PIPE)		BLACK	1 1 2 2	CN25
THERMISTOR (DISCHARGE)		BROWN	1 1 2 2	CN24
THERMISTOR (HEAT SINK)		BLACK	1 1 2 2	CN23
THERMISTOR (PIPE MID)		BLACK	1 1 2 2	CN22
			1 2	CN21
THERMISTOR (EXPANSION)		BLACK	1 1 2 2	CN20

- If there is no voltage, replace Main PCB.



**Clear 11: Compressor thermistor error**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	7 flashes	2 flashes	8 flashes

**Probable causes:**

- Misconnection.
- Sensor failure.
- Main PCB failure.

**Check:**

**Clear 11:**

**1. Check the sensor connection:**

- See if the connector has been removed
- See if the connection is correct
- Check for any damage on the sensor cable.

After solving the misconnection problem, switch the heat pump back on.

OK

**2. Remove the sensor and check its resistance value :**

- Check the resistance value.

Temperature (°C)	0	5	10	15	20	30	40	50
Resistance (kΩ)	168	130	101	79	63	40	26,3	17,8

Temperature (°C)	60	70	80	90	100	120
Resistance (kΩ)	12,3	8,7	6,3	4,6	3,4	2

- If the thermistor is faulty, replace it.



OK

**3. Check the electronic board voltage:**

- Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC5.0V)

THERMISTOR (COMPRESSOR)		BROWN	1 1	2 2	CN27
THERMISTOR (OUTDOOR)		BLUE	1 1	2 2	CN26
THERMISTOR (PIPE)		BLACK	1 1	2 2	CN25
THERMISTOR (DISCHARGE)		BROWN	1 1	2 2	CN24
THERMISTOR (HEAT SINK)		BLACK	1 1	2 2	CN23
THERMISTOR (PIPE MID)		BLACK	1 1	2 2	CN22
			1	2	CN21
THERMISTOR (EXPANSION)		BLACK	1 1	2 2	CN20

- If there is no voltage, replace Main PCB.



**Clear 12: Heat-exchange thermistor (intermediate) error**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	7 flashes	3 flashes	5 flashes

**Probable causes:**

- Misconnection.
- Sensor failure.
- Main PCB failure.

**Check:**

**Clear 12:**

**1. Check the sensor connection:**

- See if the connector has been disconnected.
- See if the connection is correct.
- Check for any damage on the sensor cable.

After solving the misconnection problem, switch the heat pump back on.

OK

**2. Remove the sensor and check its resistance value :**

- Check the resistance value

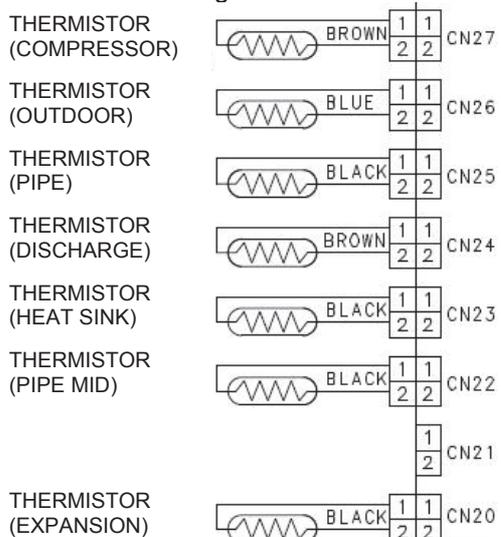
Temperature (°C)	-10	-5	0	10	15	20	25	30
Resistance (kΩ)	27,5	20,9	16,1	12,4	9,73	7,67	6,10	3,95

- If the thermistor is faulty, replace it.

OK

**3. Check the electronic board voltage:**

- Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC5.0V)



- If there is no voltage, replace Main PCB.



**Clear 14: Expansion valve thermistor error**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	7 flashes	8 flashes	6 flashes

**Probable causes:**

- Misconnection.
- Sensor failure.
- Main PCB failure.

**Check:**

**Clear 14:**

**1. Check the sensor connection:**

- See if the connector has been removed
- See if the connection is correct
- Check for any damage on the sensor cable.

After solving the misconnection problem, switch the heat pump back on.

OK

**2. Remove the sensor and check its resistance value :**

- Check the resistance value.

Temperature (°C)	0	5	10	15	20	30	40	50
Resistance (kΩ)	168	130	101	79	63	40	26,3	17,8

Temperature (°C)	60	70	80	90	100	120
Resistance (kΩ)	12,3	8,7	6,3	4,6	3,4	2

- If the thermistor is faulty, replace it.



OK

**3. Check the electronic board voltage:**

- Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC5.0V)

THERMISTOR (COMPRESSOR)		BROWN	1 1	2 2	CN27
THERMISTOR (OUTDOOR)		BLUE	1 1	2 2	CN26
THERMISTOR (PIPE)		BLACK	1 1	2 2	CN25
THERMISTOR (DISCHARGE)		BROWN	1 1	2 2	CN24
THERMISTOR (HEAT SINK)		BLACK	1 1	2 2	CN23
THERMISTOR (PIPE MID)		BLACK	1 1	2 2	CN22
			1	2	CN21
THERMISTOR (EXPANSION)		BLACK	1 1	2 2	CN20

- If there is no voltage, replace Main PCB.



**Clear 15: Current trip (permanent stoppage)**

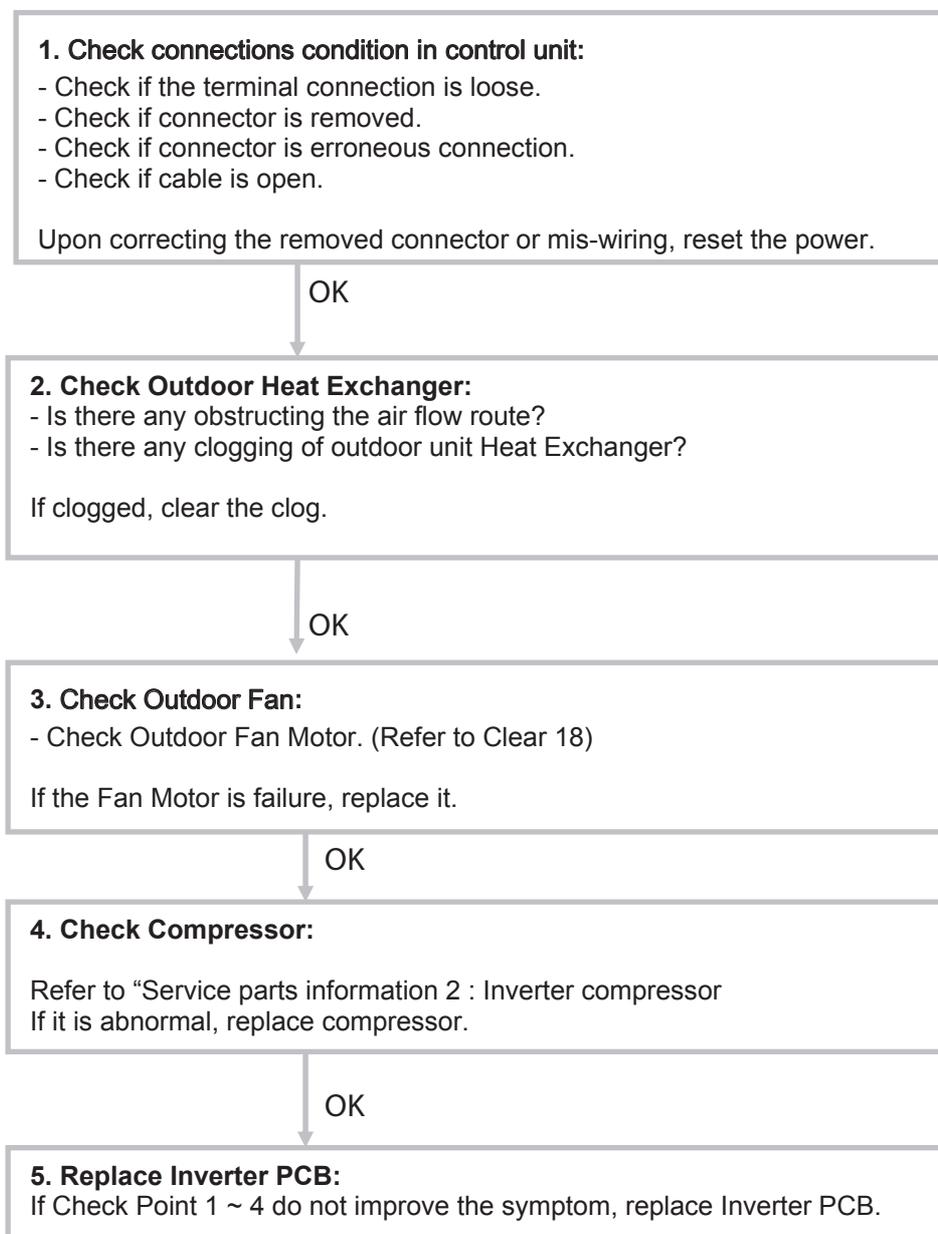
LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	9 flashes	4 flashes	13 flashes

**Probable causes:**

- Connection failure.
- Outdoor Heat Exchanger clogged.
- Outdoor Fan operation failure.
- Compressor failure.
- Main PCB failure.

**Check:**

**Clear 15:**



**Clear 17: Compressor startup error (permanent stoppage)**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	9 flashes	5 flashes	15 flashes

**Probable causes:**

- Misconnection of the various electrical components.
- Main PCB failure.
- Compressor failure.

**Check:****Clear 17:****1. Check connections condition in control unit:**

- Check if the terminal connection is loose.
- Check if connector is removed.
- Check if connector is erroneous connection.
- Check if cable is open.

Upon correcting the removed connector or mis-wiring, reset the power.

OK

**2. Check Compressor:**

Refer to "Service parts information 2 : Inverter compressor  
If it is abnormal, replace compressor.

OK

**3. Replace the electronic board :**

- If steps 1 and 2 do not solve the problem, replace Inverter PCB.

**Clear 18: Fan motor error (permanent stoppage)**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	9 flashes	7 flashes	16 flashes (fan 1), 17 flashes (fan 2)

**Probable causes:**

- Fan motor failure.
- Motor protection.
- Main PCB failure.

**Check:**

**Clear 18:**

**1. Check fan rotation:**

- Switch off the heat pump and rotate the fan manually.
- If the fan or bearings are faulty, replace them.

OK

**2. Check the ambient temperature around the motor:**

- Check excessively high temperature around the fan.

Wait until the temperature comes down again and switch the fan back on.

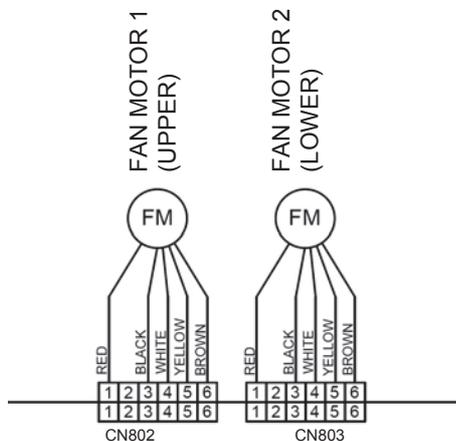
OK

**3. Check the main board output voltage:**

- On the outdoor unit, check the output voltage (DC) of the following connectors:



Terminals	Voltage
1 (red)/ 3 (black)	300~390V
4 (white)/3 (black)	15 ±2V



If the voltage is incorrect, replace Main PCB.

**Clear 20: Inverter error**

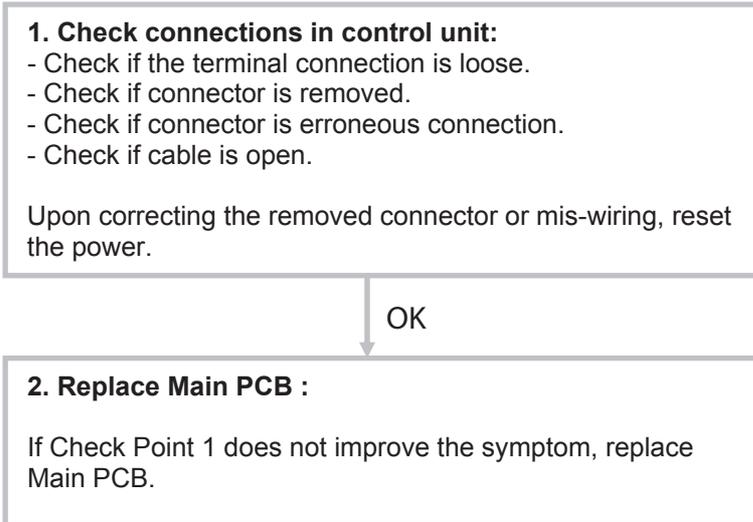
LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	6 flashes	3 flashes	18 flashes

**Probable causes:**

- Connection failure.
- Main PCB failure.

**Check:**

**Clear 20:**



**Clear 21: active filter error (only for single phase type)**

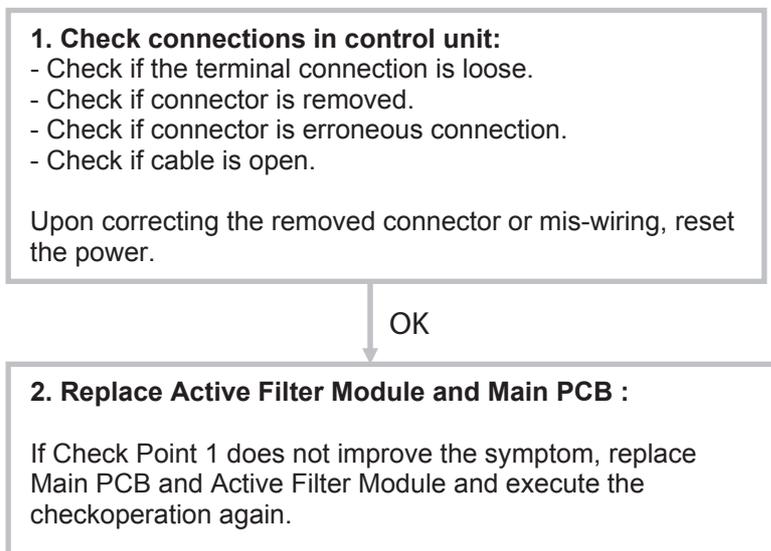
LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	6 flashes	4 flashes	19 flashes

**Probable causes:**

- Connection failure.
- Active filter module failure.
- Main PCB failure

**Check:**

**Clear 21:**



**Clear 22: Discharge temperature protection (permanent stoppage)**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	10 flashes	1 flash	11 flashes

**Probable causes:**

- Valve is close.
- EEV failure.
- Gas leak, less.
- Discharge Thermistor failure.
- Outdoor Fan operation failure.
- Outdoor Heat Exchanger clogged.

