LENNOX Powered by SAMSUNG

SERVICE MANUAL

SYSTEM AIR CONDITIONER

VRF CHILLER (R-32)
VPD010/015C6M-5Y
VPD010/015C6M-5G

VPD CHILLER

CONTENTS

VRF CHILLER derived model status

Application division	Derived models	
F Power model	VPD010C6M-5Y	VPD015C6M-5Y
J Power model	VPD010C6M-5G	VPD015C6M-5G

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CONTENTS

1. Precautions

1-1. Precautions for the Service

- **Use the correct parts when changing the electric parts.**
  - Please check the labels and notices for the model name, proper voltage, and proper current for the electric parts.
- **Fully repair the connection for the types of harness when repairing the product after breakdown.**
  - A faulty connection can cause irregular noise and problems.
- **Completely remove dust or foreign substances on the housing, connection, and inspection parts when performing repairs.**
  - This can prevent fire hazards for tracking, short, etc.
- **Check whether the parts are properly and securely assembled after performing repairs.**
  - These parts should be in the same condition as before the repair.

1-2. Precautions for the Static Electricity and PL

- **Please carefully handle the PCB power terminal during repair and measurement when it is turned on since it is vulnerable to static electricity.**
  - Please wear insulation gloves before performing PCB repair and measurement.
- **Check if the place of installation is at least 2m(6.6ft) away from electronic appliances such as TV, video players, and stereos.**
  - This can cause irregular noise or degrade the picture quality.
- **Please make sure the customer does not directly repair the product.**
  - Arbitrary dismantling may result in electric shock or fire.

1-3. Precautions for the Safety

- **Do not pull or touch the power plug or the subsidiary power switch with wet hands.**
  - This may result in electric shock or fire.
- **Do not bend the wire too much or position it so that it can be damaged by a heavy object on top.**
  - This may result in electric shock or fire.
- **Ground the connection if it is necessary.**
  - The connection must be grounded if there is any risk of electrical short due to water or moisture.
- **Fix the product securely to resist natural phenomenon such as earthquake.**
  - If the product is not properly fixed, it may fall down and cause an accident.
  - When installing the unit in a small area, take measure to keep the refrigerant concentration from exceeding allowable safety limits in case of refrigerant leakage. Consult the dealer for precautionary measure before the installation.
  - When refrigerant leaks and exceed dangerous concentration level, it may cause suffocation accidents.

1-4. Precautions for Handling Refrigerant of the VRF CHILLER

Environmental Cautions: Air pollution due to gas release

- **Safety Cautions**
  If liquid gas is released, then body parts that come into contact with it may experience frostbite/blister/numbness.
  If a large amount of gas is released, then suffocation may occur due to lack of oxygen. If the released gas is heated, then noxious gas may be produced by combustion.
- **Container Handling Cautions**
  Do not subject container to physical shock or overheating. (Flowage is possible while moving within the regulated pressure.)

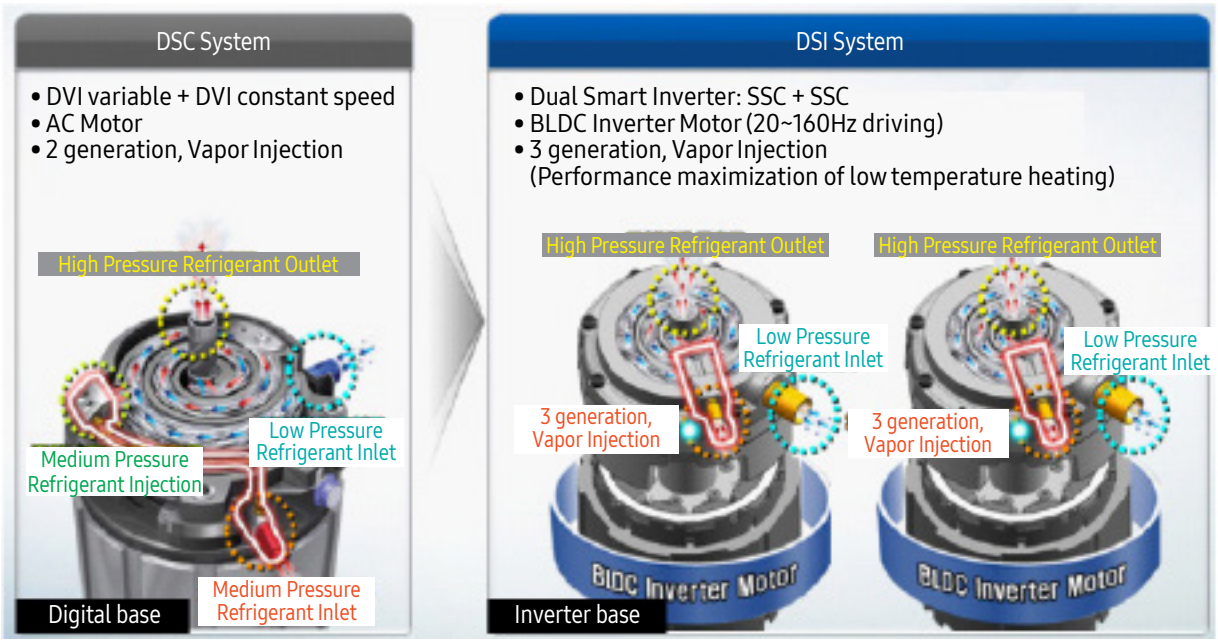
1-5. Precautions for Welding work the VRF CHILLER Pipe

- **Dangerous or flammable objects around the pipe must be removed before the welding.**
- **If the refrigerant is kept inside the product or the pipe, then remove the refrigerant prior to welding.**
  If the welding is carried out while the refrigerant is kept inside, the welding cannot be properly performed. This will also produce noxious gas that is a health hazard. This leakage will also explode with the refrigerant and oil due to an increase in the refrigerant pressure, posing a danger to workers.
- **Please remove the oxide produced inside the pipe during the welding with nitrogen gas.**
  Using another gas may cause harm to the product or others.

2. Product Features and Specifications

2-1. Product Features

2-1-1. Major Advantages of Product

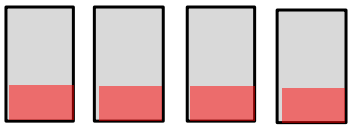


■ Control Logic

1) Simultaneous operation control

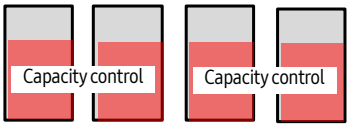
Individual capacity control based on Water Out Sensor equipped inside each Unit
Running the capacity control runs all the Units inside the module to control the capacity.

Start



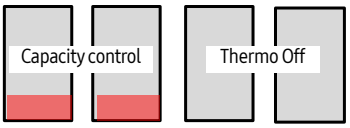
All Units will run simultaneously.

OPERATION



Each unit will control the compressor capacity based on its own discharge water temperature.

When approaching the configured temperature

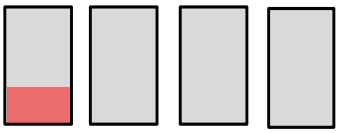


Units that have reached the configured temperature will Thermo Off.

2) Rotation operation control

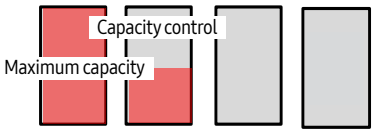
Uses the average value of the Water Out Sensor of the Unit whose pump inside the module is in operation.
Running the capacity control will run 1 Unit first. Later, when the relevant Unit is run to maximum capacity, the next Unit in order of priority will run.

Start



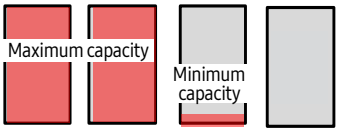
The Unit that has priority of order will be run first.

OPERATION - Rising capacity



The Unit with the previous priority of order will run at maximum capacity. If its discharge water temperature does not reach the configured value, the Unit next in order will run.

When approaching the configured temperature

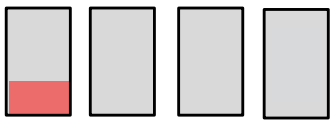


If the Unit last in order of priority is run at minimum capacity, and if the discharge water approaches the configured value, the Unit last in order of priority will Thermo Off.

3) Efficiency priority control

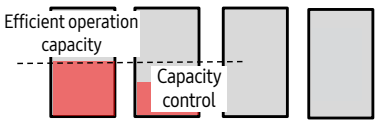
Control-based Water Out Temp: Uses the average value of the Water Out Sensor of the Unit whose pump inside the module is in operation. Precision control while in low load state / Load response speed prioritized when load capacity is increased

Start



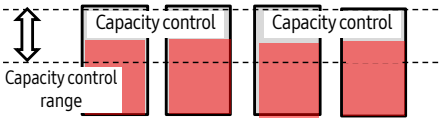
The Unit whose order of operation priority is highest will run first.

If there is a stop unit



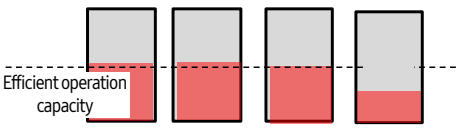
The Unit with the previous priority of order will run in the efficient operation state. If its discharge water temperature does not reach the configured value, the Unit next in order will run.

Entering into efficient operation state



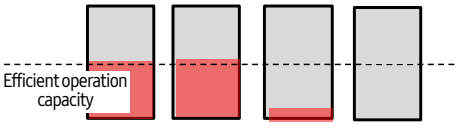
If all Units reach the efficient operation state, each Unit will run in a capacity between the efficient operation state and maximum capacity operation.

Releasing efficient operation state



All Units will reach the efficient operation state. If the discharge water temperature approaches the configured temperature, the capacity will be decreased in order of the Unit whose priority is the lowest.

Capacity control after releasing efficient operation state

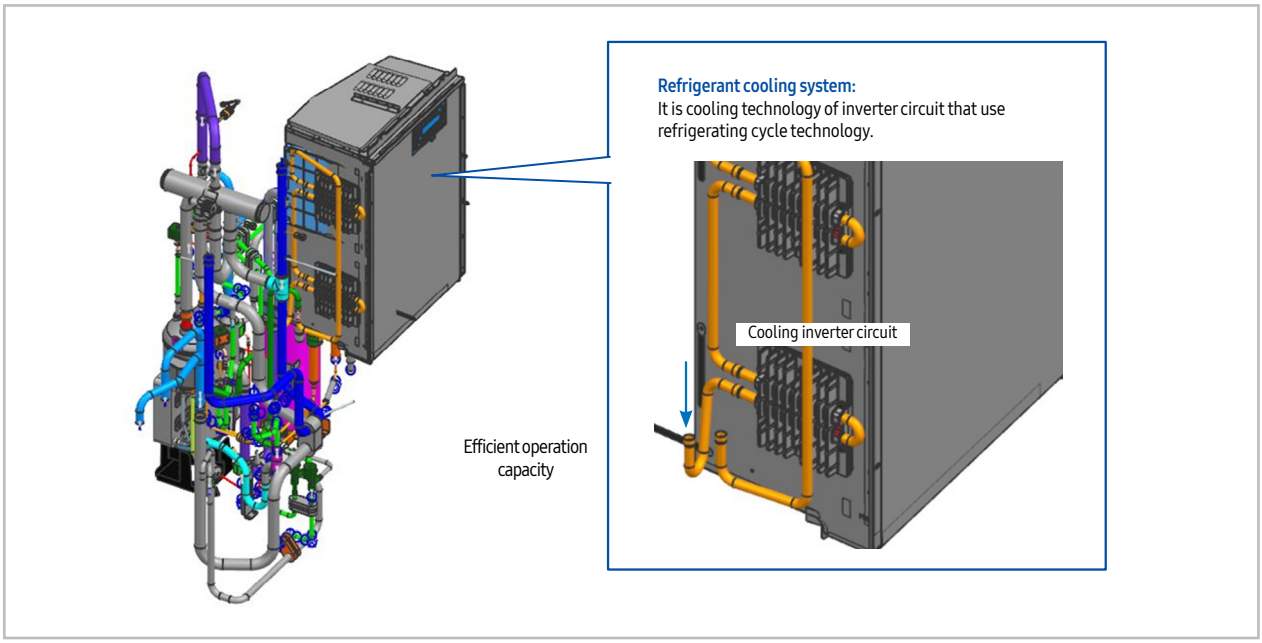


If the Unit last in order of priority is run at minimum capacity, and if the discharge water temperature approaches the configured value, the last Unit in order of priority will Thermo Off.

Feature (cont.)

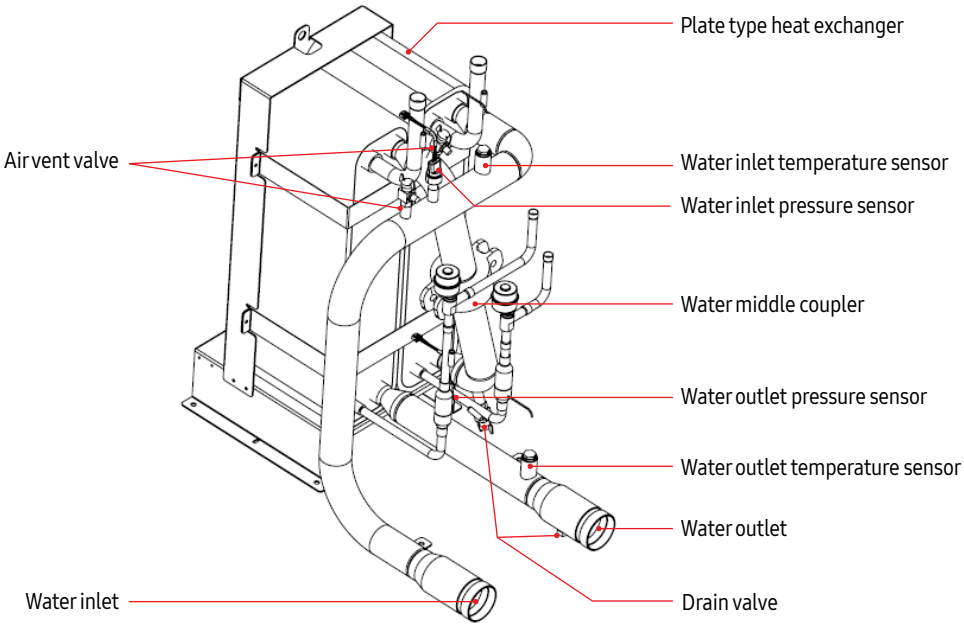
■ Inverter circuit refrigerant cooling technology

► Applied high efficiency refrigerant cooling circuit. Secured stable Inverter PCB cooling performance.
- Air cooling method: When natural convection / electric heat performance is low and is high load, efficiency is fallen.
- Refrigerant cooling system: Forced circulation / electric heat performance is high and control of (thermal conductivity is 10 times higher than air) load is available.

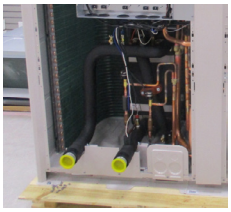
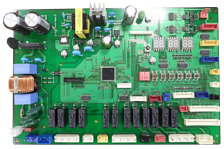
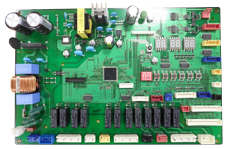
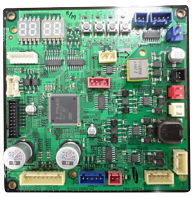
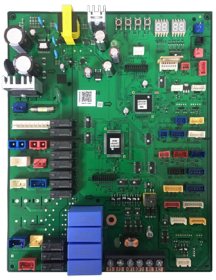
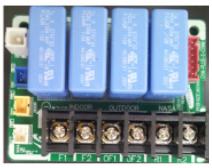
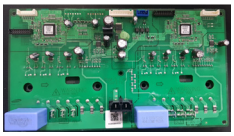
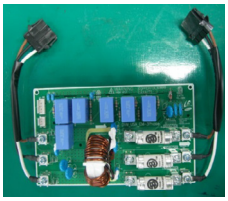
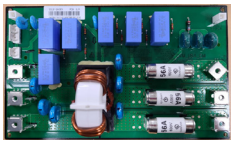
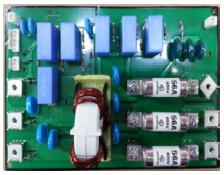
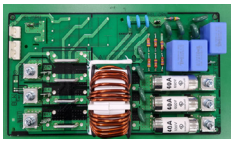


■ Obtained cooling and heating performance by high effectiveness applying plate type heat exchanger

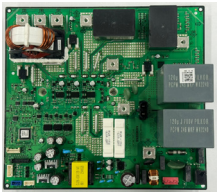
- Manufacture hot/cool water using plate type heat exchanger
- Freeze protection control specification(application for shrinkage temperature/pressure)
- Air purge, Drain valve.



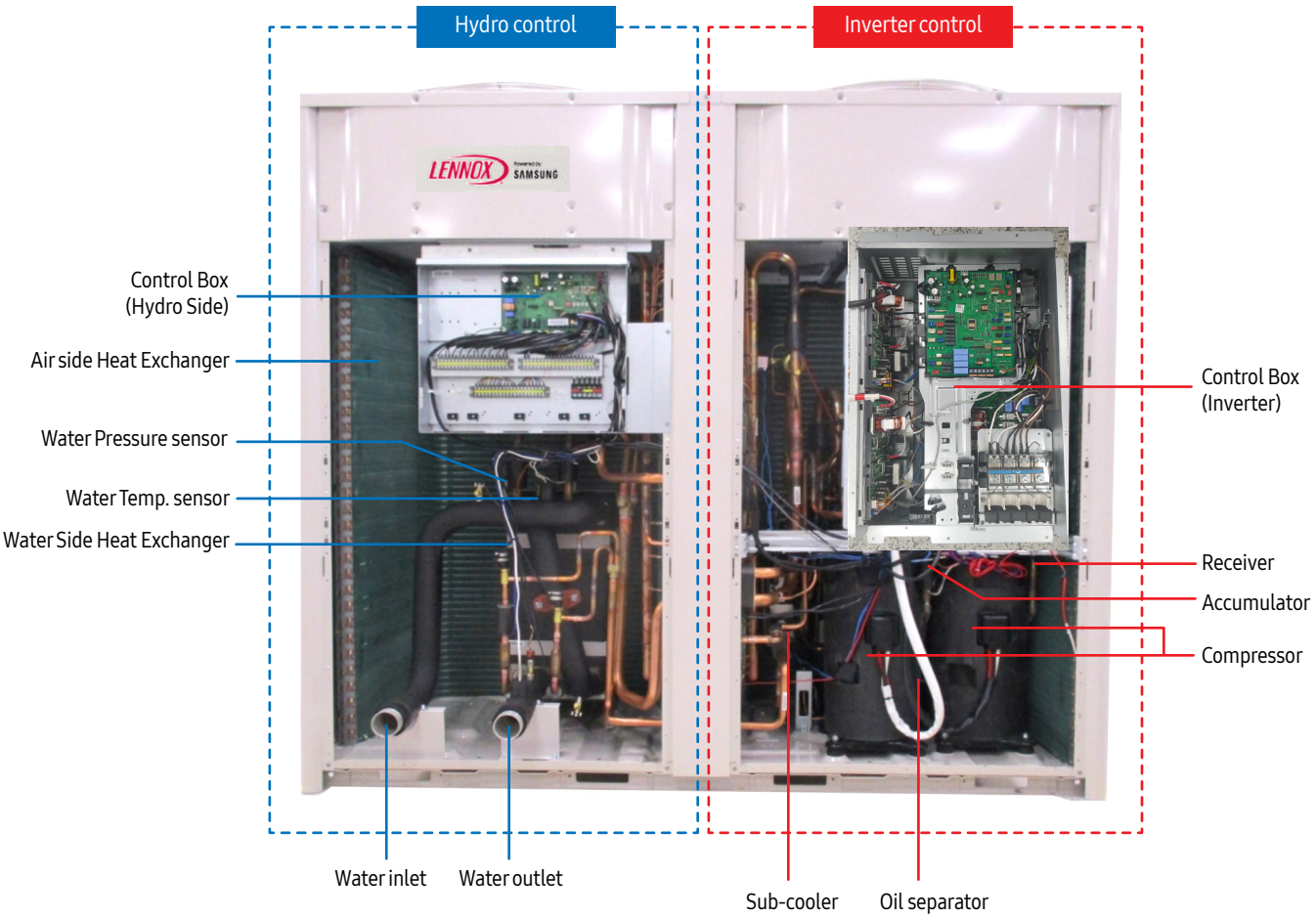
2-1-2. Changes in comparison to VRF CHILLER (R32)

<table>
<tr><th colspan="2">Changed part</th><th>Changed item and feature</th><th>Basic (R410)</th><th>New (R32)</th></tr>
<tr><td colspan="2">Hydro</td><td>- Producing hot water & cold water by using plate type heat exchanger.
- Control specification for freeze prevention (the application of the water temperature/ the pressure sensor).
- Air purge, Drain valve, Inlet/Outlet Cut grooved pipe.</td><td>  </td><td>←</td></tr>
<tr><td>Control Box (Hydro)</td><td>Hydro PCB</td><td>New Hydro PCB.
- Hot&Cold water load and protection control load of Freeze protection.
- Module controller, External control contact, Supply of Laod/Sensor.</td><td>  </td><td>  </td></tr>
<tr><td rowspan="5">Control Box (Inverter)</td><td>Main PCB</td><td>Change Main PCB.
- Separation of Load/Control
- Deleting of option resistance by model. (standardization)
- Need of option download at the time of the PCB replacement.</td><td>  </td><td rowspan="3">  </td></tr>
<tr><td>Hub PCB</td><td>New Hub PCB.
- Separation of Load/Control.
- Improvement of the fixed form of Load/ Sensor wire.</td><td>  </td></tr>
<tr><td>Communication terminal block</td><td>Communication terminal block mounted on the PCB.</td><td>  </td></tr>
<tr><td>FAN PCB</td><td>FAN Controller using 3-phase power.
- Prevention of phase imbalance.
- Protection of IPM temperature.</td><td>  </td><td>  </td></tr>
<tr><td rowspan="2">EMI PCB</td><td>J POWER MODEL
- VPD010C6M-5G
VPD015C6M-5G</td><td>  </td><td>  </td></tr>
<tr><td>F POWER MODEL
- VPD010C6M-5Y
VPD015C6M-5Y</td><td>  </td><td>  </td></tr>
</table>

Changes in comparison to VRF (cont.)

Changed part		Changed item and feature	Basic (R410)	New (R32)
Control Box (Inverter)	InverterPCB (Compressor control PCB)	J POWER MODEL - VPD010C6M-5G VPD015C6M-5G		
		F POWER MODEL - VPD010C6M-5Y VPD015C6M-5Y		
	REACTOR	Small capacity. - PF No. 8		
		Large capacity. - PF No. 9		
Compressor		- F power resourse: 66cc - J power resourse: 66CC - High-capacity compressor application.		

2-1-3. Structure of product (H/P)



2-2. Product Specifications

2-2-1. Specifications

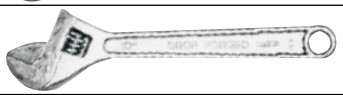
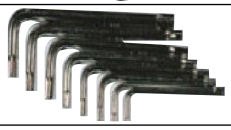
Model Name					VPD010C6M-5Y	VPD015C6M-5Y	VPD010C6M-5G	VPD015C6M-5G
Power Supply				Φ, #, V, Hz	3,3,208~230,60	3,3,208~230,60	3,3,460,60	3,3,460,60
Capacity (Rated)	Ton (Nominal)			usRT	10	15	10	15
	Cooling	(Ambient 95°F Entering/Leaving Temp 55/44°F)		kW	35.2	49.2	35.2	49.2
				kBtu/h	120.0	168.0	120.0	168.0
	Heating	Dry/Wet Bulb 44/43°F	Leaving Temp. 105°F	kW	37.5	53.3	37.5	53.3
				kBtu/h	128.0	182.0	128.0	182.0
			Leaving Temp. 120°F	kW	35.2	50.1	35.2	50.1
				kBtu/h	120.0	171.0	120.0	171.0
		Dry/Wet Bulb 17/15°F	Leaving Temp. 105°F	kW	24.6	26.4	24.6	26.4
				kBtu/h	84.0	90.0	84.0	90.0
			Leaving Temp. 120°F	kW	23.4	24.9	23.4	24.9
				kBtu/h	80.0	85.0	80.0	85.0
Power	Power Input	Cooling		kW	10.40	16.12	10.40	16.12
		Heating Dry/ Wet Bulb 44/43°F	Leaving Temp. 105°F		9.77	15.17	9.77	15.17
			Leaving Temp. 120°F		11.54	17.45	11.54	17.45
		Heating Dry/ Wet Bulb 17/15°F	Leaving Temp. 105°F		10.99	11.78	10.99	11.78
			Leaving Temp. 120°F		11.96	12.71	11.96	12.71
	Current Input	Cooling		A	28.40	44.00	14.20	22.00
		Heating Dry/ Wet Bulb 44/43°F	Leaving Temp. 105°F		26.70	41.40	13.40	20.80
			Leaving Temp. 120°F		31.50	47.70	15.80	23.90
		Heating Dry/ Wet Bulb 17/15°F	Leaving Temp. 105°F		30.00	32.20	15.00	16.10
			Leaving Temp. 120°F		32.70	34.70	16.40	17.40
	MCA			A	52.00	70.00	24.00	40.00
	MOP			A	70.00	90.00	30.00	50.00
COP	Normal Cooling			W/W	3.38	3.05	3.38	3.05
				(Btu/h)/W	11.54	10.42	11.54	10.42
	Normal Heating Dry/Wet Bulb 44/43°F		Leaving Temp. 105°F	W/W	3.84	3.52	3.84	3.52
				(Btu/h)/W	13.10	12.00	13.10	12.00
			Leaving Temp. 120°F	W/W	3.5	2.87	3.05	2.87
				(Btu/h)/W	10.40	9.80	10.40	9.80
	Normal Heating Dry/Wet Bulb 17/15°F		Leaving Temp. 10°F	W/W	2.24	2.24	2.24	2.24
				(Btu/h)/W	7.64	7.64	7.64	7.64
			Leaving Temp. 120°F	W/W	1.96	1.96	1.96	1.96
				(Btu/h)/W	6.69	6.69	6.69	6.69
Efficiency	IPLV			(Btu/h)/W	21.53	19.75	21.53	19.75
Compressor	Type			-	Scroll Inverter	Scroll Inverter	Scroll Inverter	Scroll Inverter
	Output			kW × n	7.167×2	7.167×2	7.167×2	7.167×2
	Model Name			-	DS4BC5066EVASG	DS4BC5066EVASG	DS4BC7066FVASG	DS4BC7066FVASG
	Oil	Type		-	POE	POE	POE	POE
Fan	Type			-	Propeller	Propeller	Propeller	Propeller
	Output x n			W	630 x 2	630 x 2	630 x 2	630 x 2
	Air Flow Rate			CMM (CFM)	314 (11,089)	314 (11,089)	314 (11,089)	314 (11,089)
	External Static Pressure		Max.	mmAq (inAq)	8.0 (0.315)	8.0 (0.315)	8.0 (0.315)	8.0 (0.315)
				Pa	80	80	80	80

Model Name			VPD010C6M-5Y	VPD015C6M-5Y	VPD010C6M-5G	VPD015C6M-5G
Water Side Heat Exchanger	Type	-	Brazing Plate	Brazing Plate	Brazing Plate	Brazing Plate
	Water Flow (Cooling/Heating)	LPM (CFM)	90.9 (3.21)	129.5 (4.57)	90.9 (3.21)	129.5 (4.57)
	Pressure Drop	kPa (psi)	35.0 (5.08)	60 (8.70)	35.0 (5.08)	60 (8.70)
	Max Operationg Pressure	MPa (psi)	1.0 (145)	1.0 (145)	1.0 (145)	1.0 (145)
	Connection Type	-	50A Cut Groove	50A Cut Groove	50A Cut Groove	50A Cut Groove
	Pipe (Inlet/Outlet)	A	50	50	50	50
	Quantity	EA	2	2	2	2
Minimum water quantity	Minimum water quantity	L	272.5	388.4	272.5	388.4
		gal	72.0	102.6	72.0	102.6
Refrigerant	Type	-	R32	R32	R32	R32
	Factory Charging	lbs	30.4	30.4	30.4	30.4
Sound	Sound Pressure	dB(A)	55	61	55	61
External Dimension	Net Weight	kg	424	424	430	430
		lbs	935	935	948	948
	Shipping Weight	kg	449	449	455	455
		lbs	990	990	1003	1003
	Net Dimensions (WxHxD)	mm (inch)	1,795x1,695x765 (70.67x66.73x30.12)	1,795x1,695x765 (70.67x66.73x30.12)	1,795x1,695x765 (70.67x66.73x30.12)	1,795x1,695x765 (70.67x66.73x30.12)
	Shipping Dimensions (WxHxD)	mm (inch)	1,900x1,887x919 (74.80x74.29x36.18)	1,900x1,887x919 (74.80x74.29x36.18)	1,900x1,887x919 (74.80x74.29x36.18)	1,900x1,887x919 (74.80x74.29x36.18)
Operating Water Temp. Range	Cooling	°C (°F)	5 ~ 25 (41~77) (Brine, -10~25) (14~77°F)	5 ~ 25 (41~77) (Brine, -10~25) (14~77°F)	5 ~ 25 (41~77) (Brine, -10~25) (14~77°F)	5 ~ 25 (41~77) (Brine, -10~25) (14~77°F)
	Heating	°C (°F)	25 ~ 60 (77~140)	25 ~ 60 (77~140)	25 ~ 60 (77~140)	25 ~ 60 (77~140)
Operating Amb. Temp. Range	Cooling	°C (°F)	-15 ~ 48 (5~118)	-15 ~ 48 (5~118)	-15 ~ 48 (5~118)	-15 ~ 48 (5~118)
	Heating	°C (°F)	-25 ~ 43 (-13~109)	-25 ~ 43 (-13~109)	-25 ~ 43 (-13~109)	-25 ~ 43 (-13~109)

* During heating operation. the maximum leaving water temperature allowed is 55°C (131°F) when the outside temperature is below 10°C (55°F)
* Certified efficiency data in accordance with AHRI Standard 550/590.
* Specification may be changed without further notification.

3. Disassembly and Reassembly

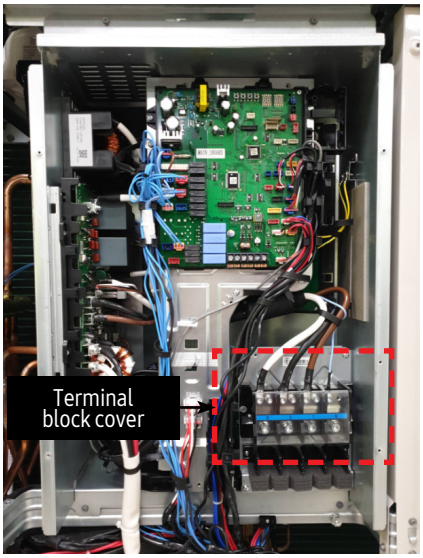
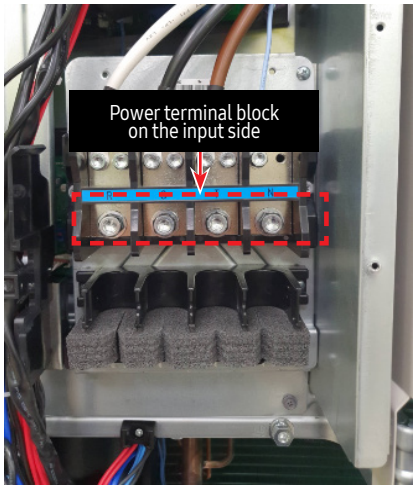
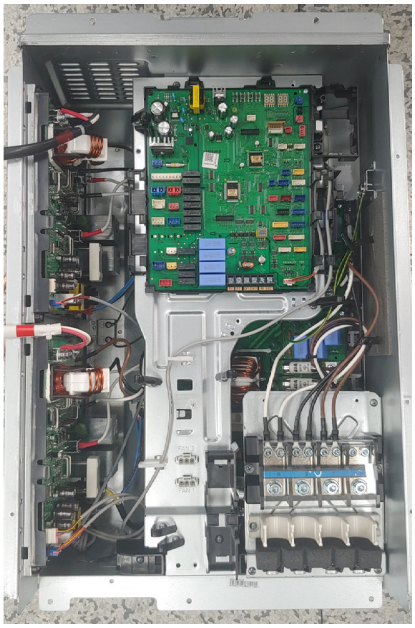
3-1. Necessary Tools

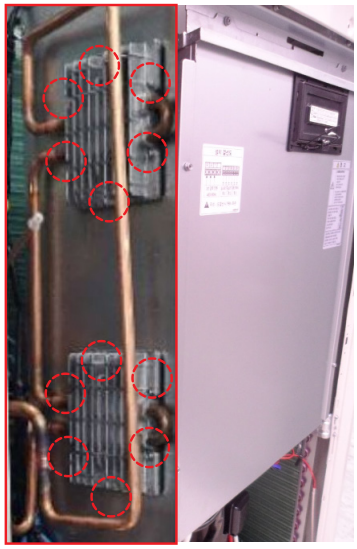
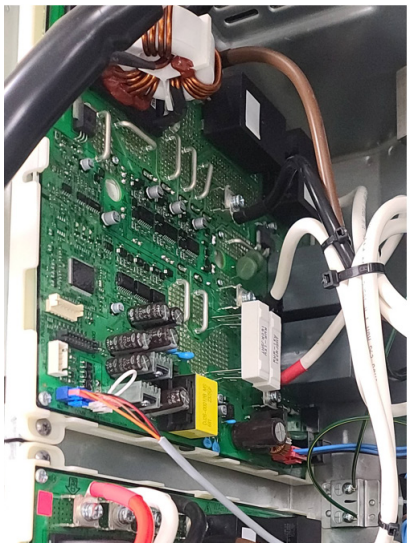
Item	Remark
+SCREW DRIVER	
MONKEY SPANNER	
-SCREW DRIVER	
NIPPER	
ELECTRIC MOTION DRIVER	
L-WRENCH	

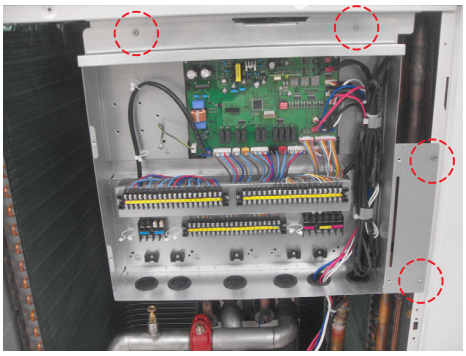
3-2. Disassembly and Reassembly

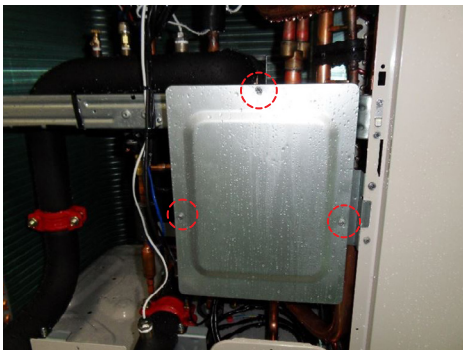
3-2-1. VPD010/015C6M-5*Series

No.	Parts	Procedure	Remark
1	Electrical equipment parts	1) Remove 24 screws from the Cabinet. (Use + Screw Driver)	
		2) Remove the 8 screws and then separate the left side Cover Control Box of Hydro part and right side Cover Control Box of Inverter part. (Use + Screw Driver)	
		3) Remove the Power, Compressor, Valve, Motor, Sensor connector of Assy PCB.	

No.	Parts	Procedure	Remark
		4) Remove the (transparent) cover on the terminal block.	
		5) Disconnect the power cables on the input side of the terminal block. The power cables are fixed with screws on the terminal block. Use a spanner or hex wrench to disconnect the power cables. Use insulation tape to wrap each power cable before storage to prevent the cables from coming into contact with each other.	
		6) Remove the 5 screws from the front part.	

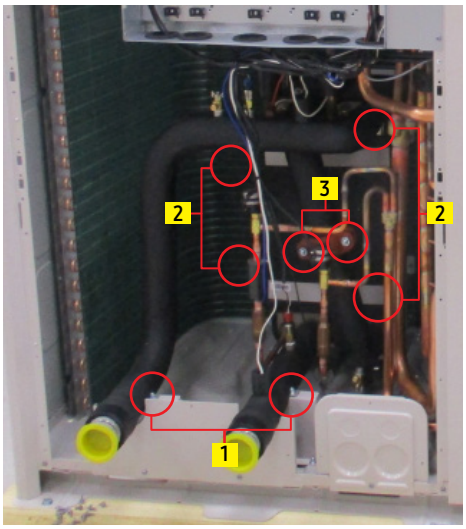
No.	Parts	Procedure	Remark
		7) Remove the 12 screws from the outside of side refrigerant cooling part. ⚠ Do not separate Heat Sink pulling Assy Piping Cooling piping compulsorily. (It can be a cause of parts damage)	
		8) Remove the 2 screws from the inside of side refrigerant cooling part.	

<table>
<tr><th>No.</th><th>Parts</th><th>Procedure</th><th>Remark</th></tr>
<tr><td>3</td><td>Hydro part Control Box</td><td>9) Remove the 4 screws from the front part.</td><td>  </td></tr>
<tr><td>4</td><td>Trans Box
(It correspond to
J power model
VPD010/015C6M-5G)</td><td>10) Remove the 3 screws from the front part and then separate the Trans Box Cover.

11) Remove the 4 screws from the top of front part.</td><td> 
  </td></tr>
<tr><td>5</td><td>Hydro part</td><td>12) Remove the 4 screws which is fixed to Bracket Tube.

13) Remove the 4 screws which is fixed to Bracket Hydro part.

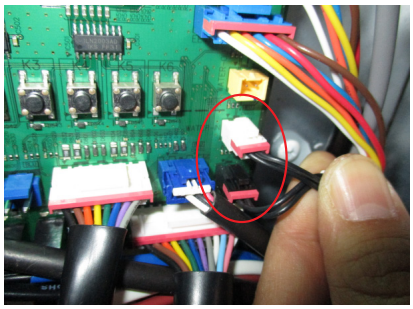
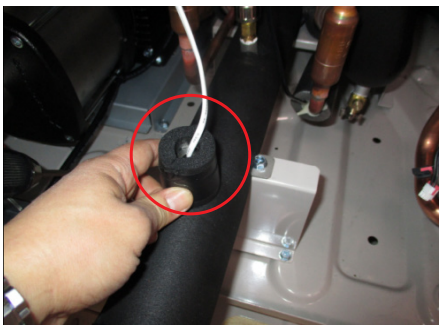
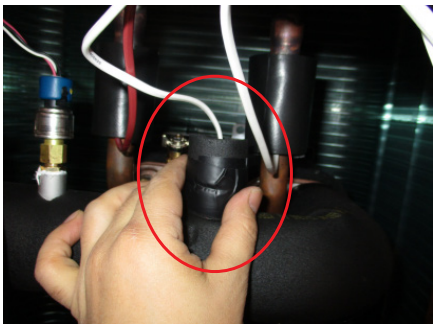
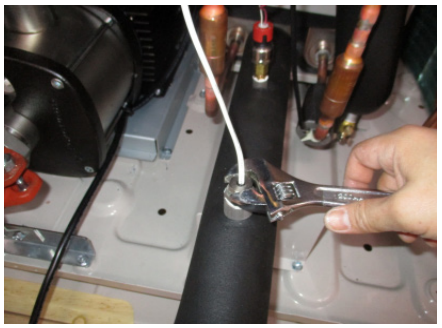
14) Remove the 2 screws securing the coupling points. Loosen BRACKET PHE SCREW where to hold the heat exchanger.

<table><tr><th>No</th><th>code</th><th>SPEC</th><th>Q'ty</th></tr><tr><td>1</td><td>6003-001053</td><td>M6</td><td>2</td></tr><tr><td>2</td><td>6009-001369</td><td>M4</td><td>4</td></tr><tr><td>3</td><td>General NUT</td><td>M8</td><td>2</td></tr></table></td><td> 
</td></tr>
</table>

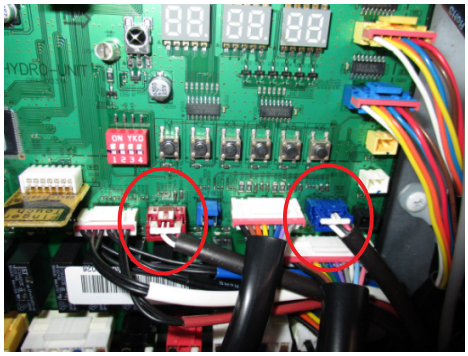
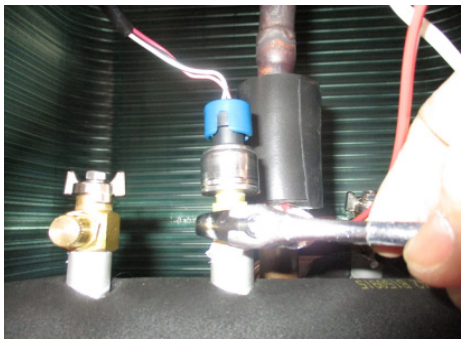
3-3. Service work of main parts

3-3-1. Temperature sensor & Pressure sensor in the water pipe side

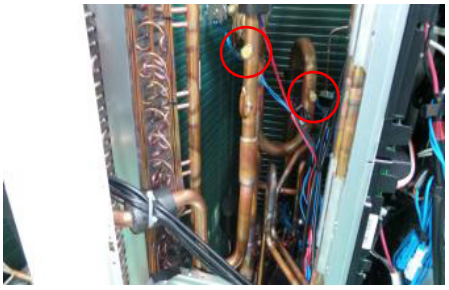
- Exchange method of the water temperature sensor

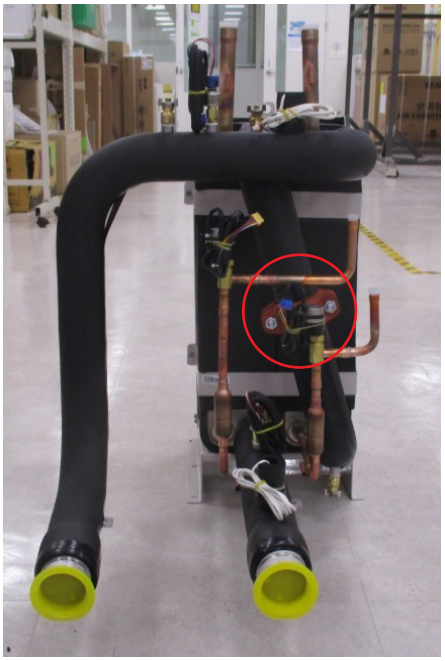
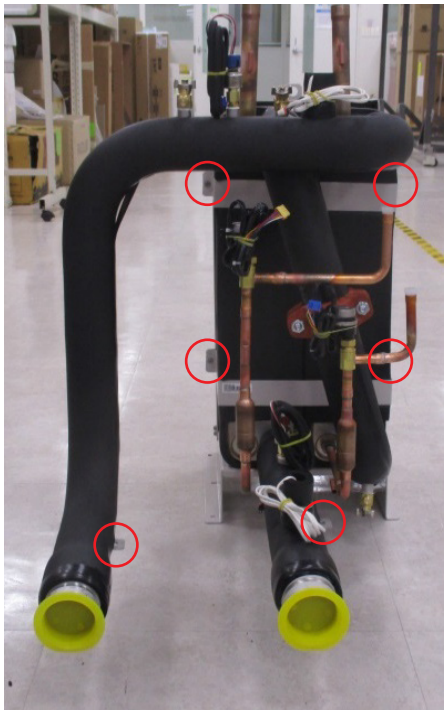
1) Power off before starting on work. 2) Unscrews the fixed screw of CABINET FRONT and C-BOX. 3) Separate the connector from PBA	
4) Separate Insu protecting the temperature sensor.	 
5) Separate the temperature sensor by using spanner.	
6) Separate the temperature sensor. It is applied Thermal Grease for an accurate temperature measurement. ※ Cover the temperature sensor with Insu so that it is not affected from the outside. - Bolt torque: 120±10% kgfcm	

- Exchange method of the pressure sensor

1) Power off before starting on work. 2) Close the valve connected to inlet/outlet of main water pipe. 3) Drain all water of water pipe connected to VRF CHILLER. 4) Unscrews the fixed screw of CABINET FRONT and C-BOX. 5) Separate the connector from PBA.	
6) Separate the pressure sensor by using spanner.	
7) Replace with the new pressure sensor. Bolt torque:120±10% kgfcm	

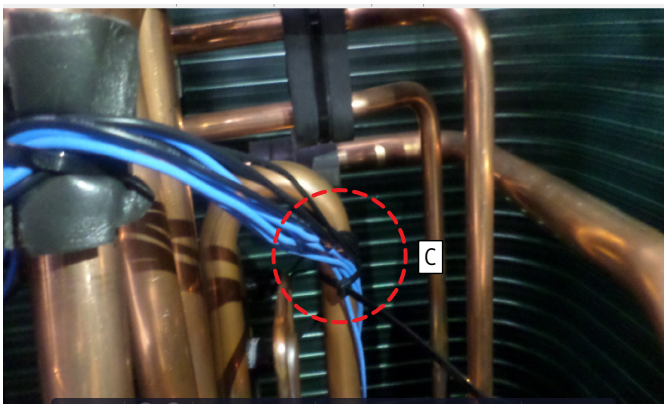
3-3-2. Plate type heat exchanger PHE

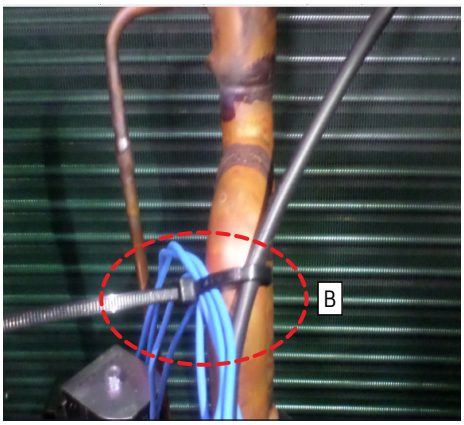
1) Power off before starting on work. 2) Close the valve connected to inlet/outlet of main water pipe. 3) Drain all water of water pipe connected to VRF CHILLER. 4) Unscrews the screw of inlet/outlet water pipe connected to VRF CHILLER. 5) Unscrews the fixed screw of CABINET FRONT. 6) Separates wire of cycle parts connected to ASSY PHE from C-BOX.	
7) Connect the refrigerant reclaimer in the charging port, Recovering the refrigerant sealed in the product. Use only charging port charging, recovery of refrigerants.	
8) Separate the four points of the pipe connected to ASSY PHE by welding .	

