

CHOFU SERVICE MANUAL

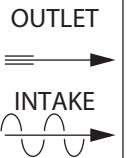
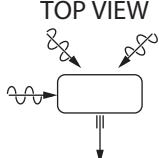
**AIR TO WATER HEAT PUMP
MONOBLOC TYPE**

**AEYC-7134SVFU-CH1
AEYC-7134SVFU-CH2**

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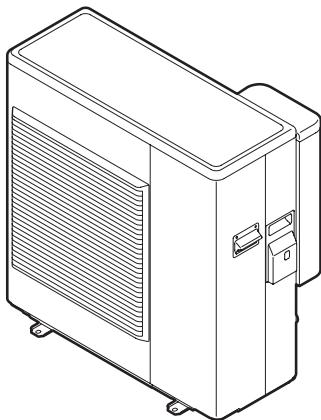
SPECIFICATION

		Unit	AEYC-7134SVFU-CH1	AEYC-7134SVFU-CH2
Cooling Capacity		kW	7.1	
Heating Capacity		kW	10.0	
Power source	phase		Single	
	V		230	
	Hz		50	
Airflow Method		OUTLET 	 TOP VIEW	
Electrical Data	Input	W	Cooling ; 2060	Heating ; 2300
	Running Current (MAX.)	A	Cooling ; 9.2(14.5)	Heating ; 10.2(26.7)
Water Pipe Size			Out ; R1(25A)	Return ; R1(25A)
Power Cord	Number of core-wire		core-wire / 3.5~4.0mm ²	
Dimensions	Height	mm	881.5	
	Width	mm	850	
	Depth	mm	330	
Net Weight		kg	85	
Air Circulation	Type		Propeller Fan	
	Motor Type		DC brushless (8-pole)	
	Rated Output	W	100	
Heat Exchanger			Plate fin configuration,forced draft 18.1 FPI	
Refrigerant Control Device			Electronic expansion Valve	
Refrigerant (R410A)		g	1500	
Thermostat			Electronic Control	
Defrosting heater (for bottom panel of unit)			nothing	built-in

- Specifications are subject to change without notice.

UNIT

REMOTE CONTROLLER

**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

- For outdoor heat exchanger of unit
Defrosting operation is controlled by the temperature of outdoor heat exchanger sensed by the thermistor.
- For bottom panel of unit (only AEYC-7134SVFU-CH2)
Defrosting heater installed at the inner bottom of the unit is controlled by the temperature of outdoor.

Anti-freezing control for the circulation water

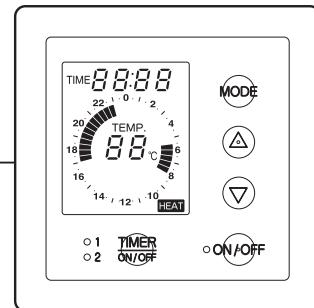
Anti-freeze operation automatically starts when the outdoor temperature is lower than 2°C.

Backup heater

Backup heater assists heating operation.
In case of heat capacity shortage, backup heater assists supply heat.

Time delay safety control

Restarting is inhibited for approximately 3 minutes.

**ON/OFF****Mode selection**

- Timer 1 "ON" time
- Timer 1 "OFF" time
- Timer 2 "ON" time
- Timer 2 "OFF" time

Setting change selection

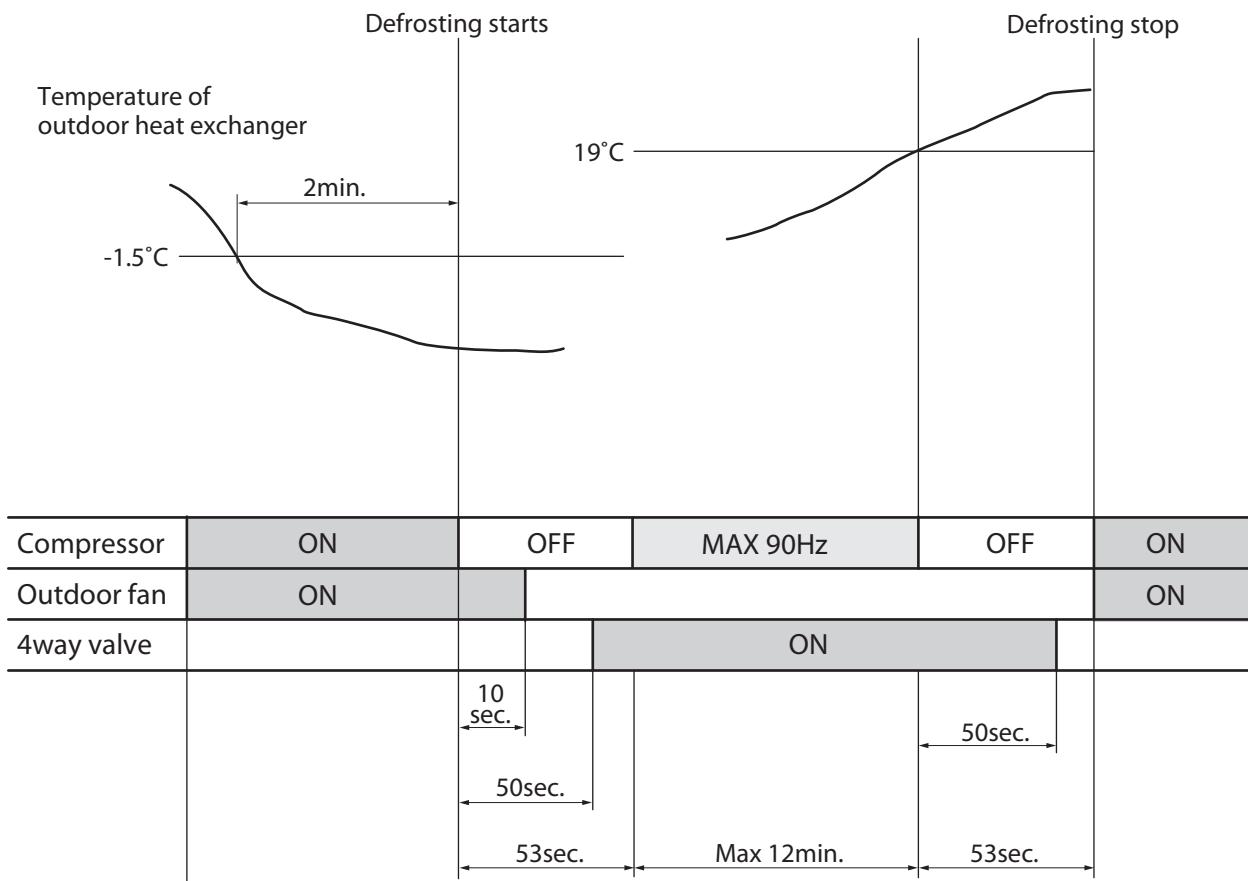
- Time adjustment
- Temperature setting
 - Cooling operation 5~22°C
 - Heating operation 23~55°C
- It can be set in units of 1°C