**Check:**

**Clear 22:**

Cooling mode

**1. Check if gas valve is open:**

If it is not open, open it and check the operation.

OK

**2. Check EEV and Strainer:**

Are EEV and Strainer open?

If EEV or Strainer is defective, replace it.

OK

**3. Check if gas leak or less gas:**

Measure gas pressure, if there is a leak, correct it.

If recharging refrigerant, make sure to perform vacuuming and recharge the specified amount.

OK

**4. Check Discharge Pipe Thermistor:**

- Is it on the holder?
- Is there a cable pinched?

Check characteristics of thermistor (Refer to Clear 7), If defective, replace the thermistor

OK

**5. Check Outdoor Heat Exchanger:**

- Is there any obstructing the air flow route?
- Is there any clogging of outdoor unit Heat Exchanger?

If clogged, clear the clog.

OK

**6. Check Outdoor Fan:**

Check Outdoor Fan Motor. (Refer to Clear 18)

If the Fan Motor is failure, replace it.

Heating mode

**1. Check if liquid valve is open:**

If it is not open, open it and check the operation.

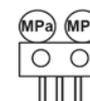
OK

**2. Check EEV and Strainer:**

Are EEV and Strainer open?

If EEV or Strainer is defective, replace it.

OK



**3. Check if gas leak or less gas:**

Measure gas pressure, if there is a leak, correct it.

If recharging refrigerant, make sure to perform vacuuming and recharge the specified amount.

OK

**4. Check Discharge Pipe Thermistor:**

- Is it on the holder?
- Is there a cable pinched?

Check characteristics of thermistor (Refer to Clear 7), If defective, replace the thermistor

OK

**5. Check Outdoor Heat Exchanger:**

- Is there any obstructing the air flow route?
- Is there any clogging of outdoor unit Heat Exchanger?

If clogged, clear the clog.

OK

**6. Check Outdoor Fan:**

Check Outdoor Fan Motor. (Refer to Clear 18)

If the Fan Motor is failure, replace it.

**Clear 24: Pressure sensor error**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	8 flashes	6 flashes	3 flashes

**Probable causes:**

- Connector connection failure.
- Pressure Sensor failure.
- Main PCB failure.

**Check:**

**Clear 24:**

**1. Check connection of the Pressure Sensor:**

- Check if the terminal connection is loose.
- Check if connector is removed.
- Check if connector is erroneous connection.
- Check if cable is open.

Upon correcting the removed connector or mis-wiring, reset the power.

OK

**2. Check output voltage of Main PCB :**  
 Check voltage of Main PCB (Measure at Main PCB side connector)

1 pin(Red) - 3 pin(Black) DC5V +/- 5%

DC

If the voltage is not correct, replace Main PCB.

OK

**3. Check output voltage of Pressure Sensor**  
 Check voltage of Main PCB (Measure at Main PCB side connector)

2 pin(White) - 3 pin(Black) Voltage is refer to the following graph.

DC

If the voltage is not correct, replace Presure Sensor.

**Clear 25: Compressor temperature protection (permanent stoppage)**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	10 flashes	3 flashes	12 flashes

**Probable causes:**

- Valve is close.
- EEV failure.
- Gas leak, less.
- Compressor Thermistor failure.
- Outdoor Fan operation failure.
- Outdoor Heat Exchanger clogged.

**Check:**

**Clear 25:**

Cooling mode

**1. Check if gas valve is open:**  
If it is not open, open it and check the operation.

OK

**2. Check EEV and Strainer:**  
Are EEV and Strainer open?  
If EEV or Strainer is defective, replace it.

OK

**3. Check if gas leak or less gas:**  
Measure gas pressure, if there is a leak, correct it.  
If recharging refrigerant, make sure to perform vacuuming and recharge the specified amount.

OK

**4. Check compressor temperature Thermistor:**  
- Is it on the holder?  
- Is there a cable pinched?  
Check characteristics of thermistor (Refer to Clear 11), If defective, replace the thermistor

OK

**5. Check Outdoor Heat Exchanger:**  
- Is there any obstructing the air flow route?  
- Is there any clogging of outdoor unit Heat Exchanger?  
If clogged, clear the clog.

OK

**6. Check Outdoor Fan:**  
Check Outdoor Fan Motor. (Refer to Clear 18)  
If the Fan Motor is failure, replace it.

OK

**7. Replace Main PCB:**  
If Check Point 1 ~ 6 do not improve the symptom, replace Main PCB.

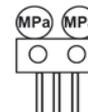
Heating mode

**1. Check if liquid valve is open:**  
If it is not open, open it and check the operation.

OK

**2. Check EEV and Strainer:**  
Are EEV and Strainer open?  
If EEV or Strainer is defective, replace it.

OK



**3. Check if gas leak or less gas:**  
Measure gas pressure, if there is a leak, correct it.  
If recharging refrigerant, make sure to perform vacuuming and recharge the specified amount.

OK

**4. Check compressor temperature Thermistor:**  
- Is it on the holder?  
- Is there a cable pinched?  
Check characteristics of thermistor (Refer to Clear 11), If defective, replace the thermistor

OK

**5. Check Outdoor Heat Exchanger:**  
- Is there any obstructing the air flow route?  
- Is there any clogging of outdoor unit Heat Exchanger?  
If clogged, clear the clog.

OK

**6. Check Outdoor Fan:**  
Check Outdoor Fan Motor. (Refer to Clear 18)  
If the Fan Motor is failure, replace it.

OK

**7. Replace Main PCB:**  
If Check Point 1 ~ 6 do not improve the symptom, replace Main PCB.

**Clear 26: Low pressure abnormal**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	10 flashes	5 flashes	20 flashes

**Probable causes:**

- Connector connection failure.
- Pressure Sensor failure.
- Main PCB failure.
- Gas leak, less.

**Check:**

**Clear 26:**

**1. Check connection of the Pressure Sensor:**

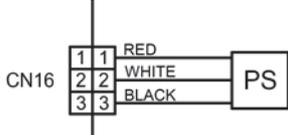
- Check if the terminal connection is loose.
- Check if connector is removed.
- Check if connector is erroneous connection.
- Check if cable is open.

Upon correcting the removed connector or mis-wiring, reset the power.

OK

**2. Check output voltage of Main PCB :**  
 Check voltage of Main PCB (Measure at Main PCB side connector)

1 pin(Red) - 3 pin(Black) DC5V +/- 5%



PS PRESSURE SENSOR

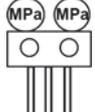
If the voltage is not correct, replace Main PCB.



OK

**3. Check if gas leak or less gas**  
 Measure Gas pressure, if there is a leak, correct it.

If recharging refrigerant, make sure to perform vacuuming and recharge the specified amount.



OK

**4. Replace Pressure Sensor**

If Check Point 1 ~ 3 do not improve the symptom, replace Pressure Sensor.

**Clear 27: P.F.C. error (only for 3-phase type)**

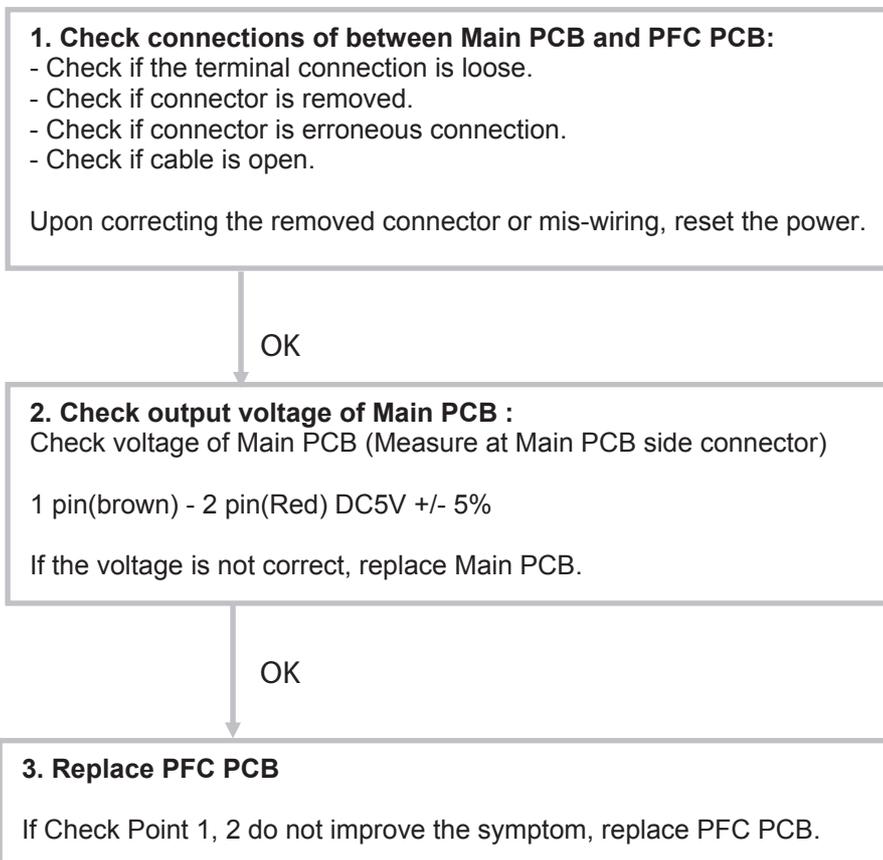
LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	6 flashes	4 flashes	19 flashes

**Probable causes:**

- Connector connection failure.
- Main PCB failure.
- PFC PCB failure.

**Check:**

**Clear 27:**



**Clear 33: Detection of compressor position error (permanent stoppage)**

LED	Hydraulic Unit		Outdoor Unit
	Green	Red	
	9 flashes	5 flashes	14 flashes

**Probable causes:**

- Misconnection.
- Main PCB failure.

**Check:****Clear 33:****1. Check connections condition in control unit:**

- Check if the terminal connection is loose.
- Check if connector is removed.
- Check if connector is erroneous connection.
- Check if cable is open.

Upon correcting the removed connector or mis-wiring, reset the power.

OK

**2. Replace the electronic board :**

- If steps 1 does not solve the problem, replace Main PCB.

## 1.2.2 Failures With No Error Code

### Clear 35: No voltage on Hydraulic Unit

**Probable causes:**

- Power supply fault.
- External causes.
- Faulty electrical components.

**Check:**

**Clear 35:**

**1. Check the installation :**  
 - Is the circuit breaker cut off?  
 - Check the wiring.

OK

**2. Check for external causes on the Hydraulic Unit and outdoor unit (noise or voltage drop):**  
 - Check for any other electrical device on the same electric circuit which might cause a drop in voltage.  
 - Check for any current leaks.  
 - Check for any equipment generating electromagnetic waves which interfere with the communication between the Hydraulic Unit and the outdoor unit.

OK

NO

**3. Check the electrical components:**  
 - Check that a voltage between AC 198 and AC 264 V exists between terminals 1 and 2 on the Hydraulic Unit terminal block.

YES

- Check Interface PCB for :  
   o either the fuse (F1).  
   o or the varistor (VA1). Fault: overvoltage - external causes - power supply to be checked).  
 - Replace the faulty component (if the varistor is blown, the PCB must be replaced).

OK

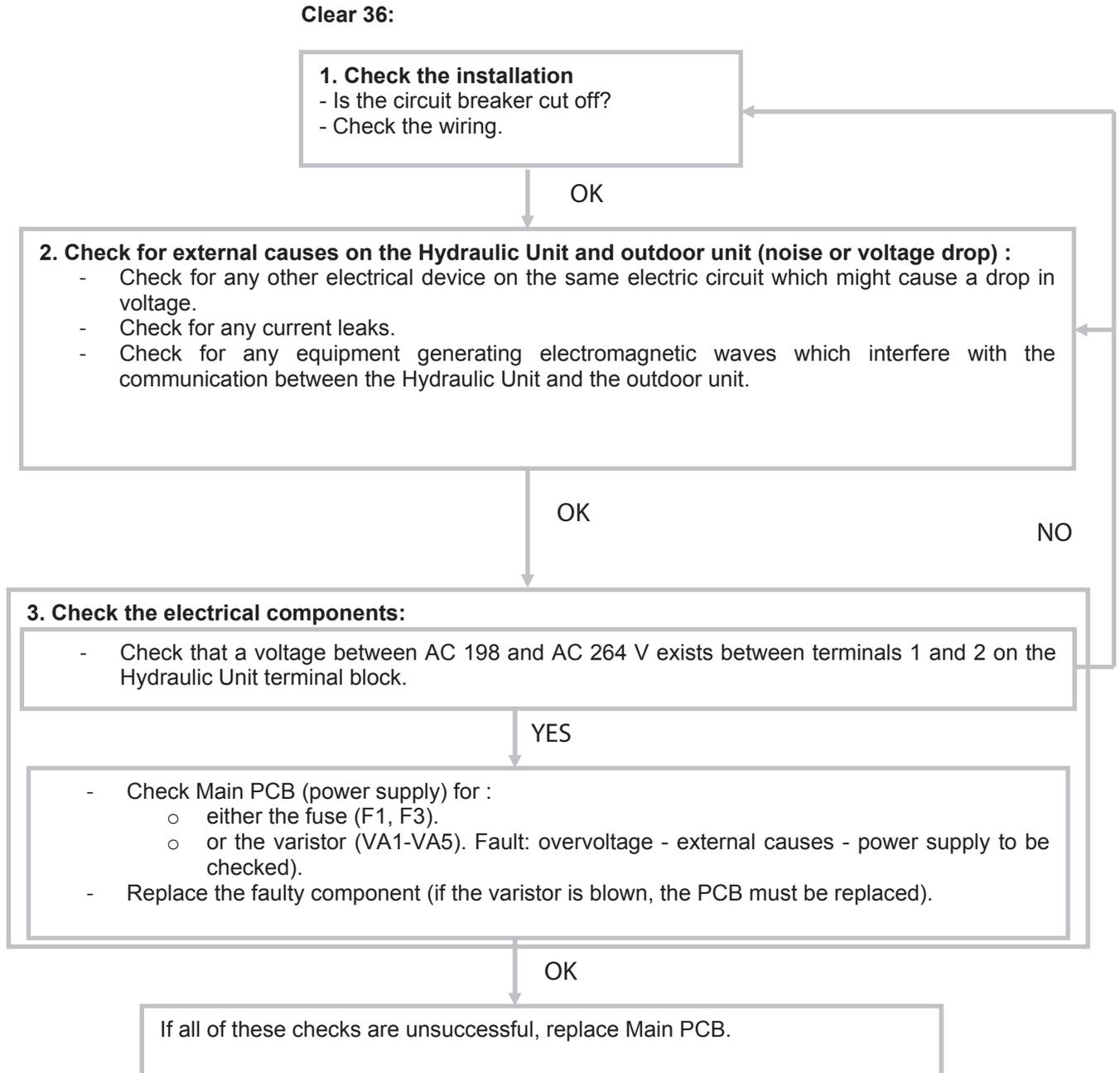
If all of these checks are unsuccessful, replace Interface PCB.

