

AIR TO WATER HEAT PUMP MONOBLOC type

SERVICE MANUAL



Models

Outdoor unit

WPYA050LE

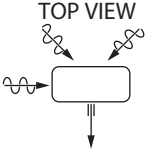
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FUJITSU GENERAL LIMITED



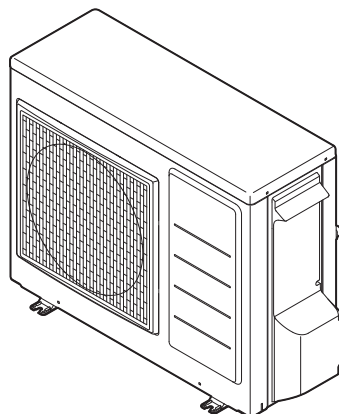
SPECIFICATION

		Unit	WPYA050LE
Cooling Capacity		kW	4.0
Heating Capacity		kW	5.0
Power source		phase	Single
		V	230
		Hz	50
Airflow Method		OUTLET  INTAKE 	TOP VIEW 
Electrical Data	Input	W	Cooling ; 1025 Heating ; 1460
	Running Current (MAX.)	A	Cooling ; 4.5(6.6) Heating ; 6.4(10.9)
Water Pipe Size			Out ; R3/4(20A) Return ; R3/4(20A)
Power Cord	Number of core-wire		core-wire / 1.5~2.0mm ²
Dimensions	Height	mm	675
	Width	mm	825
	Depth	mm	300
Net Weight		kg	50
Air Circulation	Type		Propeller Fan
	Motor Type		DC brushless(8-pole)
	Rated Output	W	30
Heat Exchanger			Plate fin configuration,forced draft 16.9 FPI
Refrigerant Control Device			Expansion Valve
Refrigerant (R410A)		g	1050
Thermostat			Electronic Control

- Specifications are subject to change without notice.



UNIT



Operation mode

Cold water mode.
Hot water mode.

Inverter control

Inverter control reduce the ON/OFF times of compressor, so can keep the water temperature changeless during operation.

Electricity consumption

Inverter control can operate with less electricity consumption than normal air to water heat pump.

Defrost control

Defrosting operation is controlled by the temperature of outdoor heat exchanger sensed by the thermistor.

Anti-freezing control for the circulation water

Anti-freeze operation automatically starts when the outdoor temperature is lower than 2°C.

Time delay safety control

Restarting is inhibited for approximately 3 minutes.

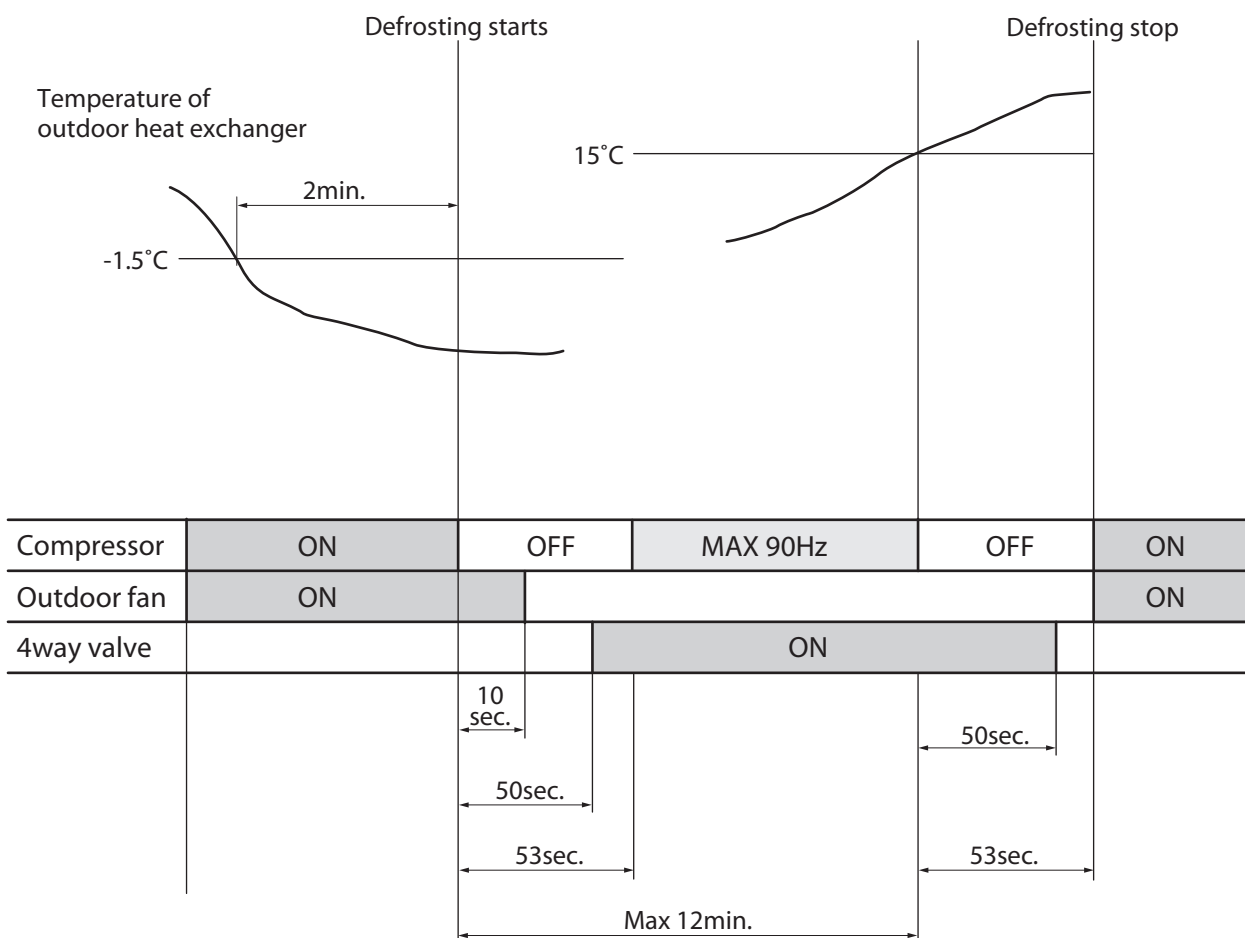


DEFROSTING OPERATION(FOR A UNIT HEAT EXCHANGER)

- Defrosting operation is controlled by the temperature of outdoor heat exchanger sensed by the thermistor and the timer switch.
- Defrosting operation starts when the both of the following conditions are met at the same time.
 - 40 minutes(*1) of continuous run of the compressor after the start of heating operation or after the completion of previous defrosting operation.
 - The temperature of the outdoor heat exchanger stays lower than -1.5°C (*2) continuously for two minutes.
- Defrosting operating is called off if either of the following conditions is met.
 - The temperature of outdoor heat exchanger rises to 15°C while 4-way-valve is ON.
 - 12 minutes has passed since compressor turned ON.