Timer selection

- Timer 1 only
- Timer 2 only
- Timer 1 and 2
- Cancel timer operation

DEFROSTING OPERATION(FOR 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.
 - 35 minutes' 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 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 19°C while 4-way-valve is ON.
 - 12 minutes has passed since compressor turned ON.



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	<ul style="list-style-type: none">If leakage of refrigerant occur in the installation, ventilate a room. If the leaked refrigerant is exposed fire, poisonous gas may be generated.
	<ul style="list-style-type: none">Boosting capacitor make the control box assembly high voltage. Make the capacitor discharge enough when servicing. Otherwise will be struck by electricity.
	<ul style="list-style-type: none">Never remodel appliance. Use designated parts or accessories to avoid accidents.
	<ul style="list-style-type: none">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.
	<ul style="list-style-type: none">Be sure to change the cable if it is damaged. Do not use damaged cable.
	<ul style="list-style-type: none">Do not use power supply cord extended or connected in halfway.
 Warning	
Check Point	<ul style="list-style-type: none">Be sure to put the units to earthing works.
	<ul style="list-style-type: none">Be sure to check the insulated resistance, more than 1M Ω.

ERROR CODES

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

UNIT ERROR CODES	APPEARANCE, PORTION, PARTS SEEMED WRONG		METHOD OF CHECK
—	—	POWER SUPPLY	check the power supply
		FUSE CF3 (250V T5A)	check the electric continuity by tester [see fig. 1]
		FUSE CF1 (250V T25A)	check the electric continuity by tester [see fig. 1]
A0	accident of DC voltage	FAN MOTOR	take off the connector ⑨, and check the resistance between red-black in the connector if the resistance is over 100kΩ, FAN MOTER is normal
		POWER MODULE	take off the terminals (orange and blue) and check the resistance between orange-blue if the resistance is over 100kΩ, POWER MODULE is normal
		POWER SUPPLY	check the power supply
A1	accident of discharge temperature	SENSOR, TEMP. DISCHARGE	check the resistance by tester [see table 2]
		SENSOR, TEMP. SUCTION	check the resistance by tester [see table 1]
		GAS LEAKAGE	check the service valve and refrigerant circuit (pipe)
A2	protective action against excess current DC current detection	UNREASONABLE OPERATION UNDER OVERLOAD	check the place of installation (blockage of air inlet & outlet) check the excess gas
		DROP OF POWER VOLTAGE	check the power voltage (230V)
		POWER MODULE	operate without the junction connector of compressor lead wire →if the error code is same, POWER MODULE should be replaced
		FUSE CF2 (250V T15A)	check the electric continuity FUSE CF2 (250V T15A) by tester
		COMPRESSOR	other than described above
A3	CT disconnection	PCB (CONTROLLER)	change the PCB (CONTROLLER)
A4	protective action against excess current AC current detection	UNREASONABLE OPERATION UNDER OVERLOAD	check the place of installation (blockage of air inlet & outlet) check the excess gas
		DROP OF POWER VOLTAGE	check the power voltage (230V)
		MOMENTARY STOP OF POWER (IN CASE OF LIGHTNING)	check the movement by reoperation
A5	abnormal revolution of compressor	UNREASONABLE OPERATION UNDER OVERLOAD	check the place of installation (blockage of air inlet & outlet) check the excess gas
		DROP OF POWER VOLTAGE	check the power voltage (230V)
		FUSE CF2 (250V T15A)	check the electric continuity FUSE CF2 (250V T15A) by tester
		POWER MODULE	check the resistance of POWER MODULE by tester take off the junction connector of compressor lead wire measure resistance between the connector pins of junction connector, six times between white-black, black-red, red-white respectively by changing the polarity →if all the figures show over 100kΩ, POWER MODULE is normal
		COMPRESSOR	other than described above
A6	accident of SENSOR	SENSOR, TEMP. SUCTION	check the resistance by tester [see table 1]
A7	accident of SENSOR	SENSOR, TEMP. DEFROST	check the resistance by tester [see table 1]
A8	accident of SENSOR	SENSOR, TEMP. DISCHARGE	check the resistance by tester [see table 2]
C0	accident of POWER MODULE	POWER MODULE	POWER MODULE should be replaced
C2	accident of SENSOR	SENSOR, TEMP. OUTDOOR	check the resistance by tester [see table 1]
C3	accident of FAN MOTOR	FUSE CF4 (250V T3.15A) FAN MOTOR	(*1) check the electric continuity FUSE CF4 (250V T3.15A) by tester →if it is continuity, check the voltage of FAN MOTOR →if the voltage is nomal, FAN MOTOR should be replaced [see fig. 2]
		PCB (CONTROLLER)	PCB (CONTROLLER) should be replaced
C4	rise of temperature (above 110°C) of POWER MODULE	MIS-INSTALLATION	check the place of installation (blockage of air inlet & outlet)
		SENSOR, TEMP. POWER MODULE	POWER MODULE should be replaced
C5	accident of SENSOR	SENSOR, TEMP. POWER MODULE	POWER MODULE should be replaced
C6	accident of PCB (CONTROLLER)	PCB (CONTROLLER)	PCB (CONTROLLER) should be replaced
C8	Inverter PCB serial error	CONNECTOR ⑬ is RARE CONTACT or POWER MODULE and PCB(CONTROLLER)	Turn off the power supply , wait for about 3 minutes take off and insert the connector ⑬, and then power up again
			POWER MODULE or PCB(CONTROLLER) should be replaced