**Clear 36: No voltage on outdoor unit**

**Probable causes:**

- Power supply fault.
- External cause.
- Faulty electrical components.

**Check:**



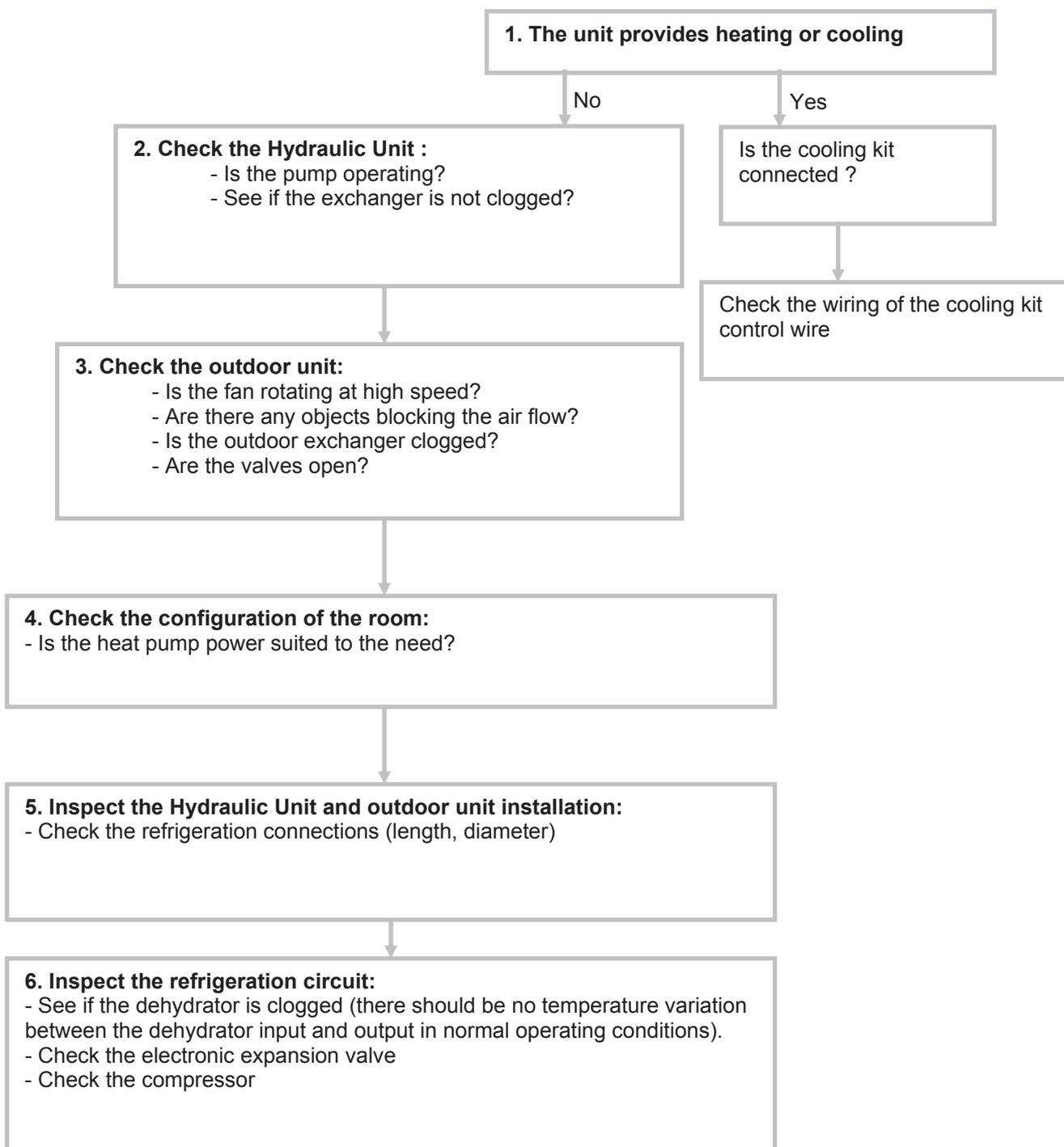
**Clear 38: No heat**

**Probable causes:**

- Hydraulic Unit error.
- Outdoor unit error.
- Influence from the outdoor environment.
- Misconnections of connectors and cables.
- Refrigeration system fault (not enough gas, clogging, dirty filters).

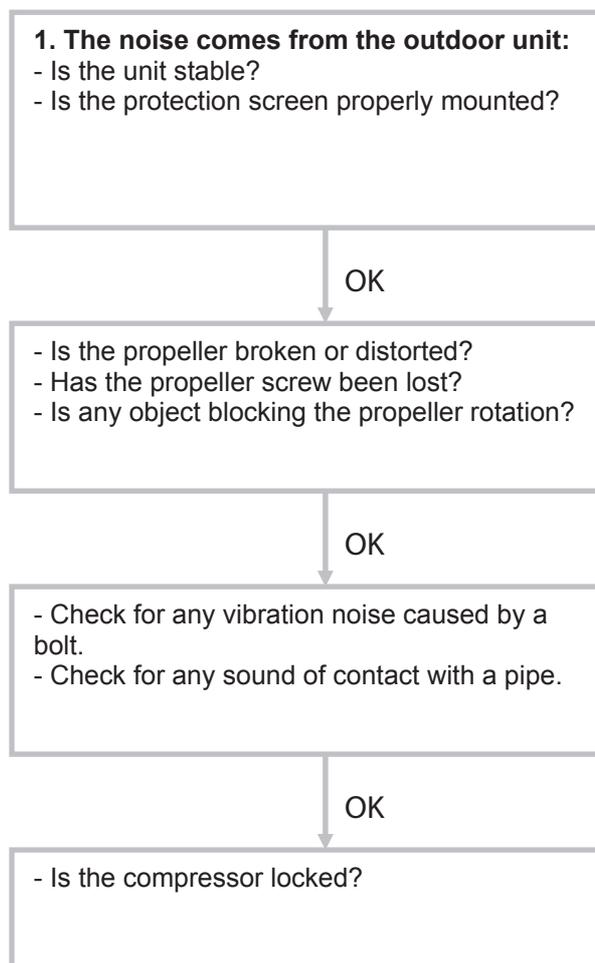
**Check:**

**Clear 38:**



**Clear 39: Abnormal noise****Probable causes:**

- Abnormal installation (outdoor)
- Fan failure
- Compressor failure.

**Check:****Clear 39:**

### 1.3 Sensor Values

#### 1.3.1 Outdoor Unit Temperature Sensors

Outdoor Heat Exchanger (outlet), Outdoor Heat Exchanger (middle)								
Temperature (°C)	-10	-5	0	10	15	20	25	30
Resistance value (kΩ)	27,5	20,9	16,1	12,4	9,73	7,67	6,1	3,95

Outdoor Discharge Pipe / Compressor / Expansion valve inlet														
Temperature (°C)	0	5	10	15	20	30	40	50	60	70	80	90	100	120
Resistance value (kΩ)	168	130	101	79	63	40	26,3	17,8	12,3	8,7	6,3	4,6	3,4	2

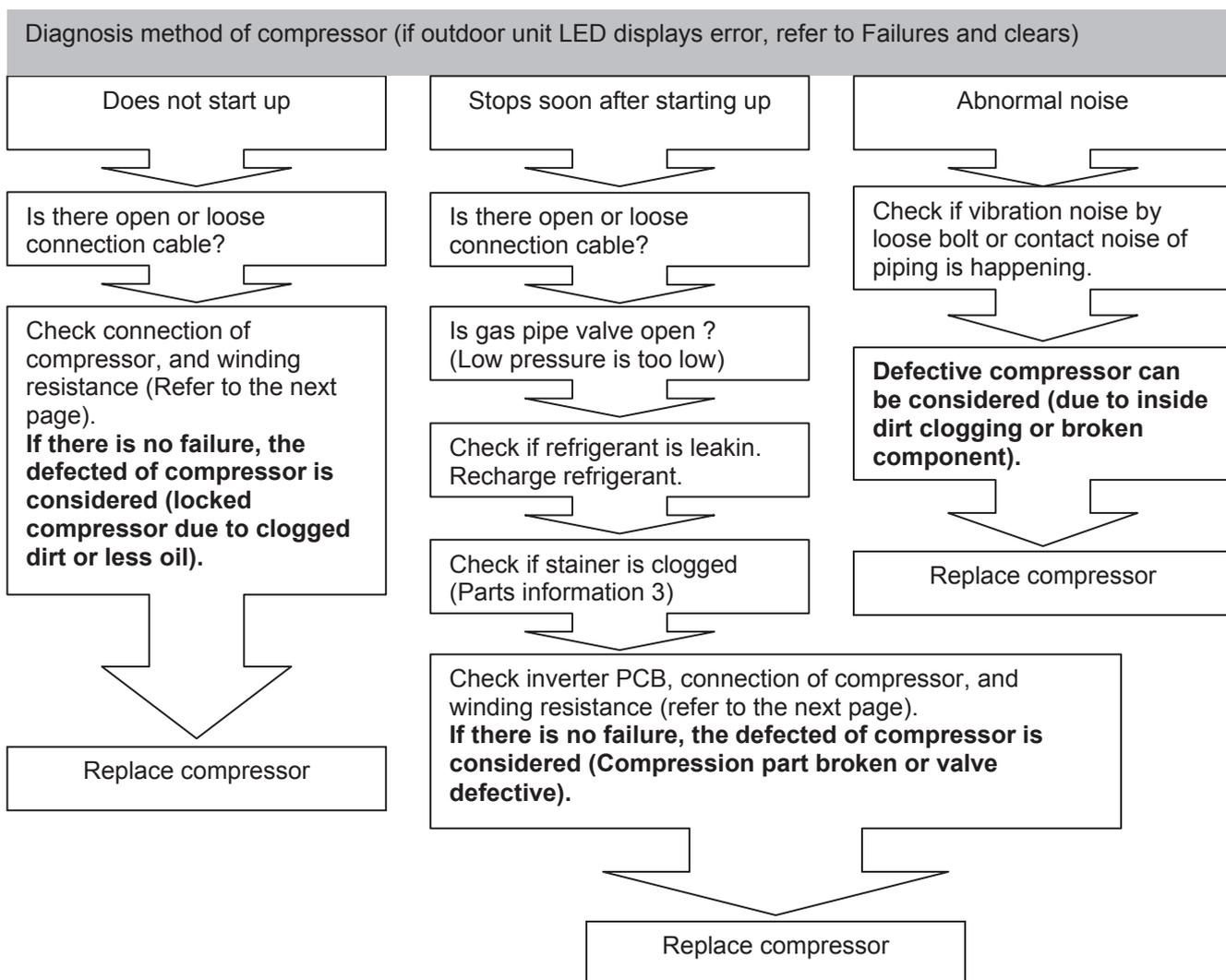
Outdoor Temperature													
Temperature (°C)	-20	-10	-5	0	5	10	15	20	30	40	50	60	70
Resistance value (kΩ)	115	62,3	46,6	35,2	26,9	20,7	16,1	12,6	7,97	5,18	3,45	2,36	1,65

Heat sink															
Temperature (°C)	0	5	10	15	20	30	40	50	60	70	80	90	100	110	120
Resistance value (kΩ)	15,8	12,2	9,5	7,5	5,9	3,78	2,50	1,69	1,17	0,83	0,60	0,44	0,33	0,25	0,19

### 1.4 Service parts information

#### 1.4.1 Information 1 : Compressor

Service parts information 1 : Compressor

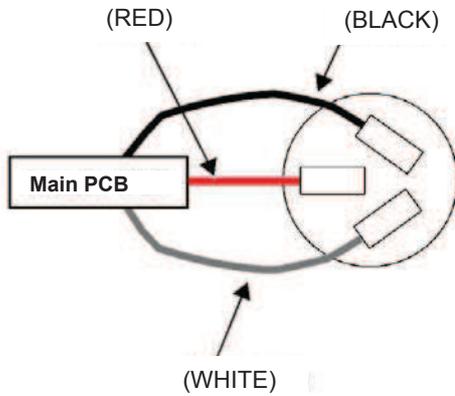


### 1.4.2 Information 2 : Inverter compressor

Service parts information 2 : Inverter compressor

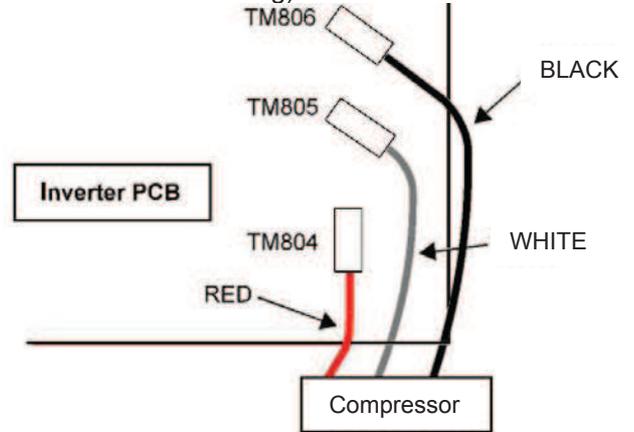
#### Check point 1 : Check connection

Check terminal connection of compressor  
(Loose or incorrect wiring)



#### Only for 3-phase type :

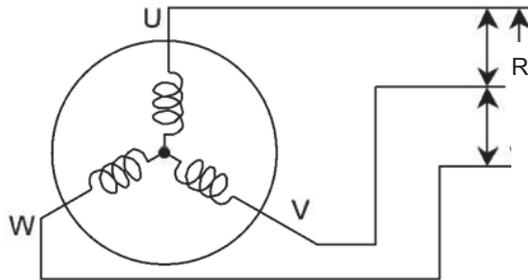
Check connection of inverter PCB  
(Loose or incorrect wiring)



#### Check point 2 : check winding resistance

Check winding resistance on each terminal

If the resistance value is 0Ω or infinite, replace compressor.