(*1) The period of time may be different in different cases.

(*2) This temperature may be different in different cases.



- Working condition of frost protection heater for expansion vessel

The heater turns ON if the outdoor temperature keeps below 3 degree for 1 minute.

The heater turns OFF if the outdoor temperature keeps above 5 degree for 1 minute.

FOR YOUR SAFETY USE

- For the safety and proper use and handling of the product, please read and follow the instructions carefully.
- The meaning of the marks below are as follows.

 Danger	Improper use will cause the significant risk of death or serious injury of the user.
 Warning	Improper use may cause the risk of death or serious injury of the user.

- Please refer the marks below.

 Caution	 High Voltage	 Prohibited
 Strict enforcement	 Connect the earthing cable	

 Danger		
Check Point	• If leakage of refrigerant occur in the installation, ventilate a room. If the leaked refrigerant is exposed fire, poisonous gas may be generated.	
	• Boosting capacitor make the control box assembly high voltage. Make the capacitor discharge enough when servicing. Otherwise will be struck by electricity.	
	• Never remodel appliance. Use designated parts or accessories to avoid accidents.	
	• In case of gas leakage, not only refill the required amount of the refrigerant gas but also find out the gas leakage point and mend it. If the service work has to be suspended before mending the leakage points, be sure to collect the refrigerant gas in the unit by using pump then fasten the service ports to avoid any further leakage. Poisonous gas may be generated when the leaked refrigerant is exposed to fire.	
	• Be sure to change the cable if it is damaged. Do not use damaged cable.	
	• Do not use power supply cord extended or connected in halfway.	
 Warning		
Check Point	• Be sure to put the units to earthing works.	
	• Be sure to check the insulated resistance, more than 1M Ω.	



ERROR CODES

The error codes displayed on the unit display board the location of the breakdown or abnormality.

UNIT ERROR CODES	APPEARANCE, PORTION, PARTS SEEMED WRONG	METHOD OF CHECK	TROUBLESHOOTING
-	POWER SUPPLY	check the power supply.	confirm the power supply.
	FUSE CF1	check the electric continuity by tester. [see fig.1]	PCB(CONTROLLER) should be replaced.
	FUSE CF3	check the electric continuity by tester. [see fig.1]	PCB(CONTROLLER) should be replaced.
	PCB(CONTROLLER)	other than described above.	PCB(CONTROLLER) should be replaced.
A0	FAN MOTOR	operate without lead wire for FAN MOTOR.	if the same error code appears again, PCB (CONTROLLER) or PUMP should be replaced.
	PUMP	operate without lead wire for PUMP.	if other error codes appear, FAN MOTOR should be replaced.
	REACTOR	check lead wires are connected to the connector of REACTOR properly. check the electric continuity between connector of REACTOR by tester.	if the same error code appears again, PCB (CONTROLLER) or FAN MOTOR should be replaced. if other error codes appear, PUMP should be replaced.
	POWER SUPPLY	check the power supply.	if the lead wires are not connected, connect them to the connector properly.
A1	SENSOR, TEMP. DISCHARGE	check the resistance by tester. [see table 4]	if there is no electric continuity for REACTOR, it should be replaced.
	GAS LEAKAGE	check the service valve and refrigerant circuit (pipe).	confirm the power supply.
A2	UNREASONABLE OPERATION UNDER OVERLOAD	check the place of installation (blockage of air inlet & outlet). check the excess gas.	SENSOR, TEMP. DEFROST should be replaced. collect refrigerant once, then recharge with prescribed mass. ensure the installation position to avoid blockage of air inlet & outlet.
	DROP OF POWER VOLTAGE	check the power voltage (230V) during operation.	if excess gas is observed, collect all refrigerant once, then recharge with prescribed mass.
	MOMENTARY STOP OF POWER(IN CASE OF LIGHTNING)	——	confirm the power supply voltage. (230V)
	PCB(CONTROLLER)	operate without the junction connector of compressor lead wire.	restart operation.
A4	COMPRESSOR	other than described above.	if the same error code appears again, PCB(CONTROLLER) should be replaced.
	UNREASONABLE OPERATION UNDER OVERLOAD	check the place of installation (blockage of air inlet & outlet). check the excess gas.	COMPRESSOR should be replaced. ensure the installation position to avoid blockage of air inlet & outlet.
	DROP OF POWER VOLTAGE	check the power voltage (230V) during operation.	if excess gas is observed, collect all refrigerant once, then recharge with prescribed mass.
	MOMENTARY STOP OF POWER (IN CASE OF LIGHTNING)	——	confirm the power supply voltage. (230V)
A5	UNREASONABLE OPERATION UNDER OVERLOAD	check the place of installation (blockage of air inlet & outlet). check the excess gas.	restart operation.
	CLOGGED THE CIRCULATION PUMP AND/OR HEATING CIRCUIT	check the pump and heating circuit.	ensure the installation position to avoid blockage of air inlet & outlet.
	DROP OF POWER VOLTAGE	check the power voltage (230V) during operation.	if excess gas is observed, collect all refrigerant once, then recharge with prescribed mass.
	MOMENTARY STOP OF POWER (IN CASE OF LIGHTNING)	——	remove the clog, then restart operation.
A6	COMPRESSOR or PCB (CONTROLLER)	other than described above.	confirm the power supply voltage. (230V)
A7	SENSOR, TEMP. SUCTION	check the resistance by tester. [see table 2]	restart operation.
A8	SENSOR, TEMP. DEFROST	check the resistance by tester. [see table 2]	COMPRESSOR should be replaced.
A8	SENSOR, TEMP. DISCHARGE	check the resistance by tester. [see table 4] (*1)	if the sensor is faulty, it should be replaced.

(*1) In case of detecting open circuit of the discharge temperature thermistor, error display appears 10 minutes after start operating.

In case of detecting short circuit of the discharge temperature thermistor, error display appears immediately.