9) Unscrew the screw of coupling connecting the two PHE in series.	
10) Separate 6 screws of Bracket fixing ASSY PHE. 11) Please reassemble in reverse order of disassembly. - Bolt torque at time of coupling tightening: 200±10% kgfcm	

Binding Wire1

■ VPD010/015C6M-5*Series



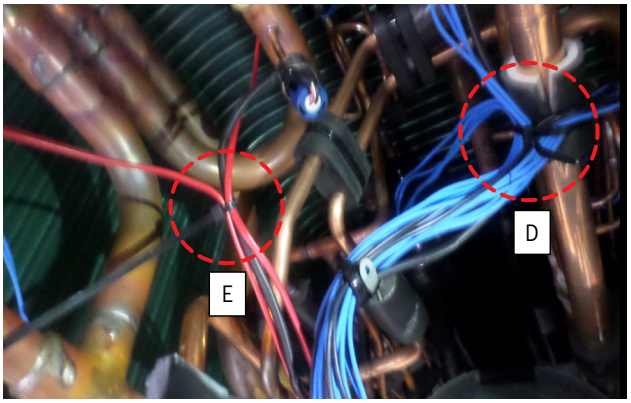


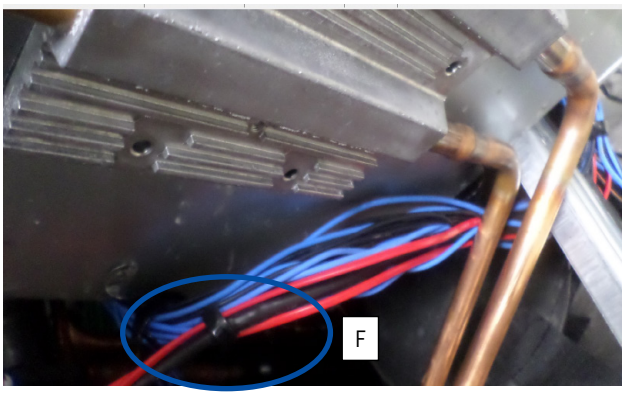
Cable Tie Holder Wire Etc.

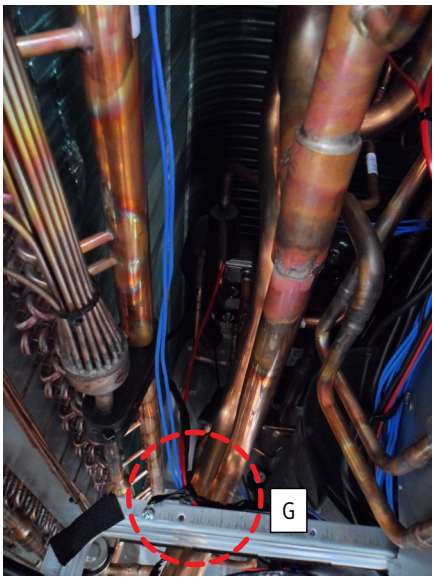
location	Specifications	Used parts
A	Binds a EEV, Pressure sensor, Temperature sensor, Water temperature sensor by Cable-Tie.	6501-001110 (L200): Cable Tie
B	Binds a High pressure switch, Oil return valve by Cable-Tie using Insu.	
C	Binds a High pressure sensor, EVI, Hot gas valve by Cable-Tie using Insu.	

Binding Wire2

■ VPD010/015C6M-5*Series





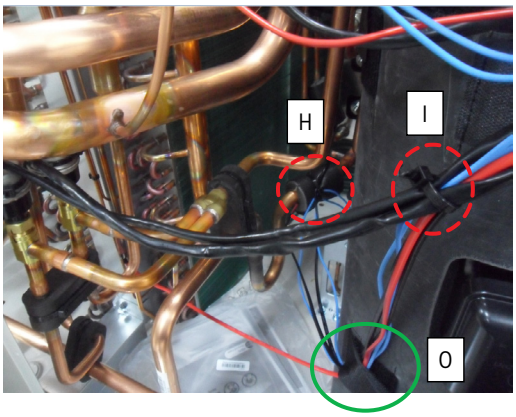


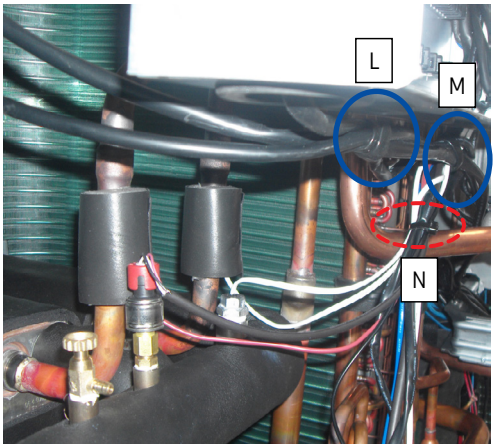
Cable Tie Holder Wire Etc.

location	Specifications	Used parts
D	Binds a Vapor injection valve, High-voltage switch, Oil return valve, High pressure sensor, EVI, Hot gas valve by Cable-Tie using Insu.	6501-001110 (L200): Cable Tie
E	Binds a Low pressure sensor , Temperature sensor bundle by Cable-Tie.	
F	Binds a Vapor injection valve, High-voltage switch, Oil return valve, High pressure sensor, EVI, Hot gas valve, Low pressure sensor , Temperature sensor by Holder wire.	6501-001107 (L368): Cable Tie
G	4Way valve, EVI EEV valve	

Binding Wire3

■ VPD010/015C6M-5*Series





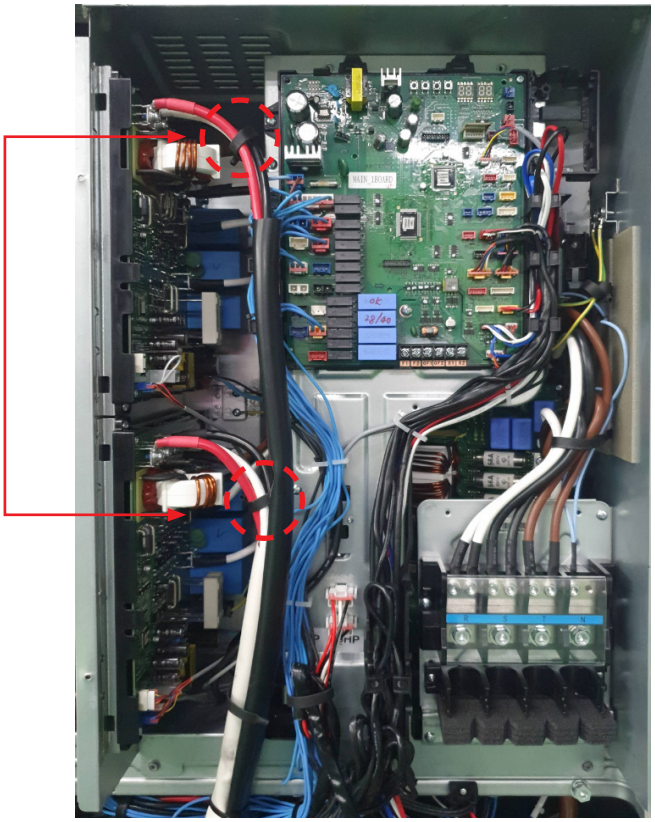
Cable Tie Holder Wire Etc.

location	Specifications	Used parts
H	Binds a Sub cooler temperature sensor 2 kinds by Cable-Tie.	6501-001107 (L368): Cable Tie
I	Binds a EEV coil, Cond out temperature sensor, Sub cooler temperature sensor 3 kinds, Oil return valve by Cable-Tie.	
J	Binds a Communication wire, Power wire, Motor wire, Suction temperature sensor by Holder wire.	DB61-00206A
K	Binds a Communication wire, Power wire, Motor wire, Suction temperature sensor by Holder wire.	
L	Binds a Motor wire, Power wire by Holder wire.	
M	Binds a Motor wire, Power wire, Communication wire, Hydro part wire bundle by Holder wire.	
N	Binds a Hydro part wire bundle by Holder wire.	
O	COND OUT, ACCUM OIL RETURN VALVE, Temperature Senser 2 kinds	FELT VELCRO

Binding Wire4

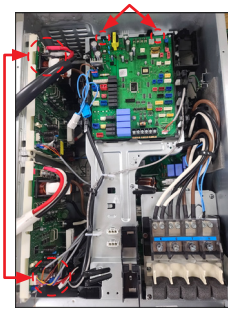
■ VPD010/015C6M-5*Series

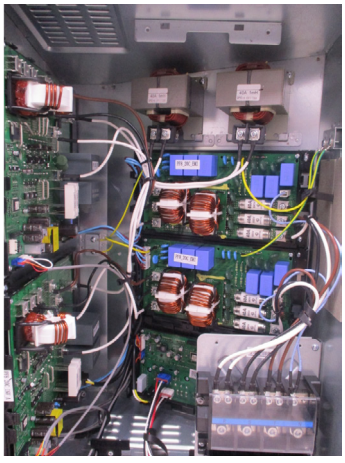
Binds a Comp wire by Holder wire.



1

Binds a Comp wire by Holder wire.





No	Code	SPEC	Q'ty
1	6002-001149	M4	2

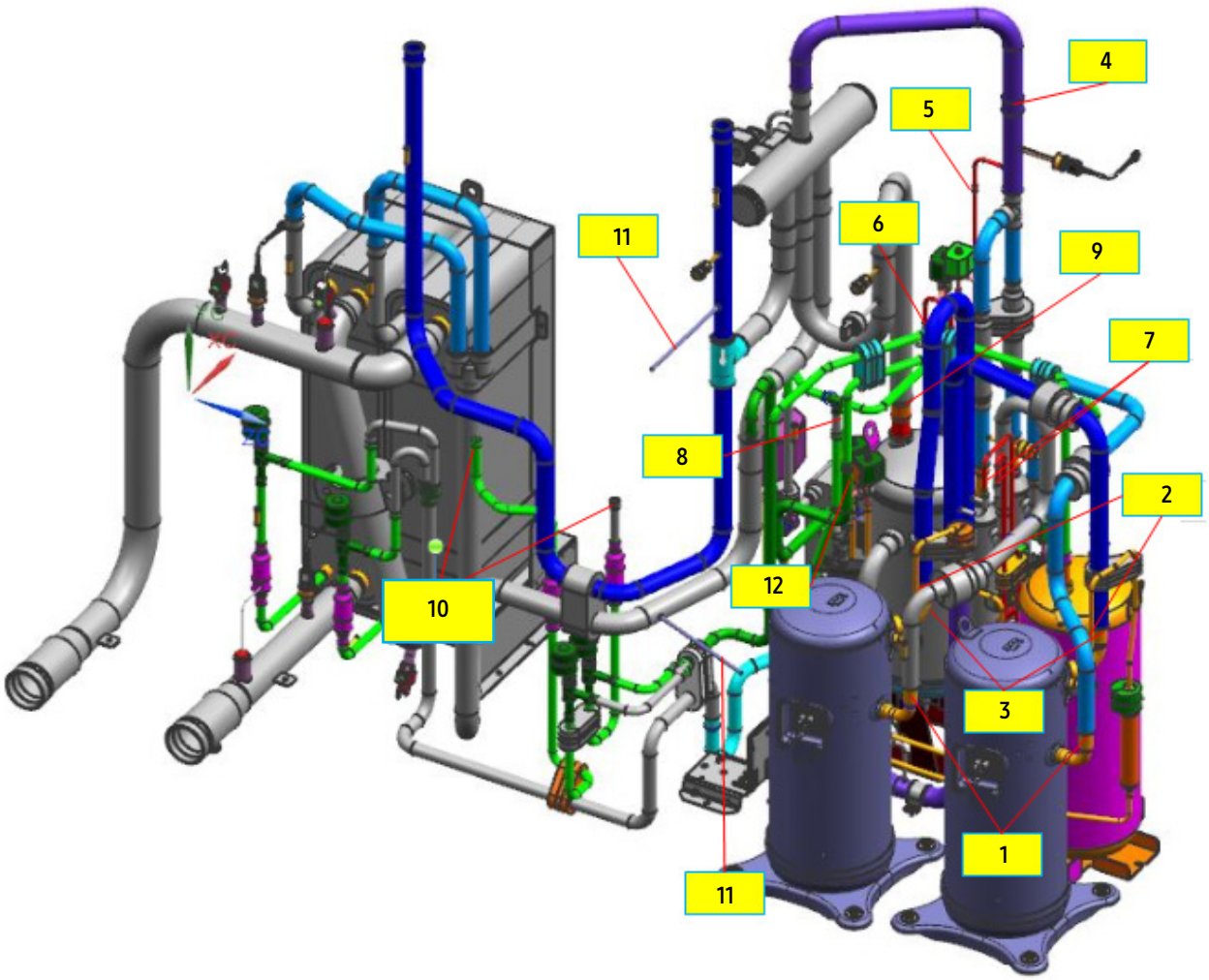
Remove the 3 screws and separate the connector and then separate the double layer structure of Control Box.

[Reference Sheet]

Pipe Welding Position

■ VPD010/015C6M-5*Series

Front welding part 2



※ All model's pipe welding position is same.

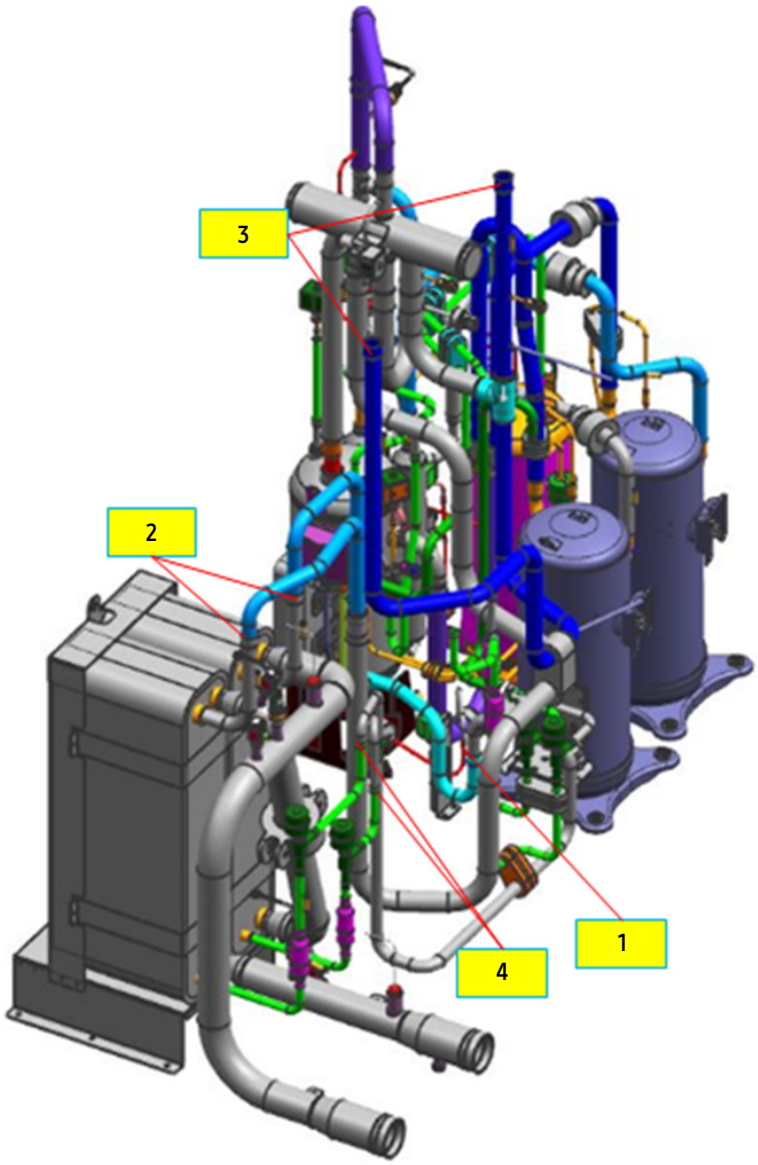
No.	Welding Position	Q'ty
1	Comp + Discharge	2
2	Comp + Suction	2
3	Comp + Vpaor Injection	2
4	Oil Sepa Out + 4way	1
5	Oil Sepa Out + Hot Gas	1
6	4Way + Hot Gas	1
7	Sution + Oil Return	2
8	Vapor Injection + EVI Bypass	1
9	Accum + 4Way	1
10	EEV + Cond Out	2
11	Pinch Pipe	2
12	Subcooler + Receicer Tube	1

[Reference Sheet]

Pipe Welding Position

■ VPD010/015C6M-5*Series

Front welding part 2



※ All model's pipe welding position is same.

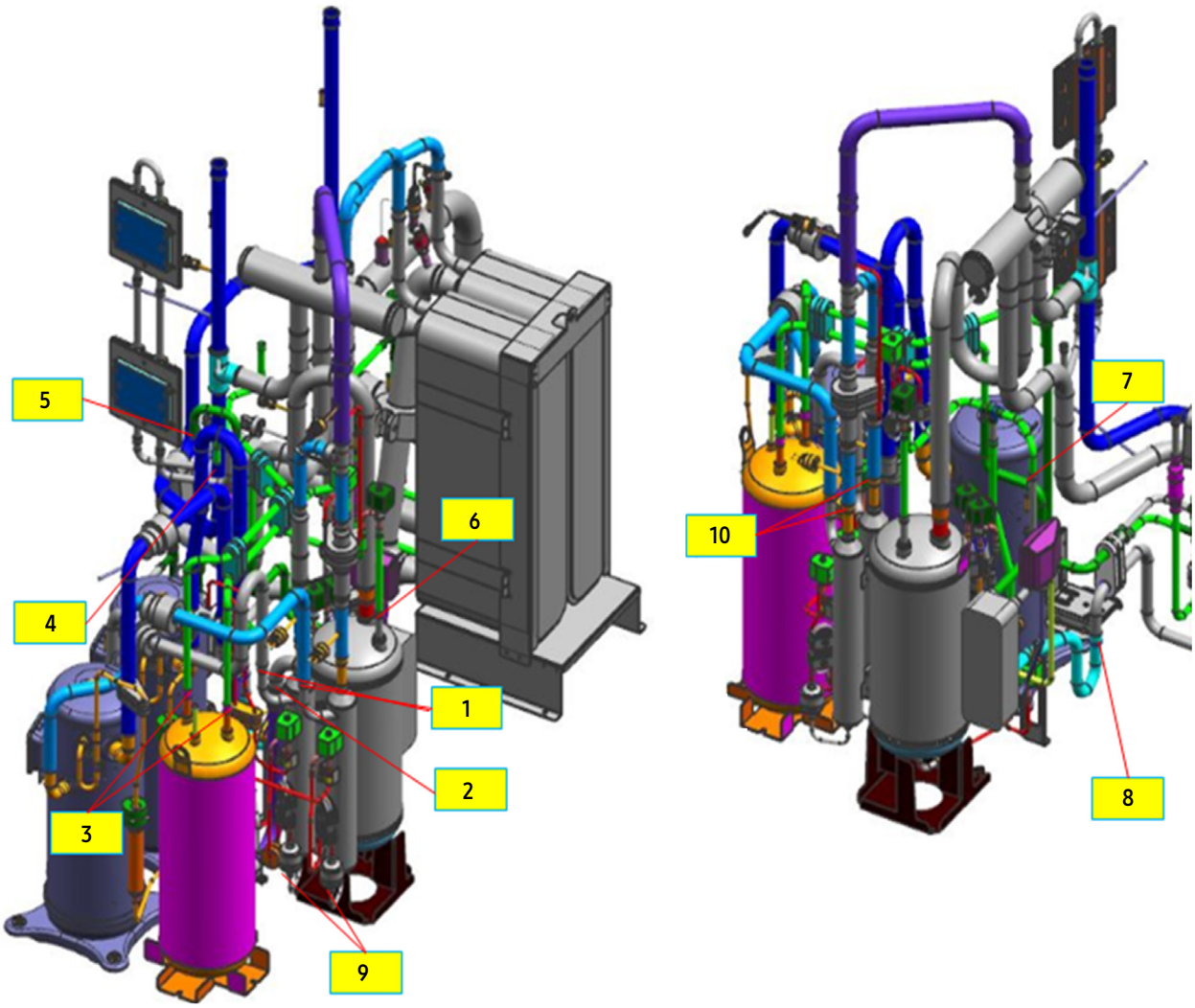
No.	Welding Position	Q'ty
1	Accum Oil Retrun valve + Suction	1
2	4Way + Assy Phe In	2
3	4Way + Cond In	2
4	EEV + Assy Phe Out	2

[Reference Sheet]

Pipe Welding Position

■ VPD010/015C6M-5*Series

Rear welding part

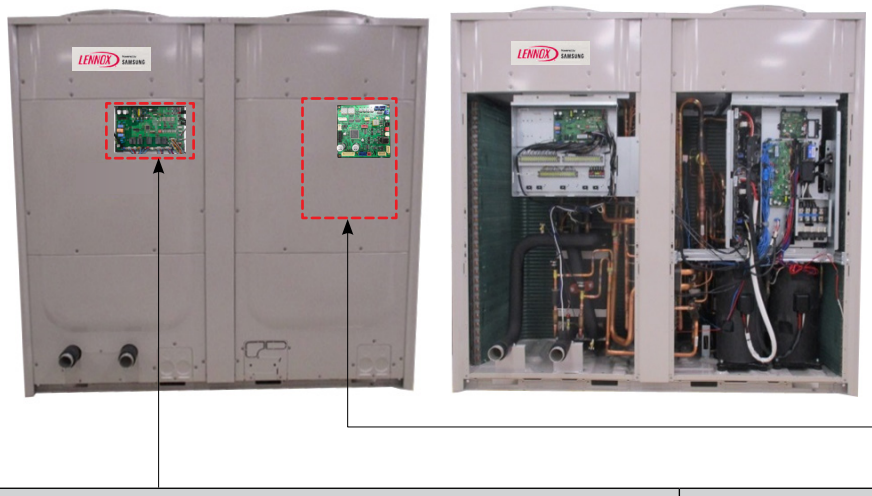


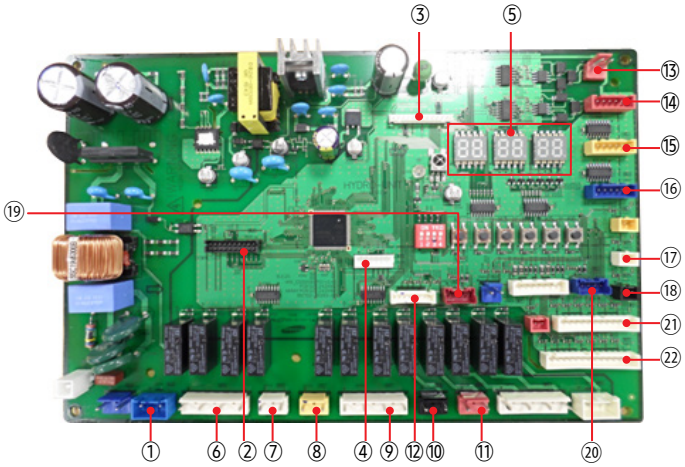
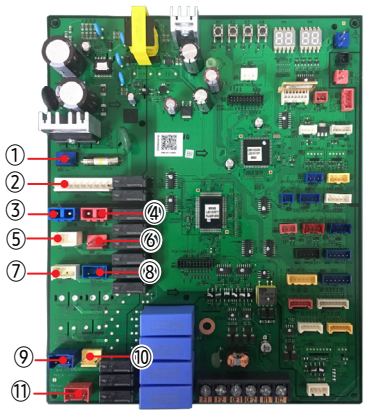
※ All model's pipe welding position is same.

No.	Welding Position	Q'ty
1	Discharge + Oip sepa Tank	2
2	Suction + Accum	1
3	Receiver Tank + Receiver Tube	2
4	Receiver Tube + Cooling	1
5	Cooling + EEV	1
6	Accum + EVI Bypass	1
7	EVI Bypass + Subcooler	1
8	Subcooler + EEV	1
9	Oil Sepa tank + Oil Return	2
10	Oil Sepa tank + Oil Sepa out	2

4. Troubleshooting

4-1. Check-up Window Description



Hydro control	Inverter control
	

No.	Function	No.	Function
1	Input power	12	Input EVA1,2 Temperature sensor
2	MICOM Download	13	Communication between Hydro and Heat source unit (F1,F2)
3	2 wire communication SUB PCB Connection	14	Module communication, Controller (OF1,OF2,V1,V2,F3,F4)
4	EEPROM Connection	15	EEV2
5	State/Error Display	16	EEV1
6	Cooling/Heating display, Operation Display	17	Input water in Temperature sensor
7	Warning Display	18	Input water out Temperature sensor
8	Defroster operation Display	19	Input PHE OUT Pressure sensor
9	Pump, Compressor operation Display	20	Input PHE IN Pressure sensor
10	Pump operation	21	Pump interlock, Control peration/Mode heat storage operation/Control
11	Freeze protection Display	22	Quiet function, Demand function Forced fan function, Unusual condition reset, Water law

No.	Function	No.	Function
1	AC 220V connection (Supply power to main PBA)	7	EVI bypass valve
2	EVI sol. valve #1, #2	8	OD EEV valve #2
3	Low ambient kit (N,A only)	9	Main Cooling
4	Hotgas bypass valve #1	10	4Way1
5	OD EEV valve #1	11	Hotgas bypass2
6	Accumulator oil return valve		

4-2. Service Operation

4-2-1. Special Operation

▶ Key input of the outdoor unit when the service enters the operation mode.

K1 (Number of press)	KEY operation	Display on 7-Segment
1times	Refrigerant charging in Heating mode	H 0 0 0
2times	Trial operation in Heating mode	H 2 0 0
3times	Refrigerant discharging in Heating mode	H 3 0 0 1
4times	Disuse	H 3 0 0 2
5times	Disuse	H 3 0 0 3
6times	Disuse	H 3 0 0 4
7times	Vacuum	H 4 0 0 1
8times	Disuse	H 4 0 0 2
9times	Disuse	H 4 0 0 3
10times	Disuse	H 4 0 0 4
11times	Disuse	H 4 0 0 A
12times	Inverter Fault Detection (Comp#1)	H 5 0 1 1
13times	Inverter Fault Detection (Comp#2)	H 5 0 1 2
14times	Inverter Fault Detection (Fan#1)	H 5 F 0 1
15times	Inverter Fault Detection (Fan#2)	H 5 F 0 2
16times	End Key operation	-

K2 (Number of press)	KEY operation	Display on 7-Segment
1times	Refrigerant charging in Cooling mode	H 5 0 0
2times	Trial operation in Cooling mode	H 6 0 0
3times	Pump down all units in Cooling mode	H 7 0 0
4times	Auto trial operation	H 8 0 0
5times	Checking the amount of refrigerant	H 9 X X (Display of last two digits may differ depending on the progress)
6times	Discharge mode of DC link voltage	H A 0 0
7times	Forced defrost operation	H b 0 0
8times	Forced oil collection	H C 0 0
9times	Inverter compressor1 check	H d 0 0
10times	Inverter compressor 2 check	H E 0 0
11times	Fan 1 check	H F 0 0
12times	Fan 2 check	H U 0 0
13times	End KEY operation	-

▶ To use key operating function for service and maintenance when installing module/group, set as main control or cancel in module/group.
(Body control settings: Hydro control Dip S / W1 times On, Modules / How to ungroup: Modular Controller Installation Manual Reference)

▶ During Discharging mode, voltage of Inv1 and Inv2 will be displayed alternately.

▶ Even when the power is off, it is dangerous when you come in contact with inverter PCB,
fan PCB since high pressure DC voltage is charged to those parts.

▶ When replacing or repairing the PCB, cut-off the power and wait until the DC voltage is discharged before replacing/repairing them.
- Wait for more than 15 minutes to allow those parts to be fully discharged.

▶ When there is error, Discharge mode of DC link voltage may not have been effective. Especially when E464 and E364 error is displayed, power element might be damaged so do not use the Discharge mode of DC link voltage.

■ Trial Operation

▶ After initial installation, stable operation for a certain period of time limited to operation conditions.

	Cooling	Heating
Method of Entry	K2 Tact Switch 2times	K1 Tact Switch 2times
Compressor	Normal operation, but the maximum frequency limit (differ by model)	
Fan and Valves	Normally control conduct	
Operation time	Min: 60 minutes, Max: 10 hours	
Etc.	• Exceed the maximum operating time at stops and waits. • Protection and control, self-diagnosis is performed.	

■ Refrigerant Filling Operation

▶ Operation to filling the refrigerant compressor was fixed at a certain frequency.

	Cooling	Heating
Method of Entry	K2 Tact Switch 1times	K1 Tact Switch 1times
Compressor	Starting frequency (Mild Start frequency) operation	
Fan and Valves	Normally control conduct	
Maximum Operation time	60minutes	
Etc.	During the filling operation does not enter the special operation, such as oil recovery, defrost.	

■ Vacuum Operation

▶ Operation to facilitate vacuum to open the valve after the Outdoor Unit repair.

Method of Entry	K1 Tact Switch 7times
Compressor	OFF
Fan	OFF
4WAY Valve	OFF
Valves	Open all valves maximum
Etc.	If not turn off the vacuum mode, the start of normal operation is prohibited.

■ Discharge mode Operation

▶ Block the Inverter PCB 3-phase relay after connected the power, and through compressor, DC voltage is discharging.
- Discharge Mode Operation Process: Push K2 button 6 times shortly.
- INV1 and INV2 DC voltage during discharge mode are displayed alternately.
- Discharge mode Display (Rotate the three page display, as shown below.)

  H'A'''' → DC Link Volt1 (For example, 120[V] 0 1 2 0 display) → DCLinkVolt2 (For example, 120[V] 0 1 2 0 display)
  → H'A'''' → DC Link Volt1 ...

▶ If want operation again after complete discharge mode: Restart after K3 key to Reset or Power Reset.

■ Forced defrost operation

▶ Forced defrost operation: Is operation when Frost Formation occurs in the outdoor. (When carried out the service)

Method of Entry	K2 Tact Switch 7 times
Start pattern	Heating Trial Operation pattern
Defrost start	Defrost start: It is after10 minutes which Safety Start finishes.
Defrost off	General defrost operation conditions are the same as.
Etc.	Defrost shut down and stop the normal pattern of the outdoor unit stop.

■ Forced oil recovery operation

▶ Forced oil recovery operation: Oil recovery in the outdoor unit for the purpose of moving, installation if necessary.

Method of Entry	K2 Tact Switch 8 times
Start pattern	Outdoor temperature is more than 10°C (50°F): Cooling Auto Trial Operation. Outdoor temperature is less than or equal to 10°C (50°F): Heating Auto Trial Operation.
Oil recovery start	Oil recovery start: It is after10 minutes which Safety Start finishes.
Etc.	Oil recovery shut down and stop the normal pattern of the outdoor unit stop.

4-2-2. VRF CHILLER EEPROM code table by models

No.	Model	EEP code
1	VPD010C6M-5Y	DB82-03480A
2	VPD015C6M-5Y	DB82-03481A
3	VPD010C6M-5G	DB82-03482A
4	VPD015C6M-5G	DB82-03483A

■ Method of PCB SW update and method of EEPROM download

SW update	Tool	Procedure
PC SW	S-net pro 2	* Refer to the S-net pro 2 manual for more detailed information. Alt 1. UART Update 1. Power down the system. 2. Connect download cable to PCB 3. Connect Converter to PC. 4. S-Net pro 2 - Add-on - UART Update Alt 2. AC unit S/W update(Communication update) 1. Power on the system. 2. Connect F1,F2 to converter. 3. Connect Converter to PC. 4. S-Net pro 2 - Connect - Add-on -AS unit Outdoor EEPROM write * This work only when communication is normal.
Converter	S-converter: OK I-converter: NG	
Cable	20PIN download cable	

Outdoor EEPROM writing	Tool	Procedure
PC SW	S-net pro 2	* Refer to the S-net pro 2 manual for more detailed information. 1. Power on the system. 2. Connect F1,F2 to converter. 3. Connect Converter to PC. 4. S-Net pro 2 - Connect - Add-on -Outdoor EEPROM write * This work only when communication is normal.
Converter	S-converter: OK I-converter: NG	
Cable	F1,F2 communication cable	

4-2-3. Option code by model classification

Item	Model	SEG																							Remark
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
F power resourse	VPD010C6M-5Y	0	1	0	0	4	4	1	1	8	3	0	1	2	3	2	3	2	3	3	3	0	0	1	0	3 Phase 3 Wires 208~230V, 60Hz
	VPD015C6M-5Y	0	1	0	0	4	4	1	1	8	3	0	1	2	3	3	2	3	2	3	3	0	0	1	0	
J power resourse	VPD010C6M-5G	0	1	0	0	4	4	1	1	8	3	0	1	2	3	2	3	2	3	3	3	0	0	1	0	3 Phase 3 Wires 460V, 60Hz
	VPD015C6M-5G	0	1	0	0	4	4	1	1	8	3	0	1	2	3	3	2	3	2	3	3	0	0	1	0	

4-2-4. Number Display Method

■ How to Display Integrated Error Code

▶ Meanings of First Alphabetical Character / Number of Error Code

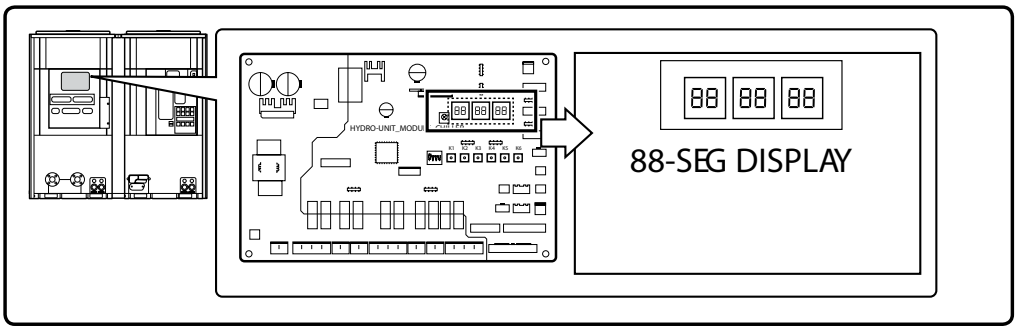
DISPLAY	Explanation	
E	When displaying Error 101~700	
C	When E206 occurs	Displays address of subordinate within the set C001: HUB, C002: FAN, C003: INV1, C004: INV2
U	When displaying outdoor unit address Ex) U200: Outdoor unit 1, U201: Outdoor unit 2, U202: Outdoor unit 3, U203: Indoor unit 4	
A	When displaying indoor unit address Ex) A000: Indoor unit adress 0, A001: Indoor unit address 1, A002: Indoor unit address 2	

▶ Order of Error Display

Classification	Error display method	Display Example
Display method for error that occurred in indoor unit	Error Number → Indoor unit address → Error Number, repeat display	E471 → A002 → E471 → A002
Display method for error that occurred in outdoor unit and other methods of error display	Error Number → Outdoor unit address → Error Number, repeat display	E471 → U200 → E471 → U200 E206 → C001 → E206 → C002

■ Error display (Error Code)

▶ Segment will display error code (4 digit).



Display	Description
101	Communication error between hydro controller and inverter controller (If not received for 3 minutes from outdoor unit)
108	Error due to repeated setting address
109	Communication error of hydro controller address not complete
122	Error on hydro Evap in Sensor (Open/Short)
123	Error on hydro Evap out Sensor (Open/Short)
128	Error on hydro Evap in Sensor (Detached)
129	Error on hydro Evap out sensor (Detached)
144	Error on hydro pipe temperature 2 sensor
145	Error on hydro EVA OUT 2 sensor
151	Hydro EEV open error (2nd detection)
152	Error due to closed EEV of hydro (2nd detection)
153	Error on hydro floating switch (2nd detection)
162	Inverter controller EEPROM error
163	Hydro controller EEPROM option setting error
198	Error due to disconnected thermal fuse (Temperature of terminal block increases.)
201	Communication error between hydro controller and outdoor unit
202	Communication error between hydro controller and inverter controller (When there is no response from indoor units after tracking is completed)
203	Communication error of Main and sub MICOM of inverter controller
205	Communication error of inverter controller main PBA - sub PBA (Sub PBA communication all not received)
206	Communication error of inverter controller main PBA - sub PBA (S PBA communication partially not received) Specification of PBA display for actual communication error C001: Hub PCB communication error C002: Fan PCB communication error C003: INV1 communication error C004: INV2 communication error
221	Error on outdoor temperature sensor (Short or Open)
231	Error on COND outlet sensor (Short or Open)
241	COND outlet sensor is detached
251	Error on discharge temperature of COMP1 (Short or Open)
257	Error on discharge temperature of COMP2 (Short or Open)
262	Discharge temperature sensor of COMP1 is detached
263	Discharge temperature sensor of COMP2 is detached
266	Top1 temperature sensor is detached
267	Top2 temperature sensor is detached
269	Suction temperature sensor is detached
270	Suction 2 temperature sensor is detached
276	Error on Top 1 temperature sensor (Short or Open)
277	Error on Top 2 temperature sensor (Short or Open)
291	Error on high pressure sensor (Short or Open)
296	Error on low pressure sensor (Short or Open)
308	Error on Suction sensor (Short or Open)

■ Error display (Error Code)

Display	Description
311	Error on double layer pipe sensor (Short or Open)
321	EVI inlet temperature
322	EVI outlet temperature
323	Error on Suction 2 sensor (Short or Open)
326	Error on Total suction sensor (Short or Open)
346	Operation failure of Fan2
347	Unconnected error of Fan2
348	Lock error on Fan2
353	Overheated motor of Fan2
355	Error due to overheated IPM of Fan2
361	INV2 Comp starting error
364	INV2 DC Peak error
365	INV2 Comp Vlimit error
366	INV2 DC-Link voltage under/over error
367	INV2 Comp Rotation error
368	Error due to full current of INV2
369	INV2 DC Link sensor error
371	INV2 DataFlash error
374	INV2 IPM Heat Sink error
378	Error due to overcurrent of Fan2
383	Error due to special overcurrent of Fan2
385	INV2 input current error
386	Error due to over voltage/low voltage of Fan2
387	Hall IC error of Fan2
389	Outdoor fan2 overload stop
391	Fan2 Date Flash error
393	Fan2 DC output sensor error
396	Fan2 DC Link voltage sensor error
399	Heat sink temperature sensor error of Fan2
400	INV2 IPM OverHeat error
407	COMP down due to high pressure
410	COMP down due to low pressure
416	COMP down due to discharge temperature
425	Phase reversal or phase failure
428	COMP down due to compressor not controlled
438	EVI EEV open error
439	Error due to refrigerant leakage (Examine when system off)
440	Restriction of heating operation by outdoor temperature
441	Restriction of cooling operation by outdoor temperature
442	Restriction of heating charging operation by outdoor temperature
443	Operation prohibited due to low pressure
445	Error due to self-diagnosis of CCH
446	Operation failure of Fan1
447	Unconnected error of Fan1
448	Lock error on Fan1
452	Instant blackout error
453	Overheated motor of Fan1
455	Error due to overheated IPM of Fan1
461	INV1 Comp starting error
462	Compressor stop due to full current control or error due to low current on CT2
464	INV1 DC Peak error
465	INV1 Comp Vlimit error
466	INV1 DC-Link voltage under/over error
467	INV1 Comp Rotation error
468	Error due to full current of INV1

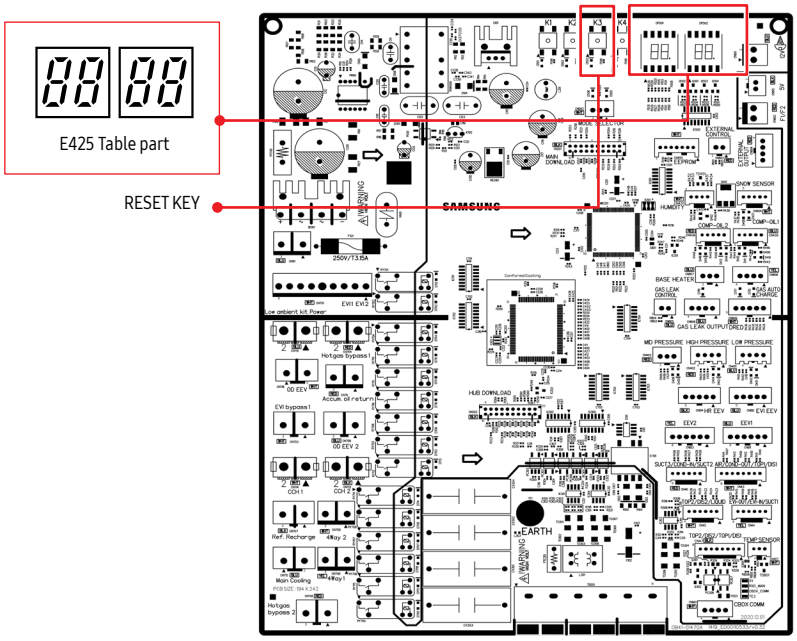
■ Error display (Error Code)

Display	Description
469	INV1 DC Link sensor error
471	INV1 Data Flash error
474	INV1 IPM Heat Sink error
478	Error due to overcurrent of Fan1
483	Error due to special overcurrent of Fan1
485	INV1 input current error
486	Error due to over voltage/low voltage of Fan1
487	Fan1 Hall IC error
489	Outdoor Fan1 overload OFF
491	Fan1 DataFlash error
493	Fan1 output sensor error
496	Fan1 DC link sensor error
499	Fan1 Heat Sink temperature sensor error
500	INV1 IPM OverHeat error
560	Switch option setting error
901	Hydro inlet temperature sensor (Tw1) Short/Open
902	Hydro outlet temperature sensor (Tw2) Short/Open
907	Frozen damage error
908	Error when freeze prevention Comp Off 3 times
909	Error when freeze prevention Comp Off 3 times
910	Error on hydro outlet temperature (Tw2) sensor (Detached)
911	Water Flow error (Water pressure sensor)
913	Flow Pressure sensor error (E911) occurs 6 times and reoccurs
918	Error on pump magnetic switch malfunction
971	External sensor (WaterOut Setting Device/ WaterLaw Room Temp sensor) is open/Short
972	Water inlet side pressure sensor is open/short
973	Water outlet side pressure sensor is open/short
974	External WaterOut sensor is open/short

4-3. Appropriate measures for symptoms

4-3-1. Reversed phase / No phase check (Outdoor unit with 3 phase power) - display E425

1. When the power is on, check the status of the power from the inverter.
   Three-phase L1(R)-L2(S)-L3(T) order, regardless of the power connection on the inverter does not phase power (no phase) can occur.
   In this case, E425 or E466 (E366) is displayed, and then air conditioner will then maintain normal conditions.
   However) N phase must be connected properly.



1) Check the voltage for L1 (R)-L2 (S) phase/L1 (R)-L3 (T) phase/L2 (S)-L3 (T) phase.

2) If there is any terminal without normal voltage, then check the power outside the air conditioner and take the appropriate measures.

3) If the 3-phase voltage is normal, then use the 3-phase tester to display the phase of the power cable
   Change the power cable connection if reversed phase is displayed.

4) Take the above measures, press the reset key (K3), and then check the power once more.

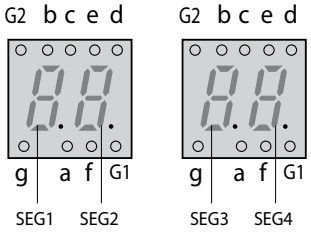
5) Check the EMI PCB Fuse connection and wiring.

6) If the same problem occurs after another check, check the Inverter PCB.

⚠ In case of wiring error (N-phase is changed with one of R, S and T) with the N-phase, will operate the power protection function, display E425 or stop the power. This is not a PCB power defect in this case, before PCB replacement, please check the power on.

■ Initial tracking (Communication check-up) - display E201

- The outdoor unit Micom attempts communication with the inverter control part connected to the communication wire (F1/F2) when the power is turned on.
- Basic segment display



Display of inverter control part

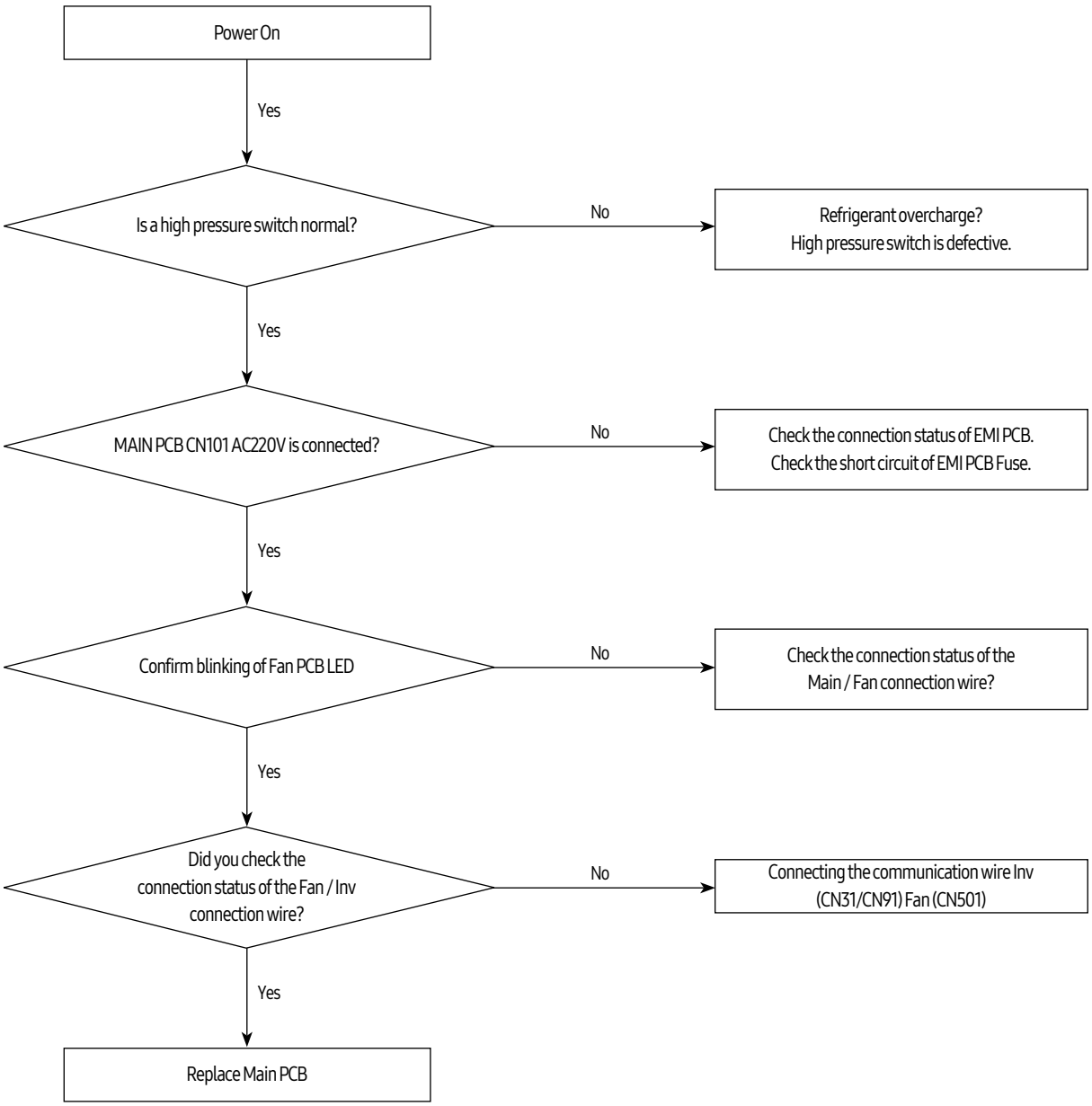
Step	Display content	Display			
		SEG1	SEG2	SEG3	SEG4
At initial power input	Checking segment display	8	8	8	8
Chiller units Communicating Setting (Addressing)	Number of connected Chiller units	SEG1	SEG2	SEG3, 4	SEG3, 4
		A	d	0	1
After communication setting (usual occasion)	Transmit / Reception address	Hydro control: A	Hydro control: 0	0	0

- Displays if communication fails, the inverter controller and Hydro control part E201.