Resistance value :

- 0.24 Ω (at 20°C) for single phase type
- 0.79 Ω (at 20°C) for 3-phase type



#### Check point 3 : replace Main PCB

If check point 1 and 2 do not improve the symptom, replace Main PCB.

### 1.4.3 Information 3 : Electronic expansion valve [EEV, EEV(INJ)]

Service parts information 3 : Outdoor unit electronic expansion valve (EEV, EEV(INJ))

#### Check point 1 : Check connection

Check connection of connector  
(Loose connector or open cable)

##### Single phase :



##### 3-phase :



#### Check point 2 : Check coil of EEV

Remove connector, check each winding resistance of coil.

Read wire	Resistance value
White-Red	46Ω +/- 4Ω at 20°C
Yellow-Red	
Orange-Red	
Blue-Red	

If resistance value is abnormal, replace EEV.

#### Check point 3 : Check voltage from main PCB

Remove connector and check voltage (DC12V)  
If it does not appear, replace Main PCB.



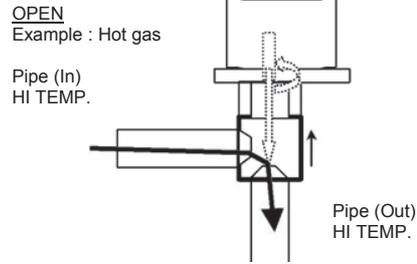
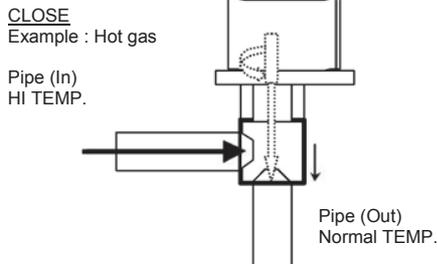
#### Check point 4 : Check noise at start up

Turn on power and check operation noise.  
If an abnormal noise does not show, replace Main PCB.

#### Check point 5 : Check opening and closing operation of valve

When valve is closed, it has a temp. (Add period) difference between inlet and outlet.

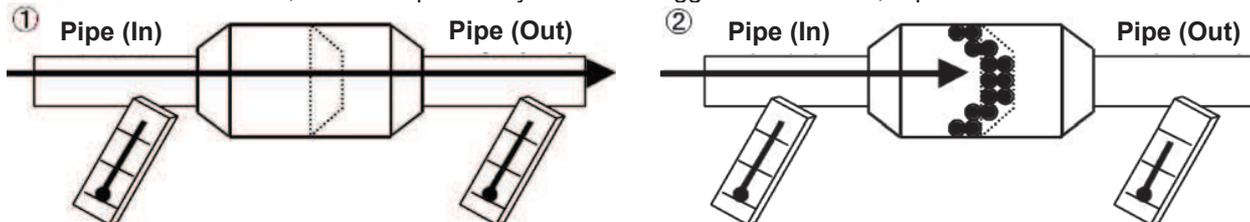
If it is open, it has no temp. (Add period) difference between inlet and outlet.



There is no refrigerant flow coming to EEV(INJ) while the liquid injection is inactive. Check whether the liquid injection is active before executing check point 5 for EEV(INJ).

#### Check point 6 : Check stainer

Stainer normally does not have temperature difference between inlet and outlet as shown in 1, but if there is a difference as shown in 2, there is a possibility of inside clogged. In this case, replace stainer.



### 1.4.4 Information 4 : Solenoid valve (SV)

Service parts information 4 : Outdoor unit solenoid valve (SV)

**Check point 1 : Check connections**  
 Check connection of connector  
 (Loose connector or open cable)

**Check point 2 : Check solenoid coil**  
 Remove connector and check if coil is open  
 (normal resistance value of each coil : 1495+/-7%)  
**If resistance value is abnormal, replace solenoid coil.**



**Check point 3 : Check voltage from main PCB**  
 Remove connector and check the voltage  
 (AC230V).  
**If the voltage does not appear, replace Main PCB.**



**Check point 4 : check opening and closing operation valve**  
 Depending on the injection activity, check if valve is operating normally.  
 (When valve opens, there is no temperature difference between inlet and outlet)

Injection is inactive  
**Pipe (In) TEMP. HI.**  
**Pipe (Out) TEMP. Normal**

Injection is active  
**Pipe (In) TEMP.= Pipe (Out) TEMP.**

☒ If the valve closes by removing the connector of the valve which does not close, it is considered to be Main PCB failure. Replace Main PCB.

☒ If it does not close by removing connector, there is a possibility of (1) clogging by dirt, or (2) deformation by the heat at the time of solenoid valve installation. In this case, replace solenoid valve.

## 2 Failures

### 2.1 Electrical System

#### 2.1.1 Outdoor Unit Overvoltage

Check for possible causes in the list below (this list is not exhaustive):

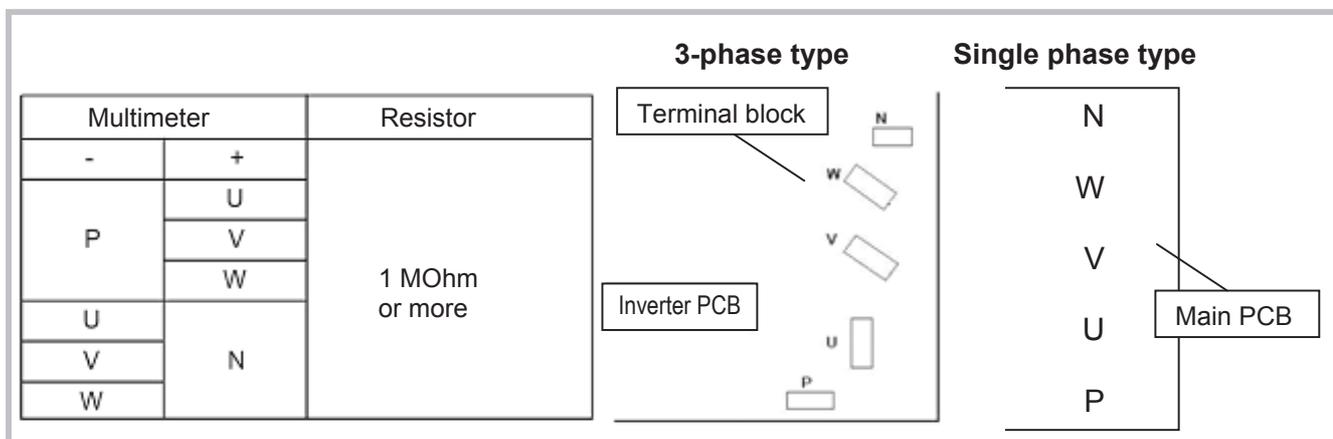
- Problem with the compressor
- Main board
- Faulty power relay

#### Steps to be followed before performing any work on the Inverter module:

- First switch off the system using the circuit breaker at the head of the line.
- Remove the unit cover and then remove the Inverter module cover.
- Measure the voltage at the condenser terminals. You should find a value of 5 Vdc or less.

#### 2.1.2 Inspection of the Power Transistor Module (Main board)

Disconnect the compressor relay and the condenser connection. Measure the resistance value at the points shown on the illustration, and then compare the values observed with those in the table.



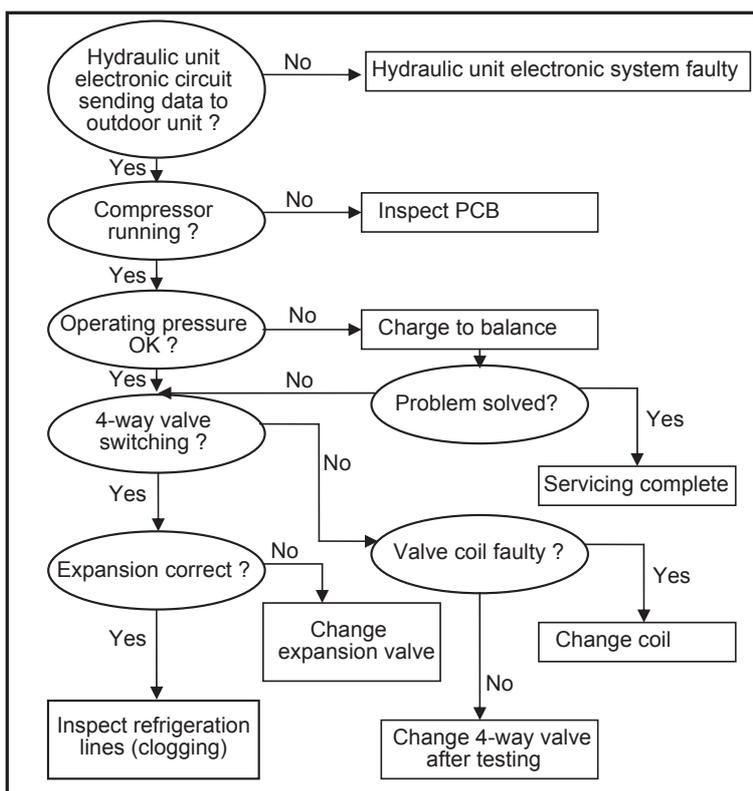
### 2.2 Refrigeration System

#### 2.2.1 Unit produces no heat

The unit remains in continuous scanning mode.

##### Initial checks:

- Check the settings
- Are the data sent by the user interface received by the heat pump?



### 2.2.2 Outdoor unit does not defrost

- Is condensation drain properly discharged (outdoor unit directly on the ground)?
- Are the auxiliaries powered?
- In boiler backup mode, is the boiler authorized?
- **In very cold areas, a fusing resistance value is recommended.**
  - Is the installation regularly subject to micro-outages of power (frequent outages on the mains power system may also cause defrosting problems)?
  - Is there a peak day clearing (EJP) outage on the installation?
- Does the heat pump regularly switch to high pressure safety mode?

If this occurs at low temperatures (< 5 °C), we recommend checking that the water pump is operating properly.

- Is the charge correct (refer to the temperature/pressure curve)?
  - Insufficient charging will result in frequent icing.
  - Overcharging will result in frequently switching to HP safety mode.

(If you still have doubts as to the charge, perform the charging with an electronic scale).

- Outdoor unit defrosting is controlled by the exchanger sensor and the controller board.

If the defrost sensor is not iced up while the rest of the exchanger is, then:

- Move the sensor between the exchanger blades to a place where the exchanger is iced up.
- If all these points have been checked, replace the outdoor controller board.

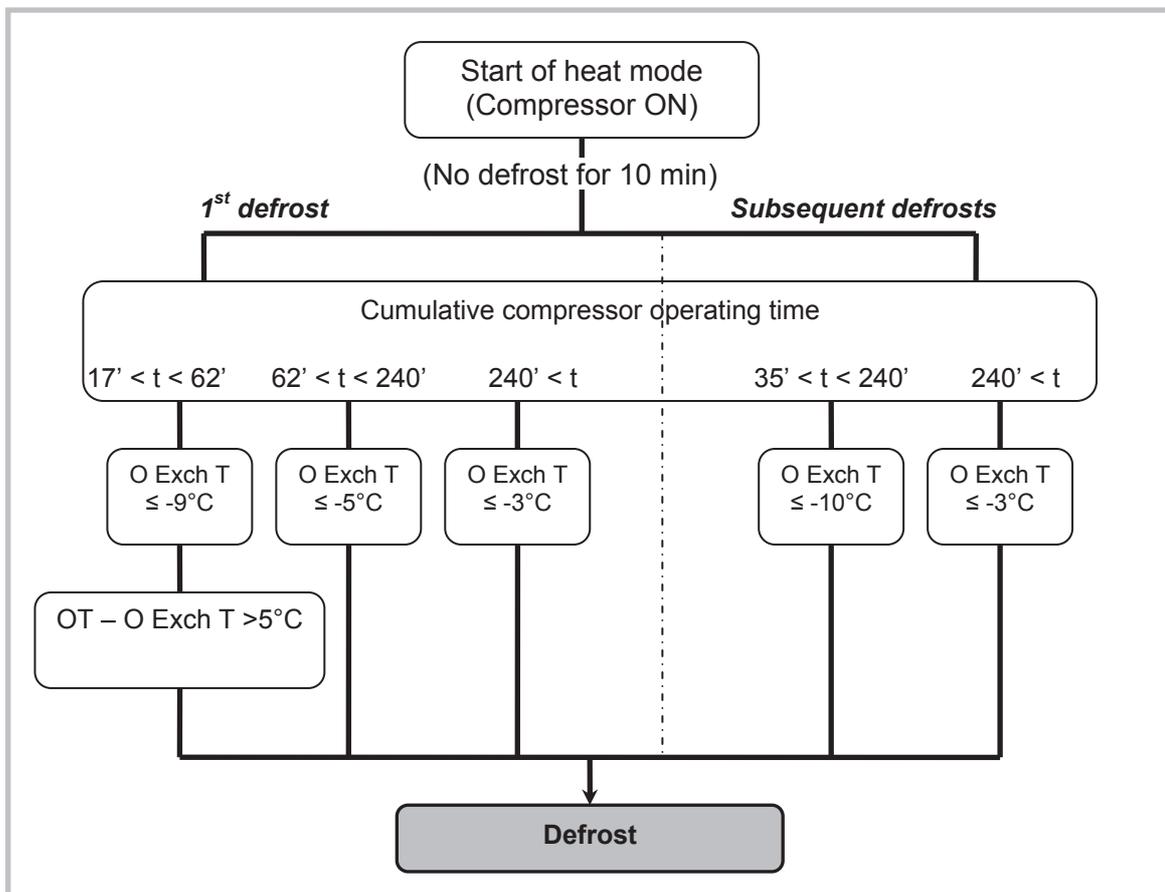
**Note:**

Outdoor unit defrosting is controlled by the exchanger sensor and the controller board. If no frosting is observed and no anomaly is otherwise noted, the sensor and board must be inspected and the faulty part will have to be replaced.