ERROR CODES

UNIT ERROR CODES	APPEARANCE, PORTION, PARTS SEEMED WRONG	METHOD OF CHECK	TROUBLESHOOTING
C0	PCB (CONTROLLER) Error	PCB (CONTROLLER)	PCB(CONTROLLER) should be replaced.
C2	Outdoor temp. sensor Error	SENSOR, TEMP. OUTDOOR	check the resistance by tester. [see table 1]
C3	Fan motor Error	FAN MOTOR	check the voltage of FAN MOTOR. [see fig. 2] if the voltage is normal, FAN MOTOR should be replaced. if the voltage is faulty, PCB(CONTROLLER) should be replaced.
		PCB (CONTROLLER)	ensure the installation position to avoid blockage of air inlet & outlet.
C4	rise of temperature of PCB (CONTROLLER)	MIS-INSTALLATION	PCB(CONTROLLER) should be replaced.
C5	PCB (CONTROLLER) sensor Error	SENSOR, TEMP. PCB (CONTROLLER)	PCB(CONTROLLER) should be replaced.
C6	PCB (CONTROLLER) Error	PCB (CONTROLLER)	PCB(CONTROLLER) should be replaced.
C7	I/F PCB serial error	MIS-WIRING [PCB (CONTROLLER) - I/F PCB CONNECTING CABLE] OR RARE CONTACT	after correcting mis wiring, restart operation.
		I/F PCB	I/F PCB should be replaced.
C8	PCB (CONTROLLER) error	PCB (CONTROLLER)	PCB(CONTROLLER) should be replaced.
CC	Heat pump regulator PCB serial error	MIS-WIRING (I/F PCB-HEAT PUMP REGULATOR) OR RARE CONTACT	PCB(CONTROLLER) should be replaced.
		I/F PCB	after correcting mis wiring, restart operation.
E4	Outgoing circulating temp. sensor Error	Heat pump regulator	I/F PCB should be replaced.
E5	Return circulating water temp. sensor Error	SENSOR, TEMP. OUTGOING CIRCULATING WATER	PCB(CONTROLLER) should be replaced.
		SENSOR, TEMP. RETURN CIRCULATING WATER	if the sensor is faulty, it should be replaced.
P1	Pump Error	PUMP or PCB (CONTROLLER)	if the sensor is faulty, it should be replaced.
		CLOGGED THE CIRCULATION PUMP AND/OR HEATING CIECUIT	if the voltage is normal, PUMP should be replaced. if the voltage is abnormal, PCB(CONTROLLER) should be re-placed.
PCB (DISPLAY) cannot be operated PCB (DISPLAY) does not display anything		check the pump and heating circuit.	remove the clog, then restart operation.
		check lead wires are connected to the connectors properly.	connect the connectors to both PCB (DISPLAY) and PCB (CONTROLLER) steadily.
		ensure that there is no disconnection for the lead wires.	lead wires should be replaced.
		other than described above.	PCB(DISPLAY) should be replaced. PCB(CONTROLLER) should be replaced.
not cool down not warm up	4-WAY VALVE	check the resistance by tester. [see fig. 4]	if the value is abnormal, the coil should be replaced.
		energization during cooling operation is 230V. if there is no energization, check the electric continuity of FUSE CF2. [see fig.1]	if there is no electric continuity for FUSE CF2, it should be re-placed. if there is electric continuity for FUSE CF2, PCB(CONTROLLER) should be replaced.
		check the blockage of air inlet & outlet.	ensure the installation position to avoid blockage of air inlet & outlet.
		check the resistance by tester. [see table 3]	if any of these sensors is faulty, it should be replaced.
	SHORT CYCLE (INSUFFICIENT AIR CIRCULATION)	check the service valve and refrigerant circuit (pipe).	after fixing the leakage point, collect the refrigerant once, then recharge with prescribed mass.
		check temperature difference heating flow/return. [see page 15]	remove the clog, then restart operation.
	CLOGGED HEATING CIRCUIT	check temperature difference means flow rate is too low.	

ELECTRIC CHARACTER

[table 1] Sensor, temp. outdoor

Temp.(°C)	Resistance(kΩ)
0	31
5	24
10	19
15	15
20	12
25	10
30	8.2
35	6.7
40	5.5
45	4.6
50	3.8
55	3.2

[table 2] Sensor, temp. defrost
Sensor, temp. suction

Temp.(°C)	Resistance(kΩ)
0	29
5	23
10	19
15	15
20	12
25	10
30	8.3
35	6.9
40	5.7
45	4.8
50	4.1
55	3.4

[table 3] Sensor, temp. outgoing
and return circulating water

Temp.(°C)	Resistance(kΩ)
0	25
10	16
20	10
30	7.0
40	4.9
50	3.5
60	2.5

[table 4] Sensor, temp. discharge

Temp.(°C)	Resistance(kΩ)
10	100
20	64
35	33
40	27
50	18
80	6.4

DISPLAY OF ERRORS IN THE PAST

1. Display method

- **For a unit display board**

Press and hold the PUMP SW. and RESET SW. at the same time for 5 seconds to display a past error code and its sequence number.

The PUMP SW. can then be used to select between a maximum of 8 past error codes to display. (If there are no error codes, " - - " is displayed.)

2. Display cancellation

- **For a unit display board**

While an error code is being displayed, press and hold the PUMP SW. and RESET SW. at the same time for 5 seconds to cancel the error code display and turn off the display.

Alternatively, if no operations are performed for 5 minutes, the error code display is automatically cancelled and the display turned off.

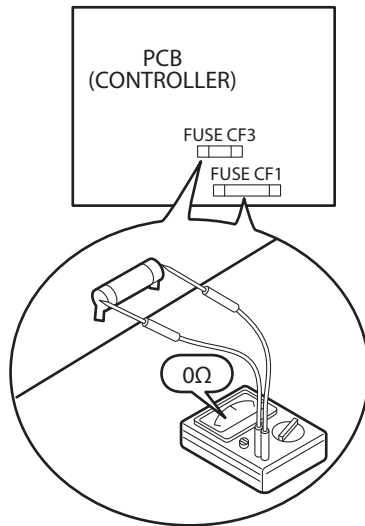
While an error code is being displayed, press and hold the reset switch for 10 seconds or more to delete all past error codes. The display turns to " - - ".



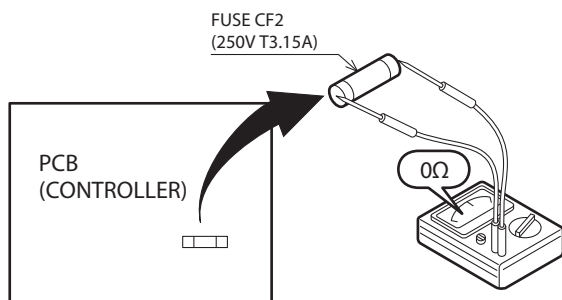
CHECK FOLLOWING STEPS

[fig. 1] Continuity of current fuse on the PCB (CONTROLLER)