4-3-2. MAIN PCB CN101 AC220V is connected?

Inverter / Hydro control part display	Main PCB has no power phenomenon (7-seg does not blink)
Judgment Method	Hub PCB power and connection wire to detect.
Cause of problem	1) HUB PCB connector wire defects and disconnection. 2) Main PCB defective. 3) Hub PCB defective. 4) High pressure switch operation

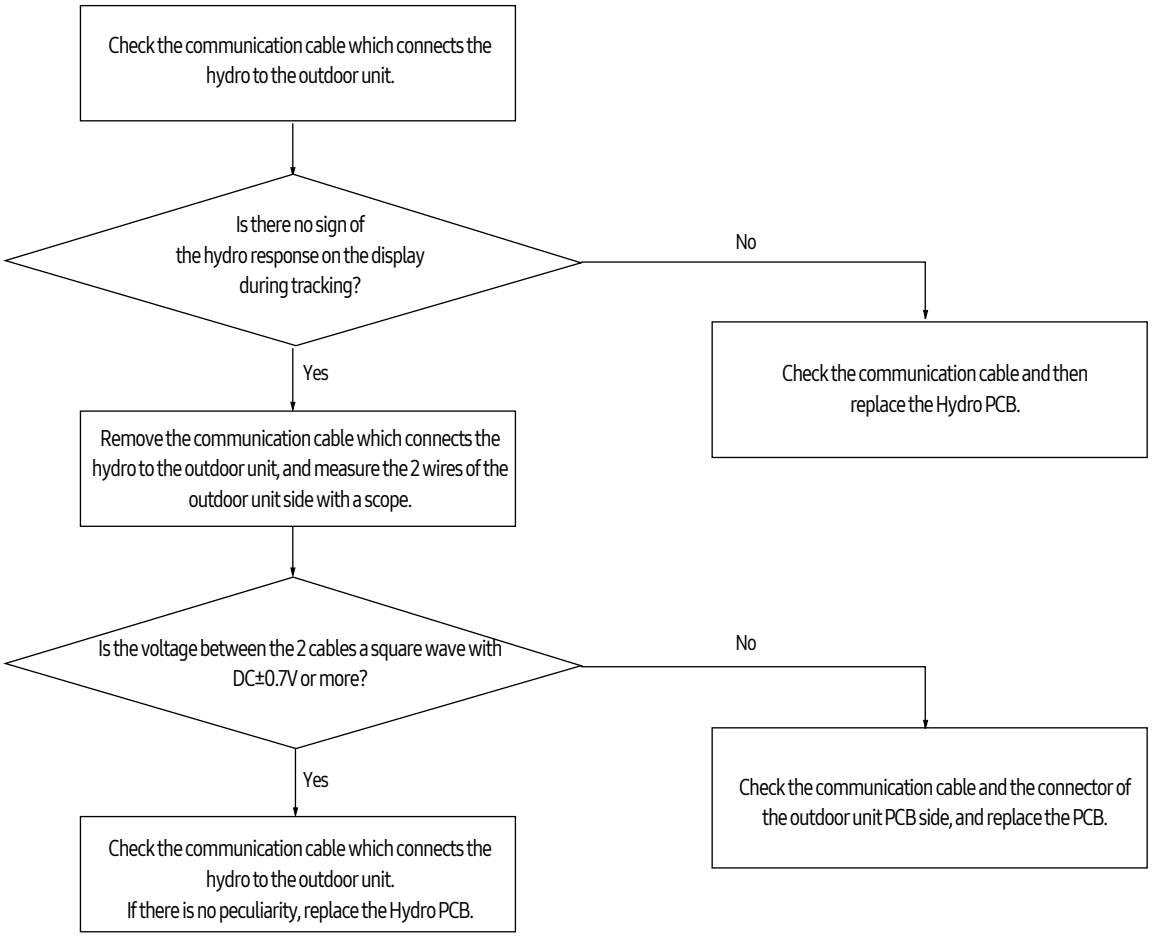
1. Inspection Method



4-3-3. Communication error between hydro and outdoor unit during tracking

Inverter / Hydro control part display	E201
Judgment Method	Refer to the inspection method below.
Cause of problem	Communication error between indoor and outdoor units.

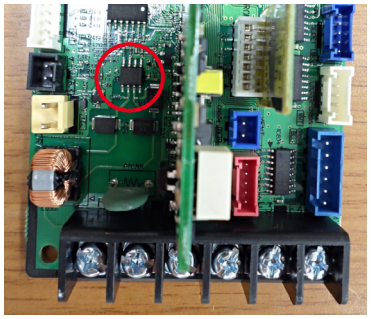
1. Inspection Method



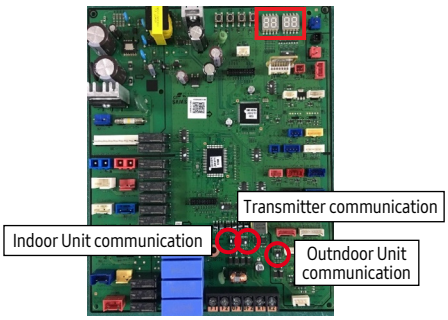
※ Essential Requirements before PBA Changes in Case of Communication Error Occurrence

1. Find the communication IC near the communication terminal. (Only for VRF products)

- Indoor Unit
  - Coil side or PTC (SMD) side: Communication IC between indoor and outdoor units.
- Outdoor Unit
  - When there is module communication as in VRF
    Above Red Connector of Main Unit: Communication IC between indoor and outdoor units.
  - When there is no module communication as in VRF
    Above Yellow Connector of Each Unit: Communication IC between outdoor units.
  - Other Outdoor Unit- Above Communication Connector: Communication IC between indoor and outdoor unit.



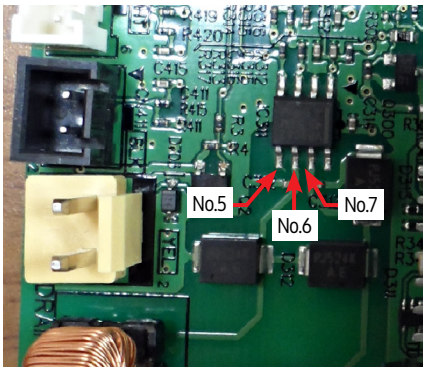
Indoor Unit



Outdoor Unit

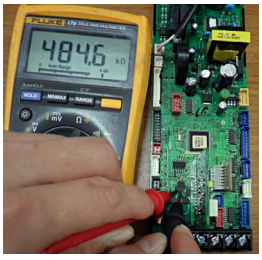
2. Measure the resistance of the communication IC.

- Measurement Method: Measure the No.5- No.6 Pin resistance
  Measure the No.5- No.7 Pin resistance



3. Defectiveness decision of the communication IC which uses a measurement resistance value.

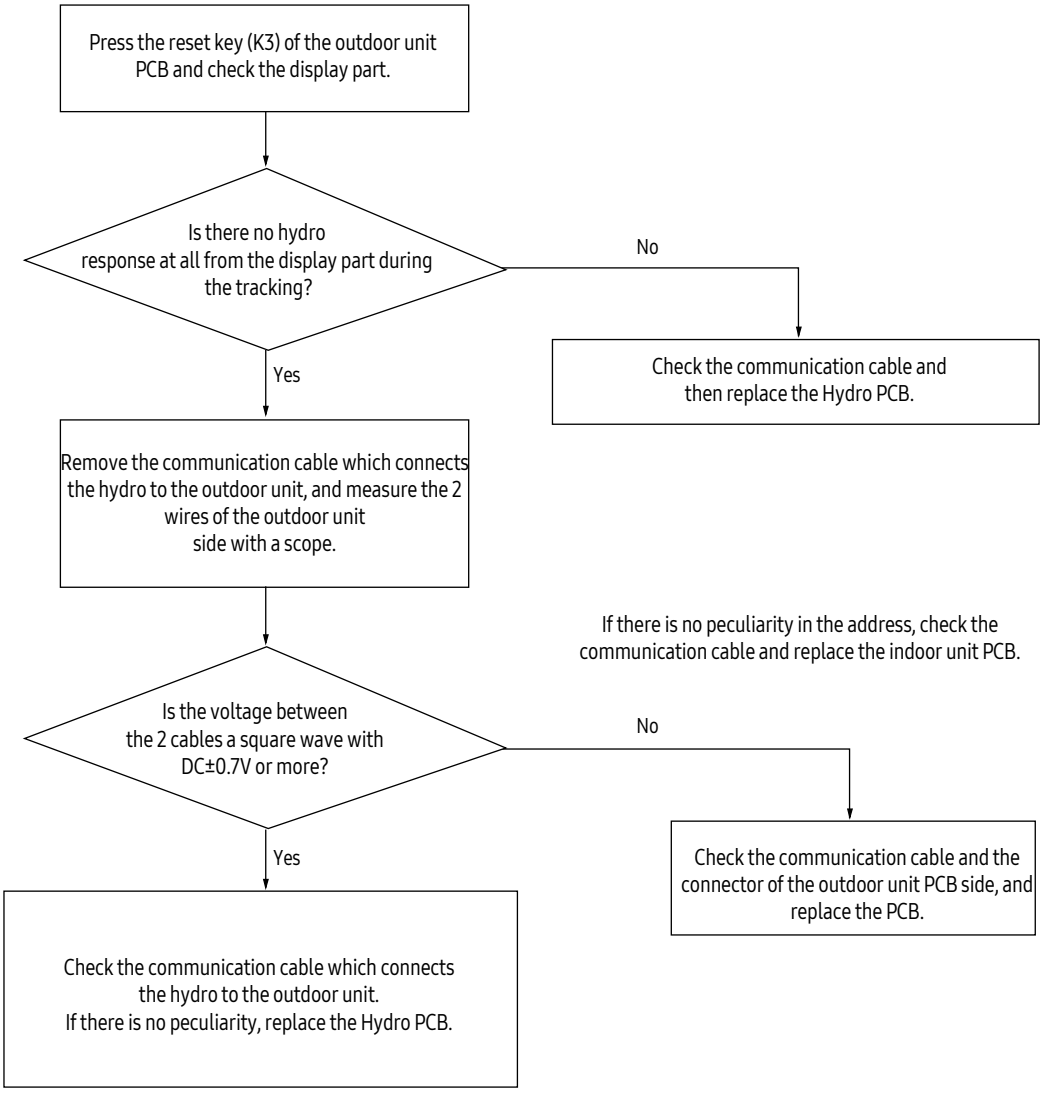
- Judging as Normal
  - Each resistance value should be measured in tens of kΩ~to hundreds of kΩ.
  - Difference between the two resistance values should be of some number of kΩ.
- Judging as defective
  - One or both are low with tens of Ω
  - One or both of them is open

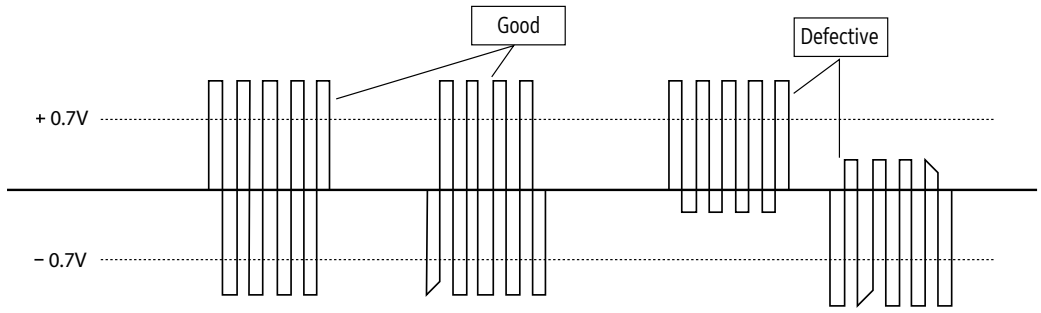


4-3-4. Communication error between indoor and outdoor unit after tracking

Inverter/ Hydro control part display	E202
Judgment Method	If the hydro and outdoor unit is unable to communicate for 2 minutes during operation.
Cause of problem	Communication error between hydro and outdoor unit.

1. Inspection Method

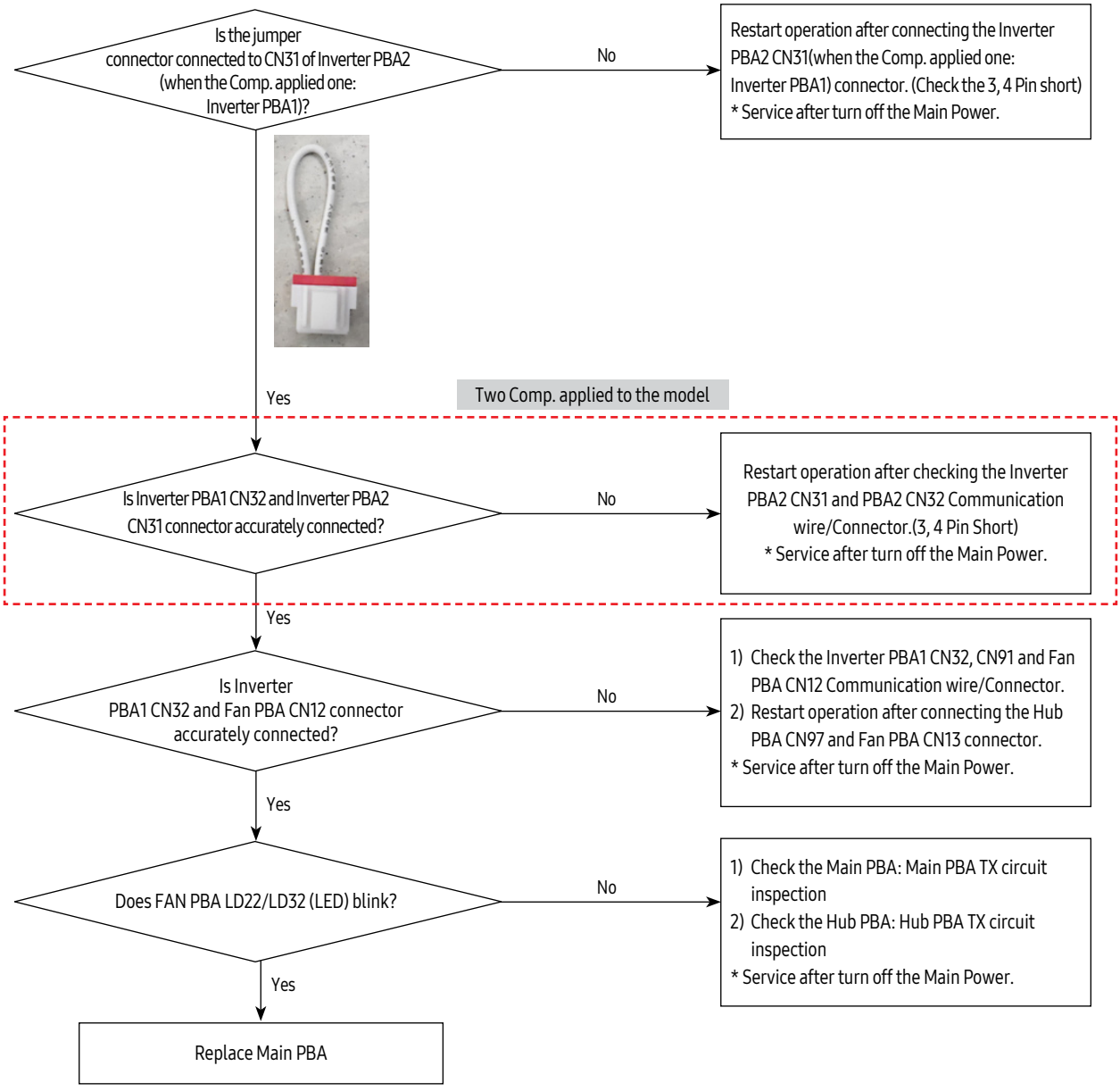




4-3-5. Internal communication error of the outdoor unit C-Box

<table>
<tr><td>Outdoor unit display</td><td>E205 - All boards of outdoor unit are not communicating</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="5">Cassette (4/Mini4 Way)</th><th colspan="3">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- Main PBA detecting uART communication other PBA. (Hub, Inverter, Fan)</td></tr>
<tr><td>Cause of problem</td><td>- Communication wire inside the C-Box is unconnected
- Main PBA defective</td></tr>
</table>

1. Cause of problem

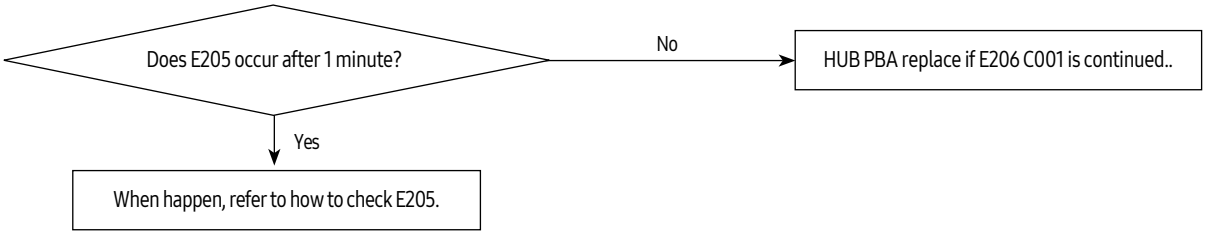


4-3-6. Internal PCB communication error of the outdoor unit C-Box

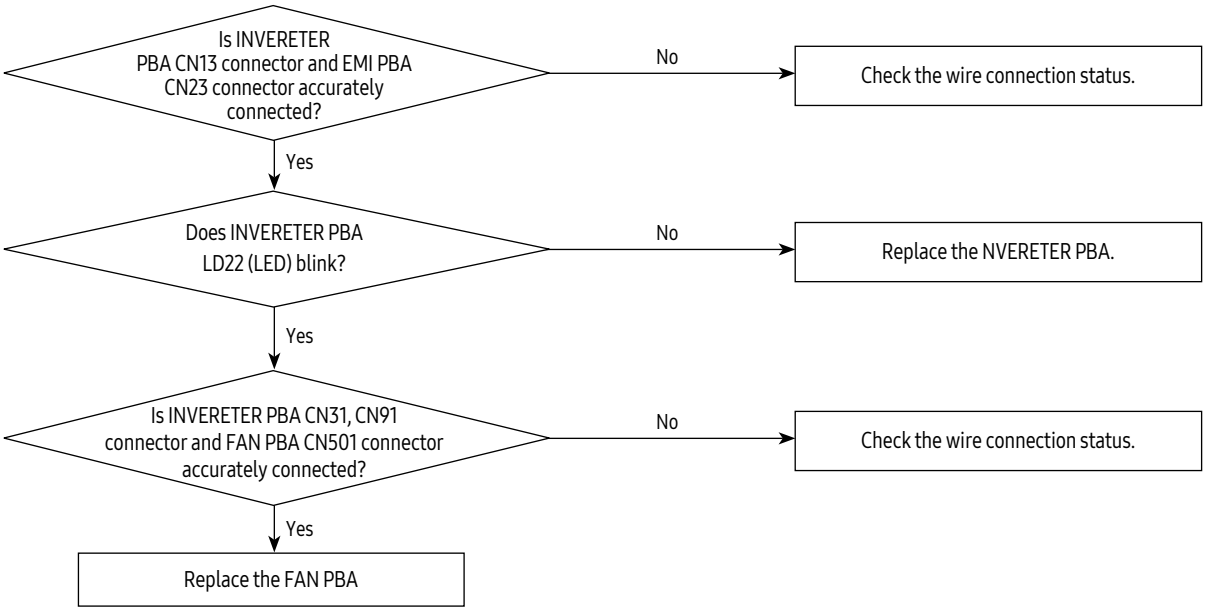
<table>
<tr><td>Outdoor unit display</td><td>E206 (C001 ~ C005) - some boards of outdoor unit are not communicating</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="5">Cassette (4/Mini4 Way)</th><th colspan="3">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- PBA does not respond to the invoked Main PBA</td></tr>
<tr><td>Cause of problem</td><td>- C-Box internal Inverter PBA, Fan PBA, Hub PBA, Water Hub PBA defective.</td></tr>
</table>

1. Cause of problem

E206 C001



E206 C002



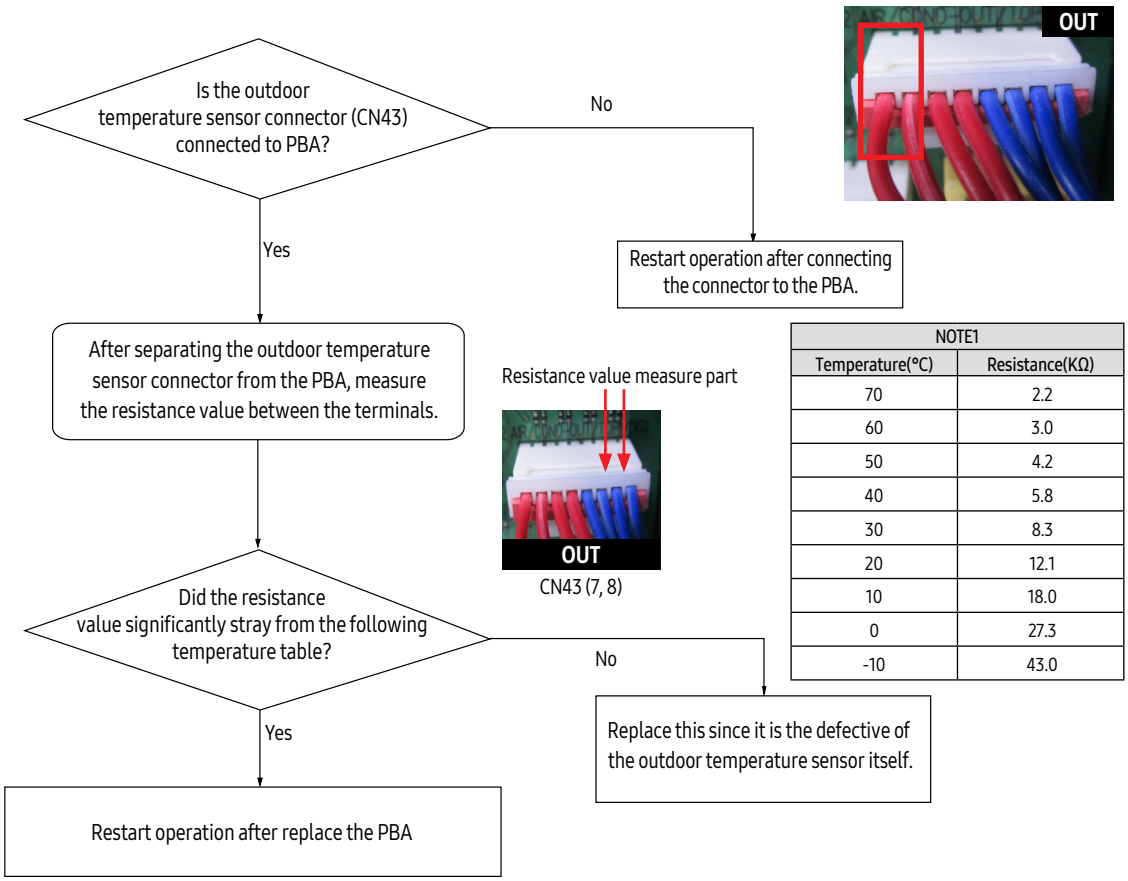
E206 C003/C004

C003: Replace the INVERTER PBA 1
C004: Replace the INVERTER PBA 2
C005: Replace the Water Hub PBA

4-3-7. Outdoor temperature sensor error

<table>
<tr><td>Outdoor unit display</td><td>E221</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="6">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="5">Cassette (4/Mini4 Way)</th><th colspan="5">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/ MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th><th>24℃</th><th>27℃</th></tr>
<tr><td>◑</td><td>×</td><td>×</td><td>◑</td><td>×</td><td>◑</td><td>×</td><td>◑</td><td>×</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>×</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- Detect according to temperature detected with the outdoor-ambient temperature thermistor.</td></tr>
<tr><td>Cause of problem</td><td>- Outdoor temperature sensor is defective. (open/short)</td></tr>
</table>

1. Cause of problem

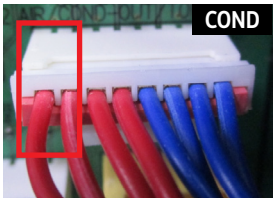


NOTE1	
Temperature(°C)	Resistance(KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

4-3-8. COND OUT temperature sensor error (Open / Short)

Outdoor unit display	E231
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation ◑ / Defrost × / Timer × / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation ◑ / Defrost × / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation ◑ / Timer × / Turbo × / 24℃ ◑ / 27℃ × ※ ●: ON ◑: Flash ×: OFF
Judgment Method	- Detect according to temperature detected with the cond-out temperature thermistor.
Cause of problem	- Cond-out temperature sensor is defective. (open/short)

1. Cause of problem



Temperature(℃)	Resistance(KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

4-3-9. Outdoor unit COND OUT sensor breakaway error

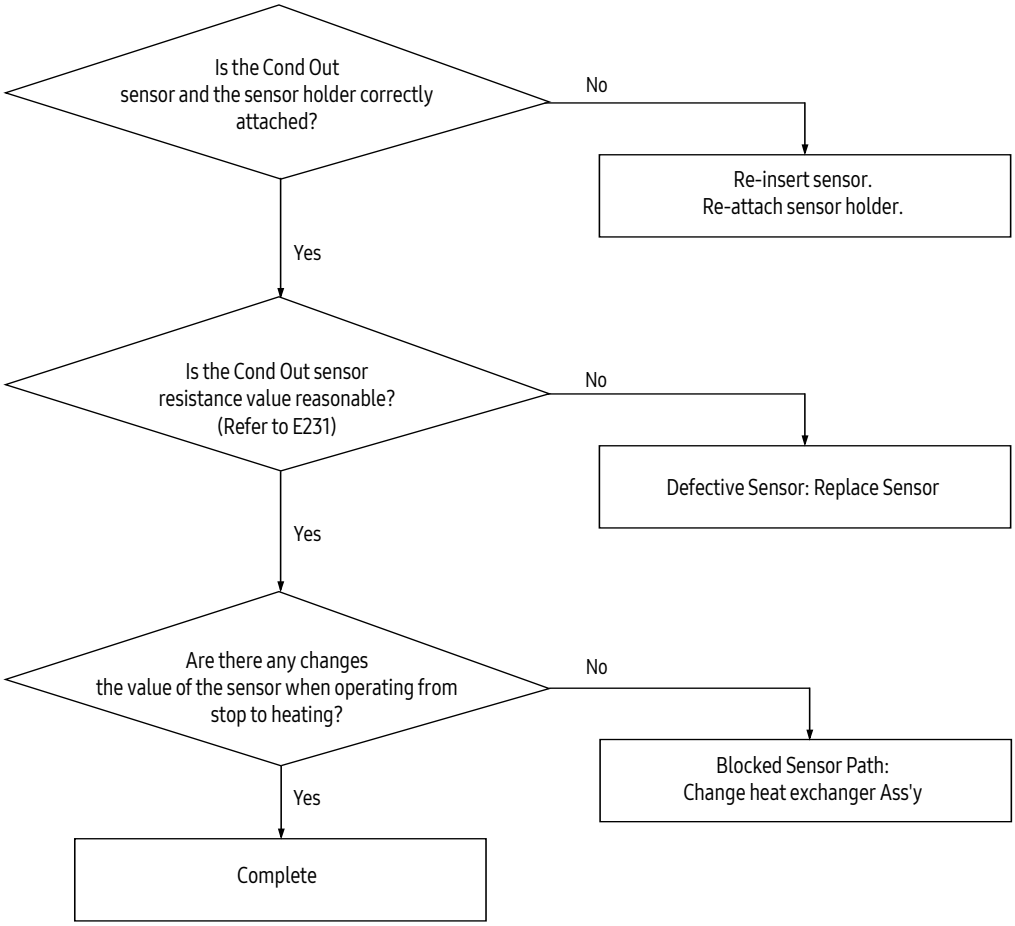
<table>
<tr><td>Outdoor unit display</td><td>E241 (Water Cooled)</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="3">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- Refer to the judgment method below.</td></tr>
<tr><td>Cause of problem</td><td>- Outdoor Cond Out sensor breakaway/defective/ relevant path blocked.</td></tr>
</table>

1. Judgment Method

   1) No inspection for Cooling operation.
   2) For heating operation (Each of the conditions below needs to be satisfied for more than 20 minutes.)
      1. Point of enter.
         1) Detected only when heating operation.(Except main heating operation)
         2) Compressor operation maintained 40 minutes after start.
      2. Point of enter
         1) l Tcondout_real-Tcondout_ini l < 2℃ maintain conditions during 40 minutes.

※ Tcondout_ini: Condout out temperature just before the compressor operating starts.
Tcondout_real: Condout temperature of the current compressor.

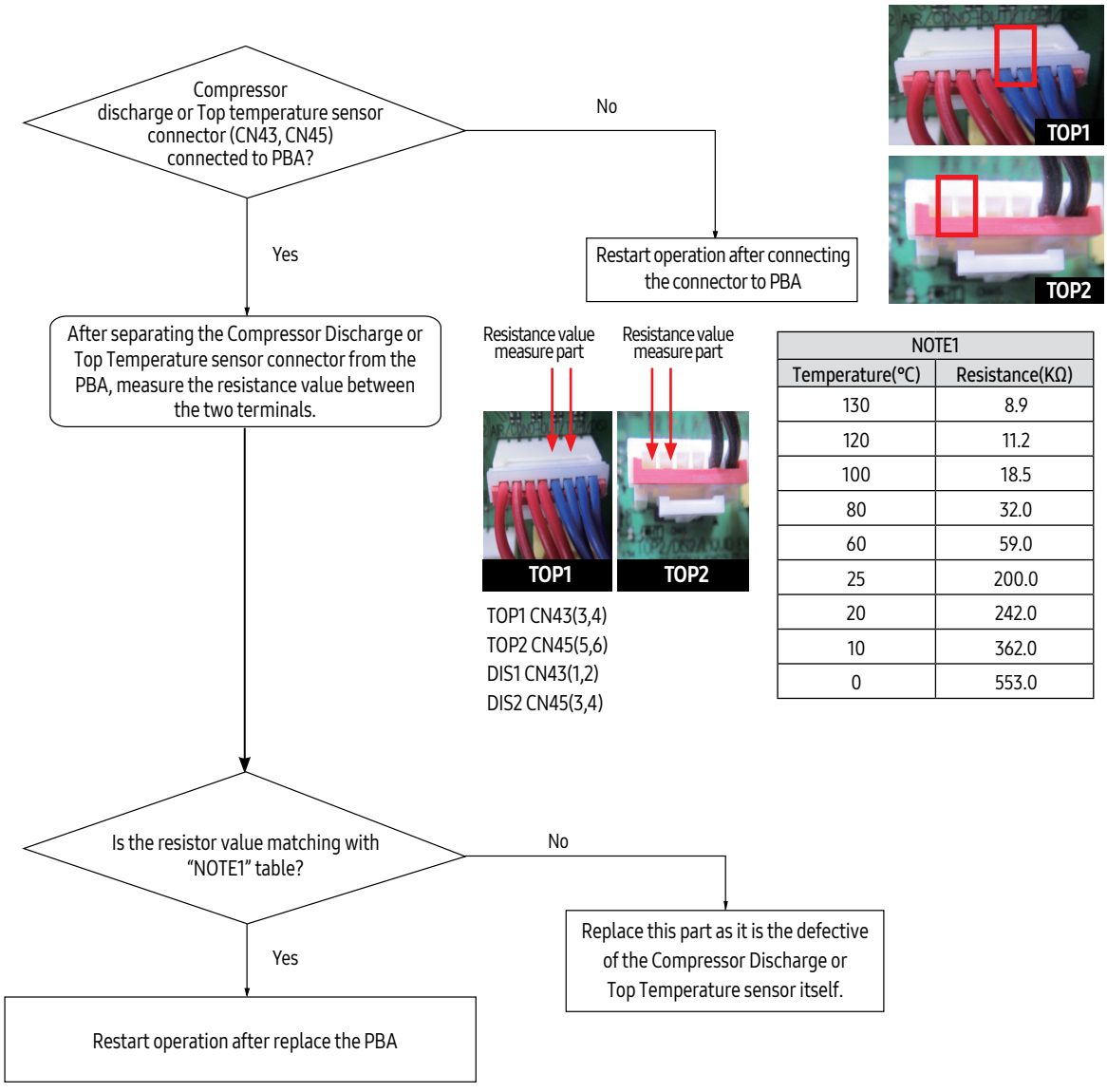
2. Cause of problem



4-3-10. Compressor discharge or TOP 1/2 temperature sensor error

<table>
<tr><td>Outdoor unit display</td><td>E251 (Compressor 1 Discharge) E257 (Compressor 2 Discharge) E276 (Compressor 1 Top) E277 (Compressor 2 Top)</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="3">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th></tr>
<tr><td>◑</td><td>×</td><td>×</td><td>◑</td><td>×</td><td>◑</td><td>×</td><td>◑</td><td>×</td><td>◑</td><td>×</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- Detect according to temperature detected with the compressor discharge pipe temperature thermistor.</td></tr>
<tr><td>Cause of problem</td><td>- Compressor Discharge or Top Temperature sensor defective. (Open/Short)</td></tr>
</table>

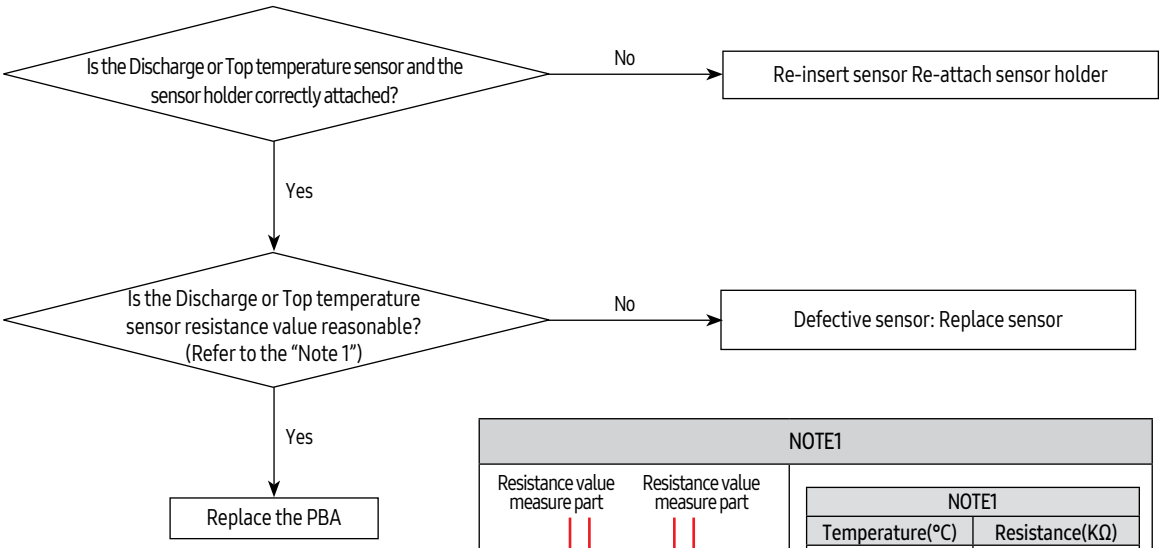
1. Cause of problem



4-3-11. Compressor discharge or TOP temperature sensor breakaway error

<table>
<tr><td>Outdoor unit display</td><td>E262 (Compressor 1 Discharge) E263 (Compressor 2 Discharge) E266 (Compressor 1 Top) E267 (Compressor 2 Top)</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="5">Cassette (4/Mini4 Way)</th><th colspan="5">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/ MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th><th>24℃</th><th>27℃</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>1) Faulty compressor frequency of 60Hz or higher.
2) Suction temperature › Low pressure saturation temperature +10 ℃
3) Relevant discharge or Top temperature ‹ High pressure saturation temperature
4) In case of keep 30 minutes in state that satisfy all above conditions (1,2&3) for 30min.</td></tr>
<tr><td>Cause of problem</td><td>- Compressor discharge or Top temperature sensor breakaway and defective / Ineffective start of compressor</td></tr>
</table>

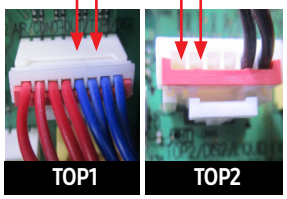
1. Cause of problem



NOTE1

Resistance value measure part

Resistance value measure part



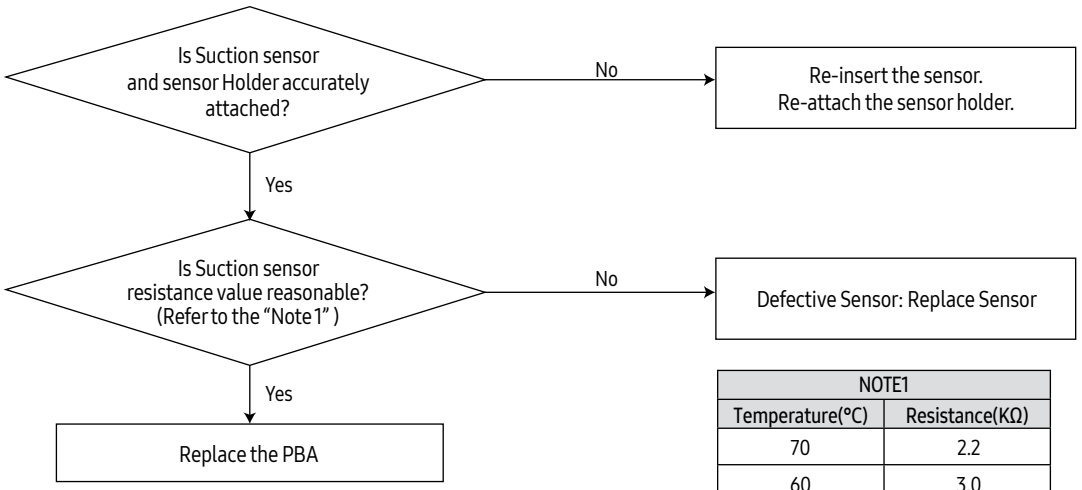
TOP1 CN43 (3,4)
TOP2 CN45 (5,6)
DIS1 CN43 (1,2)
DIS2 CN45 (3,4)

NOTE1	
Temperature(°C)	Resistance(KΩ)
130	8.9
120	11.2
100	18.5
80	32.0
60	59.0
25	200.0
20	242.0
10	362.0
0	553.0

4-3-12. E269 : Suction temperature sensor breakaway error

<table>
<tr><td>Outdoor unit display</td><td>E269</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="5">Cassette (4/Mini4 Way)</th><th colspan="3">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- Judgment Method: Difference of suction temperature of compressor starting verge and suction temperature that is on present operation: If less than 2 ℃ for 30 minutes to keep. (Judgment at heating operation only)</td></tr>
<tr><td>Cause of problem</td><td>- Suction temperature sensor breakaway/defective.</td></tr>
</table>

1. Cause of problem



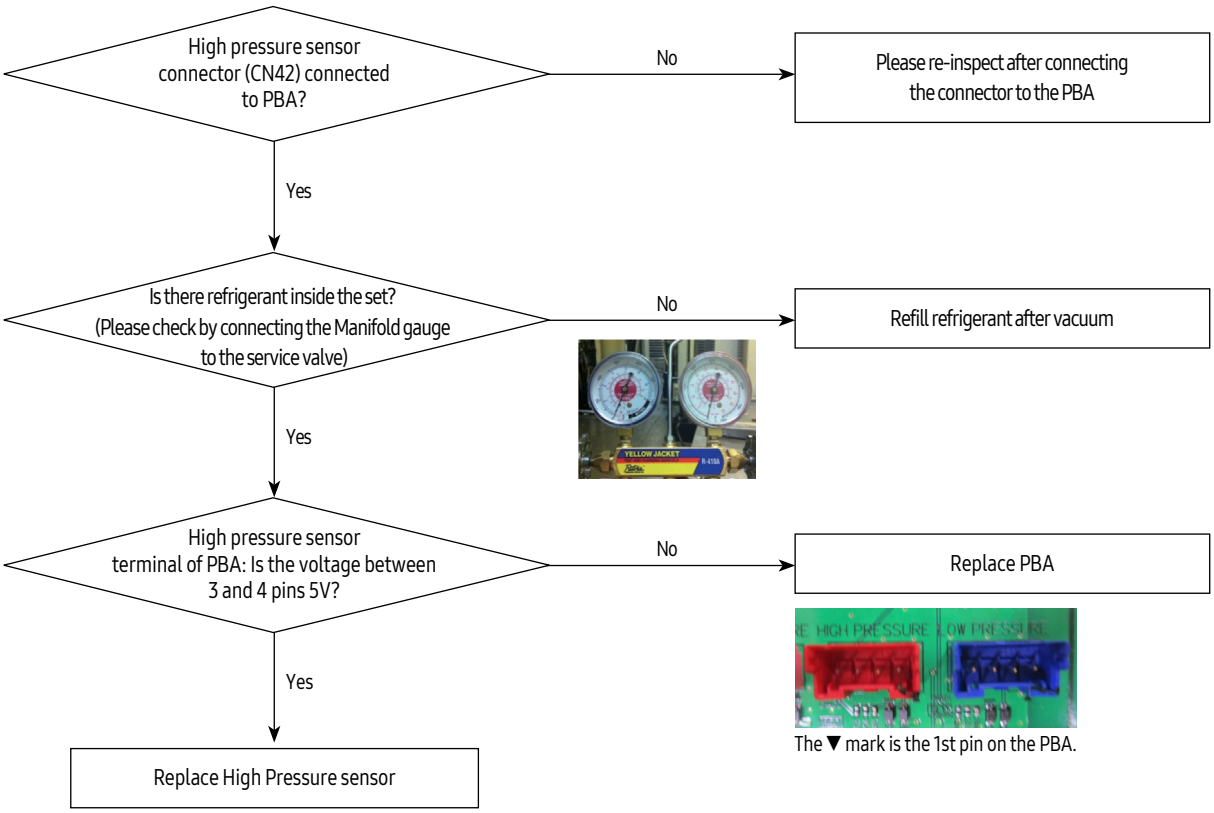
NOTE1	
Temperature(°C)	Resistance(KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

4-3-13. High pressure sensor error (Open / Short)

<table>
<tr><td>Outdoor unit display</td><td>E291</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="3">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- Detect according to temperature detected with the high pressure sensor.</td></tr>
<tr><td>Cause of problem</td><td>- Disconnection or breakdown of relevant sensor.</td></tr>
</table>

1. High Pressure sensor Open/Short error determination method
   1) Identifies from when power is supplied or 2 minutes after RESET, and only when set is stopped.
   2) An Open/Short error will occur if the input voltage standard range of 0.5V ~ 4.95V is exceeded.

2. Inspection Method



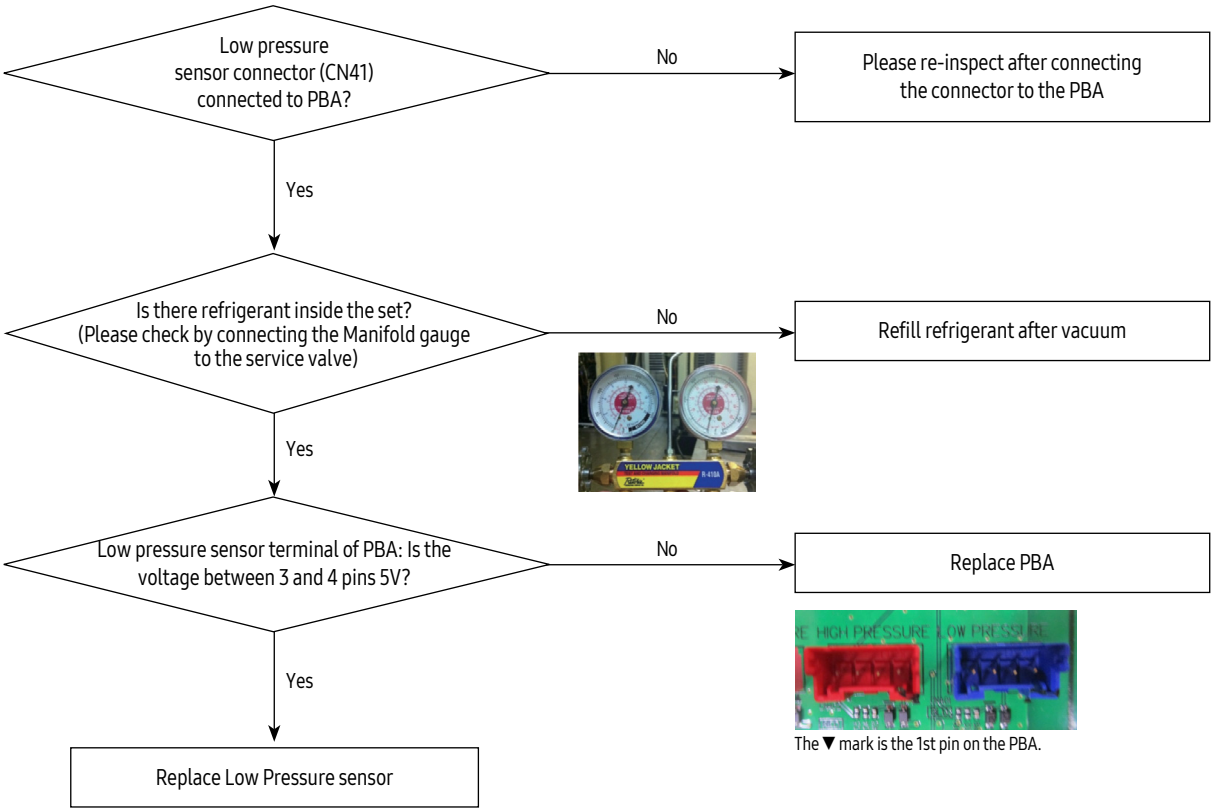
The ▼ mark is the 1st pin on the PBA.

4-3-14. Low pressure sensor error (Open / Short)

<table>
<tr><td>Outdoor unit display</td><td>E296</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="3">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- Detect according to temperature detected with the low pressure sensor.</td></tr>
<tr><td>Cause of problem</td><td>- Disconnection or breakdown of relevant sensor.</td></tr>
</table>

1. Low Pressure sensor Open/Short error determination method
   1) Identifies from when power is supplied or 2 minutes after RESET, and only when set is stopped.
   2) An Open/Short error will occur if the input voltage standard range of 0.5V ~ 4.95V is exceeded.