(*1) When checking fan motor and/or pump, turn off the power supply completely and tatch their terminal or connector

ERROR CODES

UNIT ERROR CODES	APPEARANCE, PORTION, PARTS SEEMED WRONG		METHOD OF CHECK
E4	accident of SENSOR	SENSOR, TEMP. OUTGOING CIRCULATING WATER	check the resistance by tester [see table 1]
E5	accident of SENSOR	SENSOR, TEMP. RETURN CIRCULATING WATER	check the resistance by tester [see table 1]
(*2) E8 740 760	error of transmission (REMOTE CONTROLLER)	—	turn off the power supply, wait for about 3 minutes and then power up again check the rare contact of remotecontroller cord
		REMOTE CONTROLLER	REMOTE CONTROLLER should be replaced
		PCB (CONTROLLER)	PCB (CONTROLLER) should be replaced
P1	accident of PUMP	PUMP (*1)	check the voltage of PUMP [see fig. 3] →if the voltage is nomal, PUMP should be replaced
		PCB (CONTROLLER)	PCB (CONTROLLER) should be replaced
		CONTAMINATION INSIDE THE CIRCULATION PUMP AND/OR WATER PIPING	check the PUMP and water piping
U2	backup heater PCB error	PCB(CONTROLLER)	turn off the power supply, wait for about 3 minutes and then power up again →if the error code is same, PCB(CONTROLLER) should be replaced
U3	backup heater CT error	OVERHEAT PROTECTOR WAS ACTIVATED	check the circulation water check if pipes are not clogged
		ACCIDENT OF OVERHEAT PROTECTOR	check the electric continuity OVERHEAT PROTECTOR by tester (at normal temperature) [see fig.5]
		THERMAL FUSE(133°C)	check the electric continuity THERMAL FUSE by tester [see fig.6]
		BACKUP HEATER	check the resistance by tester [see fig.7]
		PCB(CONTROLLER)	other than described above
U5	low-outside air temperature limit	THE OUTDOOR TEMP. FALLS BELOW -20°C	below -20°C, it is likely not to operate for the protection of the equipment when the temperature rises, the unit automatically re-starts the operation
		SENSOR TEMP. OUTDOOR	check the resistance by tester [see table 1]
not cool down not warm up	4-WAY VALVE	check the resistance by tester [see fig. 4]	
	SHORT CYCLE (INSUFFICIENT AIR CIRCULATION)	check the blockage of air inlet & outlet	
	SENSOR,TEMP. OUTGOING AND RETURN CIRCULATING WATER	check the resistance by tester [see table 1]	
	GAS LEAKAGE	check the service valve and refrigerant circuit (pipe)	

(*1) When checking fan motor and/or pump, turn off the power supply completely and tatch their terminal or connector

(*2)On the remote controller : 3digits display

On the unit display board : E8 is displayed

ELECTRIC CHARACTER

[table 1] Sensor, temp. defrost
Sensor, temp. outdoor
Sensor, temp. suction
Sensor, temp. outgoing
and return circulating water

Temp.(°C)	Resistance(kΩ)
0	31
5	24
10	19
15	15
20	12
25	10
30	8
35	6.7
40	5.5
45	4.6
50	3.8
55	3.2

[table 2] Sensor, temp. discharge

Temp.(°C)	Resistance(kΩ)
10	1,000
20	600
35	300
40	250
50	160
80	50

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**

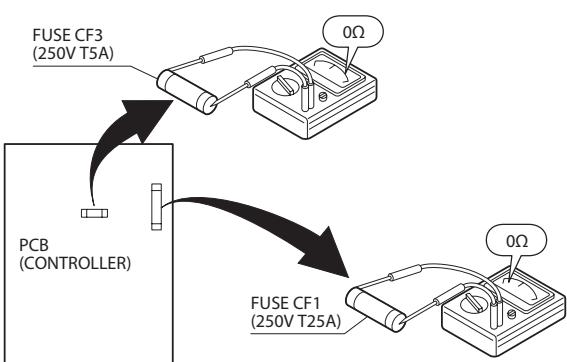
While an error code is being displayed, press and hold the PUMP SW. and RESET SW. at the same time for 5 seconds to cancel the error code display and turn off the display.