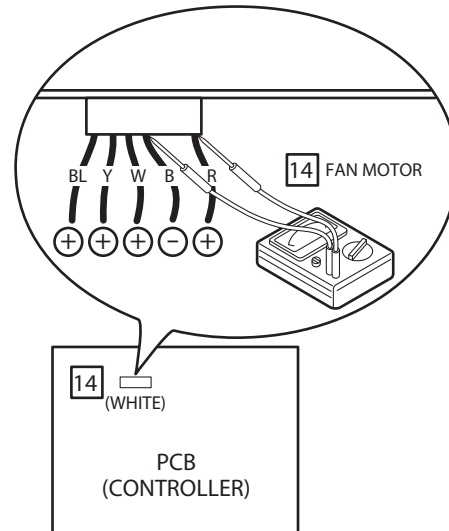
[FUSE CF1,3]



[FUSE CF2]



[fig. 2] Voltage of FAN MOTOR on the PCB(CONTROLLER)



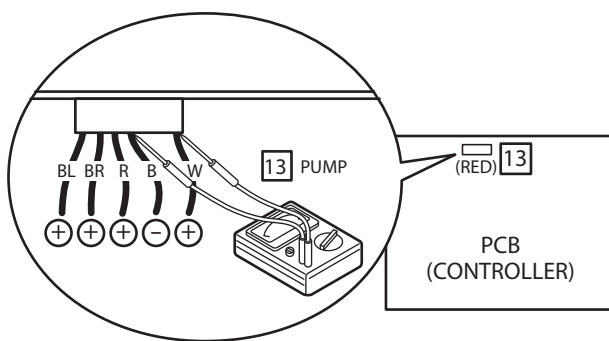
Measure voltage between the connector pins of connector 14. Connector 14 shall be checked during heating or cooling operation.

Measure voltage as follows without taking off the connector 14.

between red ⊕ and black ⊖ approx. DC200~370V } PCB (CONTROLLER)
between yellow ⊕ and black ⊖ approx. DC3~7V } is Normal
between white ⊕ and black ⊖ approx. DC15V }

→ FAN MOTER Error

[fig. 3] Voltage of PUMP on the PCB(CONTROLLER)



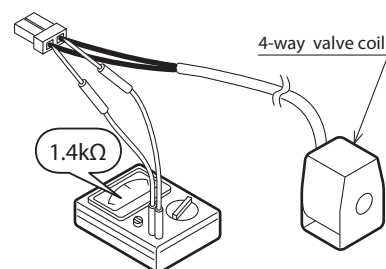
Measure voltage between the connector pins of connector 13. Connector 13 shall be checked during heating or cooling operation.

Measure voltage as follows without taking off the connector 13.

between white ⊕ and black ⊖ approx. DC200~370V } PCB (CONTROLLER)
between brown ⊕ and black ⊖ approx. DC3~7V } is Normal
between red ⊕ and black ⊖ approx. DC15V }

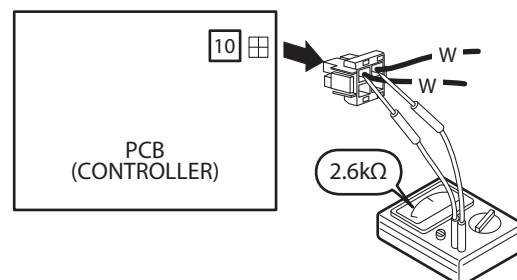
→ PUMP Error

[fig. 4] Resistance of 4-way valve coil



Take off the connector and check the resistance 4-way valve coil.

[fig. 5] Resistance of the heater for tank



HOW TO DETACH PCB(CONTROLLER)

⚠ **Wait at least 5min. After turning off the power before servicing.**

1. Unscrew and detach WIRING LID. [See picture 1]
2. Unscrew (4pcs) and detach TOP PANEL. [See picture 2]
3. Unscrew (5pcs) and detach FRONT PANEL ASSY. [See picture 3]
4. **Be sure to confirm the voltage between the connector pins of pump connector^[13] (between white⁺ and black⁻) is less than DC 10V with tester before disconnect lead wires.** [See picture 4-1, 4-2, 4-3]

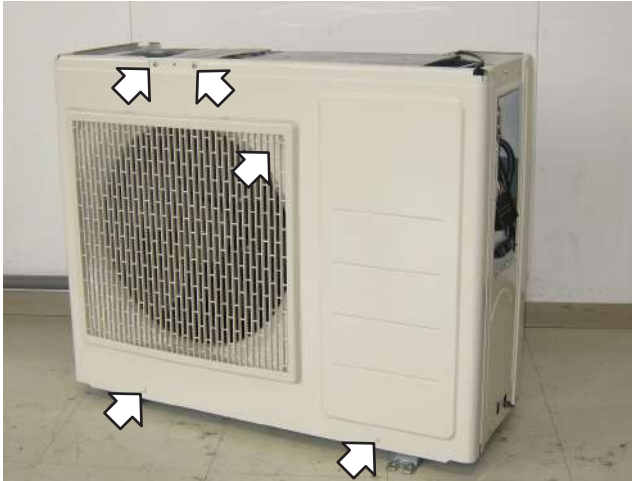
[picture 1]



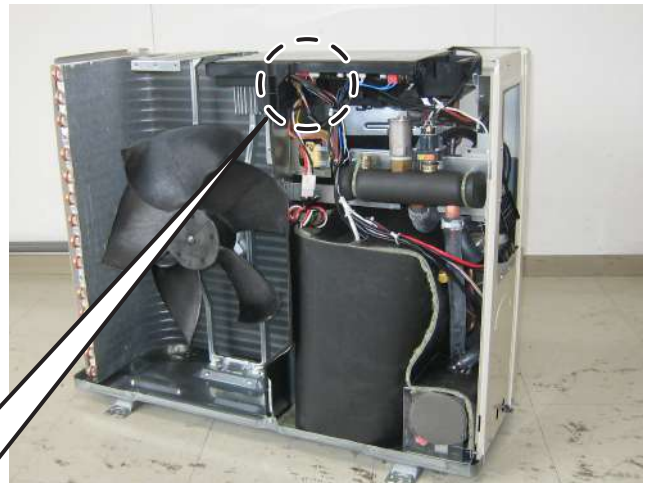
[picture 2]



[picture 3]



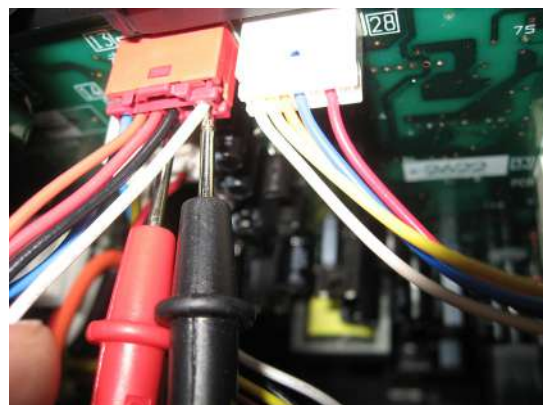
[picture 4-1]



[picture 4-2]