### Defrosting

#### a. Defrost beginning conditions

Defrost beginning conditions



O Exch T : outdoor unit exchanger temperature  
 OT : outdoor temperature  
 t : Cumulative compressor operating time

### b. Defrost ending conditions

With all models, defrosting stops if the exchanger temperature is above 10 °C or if the defrosting time is over 15 minutes).

#### 2.2.3 Crankcase heater

When the outdoor exchanger temperature is below -18°C and the heating mode has been stopped for 30 minutes, the compressor windings are powered and maintain the compressor temperature.

When operation has started and the temperature becomes higher than -16°C, heating stops.

### 2.3 Compressor Operating Checks

Using a multimeter set to mega ohm, check that the resistance value across the windings is identical irrespective of the phase (between U and V, V and W, W and U). This value should be approx. 1 Ohm.

Check that resistance between each phase and the earth is infinite. The result should be clear (you should not see the displayed value increasing slowly up to a value greater than the multimeter maximum rating).

### 2.4 Refrigeration Circuit Leak Test

The new regulation requires annual leak testing of installations with a refrigerant charge higher than 2kg.

Leak testing is to be performed with an approved detector that has been appropriately calibrated.

### 2.5 Troubleshooting

#### The heat pump is not operating at all (no illuminated indicator):

- Are the power supply voltage and frequency normal?
- Is the connection to mains correct?
- Have all the connectors been properly inserted?
- Are the fuses on the outdoor unit still operating? *If not, change the bad fuse(s).*
- Is the connection between the outdoor unit and the Hydraulic Unit correct? Do you read 230V AC between terminals 1 and 2 of the Hydraulic Unit terminal block?
- Do you read 230V AC at the transformer primary on the Hydraulic Unit? *If not, change the board.*
- Is there any voltage on the transformer secondary on the Hydraulic Unit? *If not, check the thermal fuse. If the fuse is good, the error comes from the board.*

## 3 Annual Maintenance Services

---

Ensure that the general electrical power supply has been cut off before starting any repair work.

### 3.1 Outdoor unit

- Dust off the heat exchanger if necessary, being careful not to damage the fins.
- Straighten the vanes using a comb.
- Clean refrigeration and ventilation compartment (check the fan).
- Check that there is nothing obstructing the passage of air.
- Verify that condensate drain is not obstructed.
- **Checking the refrigeration circuit :**
  - When the refrigerant charge is in excess of 2kg (>10kW models), it is compulsory to have an approved after sales service check the refrigeration circuit (conduct refrigeration circuit leak test) every year (with a certificate of capacity for the handling of refrigerants).
- Check the lack of leak (connections, valves...).

### 3.2 Electrical

- Inspect connections and tighten where appropriate
- Check condition of wires and boards

### 3.3 Operating checks

- conduct refrigeration readings at temperatures
- in case of malfunction, install pressure gauges for refrigeration diagnosis
- check voltage, current and control

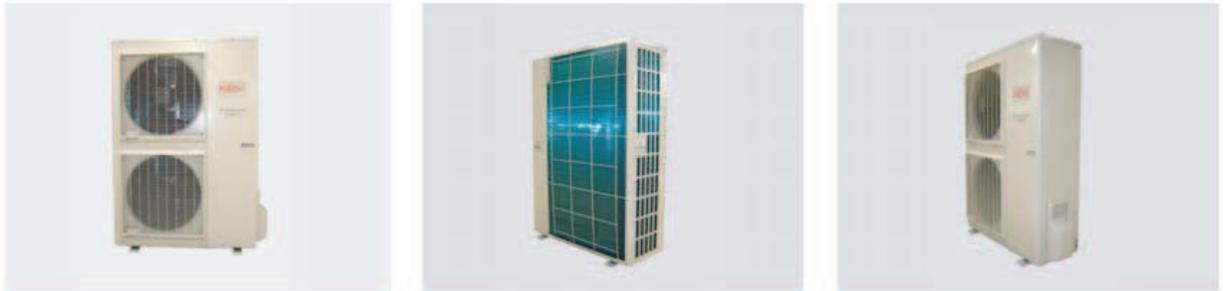
# 4 Disassembly Process of Outdoor Unit

**> Warning ! <**

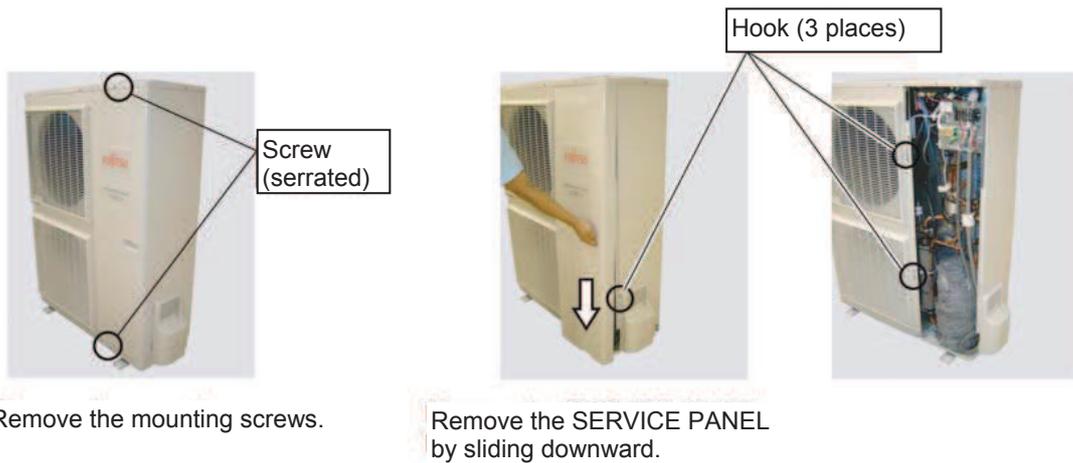
Before servicing the unit, turn the power supply switch OFF, then, do not touch electric parts for 10 minutes due to the risk of electric shock.

## 4.1 Single phase type

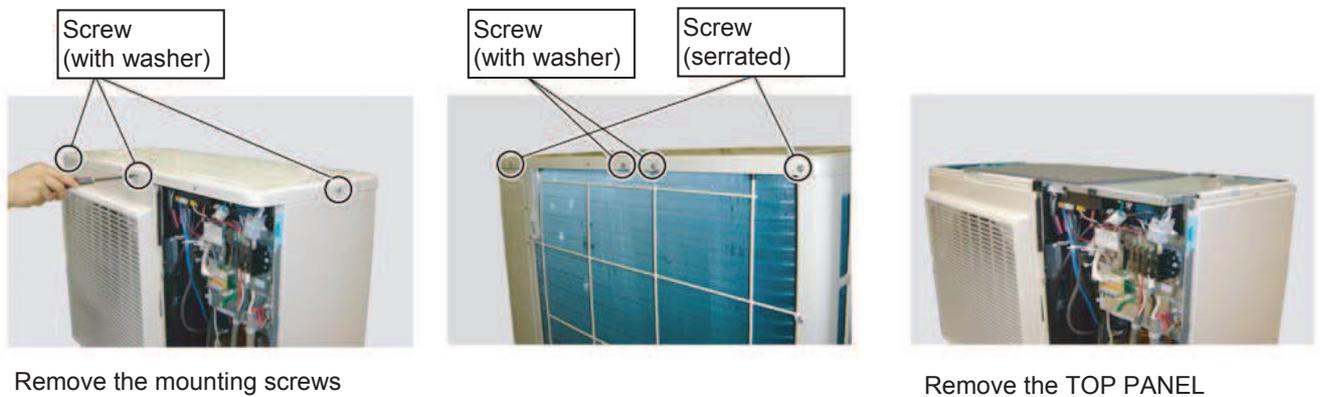
### 4.1.1 Appearance



### 4.1.2 Service panel removal

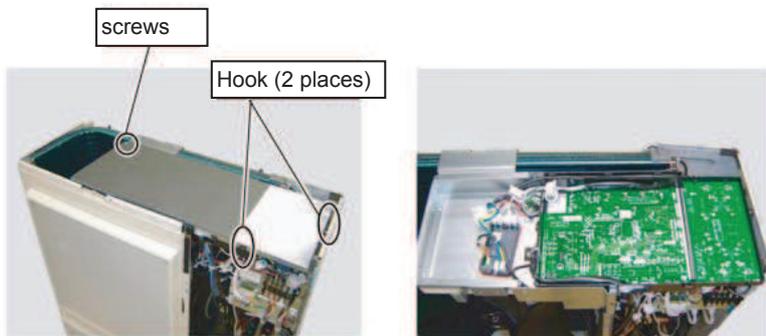


### 4.1.3 Top panel removal



**Single Phase type**

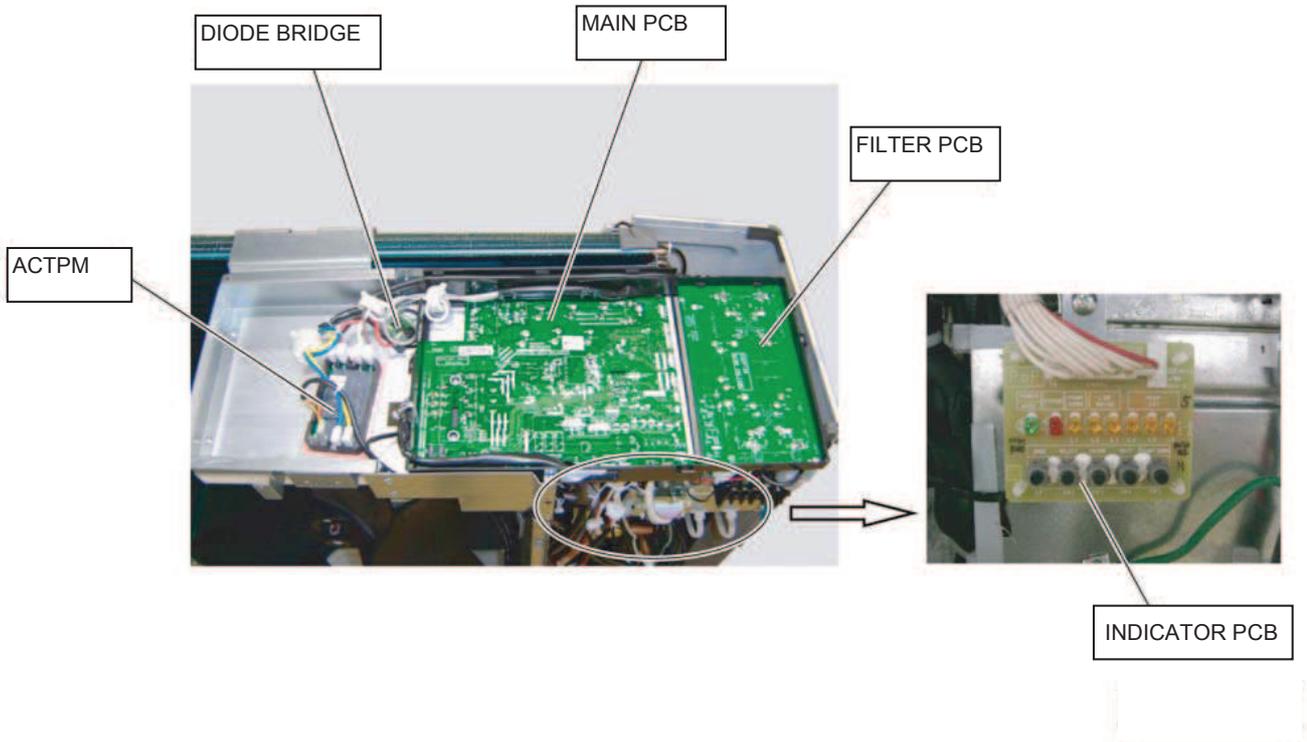
### 4.1.4 MAIN PCB, FILTER PCB, and INDICATOR PCB removal



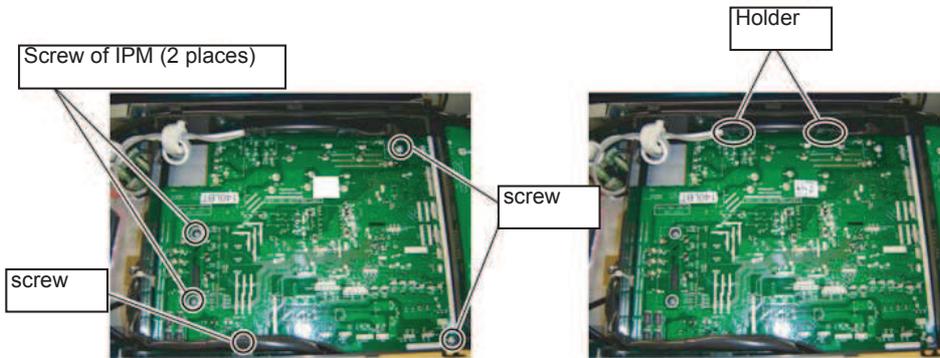
Remove the 1 mounting screw

Remove the INVERTER BOX COVER by sliding upward.