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

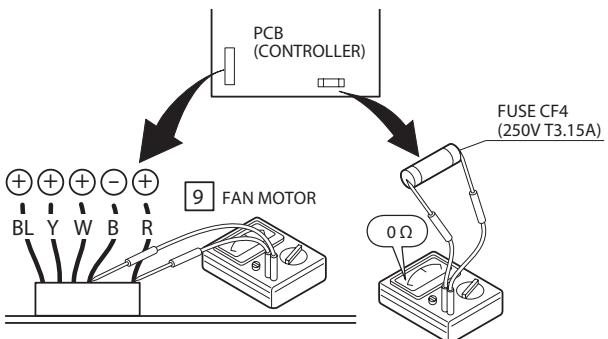
While an error code is being displayed, press and hold the reset switch for 10 seconds or more to delete all past error codes. The display turns to " -- ".

CHECK FOLLOWING STEPS

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



[fig. 2] Voltage of fan motor on the PCB(CONTROLLER)



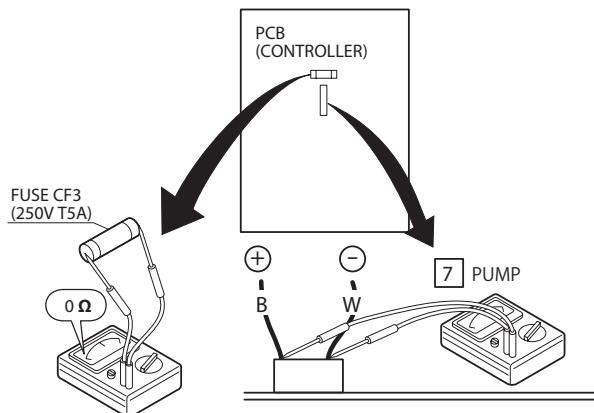
Measure voltage between the connector pins of connector [9]. Connector [9] shall be checked during heating or cooling operation.

Measure voltage as follows without taking off the connector [9].

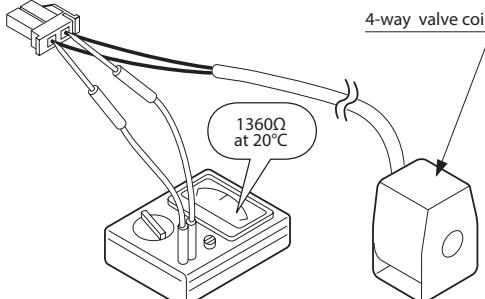
between red (+) and black (-) approx. DC200~370V
between yellow (+) and black (-) approx. DC3~7V
between white (+) and black (-) approx. DC15V] PCB
(CONTROLLER) is Normal

→ accident of FAN MOTOR

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



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



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

Measure voltage between the connector pins of connector [7]. Connector [7] shall be checked during heating or cooling operation.

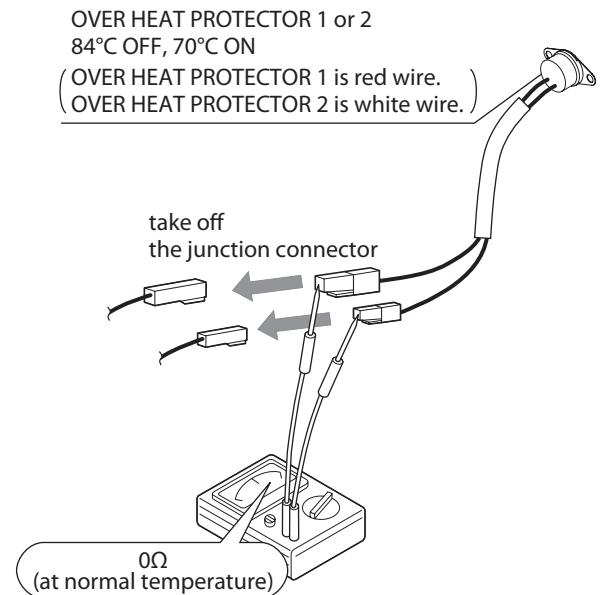
Measure voltage as follows without taking off the connector [7].

between black (+) and white (-) approx. AC207~253V] PCB
(CONTROLLER) is Normal

→ accident of PUMP

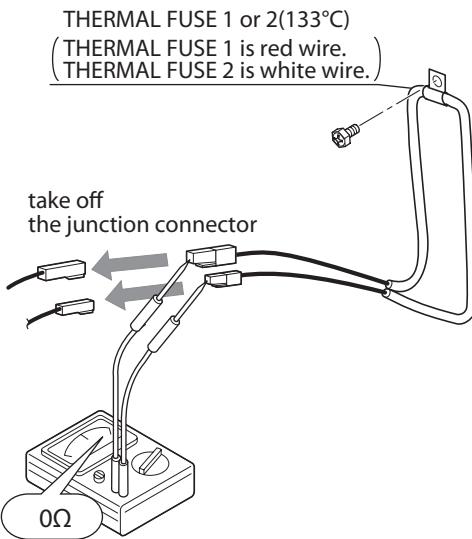
CHECK FOLLOWING STEPS

[fig. 5] Resistance of OVERHEAT PROTECTOR



Measure resistance of OVERHEAT PROTECTOR 1 and 2.