2. Inspection Method

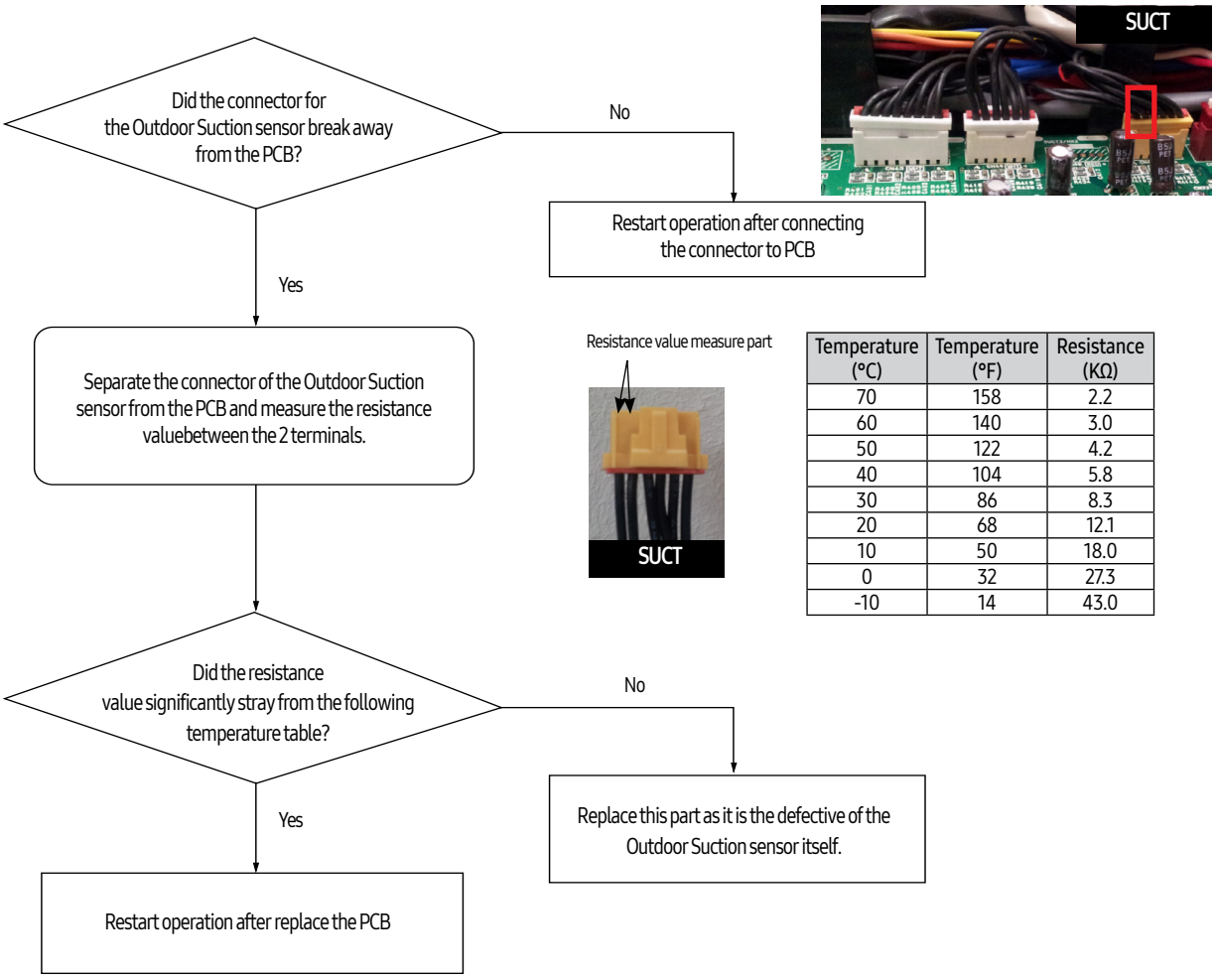


The ▼ mark is the 1st pin on the PBA.

4-3-15. Suction temperature sensor error (Open / Short)

Inverter / Hydro control part display	E308
Judgment Method	Refer to the inspection method below.
Cause of problem	Disconnection or breakdown of relevant sensor.

1. Inspection Method



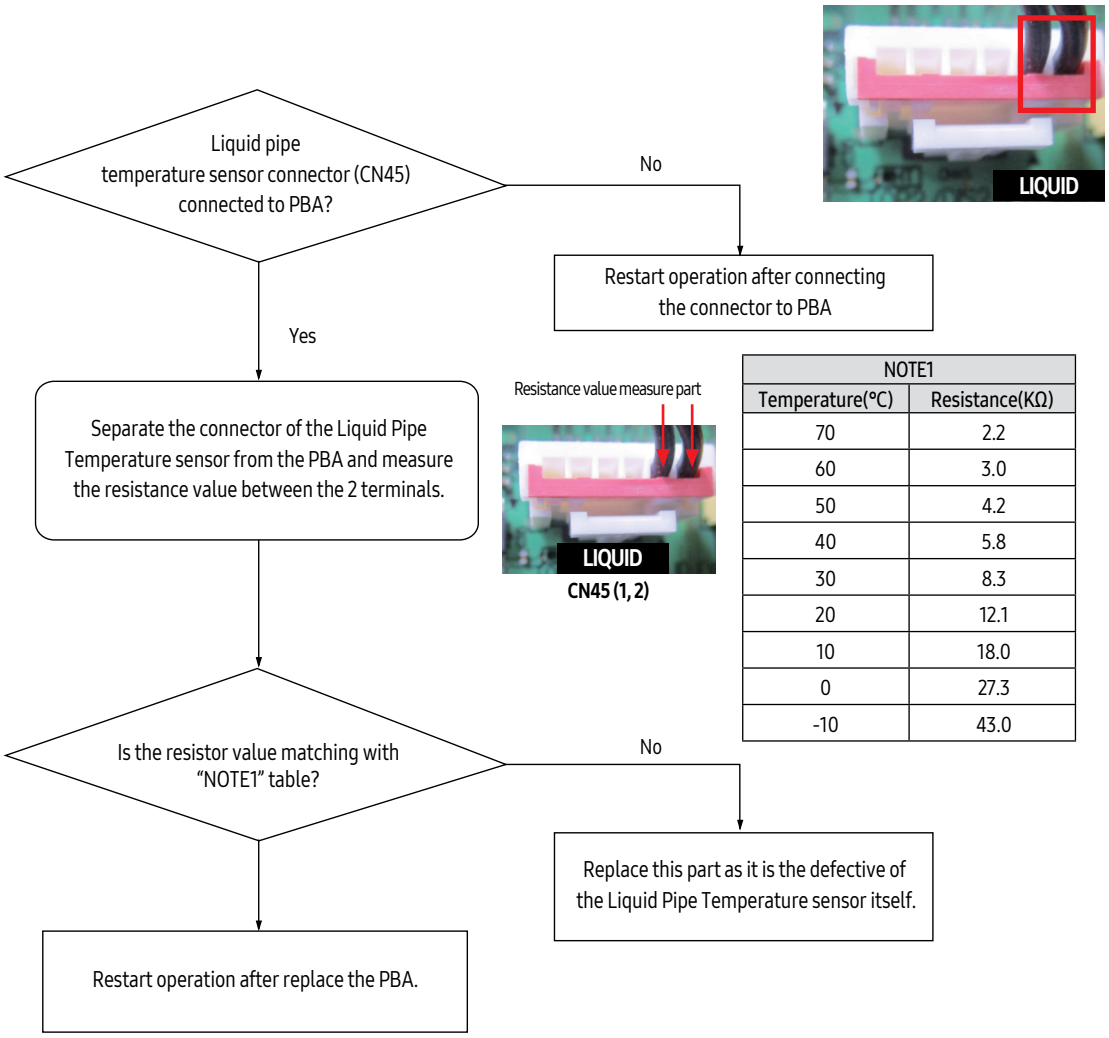
Resistance value measure part

Temperature (°C)	Temperature (°F)	Resistance (KΩ)
70	158	2.2
60	140	3.0
50	122	4.2
40	104	5.8
30	86	8.3
20	68	12.1
10	50	18.0
0	32	27.3
-10	14	43.0

4-3-16. Liquid pipe temperature sensor error (Open / Short)

<table>
<tr><td>Outdoor unit display</td><td>E311</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="3">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- Detect according to temperature detected with the liquid pipe temperature thermistor</td></tr>
<tr><td>Cause of problem</td><td>- Liquid pipe temperature sensor is defective. (open/short)</td></tr>
</table>

1. Cause of problem

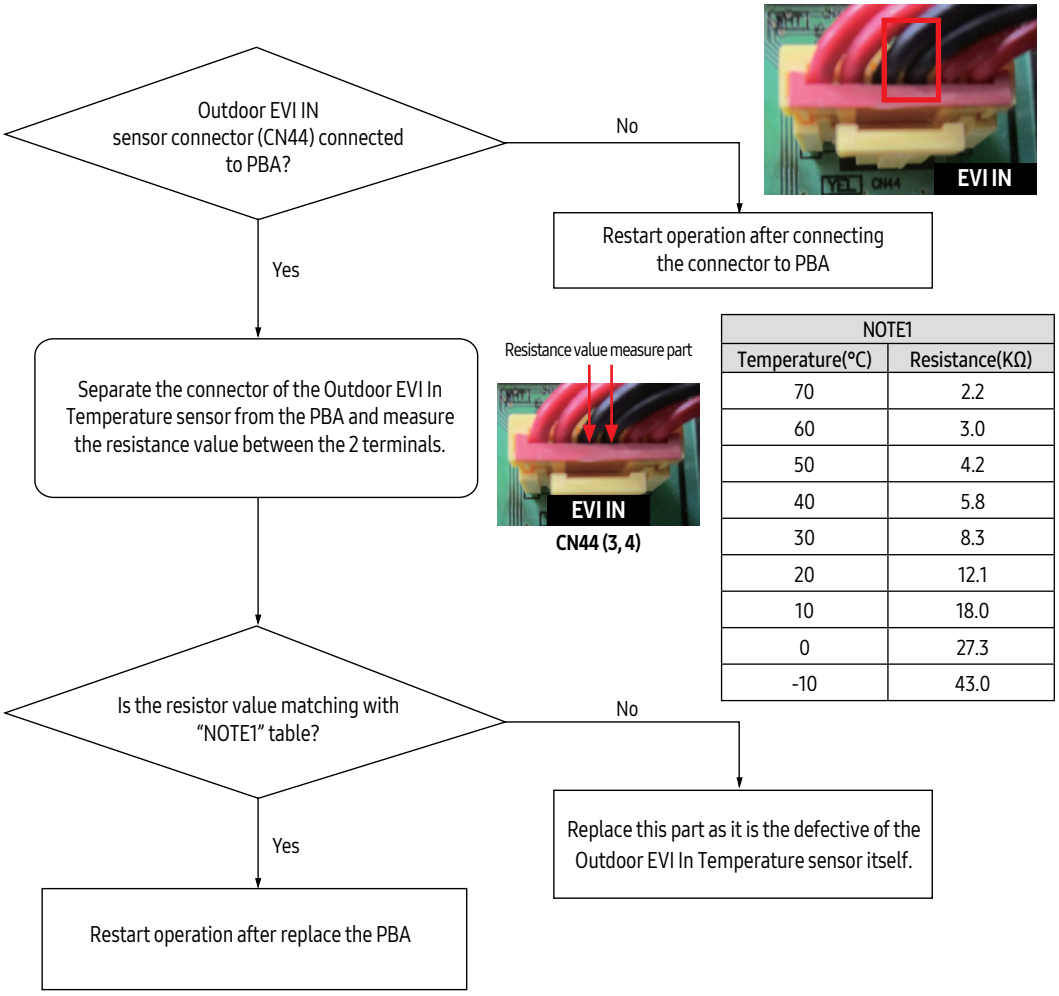


NOTE1	
Temperature(°C)	Resistance(KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

4-3-17. EVI IN temperature sensor error (Open / Short)

<table>
<tr><td>Outdoor unit display</td><td>E321</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="3">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- Detect according to temperature detected with the EVI-In pipe temperature thermistor.</td></tr>
<tr><td>Cause of problem</td><td>- EVI-In temperature sensor is defective. (open/short)</td></tr>
</table>

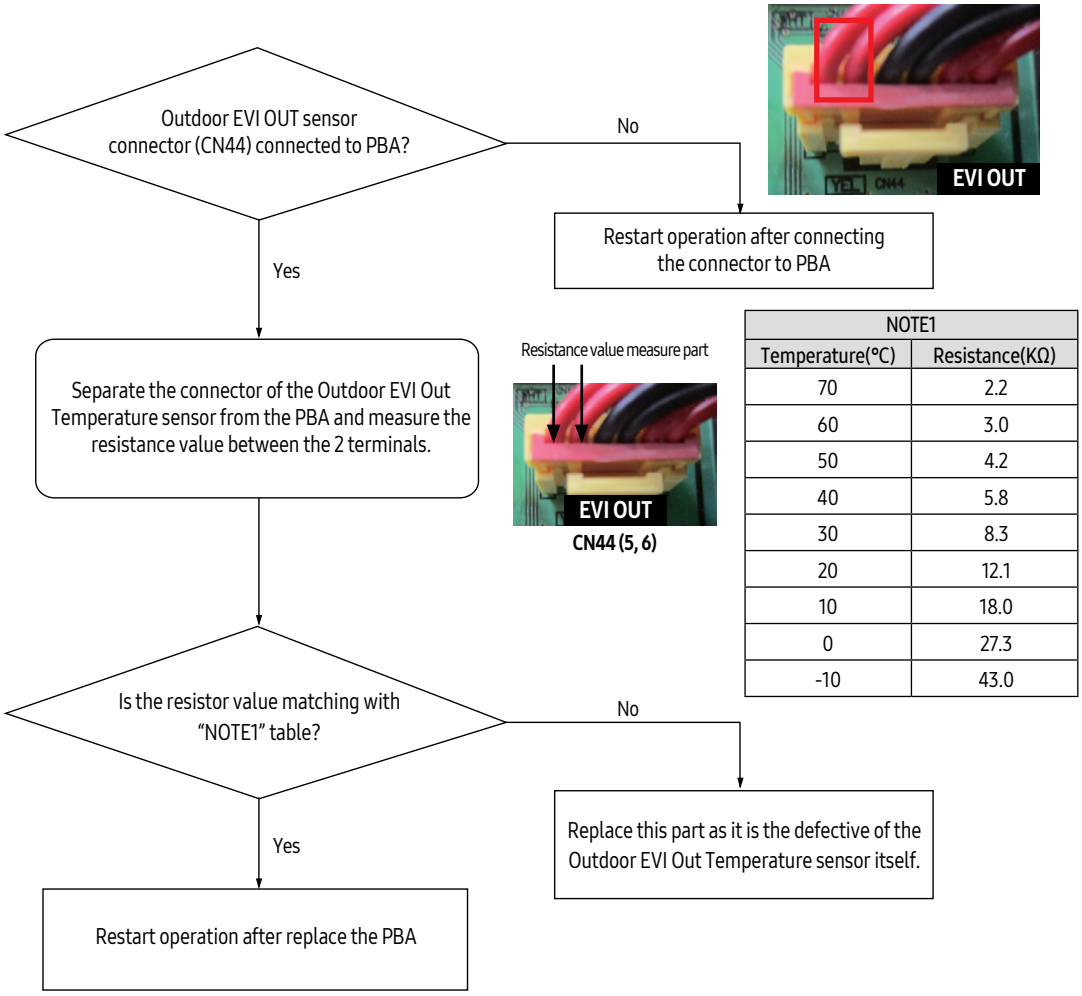
1. Cause of problem



4-3-18. EVI OUT temperature sensor error (Open / Short)

<table>
<tr><td>Outdoor unit display</td><td>E322</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="3">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- Detect according to temperature detected with the EVI-Out pipe temperature thermistor.</td></tr>
<tr><td>Cause of problem</td><td>- EVI-Out temperature sensor is defective. (open/short)</td></tr>
</table>

1. Cause of problem

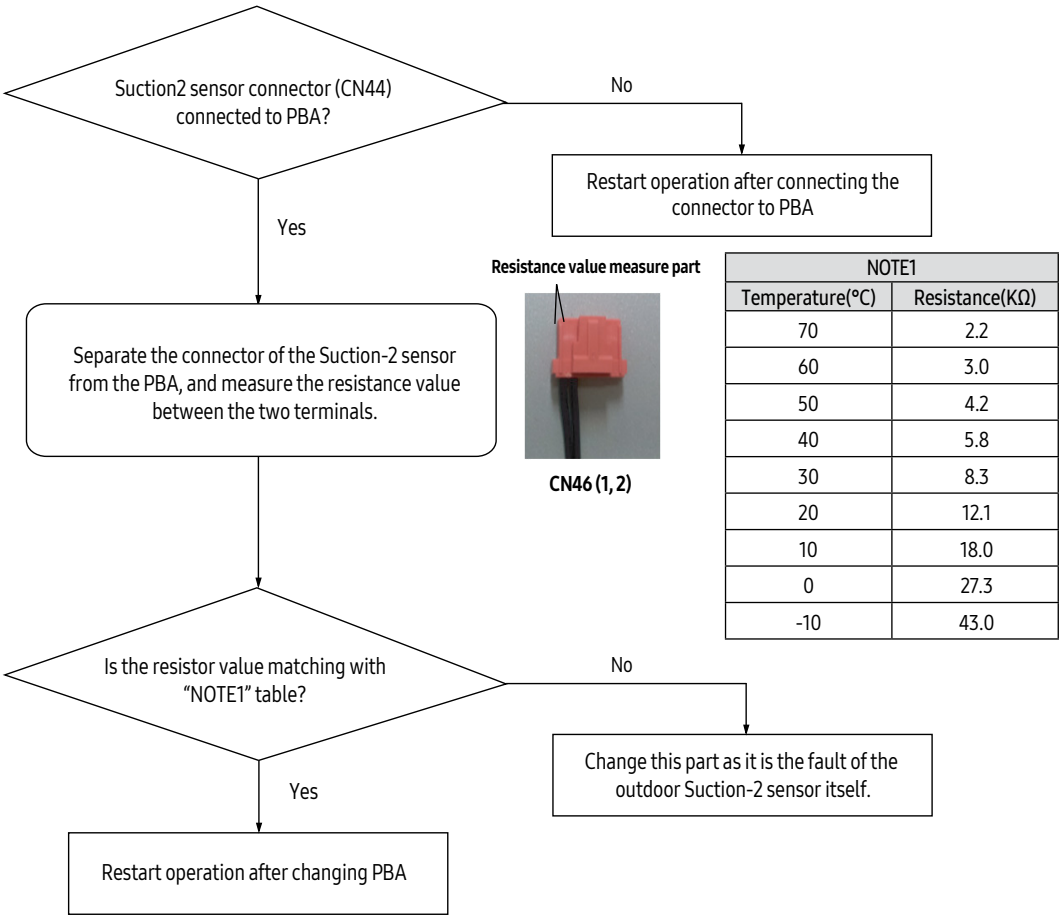


NOTE1	
Temperature(℃)	Resistance(KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

4-3-19. Suction-2 temperature sensor error (Open / Short)

<table>
<tr><td>Outdoor unit display</td><td>E323</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="3">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- Detect according to temperature detected with the Suction #2 pipe temperature thermistor.</td></tr>
<tr><td>Cause of problem</td><td>- Suction #2 temperature sensor is defective. (open/short)</td></tr>
</table>

1. Inspection Method



NOTE1	
Temperature(°C)	Resistance(KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

4-3-20. Measures of other outdoor unit error

Inverter / Hydro control part display	E347	FAN2 wire unconnected error	E399	FAN2 PBA IPM temperature sensor error
	E447	FAN1 wire unconnected error	E499	FAN1 PBA IPM temperature sensor error
	E367	COMP.2 wire unconnected error	E374	Inverter PBA2 IGBT temperature sensor error
	E467	COMP.1 wire unconnected error	E474	Inverter PBA1 IGBT temperature sensor error
Judgment Method	- Refer to the measures code below.			
Cause of problem	- Refer to the measures code below.			

1. Judgement by code

Code	Error	Measures
E347	FAN2 wire unconnected error	1. Check the FAN motor and PBA connection. 2. When connected Inverterr checker, if LED operates in the normality: External factors or when LED operates by abnormality, replace the FAN PBA.
E447	FAN1 wire unconnected error	1. Check the FAN motor and PBA connection. 2. When connected Inverterr checker, if LED operates in the normality: External factors or when LED operates by abnormality, replace the FAN PBA.
E367	COMP.2 wire unconnected error	1. Check the Compressor and Inverter PBA connection. 2. When connected inverter checker, if LED operates in the normality: External factors or when LED operates by abnormality, replace the Inverter PBA.
E467	COMP.1 wire unconnected error	1. Check the Compressor and Inverter PBA connection. 2. When connected inverter checker, if LED operates in the normality: External factors or when LED operates by abnormality, replace the Inverter PBA.
E399	FAN2 PBA IPM temperature sensor error	Replace FAN PBA
E499	FAN1 PBA IPM temperature sensor error	Replace FAN PBA
E374	Inverter PBA2 IGBT temperature sensor error	Replace Inverter PBA
E474	Inverter PBA1 IGBT temperature sensor error	Replace Inverter PBA

4-3-21. E407 : COMP DOWN due to high pressure protection control

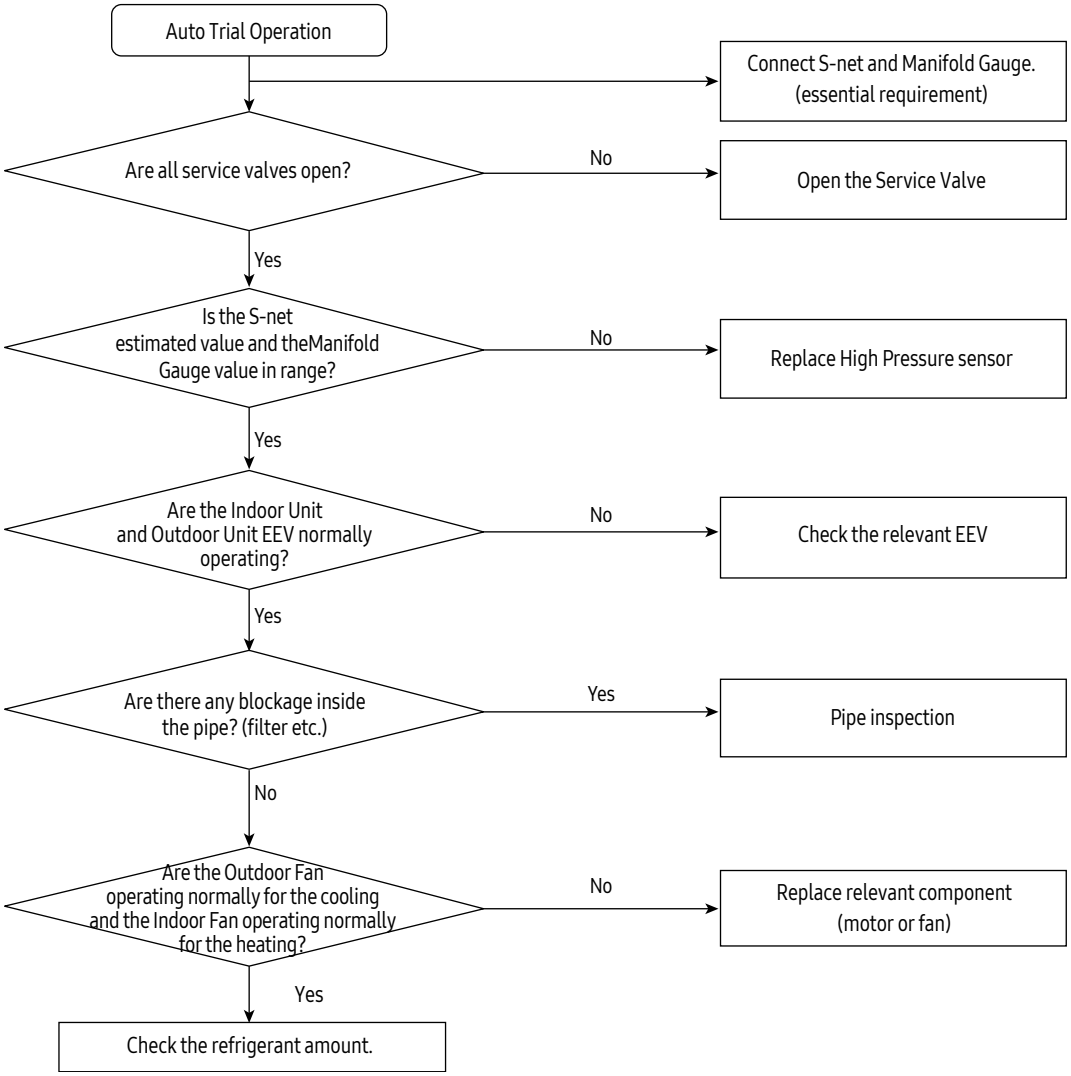
Outdoor unit display	E407 (Air Cooled)
Indoorunit display	

Duct, Cassette (1/2 Way),Console, Celing					Cassette (4/Mini4 Way)				Wall-mounted (NeoForte)		
Operation	Defrost	Timer	Fan	Filter/MPI	Operation	Defrost	Timer	Filter	Operation	Timer	Turbo
×	×	◑	◑	◑	×	◑	◑	◑	●	◑	◑

※ ●: ON ◑: Flash ×: OFF

Judgment Method	- Value of the high pressure sensor is detected at 40kg/cm² or more
Cause of problem	**‹Cooling Operation›** - Outdoor unit fan motor problem (constrained, defective) - Outdoor heat exchanger is contaminated. - Service valve locked/Fill refrigerant **‹Heating Operation›** - Service valve locked/Excessive refrigerant

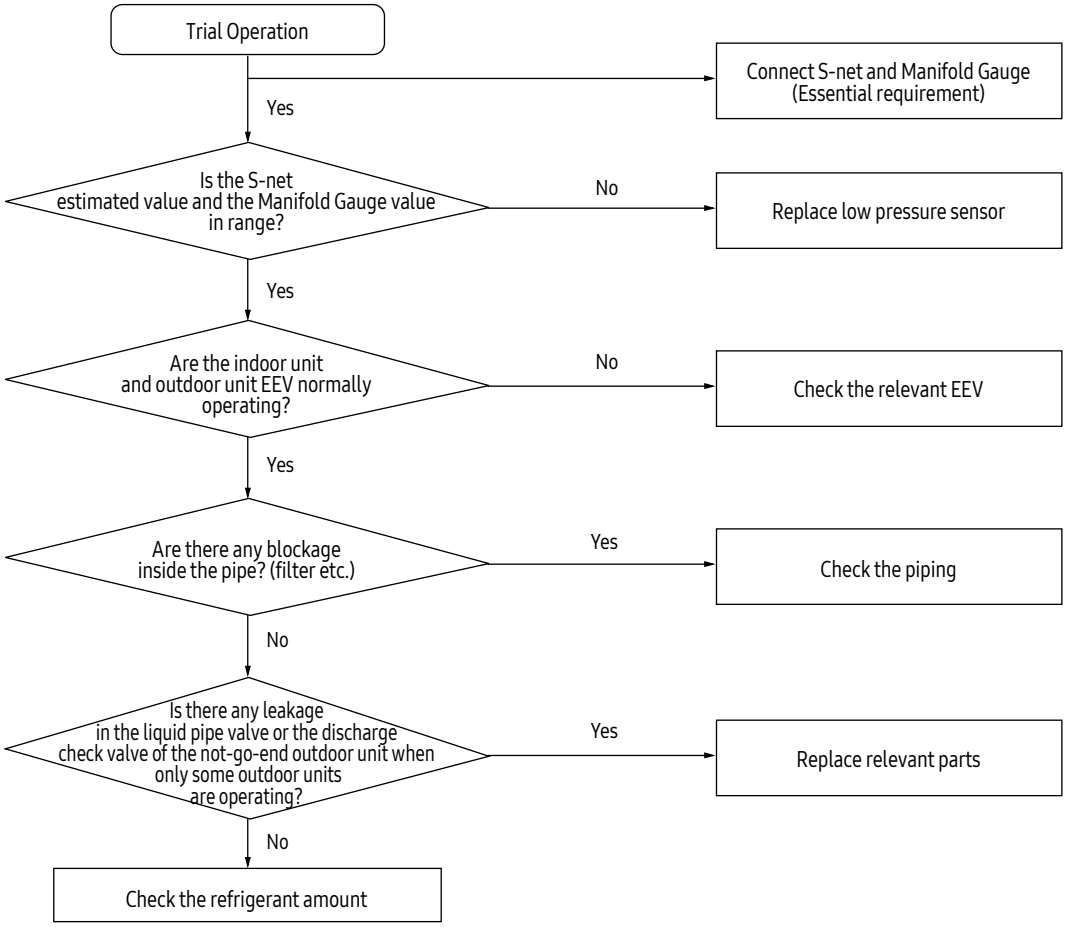
1. Cause of problem



4-3-22. E410 : COMP DOWN due to low pressure protection control

Inverter / Hydro control part display	E410
Judgment Method	Inspection when the value of low pressure sensor is 1.8kg/cm^2 (25.6 psi), or less for air conditioning and 0.8kg/cm^2 (11.4 psi) for heating.
Cause of problem	- Refrigerant shortage - Electronic expansion valve blocked - Low pressure sensor defective - Leakage of compressor discharge check valve of not-go-end outdoor unit - Error may be found when used in temperature range outside the conditions of use (Operating outside temperature at -25°C (-13°F) or less for heating and operating outside temperature at -15°C (5°F) or less for Cooling)

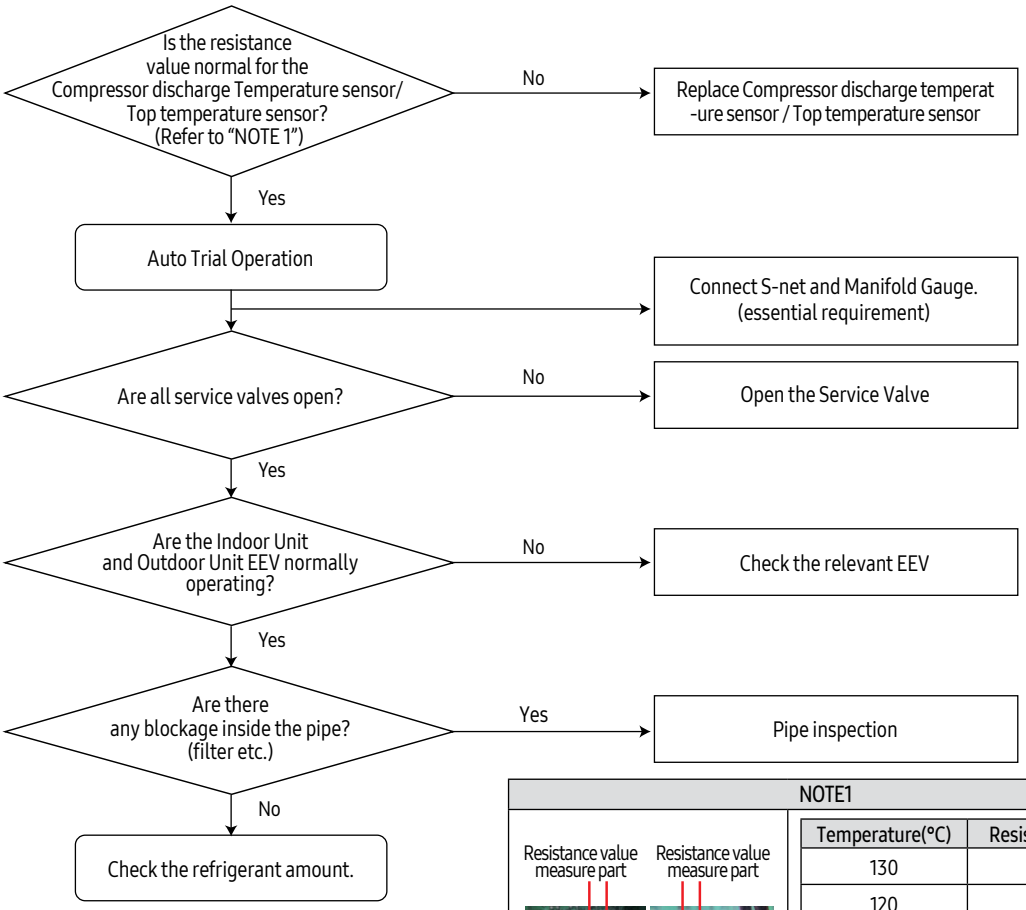
1. Inspection Method



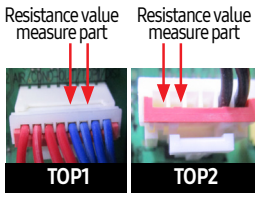
4-3-23. E416 : Suspension of starting due to compressor discharge temperature sensor/ TOP temperature sensor

Outdoor unit display	E416
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI ◑ Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter ◑ Wall-mounted (NeoForte): Operation ● / Timer ◑ / Turbo ◑ ※ ●: ON ◑: Flash ×: OFF
Judgment Method	- When value of Compressor discharge temperature sensor/ Top temperature sensor is checked at 120℃ or more
Cause of problem	- Refrigerant shortage - Electronic expansion valve is blocked. - Service valve blocked - Defective discharge temperature sensor - TOP temperature sensor defective - Blocked pipe and defective - Discharge check valve leaking on outdoor unit that is off

1. Cause of problem



NOTE1



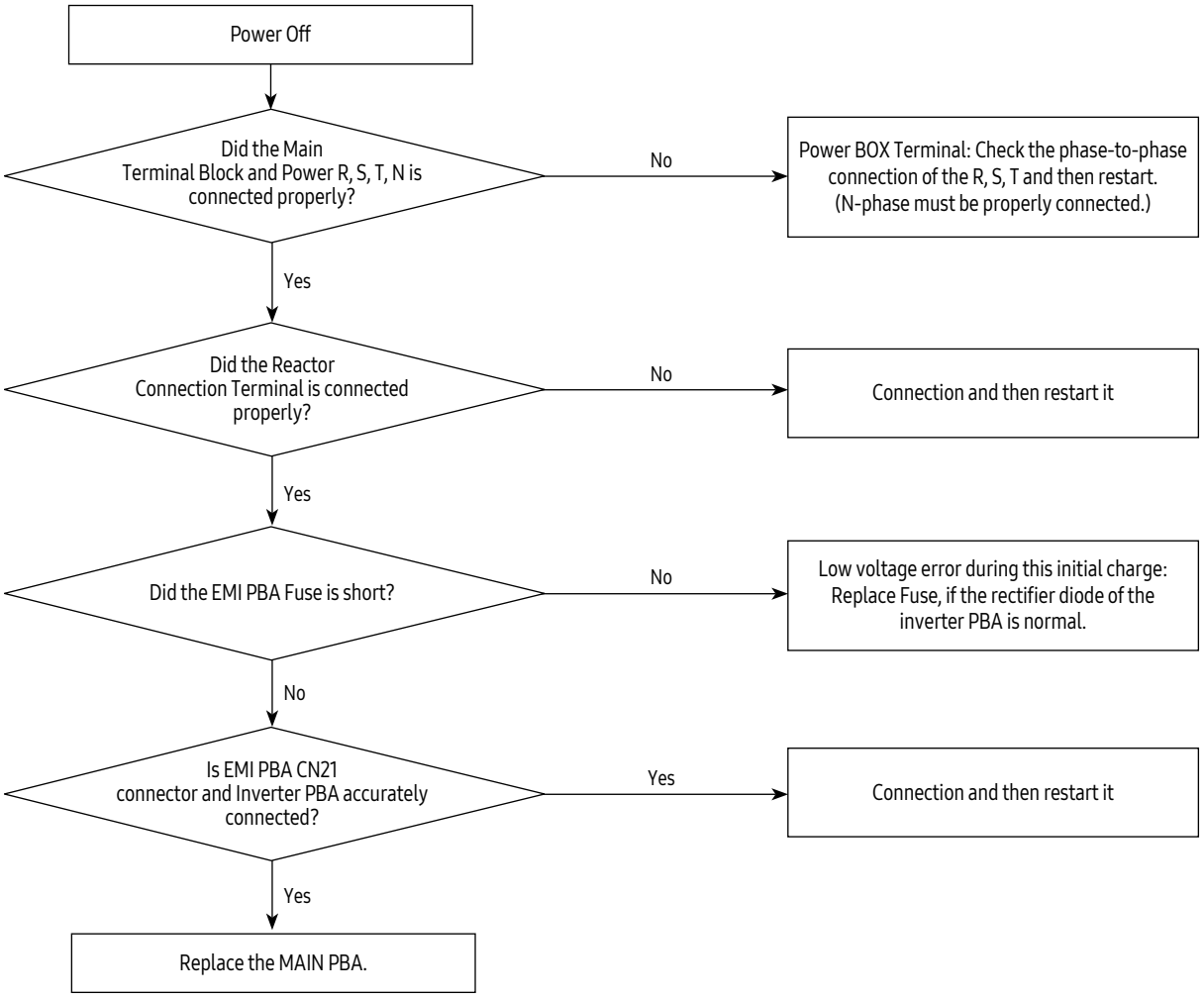
TOP1 CN43 (3,4)
TOP2 CN45 (5,6)
DIS1 CN43 (1,2)
DIS2 CN45 (3,4)

Temperature(°C)	Resistance(KΩ)
130	8.9
120	11.2
100	18.5
80	32.0
60	59.0
25	200.0
20	242.0
10	362.0
0	553.0

4-3-24. 3-phase Input Wiring error

<table>
<tr><td>Outdoor unit display</td><td>E425</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="3">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>– When turn on the power and check the status of the power from the inverter.
If the phase does not connect the power(no phase): E425 or E466 (E366) is displayed
(Air conditioner to maintain the normal state.)
However) N-phase must be properly connected.</td></tr>
<tr><td>Cause of problem</td><td>- Check the input wiring
- EMI Fuse short</td></tr>
</table>

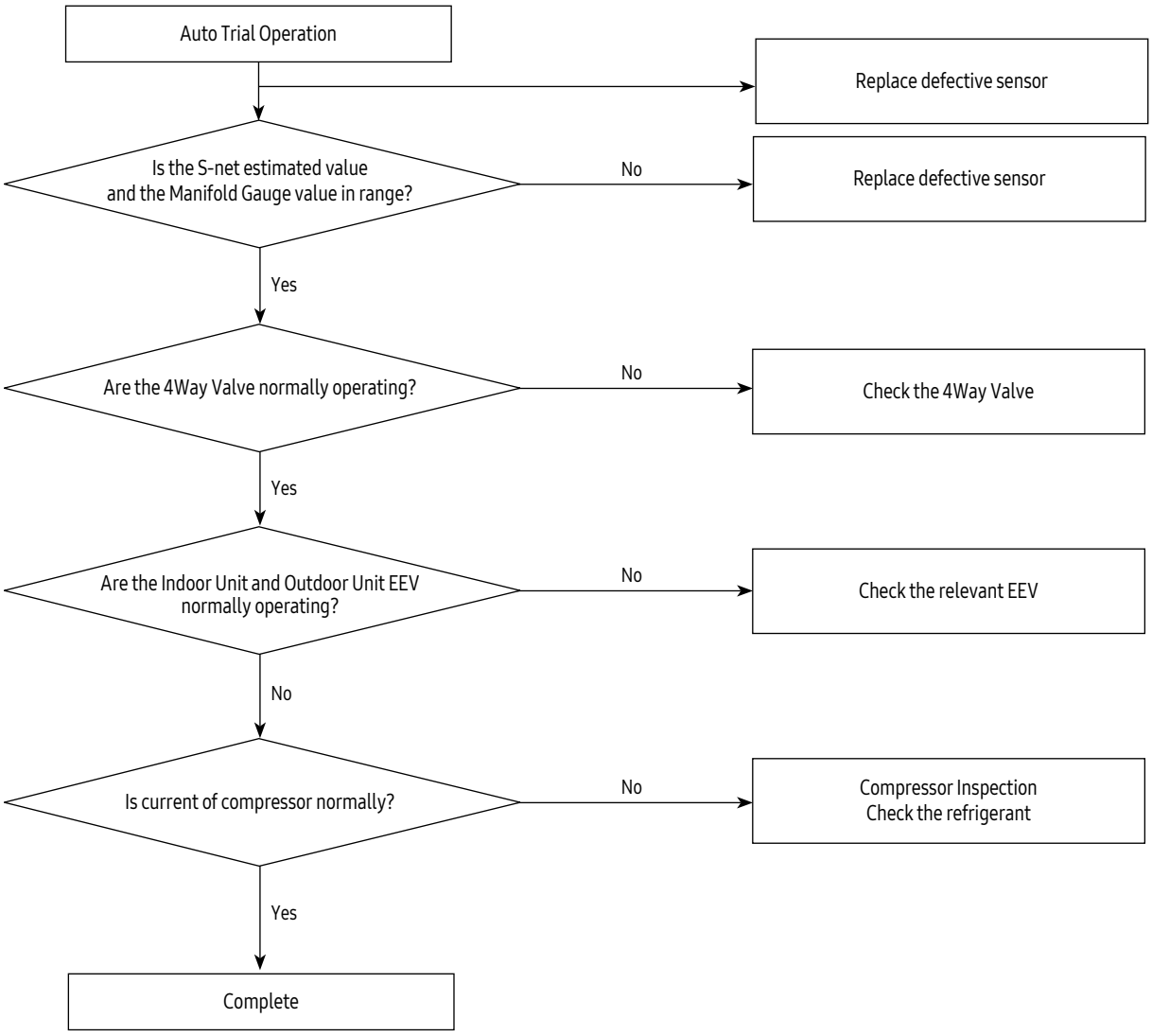
1. Cause of problem



4-3-25. E428 : Suspension of starting by abnormal compression ratio

Outdoor unit display	E428
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI ◑ Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter ◑ Wall-mounted (NeoForte): Operation ● / Timer ◑ / Turbo ◑ ※ ●: ON ◑: Flash ×: OFF
Judgment Method	- Compression ratio [(High pressure+1.03)/(Low pressure+1.03)] less than 1.5 and lasts for 10 minutes or more - Differential pressure (high pressure- low pressure) less than 0.4 MPa.g and lasts for 10 minutes or more
Cause of problem	- Indoor and Outdoor EEV breakdown - 4Way Valve breakdown - High and Low pressure sensor defective - Refrigerant shortage

1. Cause of problem



4-3-26. EVI EEV opening error

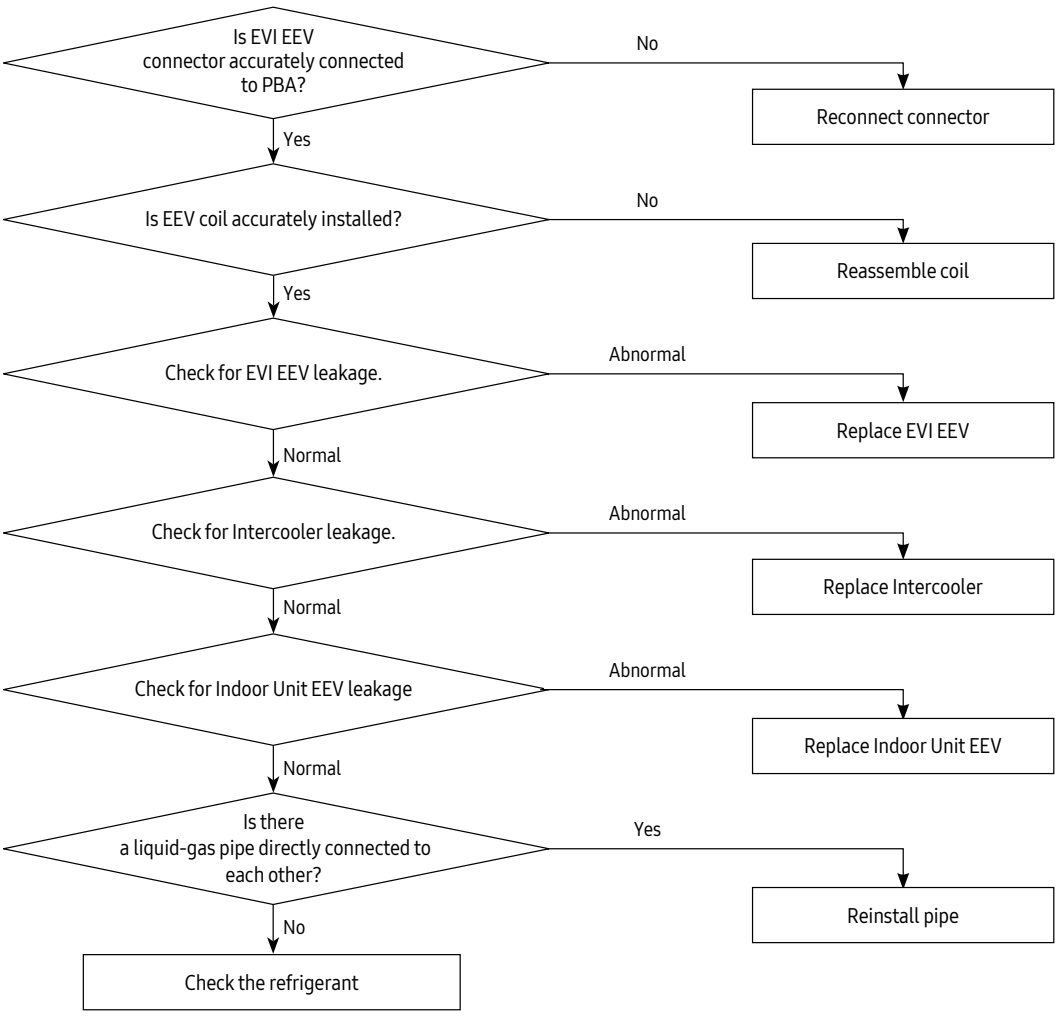
<table>
<tr><td>Outdoor unit display</td><td>E438</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="5">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/ MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th><th>24℃</th><th>27℃</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td><td>◑</td><td>×</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>– DSH<5℃, EVI Out-EVI In<0℃ & frequency> 65Hz 40 minutes maintaining</td></tr>
<tr><td>Cause of problem</td><td>– EVI EEV and Intercooler leakage, excessive refrigerant amount, Outdoor Check Valve inserted opposite.
– Indoor Unit EEV leakage, direct connection between Indoor Liquid Pipe and the Gas Pipe.</td></tr>
</table>

※ For the indoor EEV leakage check, operate one of the indoor units in cooling mode and the others in fan mode.
- In case of normal units in fan mode, EVA In/Out temperatures become close to the room temperature within 5minutes.
- Change the cooling unit to the fan mode and one of the fan unit to the cooling mode, and then check again.

※ If the refrigerant amount was excessively charged, DSH may be decreased during the cooling operation at low temperature.