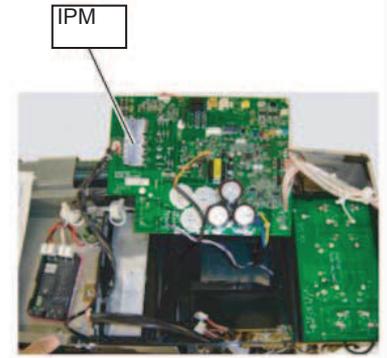
Single Phase type



### MAIN PCB removal



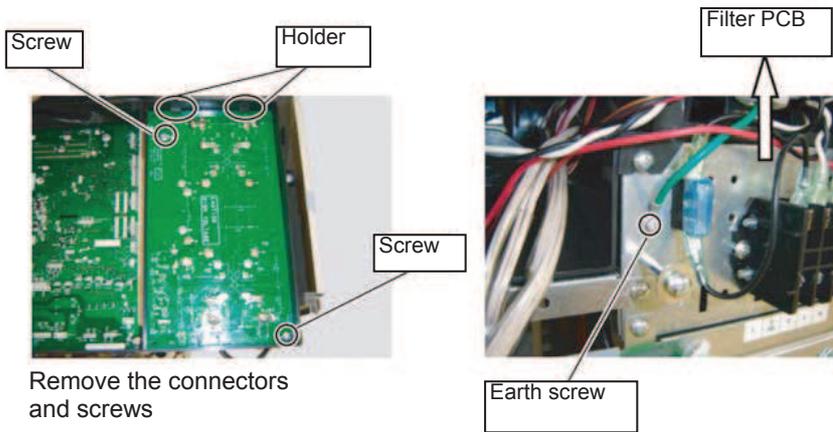
Remove the connectors and screws  
For screws of IPM.  
Note the tightening torque at the installation.  
Tightening torque is 1.2±0.2N.M



Remove the MAIN PCB

Spread the heat dissipation compound on the other side of IPM when you exchange INVERTER PCB by the repair.

### FILTER PCB removal



Remove the connectors and screws

Remove the earth screw.

Remove the FILTER PCB.

### INDICATOR PCB removal



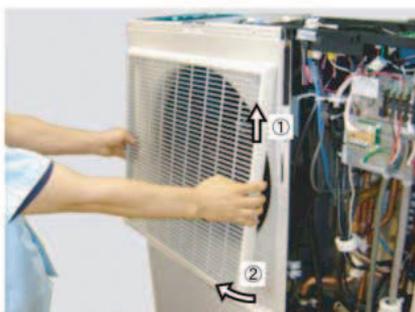
Remove the connectors and locking spacers.

Remove the INDICATOR PCB.

### 4.1.5 FAN MOTOR removal



Remove the 4 mounting screws.

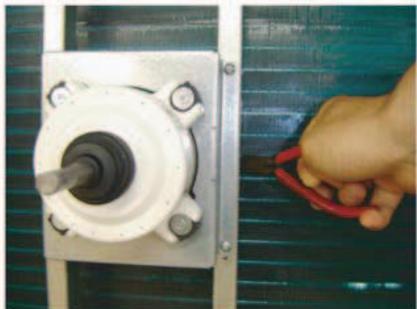


Remove the FAN GUARD by sliding upward.

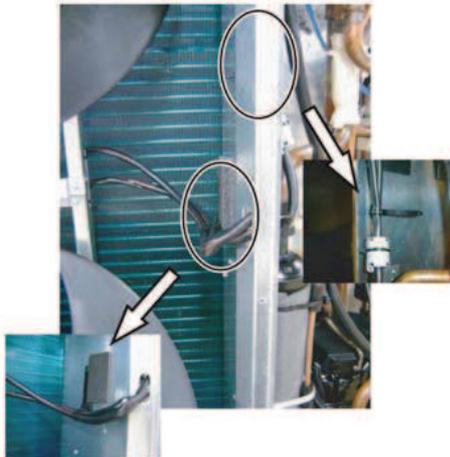


Remove the Hex Socket Screw. And remove the PROPELLER FAN. Note at the installation. Insert propeller Fan and Moter shalf reference D cutting position. And the tightening torque at the installation. Tightening torque is from 10 to 15 N.M.

Single Phase type



Cut the binder. (2 places)

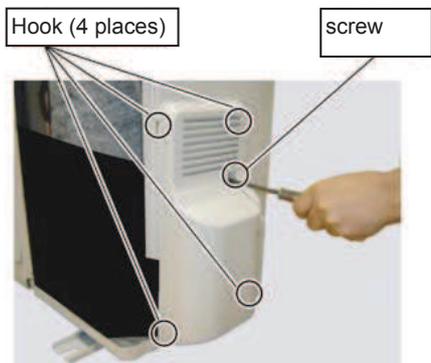


Loose the clamp. (2 places) and remove the lead wires.



Remove the 4 mounting screws. Remove the FAN MOTOR.

### 4.1.6 VALVE COVER removal

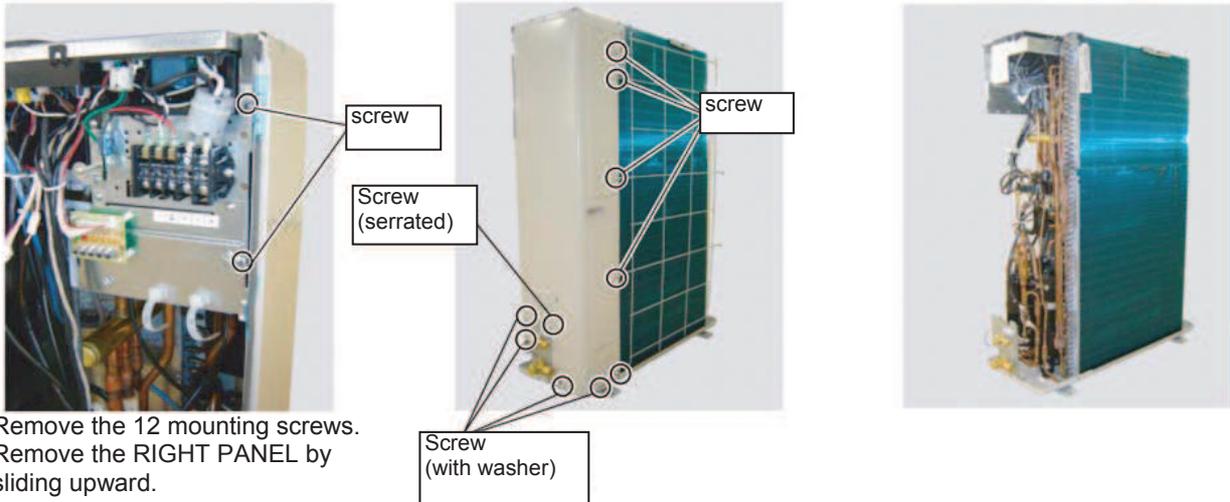


Remove the mounting screws



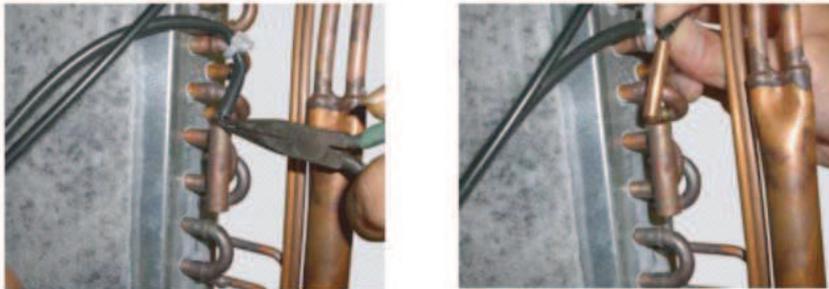
Remove the VALVE COVER.

### 4.1.7 RIGHT PANEL removal



### 4.1.8 THERMISTOR removal

#### HEAT EXCHANGER (MID) THERMISTOR



Remove the THERMISTOR SPRING. Remove the THERMISTOR.

#### HEAT EXCHANGER (OUT) THERMISTOR



Remove the THERMISTOR SPRING. Remove the THERMISTOR.

### EEV THERMISTOR



Remove the THERMISTOR SPRING.

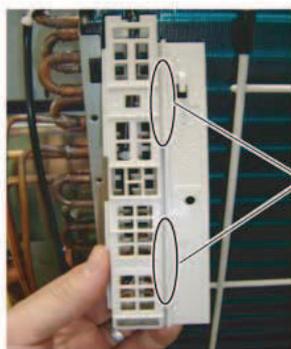


Remove the THERMISTOR.

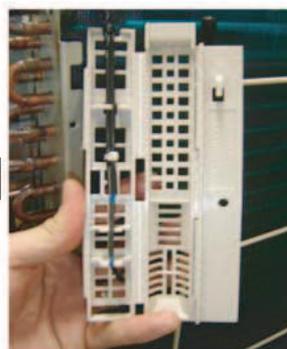
### OUTDOOR THERMISTOR



Remove the THERMOR HOLDER.



hook



Open the THERMO HOLDER and remove the THERMISTOR.

### 4.1.9 SOLENOID COIL removal

#### 4WAY VALVE



Remove the mounting screw.



Remove the SOLENOID COIL.

#### INJECTION



Remove the mounting screw.



Remove the SOLENOID COIL.

Single Phase type

#### 4.1.10 EEV COIL removal

##### **MAIN**



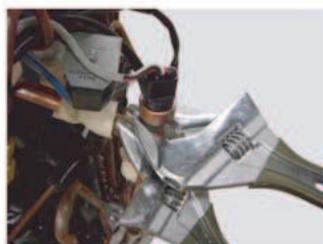
Remove the EEV coil by hand.

##### **INJECTION**



Remove the EEV coil by hand.

#### 4.1.11 PRESSURE SENSOR removal



Remove the PRESSURE SENSOR with wrench.

Note the tightening at the installation.  
Tightening torque is 12+-1.5N.m.

#### > Warning ! <

Wear gloves to prevent the frostbite, because a small amount of refrigerant leaks during work.

#### 4.1.12 COMPRESSOR removal

##### Precautions for exchange of compressor.

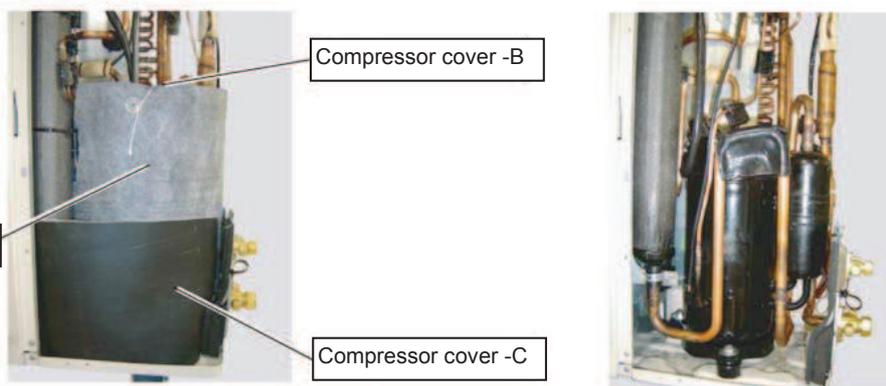
Do not allow moisture or debris to get inside refrigerant pipes during work.

##### Procedure for compressor removal.

1. Turn off the power
2. Remove the service panel and right panel
3. Fully close the 3Way valve (gas) and 3Way valve (liquid)
4. Collect the refrigerant from the 3Way valve.

Start the following work after completely collecting the refrigerant.

Do not reuse the refrigerant that has been collected.