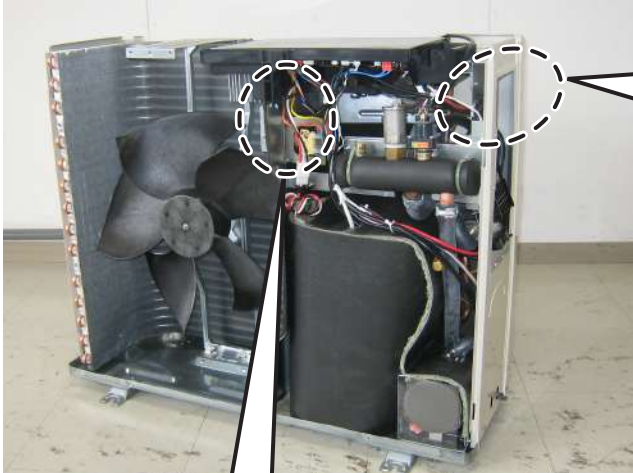
[picture 4-3]



HOW TO DETACH PCB(CONTROLLER)

5. Unscrew (3pcs). [See picture 5-1,5-2,5-3]
6. Disconnect lead wire for FAN MOTOR from CASE OF PCB. [See picture 6]
7. Disconnect 3 lead wires (black, white, red) from TERMINAL BLOCK. Unscrew the gray lead wire. [See picture 7]
8. Disconnect all lead wires from PCB(CONTROLLER) and move CASE OF PCB forward. [See picture 8]

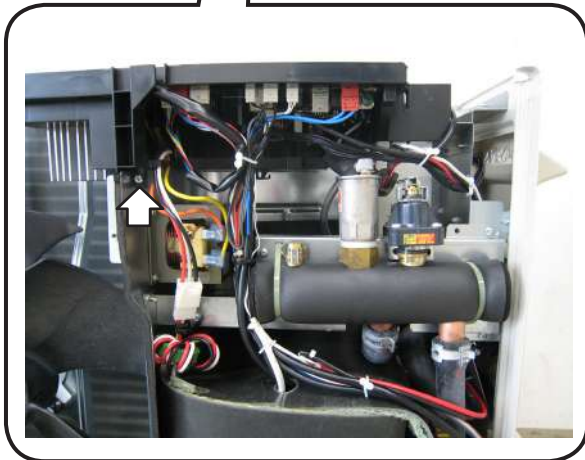
[picture 5-1]



[picture 5-2]



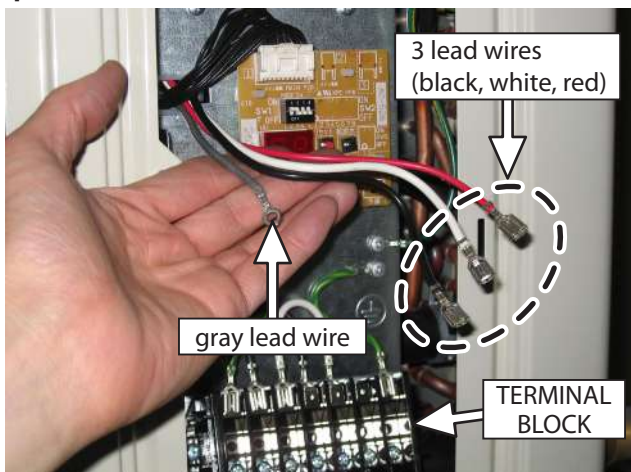
[picture 5-3]



[picture 6]



[picture 7]



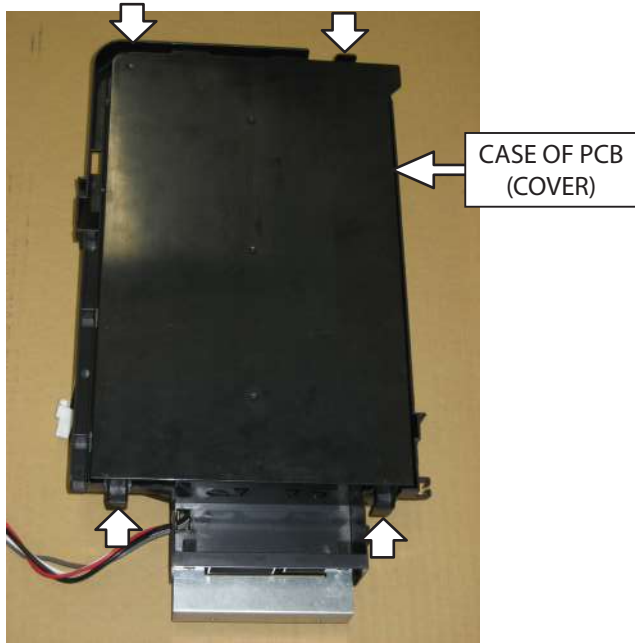
[picture 8]



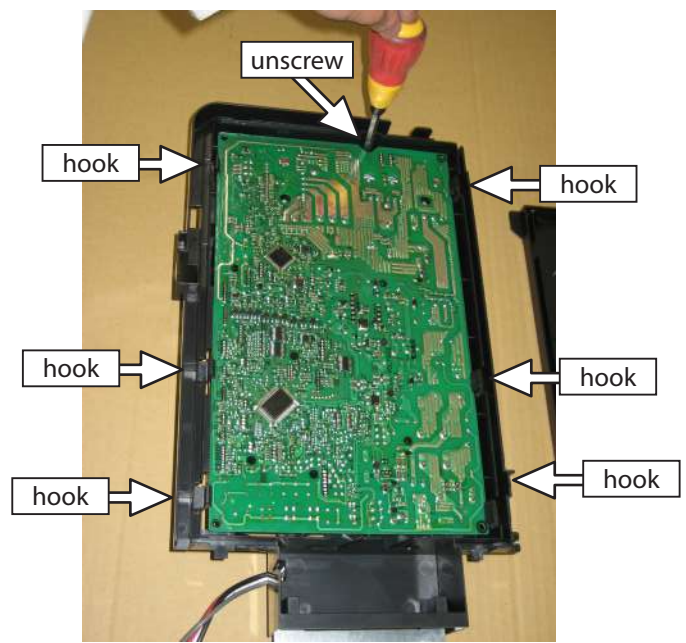
HOW TO DETACH PCB(CONTROLLER)

9. Unlock 4 hooks and detach CASE OF PCB(COVER). [See picture 9]
10. Unscrew and unlock 6 hooks. [See picture 10]
Unscrew and unlock hooks one by one and detach PCB (CONTROLLER) slowly.
11. Detach PCB (CONTROLLER) from CASE. [See picture 11]