※ For the EVI EEV leakage check, check for the EVI in sensor temperature when the cooling operation with the EVI EEV 0step.
- Separate the EVI EEV connector from the HUB PBA, when the outdoor unit is off.
- In case of EVI EEV leakage in cooling mode, EVI In temperature at least 10℃ lower than the outside temperature.

1. Cause of problem

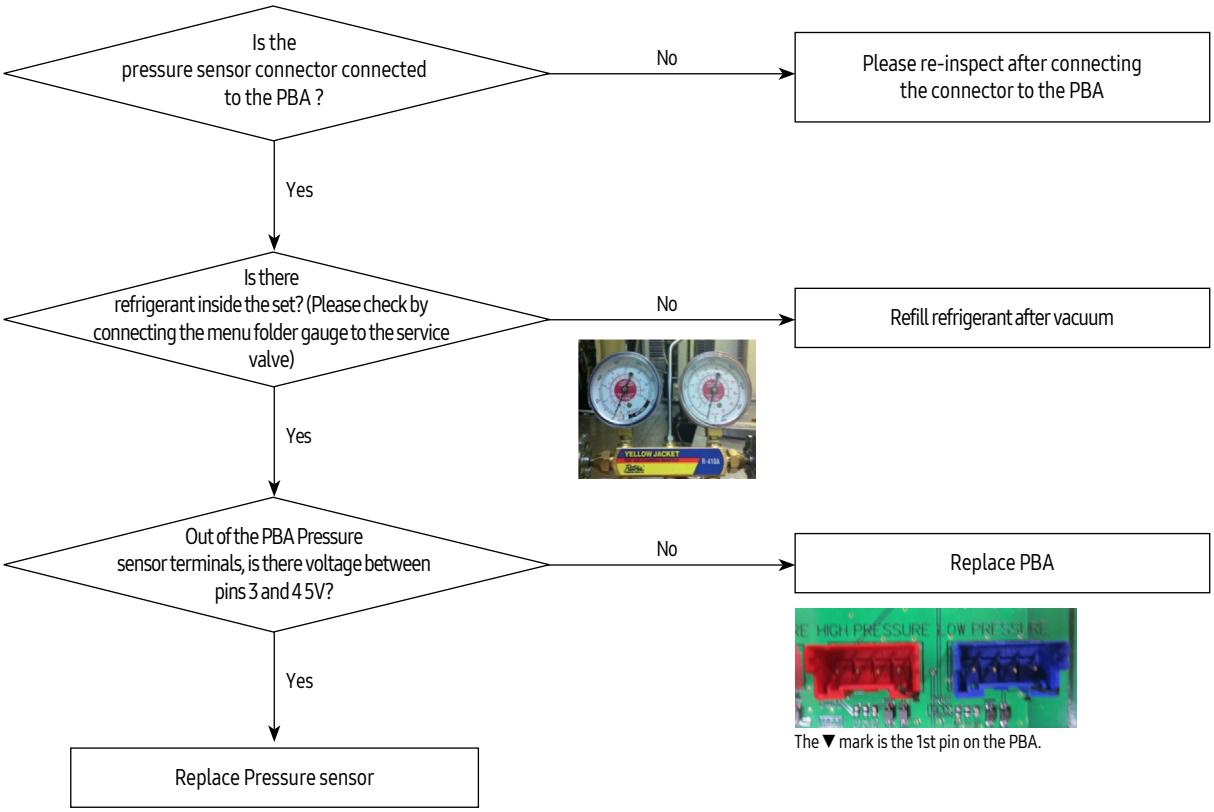


4-3-27. Refrigerant leakage error

Outdoor unit display	E439 (Refrigerant leakage judgment before starting) E443 (When start, refrigerant leakage judgment)
Judgment Method	- Before starting: Before compressor starting after system halt 2 minutes (High & low pressure sensor Open / Short error occurs and 1kg/cm2 or less) - When start: When the high pressure sensor value(cooling 3.1kg/㎠, heating 2.2kg/㎠) is detection continuously for 3 seconds
Cause of problem	- Refrigerant leakage and shortage - Disconnection or breakdown of high & low pressure sensor

1. Pressure sensor Open/Short error determination method
   1) Identifies from when power is supplied or 2 minutes after RESET, and only when set is stopped.
   2) An Open/Short error will occur if the input voltage standard range of 0.5V ~ 4.95V is exceeded.

2. Inspection Method



4-3-28. Prevention of heating operation due to outdoor temperature

<table>
<tr><td>Outdoor unit display</td><td>E440 (Prevention of heating operation due to high temperature of outdoor)
E441 (Prevention of cooling operation due to low temperature of outdoor)</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="5">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/ MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th><th>24℃</th><th>27℃</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td><td>◑</td><td>×</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- Heating operation: When the outdoor temperature is more than 30℃
- Cooling operation: When the outdoor temperature is less than -25℃</td></tr>
<tr><td>Cause of problem</td><td>- System protection operation status (Is not breakdown)
– If the outdoor temperature is satisfied the operating range, it will clear the error and start the operation automatically.</td></tr>
</table>

4-3-29. Prevention of heating refrigerant charge due to outdoor temperature

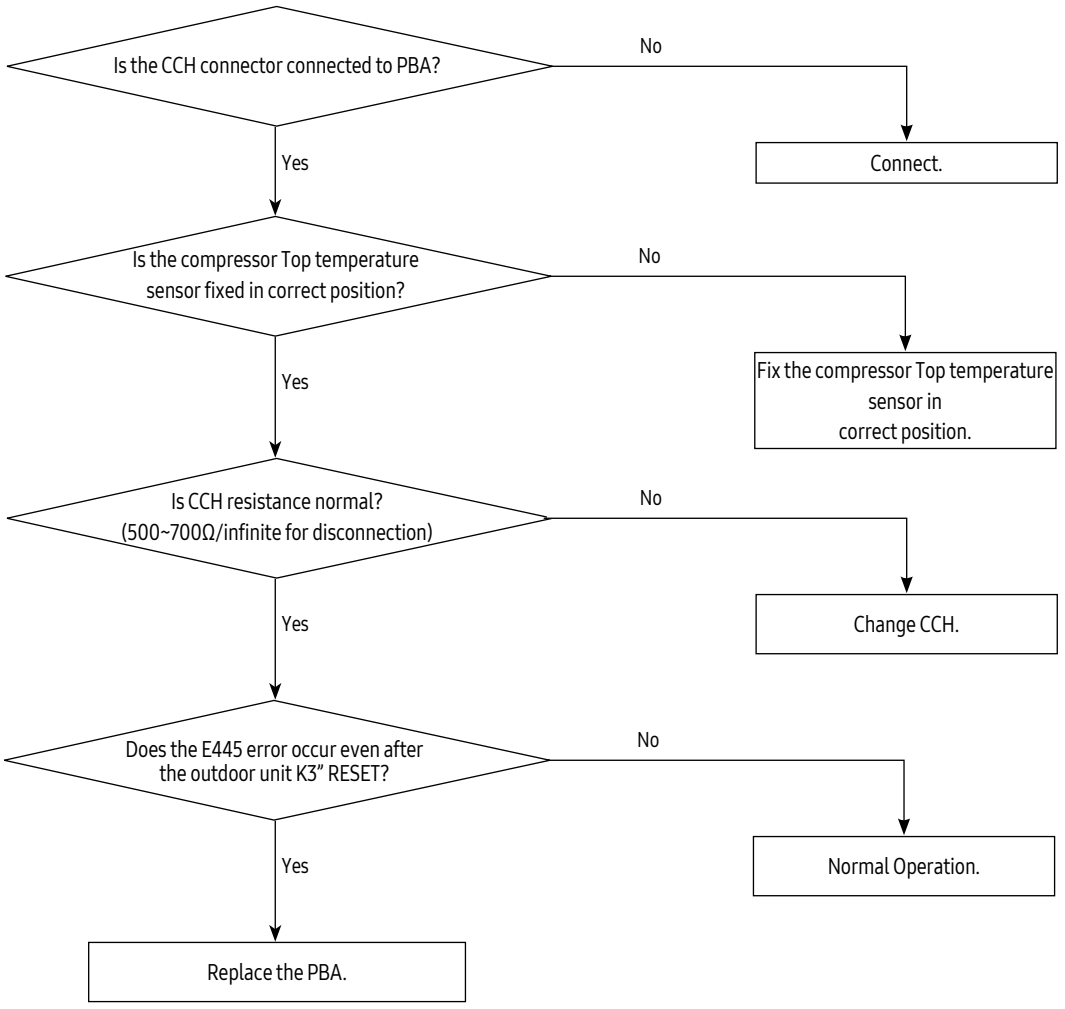
<table>
<tr><td>Outdoor unit display</td><td>E442</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><td colspan="5">Duct, Cassette (1/2 Way),Console, Celing</td><td colspan="4">Cassette (4/Mini4 Way)</td><td colspan="5">Wall-mounted (NeoForte)</td></tr>
<tr><td>Operation</td><td>Defrost</td><td>Timer</td><td>Fan</td><td>Filter/ MPI</td><td>Operation</td><td>Defrost</td><td>Timer</td><td>Filter</td><td>Operation</td><td>Timer</td><td>Turbo</td><td>24℃</td><td>27℃</td></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td><td>◑</td><td>×</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>- When the heating refrigerant charge: If the outdoor temperature is more than 15℃</td></tr>
<tr><td>Cause of problem</td><td>- System protection operation status (Is not breakdown)</td></tr>
</table>

4-3-30. CCH wire breaking error

<table>
<tr><td>Outdoor unit display</td><td>E445 (Air Cooled)</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="5">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/ MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th><th>24℃</th><th>27℃</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>●</td><td>◑</td><td>◑</td><td>◑</td><td>×</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>– Refer to the judgment method below.</td></tr>
<tr><td>Cause of problem</td><td>– CCH connector on Hub PBA is not connected / compressor top sensor breakaway / own problem of CCH</td></tr>
</table>

1. Judgment Method (2hours after reset or power on, It will be judged once.)
   ① Compressor Top temperature at the time of judgment- Tini < 2℃.
   (※Tini: Power on or temperature of initial compressor Top after reset)
   ② Compressor Top temperature at the time of judgment- Suction1 temperature < 2℃
   ③ Suction1 temperature < 30℃
   ④ UP state

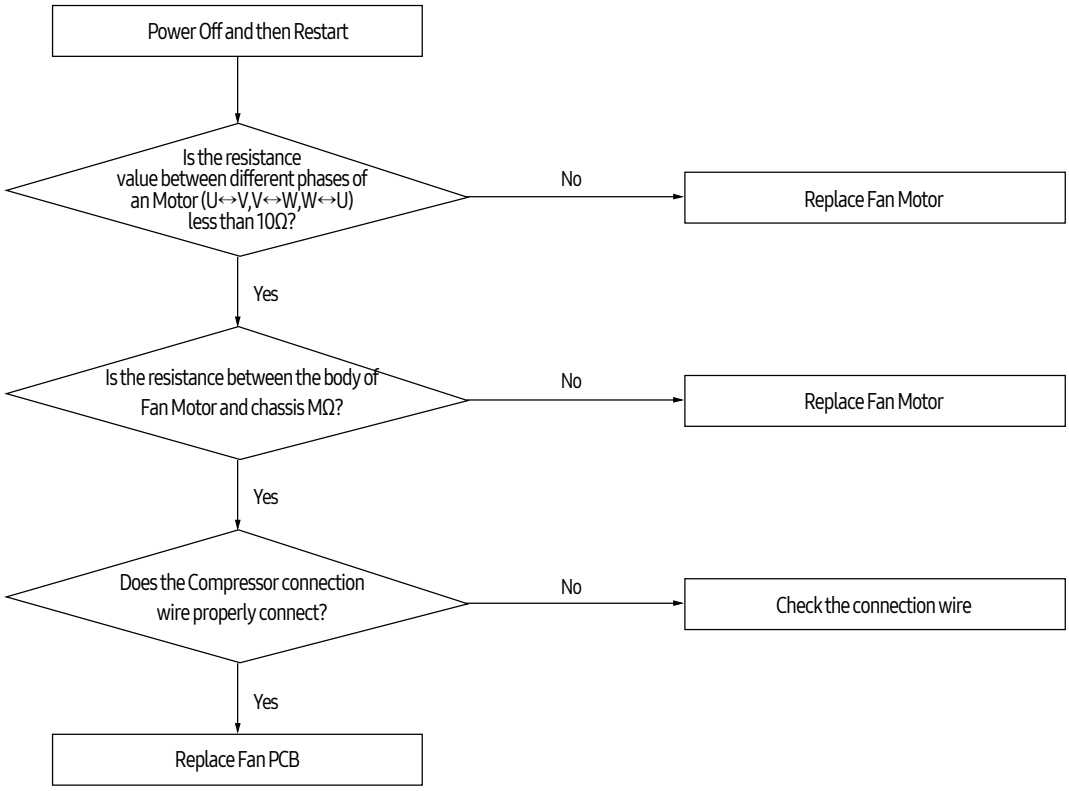
※ If all the conditions are satisfied at the same time: Mark the CCH wire breaking error (E445).



4-3-31. Fan starting error

Outdoor unit display	E446 (FAN PCB (FAN1)) E346 (FAN PCB (FAN2))
Judgment Method	- Startup, and then if the speed increase is not normally. - Detected by H/W or S/W
Cause of problem	- Compressor connection error - Defective Compressor - Defective PCB

1. Inspection Method



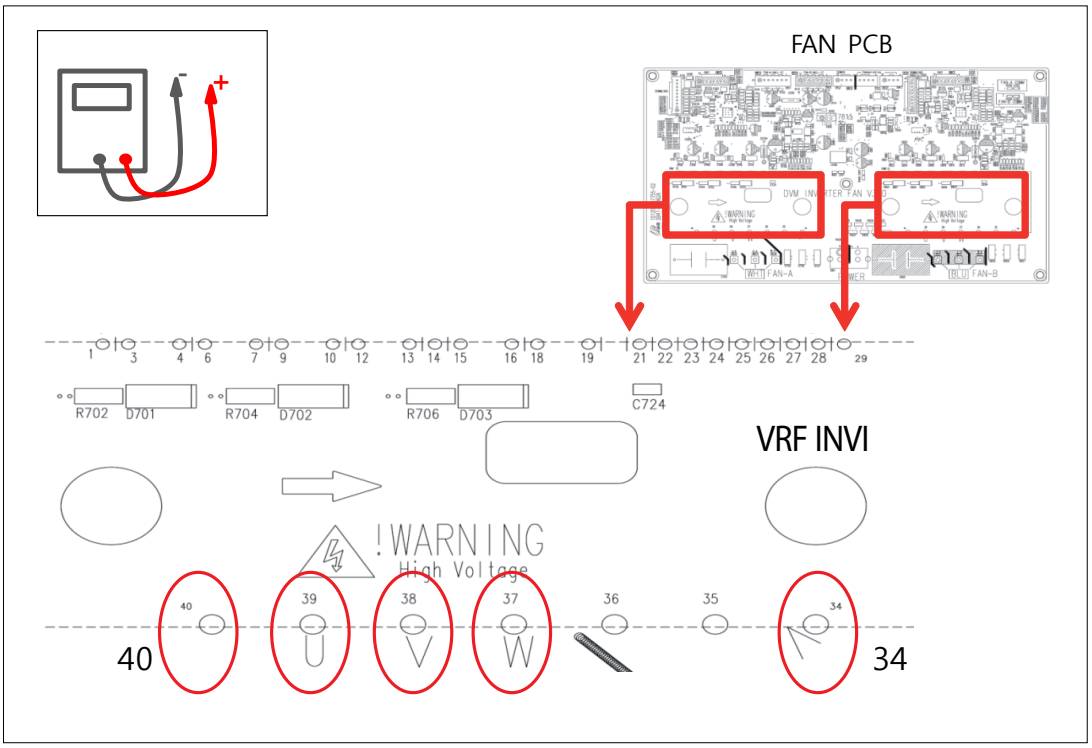
IPM breakdown diagnostics (FAN PCB)

1. Preparations before checking
   1) Power Off
   2) IPM failure, discharge mode may not work properly. Therefore, wait more than 15 minutes after the Power Off.
   3) Remove all of the Fan PCB connectors. (Comp connector included)
   4) Prepare the digital multi tester.

2. Inspection Method
   1) Refer to Figure1 and Table1, respectively the resistance value and diode voltage value measure.
   2) According to the criterion in Table 1 to determine whether the failure of IPM.

Division	Measured Point		Criterion	Remark
	+	-		
Measure the resistance values	40	U	More than 3㏁	Measurement error can occur for reasons such as the initial measurement condenser discharge. Measured over at least three times.
	40	V		
	40	W		
	U	34		
	V	34		
	W	34		
Measure the diode voltage values	U	40	0.3~0.7V	
	V	40		
	W	40		
	34	U		
	34	V		
	34	W		

‹Table 1›

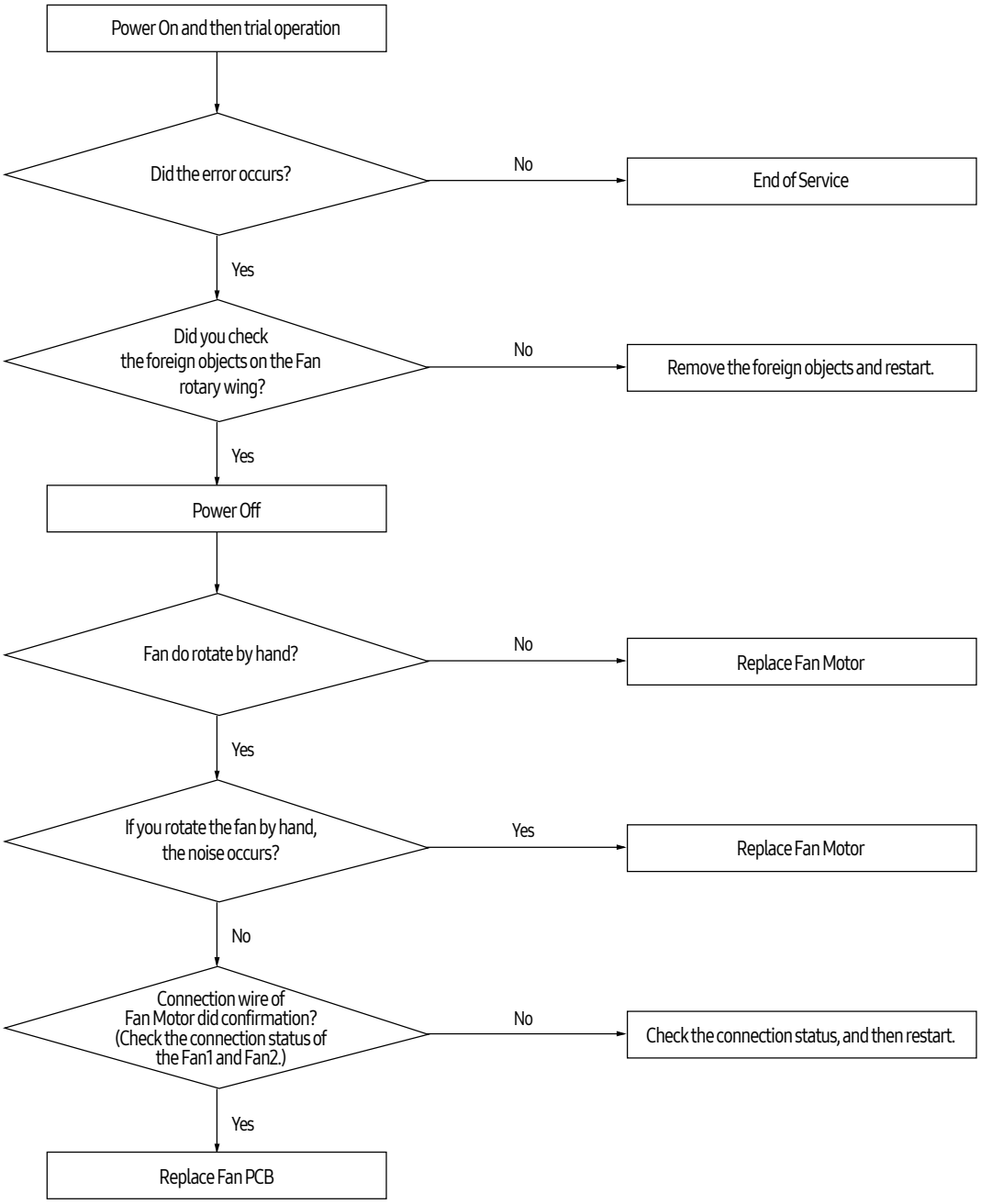


‹Figure 1›

4-3-32. Fan lock error

Inverter / Hydro control part display	E448 (FAN PCB(FAN1)) E348 (FAN PCB(FAN2))
Judgment Method	- Is checked symptoms by phase current of Fan Motor.
Cause of problem	- Fan Motor connection error. - Defective Fan - Defective PCB

1. Inspection Method



4-3-33. Momentary blackout error

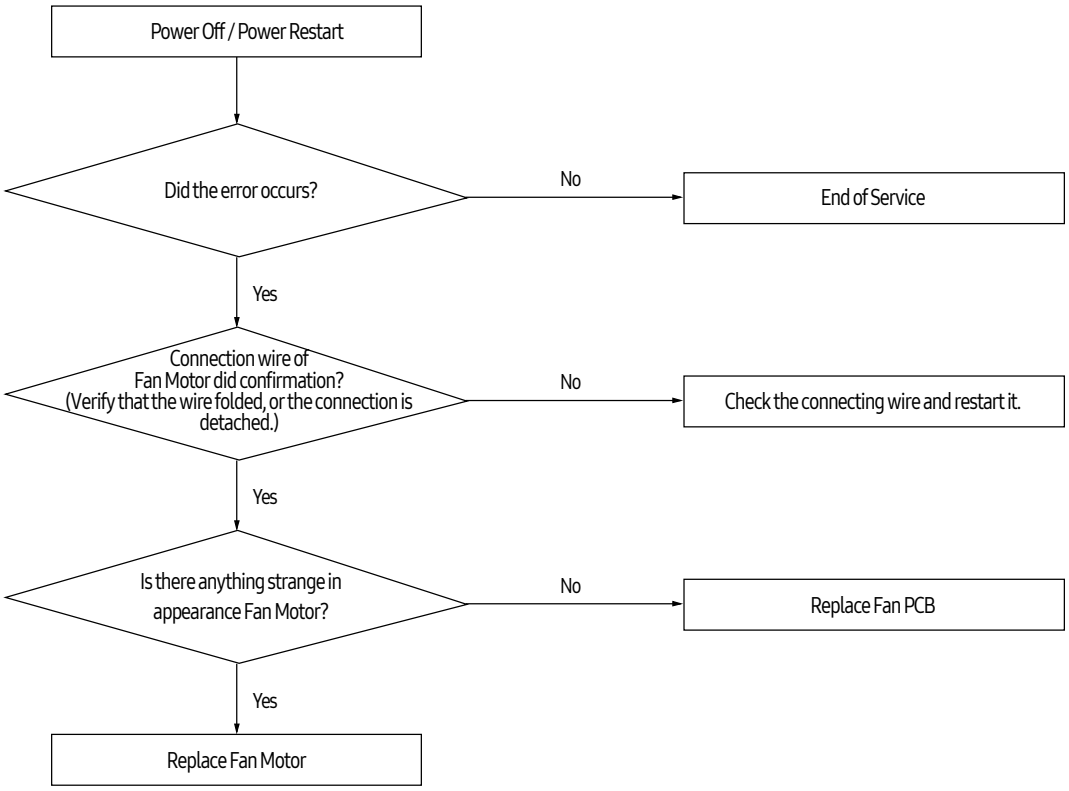
Inverter / Hydro control part display	E452 (Prevention of heating operation due to high temperature of outdoor)
Judgment Method	- Momentary stop of compressor due to momentary blackout.
Cause of problem	- Momentary stop of compressor due to momentary blackout.

1. Measures: Replace Hub PCB or Main, Hub connection wire.

4-3-34. Outdoor Fan Motor overheating

Inverter / Hydro control part display	E453 (FAN PCB(FAN1)) E353 (FAN PCB(FAN2))
Judgment Method	- Overheating due to the internal sensor of the Fan Motor.
Cause of problem	- Defective connection wire - Defective Fan Motor - Defective PCB - Defective installation conditions

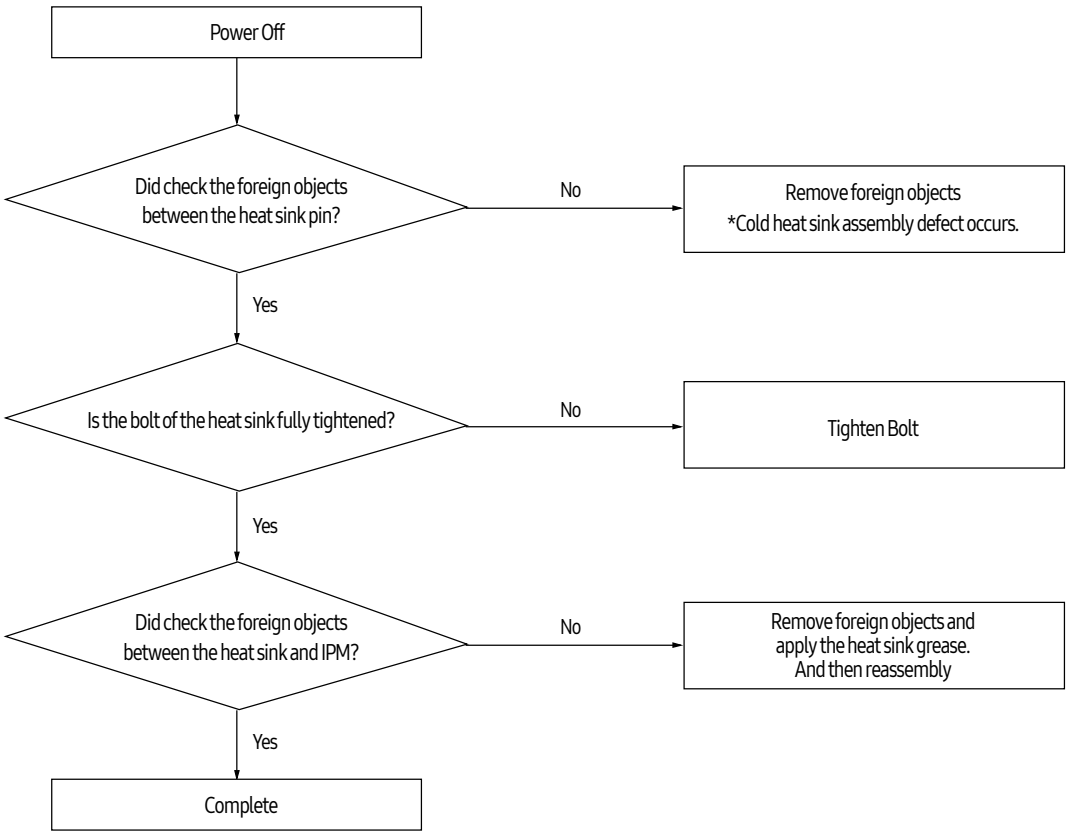
1. Inspection Method



4-3-35. Fan IPM Overheat error

Inverter / Hydro control part display	E455 (FAN1 PCB) E355 (FAN2 PCB)
Judgment Method	- IPM internal temperature more than 85°C (E455, E355)
Cause of problem	- Heat sink and IPM assembly defective. - Defective heat sink cooling

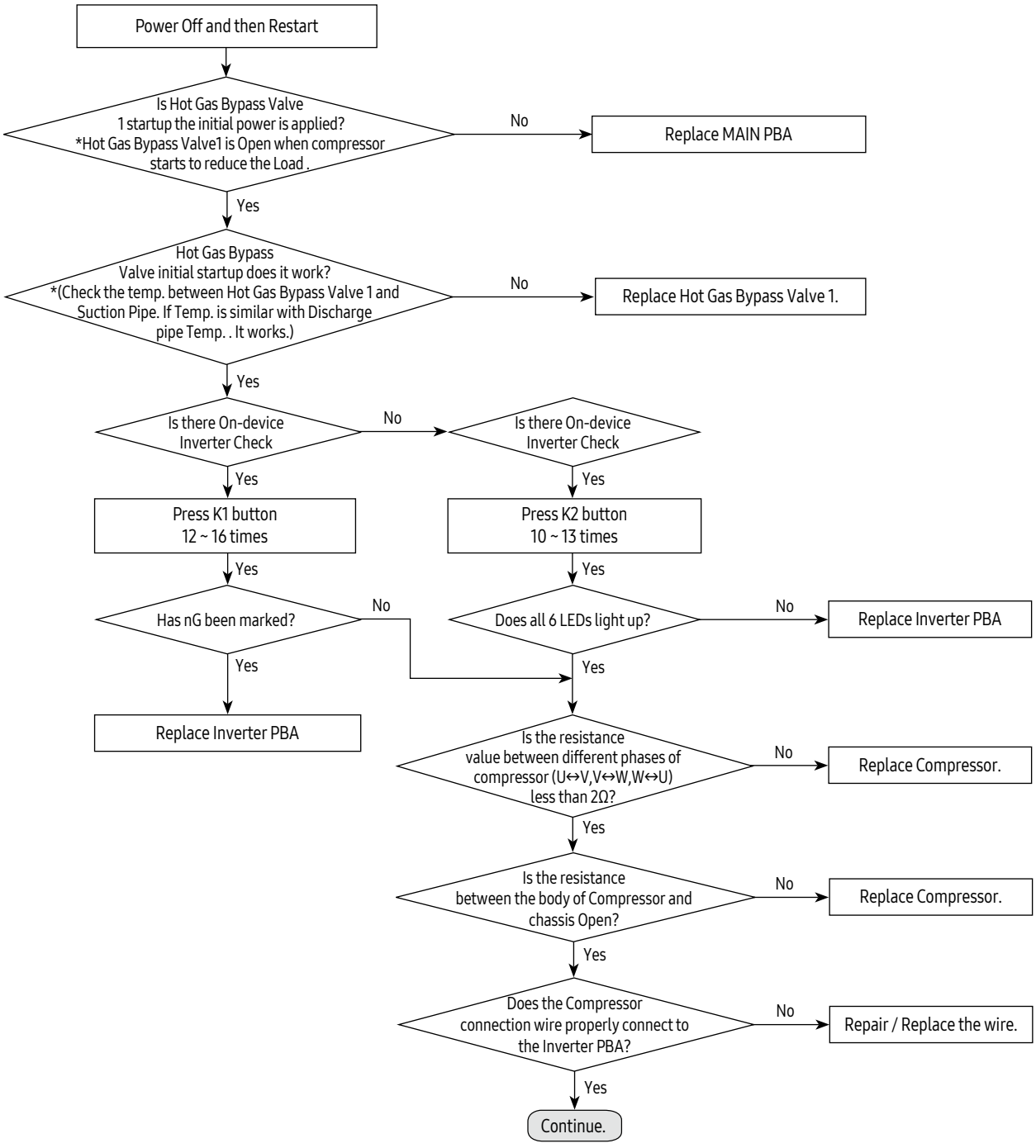
1. Inspection Method



4-3-36. Compressor starting error

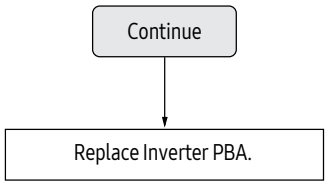
Outdoor unit display	E461 (INVERTER1 PBA) E361 (INVERTER2 PBA)
Judgment Method	- Startup, and then if the speed increase is not normally. - Detected by H/W or S/W.
Cause of problem	- Compressor connection error - Defective Compressor

1. Cause of problem

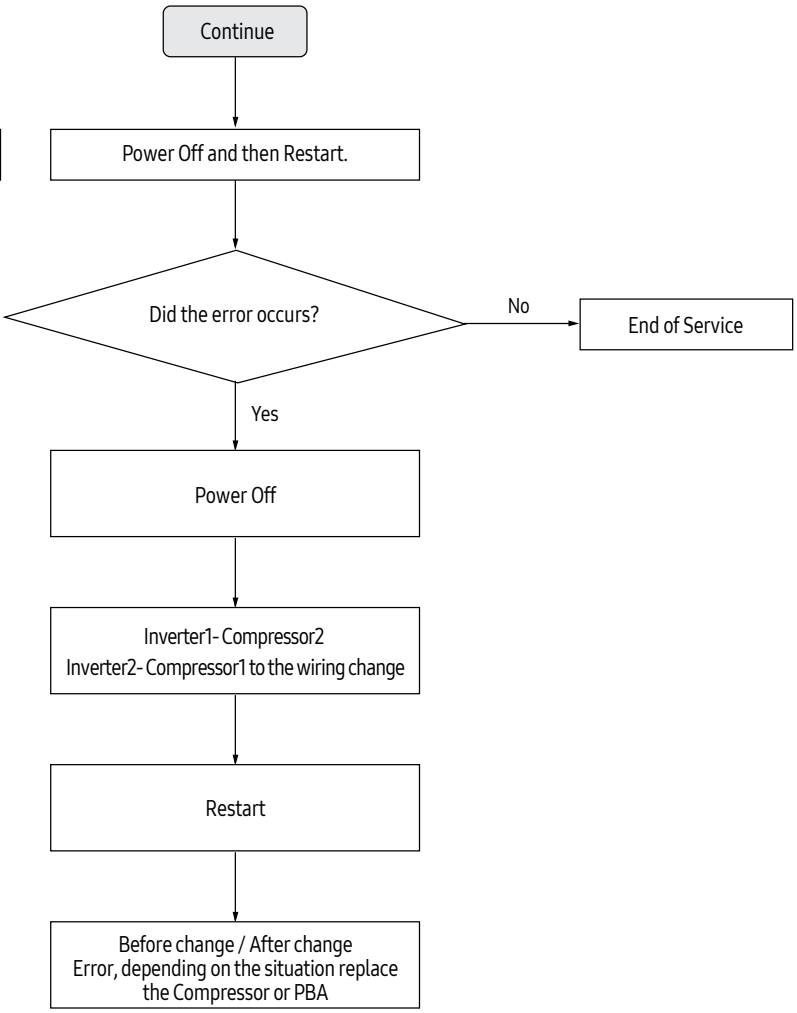


Compressor starting error (cont.)

■ **Compressor applied one**



■ **Compressor applied two**



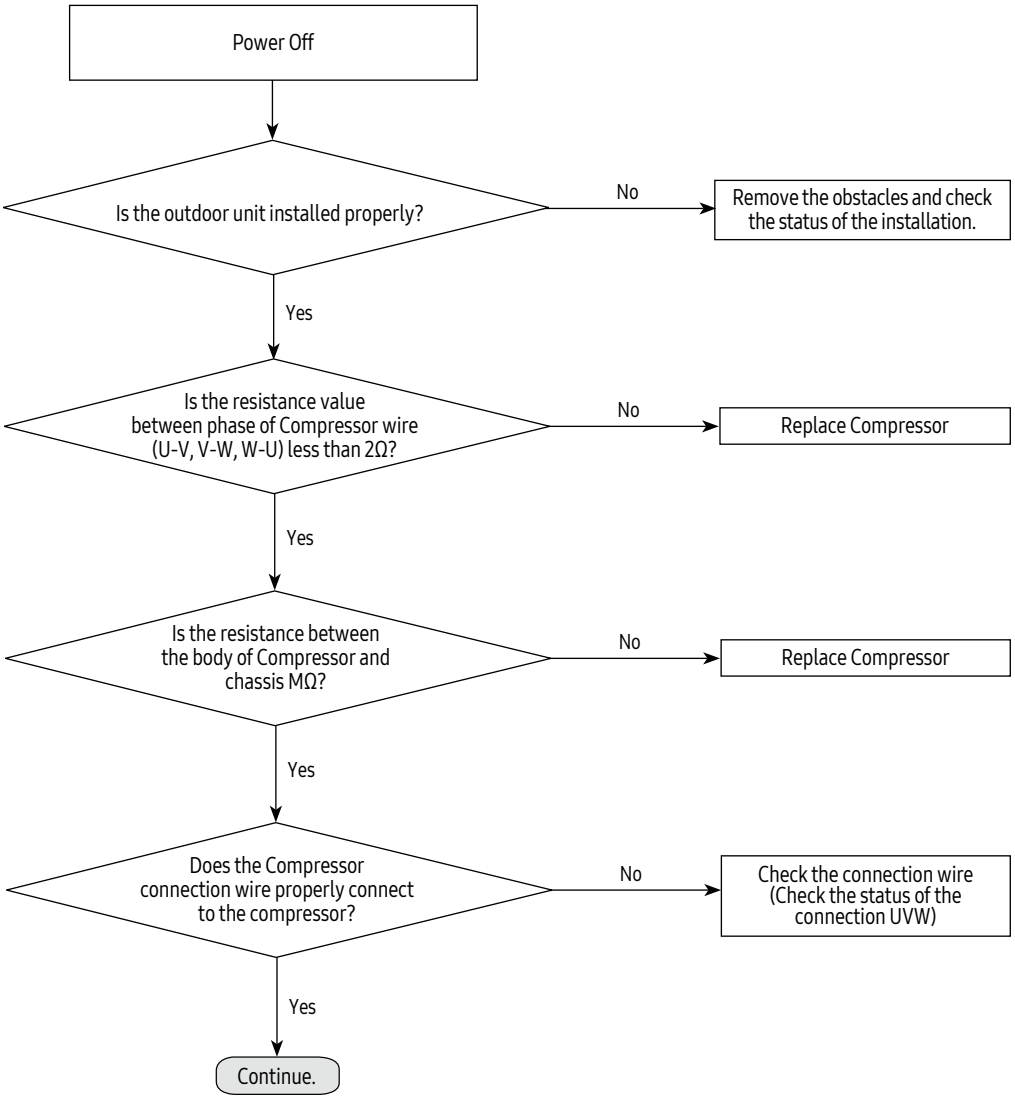
Before change	After change	Measure
E464	E464	Replace No.1Inverter PBA
E464	E364	Replace No.1 Compressor
E364	E364	Replace No.2 Inverter PBA
E364	E464	Replace No.2 Compressor

See the "Contain of compressor Exchange (3-XX)" in service manual when you replace the compressor.

4-3-37. Inverter Overcurrent error

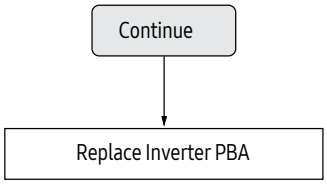
Outdoor unit display	E464/E465 (INVERTER1 PBA) E364/E365 (INVERTER2 PBA)
Judgment Method	- Will occur if the overcurrent flowing in the IPM. - Detected by H/W or S/W
Cause of problem	- COMP. defective. - Inverter PBA Defective.

1. Cause of problem

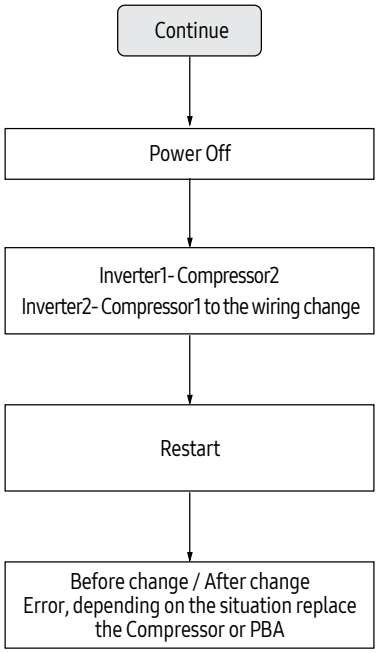


Compressor applied 2

■ **Compressor applied one**



■ **Compressor applied two**



Before change	After change	Measure
E464	E464	Replace No.1Inverter PBA
E464	E364	Replace No.1 Compressor
E364	E364	Replace No.2 Inverter PBA
E364	E464	Replace No.2 Compressor

See the "Contain of compressor Exchange (3-XX)" in service manual when you replace the compressor.

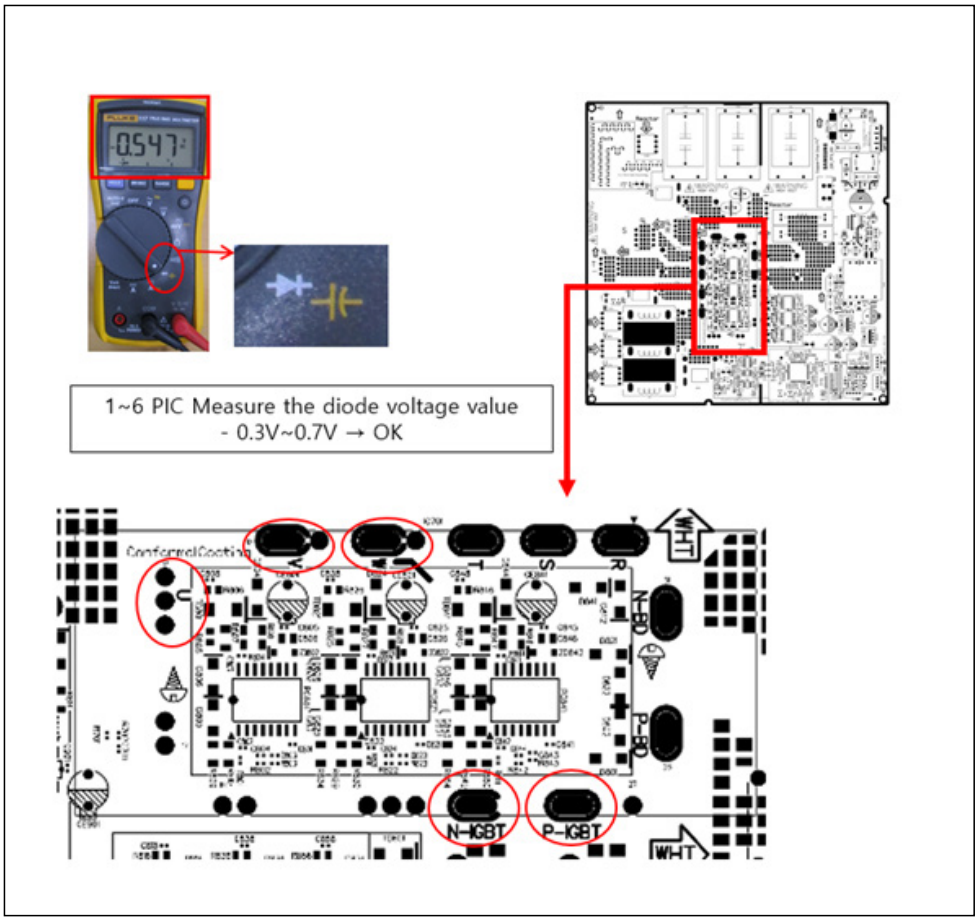
IPM [IGBT] breakdown diagnostics (Inverter PCB)

1. Preparations before checking
   1) Power Off.
   2) IPM failure, discharge mode may not work properly. Therefore, wait more than 15 minutes after the Power Off.
   3) Remove all of the Inverter PCB connectors and wire that is fixed as screw.
      (Include wire that is fixed to compressor and DC Reactor.)
   4) Prepare the digital multi tester.

2. Inspection Method
   1) Refer to Figure1 and Table1, respectively the resistance value and diode voltage value measure.
   2) According to the criterion in Table 1 to determine whether the failure of IPM.