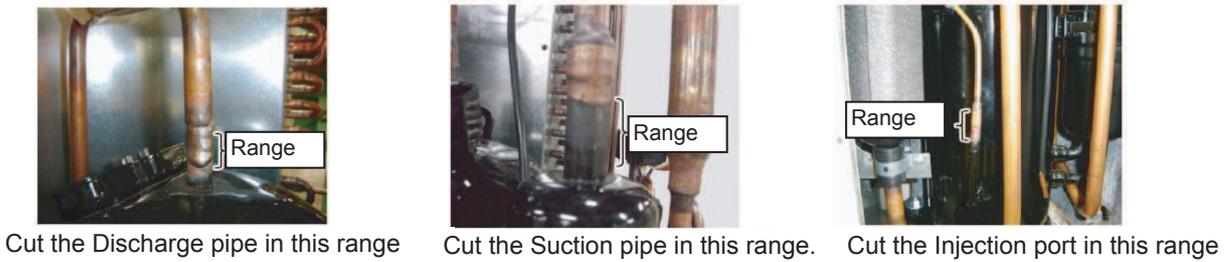
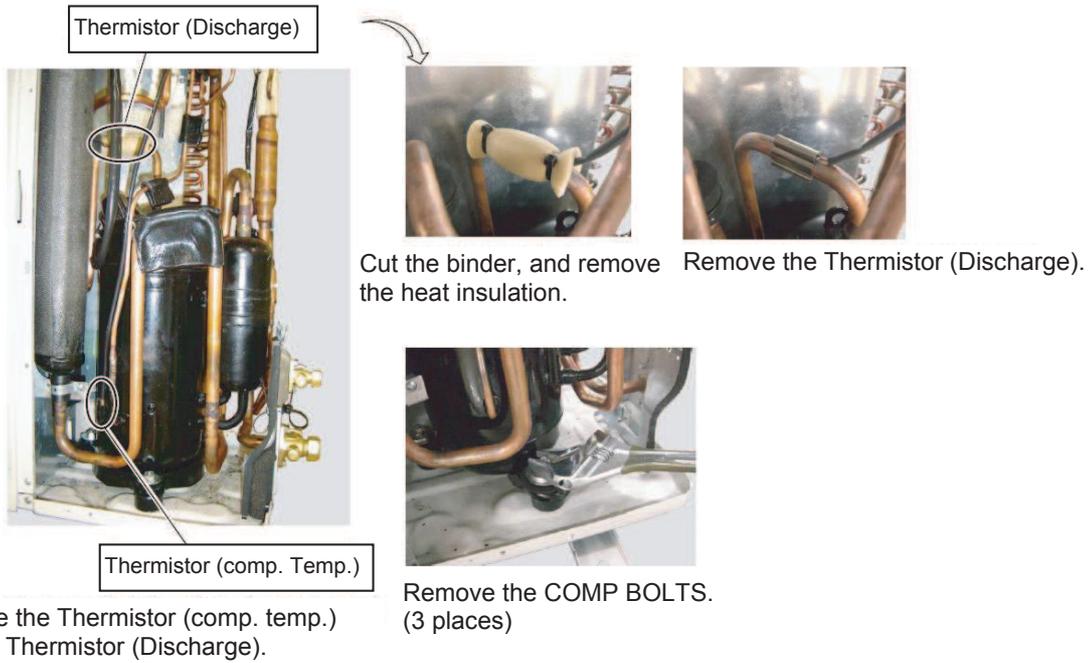
Remove the  
COMPRESSOR COVER-B and COVER-A



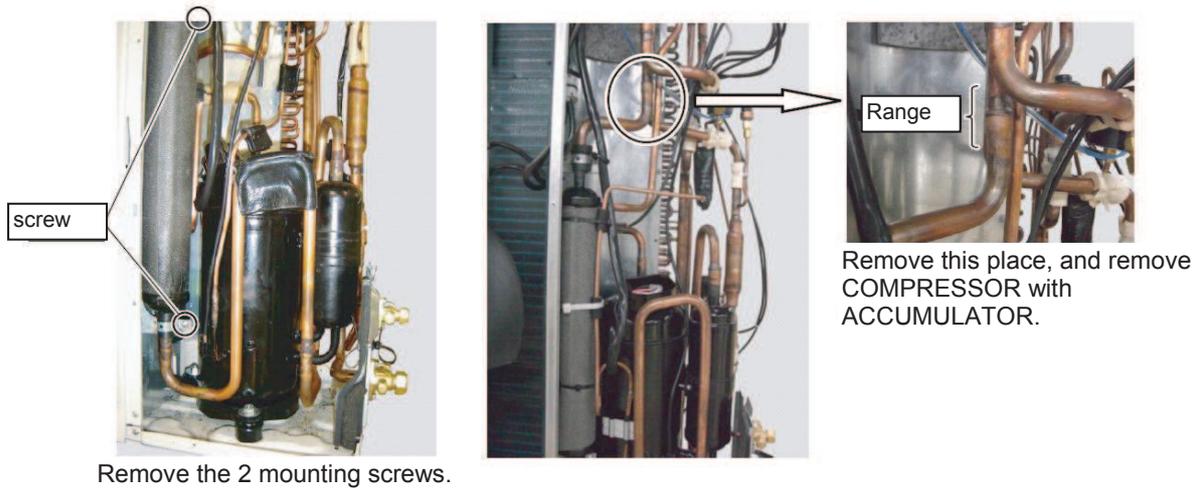
Remove the TERMINAL COVER.



Remove the connectors.  
[R : RED, C(T) : BLACK, S(W) : WHITE]



- Keep their shape better.
- There is a possibility of catching fire to oil when removing by the welding without cutting it.



**Procedure for compressor installation**

Reverse procedure to removing the compressor.

**Precautions for installation of compressor.**

1. When brazing, do not apply the flame on the terminal.
2. When brazing, be sure to replace the air in the pipe with nitrogen gas to prevent forming oxidization scale.

## 4.2 3-phase type

### 4.2.1 Appearance



### 4.2.2 Service panel removal



Screw (serrated)

Remove the mounting screws.



Hook (3 places)

Remove the SERVICE PANEL by sliding downward.



3-Phase type

### 4.2.3 Insulation sheet removal

INSULATION SHEET

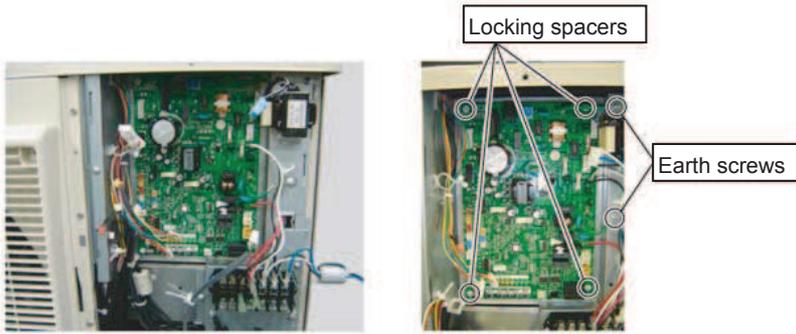


Hook (4 places)

Remove the Hook (4 places)  
Remove the INSULATION SHEET by sliding upward.



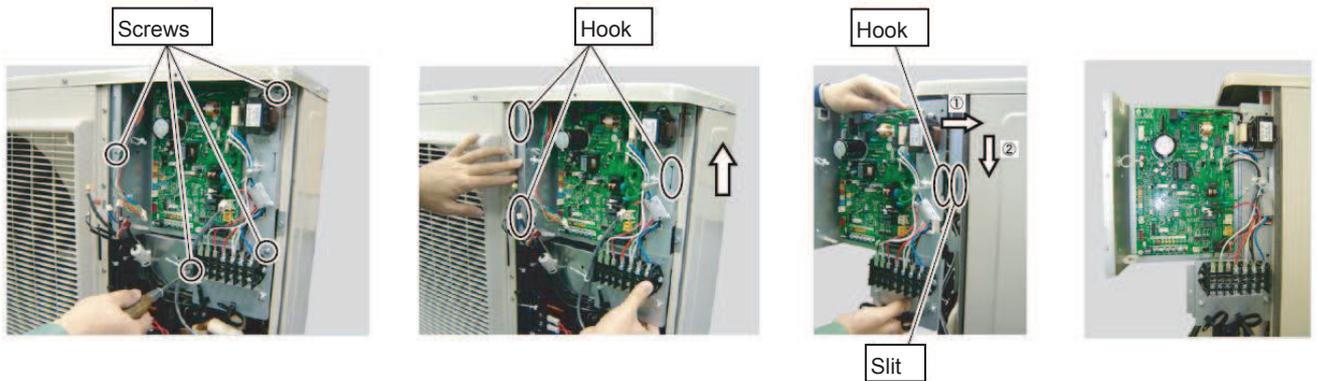
### 4.2.4 Main PCB removal



Remove the connectors.

Remove the earth screws and the locking spacers

### 4.2.5 INVERTER, PFC, FILTER, and CAPACITOR PCB removal

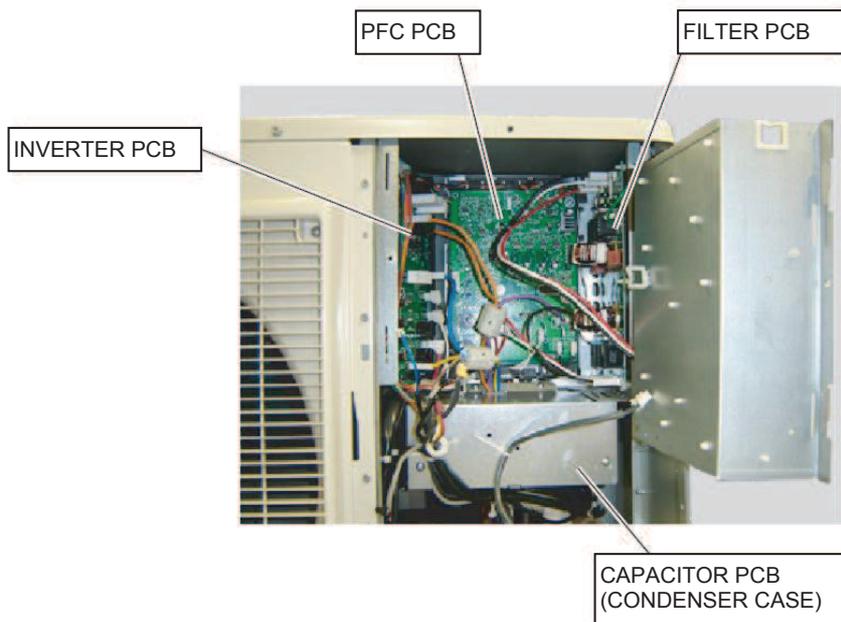


Remove the 4 mounting screws.

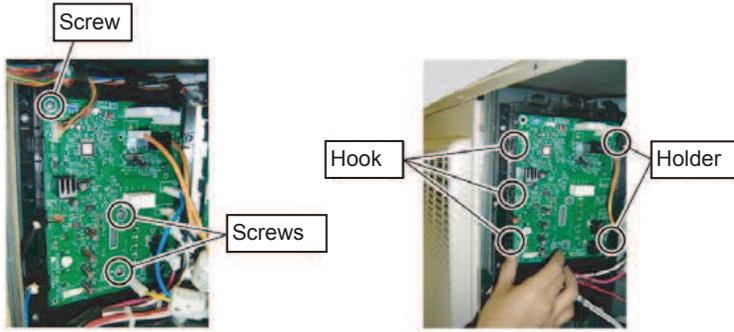
Remove the INVERTER CASE MAIN by sliding upward.

Hang the hook on the slit.

3-Phase type

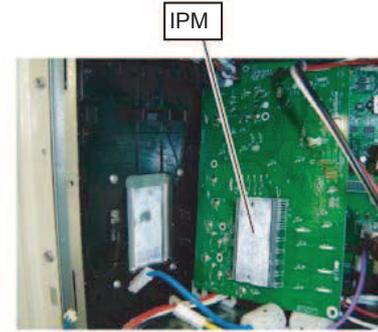


### INVERTER PCB removal



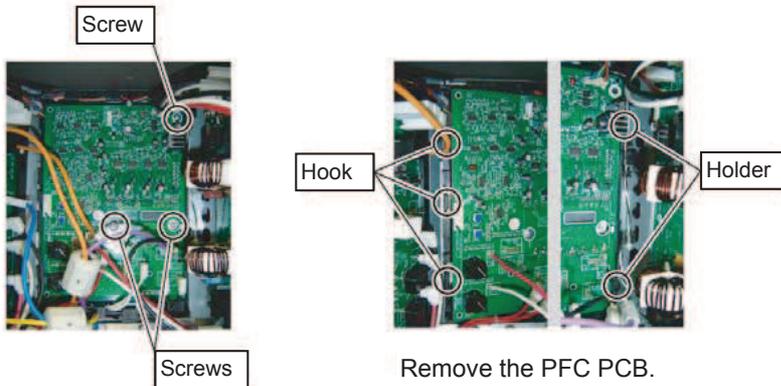
Remove the connectors and screws  
For screws of IPM.  
Note the tightening torque at the installation.  
Tightening torque is 1.2~0.2N.M

Remove the INVERTER PCB.



Spread the heat dissipation compound on the other side of IPM when you exchange INVERTER PCB by the repair.

### PFC PCB removal



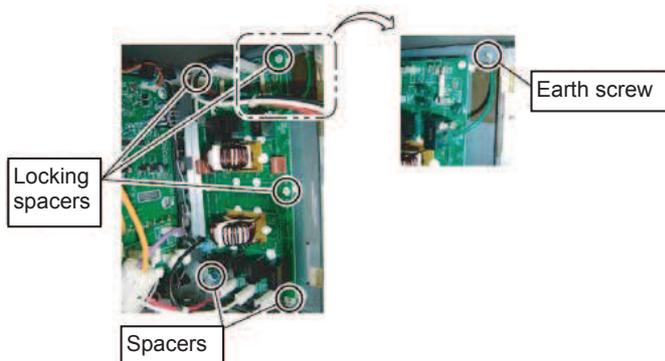
Remove the connectors and screws  
For screws of IPM.  
Note the tightening torque at the installation.  
Tightening torque is 1.2~0.2N.M

Remove the PFC PCB.



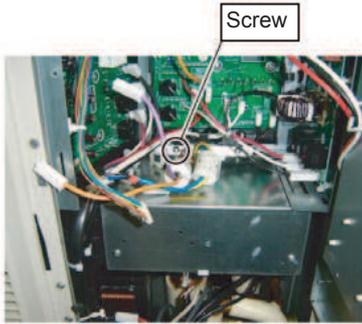
Spread the heat dissipation compound on the other side of IPM when you exchange PFC PCB by the repair.

### FILTER PCB removal

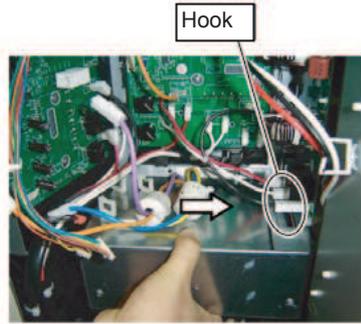


Remove the connectors, locking spacers, spacers, and earth screw.