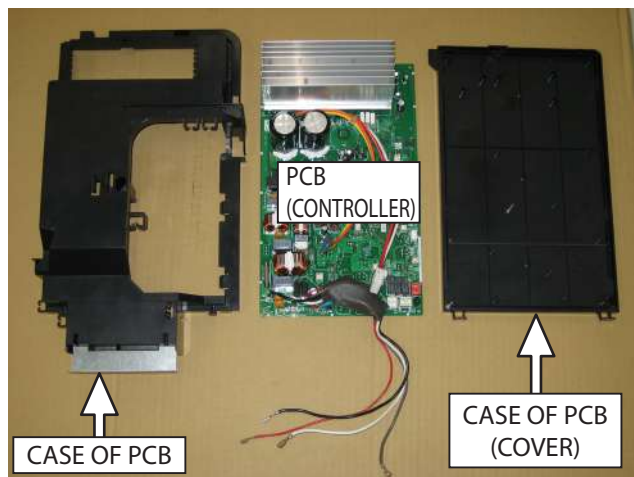
[picture 9]



[picture 10]



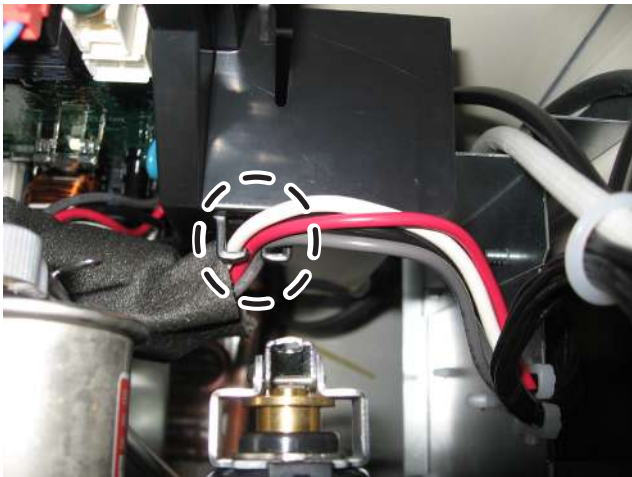
[picture 11]



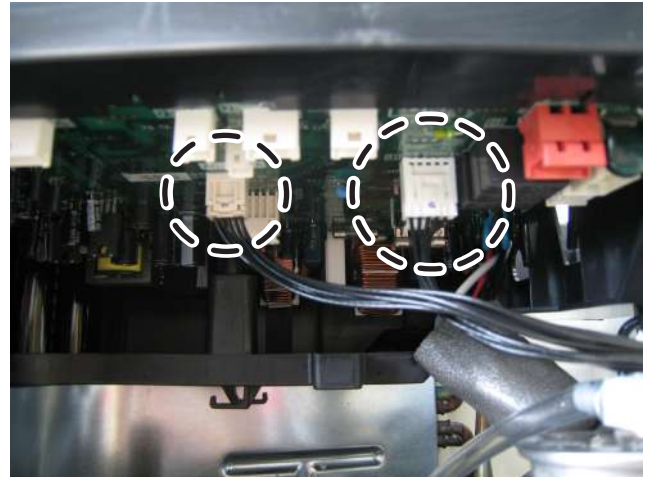
HOW TO ASSEMBLE PCB(CONTROLLER)

- Take the reverse procedure of "HOW TO DETACH PCB(CONTROLLER)".
- Be sure to confirm 3 lead wires (black, white, red) and the gray lead wire are hooked. [See picture 12-1]
- Ensure that PCB (DISPLAY) is connected to PCB (CONTROLLER) properly. [See picture 12-2]
- Be sure to put FAN MOTOR lead wires in the passage along the side of CASE OF PCB. [See picture 12-3]
- Bind lead wires as they were. [See picture 12-4]

[picture 12-1]



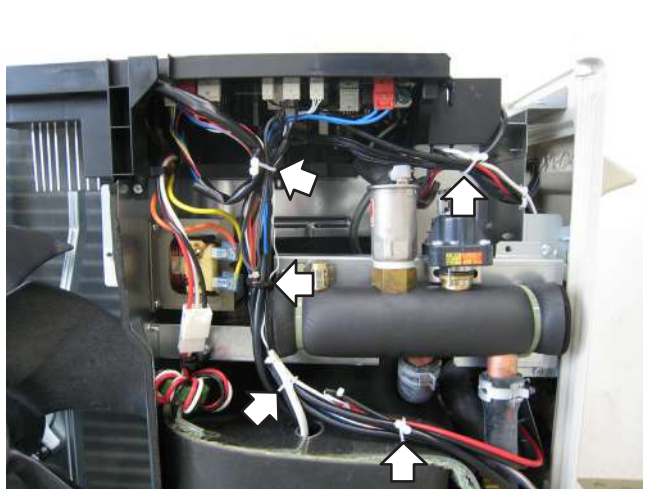
[picture 12-2]



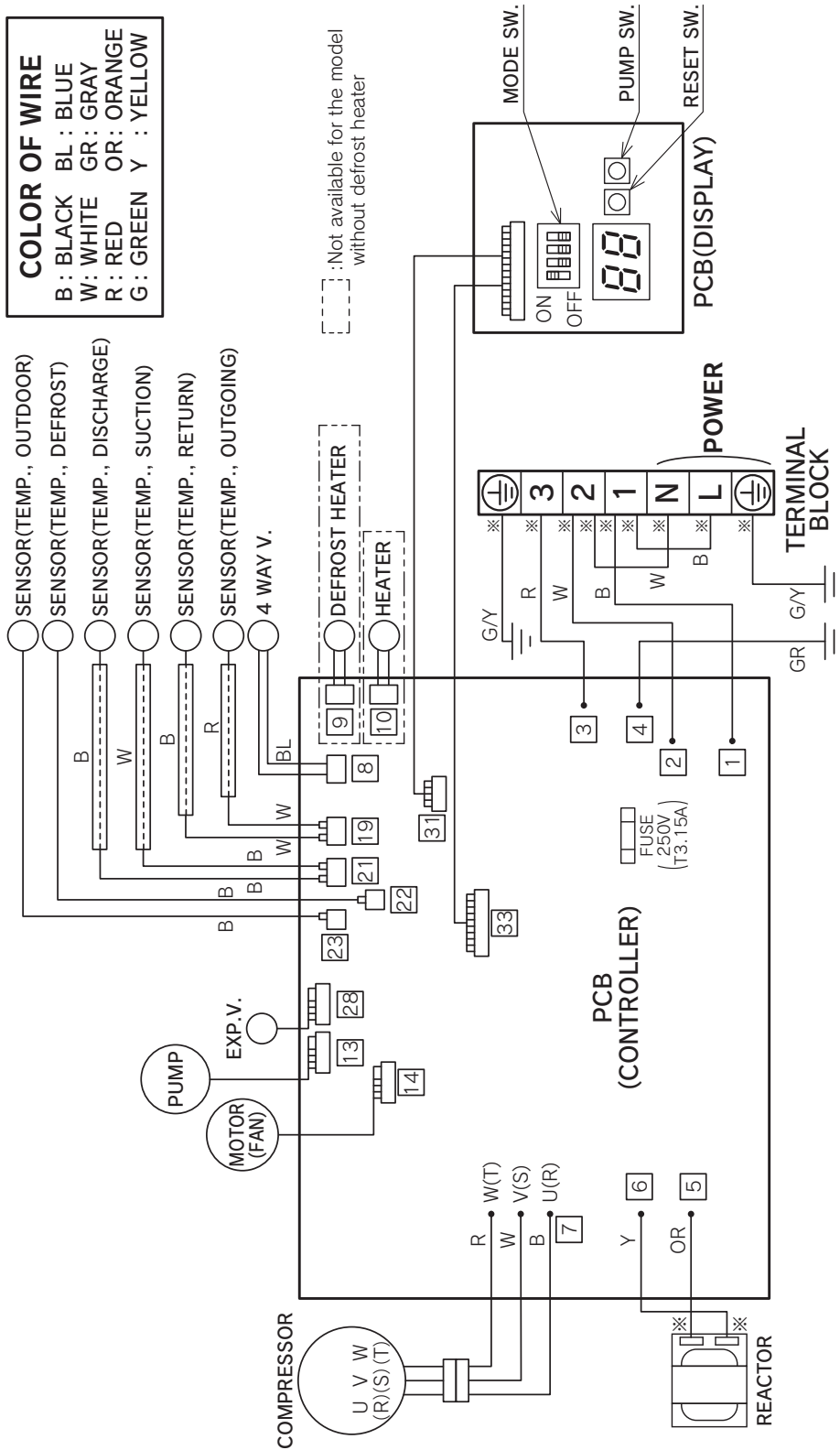
[picture 12-3]