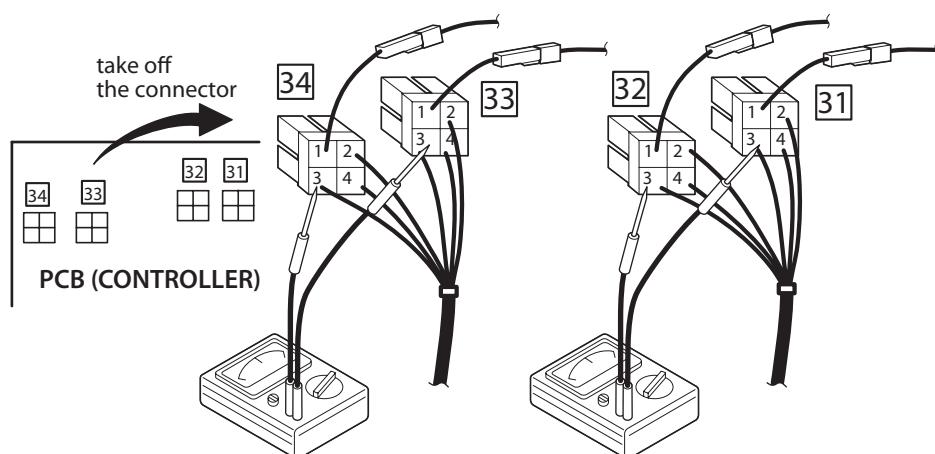
[fig. 6] Resistance of THERMAL FUSE



Measure resistance of THERMAL FUSE 1 and 2.
In case of THERMAL FUSE is disconnection, accident of the following parts is expected.
The following parts should be replaced with THERMAL FUSE.

- THERMAL FUSE
- PCB (CONTROLLER)
- O RING (P16)
- BACKUP HEATER

[fig. 7] Resistance of backup heater



Take off the connector and measure resistance between the connector pins of connector [31], [32], [33], [34].

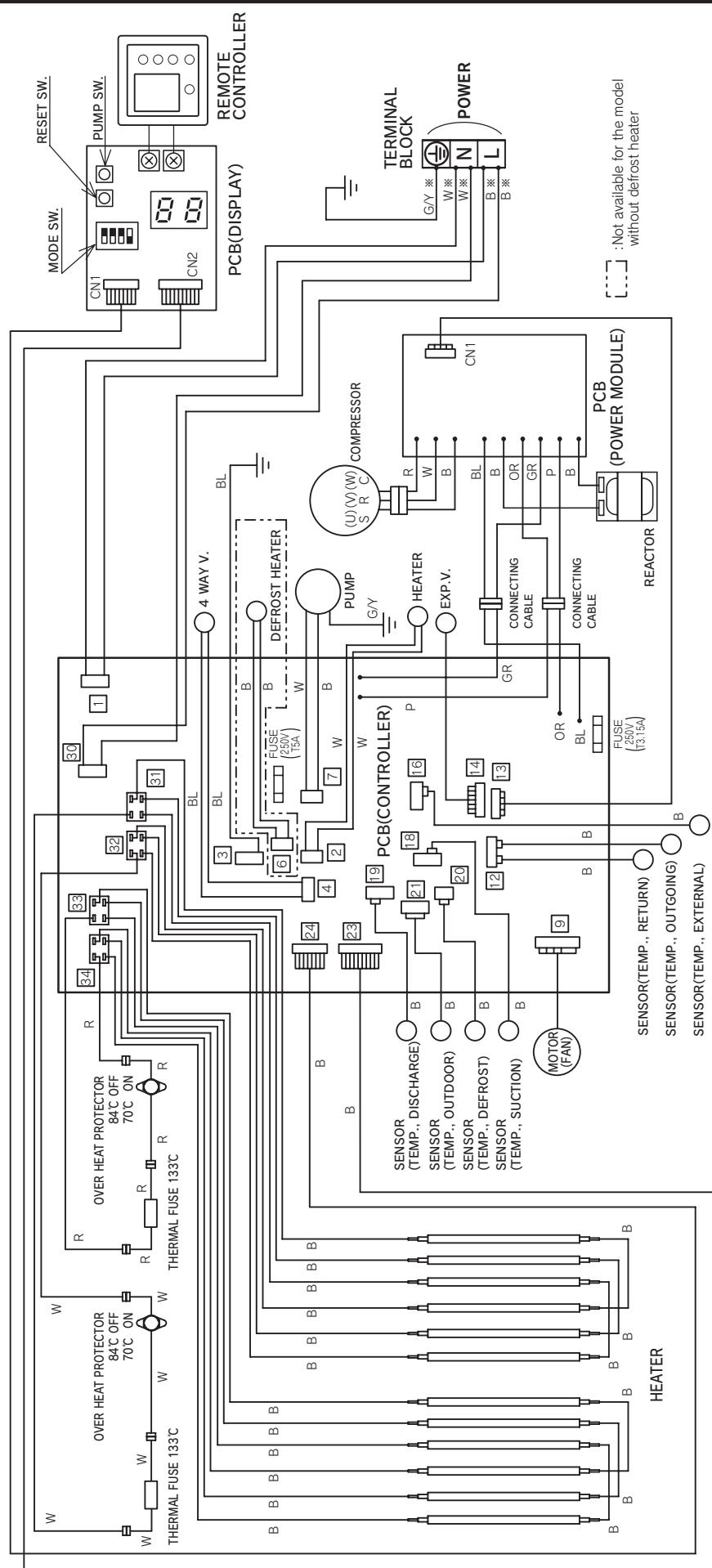
Between 2 and 2 approx.160Ω
Between 3 and 3 approx.160Ω
Between 4 and 4 approx.160Ω