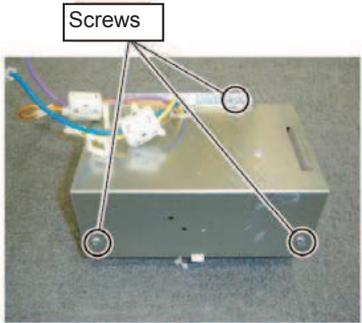
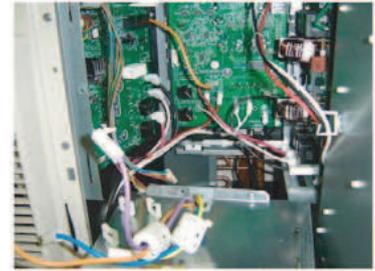
### CAPACITOR PCB removal



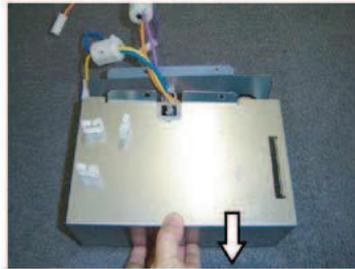
Remove the connectors, codes and screw.



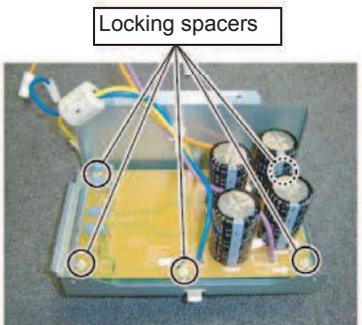
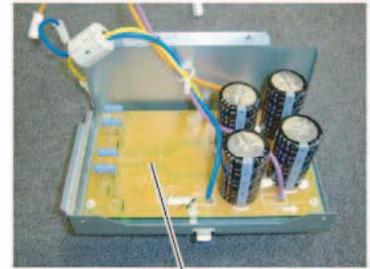
Remove the CONDENSER CASE by sliding rightward.



Remove the mounting screws.



Remove the CONDENSER COVER by sliding toward.

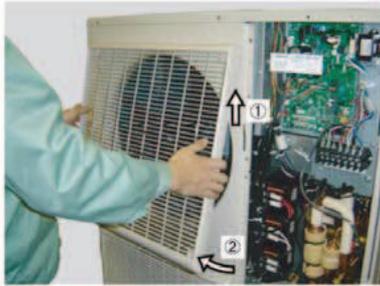


Remove the locking spacers.

### 4.2.6 FAN MOTOR removal



Remove the 4 mounting screws.



Remove the FAN GUARD by sliding upward.



Remove the Hex Socket Screw and remove the PROPELLER FAN.  
 Note at the installation.  
 Insert propeller Fan and Moter shaft reference D cutting position.  
 And the tightening torque at the installation.  
 Tightening torque is from 10 to 15Nm.



Cut the binder. (2 places)



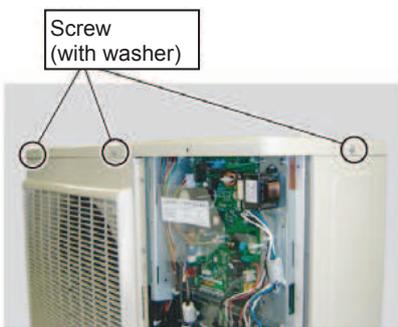
Loose the clamp, and remove the lead wires



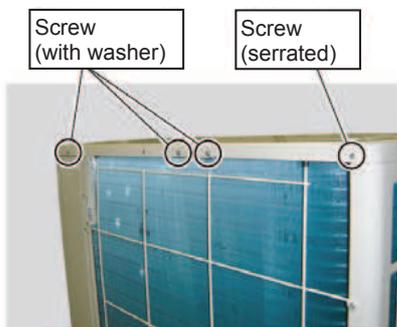
Remove the 4 mounting screws. Remove the FAN MOTOR.

3-Phase type

### 4.2.7 TOP PANEL removal

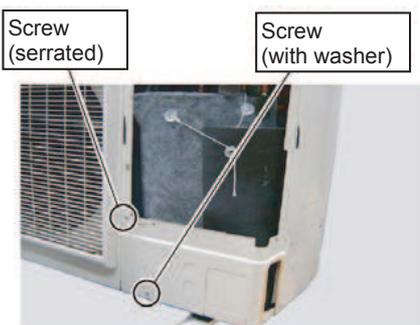


Remove the mounting screws.

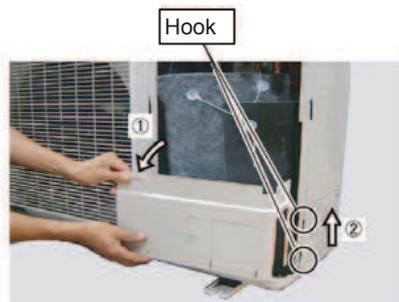


Remove the TOP PANEL.

### 4.2.8 PIPE COVER FRONT removal



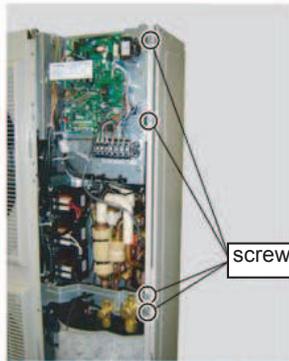
Remove the mounting screws.



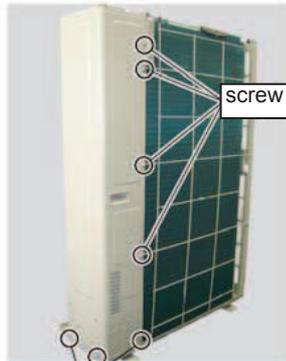
Remove the PIPE COVER FRONT.



### 4.2.9 RIGHT PANEL removal



Remove the 11 mounting screws.  
Remove the RIGHT PANEL by sliding upward.



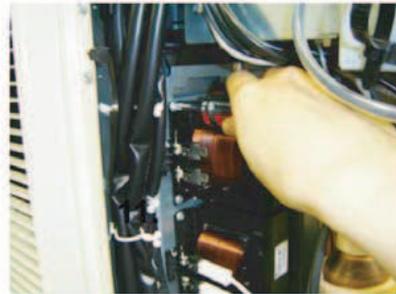
Screw  
(with washer)



### 4.2.10 REACTOR removal



Remove the connectors.



Remove the 3 mounting screws.

### 4.2.11 THERMISTOR removal

#### **HEAT EXCHANGER (MID) THERMISTOR**



Remove the THERMISTOR SPRING.



Remove the THERMISTOR.

#### **HEAT EXCHANGER (OUT) THERMISTOR**



Remove the THERMISTOR SPRING.



Remove the THERMISTOR.

### EXPANSION VALVE THERMISTOR



Remove the THERMISTOR SPRING.

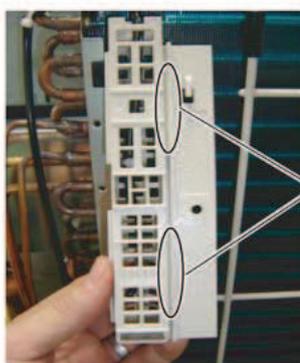


Remove the THERMISTOR.

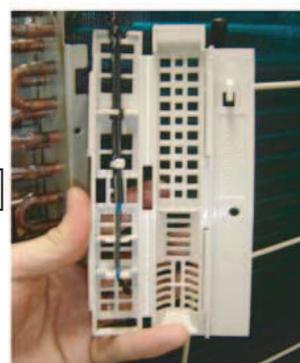
### OUTDOOR THERMISTOR



Remove the THERMOR HOLDER.



hook



Open the THERMO HOLDER and remove the THERMISTOR.

### 4.2.12 SOLENOID COIL removal

#### 4WAY VALVE



Remove the mounting screw.



Remove the SOLENOID COIL.

#### INJECTION



Remove the mounting screw.



Remove the SOLENOID COIL.

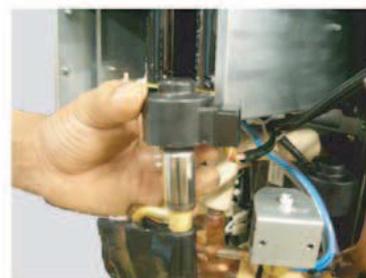
### 4.2.13 EEV COIL removal

#### MAIN



Remove the EEV coil by hand.

#### INJECTION



Remove the EEV coil by hand.

### 4.2.14 PRESSURE SENSOR removal



Remove the PRESSURE SENSOR with wrench.  
Note the tightening at the installation.  
Tightening torque is 12+-1.5N.m.

#### > Warning ! <

Wear gloves to prevent the frostbite, because a small amount of refrigerant leaks during work.

### 4.2.15 COMPRESSOR removal

#### Precautions for exchange of compressor.

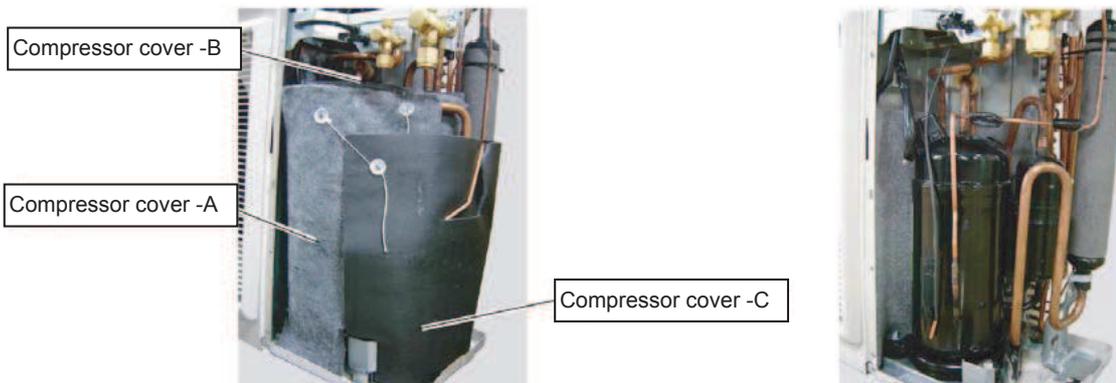
Do not allow moisture or debris to get inside refrigerant pipes during work.

#### Procedure for compressor removal.

1. Turn off the power
2. Remove the service panel
3. Fully close the 3Way valve (gas) and 3Way valve (liquid)
4. Collect the refrigerant from the 3Way valve.

Start the following work after completely collecting the refrigerant.

Do not reuse the refrigerant that has been collected.



Remove the COMPRESSOR COVER-C, COVER-B and COVER-A



Remove the TERMINAL COVER.



Remove the connectors.  
[R : RED, C(T) : BLACK, S(W) : WHITE]

**3-Phase type**

Thermistor (Discharge)



Cut the binder, and remove the heat insulation.

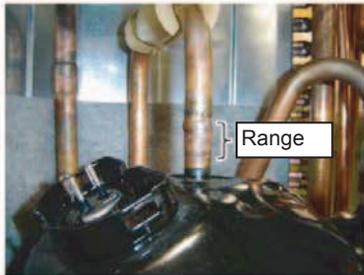
Remove the Thermistor (Discharge).

Thermistor (comp. Temp.)

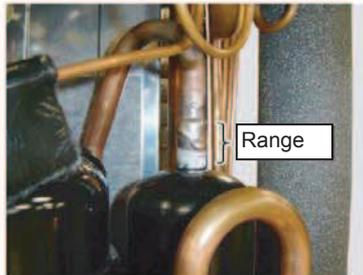
Remove the Thermistor (comp. temp.) and the Thermistor (Discharge).



Remove the COMP BOLTS. (3 places)



Cut the Discharge pipe in this range



Cut the Suction pipe in this range. Remove the COMPRESSOR.



Cut the Injection port in this range

- Keep their shape better.
- There is a possibility of catching fire to oil when removing by the welding without cutting it.

**Procedure for compressor installation**

Reverse procedure to removing the compressor.

**Precautions for installation of compressor.**

1. When brazing, do not apply the flame on the terminal.
2. When brazing, be sure to replace the air in the pipe with nitrogen gas to prevent forming oxidization scale.

### 4.3 Precautions for exchange of refrigerant-cycle-parts

1. During exchange the following parts shall be protected by wet rag and not make the allowable temperature or more.
2. Remove the heat insulation when there is the heat insulation near the welding place. Move and cool it when its detaching is difficult.
3. Cool the parts when there are parts where heat might be transmilled besides the replacement part.
4. Interrupt the flame with the fire-retardant board when the flame seems to hit the following parts directly.
5. Do not allow moisture or debris to get inside refrigerant pipes during work.
6. When brazing, be sure to replace the air in the pipe with nitrogen gas to prevent forming oxidization scale.

Part name	Allowable temperature	Precautions in work
<b>EXPANSION VALVE (MAIN)</b>	120°C	Remove the coil before brazing. And install the coil after brazing. Detaching necessity sensor.
<b>EXPANSION VALVE (INJECTION)</b>	120°C	Remove the coil before brazing. And install the coil after brazing
<b>4 WAY VALVE</b>	120°C	Remove the suction temp. sensor before brazing. And install the suction temp. sensor after brazing.
<b>3 WAY VALVE (GAS)</b>	100°C	
<b>3 WAY VALVE (LIQUID)</b>		
<b>UNION JOINT</b>	100°C	Remove the pressure sensor before brazing. And install the pressure sensor after brazing.
<b>PRESSURE SENSOR</b>	100°C	Tighten the flare part gripping it. (Tightening torque : 12+-1.5N.m) Do the static electricity measures.
<b>SOLENOID VALVE</b>	200°C	Remove the coil before brazing. And install the coil after brazing.



A series of horizontal lines spanning the width of the page, providing a template for writing or drawing.



This appliance is marked with this symbol. This means that electrical and electronic products shall not be mixed with general household waste. European Community countries(\*), Norway, Iceland and Liechtenstein should have a dedicated collection system for these products. Do not try to dismantle the system yourself as this could have harmful effects on your health and on the environment. The dismantling and treatment of refrigerant, oil and other parts must be done by a qualified installer in accordance with relevant local and national regulations. This appliance must be treated at a specialized treatment facility for re-use, recycling and other forms of recovery and shall not be disposed of in the municipal waste stream. Please contact the installer or local authority for more information.  
\* subject to the national law of each member state

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