[picture 12-4]

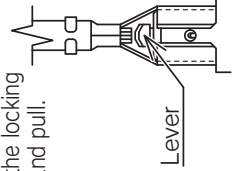


WIRING DIAGRAM



How to release locking terminals(※)

To release the terminals (*), press the locking lever and pull.



⚠ Caution ⚡ Electric Shock High Voltage

- Do not touch any part of the electric circuit (including the wiring of thermistor and others), as it has high voltage against the ground.
- Pay attention not to damage the insulated wire when you tighten the screw, as the exposed wire may cause electric shock or malfunction.
- Do not ground the oscilloscope when you operate. You might destroy it. Also do not touch any metal part of the oscilloscope while operating.

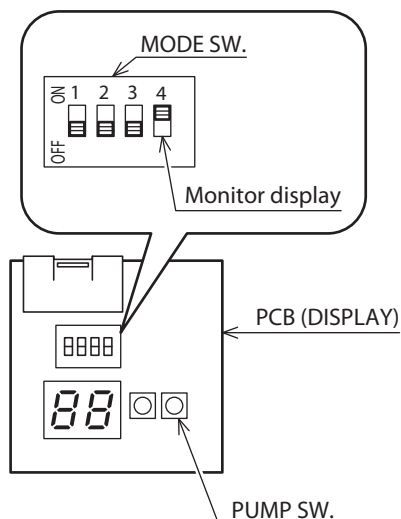
⚠ WARNING !

⚠ Electric Shock !!

- ### Warning when you fix electric components !
- Don't touch electrically charged parts, as electric shock may occur even if they are switched off.
 - Be sure to wait at least 5 min. after turning off the power and to confirm the voltage between the connector pins of pump connector 13 [between white⊕ and black⊖] is less than DC10V with a tester before servicing.

MONITOR DISPLAY METHOD

1. Switch "ON" the MODE SW. 4 on the unit PCB (DISPLAY).
The monitor number and monitor data are alternately displayed.
2. Push the PUMP SW. of the unit PCB (DISPLAY).
Every time the PUMP SW. is pressed the display changes in the sequence below.
3. Switch "OFF" the MODE SW. 4 after completing the check.

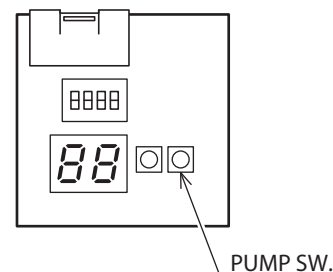


• Monitor display contents

Monitor	Monitor data display contents	
d0	Circulating water return temperature	Units of 1°C
d1	Compressor operating frequency	Units of 1Hz
d2	Discharge temperature	Units of 1°C
d3	Power consumption value	Units of 100W
d4	—	—
d5	Defrost thermistor temperature	Units of 1°C
d6	Ambient air temperature	Units of 1°C
d7	—	—
d8	Suction temperature	Units of 1°C
d9	Circulating water outgoing temperature	Units of 1°C

CHARGE THE CIRCULATION WATER AND AIR PURGE IN WATER CIRCUIT

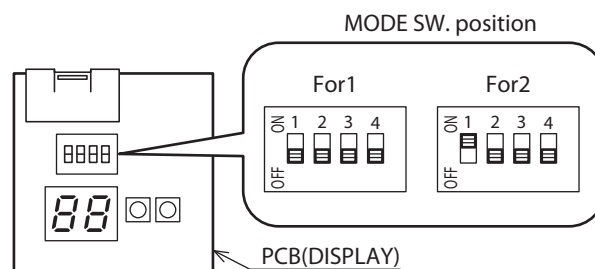
- When you push PUMP SW on display PCB, the water pump is started to operate to circulate the water.
The each digital segment of right side on display PCB lights in sequence during operating the pump.
- The pump is automatically stopped after operating for 10 minutes.
If it is not enough to let the air out of water circuit, please push PUMP SW once again after the pump stopped.
When you would like to stop operating the pump before the pump is automatically stopped, please push PUMP SW once again.