Division	Measured Point		Criterion	Remark
	+	-		
Measure the resistance values	P-IGBT	U	More than 3㏁	Measurement error can occur for reasons such as the initial measurement condenser discharge. Measured over at least three times.
	P-IGBT	V		
	P-IGBT	W		
	U	N-IGBT		
	V	N-IGBT		
	W	N-IGBT		
Measure the diode voltage values	U	P-IGBT	0.3~0.7V	
	V	P-IGBT		
	W	P-IGBT		
	N-IGBT	U		
	N-IGBT	V		
	N-IGBT	W		

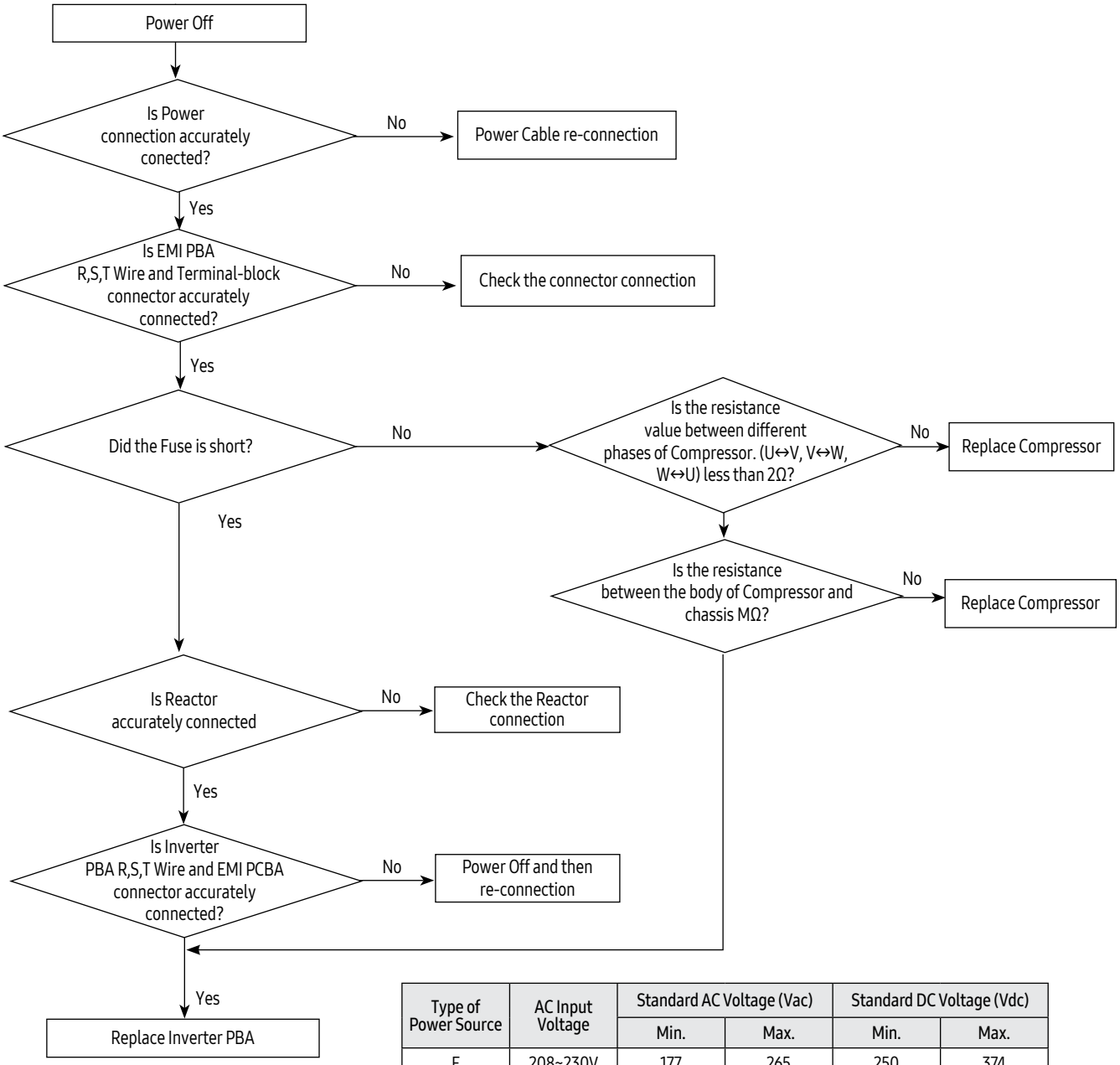
‹Table 1›



4-3-38. Overvoltage / Low voltage error

Outdoor unit display	E466 (INVERTER1 PBA) E366 (INVERTER2 PBA)
Judgment Method	- Input wiring error EMI fuse open. - DC-Link Overvoltage / Low voltage occurs.
Cause of problem	- Check the power source wiring. (R/S/T/N wire crossed or not connected) - Check the power source voltage. (Rated voltage ±10%) - Check the fuses on EMI PBA. (fuse is normally short)

1. Cause of problem

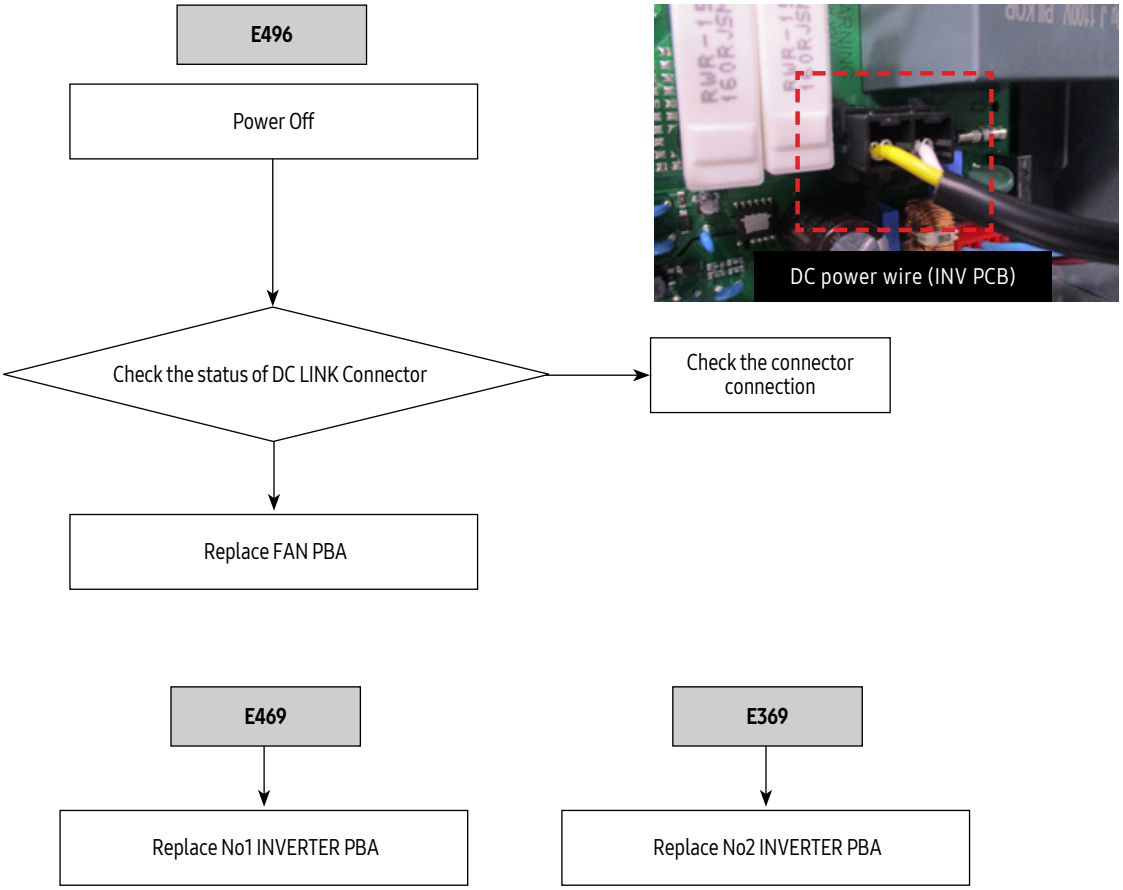


Type of Power Source	AC Input Voltage	Standard AC Voltage (Vac)		Standard DC Voltage (Vdc)	
		Min.	Max.	Min.	Max.
F	208~230V	177	265	250	374
J	460V	391	552	553	781

4-3-39. DC Link voltage sensor error

Outdoor unit display	E469 (INVERTER1 PBA) E369 (INVERTER2 PBA) E496 (OUTDOOR FAN 1 PBA)
Judgment Method	- DC voltage detection: Error judgment where the voltage value is more than 4.8V or less than 0.2V.
Cause of problem	- DC Link Connector disconnected - PBA voltage sensing circuit defective

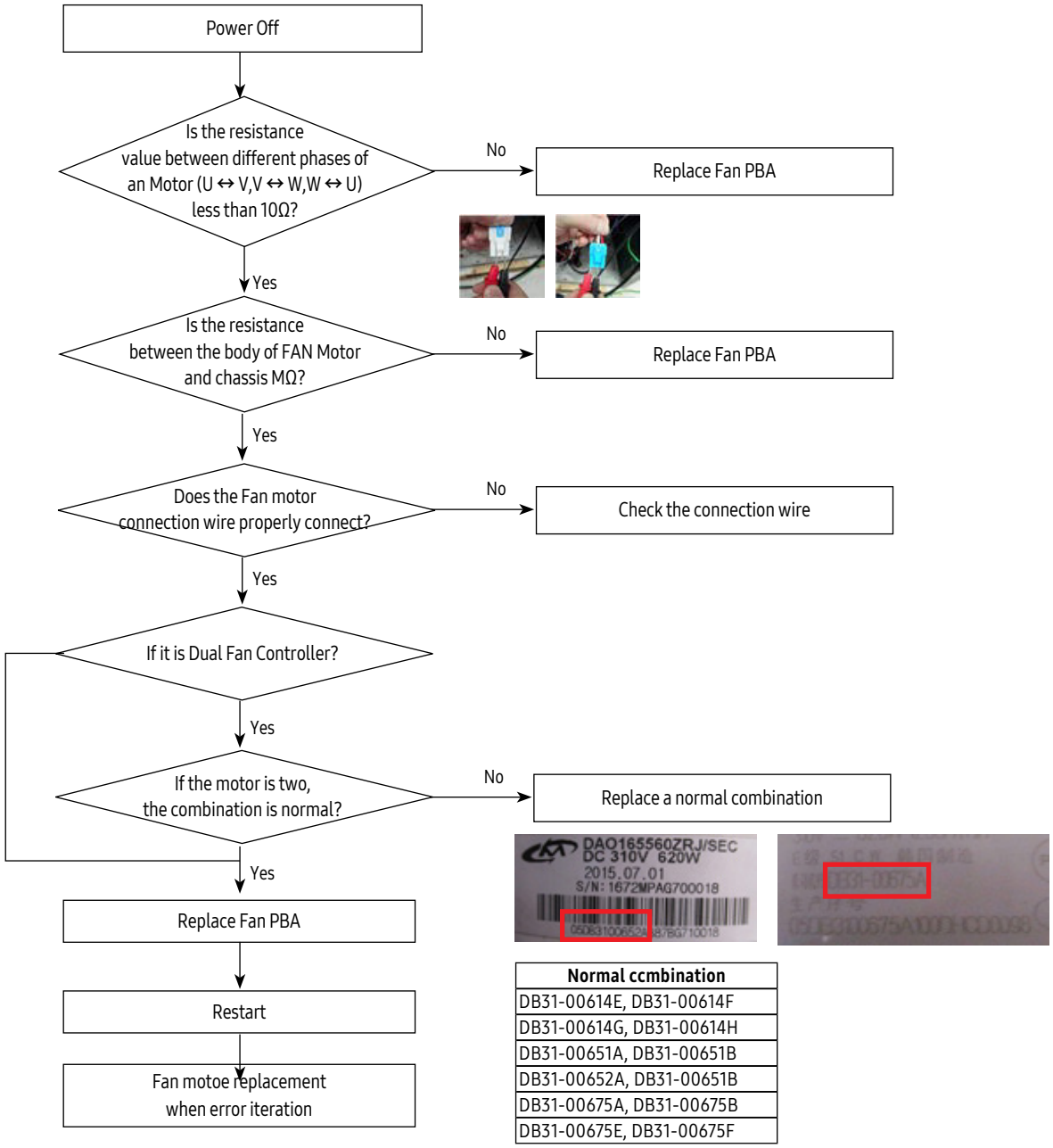
1. Cause of problem



4-3-40. Fan Motor Overcurrent error

Outdoor unit display	E478/E489 (FAN PBA(FAN1)) E378/E389 (FAN PBA(FAN2))
Judgment Method	- Occurs when overcurrent flows in the IPM. - Detected by H/W or S/W
Cause of problem	- Defective Motor - Fan motor U/V/W connection error. - Fan motor hall IC connection error. - Wire connection is crossed #1 & #2. - Defective Fan PBA

1. Cause of problem

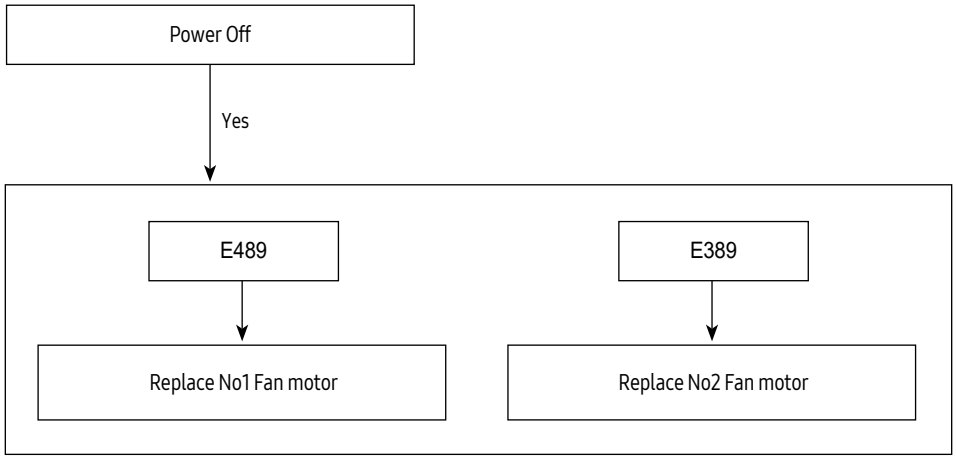


Normal ccmbination
DB31-00614E, DB31-00614F
DB31-00614G, DB31-00614H
DB31-00651A, DB31-00651B
DB31-00652A, DB31-00651B
DB31-00675A, DB31-00675B
DB31-00675E, DB31-00675F

Fan Motor Overcurrent error (cont.)

Outdoor unit display	(FAN PCB(FAN1)) (FAN PCB(FAN2))
Judgment Method	• Occurs when overcurrent flows in the IPM. • Detected by H/W or S/W
Cause of problem	• Defective FAN Motor

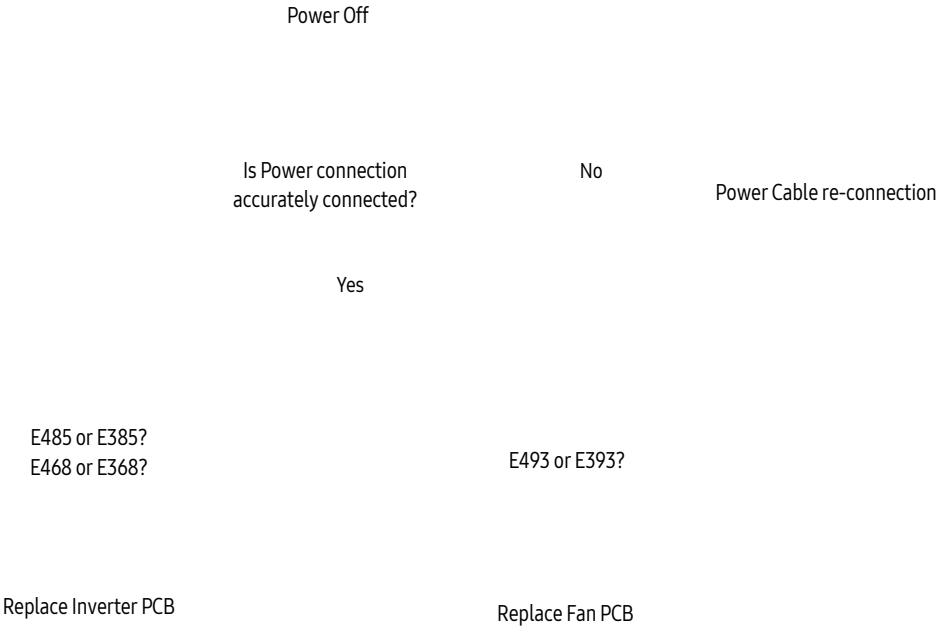
1. Inspection Method



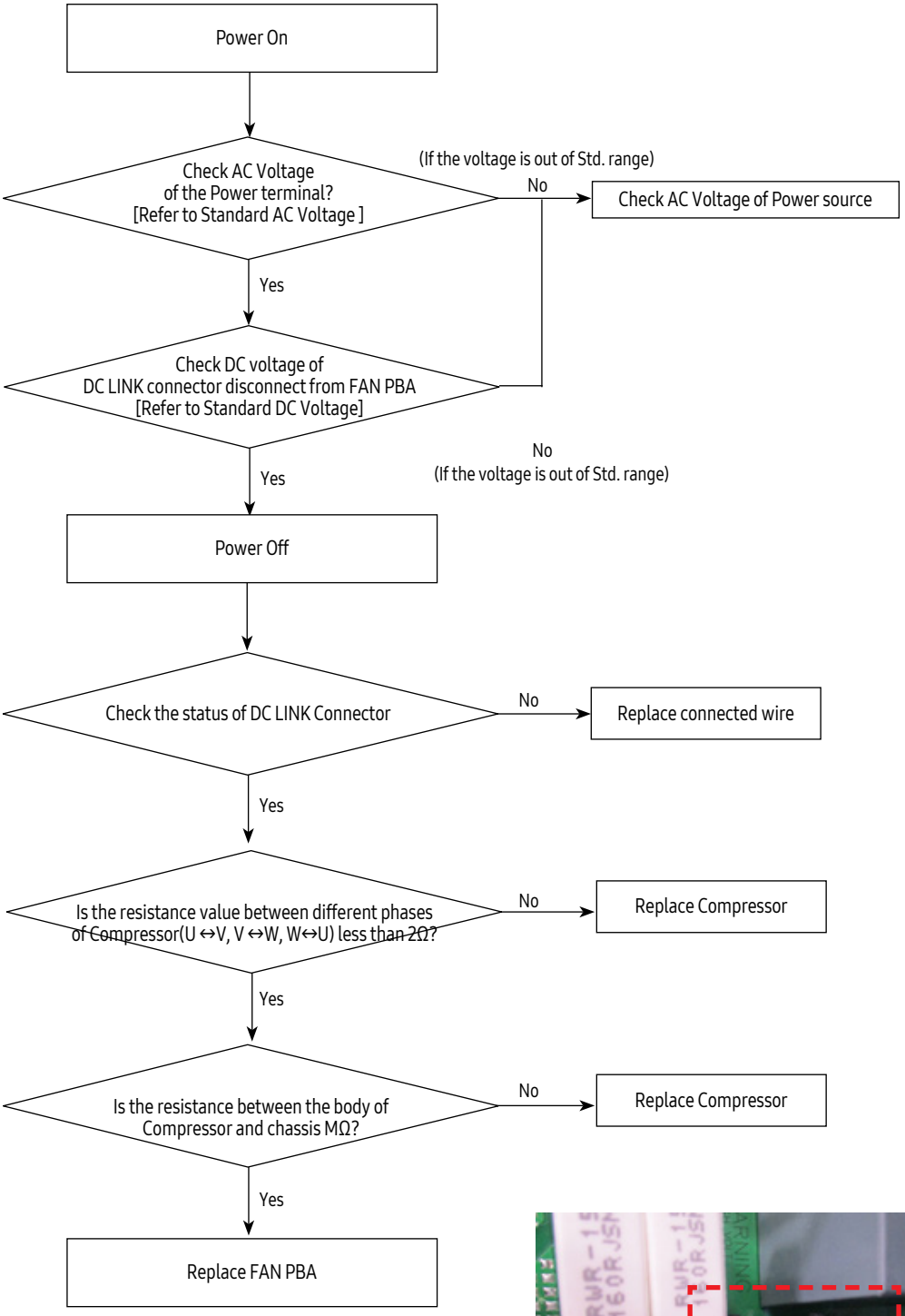
4-3-41. Input / Output Current sensor error

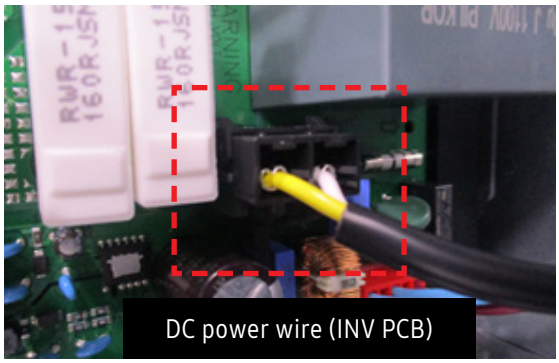
Outdoor unit display	INVERTER1 PCB(Input Current sensor) INVERTER2 PCB(Input Current sensor) INVERTER1 PCB(Output Current sensor) INVERTER 2 PCB(Output Current sensor) OUTDOOR FAN PCB (FAN1 Output Current sensor) OUTDOOR FAN PCB (FAN2 Output Current sensor)
Judgment Method	• Sensor Output detection: Judged as an error if the detected value is More than 4.5V or less than 0.5V
Cause of problem	• Input voltage defective • PCB voltage sensing circuit defective

1. Inspection Method



4-3-42. Outdoor Fan PCB Overvoltage / Low voltage error





4-3-43. Inverter overheat error

Outdoor unit display	(INVERTER1 PBA) (INVERTER2 PBA)
Judgment Method	- Inverter PBA IGBT/PFCM module temperature is more than 105℃
Cause of problem	- Heat sink and the IPM surface contact assembly defective. - Refrigerant cooling heat sink and refrigerant piping assembly defective. - Assembled bolt defective..

Table 1

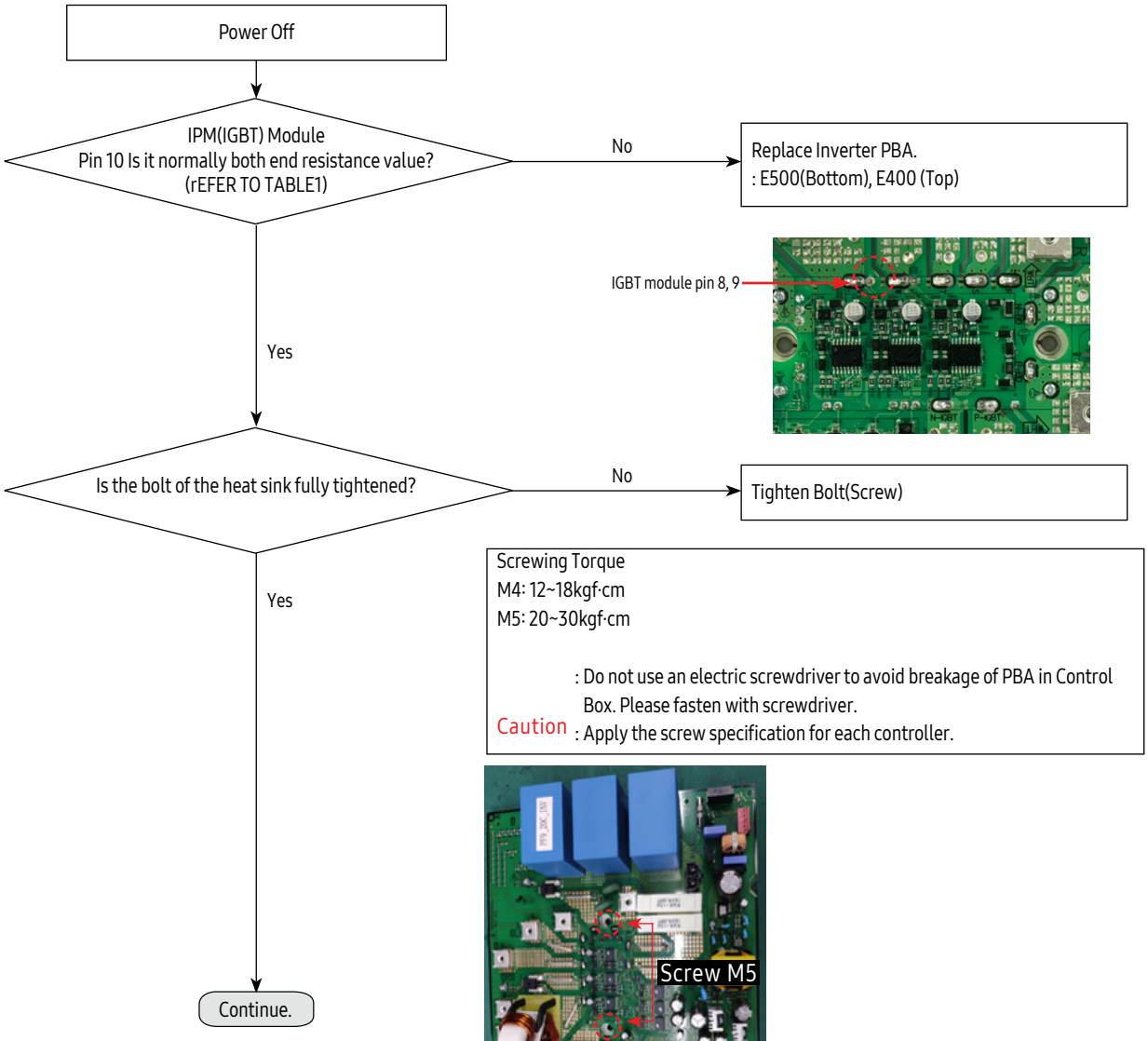
Both end resistance values of IGBT module pin(8, 9 pin)

Temperature [℃]	NTC [ohm]
10	9000
20	6000
30	4000
40	3000
50	2000
60	1600
70	1200
80	750

Measure the resistance after the power is turned off.

*Wait at least one minute after Power Off.

1. Cause of problem



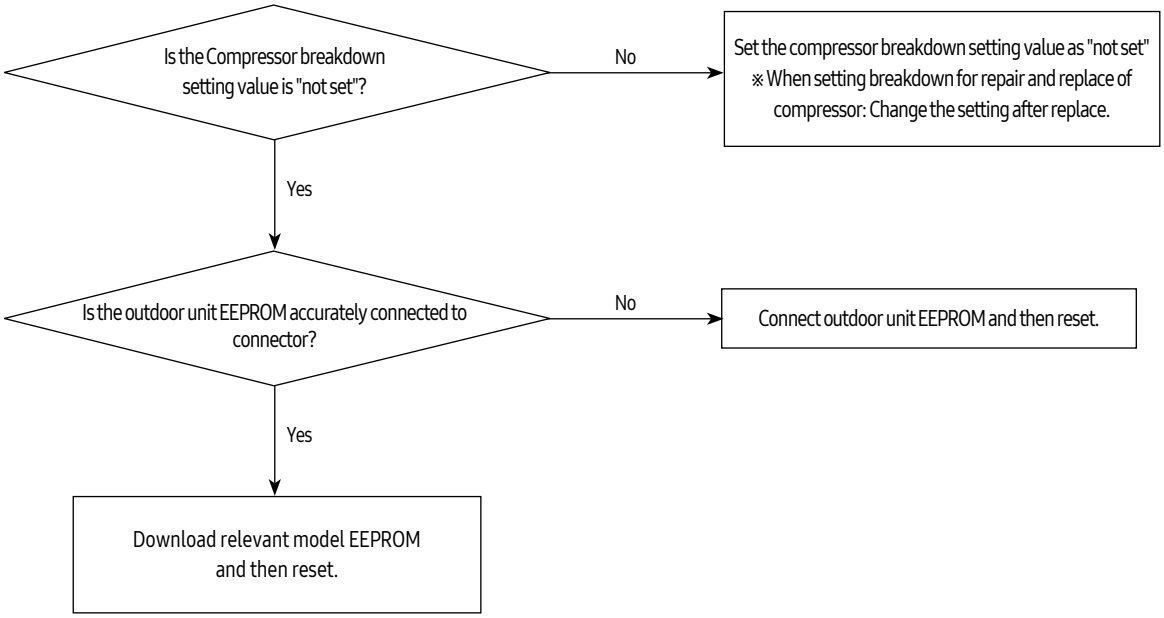
Screwing Torque
M4: 12~18kgf·cm
M5: 20~30kgf·cm

Caution
: Do not use an electric screwdriver to avoid breakage of PBA in Control Box. Please fasten with screwdriver.
: Apply the screw specification for each controller.

4-3-44. Option setting error of outdoor unit

Inverter / Hydro control part display	
Judgment Method	Refer to the inspection method below.
Cause of problem	- Option setting error of outdoor unit. (E2P option use of other model or set of the relevant outdoor unit, compressor breakdown)

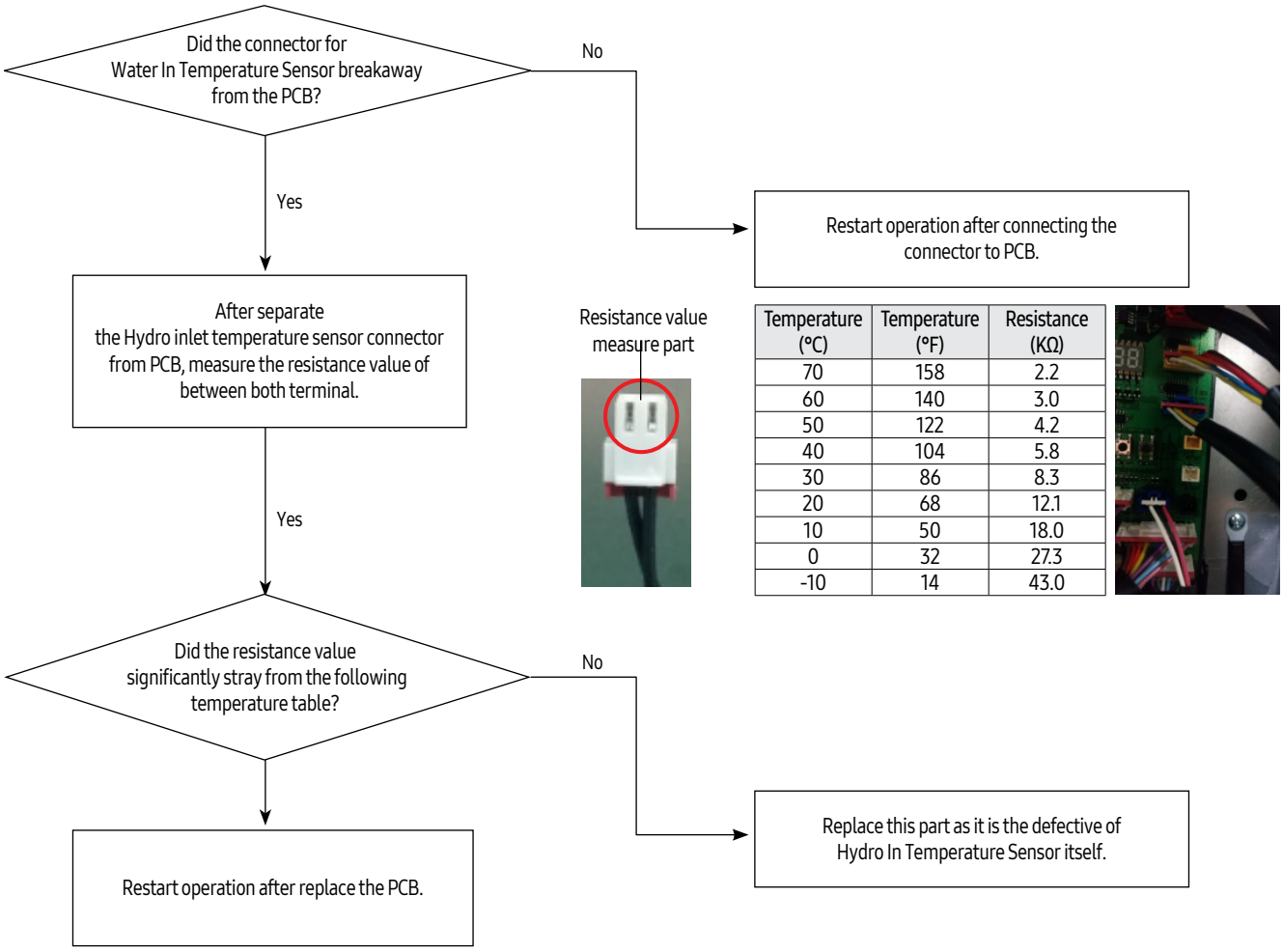
1. Inspection Method



4-3-45. Hydro inlet temperature sensor (Tw1) Short/Open

Inverter / Hydro control part display	
Judgment Method	Refer to the inspection method below.
Cause of problem	Hydro Unit Water In Temperature Sensor Open/Short error

1. Inspection Method

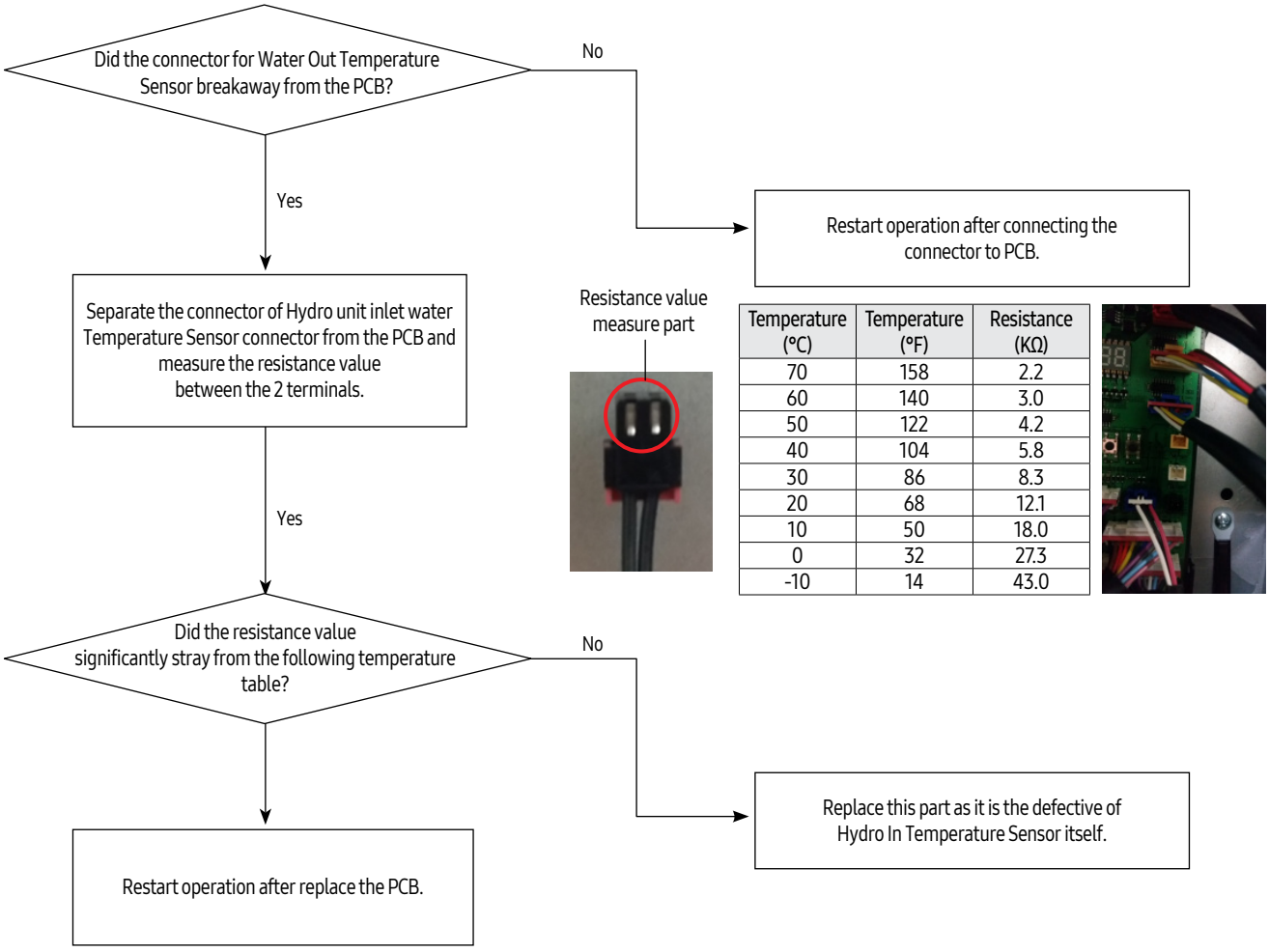


Temperature (°C)	Temperature (°F)	Resistance (KΩ)
70	158	2.2
60	140	3.0
50	122	4.2
40	104	5.8
30	86	8.3
20	68	12.1
10	50	18.0
0	32	27.3
-10	14	43.0

4-3-46. Hydro outlet temperature sensor (Tw2) Short/Open

Inverter / Hydro control part display	E902
Judgment Method	Refer to the inspection method below.
Cause of problem	Hydro Unit Water Out Temperature Sensor Open/Short error.

1. Inspection Method

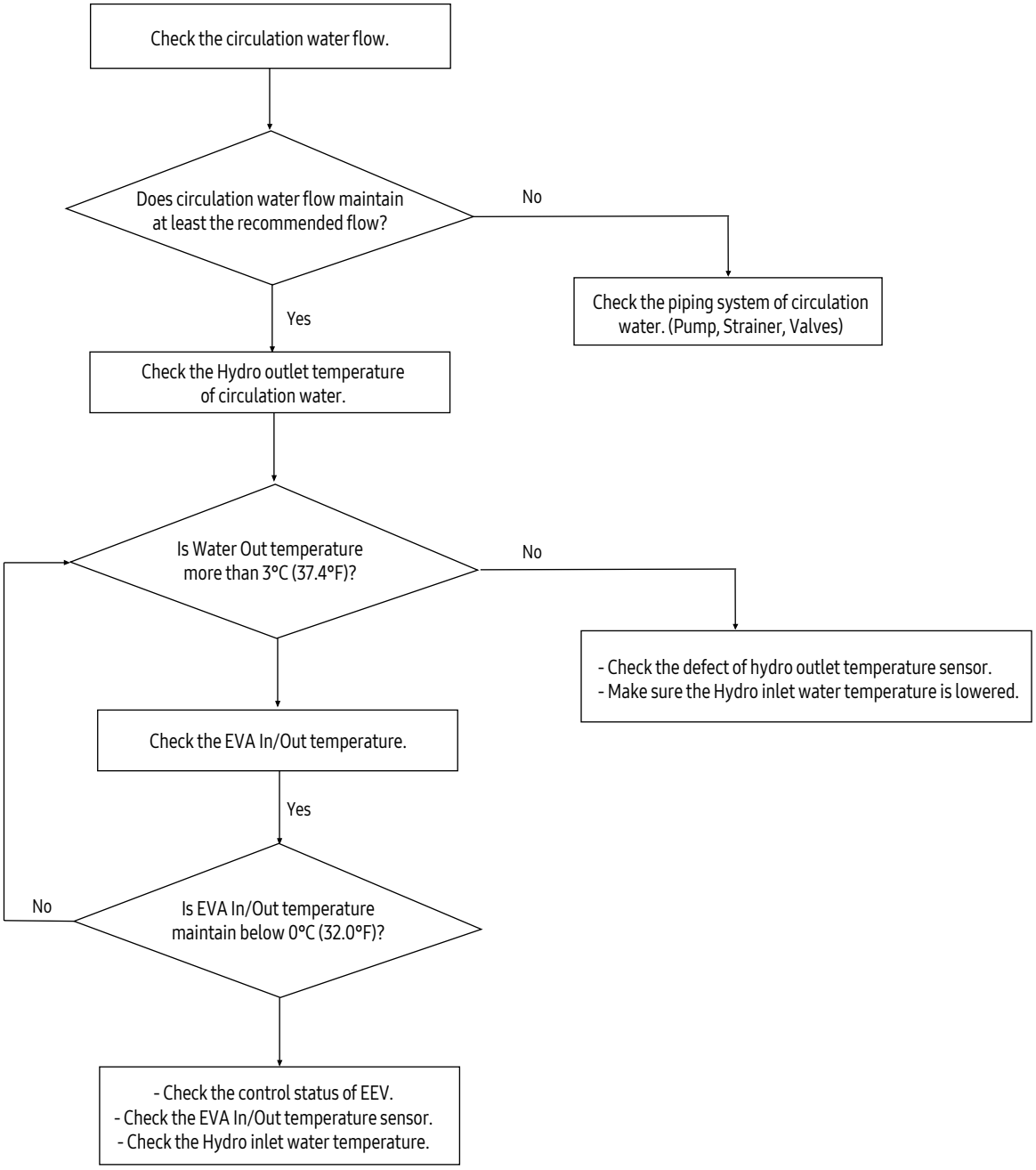


Temperature (°C)	Temperature (°F)	Resistance (KΩ)
70	158	2.2
60	140	3.0
50	122	4.2
40	104	5.8
30	86	8.3
20	68	12.1
10	50	18.0
0	32	27.3
-10	14	43.0

4-3-47. Frozen damage error

Inverter / Hydro control part display	
Judgment Method	Water outlet temperature dose not change more than 3°C (37.4°F). EVA In/Out maintains the temperature below 0°C (32.0°F).
Cause of problem	Indoor temperature of Hydro heat exchanger is low.(flow/temperature is low)

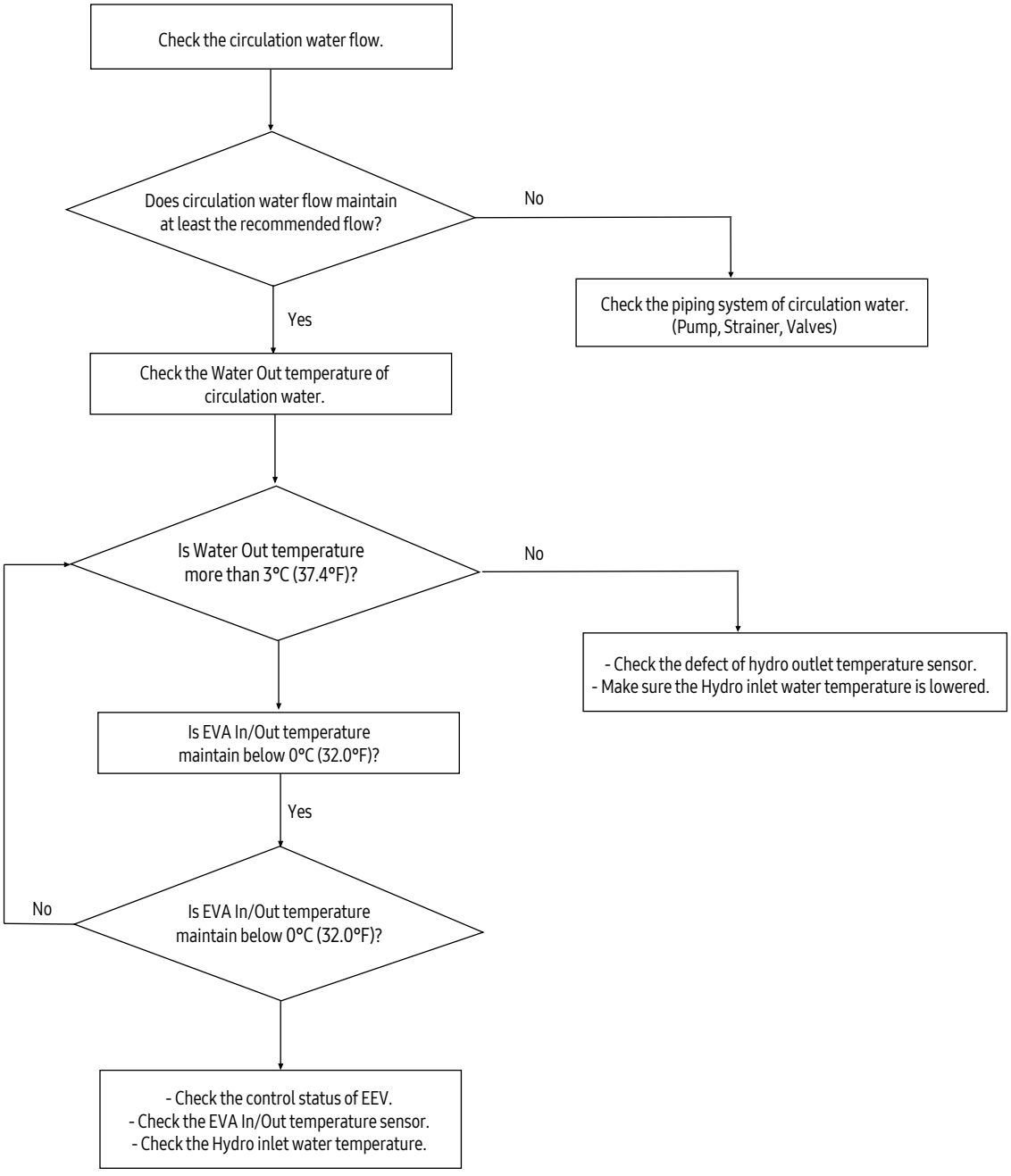
1. Inspection Method



4-3-48. Error when freeze prevention Comp Off

Inverter / Hydro control part display	(Possibility of restarting in once ~ 3 times) (Stopping on 4 times)
Judgment Method	Water outlet temperature dose not change more than 3°C (37.4°F) EVA In/Out maintains the temperature below 0°C (32.0°F). During the cooling operation, can be detected
Cause of problem	Indoor temperature of Hydro heat exchanger is low.(flow/temperature is low)

1. Inspection Method

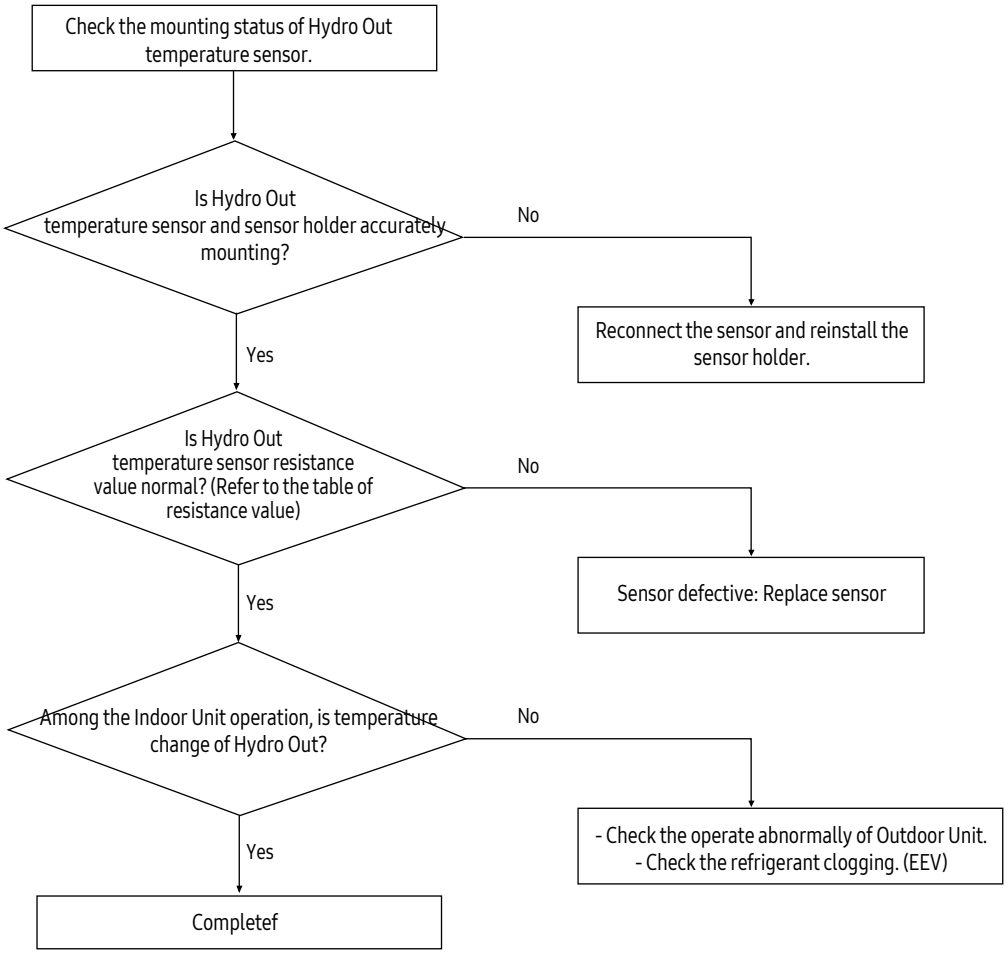


4-3-49. Hydro outlet temperature sensor Breakaway

Inverter / Hydro control part display	
Judgment Method	Water Outlet temperature before and after the operation: Temperature difference is less than 2°C (3.6°F).
Cause of problem	Breakaway of Hydro outlet temperature sensor

1. Inspection Method

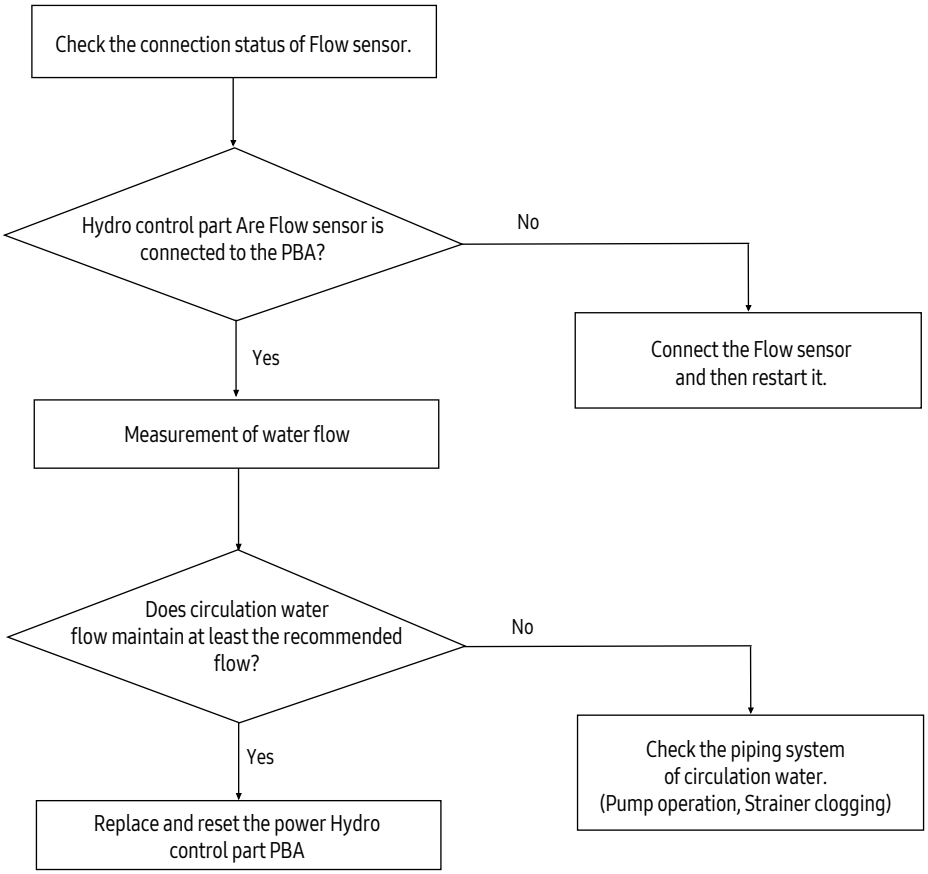
Temperature (°C)	Temperature (°F)	Resistance (KΩ)
70	158	2.2
60	140	3.0
50	122	4.2
40	104	5.8
30	86	8.3
20	68	12.1
10	50	18.0
0	32	27.3
-10	14	43.0



4-3-50. Water flow error (Water pressure sensor)

Inverter / Hydro control part display	(Auto-restarting in once ~ 5 times) (Stopping on 6 times)
Judgment Method	Output status from Pump signal: Does not detect the signal of Flow sensor, more than 5 seconds.
Cause of problem	Does not detect the signal of Flow sensor. (Flow shortage of Water piping system)

1. Inspection Method



4-3-51. Error on pump magnetic switch malfunction

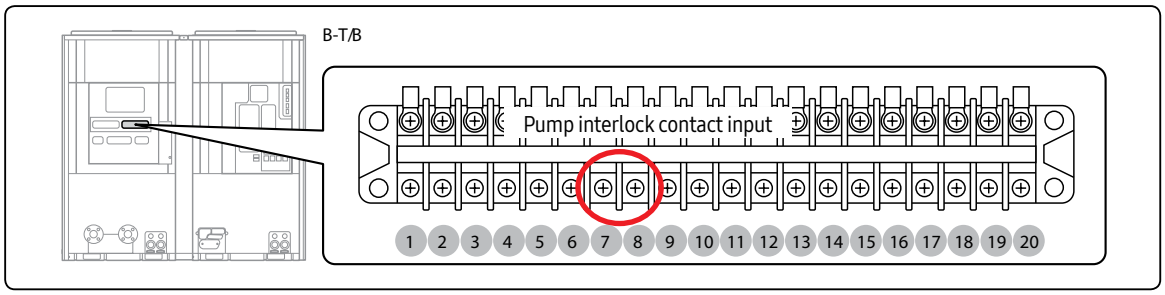
Inverter / Hydro control part display	E918
Judgment Method	Refer to the inspection method below.
Cause of problem	Pump Magnetic Switch Malfunction

Pump interlock input contact connection status.