] BACKUP HEATER
is Normal

WIRING DIAGRAM

AEYC-7134SVFU-CH1
AEYC-7134SVFU-CH2

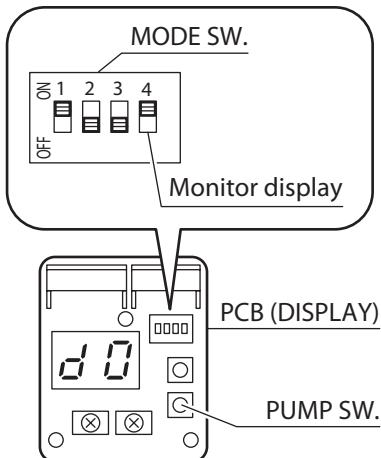
COLOR OF WIRE	
B : BLACK	BL : BLUE
W : WHITE	GR : GRAY
R : RED	OR : ORANGE
G : GREEN	Y : YELLOW
P : PINK	



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

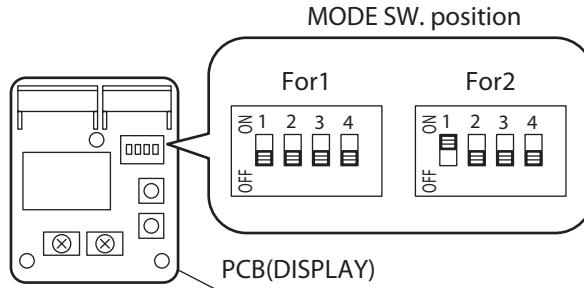


Monitor	Monitor data display contents	
d0	Circulating water return temperature	Units of 1°C
d1	Compressor operating frequency	Units of 1Hz
d2	Discharge temperature	Units of 1°C
d3	Power consumption value	Units of 100W
d4	—	—
d5	—	—
d6	Ambient air temperature	Units of 1°C
d7	External thermistor temperature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

FREEZE PREVENTION SETTING

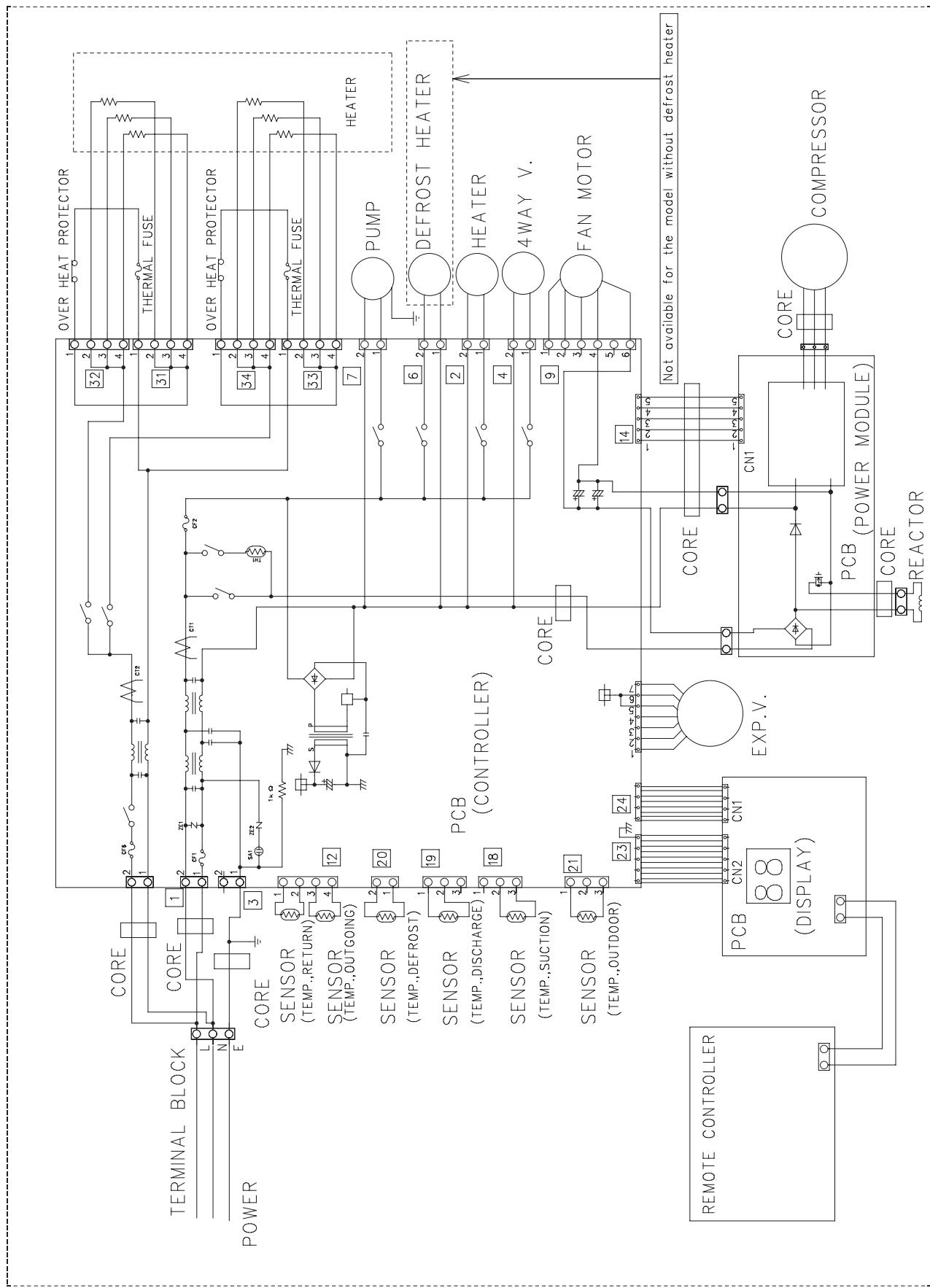
- If the outside temperature falls below about 2°C, freeze prevention operation is possible depending on the unit MODE SW. 1
 - OFF : 1. No freeze prevention operation (When using anti-freeze)
 - ON : 2. Freeze prevention operation (When the outdoor temperature falls below about 2°C, the circulating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