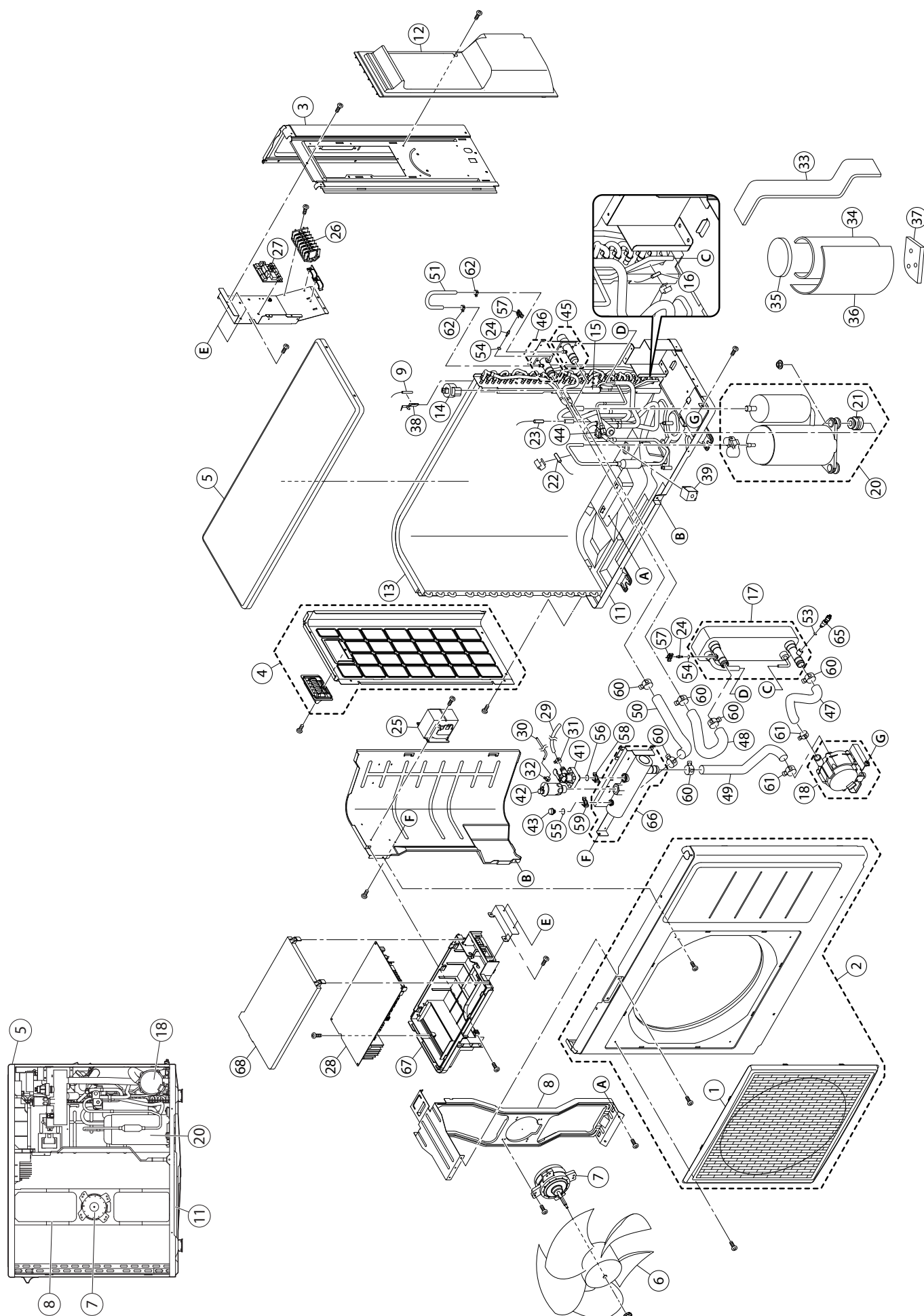


FREEZE PREVENTION SETTING

- If the outside temperature falls below about 2°C, freeze prevention operation is possible depending on the unit MODE SW. 1
- OFF : 1. No freeze prevention operation (When using anti-freeze)
- ON : 2. Freeze prevention operation (When the outdoor temperature falls below about 2°C, the circulating water is warmed and circulated.)

The factory setting is "ON : 2. Freeze prevention operation".





No.	PARTS NAME	PARTS No.
1	OUTLET GRILLE	20567790
2	FRONT PANEL ASSY.	20691630
3	RIGHT SIDE PANEL	20691780
4	LEFT SIDE PANEL ASSY.	20691800
5	TOP PANEL ASSY.	20699381
6	PROPELLER FAN	52630340
7	MOTOR	30137960
8	BRACKET,MOTOR	20681780
9	SENSOR (TEMP. OUTDOOR)	30138450
11	BOTTOM PANEL ASSY.	20705043
12	WIRING LID ASSY.	20698380
13	CONDENSER ASSY.	20692130
14	COIL,EXPANSION VALVE	30137500
15	EXPANSION VALVE	51914522
16	SENSOR (TEMP. DEFROST)	30135060
17	HEAT EXCHANGER ASSY.	20692900
18	PUMP ASSY.	20692782
20	COMPRESSOR	30137520
21	VIBRATION PROOF RUBBER	30137560
22	SENSOR	30135050
23	(TEMP. DISCHARGE & SUCTION)	
24	SENSOR (TEMP. CIRCULATING WATER)	30137510
25	REACTOR	30098720
26	TERMINAL BLOCK	30112970
27	PCB (DISPLAY)	30137930
28	PCB (CONTROLLER)	30154050
29	RUBBER HOSE (FOR RELIEF VALVE)	30137730
30	RUBBER HOSE (FOR AIR PURGE VALVE)	30137740
31	HOSE BAND (FOR RELIEF VALVE)	30084480
32	HOSE BAND (FOR AIR PURGE VALVE)	68616090
33	SOUND PROOF MATERIAL 1	20694790
34	SOUND PROOF MATERIAL 2	20694800
35	SOUND PROOF MATERIAL 3	20694810
36	SOUND PROOF MATERIAL 4	20694820
37	SOUND PROOF MATERIAL 5	20695360
38	OUTDOOR THERMISTOR HOLDER	20696760
39	COIL, 4-WAY VALVE	30137490
41	RELIEF VALVE	30112670
42	AIR PURGE VALVE	30112680
43	PLUG	20742470
44	4-WAY VALVE	30104090
45	CIRCULATING WATER OUTGOING PORT ASSY.	20694710
46	CIRCULATING WATER RETURN PORT ASSY.	20694740
47	RUBBER HOSE 1	20692840
48	RUBBER HOSE 2	20692850
49	RUBBER HOSE 3	20692860
50	RUBBER HOSE 4	20692870
51	RUBBER HOSE 5	20726660
53	O RING (P3)	30015770
54	O RING (P4)	01107120
55	O RING (P6)	01107600
56	O RING (P14)	01107150
57	QUICK FASTENER	30089210
58	QUICK FASTENER	00633600



No.	PARTS NAME	PARTS No.
59	QUICK FASTENER	00601690
60	HOSE BAND	30138460
61	HOSE BAND	30072400
62	HOSE BAND	30122230
65	DRAIN PLUG	10056760
66	CONNECTOR PIPE ASSY.	20768430
67	CASE OF PCB	20682670
68	CASE OF PCB (COVER)	20696130

UTZ-AT10CA

No.	PARTS NAME	PARTS No.
1	Interface Kit	20612052