↓

During pump operation the On signal to the contact does not enter in a row during the "pump interlock delay time" error occurs.

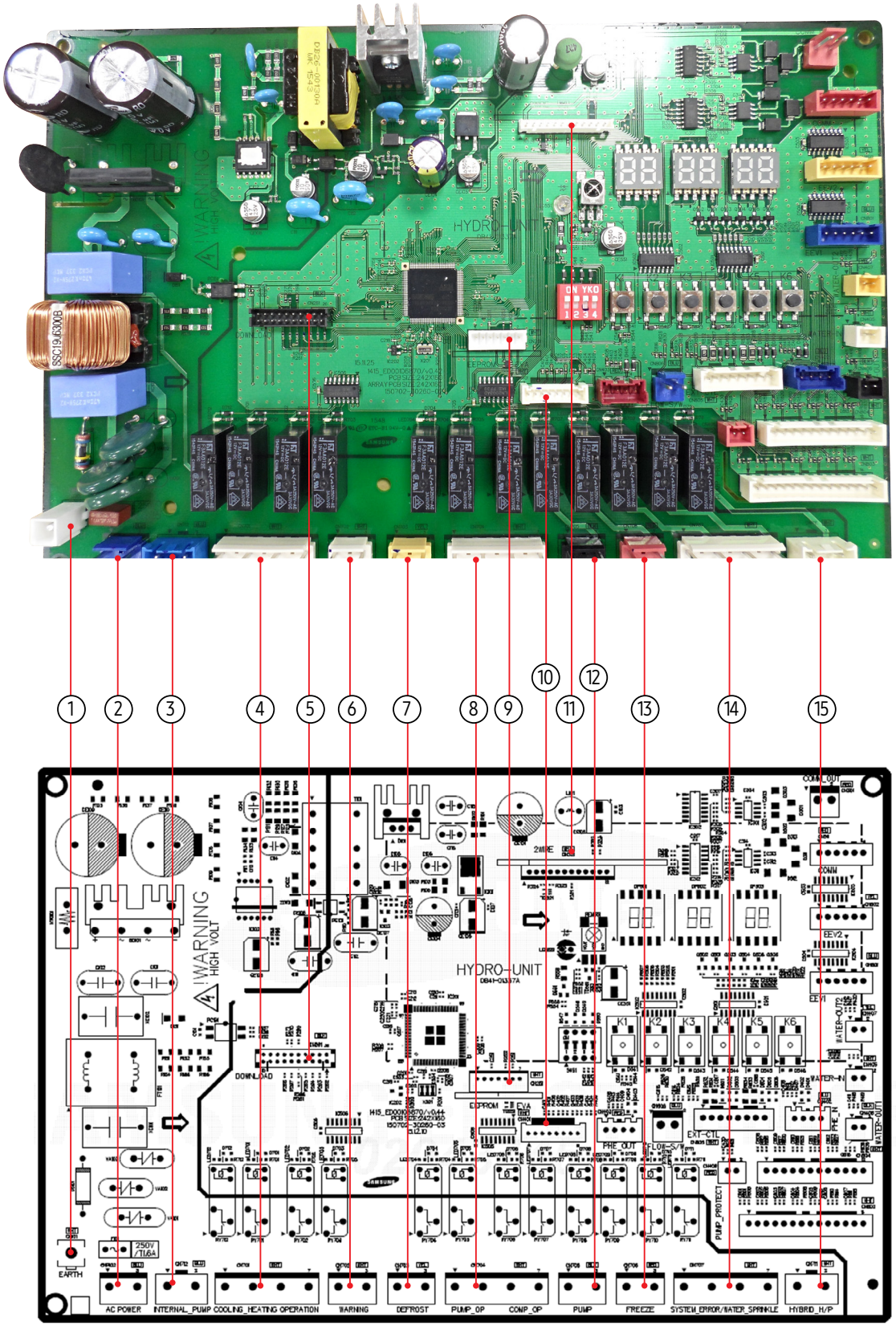
Pump interlock delay time: Setting options see Hydro



5. PCB Diagram and Parts List

5-1. ASSY PCB MAIN-HYDRO

• Model: All models name is commonness



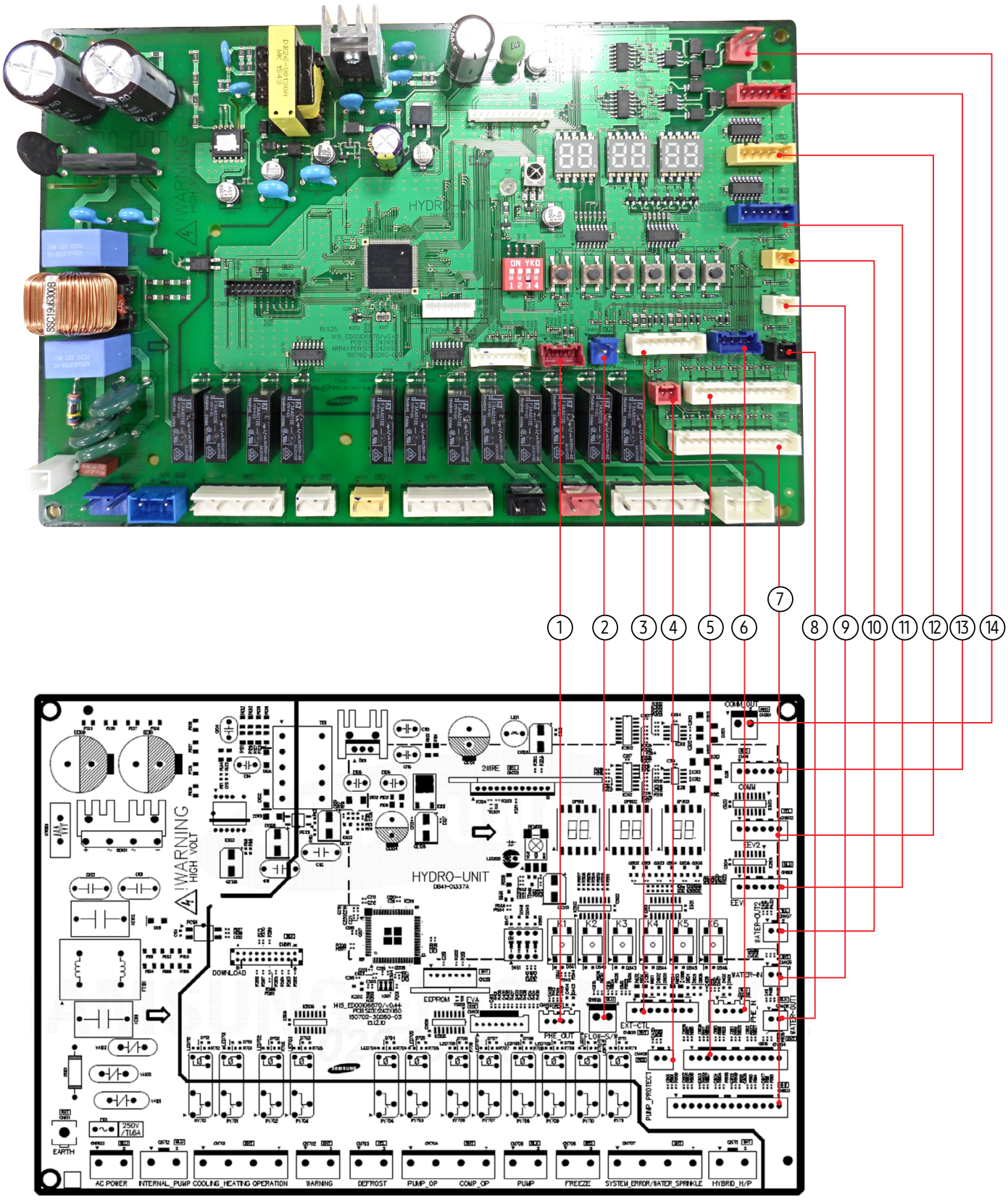
ASSY PCB MAIN-HYDRO (cont.)

• Model: All models name is commonness

① CN101-EARTH #1: EARTH	② CNP102-AC POWER #1: LIVE #2: #3: NEUTRAL	③ CN712-INTERNAL PUMP #1: NEUTRAL #2: #3: LIVE SIGNAL	④ CN701-OUTPUT #1: COOLING_HEATING_DP SIGNAL #2: #3: COOLING_HEATING_DP SIGNAL #4: #5: OPERATION_DP SIGNAL #6: #7: OPERATION_DP SIGNAL
⑤ CN261-DOWNLOAD #1: COM1_RXD #2: COM1_TXD #3: nTRST #4: TDO #5: TCK #6: TDI #7: TMS #8: TRACE_CLK #9: GND #10: 5V #11: 5V #12: MODE0 #13: RESET #14: TRACE 3 #15: DOWNLOAD #16: SEGMENT_1 #17: GND #18: TRACE 2 #19: TRACE 1 #20: TRACE 0	⑥ CN702-OUTPUT #1: WARNING_DP SIGNAL #2: #3: WARNING_DP SIGNAL	⑦ CN703-OUTPUT #1: DEFROST_OP_DP SIGNAL #2: #3: DEFROST_OP_DP SIGNAL	⑧ CN704-OUTPUT #1: PUMP_OP_DP SIGNAL #2: #3: PUMP_OP_DP SIGNAL #4: #5: COMP_OP_DP SIGNAL #6: #7: COMP_OP_DP SIGNAL
⑨ CN251-EEPROM #1: GND #2: #3: 5V #4: EEPROM_SELECT #5: EEPROM_SO #6: EEPROM_SI #7: EEPROM_CLK	⑩ CN401-TEMP SENSOR #1: EVA1_IN_TEMP #2: GND #3: EVA1_OUT_TEMP #4: GND #5: EVA2_IN_TEMP #6: GND #7: EVA2_OUT_TEMP #8: GND	⑪ CN705-OUTPUT #1: PUMP_OP SIGNAL #2: #3: PUMP_OP SIGNAL	⑫ CN321-2-WIRE SUB PCB #1: 12V #2: COM2_PCTRL_MICOM #3: COM2_VCHECK_A #4: COM2_VCHECK_B #5: COM2_MICOM_AD #6: 5V #7: COM2_ENABLE #8: COM2_F3 #9: COM2_F4 #10: COM2_Tx #11: COM2_Rx #12: GND
⑬ CN251-EEPROM #1: FREEZE_PROTECTION_DP SIGNAL #2: #3: FREEZE_PROTECTION_DP SIGNAL	⑭ CN401-TEMP SENSOR N/A	⑮ CN711-OUTPUT N/A	

ASSY PCB MAIN-HYDRO (cont.)

• Model: All models name is commonness



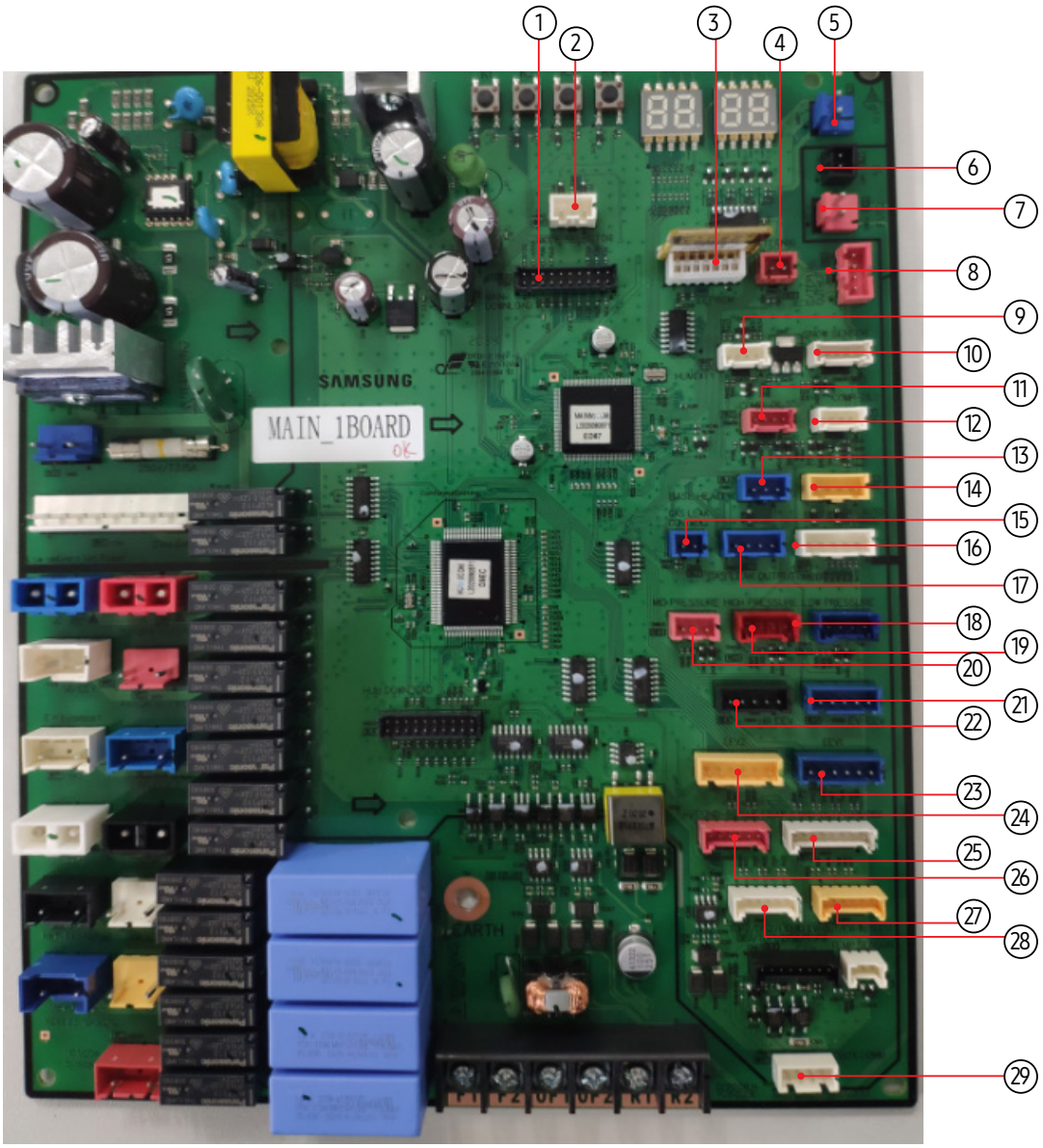
ASSY PCB MAIN-HYDRO (cont.)

• Model: All models name is commonness

① CN403-PRESSURE SENSOR #1: #2: PHE_OUT SIGNAL #3: GND #4: 5V	② CN806-FLOW SWITCH #1: FLOW SWITCH SIGNAL #2: GND	③ CN05-INPUT #1: N/A #2: N/A #3: N/A #4: N/A #5: SET TEMP #6: GND #7: EXT_WATER_OUT TEMP #8: GND	④ CN408-INPUT #1: PUMP_PROTECTION TEMP #2: GND
⑤ CN804-INPUT #1: NIGHT_LOW_NOISE_OP SIGNAL #2: GND #3: DEMAND_OP SIGNAL #4: GND #5: FAN_FORCE_OP SIGNAL #6: GND #7: UNUSUAL_CONDITION_ RESET SIGNAL #8: GND #9: N/A #10: N/A #11: WATER_LAW #12: GND	⑥ CN402-PRESSURE SENSOR #1: #2: PHE_IN SIGNAL #3: GND #4: 5V	⑦ CN803-INPUT #1: PUMP_INTERLOCK SIGNAL #2: GND #3: OPERATION_ON SIGNAL #4: GND #5: OPERATION_OFF SIGNAL #6: GND #7: OPERATION_MODE SIGNAL #8: GND #9: THERMAL_STORAGE_OP SIGNAL #10: GND #11: THERMAL_STORAGE_CTRL SIGNAL #12: GND #13: THERMAL_STORAGE_ THERMO SIGNAL #14: GND	⑧ CN406-INPUT #1: WATER_OUT1 TEMP #2: GND
⑨ CN405-INPUT #1: WATER_IN TEMP #2: GND	⑩ CN407-INPUT #1: WATER_OUT2 TEMP #2: GND	⑪ CN801-EEV 1 #1: EEV1_B_bar SIGNAL #2: EEV1_A_bar SIGNAL #3: EEV1_B SIGNAL #4: EEV1_A SIGNAL #5: 12V #6: 12V	⑫ CN802-EEV 2 #1: EEV2_B_bar SIGNAL #2: EEV2_A_bar SIGNAL #3: EEV2_B SIGNAL #4: EEV2_A SIGNAL #5: 12V #6: 12V
⑬ CN311-COMM 2,3 #1: COM3_OF1 #2: COM3_OF2 #3: 12V #4: GND #5: COM2_F3 #6: COM2_F4	⑭ CN301-COMM 1 #1: OUTDOOR F1 #2: OUTDOOR F2		

5-2. ASSY PCB MAIN

• Model: All models name is commonness



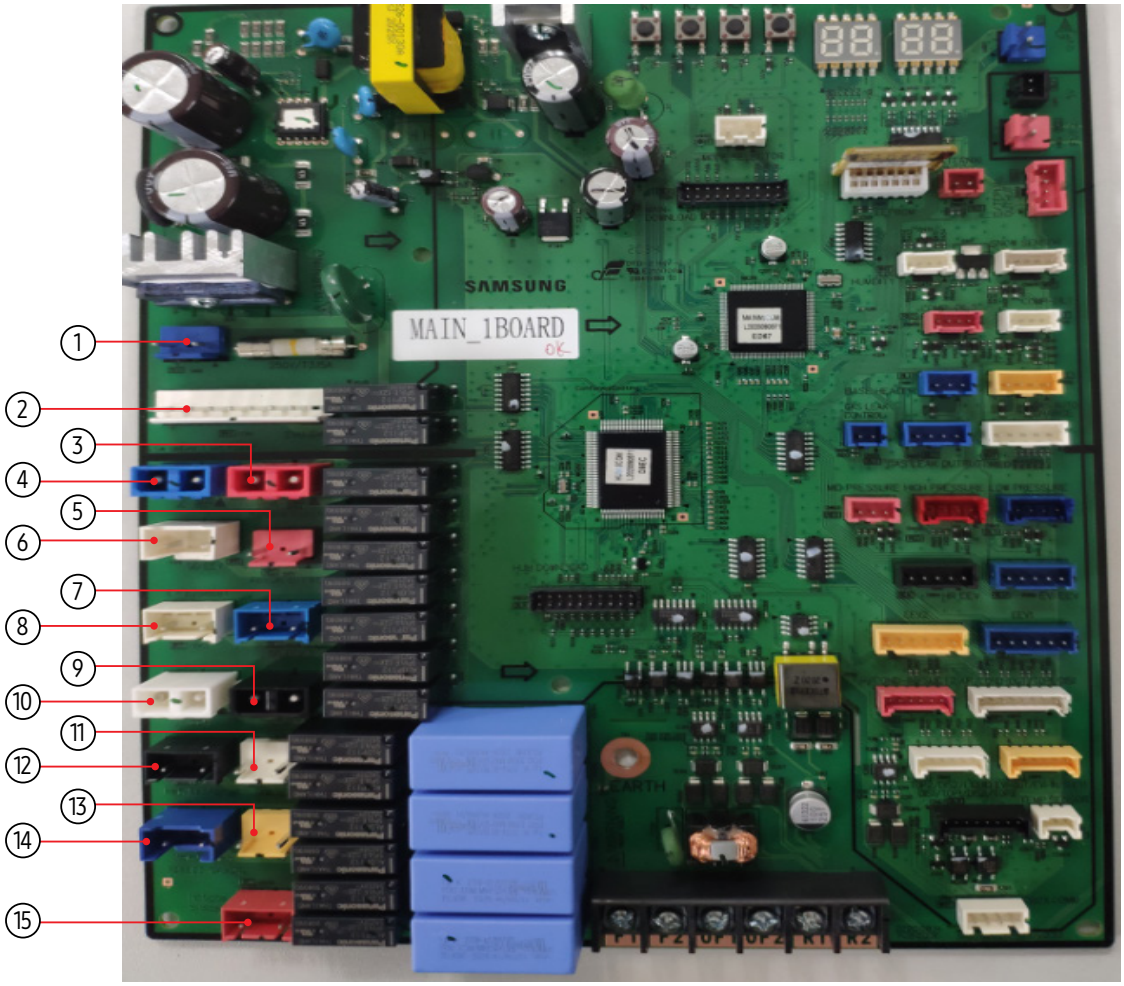
ASSY PCB MAIN (cont.)

• Model: All models name is commonness

① DOWNLOAD	② MOD SELEECTOR	③ EEPROM	④ EXTERNAL-CONTROL
#1 RXD #2 TXD #3 N-TRST #4 TDO #5 TCK #6 TDI #7 TMS #8 #9 GND #10 5V	#1 KEY_IN_3 #2 GRID_8 #3 KEY_IN_4	#1 GND #2 #3 5V #4 EEPROM_SELECT #5 EEPROM_SO #6 EEPROM_SI #7 EEPROM_CLOCK	#1 GND #2 5V
⑤ 12V	⑥ 5V	⑦ F1/F2	⑧ EXTERNAL-OUTPUT
#1 12V #2 GND	#1 5V #2 GND	#1 COM_B #2 COM_A	#1 12V #2 EEPROM CHECK OUT #3 COMP CHECK OUT
⑨ HUMIDITY	⑩ SNOW SENSOR	⑪ COMP OIL2	⑫ COMP OIL2
#1 5V #2 GND #3 ROOM TEMP2 #4 HUMIDITY	#1 12V #2 #3 GND #4 SNOW SENSOR #5 PSD POWER	#1 5V #2 COMP2 OIL TO #3 COMP2 OIL BOTTOM #4 GND #5 GND	#1 5V #2 COMP1 OIL TO #3 COMP1 OIL BOTTOM #4 GND #5 GND
⑬ BASE HEATER	⑭ GAS AUTO CHARGE	⑮ GAS LEAK CONTROL	⑯ DRED
#1 12V #2 #3 BASE HEATER OUT	#1 12V #2 AUTO CHARGE VALVE OUT #3 12V #4 AUTO CHARGE LIQUID VALVE OUT	#1 GND #2 5V	#1 DRED1 #2 DRED2 #3 DRED3 #4 GND #5 5V
⑰ GAS LEAK OUTPUT	⑱ LOW PRESSURE	⑲ HIGH PRESSURE	⑳ MID PRESSURE
#1 12V #2 PUMP DOWN START OUT #3 12V #4 PUMP DOWN END OUT	#1 #2 LOW PRESSURE SENSOR #3 GND #4 5V	#1 #2 HIGH PRESSURE SENSOR #3 GND #4 5V	#1 #2 MID PRESSURE SENSOR #3 GND #4 5V
㉑ EVI EEV	㉒ HR EEV	㉓ EEV1	㉔ EEV2
#1 EEV3 A OUT #2 EEV3 B OUT #3 EEV3 A BAR OUT #4 EEV3 B BAR OUT #5 12V	#1 EEV4 A OUT #2 EEV4 B OUT #3 EEV4 A BAR OUT #4 EEV4 B BAR OUT #5 12V	#1 EEV1 B BAR OUT #2 EEV1 A BAR OUT #3 EEV1 B OUT #4 EEV1 A OUT #5 12V #6 12V	#1 EEV2 B BAR OUT #2 EEV2 A BAR OUT #3 EEV2 B BOUT #4 EEV2 A OUT #5 12V #6 12V
㉕ AIR/COND-OUT/TOP1/DIS1	㉖ COND-IN/SUCT2	㉗ EVI-OUT/EVI-IN/SUCT1	㉘ TOP2/DI2/LIQUID
#1 COMP1 DISCHARGE #2 GND #3 COMP1 TOP #4 GND #5 COND OUT #6 GND #7 AIR #8 GND	#1 SUCTION2 #2 GND #3 COND IN #4 GN #5 SUCTION3 #6 GND	#1 SUCTION1 #2 GND #3 EVI IN #4 GND #5 EMI OUT #6 GND	#1 LIQUID #2 GND #3 COMP2 DISCHARGE #4 GND #5 COMP2 TOP #6 GND
㉙ C-BOX COMM			
#1 12V #2 INVERTER SMPS OUT #3 C-BOX COMM #4 GND			

ASSY PCB MAIN (cont.)

• Model: All models name is commonness



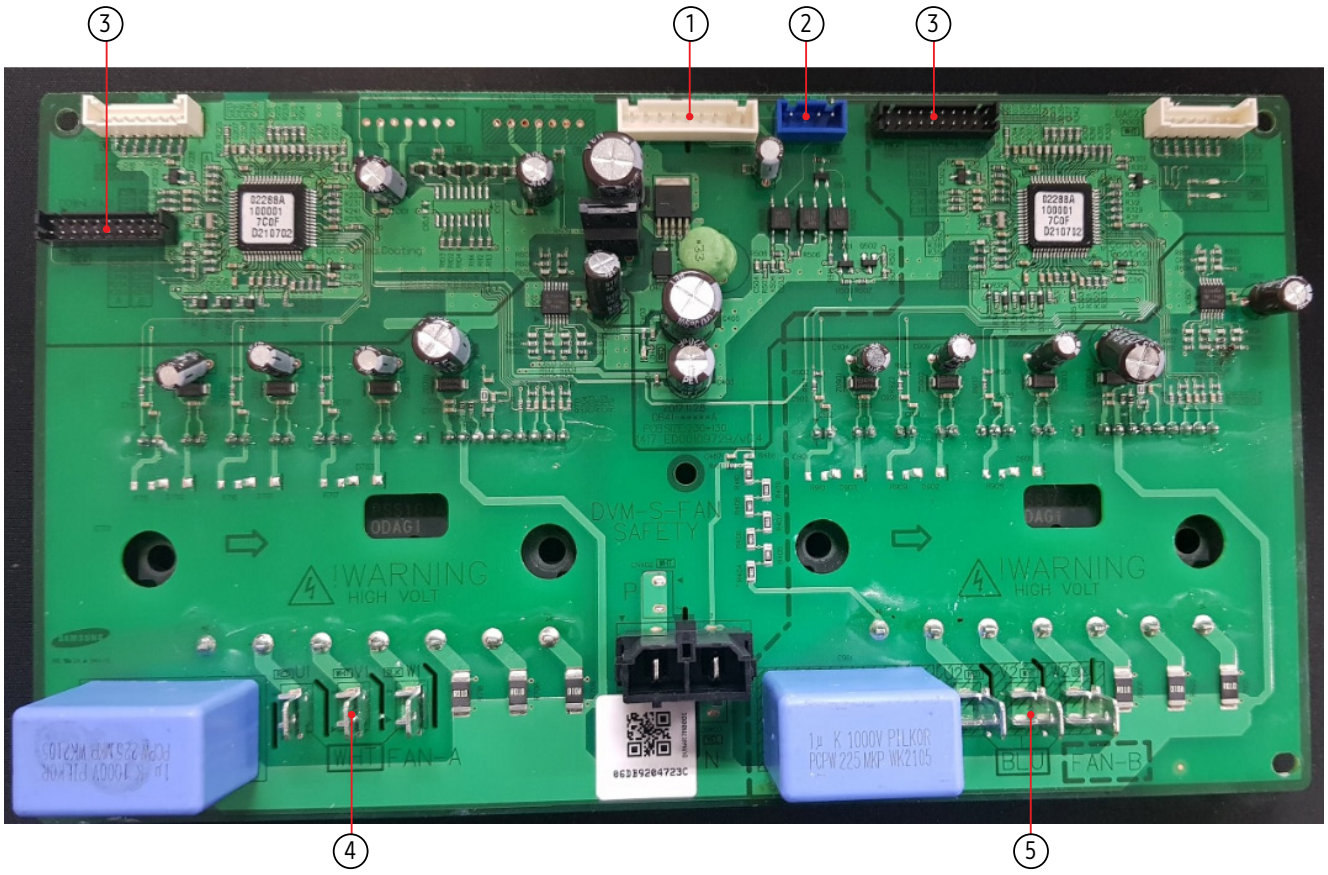
ASSY PCB MAIN (cont.)

• Model: All models name is commonness

① AC POWER INPUT #1 AC LIVE #2 AC NEUTRAL	② EVI1 EVI2 #1 EVI VALVE1 #3 EVI VALVE2 #7 EMI VALVE1 #8 EMVI VALVE2 #9 AC NEUTRAL	③ HOTGAS BYPASS #1 HOTGAS BYPASS1 #2 HOTGAS BYPASS1	④ LOW AMIBIENT #1 LOW AMBIENT #2 LOW AMBIENT
⑤ ACCUM OIL RETURN #1 ACCUM OIL RETURNVALVE #2 ACCUM OIL RETURNVALVE	⑥ OD EEV1 #1 OD EEV1 #2 OD EEV1	⑦ OD EEV2 #1 OD EEV2 #2 OD EEV2	⑧ EVI BYPASS1 #1 EVI BYPASS1 #2 EVI BYPASS1
⑨ CCH2 #1 CCH2 #2 CCH2	⑩ CCH1 #1 CCH1 #2 CCH1	⑪ 4WAY2 #1 4WAY2 #2 4WAY2	⑫ REF RECHARGE #1 REF RECHARGE #2 REF RECHARGE
⑬ 4WAY1 #1 4WAY1 #2 4WAY1	⑭ MAIN COOLING #1 MAIN COOLING #2 MAIN COOLING	⑮ EVI BYPASS2 #1 EVI BYPASS2 #2 EVI BYPASS2	

5-3. ASSY PCB SUB-FAN

• Model: All models name is commonness



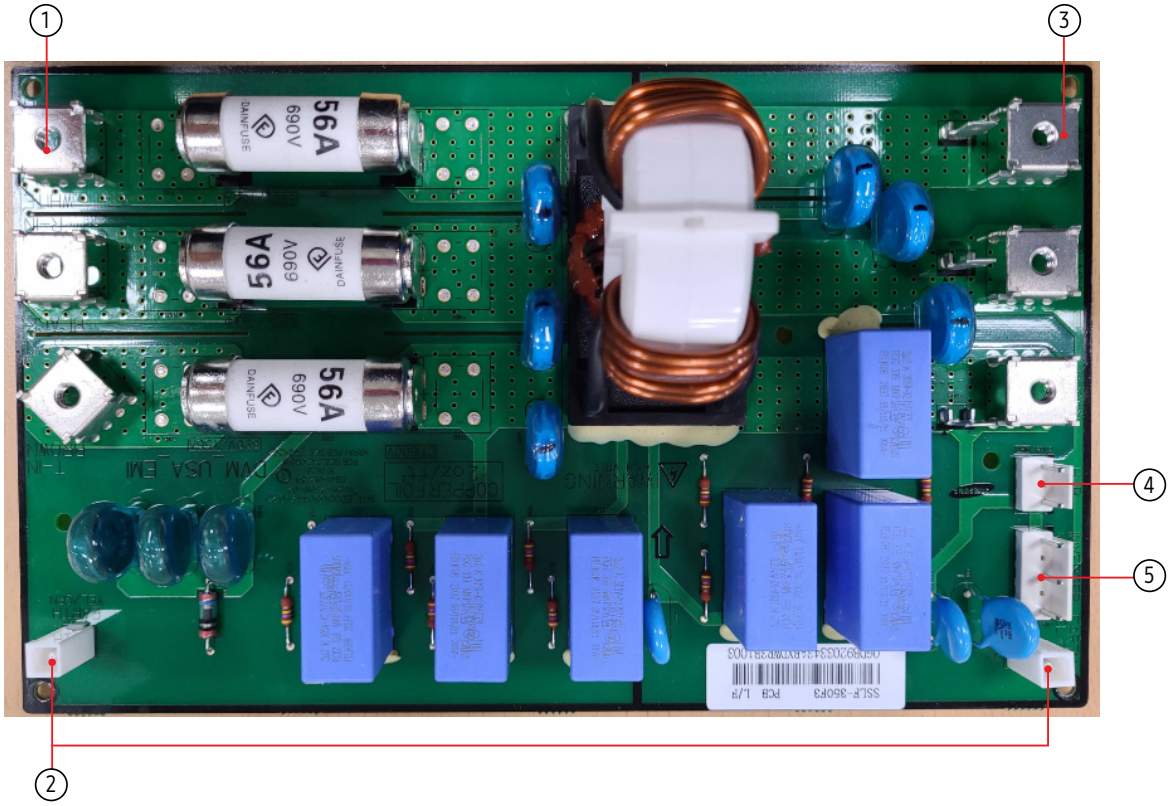
ASSY PCB SUB-FAN (cont.)

• Model: All models name is commonness

① INVERTER to FAN #1 INVERTER DC18V #2 INVERTER GND #3 - #4 INVERTER GND #5 - #6 MAIN DC 12V to INV #7 INVERTER SMPS RELAY to INV #8 COMM to INV #9 GND to INV	② Main to FAN #1 DC12V #2 INV.SMPS RELAY #3 COMM #4 GND	③ Download Connector #1 RXD #2 TXD #3 BOOT #4 TDO #5 TCK #6 TDI #7 TMS #8 NTRST #9 P_GND #10 DC 5V	④ IPM to Motor1 #1 U1 #2 - #3 V1 #4 - #5 W1
⑤ IPM to Motor2 #1 U2 #2 - #3 V2 #4 - #5 W2	⑥ DC LINK VOLTAGE SENSING #1 540Vdc from INV #2 P_GND from INV		

5-4. ASSY PCB SUB-EMI (F power model only)

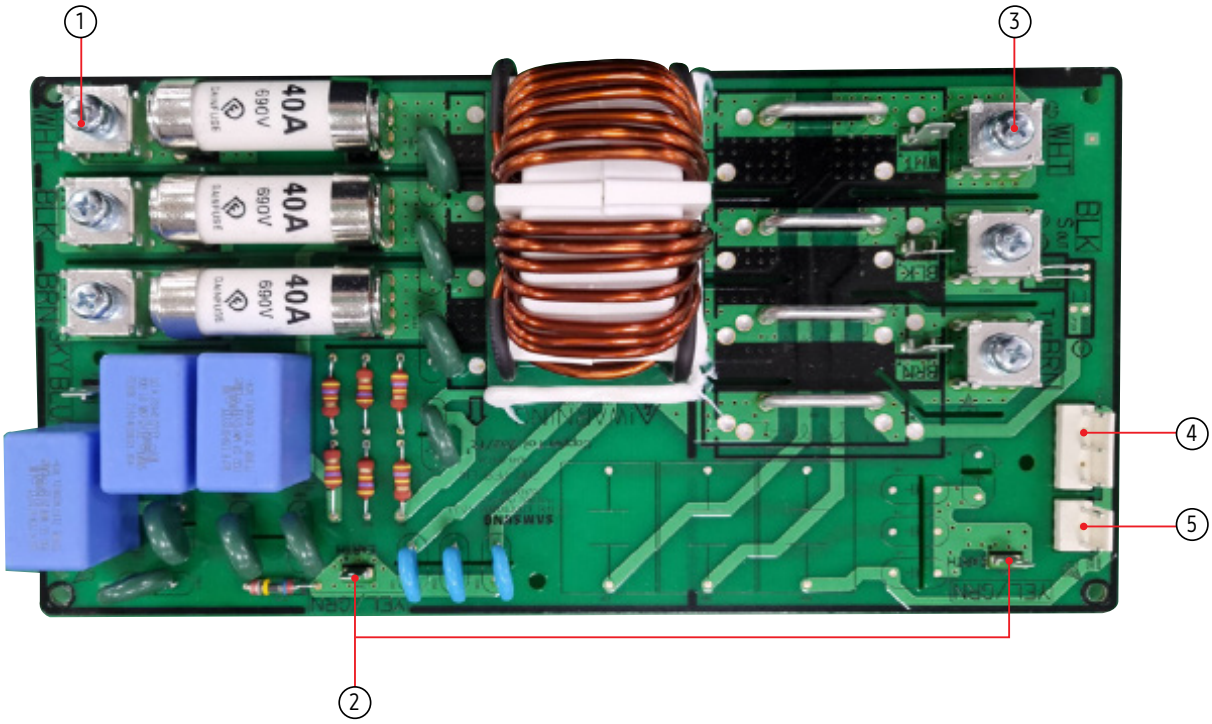
• Model: VPD010C6M-5Y, VPD015C6M-5Y



① Input Power #1 R-IN #2 S-IN #3 T-IN #4 N-IN	② Earth #1 Earth	③ Output Power #1 R-OUT #2 S-OUT #3 T-OUT	④ Connector to INVERTER PBA #1 T-OUT #2 - #3 S-OUT #4 - #5 N
⑤ Connector to HUB BPA #1 T-OUT #2 - #3 N			

5-5. ASSY PCB SUB-EMI (J power model only)

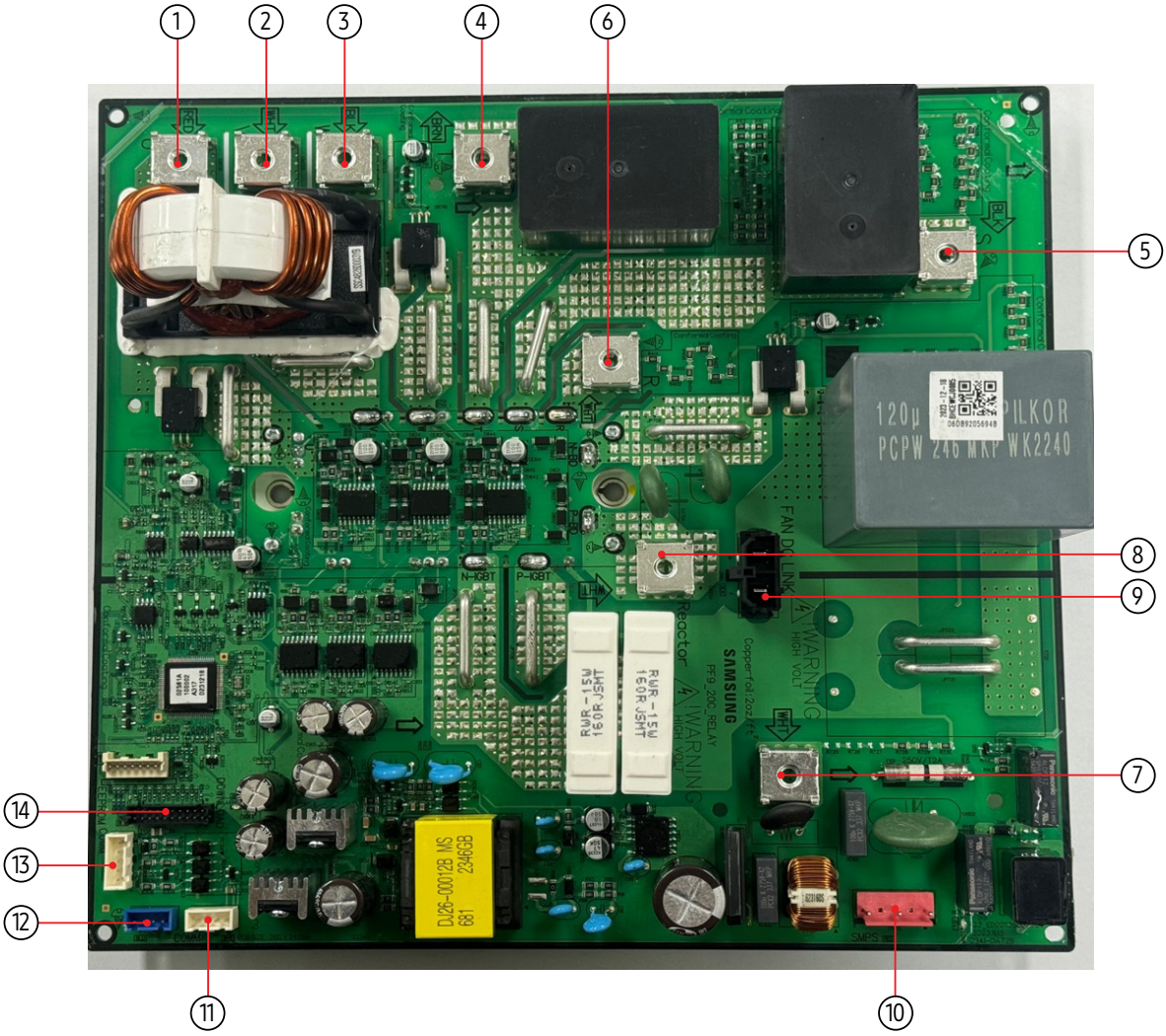
• Model: VPD010C6M-5G, VPD015C6M-5G



① Input Power	② Earth	③ Output Power	④ Connector to INVERTER PBA
#1 R-IN #2 S-IN #3 T-IN #4 N-IN	#1 Earth	#1 R-OUT #2 S-OUT #3 T-OUT	#1 T-OUT #2 - #3 S-OUT #4 - #5 N
⑤ Connector to HUB BPA #1 T-OUT #2 - #3 N			

5-6. ASSY PCB INVERTER (F power model only)

• Model: VPD010C6M-5Y, VPD015C6M-5Y



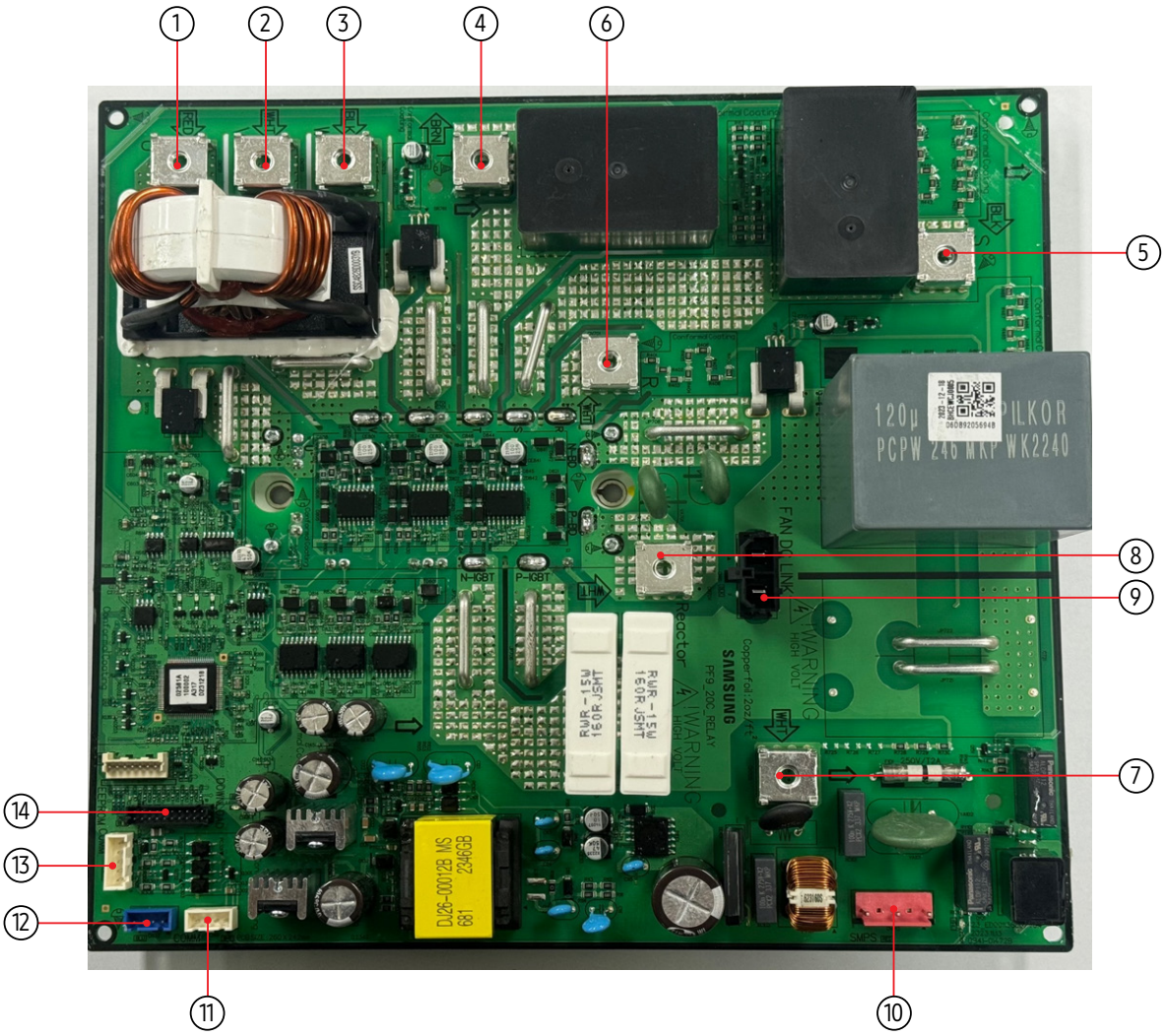
ASSY PCB INVERTER (F power model only) (cont.)