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



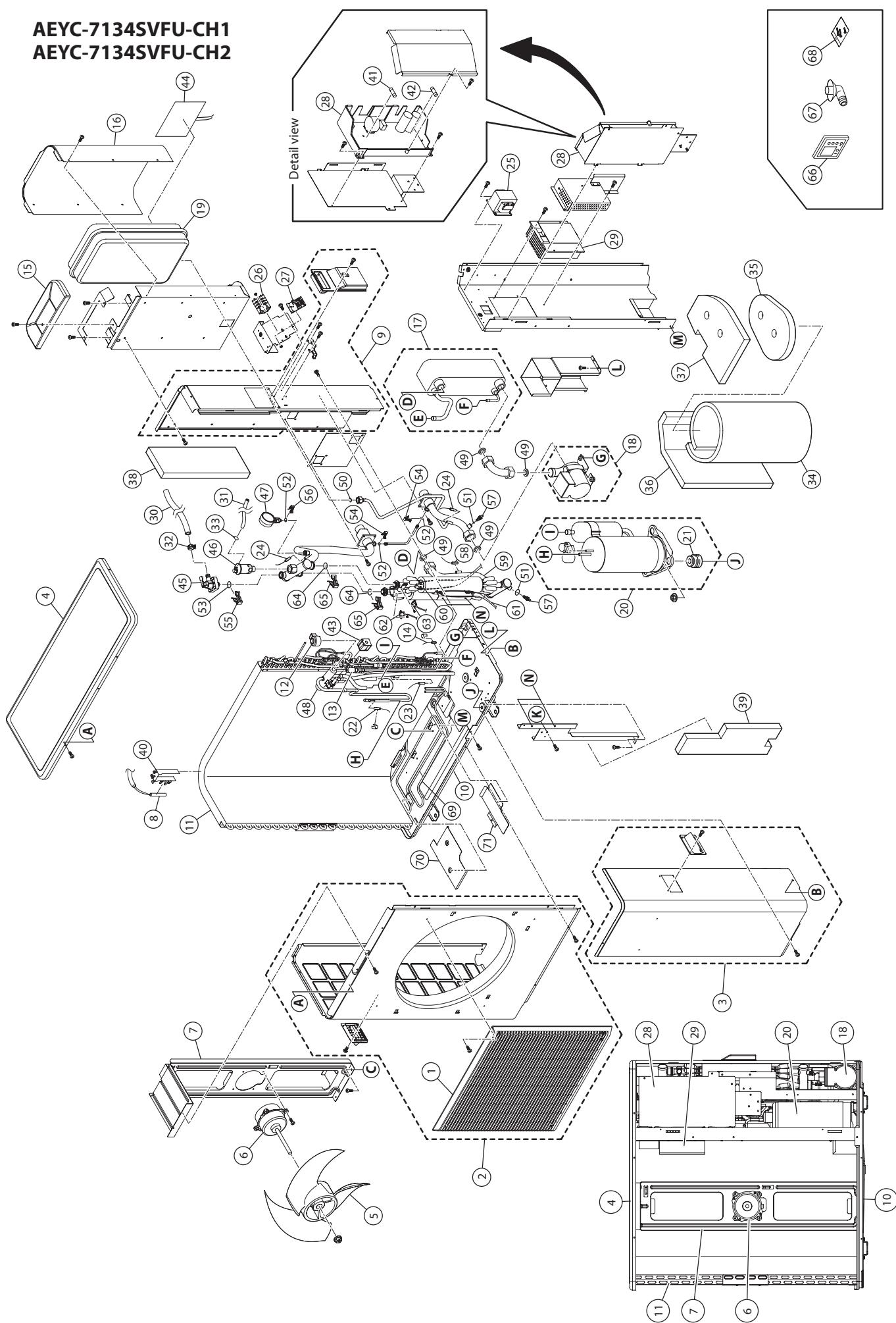
ELECTRIC CIRCUIT DIAGRAM

AEYC-7134SVFU-CH1
AEYC-7134SVFU-CH2



EXPLODED VIEW

AEYC-7134SVFU-CH1
AEYC-7134SVFU-CH2



AEYC-7134SVFU-CH1
AEYC-7134SVFU-CH2

No.	PARTS NAME	PARTS No.
1	OUTLET GRILLE	3011252[0]
2	FRONT PANEL ASSY.(LEFT)	2060035[1]
3	FRONT PANEL ASSY.(RIGHT)	2060038[0]
4	TOP PANEL ASSY.	2060040[2]
5	PROPELLER FAN	5263019[0]
6	MOTOR	3011258[0]
7	BRACKET,MOTOR	2060528[0]
8	SENSOR (TEMP.OUTDOOR)	3011436[0]
9	BACK PANEL ASSY.	2061684[0]
10	BOTTOM PANEL ASSY.	2060044[1]
11	CONDENSOR ASSY.	2060562[1]
12	COIL,EXPANSION VALVE	5191453[1]
13	EXPANSION VALVE	3011263[0]
14	SENSOR (TEMP.DEFROST)	3011435[0]
15	TANK COVER (TOP)	2060593[0]
16	TANK COVER (SIDE)	2060592[0]
17	HEAT EXCHANGER ASSY.	2060679[1]
18	PUMP ASSY.	2060596[0]
19	TANK	3011264[0]
20	COMPRESSOR	3011307[0]
21	VIBRATION PROOF RUBBER	3000111[0]
22	SENSOR (TEMP.DISCHARGE)	5110087[0]
23	SENSOR (TEMP.SUCTION)	3008990[0]
24	SENSOR (TEMP.CIRCULATING WATER)	3011298[0]
25	REACTOR	3011253[0]
26	TERMINAL BLOCK	3011259[0]
27	PCB (DISPLAY)	3005156[0]
28	PCB (CONTROLLER) with CASE	3011675[0] + 2060532[0]
29	PCB (POWER MODULE) ASSY. WITH HEAT SINK	2060534[1]
30	RUBBER HOSE (FOR RELEIF VALVE)	3011442[0]
31	RUBBER HOSE (FOR AIR PURGE VALVE)	3011443[0]
32	HOSE BAND (FOR RELIEF VALVE)	3008448[0]
33	HOSE BAND (FOR AIR PURGE VALVE)	6861609[0]
34	SOUND PROOF MATERIAL1	2061196[0]