• Model: VPD010C6M-5Y, VPD015C6M-5Y

① U-COMP U #1: COMP U	② V-COMPV #1: COMPV	③ W-COMPW #1: COMPW	④ T-INPUT TOP #1: T-IN
⑤ S-INPUT TOP #1: S-IN	⑥ R-INPUT TOP #1: R-IN	⑦ CN705-REACTOR1 #1: REACTOR1	⑧ CN704-REACTOR 2 #1: REACTOR 2
⑨ CN15-FAN POWER #1: DC_LINK #3: GND	⑩ CNP13-AC POWER #1: AC LIVE #3: AC NEUTRAL	⑪ CN31-MAIN COMM 2 #1: 12V-MAIN #2: IN-SMPS-RELAY #3: COMM-IN #4: GND-MAIN	⑫ CN32-MAIN COMM1 #1: 12V-MAIN #2: IN-SMPS-RELAY #3: COMM-IN #4: GND-MAIN
⑬ CN91-FAN DC #1: 18V #2: GND #3: 5V-FAN #4: AD-SELECT	⑩ CNS22-INV MICOM DOWNLOAD #1: RX_DEBUG #2: TX_DEBUG #3: BOOT #4: JTAG_TDO #5: JTAG_TCLK #6: JTAG_TDI #7: JTAG_TMS #8: JTAG RESET #9: GND #10: VCC #11: VCC #17: GND #18: DAC_CLK #19: DAC_CS #20: DAC_DATA		

ASSY PCB INVERTER (J power model only) (cont.)

• Model: VPD010C6M-5G, VPD015C6M-5G



ASSY PCB INVERTER (J power model only) (cont.)

• Model: VPD010C6M-5G, VPD015C6M-5G

① U-COMP U #1: COMP U	② V-COMPV #1: COMPV	③ W-COMPW #1: COMPW	④ T-INPUT TOP #1: T-IN
⑤ S-INPUT TOP #1: S-IN	⑥ R-INPUT TOP #1: R-IN	⑦ CN705-REACTOR1 #1: REACTOR1	⑧ CN704-REACTOR 2 #1: REACTOR 2
⑨ CN15-FAN POWER #1: DC_LINK #3: GND	⑩ CNP13-AC POWER #1: AC LIVE #3: AC NEUTRAL	⑪ CN31-MAIN COMM 2 #1: 12V-MAIN #2: IN-SMPS-RELAY #3: COMM-IN #4: GND-MAIN	⑫ CN32-MAIN COMM1 #1: 12V-MAIN #2: IN-SMPS-RELAY #3: COMM-IN #4: GND-MAIN
⑬ CN91-FAN DC #1: 18V #2: GND #3: 5V-FAN #4: AD-SELECT	⑩ CNS22-INV MICOM DOWNLOAD #1: RX_DEBUG #2: TX_DEBUG #3: BOOT #4: JTAG_TDO #5: JTAG_TCLK #6: JTAG_TDI #7: JTAG_TMS #8: JTAG RESET #9: GND #10: VCC #11: VCC #17: GND #18: DAC_CLK #19: DAC_CS #20: DAC_DATA		

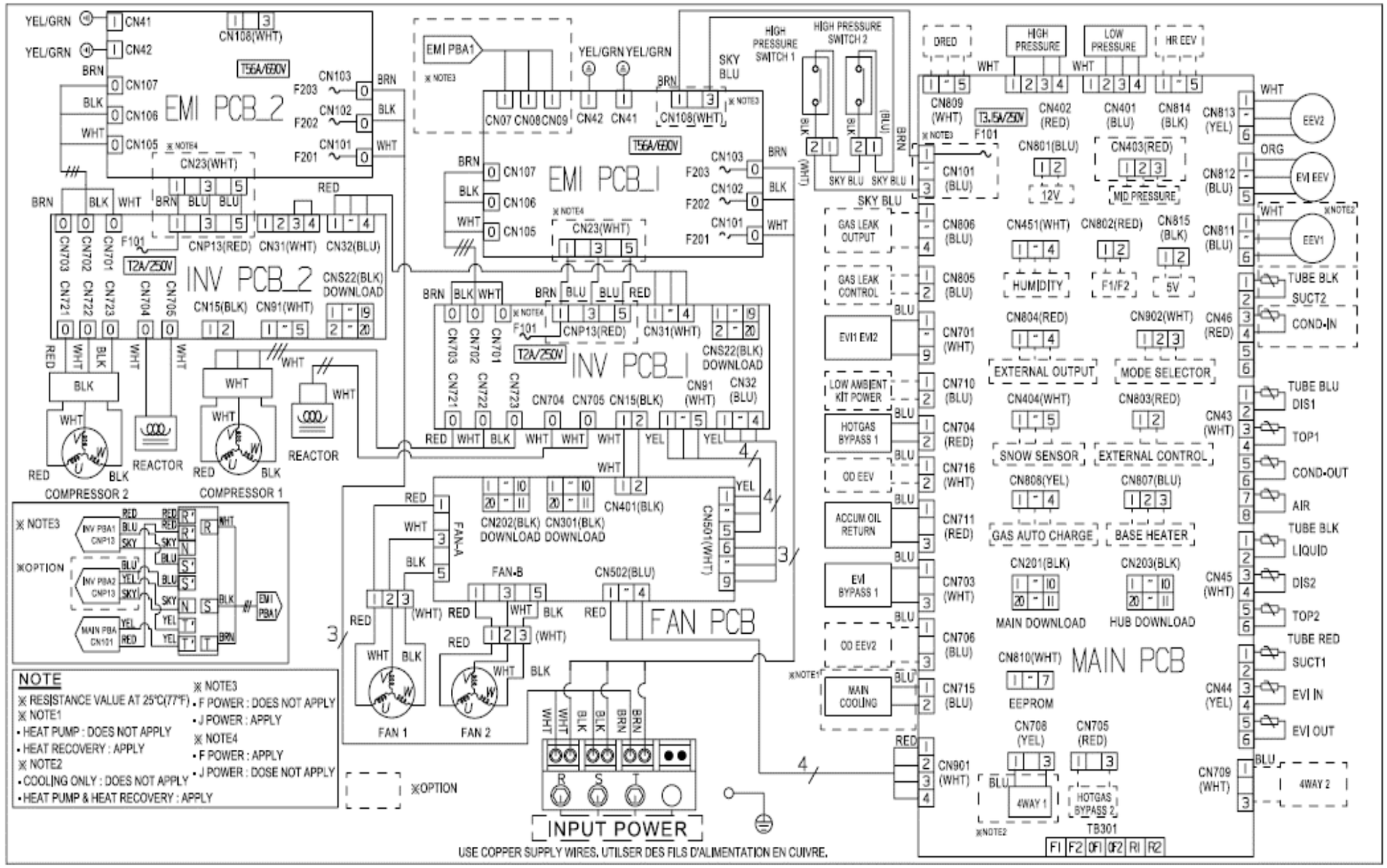
6. Wiring Diagram

6-1. VRF CHILLER hydro part wiring diagram

• Model: VPD010/015C6M-5* Series

6-2. VRF CHILLER hydro part wiring diagram

• Model: VPD010C6M-5Y, VPD015C6M-5Y



NOTE

※ RESISTANCE VALUE AT 25°C(77°F)

※ NOTE1
- HEAT PUMP : DOES NOT APPLY
- HEAT RECOVERY : APPLY

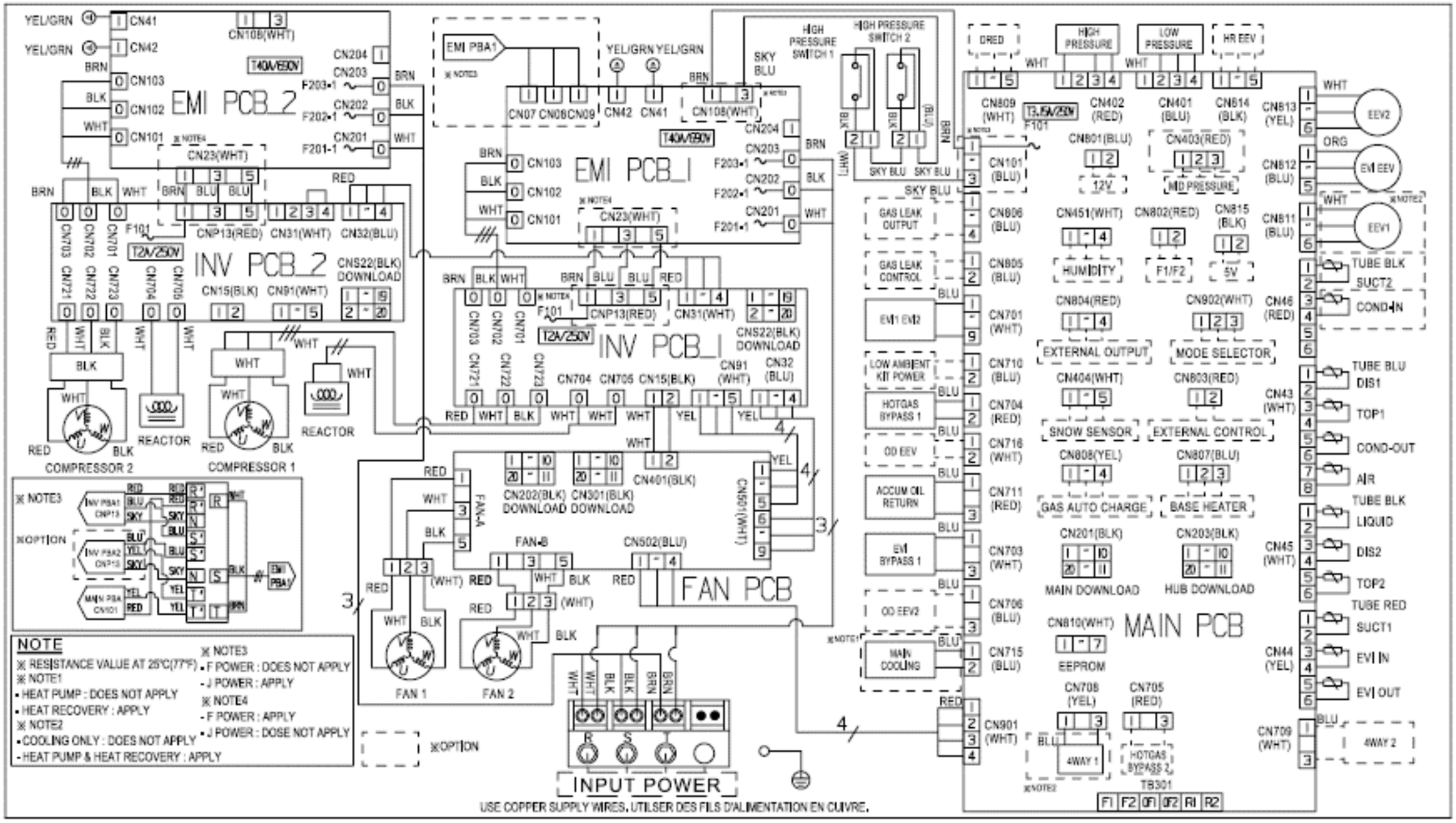
※ NOTE2
- COOLING ONLY : DOES NOT APPLY
- HEAT PUMP & HEAT RECOVERY : APPLY

※ NOTE3
- F POWER : DOES NOT APPLY
- J POWER : APPLY

※ NOTE4
- F POWER : APPLY
- J POWER : DOSE NOT APPLY

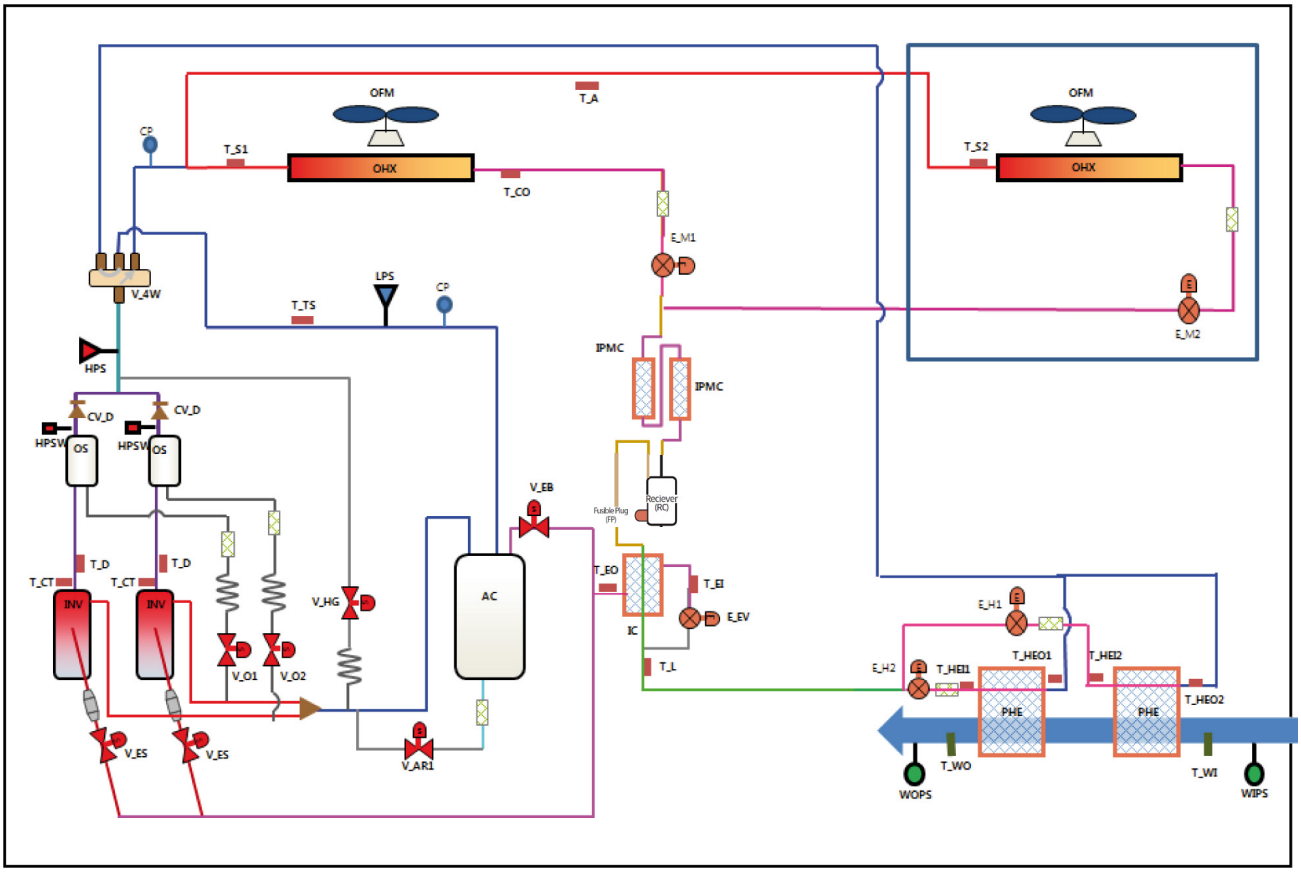
6-3. VRF CHILLER inverter control part wiring diagram

• Model: VPD010C6M-5G, VPD015C6M-5G



7. Cycle Diagram

• Model: VPD010/015C6M-5* Series



Abbreviation	Name
INV	Inverter Compressor
OFM	Outdoor Fan Motor
OHX	Outdoor Heat Exchanger
AC	Accumulator
OS	Oil Separator
IC	Intercooler
IPMC	IPM Cooler
HPS	High Pressure Sensor
LPS	Low Pressure Sensor
WIPS	Water Inlet Temperature Sensor
WOPS	Water Outlet Temperature Sensor
HPSW	High Pressure Switch
E_M1	Main EEV1
E_M2	Main EEV2
E_H1	Hydro EEV1
E_H2	Hydro EEV2
E_EV	EVI EEV
V_ES	EVI Solenoid Valve
V_EB	EVI Bypass Valve
V_O1	Oil Bypass Valve1
V_O2	Oil Bypass Valve2
PHE	Plate Heat Exchanger
REC	Receiver
CP	Charging Port

Abbreviation	Name
V_HG	Hot Gas Bypass Valve
V_4W	4way Valve
V_AR	Accumulator Oil Return Valve
CV_D	Discharge Check Valve
T_D	Discharge Temperature Sensor
T_TS	Total Suction Temperature Sensor
T_S1	Suction1 Temperature Sensor
T_S2	Suction2 Temperature Sensor
T_CO	Cond. Out Temperature Sensor
T_EI	EVI In Temperature Sensor
T_EO	EVI Out Temperature Sensor
T_L	Liquid Pipe Temperature Sensor
T_CT	Comp. Top Temperature Sensor
T_A	Ambient Temperature Sensor
T_HEI1	Hydro EVA In1 Temperature Sensor
T_HEI2	Hydro EVA In2 Temperature Sensor
T_HEO1	Hydro EVA Out1 Temperature Sensor
T_HEO2	Hydro EVA Out2 Temperature Sensor
T_WI	Water Inlet Temperature Sensor
T_WO	Water Outlet Temperature Sensor
FP	Fusible Plug

• Cycle diagram function explanation

1. Accumulator: Separating the incoming liquid refrigerant to the compressor in order to prevent liquid refrigerant.
2. Oil Separator: Separating the oil from the refrigerant discharged from the compressor, and the separated oil is returned to the compressor.
3. Intercooler: Supercooled liquid refrigerant through the heat exchanger and makes the medium pressure gas refrigerant injected into the compressor.
4. IPM Cooler: IPM (Intelligent Power Module) by cooling to prevent overheating.
5. High/Low Pressure Sensor: Measure high/low Pressure of system.
6. High Pressure Switch: Suspend immediately for protection of system if high pressure of system exceeds setting value.
7. Outdoor EEV (Main EEV): Adjust the incoming refrigerant to the outdoor heat exchanger during heating operation.
8. EVI EEV: By adjusting the amount of refrigerant passing through the sub cooler to obtain the degree of supercooling and adjust the amount of gas refrigerant entering to the compressor.
9. 4Way Valve: Change the direction of flow of the refrigerant to the cooling / heating operation.
10. ARV (Accumulator Oil Return Valve): Remaining at the bottom of the Accumulator recovered oil to the compressor.
13. Hotgas Valve: Sending the high pressure gas to low pressure pipe in order to protect low pressure.
15. EVI SOL V: This valve opens when using the Vapor Injection.
16. EVI BYPASS V: This valve opens in the sub cooling control. It's closed when using the Vapor Injection.
17. Discharge Temp. Sensor: Measure the temperature of the refrigerant discharged from the compressor.
18. Suction Temp. Sensor: Measure the temperature of the refrigerant to the compressor suction.
19. Cond Out Temp. Sensor: Measure the temperature of the outdoor heat exchanger of the air conditioning operation.
20. EVI In/Out Temp. Sensor: Measure the temperature of the refrigerant inlet and outlet of the Sub Cooler.
21. Liquid Pipe Temperature Sensor: Measure the temperature of supercooling refrigerant in the outdoor unit of the air conditioning.
22. Comp. Top Temp. Sensor: Measure the temperature of Compressor Top Cover.
23. Ambient Temp. Sensor: Measure the outdoor temperature.
24. Receiver: Container for storing a moment before sending the liquefied refrigerant in the condenser to the expansion valve.
25. Fusible Plug: Prevent the rupture of container.
26. Water Inlet Temperature Sensor: Measuring the temperature of the water flowing into the system.
27. Water Outlet Temperature Sensor: Measuring the temperature of the water leaving the system.
28. Water Pressure Sensor: Measure the water pressure.

8. Key Options

8-1. Setting hydro controller option

Basic segment display

	SEG1	SEG2	SEG3	SEG4	SEG5	SEG6	Remarks
Water In	0	1	-	0	5	0	Ex) -5 °C

View mode display

▶ Press and hold K3 and K4 for 3 seconds to enter the view mode.

▶ Press K3 to change view mode in order of the table.

▶ Press K4 to change view mode in reverse order of the table.

▶ Cancelling view mode display

- Press and hold K3 for 3 seconds.

Number of press	KEY operation	SEG1	SEG2	SEG3	SEG4	SEG5	SEG6	Remarks
1 time	Water In	0	1	-	0	5	0	ex) -5 °C
2 times	Water Out	0	2	-	1	1	0	ex) -11 °C
3 times	Outdoor temperature	0	3	-	1	1	2	ex) -11.2 °C
4 times	High pressure	0	4		2	9	3	ex) 29.3 kgf/cm 2G
5 times	Low pressure	0	5		0	7	5	ex) 7.5 kgf/cm 2G
6 times	Comp 1 current frequency	0	6		1	1	0	ex) 110 Hz
7 times	Comp 2 current frequency	0	7		1	1	3	ex) 113 Hz
8 times	Discharge1 temperature	0	8		1	0	1	ex) 101.8 °C → 101(Drop)
9 times	Discharge2 temperature	0	9		1	0	1	ex) 101.8 °C → 101(Drop)
10 times	Top1 temperature	1	0		1	0	1	ex) 101.8 °C → 101(Drop)
11 times	Top2 temperature	1	1		1	0	1	ex) 101.8 °C → 101(Drop)
12 times	Total Suction temperature	1	2	-	1	1	2	ex) -11.2 °C

Number of press	KEY operation	SEG1	SEG2	SEG3	SEG4	SEG5	SEG6	Remarks
13 times	Suction1 temperature	1	3	-	1	1	2	ex) -11.2 °C
14 times	Suction2 temperature	1	4	-	1	1	2	ex) -11.2 °C
15 times	Cond out temperature	1	5	-	1	1	2	ex) -11.2 °C
16 times	Liquid temperature	1	6		3	5	0	ex) 35 °C
17 times	EVA In1 temperature	1	7		3	5	0	ex) 35 °C
18 times	EVA Out1 temperature	1	8		5	0	0	ex) 50 °C
19 times	EVA In2 temperature	1	9		3	5	0	ex) 35 °C
20 times	EVA Out2 temperature	2	0		3	5	0	ex) 35 °C
21 times	EVI In temperature	2	1		3	5	0	ex) 35 °C
22 times	EVI Out temperature	2	2		3	5	0	ex) 35 °C
23 times	IPM1 temperature	2	3		8	0	0	ex) 80 °C
24 times	IPM2 temperature	2	4		8	0	0	ex) 80 °C
25 times	CT1	2	5		1	1	0	ex) 11.0A
26 times	CT2	2	6		1	1	0	ex) 11.0A
27 times	Operation mode	2	7			Blank/S	C/H	S: Hot water/Cool storage / C: Cooling, H: Heating
28 times	Set temperature	2	8	-	0	5	0	ex) -5 °C
29 times	Pump output	2	9		0	n/F	Blank/F	On / Off
30 times	Fan Step	3	0		0	2	4	ex) 24 step
31 times	Hydro EEV1	3	1		1	0	0	ex) 1007 step → 100 (Drop "/10")
32 times	Hydro EEV2	3	2		1	0	0	ex) 1007 step → 100 (Drop "/10")
33 times	Main EEV1	3	3		1	0	0	ex) 1007 step → 100 (Drop "/10")
34 times	Main EEV2	3	4		1	0	0	ex) 1007 step → 100 (Drop "/10")
35 times	EVI EEV	3	5		4	7	3	ex) 473 step
36 times	PHE inlet pressure	3	6		0	1	2	ex) 1.2 kgf/cm^{2}G
37 times	PHE outlet pressure	3	7		0	0	4	ex) 0.4 kgf/cm^{2}G
38 times	Capacity (Cooling)	3	8		0	7	0	ex) 70 kW
39 times	(Exterior) Room temperature	3	9		2	5	5	ex) 25.5 °C
40 times	(Exterior) Water outlet temperature	4	0	-	1	1	0	ex) -11 °C
41 times	Pressure difference calibration	4	1	-	0	0	2	ex) -0.2 kgf/cm^2

8-2. How to set hydro controller option

	Option No.		Option value			
	SEG1	SEG2	SEG3	SEG4	SEG5	SEG6
Operation On/Off input method	0	1	-	-	-	0
Temperature setting input method	0	2	-	-	-	0

1. Turn on the product.
2. Press and hold the K2 to enter the option setting.
   - In option setting, other key input (forced fan, temperature setting, etc.) is not received.
3. Press K1 shortly to display the number for selected option.
4. Press K2 shortly to display the number for set value of the selected option.
5. Finish the option setting.
   - Press K2 long to finish the setting with all option values determined and saved.
   - Press K1 long to finish the setting with all option values cancelled and keep the values as before entering the setting.

• In option setting, press K4 long to initialize all option values.

No.	Option item	Option value	Factory default	Option	Definition	Setting unit	Module control setting option Note1)
1	Operation On/Off input method	0.1	0	0	Module control/DMS	Main unit of group Note2)	
				1	External contact		
2	Temperature setting input method	0.1	0	0	Module control/DMS	Main unit of group Note2)	
				1	External contact		
3	Operation mode (Cool/Heat, normal/hot water) input method	0.1	0	0	Module control/DMS	Main unit of group Note2)	
				1	External contact		
4	Demand control input method	0.1	0	0	Module control/DMS	Main unit of group Note2)	
				1	External contact		
5	Demand level	0 ~ 11	3	0	Default (100 %)	Main unit of module	0
				1	95 %		
				2	90 %		
				3	85 %		
				4	80 %		
				5	75 %		
				6	70 %		
				7	65 %		
				8	60 %		
				9	55 %		
				10	50 %		
				11	Not applied (No limit)		
6	Quiet function input method	0.1	0	0	Module control/DMS	Main unit of group Note2)	
				1	External contact		
7	Forced fan function input method	0.1	0	0	Module control/DMS	Main unit of group Note2)	
				1	External contact		
8	Water law input method	0.1	0	0	Module control/DMS	Main unit of group Note2)	
				1	External contact		
9	Pump operation when thermo off	0.1	0	0	Pump OFF when thermo OFF and operation pattern is not standard control	Main unit of module	
				1	Pump ON always when thermo OFF		
10	Remote error reset input	0.1	0	0	Disuse	Main unit of module	
				1	Use		
11	Setting address of Chiller Unit - Module must be designated when it is installed. (Refer to Module-Controller Installation Manual)	0 ~ 15	0		Setting unit address	Each unit	

No.	Option item	Option value	Factory default	Option	Definition	Setting unit	Module control setting option Note1)
12	Quiet function level	0 ~ 3	1	0	Default (100 %)	Main unit of module	0
				1	Level1		
				2	Level2		
				3	Level3		
13	Confirm delay for unsecured flow rate when operating	10 ~ 240	30		Delay for inspecting no input for pump interlock and unsecured flow rate (by seconds)	Main unit of module	
14	Using exterior water outlet temperature sensor	0/1	0	0	Disuse	Main unit of group Note2)	
				1	Use		
15	Water law control standard	0/1	0	0	Outdoor temperature	Main unit of group Note2)	
				1	Room temperature (external room temperature sensor installation necessary)		0
16	AirCool1 (For water law)	0 ~ 20	10		Standard 1 outdoor temperature for cooling	Main unit of group Note2)	
17	AirCool2 (For water law)	30 ~ 40	35		Standard 2 outdoor temperature for cooling		
18	RoomCool1 (For water law)	15 ~ 24	20		Standard 1 room temperature for cooling		
19	RoomCool2 (For water law)	25 ~ 35	30		Standard 2 room temperature for cooling		
20	Tcool1 (For water law)	-10 ~ 25	15		Standard 1 set temperature for cooling		
21	Tcool2 (For water law)	-10 ~ 25	7		Standard 2 set temperature for cooling		
22	AirHeat1 (For water law)	-20 ~ 5	10		Standard 1 outdoor temperature for heating		
23	AirHeat2 (For water law)	10 ~ 20	15		Standard 2 outdoor temperature for heating		
24	RoomHeat1 (For water law)	15 ~ 24	20		Standard 1 room temperature for heating		
25	RoomHeat2 (For water law)	25 ~ 35	30		Standard 2 room temperature for heating		
26	Theat1 (For water law)	35 ~ 60	45		Standard 1 set temperature for heating		
27	Theat2 (For water law)	35 ~ 60	35		Standard 2 set temperature for heating		
28	Operation ON/OFF by external contact	0/1	0	0	Recognize usual signal	Main unit of group Note2)	
				1	Recognize instant signal		
29 ~ 33	Function expansion available						
34	Using low temperature function	0/1	0	0	Disuse	Each unit	
				1	Use		
35 ~ 37	Function expansion available						

Note1) For options that can be selected by module control and main option, the option value selected for last time will be saved.

Note2) Main unit of module when group is not available

Function description

No.	Description
1	Select operation On/Off input method of module/group
2	Select temperature setting input method of module/group
3	Select operation mode (Cool/Heat, Hot water/Cool storage) input method of module/group
4	Select demand control input method of module/group
5	Select demand level • Current will be limited below the set level when "Perform" command is transmitted.
6	quiet function input method of module
7	Select forced fan function input method of module • Forced fan: Removes accumulated snow by operating the fan of stopped unit in low frequency • Snow accumulation prevention, which operates occasionally when outdoor temperature is below zero, is basic function.
8	Select water law input method of module/group
9	Select pump operation status when thermo OFF
10	Select to use error clear function by external contact
11	Setting CHILLER unit address: identical with channel address used by DMS
12	Select quiet function level • Quiet function will start in set level when "Perform" command is transmitted. • Level comparison: Level3 › Level2 › Level1
13	Confirm delay for unsecured flow rate when operating: Delay for inspecting no input for pump interlock and unsecured flow rate • Compressor will not operate until water flow is detected.
14	Set when controlling water outlet temperature by installing extra water temperature gauge on water pipe header or tank • External water outlet temperature sensor should be installed on main unit of group (or module when group is not available). • Standard for water outlet temperature depends on external water outlet temperature sensor except when operation pattern is standard control.
15	Setting water law standard • To set room temperature as stnadard, external room temperature sensor should be installed. • Room temperature sensor should be installed on main unit of group (or module when group is not available).
16 ~ 27	Water law control constant: Refer to water law operation graph.
28	Recognition of external control operation ON/OFF • 0 (recognizing usual signal): Constantly inspects ON/OFF status of contact and set operation ON/OFF • 1 (recognizing instant signal): Set operation ON/OFF when contact ON/OFF signal is input (when external contact is consisted of button click)
34	Select to use low temperature function • The function will operate when set simultaneously with product option of module control. (Seg23 of installation option 02 = 'E') • Low temperature function: Expands water outlet usage range in Cool/Cool stoarge mode. (5 ~ 25 °C(41~77 °F)→ -10 ~ 25 °C (14~77 °F)) • When using low temperature function, use brine and maintain the concentration under freezing point.

Water law

This function allows water outlet temperature to change regarding damand load changes depending on outdoor temperature and room temperature. It can be set to increase energy efficiency and comfort.

- **Outdoor temparture standard**

- **Room temperature standard**

NOTE

Refer to page 125 for set values of water outlet set temperature (Tcool1, Tcool2, Theat1, Theat2), outdoor temperature (AirCool1, AirCool2, AirHeat1, AirHeat2), and room temperature (RoomCool1, RoomCool2, RoomHeat1, RoomHeat2) in the hydro controller option table No.15 ~ 27.

MICOM version display

▶ Press and hold K3 and K5 for 3 seconds to enter the view mode.

▶ Press K3 to change view mode in order of the table.

▶ Cancelling view mode display

- Press and hold K3 for 3 seconds.

	SEG1	SEG2	SEG3	SEG4	SEG5	SEG6	Remarks	Data Source
Address setting mode	0	1	0	1	1	2	Group address → 01 Module address → 01 Channel address → 12	Hydro controller
Main MICOM version	M	n	1	5	1	1	ex) ver 151101 → 1511	Inverter controller
Hub MICOM version	H	b	1	3	0	2	ex) ver 130228 → 1302	Inverter controller
Inverter 1 version	I	1	1	3	0	2	ex) ver 130228 → 1302	Inverter controller
Inverter 2	I	2	1	3	0	2	ex) ver 130228 → 1302	Inverter controller
Fan 1 version	F	1	1	3	0	2	ex) ver 130228 → 1302	Inverter controller
Fan 2 version	F	2	1	3	0	2	ex) ver 130228 → 1302	Inverter controller
EEP version	E	P	1	5	1	1	ex) ver 151101 → 1511	Inverter controller
Hydro version	H	d	1	5	1	1	ex) ver 151101 → 1511	Hydro controller

⚠ **CAUTION**

• Do not change settings for the unit by users.

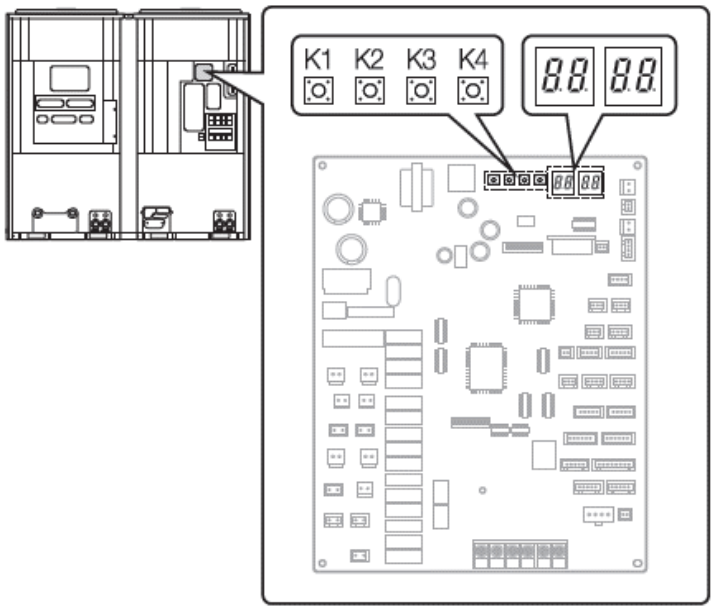
- Electrical wiring may be necessary. It may cause product malfunction if the option is not matching auxiliary equipment.
- Contact the merchandise or service center to change the setting.

8-3. Setting inverter controller option

Basic segment display

Step	Display content	Display			
		SEG1	SEG2	SEG3	SEG4
At initial power input	Checking segment display	8	8	8	8
Chiller units Communicating Setting (Addressing)	-	SEG1	SEG2	SEG3, 4	SEG3, 4
		A	d	0	1
After communication setting (Usual occasion)	Transmit / Reception address	Hydro control: A	Hydro control: 0	0	0

Setting inverter controller option switch



Installing and setting the option with tact switch and functions

1. Press and hold K2 for 3 seconds. (Only available when the operation is stopped)
   - The display will show the following.
   - If you have set the Emergency operation for compressor malfunction, 1 or 2 will be displayed on Seg 4.

   - Seg 1 and Seg 2 will display the number for selected option.
   - Seg 3 and Seg 4 will display the number for set value of the selected option.

2. If you have entered option setting, you can shortly press the K1 switch to change the value of the Seg 1 and Seg 2 to select desired option.
   - Refer to the table for the Seg number of the function for each option.

3. If you have selected desired option, you can shortly press the K2 switch to change the value of the Seg 3 and Seg 4 to change the functional setting for the selected option.
   - Refer to the table for the Seg number of the function for each option.

4. After selecting the function for options, press and hold the K2 switch for 2 seconds.
   Entire 7-segment will blink to begin tracking mode and value of the option will be be saved. If you do not end the setting mode properly, option will not be saved.

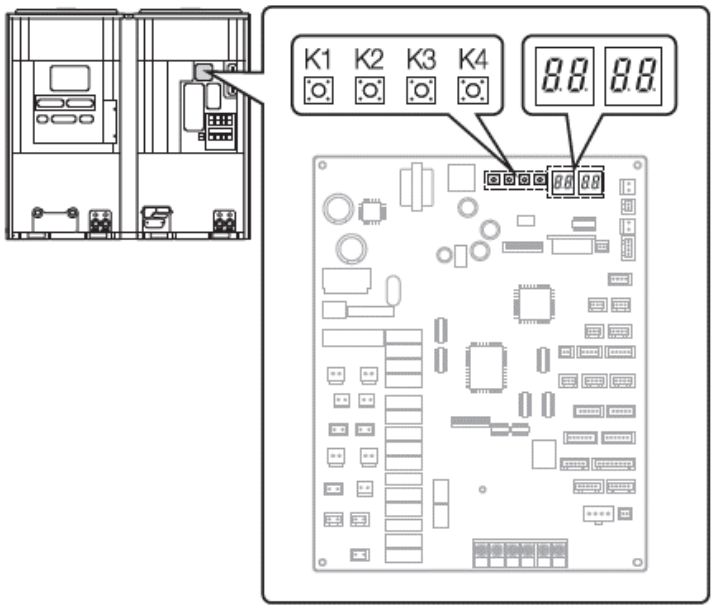
Note1) Forced fan function: Operates fan periodically to prevent show compiling on the fan while the product is stopped

Note2) Maximum cooling capacity restriction: Limits operation capacity of compressor according to indoor load

NOTE

- During option setting, you may press and hold the K1 for 3 seconds to reset the value to previous setting.
- If you want to restore the setting to factory default setting, press and hold the K4 for 3 seconds while you are in the option setting mode.
  - If you press and hold the K4 for 3 seconds, setting will be restored to factory default setting but the setting is not saved.
    Press and hold the K2 for 3 seconds and when the 7-Segment enters tracking mode, setting will be saved.

How to set a special operation using tact switch and check the view mode



K1 (Number of press)	KEY operation	Display on 7-Segment
1times	Refrigerant charging in Heating mode	H 0 1 0 0
2times	Trial operation in Heating mode	H 0 2 0 0
3times	Refrigerant discharging in Heating mode	H 0 3 0 0
4times	Disuse	H 0 3 0 2
5times	Disuse	H 0 3 0 3
6times	Disuse	H 0 3 0 4
7times	Vacuum	H 0 4 0 1
8times	Disuse	H 0 4 0 2
9times	Disuse	H 0 4 0 3
10times	Disuse	H 0 4 0 4
11times	Disuse	H 0 4 0 A
12times	Inverter Fault Detection (Comp#1)	H 0 5 0 1
13times	Inverter Fault Detection (Comp#2)	H 0 5 0 2
14times	Inverter Fault Detection (Fan#1)	H 0 5 0 4
15times	Inverter Fault Detection (Fan#2)	H 0 5 0 A
16times	End Key operation	-

K2 (Number of press)	KEY operation	Display on 7-Segment
1times	Refrigerant charging in Cooling mode	"H" "5" " " " "
2times	Trial operation in Cooling mode	"H" "6" " " " "
3times	Pump down all units in Cooling mode	"H" "7" " " " "
4times	Auto trial operation	"H" "8" " " " "
5times	Checking the amount of refrigerant	"H" "9" "x" "x" (Display of last two digits may differ depending on the progress)
6times	Discharge mode of DC link voltage	"H" "A" " " " "
7times	Forced defrost operation	"H" "b" " " " "
8times	Forced oil collection	"H" "C" " " " "
9times	Inverter compressor1 check	"H" "d" " " " "
10times	Inverter compressor 2 check	"H" "E" " " " "
11times	Fan 1 check	"H" "F" " " " "
12times	Fan 2 check	"H" "U" " " " "
13times	End KEY operation	-

- To use key operating function for service and maintenance when installing module/group, set as main control or cancel in module/group.
- During Discharging mode, voltage of Inv1 and Inv2 will be displayed alternately.
- Even when the power is off, it is dangerous when you come in contact with inverter PCB, fan PCB since high pressure DC voltage is charged to those parts.
- When replacing or repairing the PCB, cut-off the power and wait until the DC voltage is discharged before replacing/repairing them.
- Wait for more than 15 minutes to allow those parts to be fully discharged.
- When there is error, Discharge mode of DC link voltage may not have been effective. Especially when E464 and E364 error is displayed, power element might be damaged so do not use the Discharge mode of DC link voltage.

9. Trial Operation

9-1. Trial operation for each CHILLER unit

NOTE

Before a test run, check whether the power wire is disconnected or misconnected.
If the power wire is disconnected or misconnected, error code displays or power is not supplied or major part is not operated.
The pump built-in model is able not to operate or to be occurred trip of OCR or to reverse rotation of pump,
especially if the power wire is disconnected or misconnected.

1. Turn on the product.
2. Check if DIP S/W 1 is on.

DIP S/W	No.1	
	On	Off
	Main control	Remote control

NOTE

When set as main control, the product do not receive any control of external contact, module control, and upper controller, and any orders from module/group control.

3. Water side pressure sensor calibration
   - Sensor calibration operates for more precise water rate inspection.
   - It operates in main control only.
   - Water flow in the system must not exist when calibrating sensor.
   - Press and hold K4 and K6 for 3 seconds to start the calibration when operation of the product and the pump is off.

Seg1	Seg2	Seg3	Seg4	Seg5	Seg6
K		C	A	L	I

   - The operation will finish automatically within 30 seconds.
   - The product and the pump cannot be operated while calibrating the pressure difference.

4. Forced fan function removes accumulated snow on the fan. Skip this step if snow is not accumulated.
   - Press and hold K6 for 3 seconds when operation is off and the fan will operate.

Seg1	Seg2	Seg3	Seg4	Seg5	Seg6
K			F	A	N

   - During forced fan function, press K6 and the operation will stop.
   - If the operation is on during forced fan function, the fan will stop.

5. Forced pump function checks if water flow is normal.
   - Press and hold K5 for 3 seconds when operation is off and the pump will operate.

Seg1	Seg2	Seg3	Seg4	Seg5	Seg6
K		P	U	M	P

   - During forced pump function, press K5 and the operation will stop.
   - If the operation is on during forced pump function, the pump will stop.

6. Operation mode in main control is selected be cooling/heating switch.

DIP S/W	No.2	
	On	Off
	Cool mode	Heat mode

- Operation mode can be changed only when operation is off.

7. Change the set temperature if necessary in main control.

Default value	Cooling	Heating
	7 °C (45 °F)	45 °C (113 °F)

- Temperature can be adjusted by K3 and K4

Set temperature	K3	K4
	0.1 °C (0.18 °F) up	0.1 °C (0.18 °F) down

- Set temperature range

Set temperature range	Cooling		Heating
	On	Off	
	-10 ~ 25 °C (14~77 °F)	5 ~ 25 °C (41~77 °F)	25 ~ 60 °C (77~140 °F)

- Use brine when using in low temperature condition and maintain the concentration.

8. Operation on/off by tact switch is only possible when main control is set.

Operation mode	K1	K2
	Operation ON	Operation OFF

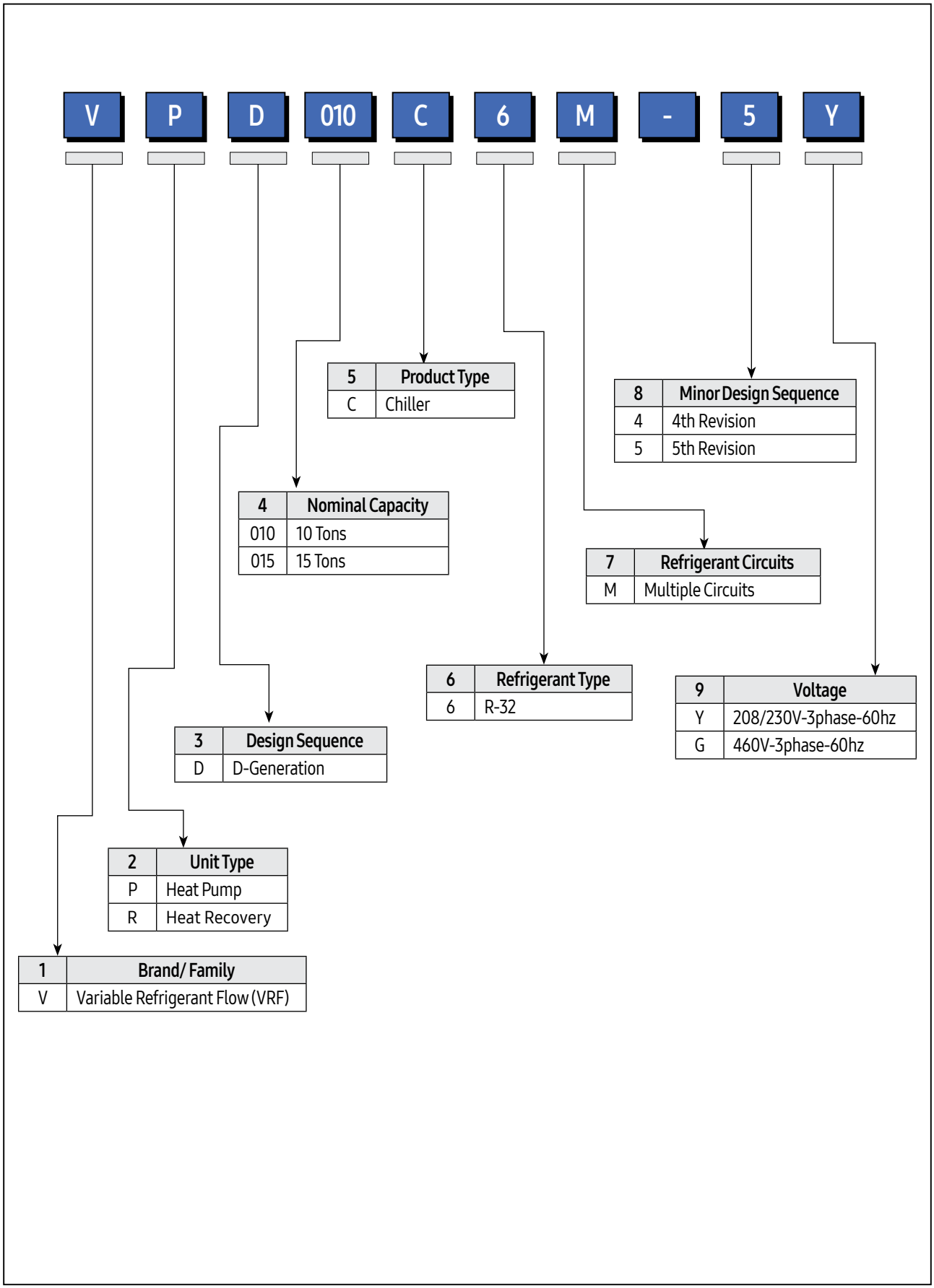
9. Press and hold K5 and K6 for 3 seconds to initialize hydro controller.

⚠ CAUTION

Make sure to close the top and bottom part of the product cabinet during operation.
If you operate the unit with the front cabinet open, it may cause damage to the product and you may not get the precise data from S-NET pro.

10. Reference Sheet

10-1. index of Model Name



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