35	SOUND PROOF MATERIAL2	2061197[0]
36	SOUND PROOF MATERIAL3	2061198[0]
37	SOUND PROOF MATERIAL4	2061199[0]
38	SOUND PROOF MATERIAL5	2061200[0]
39	SOUND PROOF MATERIAL6	2061201[0]
40	OUTDOOR THERMISTOR HOLDER	2004010[0]
41	FUSE(5A)	4001641[0]
42	FUSE(3.15A)	4001640[0]
43	COIL, 4-WAY VALVE	3011261[0]

AEYC-7134SVFU-CH1
AEYC-7134SVFU-CH2

No.	PARTS NAME	PARTS No.
44	TANK HEATER	3011437[0]
45	RELIEF VALVE	3011267[0]
46	AIR PURGE VALVE	3011268[0]
47	PRESSURE GAUGE	3011269[0]
48	4-WAY VALVE	3010409[0]
49	PACKING B	3011303[0]
50	PACKING C	3011306[0]
51	O RING (P4)	0110712[0]
52	O RING (P6)	0110760[0]
53	O RING (P14)	0110715[0]
54	QUICK FASTENER	5277570[0]
55	QUICK FASTENER	0063360[0]
56	QUICK FASTENER	0060169[0]
57	DRAIN PLUG	3007801[0]
58	SENSOR (TEMP. EXTERNAL)	3004784[0]
59	BACKUP HEATER ASSY	2060703[1]
60	THERMAL FUSE 1 (RED WIRE)	2061082[0]
61	THERMAL FUSE 2 (WHITE WIRE)	2061083[0]
62	OVER HEAT PROTECTOR 1 (RED WIRE)	3011271[0]
63	OVER HEAT PROTECTOR 2 (WHITE WIRE)	3011677[0]
64	O RING (P16)	0110716[0]
65	QUICK FASTENER	0060262[0]
66	REMOTE CONTROLLER	3011299[0]
67	DRAIN ELBOW	2014808[0]
68	FLAT COUNTERSUNK SCREW ASSY	2022620[1]

The digit in [] may vary depending on the version for the improvement.

ONLY FOR AEYC-7134SVFU-CH2

No.	PARTS NAME	PARTS No.
69	DEFROST HEATER	3011689[0]
70	DEFROST HEATER HOLDER 1	2061842[0]
71	DEFROST HEATER HOLDER 2	2061843[0]

The digit in [] may vary depending on the version for the improvement.

RA-69-[1]

ISSUED	DEC.2009